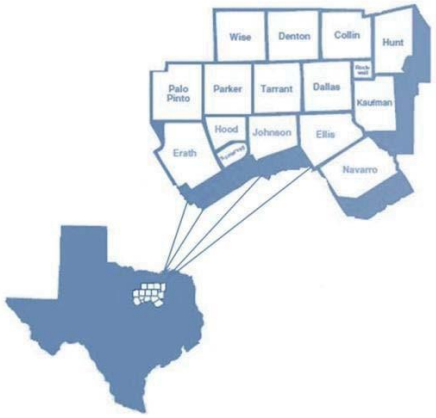
May 2013

North Central Texas
Council of Governments

What is NCTCOG?

The North Central Texas Council of Governments is a voluntary association of local governments established in 1966 to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions.

NCTCOG serves a 16-county region of North Central Texas, which is centered on the two urban centers of Dallas and Fort Worth. Currently, NCTCOG has 240 member governments including 16 counties, 170 cities, 24 school districts, and 30 special districts.



Abstract

TITLE: Freight North Texas: The Regional Freight System Inventory

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ABSTRACT: The North Central Texas Council of Governments developed a freight inventory for the regional freight system to determine the current conditions and strengths, and where future work and research is warranted. This document will serve as a guide to the future of the North Central Texas Council of Governments Freight Planning Program's policies, programs, and projects to improve the freight system within the region.

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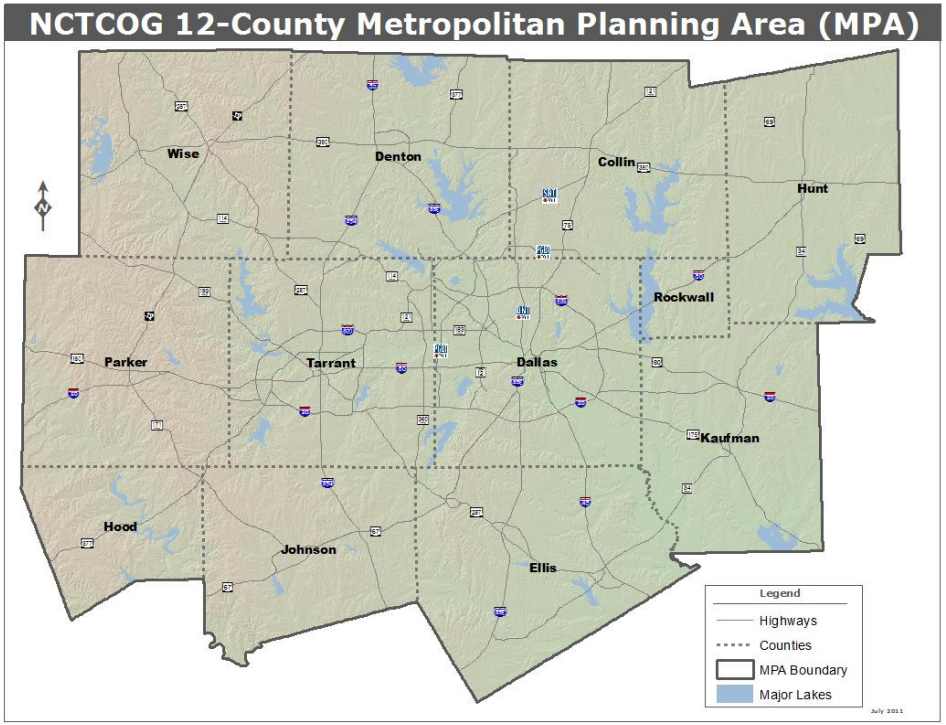
The North Central Texas region is a national leader and innovator in transportation policy, projects, and programs. The North Central Texas Council of Governments (NCTCOG) staff oversees freight system planning in the NCTCOG 12-county Metropolitan Planning Area (MPA), shown in ***Figure 1.1***. This 12-county region covers approximately 10,000 square miles and over 170 municipalities.

Freight*—the goods transported by rail, truck, air, or water.*

In its 2007 Logistics Quotient™, Expansion Management released a ranking of the 72 Metropolitan Statistical Areas (MSA) in the United States (US). The Dallas-Fort Worth (DFW) Region received the highest ranking possible, a 99, for being a logistics-friendly metropolitan area. Out of the 72 MSAs, only five (including DFW) received a rating of 99.

Figure 1.1 NCTCOG 12-County Metropolitan Planning Area



Source: NCTCOG Staff, 2011

Transporting freight is a key component of the North Central Texas regional economy. The region is located at the crossroads of four major interstate highways: IH 20, IH 30, IH 35 (which includes both IH 35E and IH 35W), and IH 45. IH 35 has served as the North American Free Trade Agreement (NAFTA) corridor since 1995, (see ***Figure 1.2)***. The top commodities traded between the NAFTA partners of Canada, Mexico, and the US are identified in ***Table 1.1***. Additionally, the region is a national railroad crossroads, as well as a national and international air cargo hub, making the region a natural logistics hub.

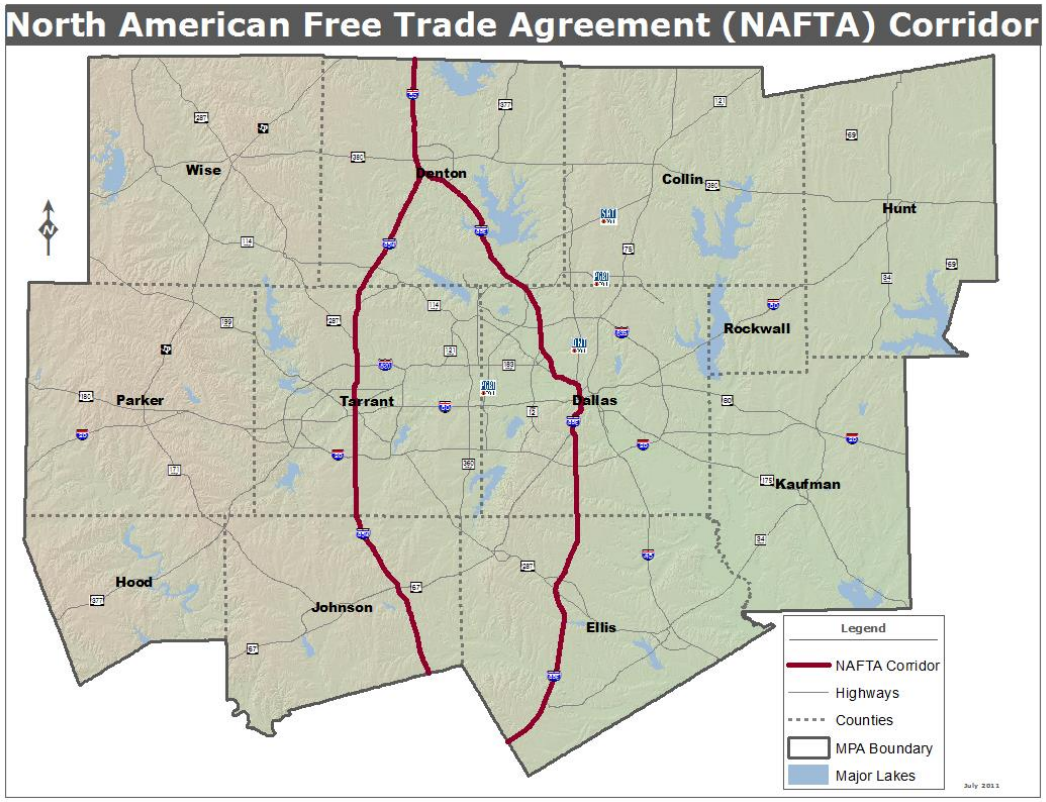
Table 1.1 Top Commodities with NAFTA Partners

Country	Type	Weight (Tons)	Value (Millions US $)	Top Commodity (by weight)	Top Commodity (by value)
Canada	Import	1,809	$ 3,926	Wood Products	Transportation Equipment
	Export	2,603	$ 4,608	Coal n.e.c.*	Electronics
Mexico	Import	5,368	$ 13,809	Non-metallic minerals	Electronics
	Export	9,640	$15,551	Coal n.e.c.*	Electronics

Source: *Freight Analysis Framework (FAF) 3*
**Coal n.e.c. refers to coal and petroleum products that are not elsewhere classified.*

North American Free Trade Agreement (NAFTA)*—an agreement established on January 1, 1994, by the governments of Canada, Mexico, and the United States, creating a trilateral trade bloc in North America.*

Figure 1.2 North American Free Trade Agreement (NAFTA) Corridor



Source: *NCTCOG Staff, 2011*

Within the US, logistics operations move in two key ways:

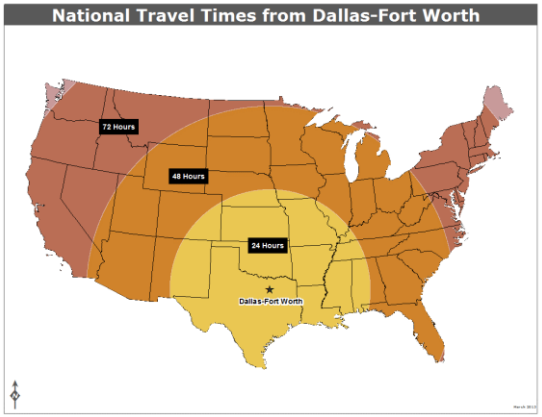
- From production center to export center, as is the case of agricultural products from the Midwest.
- From ports along the coast to distribution centers throughout the country, as is the case with containers arriving from Asia, through the Ports of Los Angeles and Long Beach (LA/Long Beach).

A majority of US imports arrive through the Ports of LA/Long Beach, which combined are the two busiest sea ports in the nation.[1] Most freight entering through the Ports of LA/Long Beach travels through the North Central Texas region via truck or train on its way to markets in the eastern US.

North Central Texas is centrally located within the lower 48 states which allows the region to serve as a primary distribution center, or inland port, for the Southwestern US and the nation. Trucks leaving the region can reach the majority of the country within 72 hours (see ***Figure 1.3***).

The region is also at a crossroads of the east west rail from the Ports of LA/Long Beach to the eastern US and the north-south rail lines from Mexico and the Port of Houston to the Upper Midwest. The region is also a large air cargo hub and a major distribution center.

Figure 1.3 Dallas-Fort Worth Reach Map



Source: *NCTCOG Staff, 2012*

The freight industry is vital to both the regional and State economies. In 2010, the North Central Texas region accounted for 34 percent of Texas' gross domestic product (GDP).[3]

National Freight Movement

Freight is also vital to the US, not only to the transportation industry, but to all facets of industry and the economy. In 2007, an average of 52 million tons of freight, worth $46 billion, was moved along the US transportation system every day.[4] Following the recession in 2008 and 2009, where freight volumes decreased by 2.4 and 11.1 percent, respectively,[5] freight tonnage increased in 2010 to 97 percent of the total tonnage moved in 2007.[6]

Freight movement within the nation is not only vital to the US economy, but also to the world economy. The top 25 US trading partners in 2010 are listed in ***Figure 1.4***. This list also includes the amount of trade between the US and these 25 partners in 2000, 2005, 2010, and 2011.

A majority of the freight moved within the US is moved by truck. Long-haul freight truck traffic in the US is concentrated on major routes connecting

[1] Bureau of Transportation Statistics; America's Container Ports: Linking Markets at Home and Abroad

[3] Bureau of Economic Analysis, 2012

[4] FHWA Freight Facts and Figures 2011
[5] FHWA Freight Facts and Figures 2010
[6] FHWA Freight Facts and Figures 2011

population centers, ports, border crossings, and other major activity hubs (see ***Figure 1.5***).[7]

Figure 1.4 Top 25 US Trading Partners

2000, 2005, 2010, and 2011
(billions of current U.S. dollars)

Partner	2011 Rank	2000	2005	2010	2011
Canada	1	406	499	527	596
China	2	116	285	457	503
Mexico	3	248	290	393	461
Japan	4	212	194	181	195
Germany	5	88	119	131	148
United Kingdom	6	85	90	98	107
South Korea	7	68	71	88	100
Brazil	8	29	40	59	75
France	9	50	56	65	68
Taiwan	10	65	57	62	67
Netherlands	11	32	41	54	66
Saudi Arabia	12	20	34	43	61
India	13	14	27	49	58
Venezuela	14	24	40	43	56
Singapore	15	37	36	46	50
Italy	16	36	43	43	50
Switzerland	17	20	24	40	49
Belgium	18	24	32	41	47
Ireland	19	24	38	41	47
Russian Federation	20	10	19	32	43
Hong Kong	21	26	25	31	41
Malaysia	22	37	44	40	40
Nigeria	23	11	26	35	39
Australia	24	19	23	30	38
Colombia	25	11	14	28	37
Top 25 total[1]		1,746.7	2,187.5	2,662.4	3,041.8
U.S. total trade		1,997.3	2,575.3	3,191.4	3,688.3
Top 25 as % of total		87.5	84.9	83.4	82.5

[1]Top 25 trading partners change each year. Totals represent the top 25 trading partners for each year, not necessarily the top 25 trading partners listed here for 2011.
Note: Numbers may not add to totals due to rounding.

Source: *FHWA Freight Facts and Figures, 2013*

Long-Haul Trucks*—trucks travelling more than 500 miles between their origin and destination.*

[7] FHWA Freight Facts and Figures 2011

US freight truck traffic is projected to increase by the year 2040, when long-haul truck travel is forecast to be 662 million miles per day (see ***Figure 1.6***).[8]

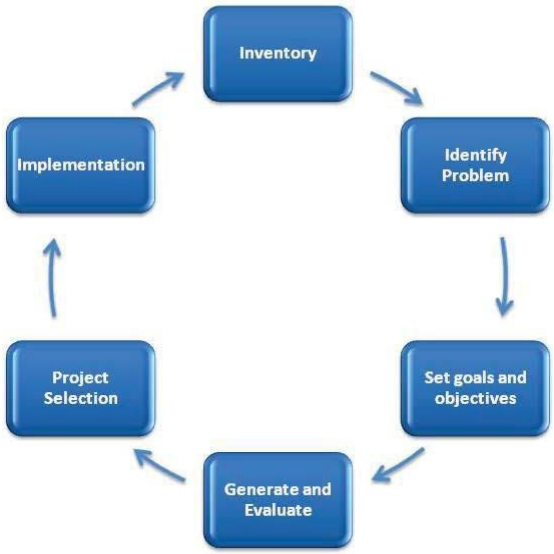
Freight North Texas Study—Background

NCTCOG staff, in conjunction with Federal Highway Administration (FHWA) staff, hosted a Peer-2-Peer Exchange in July 2010. Metropolitan Planning Organizations' (MPOs) freight staff from around the country, with completed freight system plans, were invited and provided valuable input. This exchange enabled staff to learn from others' experiences, best practices, and lessons learned.

Freight North Texas includes a current state-of-the system assessment as well as a needs assessment for future programs and studies. As a part of this study, NCTCOG staff convened the Regional Freight Advisory Committee (R-FAC) consisting of regional freight professionals, in September 2011; a roster of R-FAC members is listed in ***Appendix C***. The R-FAC provides guidance to NCTCOG staff regarding freight activities, as well as strategic product and project review. Freight North Texas and R-FAC will advise and guide NCTCOG staff in prioritizing and improving freight planning in the North Central Texas region.

Freight North Texas is the first step in the continuous planning process, shown in ***Figure 1.5***. As more data is collected and further study conducted, the freight planning program will continue to move through this process.

Figure 1.5 Continuous Planning Process



[8] FHWA Freight Facts and Figures 2011

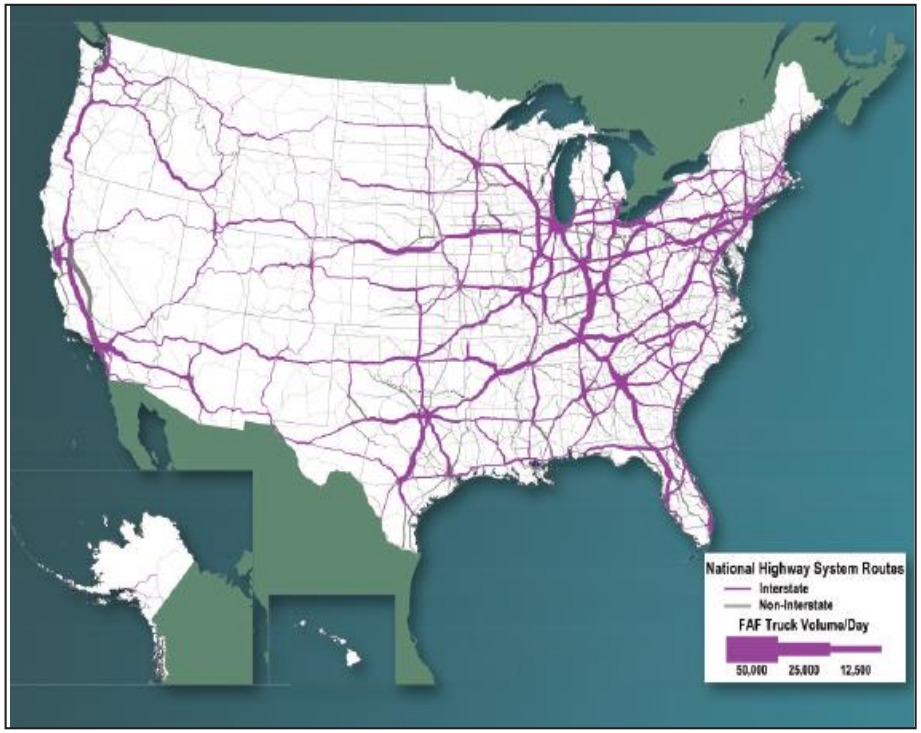
Freight North Texas Study—Summary

Freight North Texas is organized into five chapters:

- An introduction to freight planning
- An overview of freight in North Central Texas
- A snapshot of the current regional freight system
- Current system issues
- Recommendations for future freight policies, programs and projects.

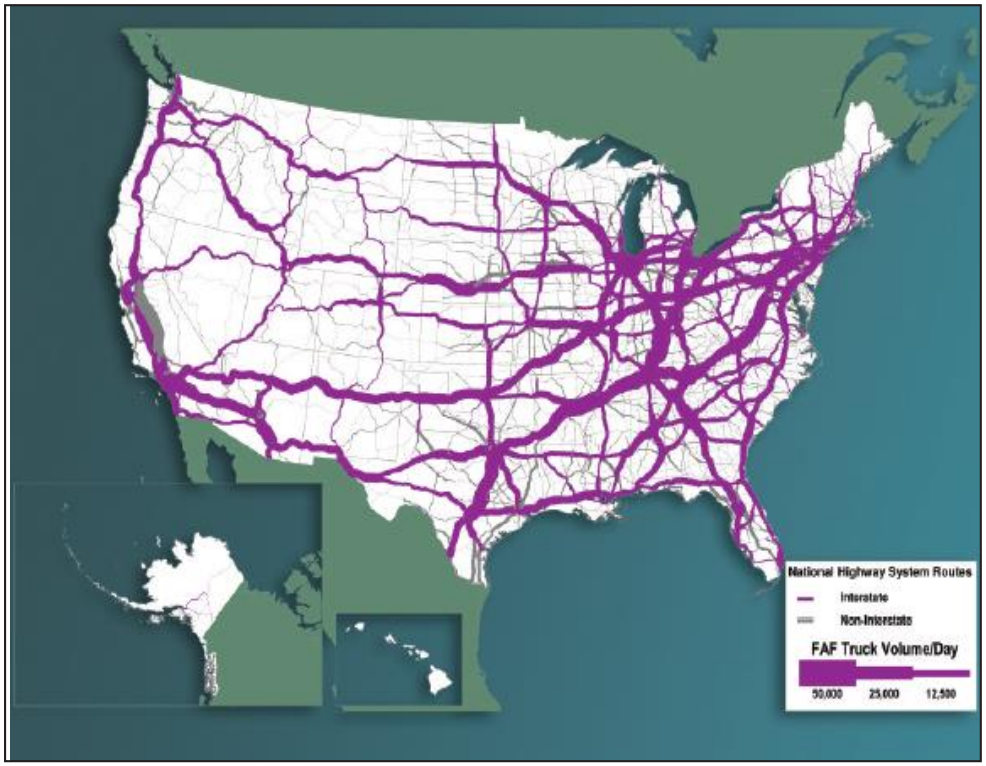
The overarching goal of Freight North Texas is to enhance the safety, mobility, and air quality of regional freight movements by creating a comprehensive freight system review within North Central Texas. This document recommends future freight policies, programs, and projects.

Figure 1.6 Average Daily Long-Haul Freight Traffic on the National Highway System, 2007



Source: *FHWA Freight Facts and Figures, 2013*

Figure 1.7 Average Daily Long-Haul Freight Traffic on the National Highway System, 2040



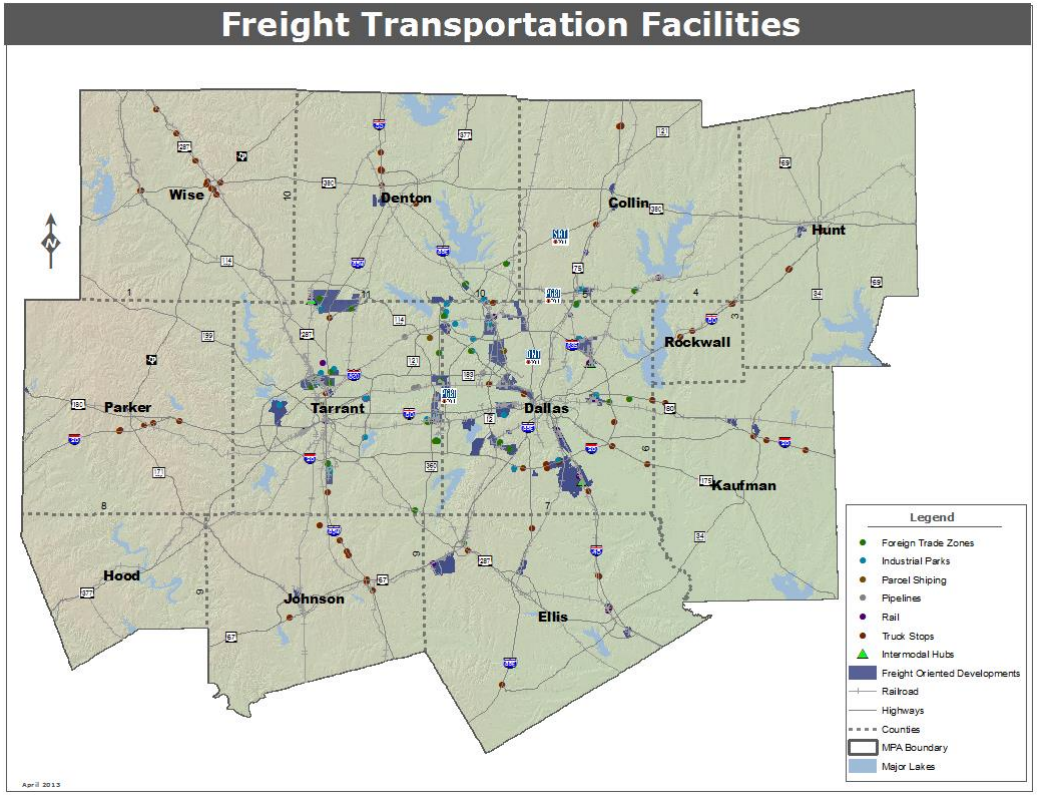
Source: *FHWA Freight Facts and Figures, 2013*

Metropolitan Transportation Plan-Mobility 2035 Overview

As the MPO for the North Central Texas region, NCTCOG is required to maintain a long-range transportation plan. The Metropolitan Transportation Plan (MTP) defines a vision for the region's multimodal transportation system. The MTP's purpose is to identify policies, programs, and projects for development that respond to adopted goals. The MTP is also a guide for the expenditure of State and federal funds for the next 25 years.

On March 10, 2011, NCTCOG adopted a new MTP, Mobility 2035: The Metropolitan Transportation Plan for North Central Texas. Mobility 2035 was developed with public input and collaboration with regional transportation partners. Freight is included as a section within the *"Mobility Options"* chapter. The freight section provides information regarding anticipated freight activities through the 2035 horizon year for various freight modes. ***Figure 2.1*** shows the primary freight facilities located within the region.

Figure 2.1 Freight Transportation Facilities



Source: *NCTCOG Staff, 2011*

Freight Modes

A variety of modes are used to transport freight in the North Central Texas region. Freight is not a transportation mode; rather freight consists of the goods transported by rail, truck, air, or water.

Trucks

Trucks are the most utilized mode of transportation for a majority of the goods moving into, through, and out of the region. The extensive regional roadway network allows trucks to access the region from many directions, saving time and money for both the truck operators and consumers.

Trucks are an attractive option for shippers. This allows trucks to access nearly every major metropolitan area in North America. The flexibility offered by trucks is one attribute that sets it apart from other modes. Approximately 83 percent of all goods being shipped to and from the region are transported on trucks.[10] The region relies heavily on trucks to deliver the following commodities:

- Nonmetal mineral products
- Gasoline
- Food products
- Wood products

There are several hundred national and local trucking companies operating within the region. Truck shipments are the region's economic lifeblood, carrying products during the supply chain's critical first and last miles. Everything used on a daily basis travels by truck at some point on its journey.

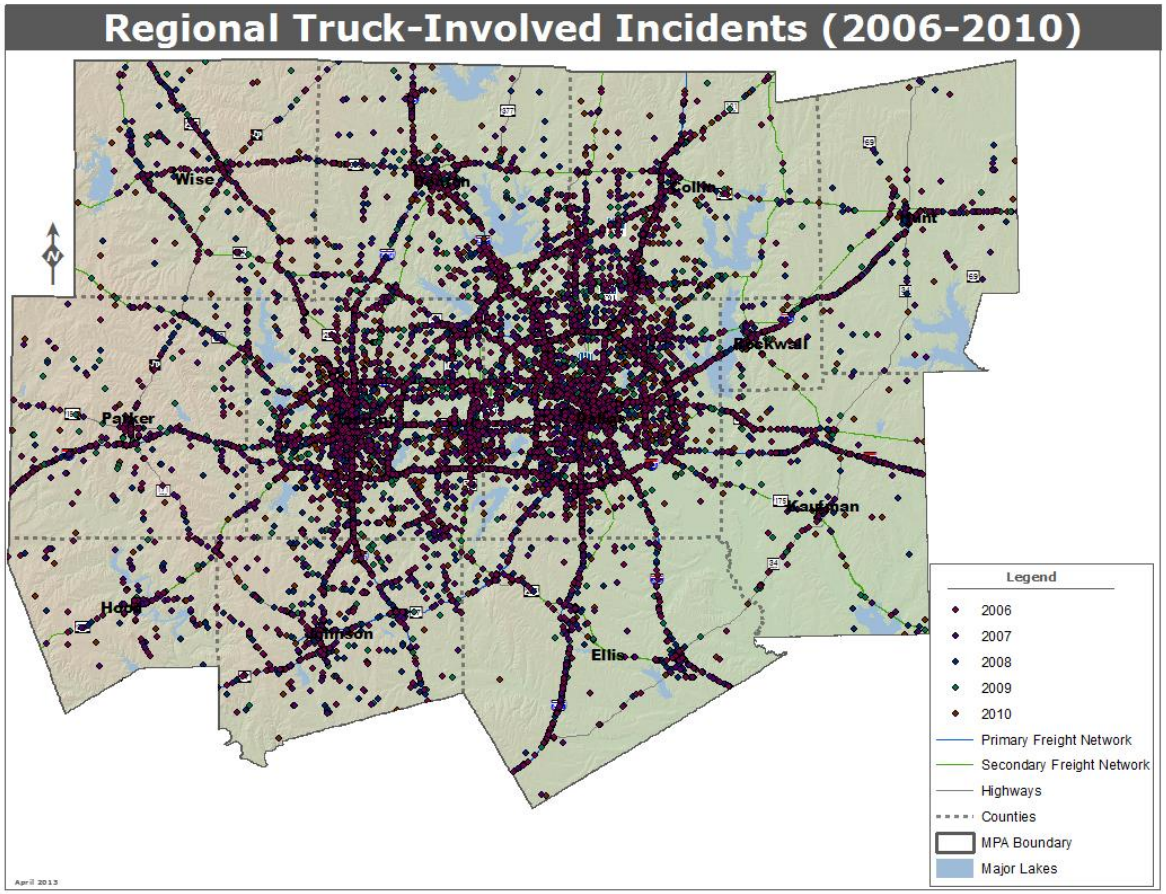
> ***First/Last Mile****—highway connections to ports and rail yards that are key to the efficiency of the freight system.*

During the five year period from 2006 through 2010, the total number of traffic incidents in the region decreased from 94,743 to 86,645.[11] Within the region, commercial trucks are involved in only 5.32 percent of all regional incidents. Overall, truck-involved incidents are not concentrated at any one location; rather these incidents occur on all portions and segments of the region's 12-county roadway network as shown in ***Figure 2.2***.

[10] Freight Analysis Framework 3, Federal Highway Administration

[11] Texas Department of Transportation's Crash Records Information System (CRIS), 2012.

Figure 2.2 Regional Truck-Involved Incidents 2006-2010



Source: *Texas Department of Transportation (TxDOT), 2012*

Rail

Three Class I Railroads (BNSF Railway, Kansas City Southern Railway, and Union Pacific Railroad) and two regional railroads (Dallas, Garland and Northeastern Railroad and the Fort Worth and Western Railroad) operate within the region. The regional railroads interchange with the Class I Railroads (railroads with annual operating revenues of $250 million or more) to deliver key commodities into and within the region.

In addition to the two regional railroads headquartered within the region, BNSF Railway's corporate headquarters is located in Fort Worth.

Rail shipments utilize a rail network covering more than 2,300 miles. The rail network provides the link between the region and major international and domestic freight routes in North America.

Rail is often utilized for items shipped in large quantities that are heavy (such as coal and grain), with a low value per unit (such as gravel), or shipped at a distance over 500 miles.

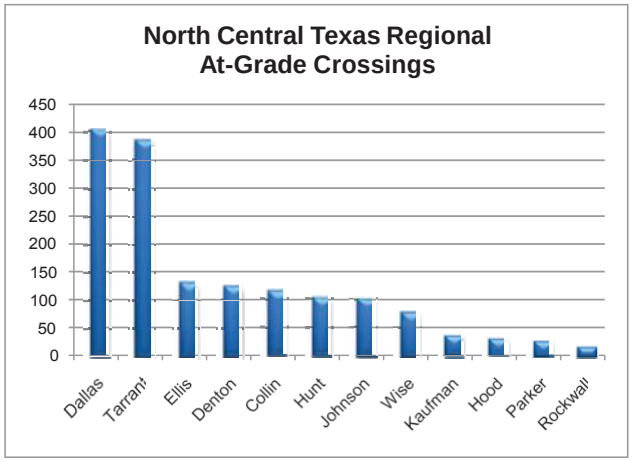
The region relies heavily on rail to deliver the following commodities:

- Coal
- Vehicles
- Food products
- Chemicals
- Consumer products (i.e. electronics, clothing, etc.) [12]

The regional railroad system is extensive, as seen in ***Figure 2.3***. There are 1,557 at-grade railroad-highway crossings within the 12-county region. A breakdown by county is shown in ***Table 2.1***. A majority of the rail-related injuries and fatalities occur at at-grade crossings.

[12] Freight Analysis Framework 3, Federal Highway Administration

Table 2.1 Regional Crossing Breakdown



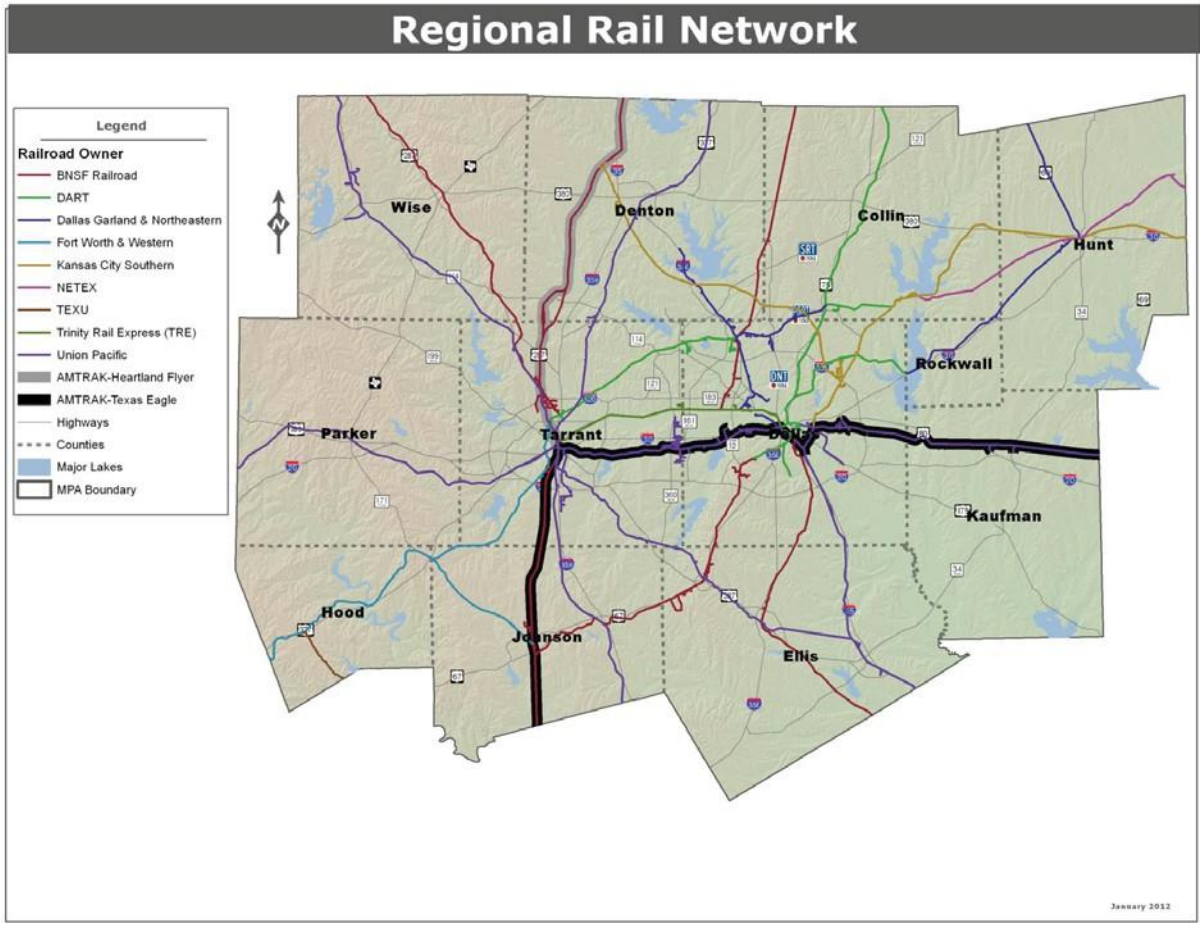
Source: *Federal Railroad Administration, 2011*

Train and Railroad Crossing Facts [13]

- *The average train weighs 12 million pounds.*
- *A train traveling 50 mph and pulling 100 cars takes one mile to stop.*
- *The weight ratio of a train to a car is the same as a car to an aluminum can.*
- *The majority of vehicle-train collisions occur when trains are traveling at less than 35 mph.*
- *Nearly two-thirds of all collisions occur during daylight hours.*

[13] Tennessee Department of Transportation, 2011, http://news.tennesseeanytime.org/node/6921

Figure 2.3 Regional Rail Network



Source: *NCTCOG Staff, 2012*

Pipeline

Pipelines and pipeline facilities in the region transport petroleum, natural gas, and other hazardous materials. The oil and natural gas industry is an integral component of the regional economy. The Barnett Shale formation, located below the region, is an onshore natural gas field stretching from the city of Dallas to the west and south. The Barnett Shale covers 5,000 square miles and eight of the 12 Metropolitan Planning Area (MPA) counties, including:

- Dallas County
- Denton County
- Ellis County
- Hood County
- Johnson County
- Parker County
- Tarrant County
- Wise County

Throughout the region, pipelines are used to transport commodities associated with the oil and gas industry including:

- Gasoline
- Natural gas
- Water
- Other fuel oils

The recent Barnett Shale exploration for natural gas resources has led to an increase in regional pipelines. Pipelines are considered the safest and most efficient way to move oil and gas products.

Due to the large size of the Barnett Shale and the oil industry in North Central Texas, the region's pipeline network is large as well. Regional commercial pipelines total approximately 16,000 miles, roughly the same distance as three roundtrip flights between Los Angeles and New York City. This extensive network, which operates mainly below ground, transports approximately 62.8 million tons annually in North Central Texas, second only to trucks in tonnage transported.[14]

[14] Freight Analysis Framework 3, Federal Highway Administration

Air Cargo

Air cargo is the movement of freight by air. This mode, typically consisting of high value and/or high priority items, represents only a small share of the total tonnage shipped annually in the US In 2006, air transportation carried 15.4 billion ton miles. This equates to 0.3 percent of the total cargo movement activity by weight within the US Some of the top commodities transported by air for the North Central Texas region are:

- Electronics
- Machinery
- Medical equipment
- Pharmaceuticals

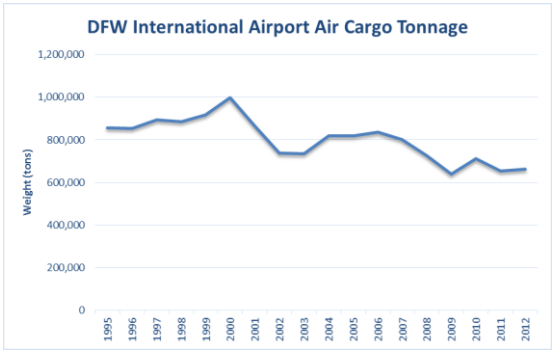
Within the region, all scheduled regional air cargo is handled at one of three airports:

- Dallas/Fort Worth International Airport (DFW)
- Dallas Love Field (DAL)
- Fort Worth Alliance Airport (AFW)

Figures 2.4 and 2.5 show the air cargo tonnage at DFW and AFW from 1995 to 2012. In general, air cargo is handled at the same airports with scheduled

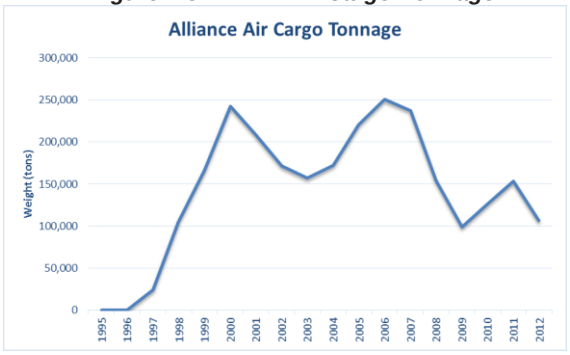
commercial passenger service. These diverse air transportation modes coexist due to the population and industrial base as well as the extensive airport facilities, infrastructure, and services that are already present in and around the passenger airports.

Figure 2.4 DFW Air Cargo Tonnage



Source: *NCTCOG Staff, 2013*

Figure 2.5 AFW Air Cargo Tonnage



Source: *NCTCOG Staff, 2013*

Intermodal

Intermodal transport refers to the movement of containers of freight between modes, including:

- Rail to truck
- Truck to rail
- Rail to rail
- Ship to truck
- Truck to ship

Within the North Central Texas region, intermodal refers to the transfers between the truck and rail modes.

Intermodal freight has the highest growth rate of all freight conveyance methods. The region has benefitted from the influx of intermodal traffic due to direct rail access to the Ports of LA/Long Beach, which combined handle more intermodal traffic than any other US port;[15] one-third of all intermodal container traffic entering and leaving the US moves through the ports of LA/Long Beach.[16] The region relies on intermodal freight to deliver the following commodities:

- Natural sands
- Food products
- Consumer products (i.e. electronics, clothes, etc.)

Double-Stack*—the process of stacking two or more containers in a well rail car.*

A majority of intermodal trains are double-stack trains, which reduces shipping costs by 23 percent for a container travelling 2,000 miles.[17] The region is home to three major intermodal rail yards (see ***Table 2.2***):

- BNSF Railway's AllianceTexas facility, located in Fort Worth
- Union Pacific Railroad's Dallas Intermodal Terminal, located in Wilmer/Hutchins
- Union Pacific Railroad's Mesquite Intermodal Terminal in Mesquite

Combined, these facilities handle over one million intermodal transfers (also known as lifts) annually.

[15] Bureau of Transportation Statistics; America's Container Ports: Linking Markets at Home and Abroad

[16] *Trains, The Magazine of Railroading*, November 2011, page 29.

[17] *Trains, The Magazine of Railroading*, November 2011, page 29.

Table 2.2 Regional Intermodal Hubs

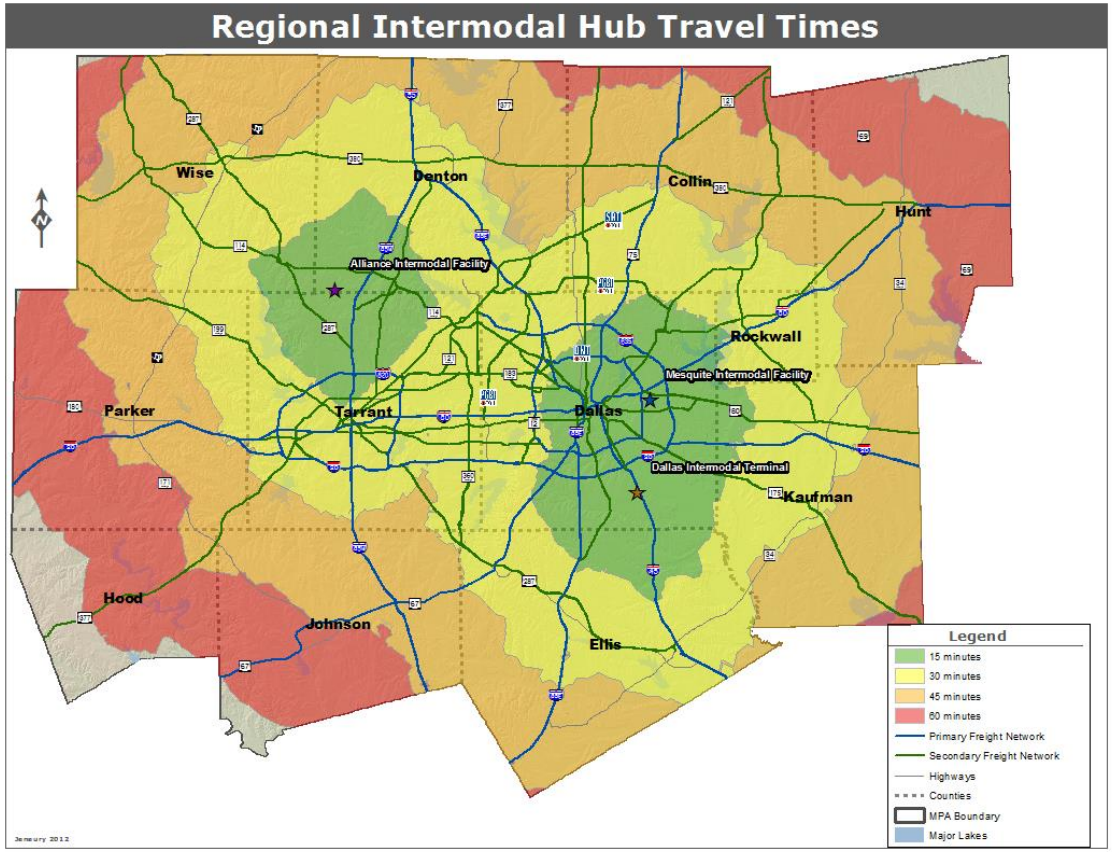
Name	City	Annual Lift Capacity
Alliance Intermodal Facility	Fort Worth	600,000
Dallas Intermodal Terminal	Wilmer/Hutchins	365,000
Mesquite Intermodal Terminal	Mesquite	225,000

Source: *IANA, 2011*

Lift*—the process of moving a container or trailer to and/or from a rail car.*

The intermodal hubs/terminals are strategically located within the region. Almost all of the region can be accessed by truck from these three hubs/terminals within 60 minutes. ***Figure 2.6*** illustrates the travel times for the three major regional hubs/terminals.

Figure 2.6 Regional Intermodal Hub Travel Times



Source: *NCTCOG Staff, 2011*

Ports

While the North Central Texas region does not have direct access to a water or sea port, the region is the largest inland port in the nation.

***Inland Port**—an inland site operating in a similar capacity to that of a seaport.*

Located 250 miles southwest of the region, the Port of Houston is a 25-mile-long complex of public and private facilities located near the Gulf of Mexico.[18] The port is ranked first in the US in foreign waterborne tonnage, first in US imports, second in US export tonnage, and second in the US in total tonnage.[19]

There are 16 ports along the Texas Gulf Coast, less than 600 miles from the region, as shown in ***Figure 2.7***.

Figure 2.7 Texas Gulf Coast Ports

***Source:** Texas Ports Association, 2011*

Globally, larger and larger volumes of freight are being moved. A majority of today's freight originates in Asia, moving east to the Ports of LA/Long Beach and moving west through the Suez Canal to Europe and East Coast Ports. The Panama Canal is currently in the process of being widened and deepened; the project is expected to be completed in 2015.

The Panama Canal expansion project includes the addition of a third set of locks to the canal system, as well as the widening and deepening of the existing navigational channels. The expanded canal will allow more and larger cargo ships to pass through.[20]

This increased capacity will allow larger ships and shipments to enter our nation's ports. The expansion project is designed to allow for anticipated traffic growth from 280 million Panama Canal/Universal Measurement System (PC/UMS) tons in 2005 to nearly 510 million PC/UMS tons in 2025. The expanded canal will have a maximum sustainable capacity of approximately 600 million PC/UMS tons per year.[21]

***TEU**—twenty-foot equivalent unit, 8-foot by 8-foot by 20-foot intermodal container.*

The current Panamax ships are 965 feet long by 106 feet wide and can carry a maximum of 5,000 TEUs.[22] These 5,000 containers would equal 2,500 trucks or approximately 21 freight trains. The new Panamax ships are 1,200 feet long by 160.7 feet wide and can

[18] Texas Ports Association
[19] Texas Ports Association
[20] Panama Canal Authority website, http://www.pancanal.com.
[21] Panama Canal Authority website, http://www.pancanal.com.
[22] Autoridad del Canal de Panama

carry a maximum of 12,000 TEUs.[23] These 12,000 containers would equal 6,000 trucks or approximately 50 freight trains. The full impact that the Panama Canal widening will have on Texas ports and the North Central Texas region is unknown.

***Post-Panamax Ships**—ships that cannot fit through the existing, pre-widened Panama Canal.*

Importance of Freight in the Region

With approximately 6.5 million residents, the North Central Texas region is the fourth-largest metropolitan area in the US and one of the nation's largest destination markets.[24] Located in the approximate geographic center of North America and having access to major domestic and international trade routes allows the region to be accessed by multiple transportation modes including truck, rail, and air.

North Central Texas: North America's Distribution Hub

The North Central Texas region can be accessed by six interstate highways, three Class I Railroads, two Regional Railroads, and three airports with extensive cargo operations. ***Table 2.3*** provides an inventory of regional transportation assets. These modes utilize regional infrastructure linking nearly every major population center throughout the US, Mexico, and Canada directly to the region.

Table 2.3 Regional Transportation Assets

Roadway		IH 20
		IH 30
		IH 35
		IH 45/US 75
		IH 635
		IH 820
Rail	Class I	Union Pacific Railroad
		BNSF Railway
		Kansas City Southern Railway
	Regional Rail	Dallas, Garland and Northeastern Railroad
		Fort Worth and Western Railroad
Air		DallasFort Worth International Airport
		Dallas Love Field
		Fort Worth Alliance Airport

***Source:** NCTCOG, 2011*

Additionally, the region is home to four foreign trade zones (FTZ). FTZs benefit the region as many of the tariffs and fees associated with the goods-importing process are waived. This benefit encourages employers to keep manufacturing jobs in the region instead of outsourcing, and the tariff savings help to offset the cost savings of using foreign workers. With four FTZs, companies can ship products to the region directly from other countries.

This process bypasses long processing times at the major US points of entry. An FTZ not only saves money for companies utilizing them, but also benefits the region through job creation, ensuring goods arrive more quickly, and reducing product cost. ***Table 2.4*** lists the region's FTZs and national ranking among the 132 US foreign trade zones.

***Foreign Trade Zone (FTZ)**—an area within the US at or near an airport under US Customs control where goods are held duty-free, pending customs clearance.*

Table 2.4 Regional Foreign Trade Zones, 2010

FTZ ID	FTZ Name	Goods Processed (Millions US $)	National Ranking
196	Alliance Texas	$6,895	5
113	Ellis County Trade Zone Corporation	$1,170	31
39	DFW Airport	$909	37
168*	Metroplex International Trade Development Corporation	--	Tied for 132

***Source:** Annual Report of Foreign Trade Zones, 2010*
**FTZ 168 was inactive in 2010*

[23] Autoridad del Canal de Panama
[24] 2010 US Census Bureau

Economic Importance

The economic importance of freight in the North Central Texas region is immense. Freight's economic importance is evidenced by the devastating impacts any disruption in the freight system would have on the region. The FHWA estimates:

- **Within 6–12 hours** assembly lines would come to a stop.
- **Within 24 hours** hospitals would begin to run out of essential supplies.
- **Within 48 hours** service stations would begin to run out of gas.
- **Within 72 hours** grocery stores would begin to run out of perishable items.[25]

With the increased reliance on just-in-time shipping, the need for large warehousing spaces is removed, making timely deliveries critical. The freight industry not only ensures the timely delivery of goods to the region, but also provides employment opportunities. Over 200,000 workers are employed in the transportation and material-moving industry, with a median income of $26,720.[26] Freight sector employment for the 10-year period from 1998-2008 can be seen in ***Table 2.5***.

Just-in-Time—*an inventory control system that controls the flow of shipments to arrive just in time for use.*

Without a well-functioning freight system, goods could not be produced, shipped, or purchased. Ensuring the region's freight system is functioning properly is key to ensuring the success of the region's economy. In 2009, congestion cost freight shippers an estimated $33 billion in the US In the North Central Texas region, truck congestion cost freight shippers an estimated $948 million annually, the fifth highest US metropolitan regional cost.[27] Freight bottlenecks cost approximately $200 billion, or 1.6 percent of the US GDP, each year.[28]

In 2007, approximately 260,000 tons of goods were shipped from the region. The Bureau of Transportation Statistics (BTS) estimates the value of a ton of goods shipped ranges from $430 for bulk commodities to $18,000 for electronic and electrical equipment. As freight continues to grow, the economic impact of freight from both the jobs created and value of goods shipped will play an important role in regional growth.

Regional Growth

The 12-county NCTCOG MPA population is approximately 6.5 million people. NCTCOG demographic estimates indicate increases to nearly 10.5 million people with 6.6 million jobs in the region by the year 2040. The FHWA estimates freight shipment tonnage will increase between 2010 and 2040 by 61 percent nationally. This statistic mirrors the projected regional population growth of 61 percent between 2010 and 2040. This estimated growth further illustrates the region's reliance on and need for an efficient freight network to ensure regional economic growth.

[25] *Keeping the Supply Chain Moving*, Federal Highway Administration
[26] Dallas Regional Chamber
[27] 2010 Mobility Report, Texas Transportation Institute
[28] *President's Economic Recovery Advisory Board, 2009*

Table 2.5 Regional Freight Employment, 1998-2008

Year	Freight Employment Sectors			Total Employment in Freight Sectors	Total Employment	Freight Percentage
	Manufacturing	Wholesale Trade	Transportation and Warehousing			
1998	325,485	159,257	103,255	587,997	2,381,984	25%
1999	317,090	164,912	108,278	590,280	2,463,568	24%
2000	320,892	171,734	114,961	607,587	2,554,615	24%
2001	321,012	138,285	114,409	573,706	2,599,074	22%
2002	276,978	161,473	105,539	543,990	2,508,908	22%
2003	273,552	162,545	117,146	553,243	2,451,612	23%
2004	266,419	158,061	116,282	540,762	2,468,593	22%
2005	269,093	158,370	120,863	548,326	2,488,407	22%
2006	277,543	159,757	123,771	561,071	2,572,201	22%
2007	272,834	156,758	123,986	553,578	2,635,196	21%
2008	265,416	166,467	127,662	559,545	2,671,479	21%

Source: *US Census County Business Patterns, 2011*

Freight Infrastructure Preservation

Freight infrastructure preservation is not a "hot topic" high on the average resident's priority list for transportation projects to be funded. Most people view congestion personally experienced on a daily basis as a more critical issue. Freight, typically trucks, is seen as a nuisance and a hazard to be removed from the roadway network, increasing capacity for passenger vehicles.

While separating passenger and freight vehicles is the safest way to provide for both travel types, the funding and space needed for such infrastructure is not available. This means that freight and passenger vehicles must share the same roadway infrastructure. When the existing infrastructure was built, the traffic mixing and levels seen today were simply not anticipated. Poor infrastructure leads to network congestion affecting consumer product distribution. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation identified eight planning factors for consideration in the metropolitan planning process. One factor is to emphasize existing transportation system preservation. The Moving Ahead for Progress in the 21st Century (MAP-21) legislation enacted July 6, 2012, identifies this factor as well. Transportation planners have the responsibility to preserve the transportation infrastructure for both passenger and freight uses.

Preserving freight infrastructure preserves jobs within the freight and logistics industries and helps to strengthen and maintain local, regional, and state economies. Additionally, preserving freight infrastructure, especially rail and roadways, can help to prevent and alleviate current and future bottlenecks. Preserving freight infrastructure also enhances air quality.

Why Preserve Freight Infrastructure?

The nation's transportation network has made goods accessible to areas where they were not previously available. Goods, such as fresh fruits and vegetables, dairy products, and electronics can now be reliably shipped across town or across the country.[29] Highways and bridges, used daily by freight and passenger traffic, have been neglected in recent decades, while at the same time highway congestion has grown worse. Today, roadway congestion has reached near-critical levels. Congestion is now impacting not only commuters, but also the freight shipments many companies rely on for just-in-time deliveries. Congestion impacts our ability to purchase produce at the grocery store, clothing at the mall, and electronics at retailers. The only freight mode with available capacity is rail;[30] however, with increases in both residential and employee populations within urban and rural areas, rail is also experiencing increased congestion levels.

Simply adding capacity to the freight system is neither a practical nor a sustainable way to manage increasing congestion. Preserving freight infrastructure within urban areas is especially critical given the Panama Canal expansion project. Due to the projected increase in freight traffic, planning to preserve the existing infrastructure as well as eliminate any potential future conflicts is important.

Widespread urban development, coupled with the projected increase in freight activity, means that many of the challenges facing freight land use will continue into the near future. As with much of the nation's freight infrastructure, several of the problems experienced by industrial freight facilities today are not of their own creation. Many freight facilities were built on land in unincorporated areas or areas that have since been developed, revitalized, or converted to uses other than industrial. Adjacent residential uses are often occupied by lower-income residents and protected populations where environmental justice concerns must be taken into consideration. In some cases, adjacent vacant land has been turned into upper-income residential neighborhoods a group traditionally opposed to freight- related land uses within their neighborhoods by developers,.

In areas of rapid urban development, the pressure to develop areas as residential, commercial, and retail uses can pose a significant threat to existing freight infrastructure. When freight infrastructure and industrial land uses are lost to development pressures, it is difficult to recover or purchase new industrial land within a rapidly growing urban area. As these uses are lost, freight facilities may be forced to close or relocate farther from their customers. When this occurs, transportation efficiencies are lost, the prices of goods increase, and freight shippers, residents, and the region's economy are negatively affected.

Regional Examples

Within the region, there are several examples of freight infrastructure that have disappeared as well as

[29] Report of the National Surface Transportation Policy and Review Study Commission: Transportation for Tomorrow, National Surface Transportation Board, December 2007.

[30] American Rails website: http://www.american-rails.com.

examples of freight infrastructure that are being preserved in a conscious and deliberate manner.

Freight Infrastructure Losses

Between 2000 and 2005, over 70 locations with freight-related land uses changed from industrial to other uses. These changes were primarily to residential, retail, and vacant uses and occurred throughout the region. Once these land-use changes occur, it is difficult if not impossible to find similarly located and sized land within urban areas for industrial uses. This requires the industrial companies to find new, cheaper land outside of the metropolitan core, which increases production and shipping costs. Or if suitable land cannot be found within the region, companies will relocate to an area with more affordable land.

Freight Infrastructure Preservation

Conversely, the Dallas Logistics Hub in southern Dallas County is a 6,000-acre, master-planned logistics park. The hub has space for 60 million square feet of distribution, manufacturing, office, and retail developments. The hub is located adjacent to the Union Pacific Intermodal Terminal, four interstate highways, and Lancaster Regional Airport, a general aviation airport.[31] The hub's developer has worked with the four surrounding cities to ensure appropriate zoning is in place. While the facility is far from build-out, the land has been zoned for freight usage and is being held by the hub until it is purchased by companies interested in locating within this logistics park.

Summary

While freight infrastructure preservation is not often a top priority, transportation planners along with policy- and decision-makers must make a conscious and concerted effort to preserve the existing freight infrastructure within metropolitan areas. Freight is the lifeblood of our economy and impacts our lives daily. Ensuring freight infrastructure and capacity are preserved now prevents future bottlenecks in the freight distribution system and higher prices, and allows for continued access to products.

[31] Dallas Logistics Hub website, http://www.dallashub.com.

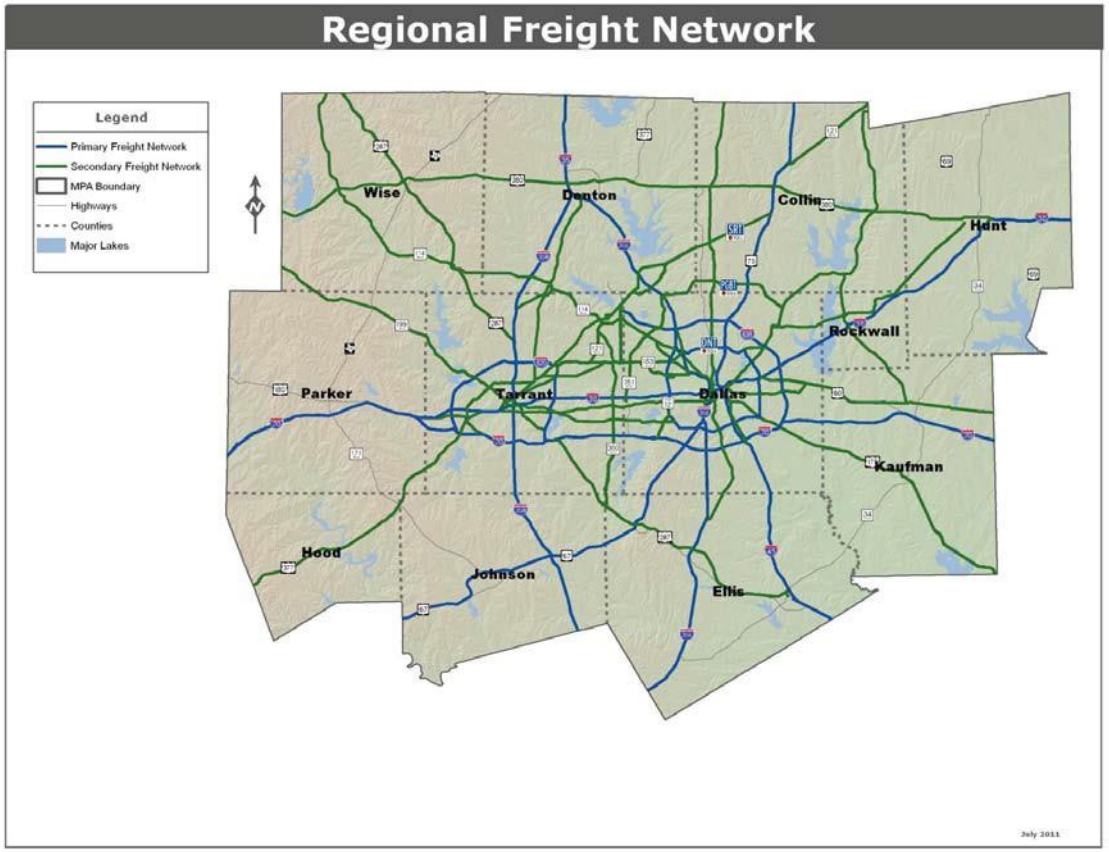
Current Freight System

A regional freight system inventory was conducted to identify freight assets.

Regional Freight Networks

A regional roadway network review identified the region's Primary Freight Networks (PFN) and Secondary Freight Networks (SFN). The PFN corridors are used by the majority of freight shippers moving through the region. The SFN corridors are primarily used by intraregional traffic. The PFN and SFN facilities are shown in ***Figure 3.1***. These corridors also provide the access and egress points into and out of the North Central Texas Region.

Figure 3.1 Regional Freight Network



Source: *NCTCOG Staff, 2011*

Freight System Issues

An analysis of the regional freight system's strengths, weaknesses, opportunities, and threats, or SWOT, was conducted to aid in identifying the major issues for the regional system. The SWOT analysis results can be seen in ***Table 3.1***.

Table 3.1 Regional Freight SWOT Analysis

Strengths	**Weaknesses**
• Six Interstate Highways • Located at the center of domestic/international trade routes (NAFTA) • Strong multimodal infrastructure • Large population base • Large workforce pool • Moderate climate • Four FTZs • BNSF Railway headquarters	• No water port • Tower 55 rail bottleneck • IH 35E congestion • IH 35W congestion • Lack of public awareness regarding regional freight issues • Regional policies • Decision-maker focus on passenger traffic
Opportunities	**Threats**
• Fast growing population • Increased global trade • Panama Canal widening • Tower 55 improvements	• Increased roadway and rail congestion • Funding shortage for infrastructure improvements/projects • Water shortage • Energy shortage • Deteriorating/Aging infrastructure • Lack of public understanding of freight issues

One of the threats found during the SWOT analysis was increased roadway congestion. Traffic congestion impacts not only freight vehicles, but also passenger vehicles and the prices of goods.

In an effort to determine the impacts of congestion on freight mobility, the American Transportation Research Institute (ATRI) tracked trucks with global positioning system (GPS) units in an effort to study travel patterns, distances, and travel time in 2009 for a FHWA study. ***Figures 3.2 through 3.7*** contain a series of maps showing a sample of 3,000 trucks over a seven day period moving out of Dallas. These maps illustrate freight traffic leaving the region that travel long distances. Regional freight issues have implications and impacts far beyond North Central Texas.

Figure 3.2 Start—Day 0

Source: FHWA, 2010

Figure 3.3 24 Hours

Source: FHWA, 2010

Figure 3.4 48 Hours

Source: FHWA, 2010

Figure 3.5 72 Hours

Source: FHWA, 2010

Figure 3.6 5 Days

Source: FHWA, 2010

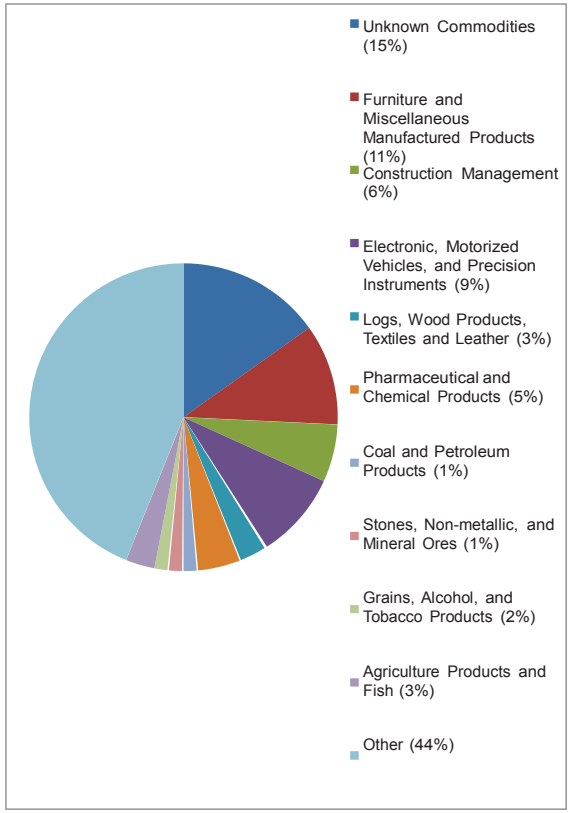
Figure 3.7 7 Days

Source: FHWA, 2010

Freight Facilities Survey Results

NCTCOG staff conducted a freight facilities survey in 2011 to obtain input from freight users to aid in shaping regional freight improvements. Over 50 responses were received; key results of this survey can be found in ***Figures 3.8 through 3.15.*** Additional survey results can be found on the Freight North Texas website.

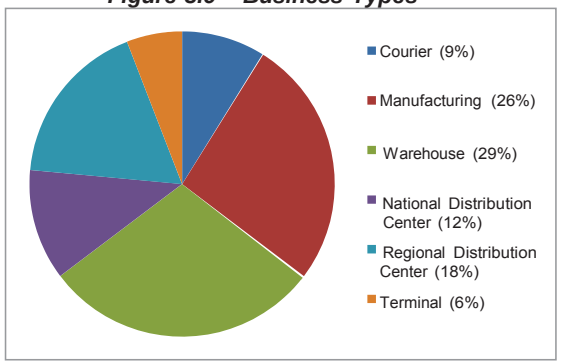
Figure 3.8 Commodities



Source: *Freight Facilities Survey, 2011*

As one of the largest economies in the US, the North Central Texas region ships and receives numerous commodities on a daily basis. This constant flow of materials is crucial for the region to meet the needs of its large population base, as shown in **Figure 3.8**.

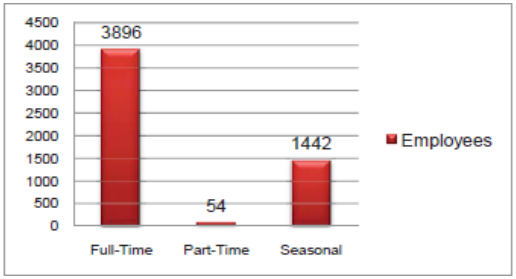
Figure 3.9 Business Types



Source: *Freight Facilities Survey, 2011*

Figure 3.9 illustrates the region's reliance on the production, storage, and distribution of goods. These key steps in the supply chain are integral in maintaining the robust freight system in North Central Texas.

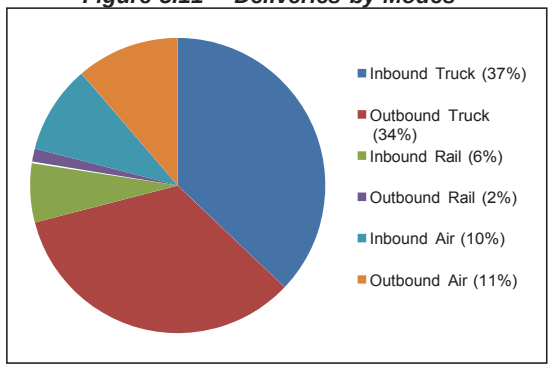
Figure 3.10 Employee Types



Source: *Freight Facilities Survey, 2011*

Figure 3.10 shows the significant number of jobs resulting from freight activities within the region. A majority of freight-related jobs result in full-time employment which have a larger and more reliable impact on the region's economic success than do other types of employment (including part-time and seasonal).

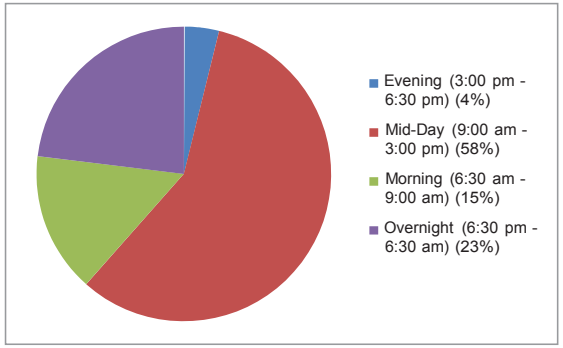
Figure 3.11 Deliveries by Modes



Source: *Freight Facilities Survey, 2011*

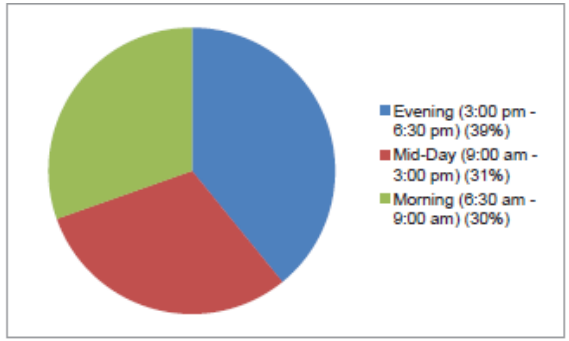
Figure 3.11 reinforces that freight is moved to, from, and within the region by truck at a similar rate to other areas in the nation. Nationally, trucks carry between 60 percent and 70 percent of the nation's freight. The region's reliance on trucks for freight shipments further illustrates the need for transportation officials to consider freight needs when programming roadway improvements, congestion mitigation techniques, and infrastructure improvements.

Figure 3.12 Delivery Times—Inbound



Source: *Freight Facilities Survey, 2011*

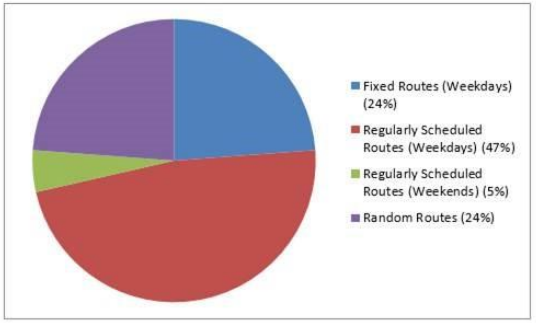
Figure 3.13 Delivery Times—Outbound



Source: *Freight Facilities Survey, 2011*

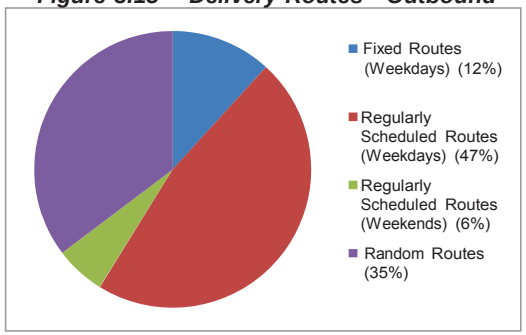
Figures 3.12 and 3.13 illustrate that freight shipments occur throughout the day, with a majority of shipments occurring during daytime hours (9:00 a.m. – 3:00 p.m.). It is important to provide ample parking in addition to loading and unloading areas to accommodate freight providers. The lack of parking and loading amenities is often a primary impediment for freight shippers in an urban environment.

Figure 3.14 Delivery Routes—Inbound



Source: *Freight Facilities Survey, 2011*

Figure 3.15 Delivery Routes—Outbound



Source: *Freight Facilities Survey, 2011*

Figures 3.14 and 3.15 indicate a majority of regional freight shipments occur on weekdays are regularly scheduled, and on fixed routes; however, 35 percent of freight shipments are described as occurring on random routes. As more municipalities adopt truck routes, trips made on random routes may begin to shift to more reliable, fixed routes.

Freight Information System

The Freight Information System (FIS) was developed as a clearing house for freight-related information on a regional level. The FIS centralizes available freight information to make data more accessible to regional planners. The FIS includes:

- Locations of freight facilities
- Commodity Flow Survey (CFS) data
- Intermodal connectors
- Surface Transportation Board (STB) Carload Waybill sample data

A complete list of the data included in the FIS can be found in ***Appendix E***.

The FIS is revised as existing information sources are updated and new information sources become available.

Freight Scans

The freight infrastructure and industry in each of the four core urban counties within the MPA was reviewed. Freight Scan fact sheets for each of these counties can be found in ***Appendix F***. A findings summary for each county is listed in the following sections.

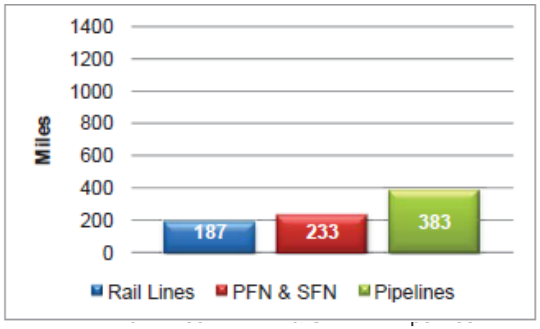
<u>Collin County</u>

One of the fastest growing counties in the nation, Collin County relies on the efficient delivery of goods to ensure continued growth. This reliance on freight has led the county to the highest average earnings for all freight industry jobs in the region. Major employers benefiting from the Collin County freight system are:

- Raytheon Company
- Alcatel USA, Inc.
- Hewlett-Packard Company

Freight infrastructure and distances within Collin County are shown in ***Figure 3.16***.

Figure 3.16 Collin County Freight Infrastructure



Source: *NCTCOG Staff, 2012*

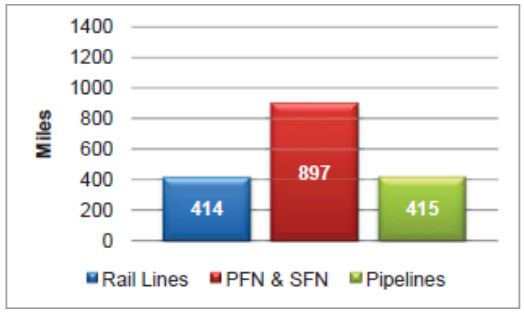
Dallas County

Dallas County has the strategic advantage of having direct access to major freight corridors serving the nation's largest cities and ports. Access is provided by four interstate highways and three Class I Railroads. Direct access allows approximately 480 million tons of goods annually to be handled within the County. Several industries located within the county rely directly on this system, including:

- Texas Instruments (TI)
- Parkland Health and Hospital System
- UPS

Freight infrastructure and distances within Dallas County are shown in ***Figure 3.17***.

Figure 3.17 Dallas County Freight Infrastructure



Source: *NCTCOG Staff, 2012*

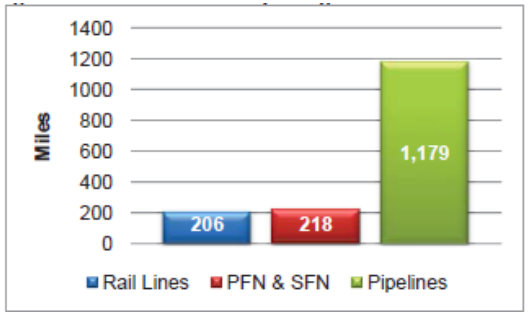
Denton County

As a northern gateway into the region, Denton County is home to several premier freight facilities. The NAFTA Corridor along IH 35, the primary trade route for international goods, runs through the heart of Denton County. In all, 16,000 workers support the county's freight industries, including:

- Frito-Lay North America, Inc.
- AT&T Distribution
- FedEx

Freight infrastructure and distances within Denton County are shown in ***Figure 3.18***.

Figure 3.18 Denton County Freight Infrastructure



Source: *NCTCOG Staff, 2012*

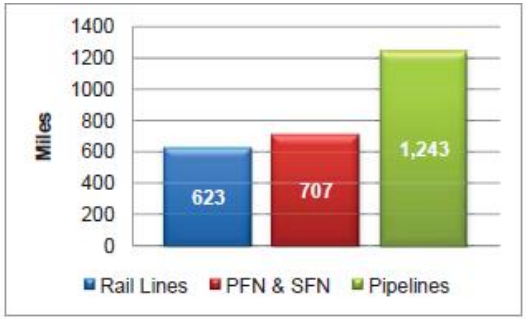
Tarrant County

Located at the crossroads of major highway and railroad intersections, freight plays an integral role in the social and economic development of Tarrant County. The county's freight industry employs over 130,000 workers, providing a large economic impact for the county's residents. Several corporations within the county rely directly on the efficiencies of the county's freight system, including:

- BNSF Railway Company
- D.R. Horton, Inc.
- Lockheed Martin Corporation

Freight infrastructure and distances within Tarrant County are shown in ***Figure 3.19***.

Figure 3.19 Tarrant County Freight Infrastructure



Source: *NCTCOG Staff, 2012*

Regional Rail Initiatives

NCTCOG staff has undertaken a variety of freight rail initiatives. These initiatives include the Railroad Crossing Reliability Partnership Program, the Regional Railroad Crossing Banking Program, the Tower 55 Rail Reliever Study, and Quiet Zone tracking.

Railroad Crossing Reliability Partnership Program

The Railroad Crossing Reliability Partnership Program was a request for project proposals held in 2003 and 2004. The projects addressed safety and reliability issues at some of the 2,000 at-grade highway-rail at-grade crossings within the MPA. Safety concerns at these at-grade crossings included the wide variety and reliability of warning devices at various locations. Some at-grade crossings were gated with signalized controls such as flashing lights; these electric devices are referred to as active warning devices. Other crossings had only passive (non-electric) warning devices such as stop signs, railroad crossing signs, and pavement markings. In 2003, $8.9 million was awarded to 19 railroad crossing improvement projects and in 2004, $5.9 million was awarded to 23 Trinity Rail Express (TRE)/Dallas Area Rapid Transit (DART) railroad crossing improvement projects.

Regional Railroad Crossing Banking Program

The Regional Railroad Crossing Banking Program was created in October 2008 in response to the Federal Railroad Administration's (FRA) goal of closing 25 percent of all highway at-grade railroad crossings in the US. The program was created as an effort to reduce the number of at-grade crossing accidents and fatalities and to reduce the amount of maintained infrastructure. In support of these initiatives, the railroad industry's current goal is to close two existing at-grade crossings in exchange for each new at-grade crossing. For small communities experiencing growth, there are often not enough existing crossings to offer for closure when a new crossing is required. The program created a database to track closed crossings and to collect credits for at-grade railroad crossings eliminated through closure or grade separation. In addition, the program allows local governments to exchange credits and/or establish a value to sell credits, as needed.

Tower 55

Tower 55 is an at-grade railroad intersection of several major Class I Railroads, located southeast of downtown Fort Worth. Approximately 120 freight trains pass through this location daily. Due to the site geometry, each train must come to a complete stop prior to crossing through the intersection. The average wait time is 15 minutes, with 90-minute delays during peak periods. Long freight trains coupled with lengthy wait times at Tower 55 are responsible for several negative impacts to the region including congestion and air quality. The Tower 55 project purpose is to reduce train congestion associated with the current rail infrastructure intersecting at Tower 55.

In 2010, the Tower 55 project was selected under the Federal Government's Transportation Investment Generating Economic Recovery (TIGER) program. The project received $34 million dollars to be used to install new signaling, increase rail capacity, upgrade bridges, and improve street and pedestrian crossings. Construction on this project is expected to be completed by approximately February 2015.

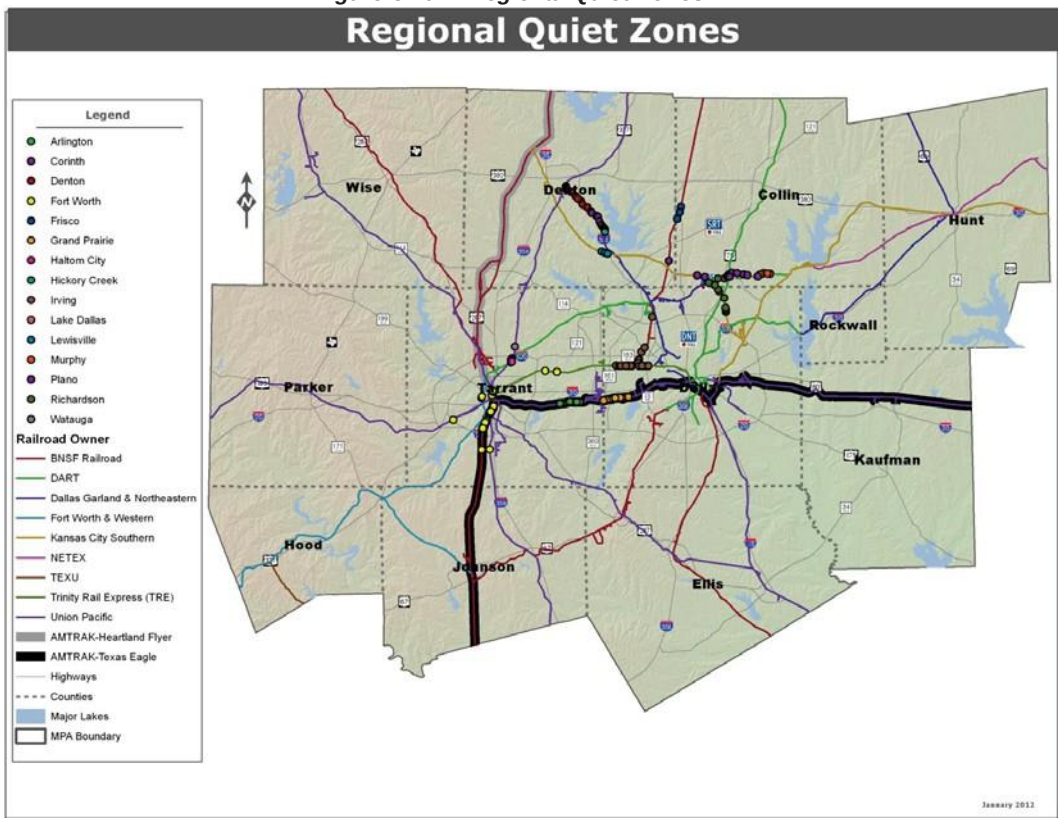
Quiet Zones

NCTCOG tracks and maintains a database of railroad quiet zone locations within the region. Quiet Zone implementation is coordinated between the local government, the FRA, and the railroad right-of-way owner. Currently, there are 19 Quiet Zones throughout the region. ***Figure 3.20*** shows the Quiet Zone locations within the region.

Source: *Railroad Controls Limited, 2006*

Quiet Zone*—a group of one or more railroad crossings at which the sounding of train horns is prohibited.*

Figure 3.20 Regional Quiet Zones



Source: *NCTCOG Staff, 2011*

Regional Truck Initiatives

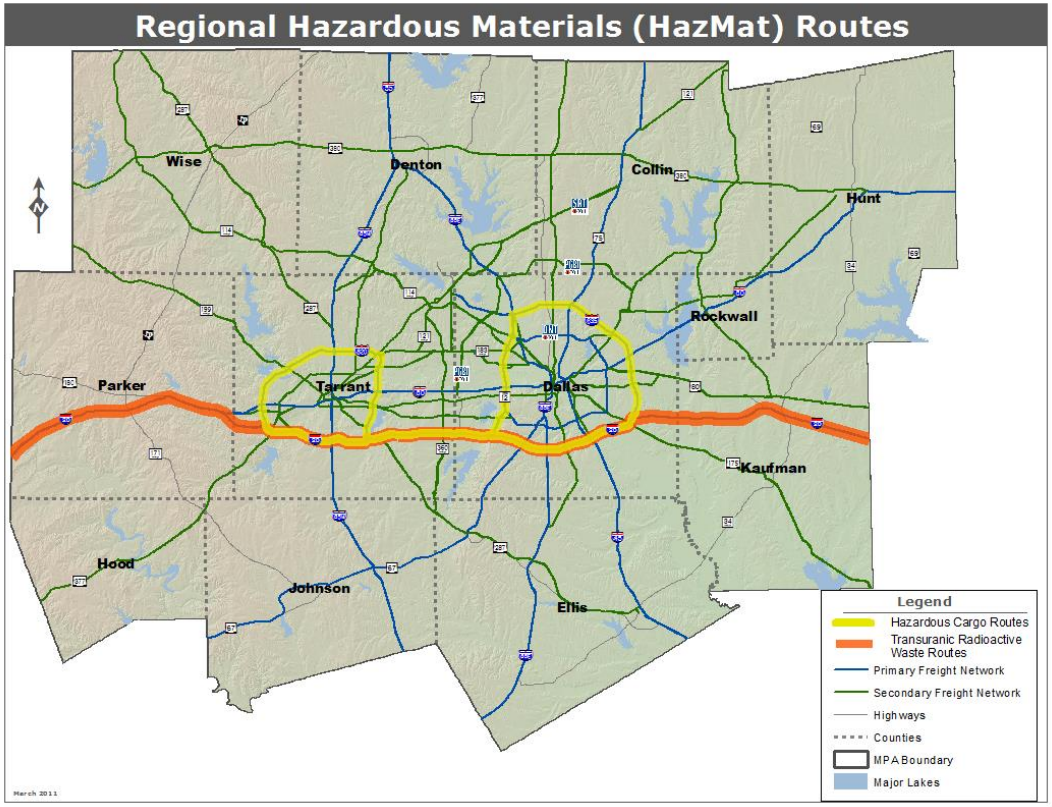
NCTCOG staff has undertaken a variety of truck initiatives. These initiatives include regional hazardous materials routes, regional truck route tracking, load-restricted bridge tracking, height-restricted bridge tracking, and truck lane restrictions.

Regional Hazardous Materials Routes

In 1985, NCTCOG completed the Hazardous Materials Routing Study which analyzed hazardous materials (HazMat) routes within and through the DFW metropolitan area. The study's goal was to develop a regional HazMat route designed to reduce the potential exposure of individuals in the event of a HazMat incident. The study results led to the designation of IH 20, IH 820, and IH 635/Loop 12 as the regional Hazardous Cargo Routes and IH 20 as the Transuranic Radioactive Waste Cargo Route. ***Figure 3.22*** shows the regional hazardous materials truck routes within the region. The regional Hazardous Cargo Routes and the Transuranic Radioactive Waste Cargo Route are both located along PFN and SFN corridors.

Transuranic Waste*—the highest level of hazardous waste transported in the US and more cautious transport than other types of hazardous waste.*

Figure 3.21 Regional HazMat Routes



Source: *NCTCOG Staff, 2011*

Regional Truck Routes

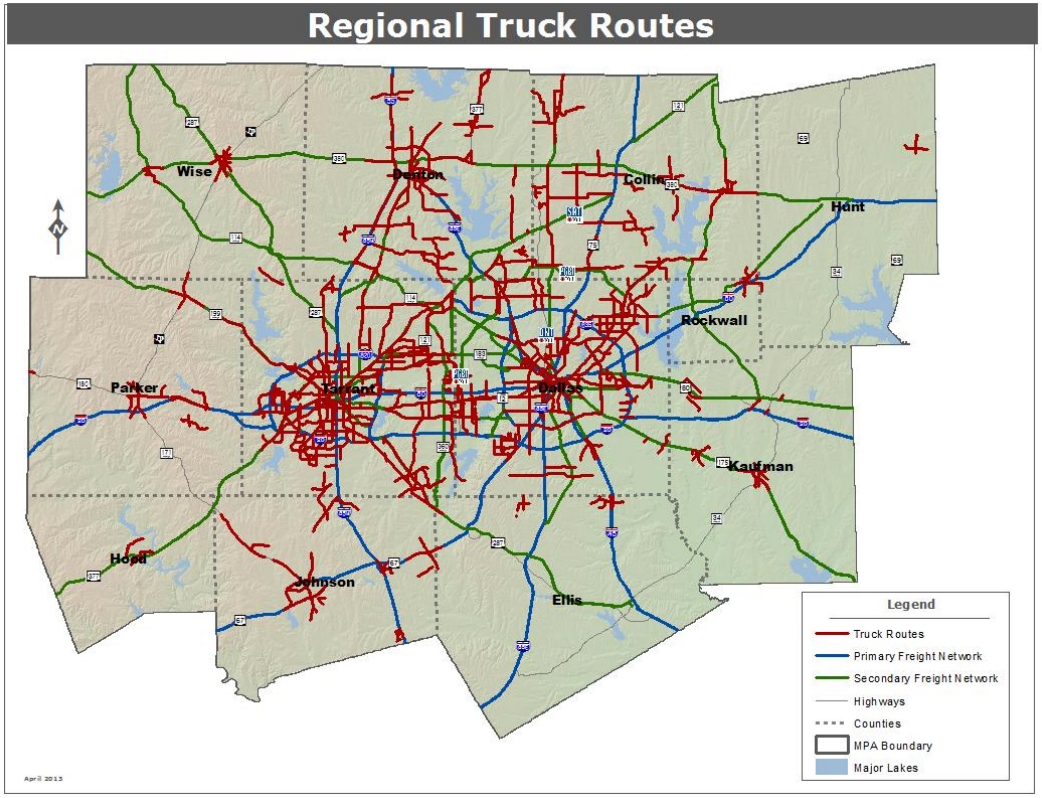
Dedicated truck routes are an important regional freight system component. Federal, State, and local governments can establish truck routes as a way to direct freight traffic to alleviate congestion for both passenger and freight vehicles. Truck routes also provide designated routes to key freight facilities. Within the North Central Texas region, 96 municipalities have some form of truck route designated by ordinance. The different roadway classifications and the level of government with the authority to regulate traffic on each roadway type are shown in ***Table 3.2***. The locations of these routes are shown in ***Figure 3.22***. While a majority of the regional truck routes are located on local streets, several segments are located on SFN corridors and to a lesser degree on PFN corridors.

Table 3.2 Roadway Functional Classes

Roadway Type	Regulation Authority	Regional Examples
Interstate Highways (IH) US Highways (US)	Federal Government	IH 30 US 377 US 75
State Highways (SH) Farm-to-Market Roads (FM)	State Government	SH 183 FM 157
Local Arterials	Municipal/Local Government	Coit Road Randol Mill Road

Source: *NCTCOG Staff, 2011*

Figure 3.22 Regional Truck Routes



Source: *NCTCOG Staff, 2011*

Load-Restricted Bridges

There are a total of 307 load-restricted bridges within the region, as shown in ***Figure 3.23.*** Several load-restricted bridges are located along PFN and SFN corridors. The number of load-restricted bridges per county is shown in ***Table 3.3***.

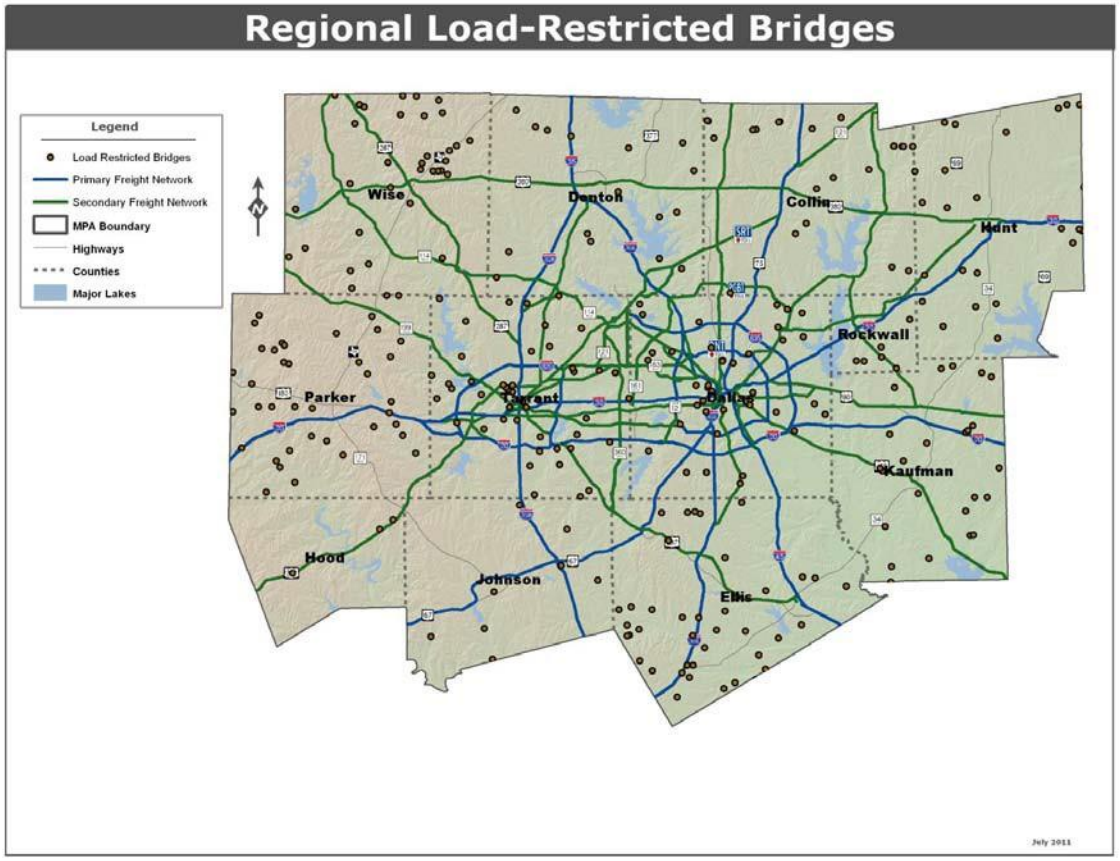
Table 3.3 Load-Restricted Bridges by County

County	Number Load Restricted Bridges
Collin	23
Dallas	40
Denton	17
Ellis	42
Hood	3
Hunt	25
Johnson	8
Kaufman	24
Parker	38
Rockwall	6
Tarrant	45
Wise	36
TOTAL	**307**

Source: *TxDOT, 2011*

Load-Restricted Bridges*—bridges that have weight limits imposed due to age or construction materials.*

Figure 3.23 Regional Load-Restricted Bridges



Source: *TxDOT, 2011*

Height-Restricted Bridges

There are a total of 64 height-restricted bridges within the region, as shown in ***Figure 3.24.*** Several height-restricted bridges are located along PFN and SFN corridors. The number of height-restricted bridges per county is shown in ***Table 3.8***.

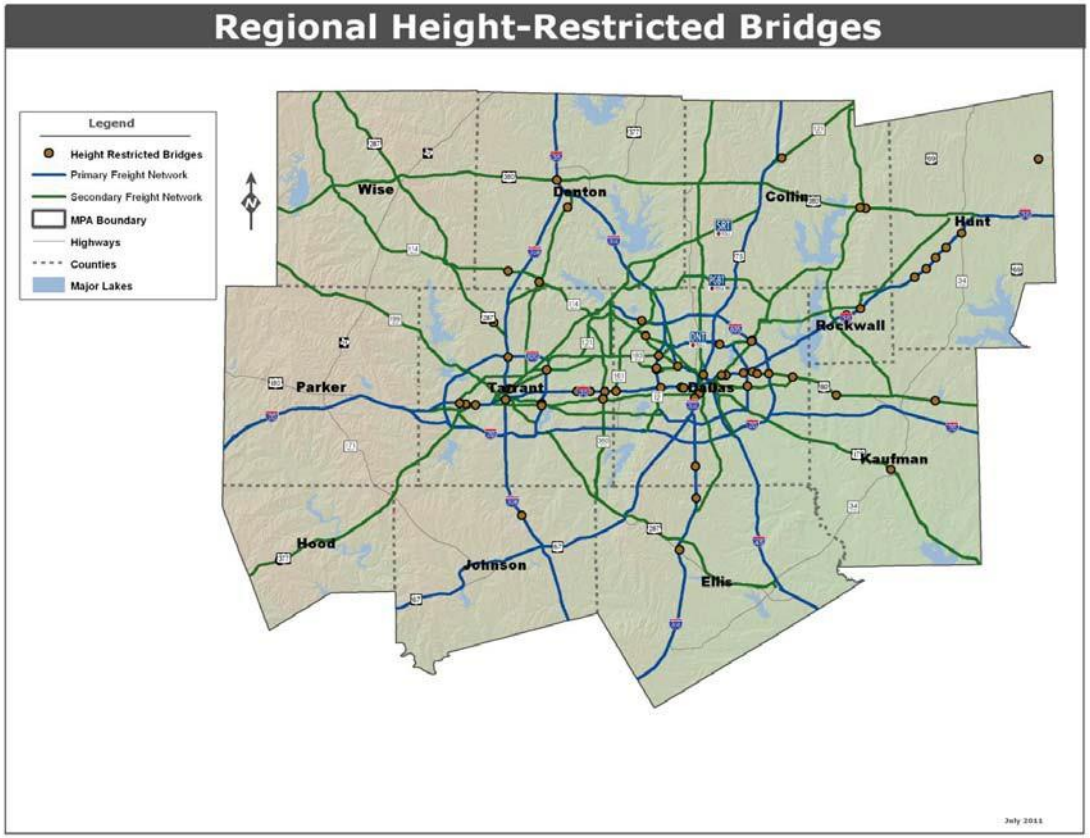
Table 3.8 Height-Restricted Bridges by County

County	Number Height Restricted Bridges
Collin	3
Dallas	26
Denton	4
Ellis	2
Hood	1
Hunt	6
Johnson	1
Kaufman	3
Parker	0
Rockwall	2
Tarrant	16
Wise	0
TOTAL	**64**

Source: *TxDOT, 2011*

Height-Restricted Bridges*—roadways crossed by grade-separated bridges, whose distance from the roadway surface is 14 feet or less.*

Figure 3.24 Regional Height-Restricted Bridges



Source: *TxDOT, 2011*

Regional Truck Lane Restrictions

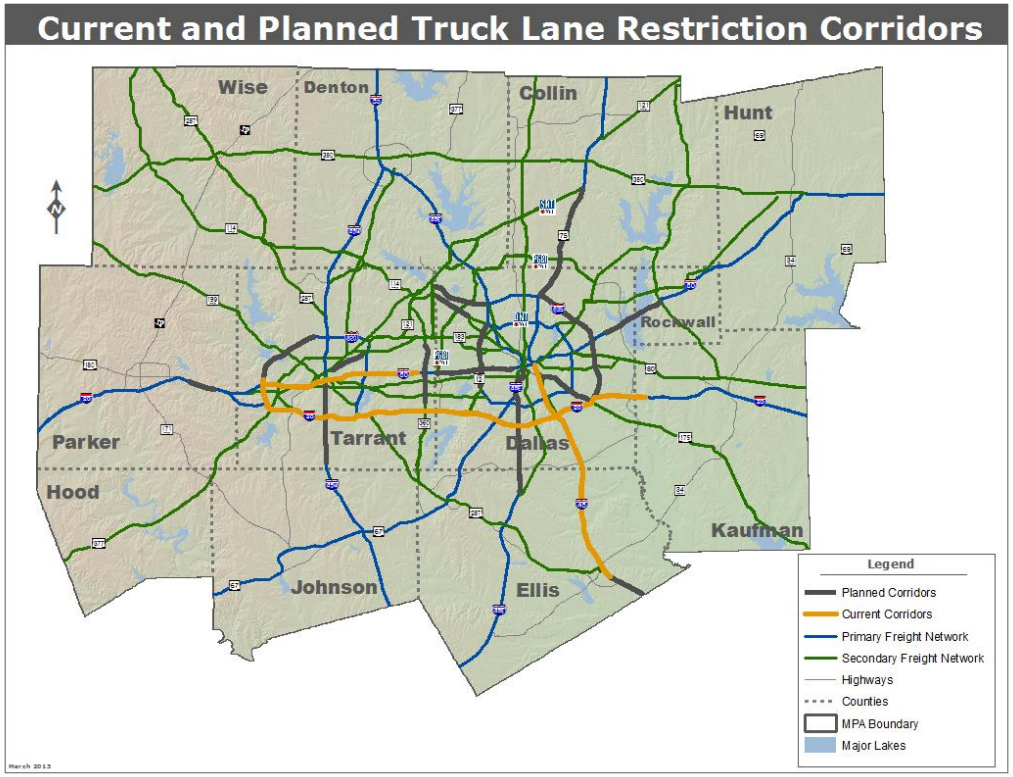
In 2006, NCTCOG published the Truck Lane Pilot Study Final Report. The Truck Lane Pilot Study was conducted from August 2005 to January 2006 along two test sections:

- IH2 0 from Cedar Ridge Drive to IH 45
- IH 30 from Hulen Street to Collins Street (FM 157)

The Pilot Study's success led to truck lane restrictions being implemented along these two segments. Following this successful implementation, NCTCOG conducted the Truck Lane Restriction Expansion Study in 2009. This study examined additional truck lane restrictions along IH 20, IH 30, IH 45, and IH 820. This expansion added 187 miles of truck lane restrictions for a total of 245 miles of restrictions throughout the region.

Upon completion of the Truck Lane Restriction Expansion Study in June 2009, NCTCOG began work on a revision to the methodology for the selection of corridors for potential future truck lane restrictions. This effort created a documented and vetted methodology for the selection of future truck lane restriction corridors within the region, as well as documentation for corridors not selected for future truck lane restrictions. Current and planned truck lane restrictions within the region are identified in ***Figure 3.25.*** All of these corridors are located on PFN and SFN corridors.

Figure 3.25 Regional Truck Lane Restrictions



Source: *NCTCOG Staff, 2013*

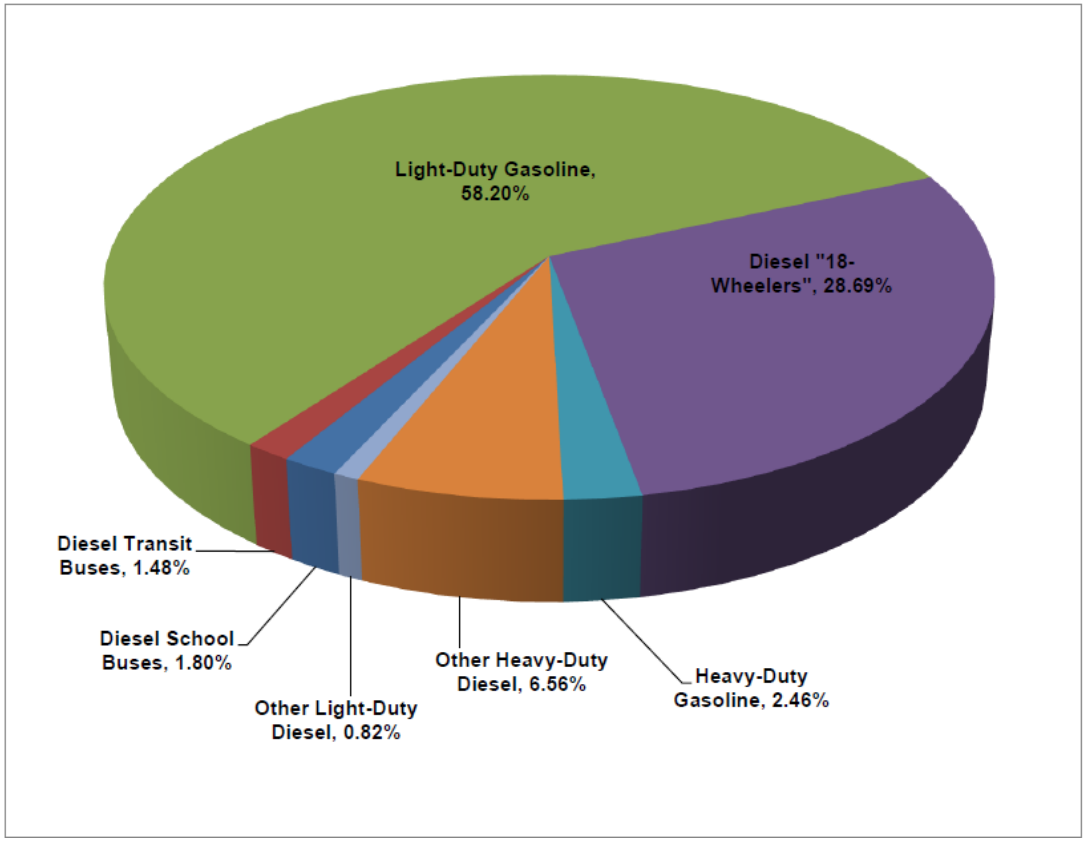
Freight and Air Quality

Generally trucks and trains use diesel fuel. Diesel engines are a major source of nitrogen oxides (NO_X), which is the primary precursor to ground-level ozone formation in the 10-county air quality nonattainment area. This area includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise. ***Figure 3.26*** illustrates the percentage of NO_X emissions produced by trucks (18-wheelers) in 2012, 28.69 percent. Light-Duty gasoline vehicles (passenger vehicles) produced more NO_X emissions, 58.20 percent, than trucks.

As the MPO, NCTCOG conducts transportation-related air quality analyses for the nonattainment area. Emphasis is placed on on-road mobile sources, including freight trucks. NCTCOG staff also administers numerous programs and projects to help reduce emissions from both on-road vehicles and non-road mobile sectors, such as locomotives, by incentivizing the use of newer, cleaner engines or encouraging more efficient operations.

Nonattainment Area—*a designation given by the Environmental Protection Agency (EPA) that is applied to areas that do not meet national air quality standards.*

Figure 3.26 On-Road NO_X Emissions Inventory by Sector



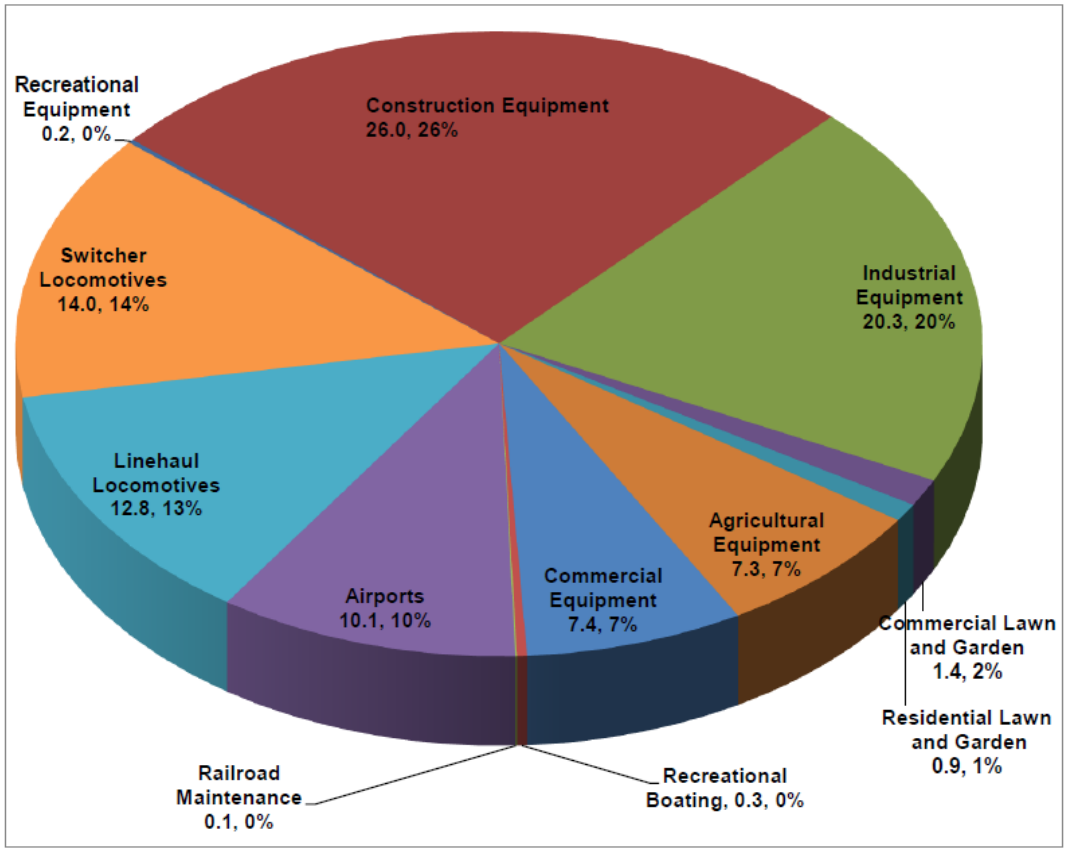
Source: Texas Commission on Environmental Quality (TCEQ)*, 2012*

Additionally, diesel engines contribute to particulate matter (PM) pollution. Exposure to PM has been linked to serious health conditions and is the major source of haze that reduces visibility.[32] Freight activity, particularly trucking, has a significant impact upon Greenhouse Gas (GHG) emissions nationwide through the release of carbon dioxide (CO_2) during fuel combustion. The GHG intensity of truck-based freight is higher than rail; however, the trucking sector carries nearly one-third of all freight shipments.[33] Increasing the fuel efficiency of freight trucks is crucial to reducing GHG emissions in the transportation sector, the fastest-growing source of these emissions in the US. Heavy-Duty vehicles contribute approximately 19 percent of all transportation-based GHG emissions. However, heavy-duty freight truck fuel efficiency has changed little since the mid-1990s.[34] Additionally, the freight industry has a significant impact on ozone-forming pollutants within the NCTCOG nonattainment area.

Figure 3.27 illustrates the percentage of NO_X emissions produced by Non-Road sources, including rail and construction equipment.

[32] "Destination Sustainability: Reducing Greenhouse Gas Emission from Freight Transportation in North America", Commission for environmental Cooperation, 2011.
[33] Environmental Protection Agency - Office of Transportation and Air Quality. *Greenhouse Gas Emissions from the US Transportation Sector 1990-2003.* March 2006. www.epa.gov/otaq/climate/420r06003.pdf.
[34] US Department of Energy, Energy - Efficiency and Renewable Energy. Vehicle Technologies Program. Fact #372: Truck Fuel Economy by Size Class. May 16, 2005. www1.eere.energy.gov/vehiclesandfuels/facts/2005/fcvt_fotw372.html.

Figure 3.27 Non-Road NO_X Emissions Inventory by Sector



***Source: Texas Commission on Environmental Quality (TCEQ)**, 2012*

Freight and Social Issues

Freight impacts all aspects of life, including social issues. Freight training/education and environmental justice issues related to the location of freight facilities are critical freight-related social issues within the region.

Freight Training Facilities

The North Central Texas region is a key location in freight transportation and freight industry training, with a growing demand for a workforce to meet freight industry needs.

The region is currently home to 41 training and higher education facilities offering programs that can feed into a Transportation, Distribution, and Logistics (TDL) career.[35]

The TDL pathway allows individuals to pursue careers in planning, management, and the movement of people, materials, and goods by road, pipeline, air, rail, and water; and related professional and technical support services. These include transportation infrastructure planning and management, logistics services, and mobile equipment and facility maintenance. For the purpose of this study, educational opportunities for a freight industry career were divided into three levels. These levels were grouped by educational facilities and type:

- Level One: Certification programs
- Level Two: Associates degree programs
- Level Three: Bachelors, Masters, or Doctoral Degree programs

A list of schools and occupations can be found on the Freight North Texas website.

Levels of Educational Opportunities

Level One

Level One schools offer certification programs for TDL career paths. Level One Schools were created to ensure recipients receive the industry-defined and nationally validated standards of education in their field. The credits earned at these schools typically are not transferable to other schools. There are 19 Level One schools in the region.

Level Two

Level Two schools offer associates' degrees, with potentially transferable credit hours. This degree program is typically completed in two years. Many schools providing this level of education also provide certificates of completion and/or Associate degrees in specific program fields. There are five schools and seven Community College Districts at 36 campuses with programs in the region.

Level Three

Level Three schools offer a higher level of educational experiences that can expand and sharpen student's skills to help them become better decision-makers. The students are provided knowledge of the latest technologies and foundations to meet the challenges in their chosen career path. There are 17 schools within the region offering one or more degrees (Bachelors, Masters, or Ph.D.) in this career cluster.

University Degree Facilities

The region offers students wanting to pursue a degree in the TDL Career Cluster 14 private and nine public universities, a total of 258 occupational options. All of these schools provide undergraduate degree programs, the most common level of education for students who would like to specialize in the logistics field. For this career cluster, the base degree is a

[35] States' Career Clusters Initiative

business degree with a specialization in logistics or supply chain. Two universities offer specialized bachelor's degrees:

- University of North Texas (UNT), Denton Campus—a Bachelor of Science (BS) in Logistics
- UNT, Dallas Campus—BS in Logistics and Supply Chain Management; and
- Texas Christian University—Bachelors of Business Administration in Supply and Value Chain Management.

Three schools offer a specialized Master's program:

- UNT—Master of Business Administration in Logistics and Supply Chain Management;
- University of Texas-Arlington—Master of Science (MS) in Logistics; and
- University of Texas at Dallas—MS in Management and Administrative Science with a Supply Chain Management concentration and MS in Supply Chain Management.[36]

The North Central Texas region has taken the lead in developing educational opportunities within the freight and logistics sectors. With 85 different campuses to attend and 59 career pathways to choose from, the region offers students over 700 career options in the freight sector. As this industry continues to grow in the region the educational opportunities will, too.

[36] International Inland Port of Dallas

Environmental Justice Analysis

Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with regard to the development, and implementation of plans, policies, and programs. Freight facilities are often located in urban areas to gain efficiencies from access to multiple transportation modes and close proximity to customers. While gains in productivity may be realized from operating in urban areas, there are often unintended, but equally important, consequences. These include the effects operations have on EJ or protected populations. These federally designated populations, identified in Executive Order 12898, include:

- Black/African American
- American Indian/Alaskan Native
- Asian
- Native Hawaiian or Pacific Islander
- Hispanic
- Low-income
- Persons 65 years or older
- Person with disabilities
- Female head of household (any female-headed household with children and no husband)

Executive Order 12898 provides a federal designation whereby agencies must "collect, maintain, and analyze information on the race, national origin, income level and other readily accessible and appropriate information surrounding facilities or sites expected to have substantial environmental or economic effect on surrounding populations."[37]

It is the goal of NCTCOG to ensure an inequitable level of benefits and burdens is not placed on EJ populations. This is done by ensuring EJ populations are not exposed to above-average levels of congestion, and air, and noise pollution from regional freight facilities. It is equally important for EJ populations to have equal access to the jobs these facilities create.

Freight planning in North Central Texas incorporates EJ and non-discrimination principles to ensure no person is excluded from participation in, denied benefits of, or discriminated against during planning efforts. Through the freight planning program, NCTCOG seeks to understand the impacts of freight programs and activities in the region and EJ

[37] Executive Order 12898

populations through outreach, education, and analysis during the freight planning process.

Community Impacts

The types of impacts freight operations have on all communities can be classified into four general categories: health, quality of life, environmental, and economic.

Health impacts can be both direct and indirect. Direct causes include increased exposure to ozone and diesel particulates due to increased freight operations. Indirect causes include increased traffic congestion which can elevate stress levels and can, over time, lead to a weakened immune system. Increased traffic congestion can lead to reduced levels of safety leading to injuries, crashes, and accidents. Identifying potential direct and indirect health impacts of increased freight operations is one element to understanding the social consequences of freight operations.

Quality of life impacts are associated with the visual and aesthetic concerns that may occur due to freight operation increases. This may include the diminished enjoyment of public amenities because of freight movements such as a freight facility that displaces a local park or blocks an aesthetically pleasing view. While there is no proof these quality of life issues can deteriorate health, they can negatively impact an individual's quality of life. Additionally, noise pollution and associated vibration impacts can become an issue for noise-sensitive communities as truck traffic increases and previously lightly traveled roads become more congested.

Environmental impacts are the most publicized effects on a community. Environmental effects include the impacts the facility has or may have on air, soil, and water quality, including:

- Increased levels of ozone and airborne diesel particulates
- Soil and water direct-source contamination from oil/gas leaks and improper waste disposal
- Soil and water indirect contamination due to storm water runoff containing contaminants flowing into a natural water supply or the ground

All of these sources of contamination can have an equally negative impact on the environment and illustrate the importance of and need for comprehensive education, planning, and management practices to ensure the environment is protected.

Freight facilities also have positive impacts through the related economic impacts and benefits to the community. If done correctly, freight operations can be a key driver for a community as local jobs are created, supplies are purchased, and facilities are built. This economic impact can help to enrich the local tax base as well as circulate additional funds into the local businesses benefiting both the city and surrounding community.

Freight Programs at NCTCOG

As the MPO for the 12-county North Central Texas region, the NCTCOG Transportation Department staff works on a variety of aspects of freight planning throughout the various program areas. In addition to the Freight Planning Program within the Transportation Department, there are several program areas and departments within the agency whose work directly affects and benefits freight within the region.

Air Quality

This program area focuses on programs to aid in the reduction of pollutants in the region's air. In 2004, the US Environmental Protection Agency (EPA) designated nine counties in North Central Texas as nonattainment for the pollutant ozone in accordance with the National Ambient Air Quality Standards (NAAQS). Wise County was added to the nonattainment area in 2012. NCTCOG works in cooperation with federal, State, and local partners to ensure all air quality requirements are met.

Locally Enforced Idling Restrictions

Locally Enforced Idling Restrictions (LEIR) focus on heavy-duty truck idling; these vehicles produce large quantities of emissions when idling, further contributing to the region's air quality problem. To address excessive emissions, LEIR was included in the DFW 8-Hour Ozone Attainment Demonstration State Implementation Plan (SIP).

On May 8, 2008, the RTC approved a resolution supporting the Texas Commission of Environmental Quality's (TCEQ's) locally enforced motor vehicle idling rule. To date, 23 municipalities and four counties in the region have adopted idling restrictions. Adoption requires entrance into a memorandum of agreement with TCEQ for the purpose of transferring enforcement authority to the local jurisdiction, as well as the creation of an implementation plan outlining the education and compliance activities that will take place.

Under this rule, no gasoline-or diesel-powered vehicle with a gross vehicle weight rating greater than 14,000 pounds may idle for more than five minutes if the vehicle is within a jurisdiction that has adopted the rule. This rule is applicable year-round to both public and private vehicles. Several exemptions do exist related to vehicle type, engine certification, operations, and air conditioning/heating provisions.

Heavy-Duty Vehicle and Equipment Programs

The Air Quality program area also has a variety of programs and calls for projects that focus specifically on heavy-duty vehicles, including:

- Blue Skyways Collaborative
- Construction Fleets
- Diesel Idling Reduction Program
- Heavy-Duty Vehicle and Equipment Grant Program (HDVEGP)
- North Central Texas Clean School Bus Program
- North Texas Emissions Reduction Grant (NTERG) Program
- Regional Refuse Hauler Program

Congestion Management and Systems Operation

This program area focuses on congestion management programs and projects, as well as safety and sustainable development initiatives. These initiatives include hazardous materials incidents tracking, brownfields redevelopment, the Thoroughfare Assessment Program (TAP)/Traffic Signal Integration and Monitoring Program, and the Regional Traffic Signal Retiming Program (RTSRP).

Brownfield—*real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.*

Thoroughfare Assessment Program (TAP)/Traffic Signal Integration and Monitoring Program

The purpose of the TAP was to improve traffic flow and enhance the capacity of existing arterial systems by implementing new signal timing and low-cost operational improvements along select corridors including:

- Lane assignment changes
- Vehicle detector upgrades
- Addition of pedestrian push buttons
- Signal head upgrades
- Controller and cabinet upgrades
- Communication with central computer
- Addition of GPS clocks
- Re-striping

Over 1,900 signalized intersections and 90 corridors were improved through this program; 22 percent, approximately 420 projects, were located on PFN or SFN corridors; ***Figure 3.28*** shows the locations of these projects.

Improved and coordinated traffic flow has resulted in the improvement of the air quality standards in the DFW nonattainment area. This project was implemented in three phases:

- *TAP Phase 2.0:* Signal retiming and low-cost operational improvements at select locations on 20 corridors with 482 signalized intersections; completed in July 2009.

- *TAP Phase 3.1:* This program phase began in November 2005; included 13 corridors with 258 signalized intersections; signal retiming and low-cost operational improvements at select locations were implemented.

- *TAP Phase 3.2:* The implementation phase of the program began in April 2006. A total of 60 corridors with 1,178 signalized intersections were improved; this phase was completed in December 2009.

Regional Traffic Signal Retiming Program (RTSRP)

The RTSRP purpose is to retime 390 select signalized intersections to allow traffic to flow efficiently through corridors and reduce idle emissions generated by stop-and-go traffic. Coordinated traffic signal systems along major arterials will also significantly increase the efficiency of the existing system and reduce traveler delay by eight percent to 25 percent. Approximately 162, or 42 percent, of the planned improvements will be located on PFN or SFN corridors. The RTSRP includes:

- Establishment of a baseline analysis
- Implementation of signal retiming
- Performance of a subsequent analysis (improved conditions)
- Preparation of a program executive summary

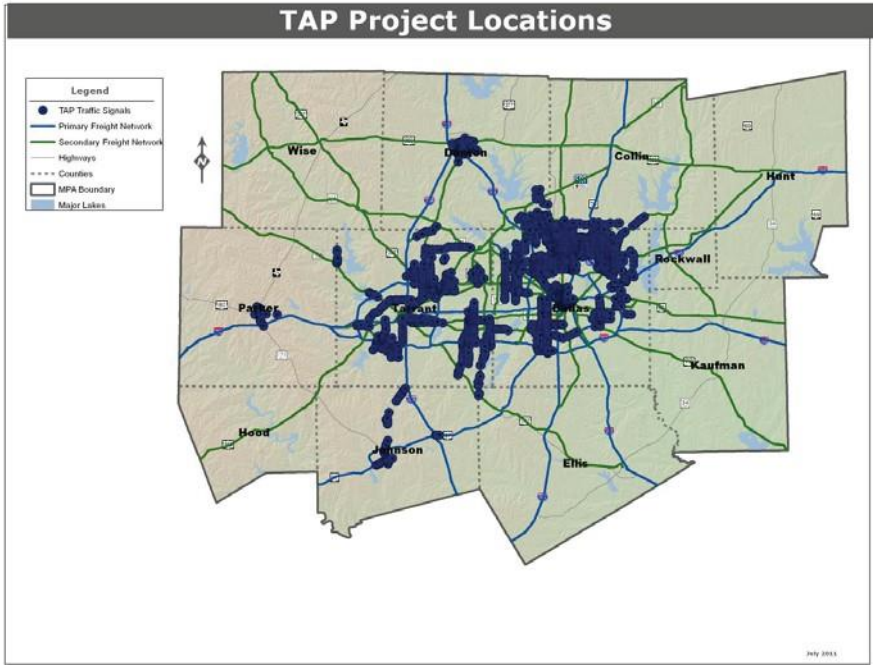
This program began implementation in December 2010 and is expected to be completed by September 2013; ***Figure 3.29*** shows the locations of these projects.

The TAP and RTSRP programs benefit both passenger and freight traffic moving through the region. The programs provide synchronized traffic signals designed to reduce stop-and-go traffic and improve traffic flow along regional roadways.

Workforce Development Department

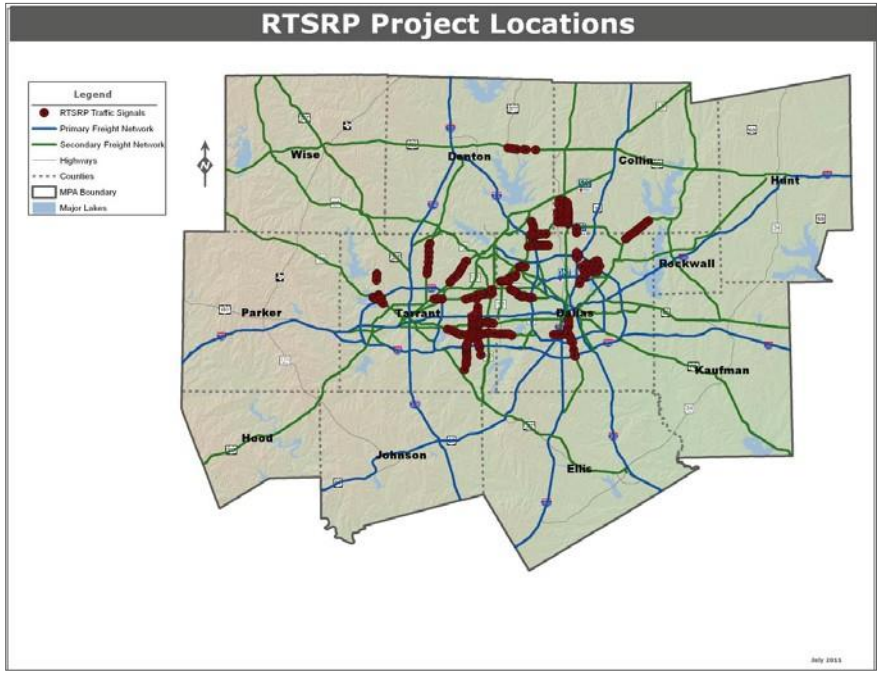
The NCTCOG Workforce Development Department focuses on all aspects of workforce development within the region. One of these focus areas is logistics education. The department provides staff support to the North Texas Supply Chain Council (NTSCC) and assisted in CLA/CLT certification program creation. Additional information related to this department's work with logistics education can be found in the "*Freight Training Facilities*" section of this chapter.

Figure 3.28 Thoroughfare Assessment Program (TAP) Locations



Source: *NCTCOG Staff, 2011*

Figure 3.29 Regional Traffic Signal Retiming Program (RTSRP) Locations



Source: *NCTCOG Staff, 2011*

Freight Groups in North Central Texas

There are a variety of freight groups, ranging from professional organizations to mode-specific groups, within North Central Texas, including:

- American Society of Transportation and Logistics
- Blue Skyways Collaborative
- DFW Air Cargo Association
- DFW Council of Supply Chain Management Professionals Roundtable
- Dallas-Fort Worth Clean Cities Coalition
- Institute of Transportation Engineers-TexITE Chapter
- North Texas Commission's Logistics Development and Marketing Committee
- North Texas Supply Chain Council (NTSCC)
- Owner Operator Independent Trucker Association Supply Chain Consortium
- Texas Motor Transportation Association-Metroplex
- Chapter
- Transportation Club of Dallas-Fort Worth

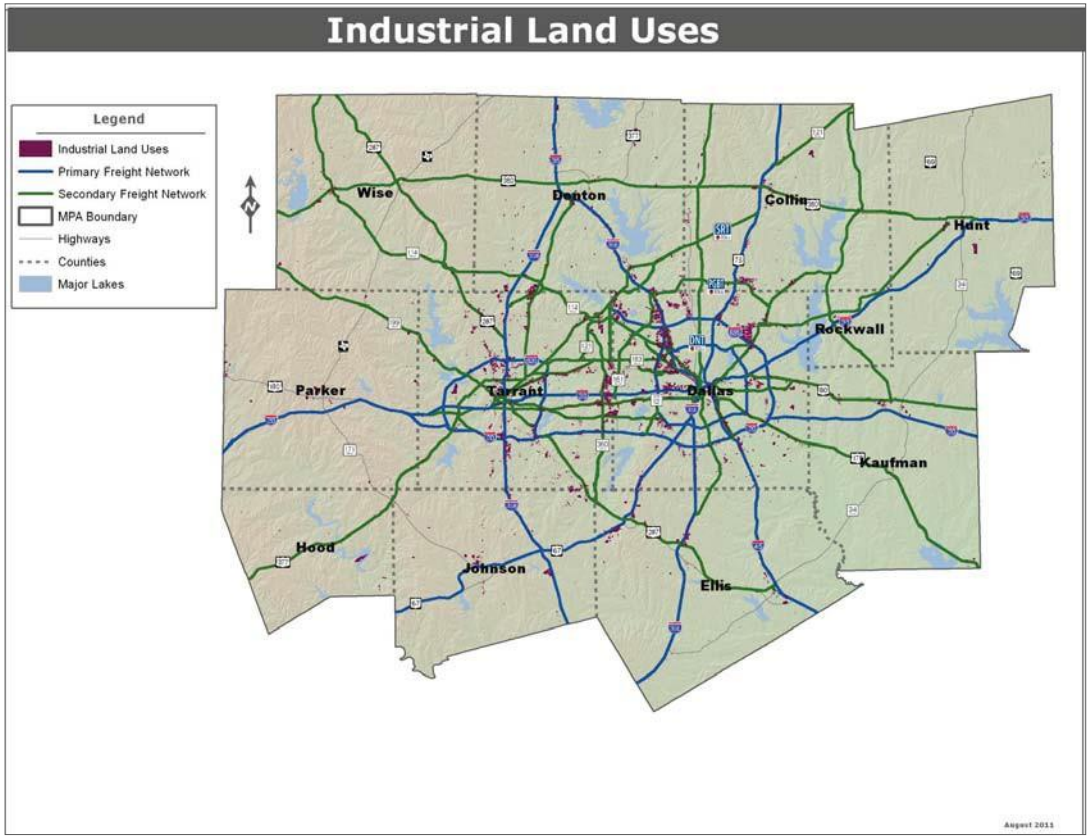
Ensuring staff works with and, as applicable and appropriate, are members of these various groups ensures the freight system users and the freight sector's views are taken into consideration during freight program planning efforts.

Freight Transportation Land-Use Profile

As discussed in Chapter 2, freight facilities and their associated land uses generally pre-date adjacent land uses. Freight facility development typically occurred on land in unincorporated areas where traditionally industrial uses have since been converted to other uses. Residential uses adjacent to industrial uses are often occupied by lower-income residents and protected populations where EJ concerns, discussed in Chapter 3, must be taken into consideration. In some cases, adjacent vacant land has been converted to upper income developments, a population group typically opposed to such uses. If freight infrastructure and industrial land uses are lost due to development pressures it is difficult to recover or purchase new land. This is especially true within a rapidly growing urban area requiring freight activities to provide needed goods and services.

While the impacts and benefits of industrial land uses are felt throughout the region, industrial uses only account for 1.3 percent of all land uses within the region. Industrial land uses can be problematic when surrounded by non-compatible uses. Industrial uses are not compatible with residential areas, schools, or areas of high pedestrian activity. It is often designed for heavy freight movements, continuous operations, bright lights, and loud noises. ***Figure 4.1*** illustrates the location of industrial land uses in relation to PFN and SFN corridors.

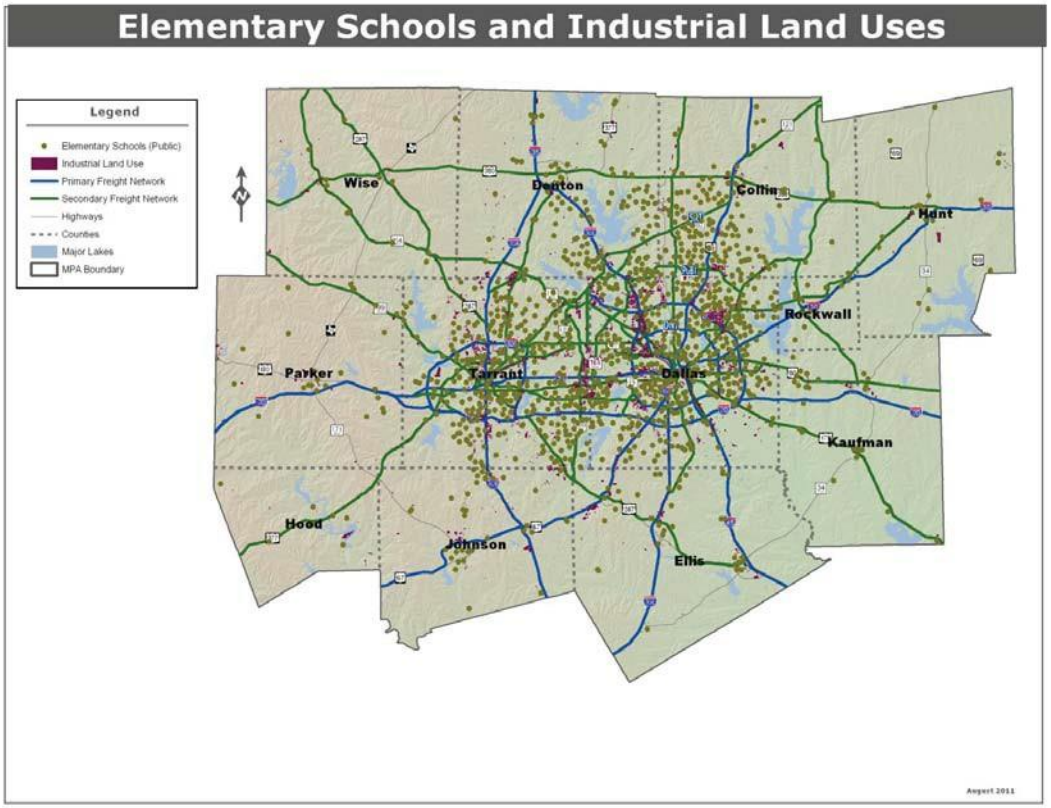
Figure 4.1 Regional Industrial Land Uses



Source: *NCTCOG Staff, 2011*

Criteria for locating industrial land uses are similar to criteria used to site schools. These include available land, public infrastructure, and cost. One critical area that the freight transportation industry, local governments, and school boards should focus on is the location of elementary schools and their proximity to industrial land uses and freight facilities. Within the 12-county MPA, approximately 20 percent of all public elementary schools are within a quarter of a mile of an industrial land use, shown in ***Figure 4.2***. This close proximity can lead to safety issues for students as well as restricting travel times and speeds for freight traffic due to reduced speed limits. School boards should take adjacent land uses, their traffic impacts, and their impacts on students traveling to and from school into consideration when planning for new school facilities and designating current school attendance zones.

Figure 4.2. Public Elementary Schools and Industrial Land Uses



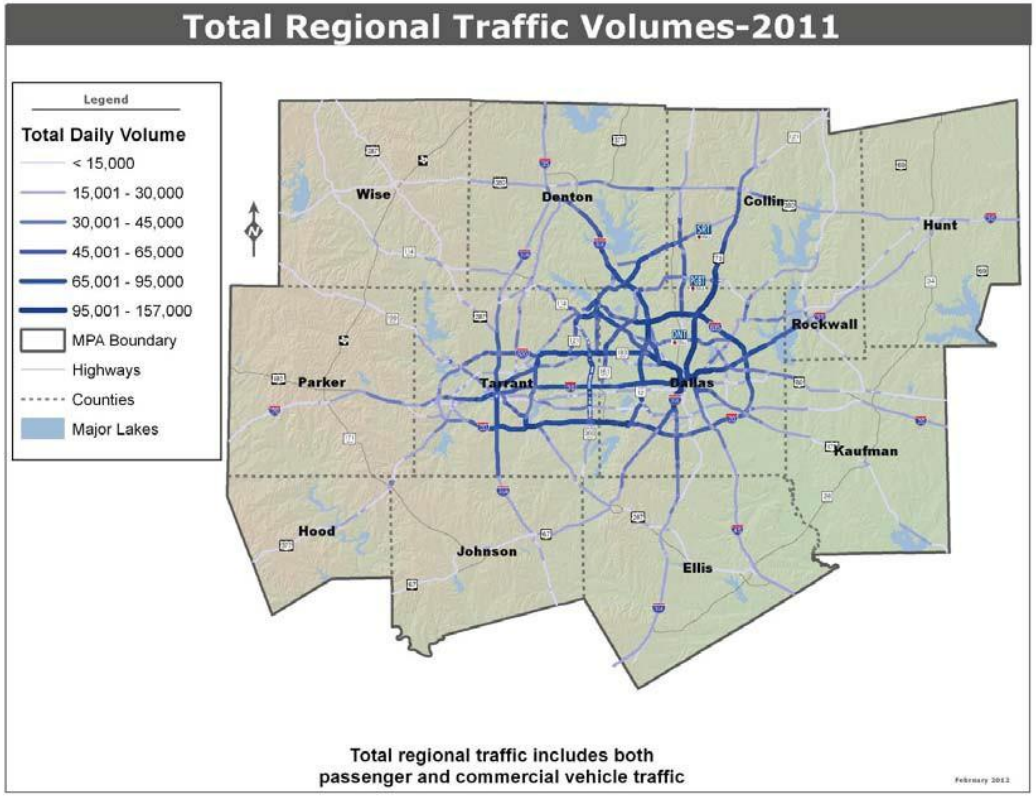
Source: *NCTCOG Staff, 2011*

Roadway congestion is a major issue for all drivers and is especially cumbersome for truck drivers. ***Figure 4.3*** shows 2011 total regional traffic volumes. ***Figure 4.4*** shows the 2011 peak period traffic volumes for all traffic on the region's roadways, while ***Figure 4.5*** depicts 2011 peak period truck volumes. ***Figures 4.6 and 4.7*** identify the 2011 off-peak period volumes for all traffic and trucks.

Recurring congestion can be planned for and around with route and schedule changes. Non-recurring congestion, due to accidents or emergency maintenance, cannot be planned for and affects the predictable and timely movement of trucks through the region. This delay impacts the driver's hours of service as well as the timeliness of shipments. While the overall impact of non-recurring congestion is generally known, the threshold of delay and what is considered to be a "bad" travel time versus a "good" travel time is unknown. Further study of this issue is needed.

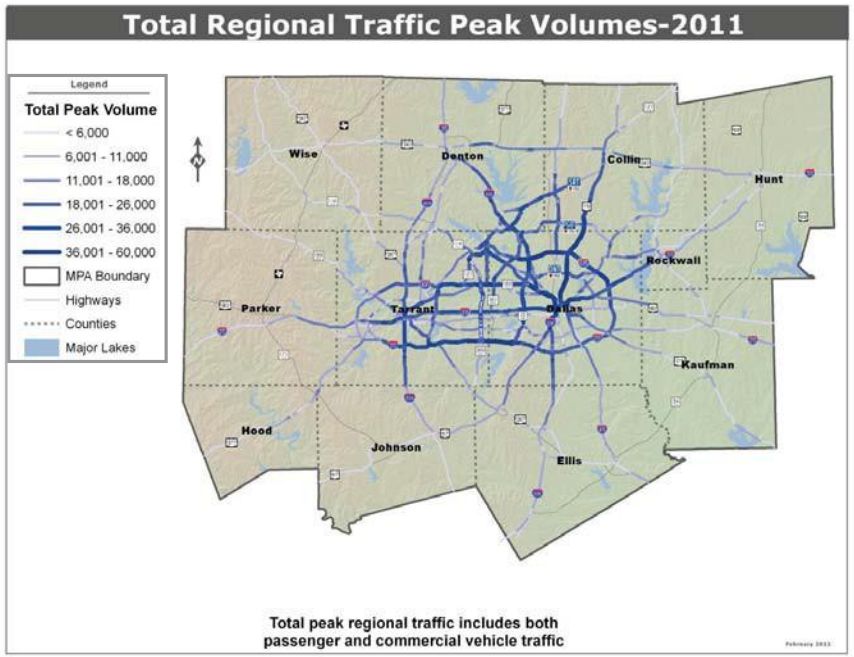
Traffic congestion will continue to increase as the regional population increases and the goods needed to sustain the population must be moved into, through, and out of the region. While the region's toll facilities have relatively light congestion in comparison to the non-tolled facilities, the toll rates along those facilities are higher based on the number of axles with truck toll rates, two to five times higher than those for passenger vehicles. ***Figures 4.8 and 4.9*** identify the 2035 traffic volumes for all traffic and trucks, respectively.

Figure 4.3. Total Regional Traffic Volumes—2011



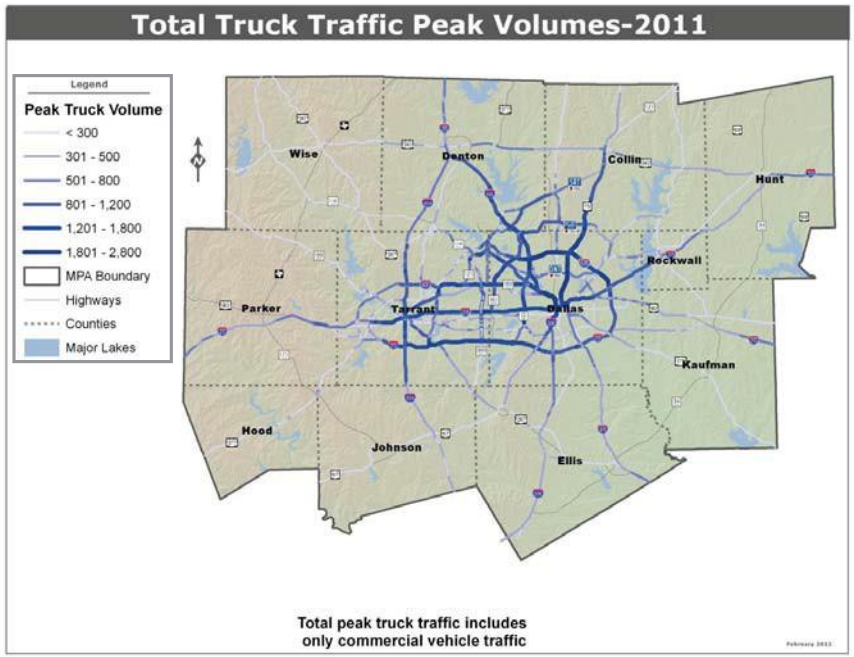
Source: *NCTCOG Staff, 2012*

Figure 4.4. Total Regional Peak Period Volumes—2011



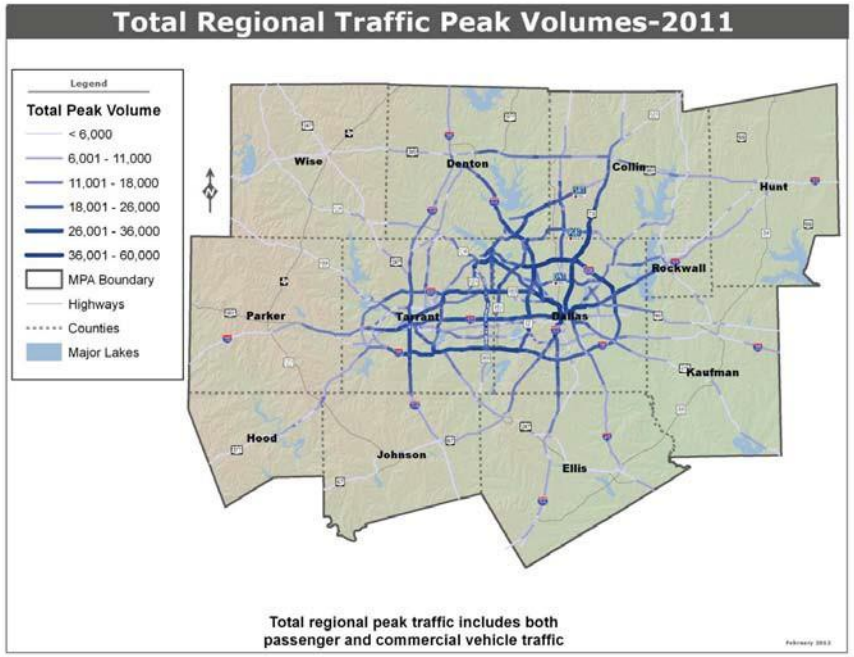
Source: *NCTCOG Staff, 2012*

Figure 4.5. Total Truck Traffic Peak Period Volumes—2011



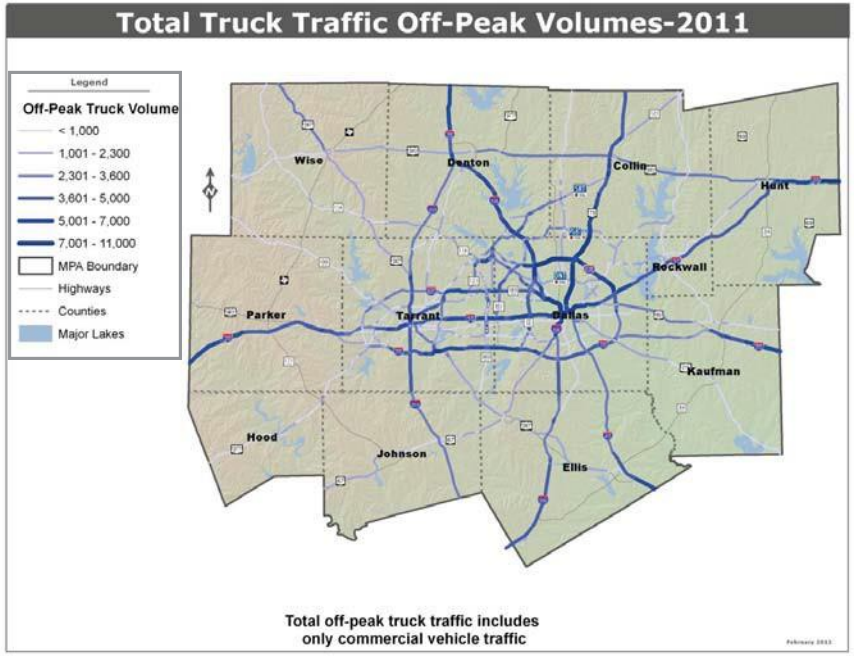
Source: *NCTCOG Staff, 2012*

Figure 4.6. Total Regional Off-Peak Period Volumes—2011



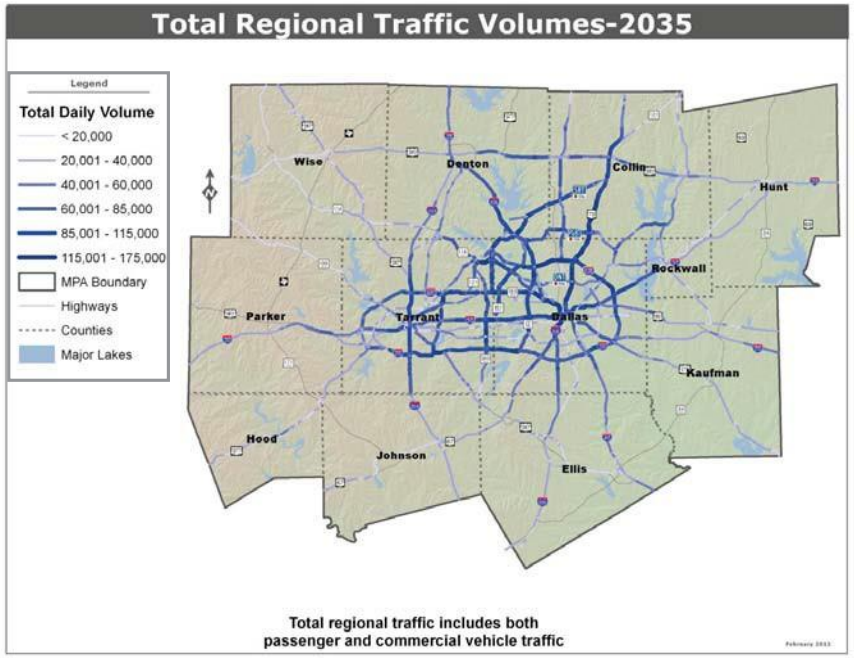
Source: *NCTCOG Staff, 2012*

Figure 4.7. Total Truck Traffic Off-Peak Period Volumes—2011



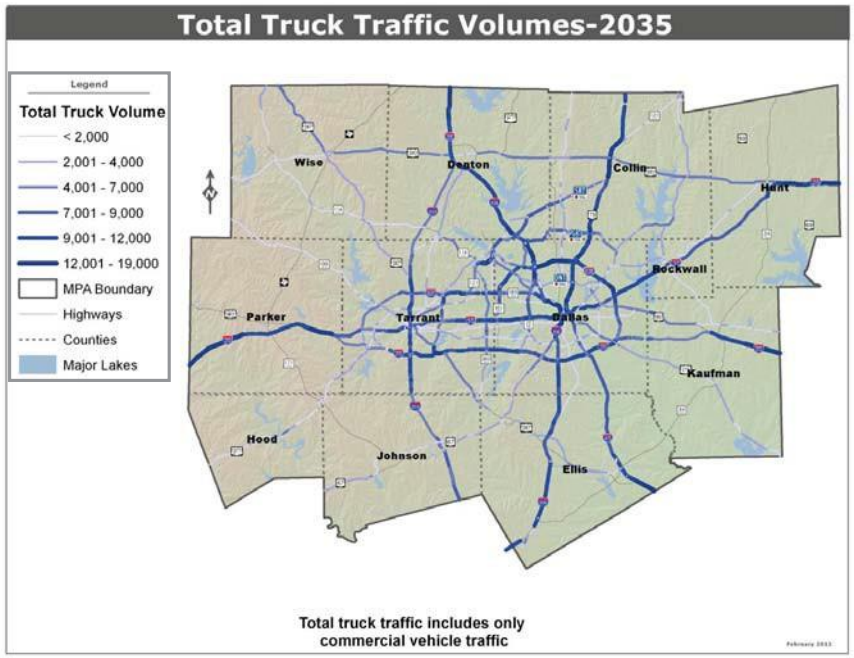
Source: *NCTCOG Staff, 2012*

Figure 4.8. Total Regional Traffic Volumes—2035



Source: *NCTCOG Staff, 2012*

Figure 4.9. Total Truck Traffic Volumes—2035



Source: *NCTCOG Staff, 2012*

Infrastructure Strategies for the Future Regional Freight System

Freight is an important component of the North Central Texas region's economy and to the quality of life for regional residents. The freight perspective should be brought into the project selection decision-making process and the project ranking/consideration phase of infrastructure projects. It is critical that the freight perspective is not considered too late in the process or as an afterthought. Inviting freight stakeholders to participate in the process has several benefits, including:

- Ensure freight is able to flow efficiently
- Ease regional roadway congestion while boosting the regional economy
- Provide partnership opportunities for the public and freight sectors beyond infrastructure projects

Many projects intended to enhance freight mobility can be implemented quickly and at low cost. ***Table 4.1*** provides a listing of potential project types. Typically, these projects:

- Are less than $1 million to implement
- Are spot-or location-specific improvements
- Do not require environmental clearances or right-of-way acquisition
- Do not require special programming
- Can be implemented at the local level
- Take less than one year to implement

Table 4.1 Quickly Implementable Freight Projects

Constraint Type	Issue	Improvement Options
Physical	Turning Radii	Add turning lane Widen lane
	Weaving	Extend existing lane Restriping
	Lane Drop	Add auxiliary lane Extend ramp length
	Inadequate Interchange Capacity	Add traffic signal Channelization
	Inadequate Mainline Capacity	Add warning signs Speed reduction
	Inadequate Intersection Capacity	Add dedicated turning lane Intersection layout improvement
Operational	Traffic Control	Signal installation Traffic signal upgrade
	Poor Signage/Warning Signs	Improve road signage at interchange entrances and exits Better advance navigational signing
Regulatory	Parking Restrictions	Revise parking restrictions Provide additional parking

Source: *NCFRP Report 7: Identifying and Using Low-Cost and Quickly Implementation Ways to Address Freight-System Mobility Constraints, 2010.*

Future Federal Policies Impacting Freight

One operational restriction on highway freight transportation are the Hours-of-Service (HOS) regulations. The HOS regulations place limits on when and how long commercial vehicle (CMV) drivers may drive.

These regulations are based on scientific review and are designed to ensure truck drivers get the necessary rest to perform safe operations.[38] The current truck driver HOS regulations allow drivers carrying property to operate a vehicle for a maximum of 11 hours and be on duty for a maximum of 14 consecutive hours, see ***Table 4.2***. The regulations for intra-state vehicles (those vehicles only operating within the state of Texas) are slightly different. These drivers are allowed to operate a vehicle for a maximum of 12 hours and be on duty for a maximum of 14 consecutive hours.

On December 27, 2011, a new HOS proposed rulemaking was published. The effective date of this Final Rule is February 27, 2012. These new regulations shorten the consecutive hours that interstate CDL truck drivers are allowed to drive as well as changes to the "restart time", mandatory rest periodsthat drivers must take before being allowed to start a new driving period.

These rules have the potential to increase by five to seven percent the number of truck drivers and trucks needed to move the amount of freight that is currently moved along US highways, exacerbating an already existing driver shortage[39]. This will not only tax an already stretched labor force, but it will also increase the travel time for goods and necessitate more and safer truck-parking facilities to accommodate shortened drive times.

What is a CMV Vehicle?

A CMV is defined as a vehicle that is used as part of a business, is involved in interstate commerce, and any one of the following:

- Weighs 10,001 pounds or more
- Has a gross vehicle weight rating or gross combination weight rating of 10,001 pounds or more
- Is designed or used to transport 16 or more passengers (including the driver) not for compensation
- Is designed or used to transport 9 or more passengers (including the driver) for compensation
- A vehicle that is involved in interstate *or* intrastate commerce and is transporting hazardous materials in a quantity requiring placards

Source: *Federal Motor Carrier Safety Administration, 2011*

Table 4.2 Property-Carrying CMV Driver

11-Hour Driving Limit	May drive a maximum of 11 hours after 10 consecutive hours off duty.
14-Hour Driving Limit	May not drive beyond the 14 consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period.
60/70-Hour On-Duty Limit	May not drive after 60/70 hours on duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty.
Sleeper Berth Provision	Drivers using the sleeper berth provision must take at least 8 consecutive hours in the sleeper berth, plus a separate 2 consecutive hours either in the sleeper berth, off duty, or any combination of the two.

[38] Federal Motor Carrier Safety Administration, 2011

[39] Marketplace Morning Report, "*New Regulations Cause Trucker Shortage,*" August 8, 2011.

[40] *Federal Motor Carrier Safety Administration, 2011*

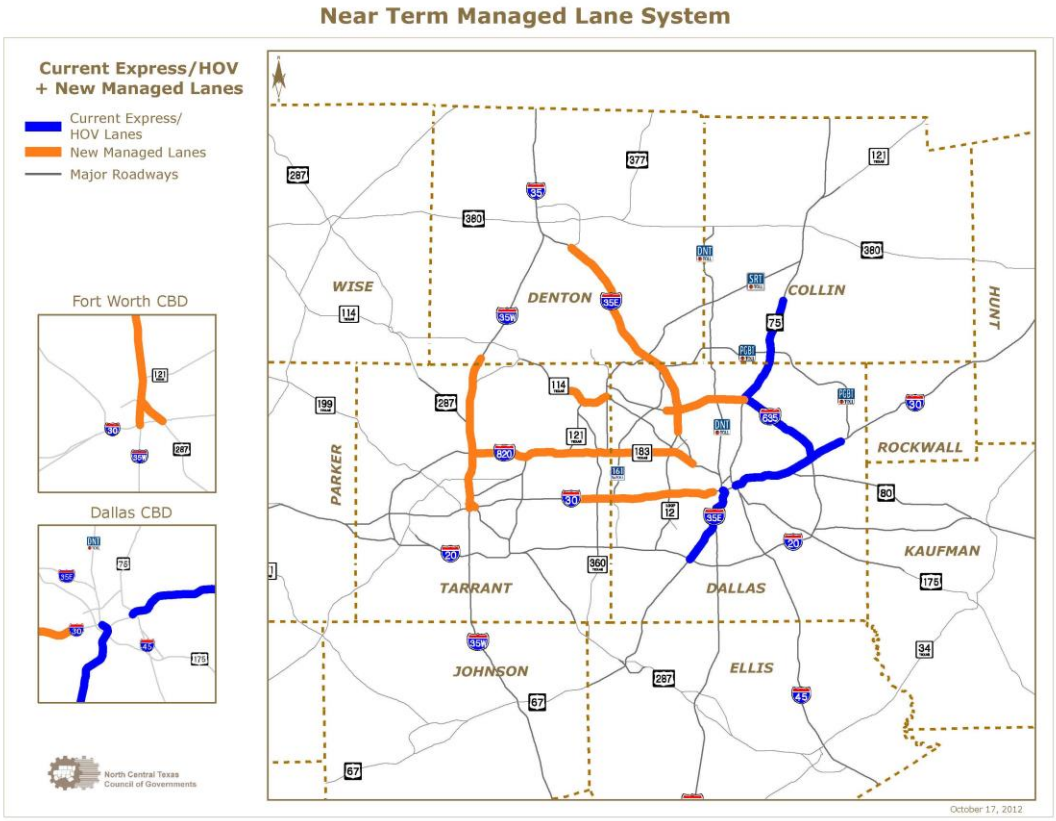
Future NCTCOG Policies Impacting Freight

One regional operational restriction on highway freight transportation is the managed lanes policy approved by the Regional Transportation Council (RTC) at their September 2007 meeting, later amended on December 13, 2012. This managed lane policy includes both the Tolled Managed Lane Policy and the Express Lane/HOV Policy.

The original Managed Lane Policy stated that trucks be allowed on these facilities (with the exception of IH 635-LBJ Freeway) and would pay a higher rate that was not specified. The current policy also states every Managed Lane corridor within the region shall operate under the same policy. The amended Tolled Managed Lane Policy simply states that "trucks will be allowed and will pay a higher rate." The Express Lane/HOV Policy excludes trucks from using those converted HOV lanes due to design constraints as those lanes were not designed and were never intended to accommodate truck traffic.

The regional managed lane system is shown in **Figure 4.10**. The Tolled Managed Lane corridors will operate differently that then Express Lane/HOV corridors. Free general-purpose lanes will continue to be available in all of these managed lane corridors for those not wishing to pay a toll. These managed lanes will operate with a 50 mph speed guarantee.

Figure 4.10. Mobility 2035 Managed/HOV System/Tollroad System



Source: *NCTCOG Staff, 2012*

Freight Performance Measures

In an effort to provide the best projections and to select projects with the most benefit for future freight activity, regional performance measures and associated data must be collected on a regular basis. It is often difficult to determine freight performance measures because many planners are unsure what data is useful and necessary. Freight-specific data are not typically collected by State and federal agencies and the data planning officials need to create a robust freight plan are privately held. While this data can be purchased, (for example IHS Global Insight Transearch data, IMPLAN Economic Modeling, and RIMS II from the Bureau of Economic Analysis) the cost is often prohibitive.

Locally defined freight performance measures are specific data sets collected by planning agencies to determine the effectiveness of various freight policies, programs, or projects. In general, freight performance measures are mode-specific, although some, such as the freight industry's economic impact. can apply to all modes,

The following are freight performance measures collected on an annual or semiannual basis from free data sources. These data typically are a year or two behind, but do offer trends analysis and base-year data for planning purposes.

Truck

- Number and severity of truck-involved incidents
- Volume/Tonnage of freight shipped/moved
- Trends of trucking costs
- Commodity flows
- Travel time and reliability
- Pavement conditions
- Level of Service (LOS)
- Estimated congestions levels
- Bridge conditions
- Employment
- Number of trucks by type

Rail

- Number, severity, and locations of incidents
- Number of at-grade crossings
- System condition and performance
- Freight rail yields
- Freight rail revenue ton miles
- Freight rail volumes
- Value
- Employment
- Location of abandoned track

Air

- Number of air cargo carriers
- Freight volumes
- Value
- Employment
- Carrier route miles

Pipeline

- Oil/Natural gas movement
- Number of pipeline incidents
- Number of hazardous materials incidents
- Volume moved

Intermodal

- Lift capacity
- Terminal capacity
- Number of TEUs, containers, or rail cars
- Storage capacity (onsite)
- Pavement conditions on links to facilities
- Average distance between terminals and regional shipping points

All Modes

- Hazardous materials incidents
- Cost per ton-mile
- Fuel consumption per ton-mile

The data collection necessary for these performance measures will create a robust data system for regional planners and aid decision-makers in ensuring freight is a consideration in transportation planning. This data can also be used by decision-makers to determine the effectiveness of future regional freight funding policies, programs, and projects.

Freight North Texas Recommendations

The analyses presented in Chapters 1-4, have led to the following recommendations to enhance the regional freight system:

- Collection and management of innovative performance measures.
- Coordinated regional freight planning between local governments and the freight industry.
- Adoption of a regional freight agenda by the RTC.
- Completion of county-level freight scans for all 12 counties within the MPA.
- Publication of a quarterly freight newsletter.
- Publication of a Regional Freight Fact Book.
- Publication of mode-specific Freight Fact Sheets.
- Completion of follow-up studies recommended in Freight North Texas.
- A freight summit every two years to educate and inform regional stakeholders regarding regional freight planning.

Completing these recommendations will provide the North Central Texas region with the ability to develop a more cohesive, seamless, and integrated freight transportation system. Completing these recommendations will also provide a more complete freight system synopsis and its interactions with the regional passenger traffic. In addition, there will be more partnership and collaboration opportunities between the public and private sectors.

Recommended Freight System Changes

Recommendations for initiatives to integrate freight considerations into regional planning efforts include:

- Coordinated regional truck route planning between local agencies and with the freight industry.
- Coordinated regional freight rail planning between the railroads and local governments.
- Long-term roadway planning coordination with railroads.
- Creation of freight project criteria for consideration in transportation project selection.
- Creation of a freight project benefits tool for the region's Transportation Improvement Program (TIP) to calculate the benefits to freight from regional projects.

Recommended Future Freight-Oriented Polices

To provide the best regional freight planning policies possible, the following programs are recommended for the regional freight program:

- Freight-Intense Land-Use Tracking
- Freight-Benefiting Project Tracking and Inventory
- Regional Freight Agenda Adoption

Freight-Intense Land-Use Tracking

Tracking freight-intense land uses within the region will allow for accurate mapping of these facilities, as well as a focus for strategic funding for the areas with the greatest need including:

- Warehouses
- Distribution Centers
- Manufacturing
- Industrial Parks
- Foreign Trade Zones
- Rail Yards
- Pipeline Facilities
- Truck Stops

***Freight-Intense Land Use**—an area with one or more continuously operating freight-oriented businesses.*

Freight-Benefiting Project Tracking and Inventory

Regional projects not classified as freight projects, but benefiting the freight industry should be reviewed and tracked. Among these are:

- Intelligent Transportation Systems (ITS)
- Grade Separations (both highway and rail)
- Dynamic Messaging
- Traffic Signal Synchronization
- Highway Infrastructure Improvements
- Workforce Development
- Freight Efficiency Outreach Center
- Roadway Safety Programs

Regional Freight Agenda Adoption

The adoption of a regional freight agenda by the RTC would guide future MPO freight policies. This agenda could:

- Seek freight community participation in the planning process
- Monitor freight traffic throughout the region to identify bottlenecks
- Improve freight movement efficiency within, to, and from the region
- Promote safety, mobility, and accessibility
- Reduce air quality impacts of freight movements
- Seamlessly incorporate freight considerations in transportation projects

NCTCOG Continuing Freight Efforts

As discussed in Chapter 3, there are a variety of freight initiatives that are on-going efforts to improve the freight system within the region. These continuous efforts include:

- Railroad Crossing Reliability Partnership Program
- Regional Railroad Crossing Banking Program
- Tower 55 Improvement Project
- Quiet Zone Tracking
- Regional Hazardous Materials Routes
- Regional Truck Route Tracking
- Load Restricted and Height Bridges Tracking
- Truck Lane Restrictions

Freight North Texas Follow-Up Studies

Freight North Texas provides a current North Central Texas regional freight system snapshot and is not intended to be an exhaustive review. To continue freight planning efforts, the following should be completed:

- Freight Congestion and Delay Report
- Economic Impact of Freight on the Region
- Freight and Environmental Justice Report
- Freight Project Evaluation System
- Land-Use Compatibility Analysis
- Regional Truck Parking Study

Freight Congestion and Delay Report

Data from the various freight modes will be reviewed to determine the areas of congestion and delay within the region. This information will be used to determine the average time it takes to process freight truck and train shipments through the region to achieve a base number. A final report will include best practices for avoiding delay. Maps illustrating bottlenecks and chokepoint locations and the average delay experienced per mode will be included. Additionally, a study of the region's intermodal yards will be performed to determine industry best practices of freight technology uses at these facilities. This information will be collected through responses from a freight facility survey, data from state and local government agencies' traffic statistics, and information received from impacted freight stakeholders.

Economic Impact of Freight on the Region

A study will be conducted to determine the freight industry's economic impact to the region.

Freight Project Evaluation System

Criteria for prioritizing freight projects based on safety, mobility, and air quality will be developed. The projects will be ranked on a point system that will include cost estimates/thresholds, available funding, regional significance, time-sensitivity, and location in relation to the freight corridors identified in Freight North Texas. Once the Freight Project Evaluation System is developed, various sources of funding and implementation strategies will be identified. Also a timeline will be developed to determine potential funding sources for the freight improvements recommended in Freight North Texas.

Land-Use Compatibility Analysis

A land-use evaluation for all freight facilities within the region will be conducted. An inventory of the facilities within or adjacent to non-compatible land uses will be created. A detailed definition of compatible and non-compatible land uses and a review of adjacent vacant land and county-specific future land-use plans will also be developed. Freight infrastructure that is in danger of disappearing, in need of preservation, or has already disappeared will also be documented.

Regional Truck Parking Study

A regional truck-parking study will be conducted to determine the locations and adequacy of both short-term and long-term truck parking. A review of safety issues will also be conducted.

Summary and Conclusions

Having completed a thorough review of the regional freight system, NCTCOG staff will continue to advance freight planning within the region. Staff will bring freight needs, benefits, and successes to the attention of the region and the MPO policy boards. This will be accomplished through public involvement, presentations, publications, and the R-FAC. The importance of freight can be brought to the forefront through education and public outreach to regional residents, planners, and policy makers.

APPENDIX A

Glossary of Freight Terms

Glossary of Freight Terms

Brownfield— real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Class I Railroad—one of the largest freight railroads, as classified based on operating revenue

Container—a truck trailer body that can be detached from the chassis for loading into a vessel, a rail car or stacked in a container depot; containers may be ventilated, insulated, refrigerated, flat rack, vehicle rack, open top, bulk liquid or equipped with interior devices. A container may be 20 feet, 40 feet, 45 feet, 48 feet or 53 feet in length, 8 feet or 8'6" in width, and 8'6" or 9'6" in height.[i]

Containerized Freight—containers/truck trailers that can be shipped on vessels, rail, or trucks.

Distribution Center—a structure that is primarily used for the receipt, temporary storage, and distribution of goods en route from productions sites to points of consumption.[ii]

Double Stack— the process of stacking two or more containers in a well rail car.

Environmental Justice— the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with regard to the development and implementation of plans, policies, and programs.

First/Last Mile—highway connections to ports and rail yards that are key to the efficiency of the freight system.

Foreign Trade Zone (FTZ)— an area set outside of the US Customs port of entry where goods are processed as if they are outside of the US

Freight—the goods transported by rail, truck, air, or water.

Height-Restricted Bridges-- roadways crossed by grade-separated bridges, whose distance from the roadway surface is 14 feet or less.

Inland Port—an inland site operating in a similar capacity to that of a seaport

Just-in-Time— an inventory control system that controls the flow of shipments to arrive just in time for use.

Less than Container Load (LCL)/Less than Truckload (LTL)—the quantity of freight that is less than that required for the application of a container load rate.[iii]

Lift—the process of moving a container or trailer to and or from a rail car.

Load-Restricted Bridges— bridges that have weight limits imposed due to age or construction materials.

Long Haul Trucks—trucks travelling more than 500 miles between their origin and destination.

Nonattainment Area— a designation given by the Environmental Protection Agency (EPA) that is applied to areas that do not meet national air quality standards.

North American Free Trade Agreement (NAFTA)—an agreement established on January 1, 1994 by the governments of Canada, Mexico and the United States, creating a trilateral trade bloc in North America

Piggy-Back— the carrying of semi-truck trailers or containers on a rail flatcar between distribution centers.

Post-Panamax Ships— ships that cannot fit through the existing, pre-widened Panama Canal.

Quiet Zone— a group of one or more railroad crossings at which the sounding of train horns is prohibited.

SWOT Analysis—an analysis that looks at the Strengths, Weaknesses, Opportunities, and Threats to a study area.

TEU—Twenty-foot Equivalent Unit, a standard measure of container volume[iv] that is equal to 20 feet by 8 feet by 8 feet.

Third Party Logistics Provider (3PL)—a company that provides logistics services to other companies for some or all of their logistics needs. It typically includes warehousing and transportation services. Most 3PL's also have freight forwarding licenses.[v]

Transuranic Waste— the highest level of hazardous waste transported in the US and more cautious transport than other types of hazardous waste.

Truck—a freight hauling vehicle with 3 or more axles

Truck Load—quantity of freight required to fill a truck, or at a minimum, the amount required to qualify for a truckload rate.[vi]

Warehouse—a structure that is primarily used for the receipt, temporary storage, and distribution of goods en route from productions sites to points of consumption.[vii]

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[i] "Glossary of Shipping Terms", MARAD, 2008
[ii] Robins, Martin E. and Anne Strauss-Wieder. "Principles for a US Public Freight Agenda in a Global Economy" January 2006.
[iii] "Glossary of Shipping Terms", MARAD, 2008
[iv] "Quick Response Freight Manual II", FHWA, 2007
[v] "Glossary of Shipping Terms", MARAD, 2008
[vi] "Quick Response Freight Manual II", FHWA, 2007
[vii] Robins, Martin E. and Anne Strauss-Wieder. "Principles for a US Public Freight Agenda in a Global Economy" January 2006.

APPENDIX B

Glossary of Freight Acronyms

APPENDIX B

Glossary of Freight Acronyms

3PL—Third Party Logistics Provider

BEA—Bureau of Economic Analysis

BTS—Bureau of Transportation Statistics

DC—Distribution Center

DoD—Department of Defense

DoE—Department of Energy

FAF3—Freight Analysis Framework, Version 3

FHWA—Federal Highway Administration

FMCSA—Federal Motor Carrier Safety Administration

FNT—Freight North Texas

FRA— Federal Railroad Administration

GDP—Gross Domestic Product

IANA—Intermodal Association of North America

IH—Interstate Highway

IPANA—Inland Ports Across North America

LCL—Less-than-Container Load

LTL—Less than Truckload

MPA—Metropolitan Planning Area

MPO—Metropolitan Planning Organization

MSA—Metropolitan Statistical Area

MTP—Metropolitan Transportation Plan

NAFTA—North American Free Trade Agreement

NASCO—North America's Corridor Coalition

NCTCOG—North Central Texas Council of Governments

PFN—Primary Freight Network

PHMSA—Pipeline and Hazardous Materials Safety Administration

R-FAC—Regional Freight Advisory Committee

RTC—Regional Transportation Council

SFN—Secondary Freight Network

STB—Surface Transportation Board

STTC—Surface Transportation Technical Committee

TEU—Twenty-foot Equivalent Unit

TxDOT—Texas Department of Transportation

USDOT—United States Department of Transportation

APPENDIX C

Regional Freight Advisory Committee (R-FAC) Roster

Regional Freight Advisory Committee (R-FAC) Members Roster

Steve Boecking
Vice President Business Development
Hillwood Properties

Brian Boerner
Manager, Regulatory Affairs-Barnett Shale
Chesapeake Energy Corporation

Andre Bryant
Senior Group Leader—Logistics
Target

Norma Del La Garza-Navarro
Assistant Vice President, Commuter Rail - TRE Chief Administrative Officer
Trinity Railway Express (TRE)

Les Findeisen
Director of Policy
Texas Motor Transport Association (TMTA)

Kevin McIntosh
Assistant Vice President, State and Local Relations
Kansas City Southern Railway Company

Tiffany Melvin
Executive Director
North America's Corridor Coalition, Inc. (NASCO)

Tom Neville
Senior Manager of Railroad Management
DART/TRE

Carl Proefrock
Trinity Logistics Group, Inc.

Mike Rader
President
Prime Rail Interest
Southern Dallas County Logistics Project

Mark Rhea
Vice President of Driver Development and Strategic Accounts
FFE Transportation Services

Clint Schelbitzki
Director, Public Affairs Union Pacific Railroad

Chip Sheely
Director of Fleet Services
Southeastern Freight Lines

French Thompson
Manager Engineering – Engineering Services
BNSF Railway

Mark Thorpe
Assistant Vice President, Air Service Development
Dallas/Fort Worth International Airport

Georgi Ann Jasenovec
Freight Operations and International Border Transportation Manager
FHWA-Texas Division

APPENDIX D

Freight Information System (FIS) Data Listing

APPENDIX D

Freight Information System (FIS) Data Listing

Mode	Name	Description	Source	Last Updated	Update Frequency
Air	Air Cargo Analysis	Analysis of Air Cargo Operation in the Region	Air Cargo Analysis	January 2009	N/A
Air	Air Cargo Data	Ranks US Airports by Cargo Landed	Air Cargo by Airport	October 2011	Annually
Air	DFW Cargo Carriers	Cargo Operators out of DFWIA	DFWIA Cargo Operators	N/A	N/A
Air	5010 Data	FAA's 5010 Database	Airport IQ	January 2012	Quarterly
Air	DFWIA Top Trading Partners	DFWIA Top 5 International Trading Partners	DFWIA Trade Partners	December 2010	N/A
Air	Regional Air Cargo Carriers	List of Regional Air Cargo Carriers	Regional Cargo	N/A	N/A
Facilities	FTZ	Map of FTZ locations	FTZ	June 2009	As needed
Facilities	Intermodal Connectors	Inventory of Intermodal Connectors	Intermodal Connectors	March 2008	As needed
Facilities	Airports	Shapefile inventory of Airports	Airports	May 2009	N/A
Facilities	Freight Facilities	Inventory or Region's Freight Facilities	Freight Facilities	October 2011	Annually
FTZ	FTZ Data	National FTZ Database Listed by FTZ Number	FTZ	December 2011	Annually
General Freight	Commodity Flow Survey	Origin and Destination of Commodities Flows by Mode	Commodity Flow	December 2009	Every 5 Years
General Freight	Exports from Metropolitan Areas	Export Values by Metropolitan Area	Exports	December 2010	Annually
General Freight	Federal Freight Sources	Comprehensive list of Freight Related Databases	Federal Freight Sources	N/A	N/A
General Freight	BLS Labor Statistics	BLS Labor Statistics by Industry	Labor Data	March 2011	Annually
General Freight	Border Crossing Data	Total Border Crossings of Trucks and Trains	Border Crossing	August 2011	Annually
General Freight	Intermodal Hubs	Regional Intermodal Hubs with Contact Information	Intermodal Hubs	N/A	As needed
General Freight	Freight Analysis Framework	Freight Movements by Origin and Destination; Listed by Mode	FAF 3	2010	Every 5 Years
General Freight	Freight Transportation Index	Measures volume of nation's freight output	BTS Freight Trans Index	Feb -2012	Quarterly
General Freight	Transborder Data	Value of Goods Traded between Countries	Trade Value	Jun-10	Every 5 years

APPENDIX D

Freight Information System (FIS) Data Listing

General Freight	US Waterway Data	Cargo Flows between US and Foreign Ports	Waterway Data	December 2011	Annually
Rail	Railroad Quiet Zones	Inventory Of Quiet Zones in the MPA	Quiet Zones	December 2011	As needed
Rail	Waybill Data	STB's Waybill Data	Waybill Data	December 2010	Annually
Rail	FRA Crossing Inventory	FRA's Railroad Crossing Inventory (raw format)	FRA Crossing Inventory	November 2011	Quarterly
Rail	FRA GIS	Interactive Map of Rail Lines in GIS	FRA GIS	N/A	N/A
Rail	Rail Owner Map	Regional Rail Network	Regional Rail Network	December 2011	As needed
Rail	FRA Rail Crossings	Regional Railroad Crossings	FRA Crossings	August 2011	Bi-Annually
Rail	RRCBP (Excel)	Inventory of Rail Road Crossing Banking Program	RRCBP	August 2010	As needed
Rail	Safety Data	Safety Data Related to Crossings and Operations	FRA Safety Data	December 2011	Monthly
Rail	BNSF Rail Stations	Inventory of BNSF's Rail Stations	BNSF Rail Stations	N/A	N/A
Truck	Truck Lane Restrictions	Regional Freeways with Truck Lane Restrictions	TLRE Study	August 2009	As needed
Truck	Truck Lane Rest. Map	Map of Truck Lane Restrictions	TLRE Map	July 2009	As needed
Trucks	Truck Accident Data	Location and Cause of Tractor Trailers Accidents	TxDOT	May 2012	Annually

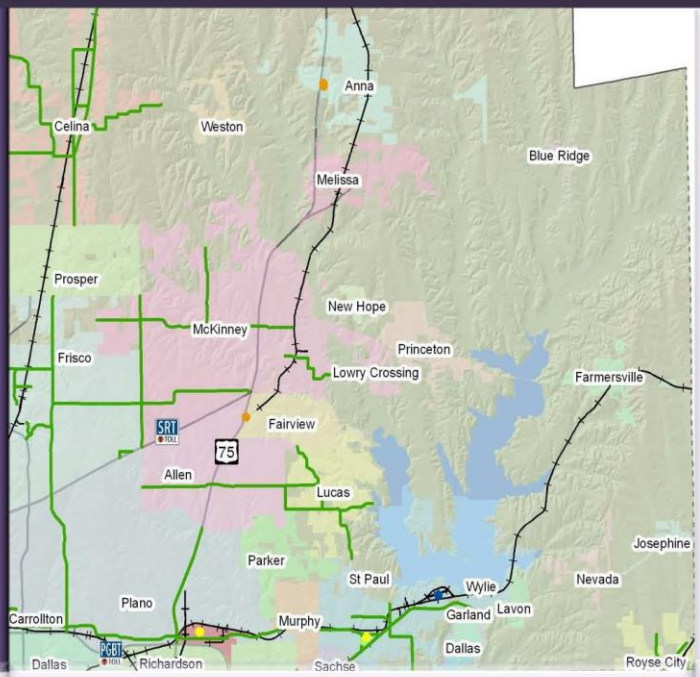
APPENDIX E

County Freight Scans

Collin County Freight Scan

As one of the fastest growing areas in the nation, Collin County relies on the efficient delivery of goods to ensure the continued growth of the County. The County's heavy reliance on freight has directly produced nearly 24,000 jobs, a large economic impact for its residents.

Being served by three freight railroads and a major federal highway has allowed the County to attract several major manufacturing industry leaders to locate within its borders. Collin County also boasts some of the highest average earnings of all freight workers in North Central Texas which helps to ensure a quality workforce is attracted to the many jobs created by the freight industry.



Freight Facilities

- Truck Stops
- Railyards
- Industrial Parks
- Truck Routes
- Freight Oriented Developments
- Rail
- Highways

FREIGHT NORTH TEXAS

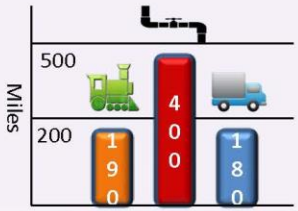
Wages

Workers in Collin County enjoy some of the highest wages for freight jobs in North Texas. These jobs include those in transportation, warehousing, and manufacturing.

The average annual earnings for a freight industry worker in Collin County is approximately $67,000

Infrastructure

Collin County's infrastructure consists of over 770 miles of railway, roadway, and pipeline. This extensive network allows freight to be easily moved, distributed, and transferred to and from Collin County via multiple modes.



Industries

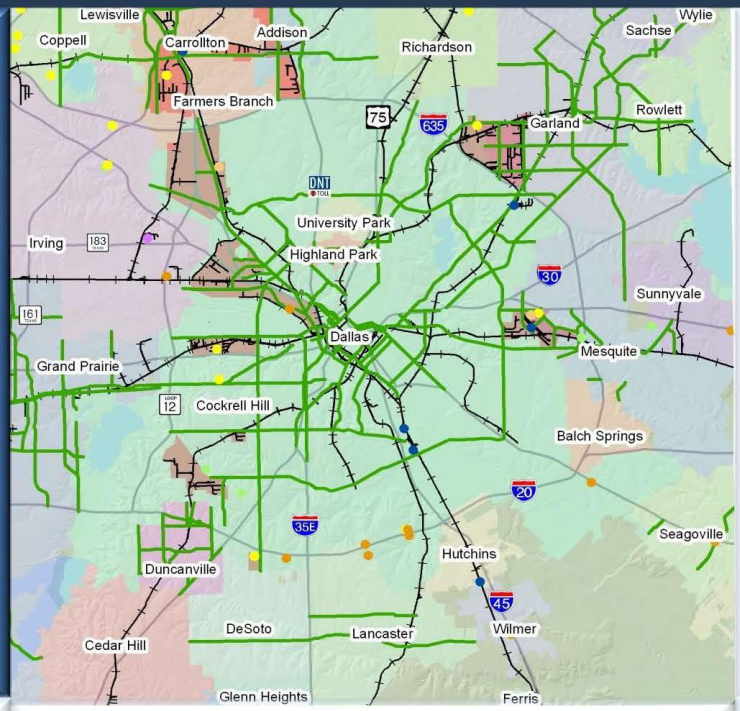
Possessing a highly skilled and compensated workforce has allowed the freight industry to flourish in Collin County. As a result Collin County has become a hub for the manufacturing industry and the subsequent transportation jobs.

Company	Employees	Industry
Raytheon	2,500	Manufacturing
Alcatel	1,830	Manufacturing
Hewlitt-Packard	1,200	Manufacturing

Dallas County Freight Scan

Dallas County has the strategic advantage of having direct access to major freight corridors serving the nation's largest cities and ports via four interstate highways and four freight railroads. This access allows the County to handle approximately 480 million tons of goods annually.

The County's reliance on freight has produced over 180,000 jobs, which provide a large economic impact for its residents. Several industries located within the County rely directly on the efficiencies of the County's freight system. With over 95 percent of the freight being handled by truck and rail, the County's freight shippers will continue to benefit from a large and extensive transportation network.



Freight Facilities

- Truck Stops
- Railyards
- Pipelines
- Parcel Shiping
- Industrial Parks
- Foreign Trade Zones
- Truck Routes
- Freight Oriented Developments
- Rail
- Highways

FREIGHT NORTH TEXAS

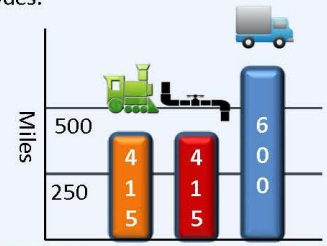
Wages

Workers in Dallas County have jobs in the freight sector that include those in transportation, warehousing, and manufacturing.

The average annual earnings for a freight industry worker in Dallas County is $62,000

Infrastructure

Dallas County's infrastructure consists of over 1,400 miles of railway, roadway, and pipeline. This extensive network allows freight to be easily moved, distributed, and transferred to and from Dallas County via multiple modes.



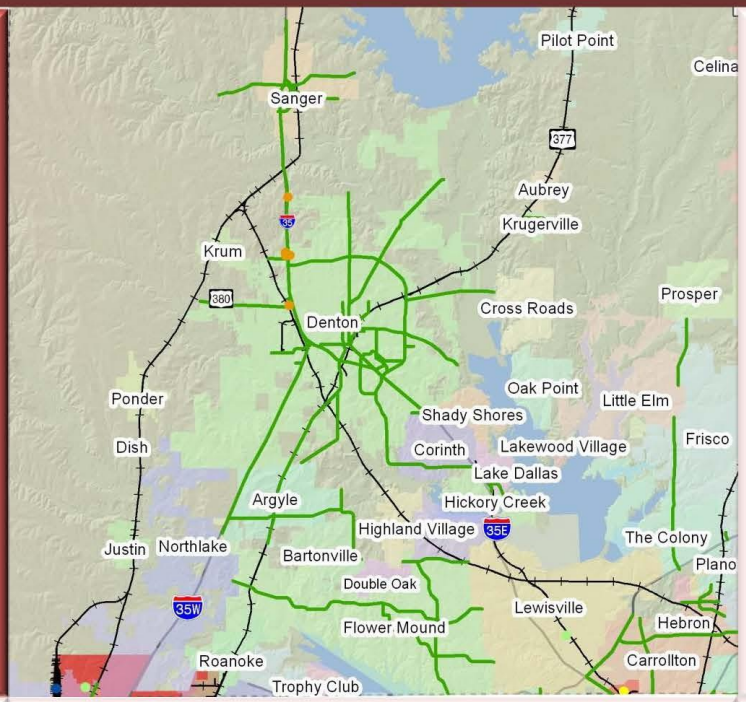
Industries

The largest population in North Texas and an established freight infrastructure have led to several major employers calling Dallas County home. These employers work in industries ranging from manufacturing to health care to transportation.

Company	Employees	Industry
Texas Instruments	9,800	Manufacturing
Parkland Hospital	9,178	Health Care
UPS	2,700	Transportation

Denton County Freight Scan

As a gateway into the Dallas-Fort Worth region, Denton County is home to some of the premier freight facilities in the nation. The primary trade route for international goods to and from Texas, IH 35, runs down the heart of the County further supporting its first-class freight infrastructure. The County's large reliance on freight has directly produced nearly 16,000 jobs, a large economic impact for its residents. Denton County is home to one of the largest Industrial areas in the region as well as the largest foreign trade zone in the nation at AllianceTexas. Approximately 600,000 large-scale intermodal cargo transfers between rail and trucks occur every year illustrating the County's reliance on both modes of transportation. Additionally the County's large pipeline network has allowed for the safe and efficient transport of the County's natural resources.



Freight Facilities

- Truck Stops
- Railyards
- Industrial Parks
- Foreign Trade Zones
- Truck Routes
- Freight Oriented Developments
- Rail
- Highways

FREIGHT NORTH TEXAS

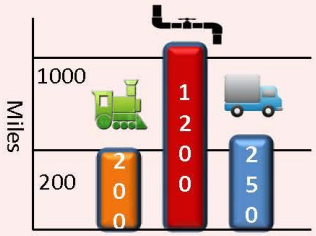
Wages

Workers in Denton County have jobs in the freight sector that include those in transportation, warehousing, and manufacturing.

The average annual earnings for a freight industry worker in Denton County is $54,000

Infrastructure

Denton County's infrastructure consists of over 1,600 miles of railway, roadway, and pipeline. This extensive network allows freight to be easily moved, distributed and transferred to and from Denton County via multiple modes.



Industries

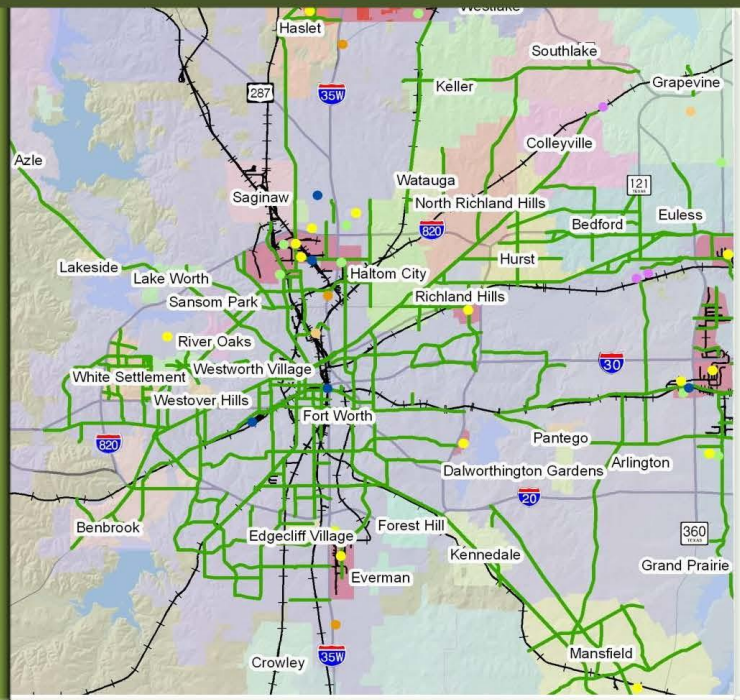
Possessing a large industrial area, foreign trade zone, and a major trade corridor have led to many industries calling Denton County home. These employers work in industries ranging from manufacturing to wholesale trade to transportation.

Company	Employees	Industry
Frito Lay	2,000	Manufacturing
AT&T Distribution	1,200	Wholesale Trade
FedEx	787	Transportation

Tarrant County Freight Scan

Located at the crossroads of major national and international trade routes, freight plays an integral role in the social and economic development of Tarrant County.

The County's freight industry produces over 130,000 jobs which provide a large economic impact for the County's residents. Several industries located within the County rely directly on the efficiencies of the County's freight system. Tarrant County's robust pipeline network has allowed for the safe and efficient transport of the County's natural resources. Additionally, with over 20,000 acres designated for freight-oriented development, Tarrant County will be able to continue to meet the freight industry's needs and remain as one of the premier counties in North Texas for job growth and business retention.



Freight Facilities

- Truck Stops
- Railyards
- Pipelines
- Parcel Shiping
- Industrial Parks
- Foreign Trade Zones
- Truck Routes
- Freight Oriented Developments
- Rail
- Highways

FREIGHT NORTH TEXAS

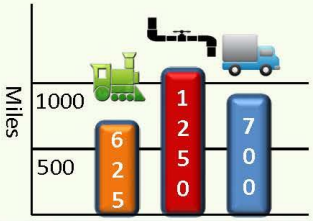
Wages

Workers in Tarrant County enjoy some of the highest wages for freight jobs in North Texas. These jobs include those in transportation, warehousing, and manufacturing.

The average annual earnings for a freight industry worker in Tarrant County is $65,000

Infrastructure

Tarrant County's infrastructure consists of over 2,500 miles of railway, roadway, and pipeline. This extensive network allows freight to be easily moved, distributed and transferred to and from Tarrant County via multiple modes.



Industries

Robust population growth and access to several transportation modes have led to many major employers calling Tarrant County home. These employers work in industries ranging from manufacturing to health care to transportation.

Company	Employees	Industry
Lockheed Martin	13,500	Manufacturing
Harris Methodist	3,900	Health Care
BNSF Railway	2,500	Transportation

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