Appendix C: Regional Economic Freight Profiles

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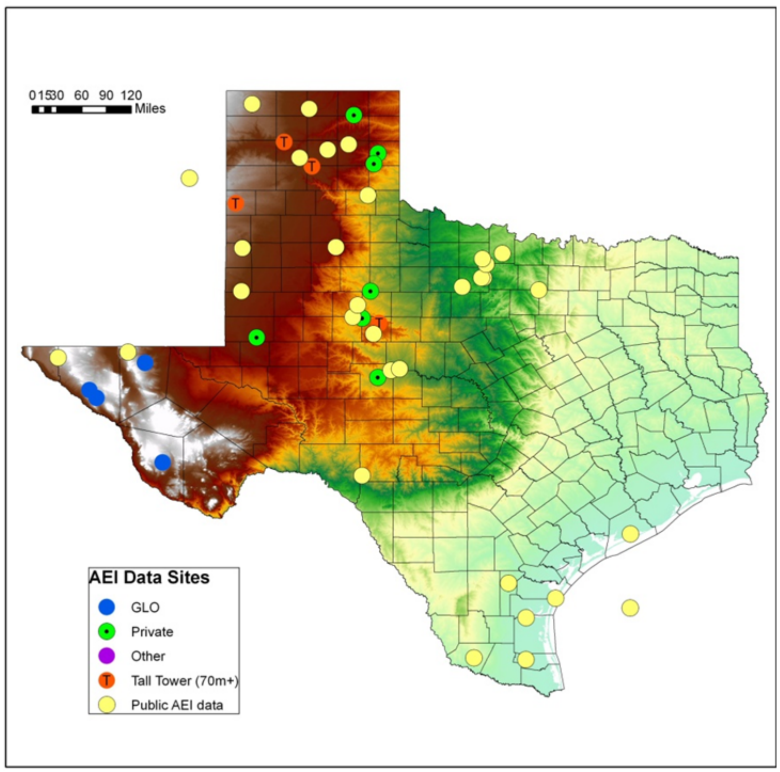
A: Central Texas

Introduction

The Central Texas economic region, whose population is just over a half million (2.2% of the state), is widely dispersed, and its population has declined by 0.6% in the past 10 years. The major metropolitan area in the region is Abilene with a population of 247,114[1]. It is located about one-third the distance from Dallas to El Paso and is within a major east-west interregional, intercoastal commercial corridor containing IH 20, Union Pacific Railroad (UP), Burlington Northern Santa Fe Railroad (BNSF), and numerous pipeline and communication lines (Abilene MPO, 2010). The next major metropolitan area is San Angelo, perhaps the only major city in Texas not located near an interstate highway. Located about 100 miles southwest of Abilene, its population is 154,769[1]. Brownwood, another metropolitan area in the region, has a population of 128,229[1].

Economic Profile and Freight Movements

Changes come slowly to the central region of Texas, as can be demonstrated by the heavy reliance on the oil and gas industry throughout the region, particularly in small towns. Nonetheless, a number of important economic trends are clear throughout the region. Chief among these is the emergence of a new wind energy industry. As seen in Figure A1, many new wind farms have been constructed in recent years in the northern section of the region, approximately north of San Angelo and west of Abilene. Support services for wind energy have emerged in the neighboring cities of San Angelo and Abilene, with new steel fabrication plants opening, and a number of turbine engineering offices taking root in city business parks. One of the largest wind power facilities in the world, the Horse Hollow Wind Energy Center, is located



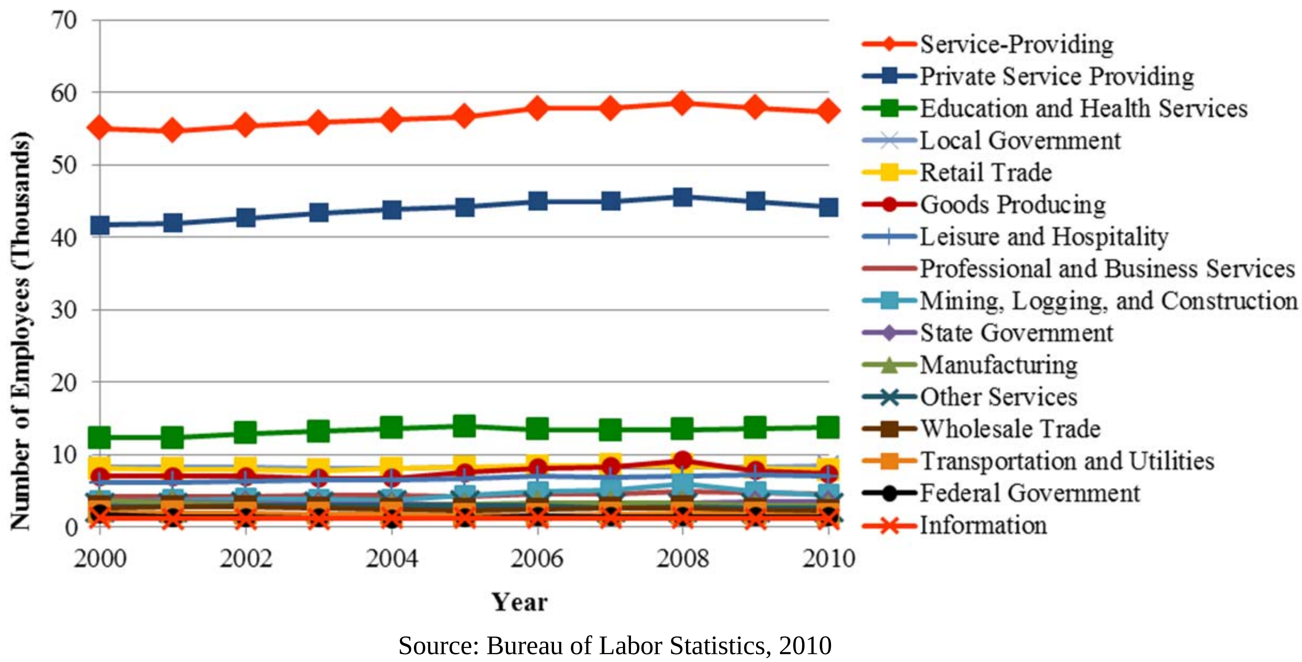
Source: Alternative Energy Institute, 2008

Figure A1: Wind Energy in Texas

[1] 2008 Population Estimates

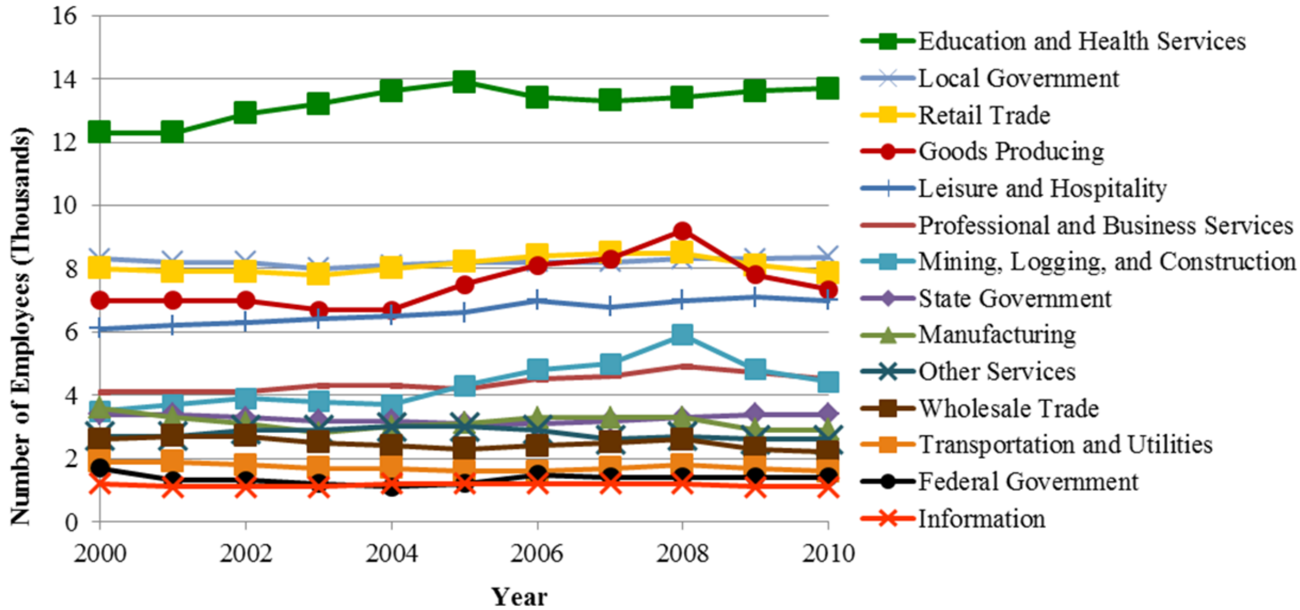
near Abilene. It currently produces 735 megawatts (MW) of electricity and helped Texas overtake California in total installed wind power capacity. The wind plant consists of 291 1.5-MW wind turbines from General Electric and 130 2.3-MW wind turbines from Siemens and is spread across about 47,000 acres in Taylor and Nolan counties (State Energy Conservation Office, 2006). Martifier-Hirschfeld Energy Corporation, a joint venture between the Martifer Group and Hirschfeld, plan to develop a factory in San Angelo, for the production of steel towers for wind turbine generators and create a total of 255 jobs. The factory is expected to be completed in the second quarter of 2010, and to reach a capacity of 400 towers a year by 2013 (Concho Valley Business Resources, 2009; ReliablePlant.com, 2010).

Reviews of the region's employment by metropolitan statistical area show that the service-providing and private service-providing industries are the top employers in the area (Figures A2 and A4). A similar trend was recorded for all the other regions in Texas. When these two industries are purged from the graphs as in Figures A3 and A5, a much more detailed review of the other industries can be observed. In the Abilene MSA, the education and health services industry is the largest employer from 2000 to 2010, followed by local government, retail trade, and goods-producing industries. However, freight-related industries such as goods-producing, mining/logging/construction (including petroleum), and manufacturing industries experienced a sharp decline in their number of employees from 2008 to 2010, during the economic downturn. This trend is similar to the current trend in Texas. Unemployment in these industries in recent years can be said to account for the MSA's unemployment rate increase from 2008 to 2009, despite the increase in the MSA's labor force during the same period of time (see Figures A6 through A9).



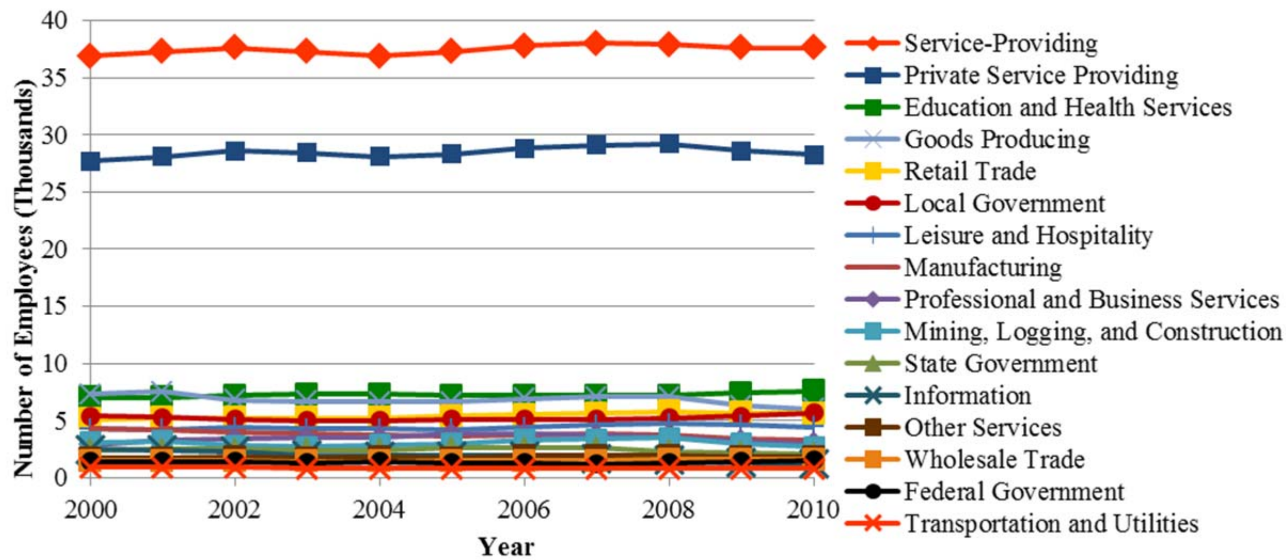
Source: Bureau of Labor Statistics, 2010

Figure A2: Abilene MSA Employment by Industry, 2000 to 2010



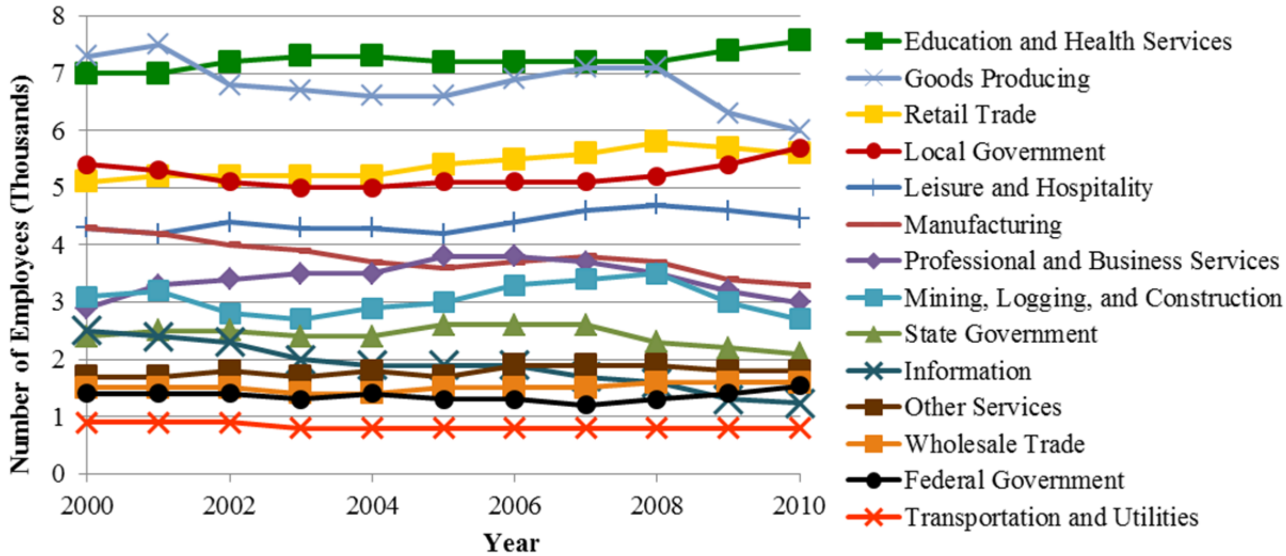
Source: Bureau of Labor Statistics, 2010

Figure A3: Abilene MSA Employment by Industry less Service-providing, 2000 to 2010



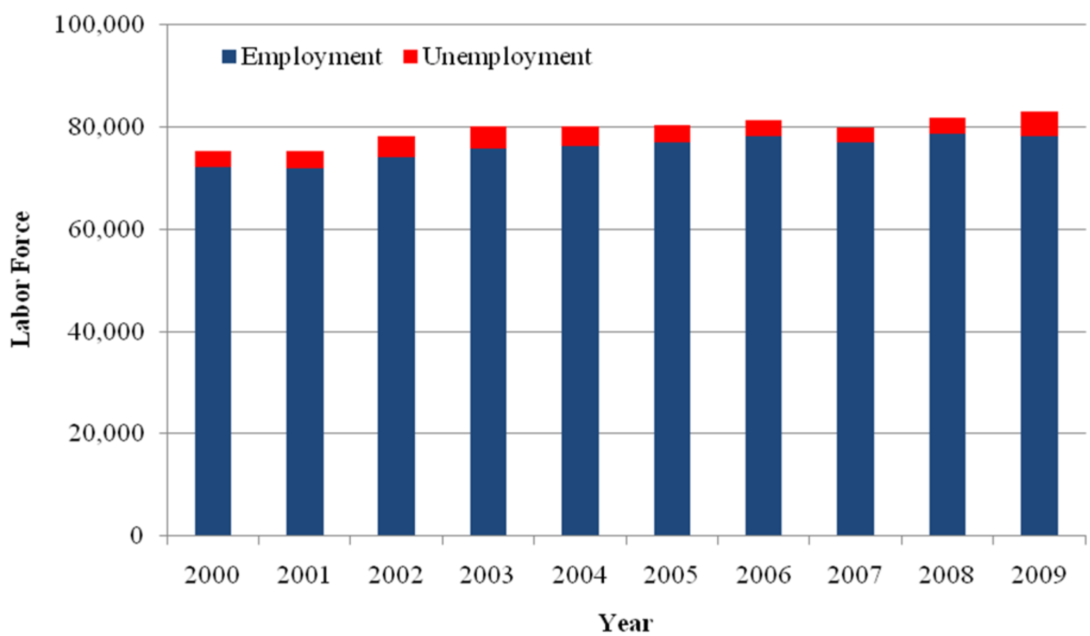
Source: Bureau of Labor Statistics, 2010

Figure A4: San Angelo MSA Employment by Industry, 2000 to 2010



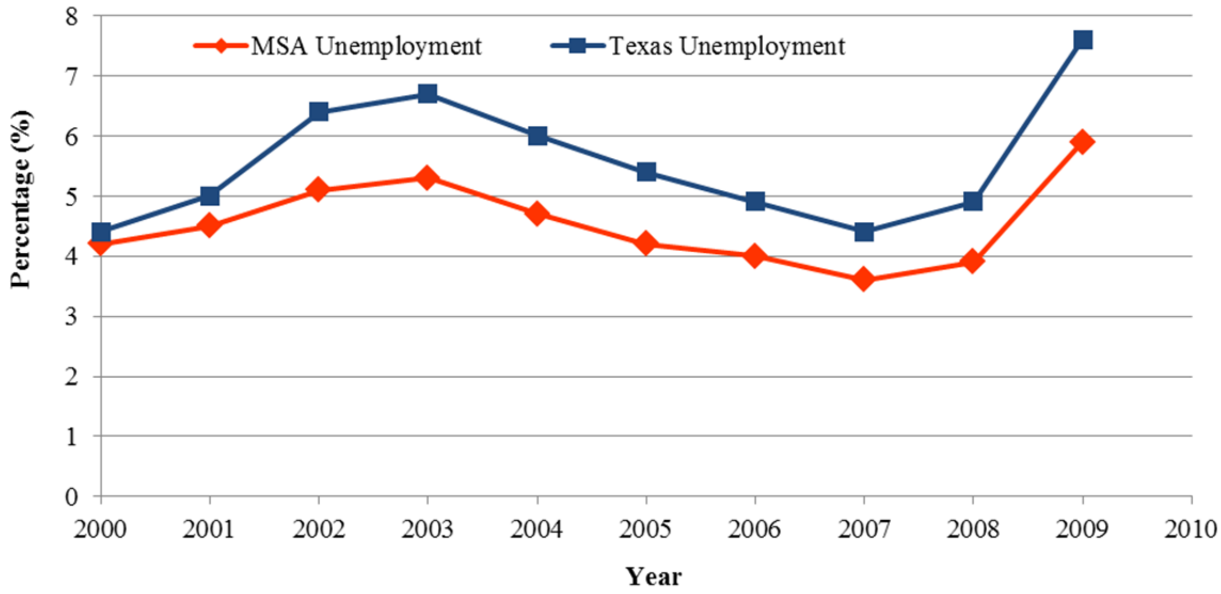
Source: Bureau of Labor Statistics, 2010

Figure A5: San Angelo MSA Employment by Industry less Service-providing, 2000 to 2010



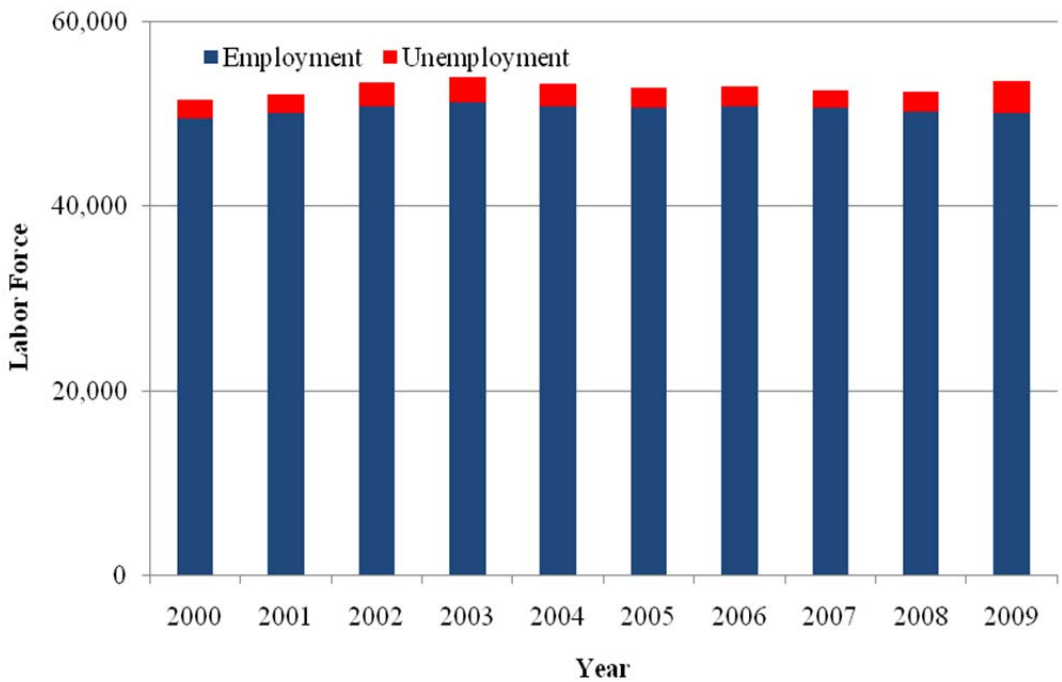
Source: Texas Workforce Commission, 2010

Figure A6: Abilene MSA Labor Force, 2000 to 2009



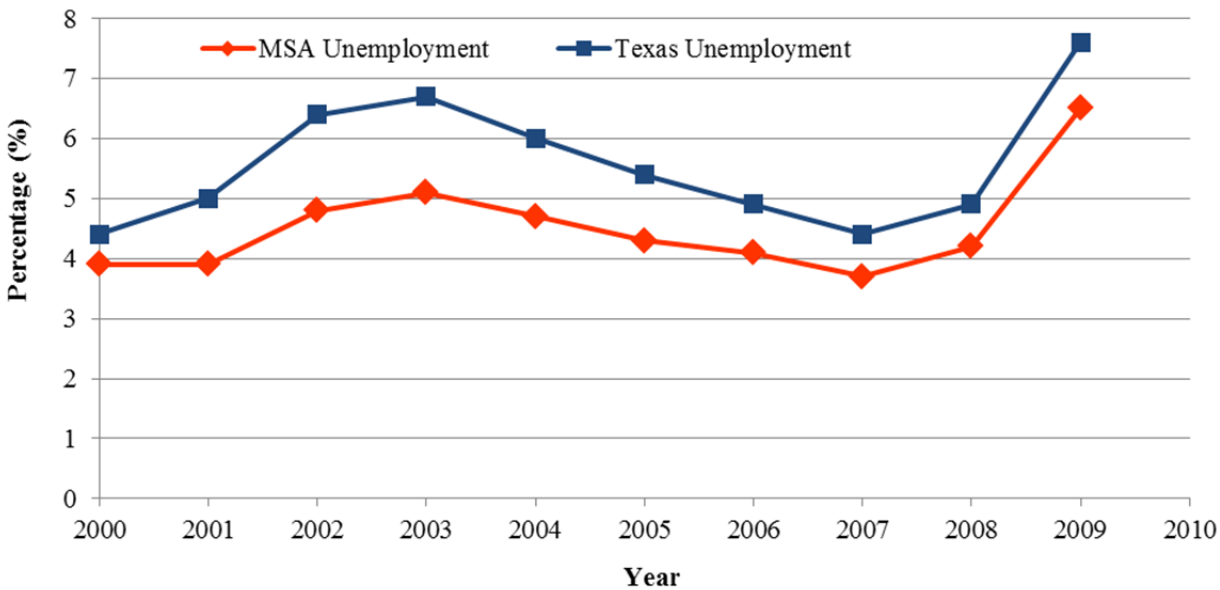
Source: Texas Workforce Commission, 2010

Figure A7: Abilene MSA Unemployment Rate, 2000 to 2009



Source: Texas Workforce Commission, 2010

Figure A8: San Angelo MSA Labor Force, 2000 to 2009



Source: Texas Workforce Commission, 2010

Figure A9: San Angelo MSA Unemployment Rate, 2000 to 2009

In the San Angelo MSA, the education and health services industry remained the top employer from 2002 to 2010, similar to that of the Abilene MSA. However, the second largest industry in the area, the goods-producing industry, experienced a sharp decline in its number of employees in 2009 and 2010. As of the first quarter of 2010, the number of employees in this industry was almost equivalent to that of the retail trade and local government industries. Other industries that also experienced a decline in their number of employees during the same period of time are leisure/hospitality, manufacturing, professional/business services, mining/logging/ construction (including petroleum), and state government industries (see Figure A5). All of these industries experienced the increasing unemployment rate in the region from 2008 to 2009 (see Figures A7 and A9).

Inventory of Freight Facilities

Roadway Infrastructure

Road transportation is the major freight transportation facility connecting various areas both inside and outside the region. There are nearly 9,685,032 centerline miles of state-maintained highways in the region. The major road utilized for freight traffic is primarily Interstate Highway 20, which branches from IH 10 about 100 miles east of El Paso, connecting the region's major city of Abilene with the Dallas/Ft. Worth MSA. Currently IH 10 and IH 20 see major truck traffic particularly in response to the NAFTA. As of 2003, these corridors combined to carry nearly 20% of Texas NAFTA freight truck traffic (by vehicle miles traveled [VMT]). This amounts to more than 1,000 average annual daily traffic (AADT) along IH 10 east of El Paso, of which some 250 then veer off to utilize IH 20. Generally, both roadways see diminished NAFTA truck traffic heading eastbound across the region and the state (Cambridge Systematics, 2007b).

In San Angelo, major freight highways include US 87, US 67, US 277, and Loop 306. As illustrated in Figure A10, US 87 and US 277 form part of the Texas Trunk System Corridors, which are designated rural four-lane divided highways built to enhance mobility, complement the interstate system, and connect cities in the state with a population of more than 20,000 as well as major ports and points of entry (Texas Transportation Planning Manual, 2001). In 2004, commercial vehicles accounted for approximately 15% of vehicles traveling into and out of San Angelo daily (San Angelo MPO, 2010). The major freight highways in the Abilene area include IH 20, US 83, and Loop 322.

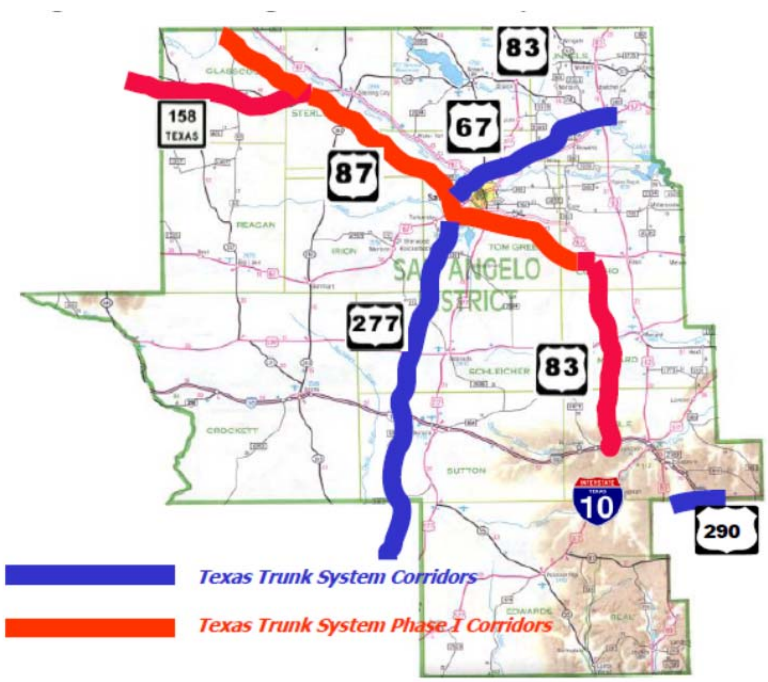


Figure A10: Texas Trunk System Corridors in San Angelo

Source: San Angelo MPO, 2010

Capacity of the road system in this region of Texas is generally greater than volume, with little or no congestion along a vast majority of these major routes. Most of the major truck routes in the region demonstrate movement at or near free-flow speed (greater than 55 mph). Minor congestion (volume to capacity ratios of .75–.95) exists in and around the major cities in the region, but does not spread much beyond city limits (Cambridge Systematics, 2007b).

By most measurements, truck travel is expected to develop very rapidly over the coming decades. NAFTA truck traffic utilizing IH 10 and IH 20 as key routes is expected to increase more than 200% on both corridors by 2030 (Table A1), even if no improvements to these roadways take place (Cambridge Systematics, 2007b). While congestion in the area is certainly not widespread, pockets of delay affect the freight transportation system significantly. Many projects are underway or in the planning stages to reverse the trend of increasing congestion at these locations, and these are discussed later.

The Texas Trunk System priority corridor connecting IH 44 at Wichita Falls with IH 20 at Abilene is expected to significantly impact freight movement within and through the Abilene Metropolitan Area (Abilene MPO, 2010).

Table A1: NAFTA Truck Growth

Source: Cambridge Systematics, 2007b

	2003				2030				2003 to 2030 Growth	
Corridor	Total Truck V1T *(Daily)*	NAFTA Truck VMT *(Daily)*	NAFTA Truck Percent of Total Trucks in corridor	Percent of Total Statewide NAFTA Truck VMT	Total Truck VMT *(Daily)*	NAFTA Truck VMT *(Daily)*	NAFTA Truck Percent of Total Trucks in corridor	Percent of Total Statewide NAFTA Truck VMT	Total Truck VMT % Growth *(Daily)*	NAFTA Truck VMT % Growth *(Daily)*
IH 35	5,314,072	1,451,922	27.3%	36.6%	13,102,996	6,431,449	49.1%	37.7%	147%	343%
IH 10	6,081,728	881,498	14.5%	22.2%	11,042,430	2,979,738	27.0%	17.5%	82%	238%
US 281	929,295	234.969	25.3%	5.9%	2,543,045	1,390,817	54.7%	8.2%	174%	492%
US 59	2,466,933	224.596	9.1%	5.7%	4,438,198	1,228,074	27.7%	*7.2%*	80%	447%
IH 20	3,484,420	183.107	5.3%	4,6%	6,271.503	669,922	10.7%	3.9%	80%	266%
IH 30	1,456,930	167.481	11.5%	4.2%	3,924,048	1,048,206	26.7%	6.1%	169%	526%
US 77	970,054	142.839	14 1%	3.6%	1,757,992	701,373	39.9%	4.1%	81%	391%

The Ports-to-Plains Trade Corridor, 2,300 miles from Laredo, TX to Alberta, CN, coincides with US 87 and US 277 at San Angelo where it continues southward to Del Rio, Eagle Pass, and Laredo. The corridor is significant for its direct connection with the Mexico and Canadian borders because of the potential to attract and serve both existing and future travel demands associated with NAFTA trade (San Angelo MPO, 2010).

Rail Infrastructure

The rail system in the region is primarily composed of two Class I lines and two short line rail railroads. The Class I lines are a UP line operating more or less parallel with Interstate 10 and 20, and a BNSF line running from the center of the state via Brownwood and Abilene toward Lubbock and the Texas–New Mexico border. The UP and BNSF lines cross near Sweetwater, providing connections to Lubbock. The short line railroads are the South Orient Rail line (SORR), and Fort Worth & Western Railroad (FWRR), which runs from Carrollton to San Angelo Junction.

The Texas Department of Transportation (TxDOT) owns the SORR line, which runs parallel to US 67 from San Angelo to the Mexican border at Presidio, via Fort Stockton (see Figure A11). Operation on the line was leased by TxDOT to Texas Pacifico Transportation Company (TXPF), a subsidiary of Grupo Mexico[2] for an operating lease term of 40 years with renewal options (TxDOT, 2010). Since its acquisition, TXPF has invested over $8 million in track rehabilitation to keep the line operable at 10 mph. Commodities hauled include steel plates for fabricators (in San Angelo), sand from Rankin, and agricultural commodities. It provides a vital connection to the center of the region and also serves as an alternate route into Mexico (San Angelo MPO, 2010). However, freight movement on the SORR is very limited because of the deteriorated condition of the infrastructure, which has restricted train speeds of 10 mph. It is designated as “Expected Track,” which limits higher train speeds and also restricts the transport

[2] Grupo Mexico owns 73% of Ferromex, the Mexican railroad company that connects with the South Orient at Presidio (TxDOT, 2010).

of hazardous materials to five cars per train (TxDOT, 2010). Despite its current condition, train traffic along the SORR route increased from 2,519 carloads in 2001 to 2,975 carloads in 2008, due to increase in agricultural harvests and mining developments in the region (TxDOT, 2010).

Source: San Angelo MPO, 2005

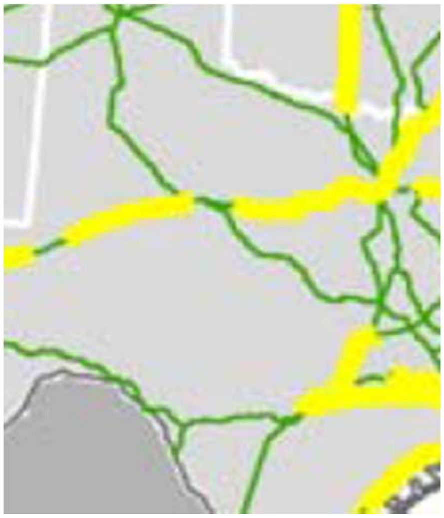
Figure A11: South Orient Railroad

According to TxDOT, in 2007, a total of 144 carloads of wind tower components were delivered to Fort Stockton with traffic increasing to 196 carloads in 2008. An additional 283 carloads of pipe for energy development in the region was also transported, and 15 carloads of fracture-sand per week to be used in mining petroleum products were delivered to TexSand Company[3] in late 2009 (TxDOT, 2010). Rail traffic to the company is expected to increase to 40 carloads per week in the near future (TxDOT, 2010). Another recent study completed for the Fort Stockton Economic Development Corporation projected that 3,808 additional carloads would be added to the SORR in the first year if the line were rehabilitated to Fort Stockton (TxDOT, 2010). Traffic is also expected to increase dramatically as a result of the decision by the Martifer-Hirschfeld Energy Corporation to locate a wind tower production facility on the line, which will receive inbound raw materials and ship tower components out, some of which could travel to the Fort Stockton area (TxDOT, 2010).

UP and BNSF both operate extensive rail systems that feed the region with coverage from the U.S. West Coast and Gulf ports to key inland population centers. UP and BNSF both have intermodal facilities at El Paso that treat trailers on flat cars (TOFC)/containers on flat cars (COFC), which go through the region. The region relies on rail for shipments of grain to export points, such as the Port of Galveston. Recently, there has also been an increasing use of rail facility by wind industry in the region (San Angelo MPO, 2010).

Capacity of rail moving through the region on the primary UP lines is higher than its current use, according to the 2007 National Rail Investment and Infrastructure Study (Cambridge Systematics, 2007a). The most heavily used line, operated by UP along IH 20 between Dallas and El Paso, currently has a volume-to-capacity ratio of .7 to .8 (noted in yellow) along the majority of the route, with even less volume near the major city of Abilene (see Figure A12). Approximately 50–100 trains utilize this corridor on a daily basis. The segment of rail along US 90, roughly parallel to IH 10, sees some 25–50 trains per day, while the BNSF rail line operating in the midsection of the state (via Brownwood), sees less than 15 trains per day.

[3] TexSand Company leased land adjacent to the rail yard in Fort Stockton (TxDOT, 2010).



Source: Cambridge Systematics, 2007a

Figure A12: Capacity of Texas railways

In Abilene, grade-separated crossings of the BNSF line have been provided to all but six minor arterials and other lesser roadways. A grade separation project is currently underway for FM 3438 to improve access to Dyess Air Force Base (Abilene MPO, 2010).

Air Infrastructure

There are two major airports in the region, San Angelo Regional Airport (Mathis Field) and Abilene Regional Airport. A third airport, Dyes Air Force Base, is owned and operated by the military and is an important military freight facility in the area.

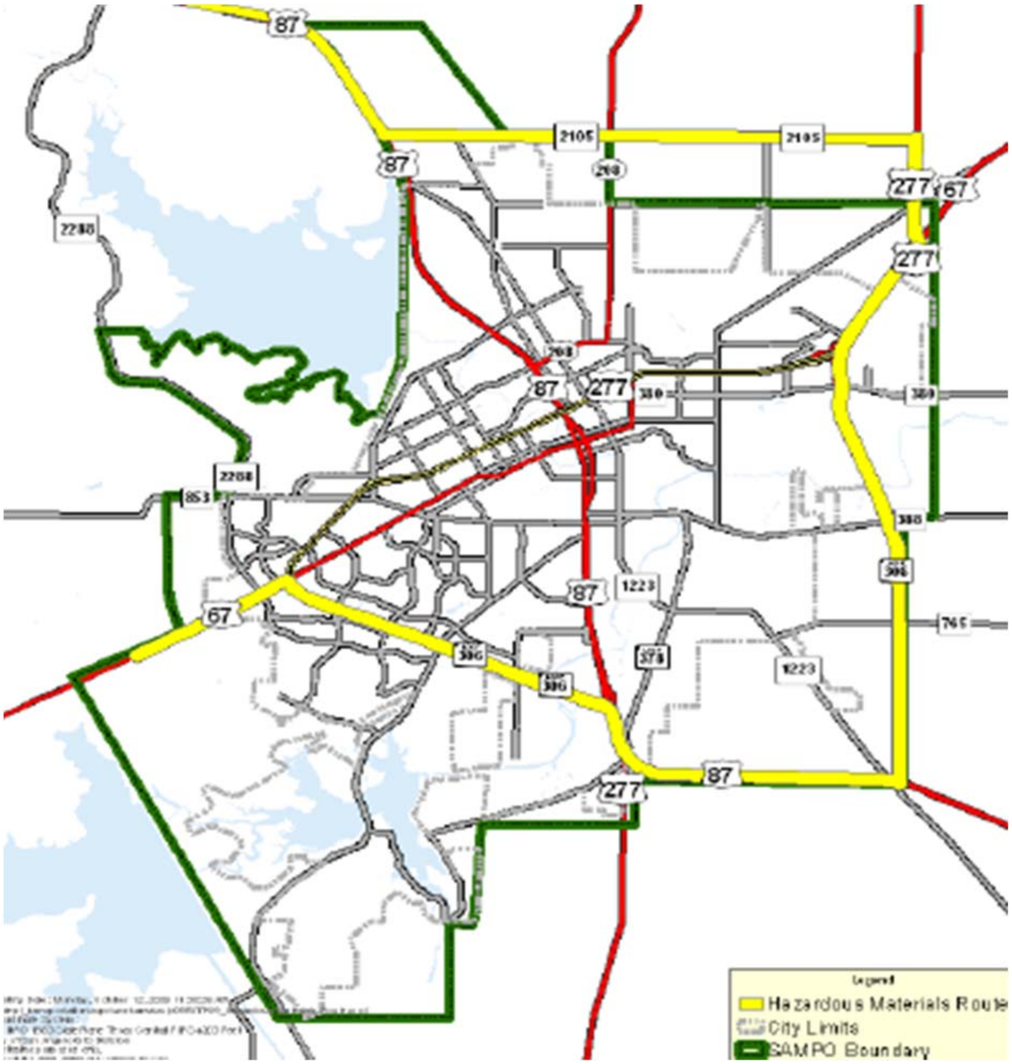
Mathis Field is classified as a commercial, primary, non-hub airport and generates $1.2 million annually from rental property and other activities on aerodrome (City of San Angelo, nd). It is located southwest of San Angelo on Texas Highway 584, Knickerbocker Road, 8 miles from downtown, and is the only commercial airport serving the Concho Valley.

It serves over 66,000 passengers annually, 7 commercial passenger flights per day and almost 100,000 air operations annually (City of San Angelo, nd). As of October 2009, 48% of the 273 average daily flights to the airport were military flights, 22% were local general aviation, 20% transient general aviation, 5% air taxi and 5% commercial (AirNav.com, 2010). The airport has an Industrial Aviation park that currently hosts commercial and civic organizations and an undeveloped large industrial airpark for light industrial purposes (San Angelo Chamber of Commerce, nd).

Critical Freight Needs and Issues

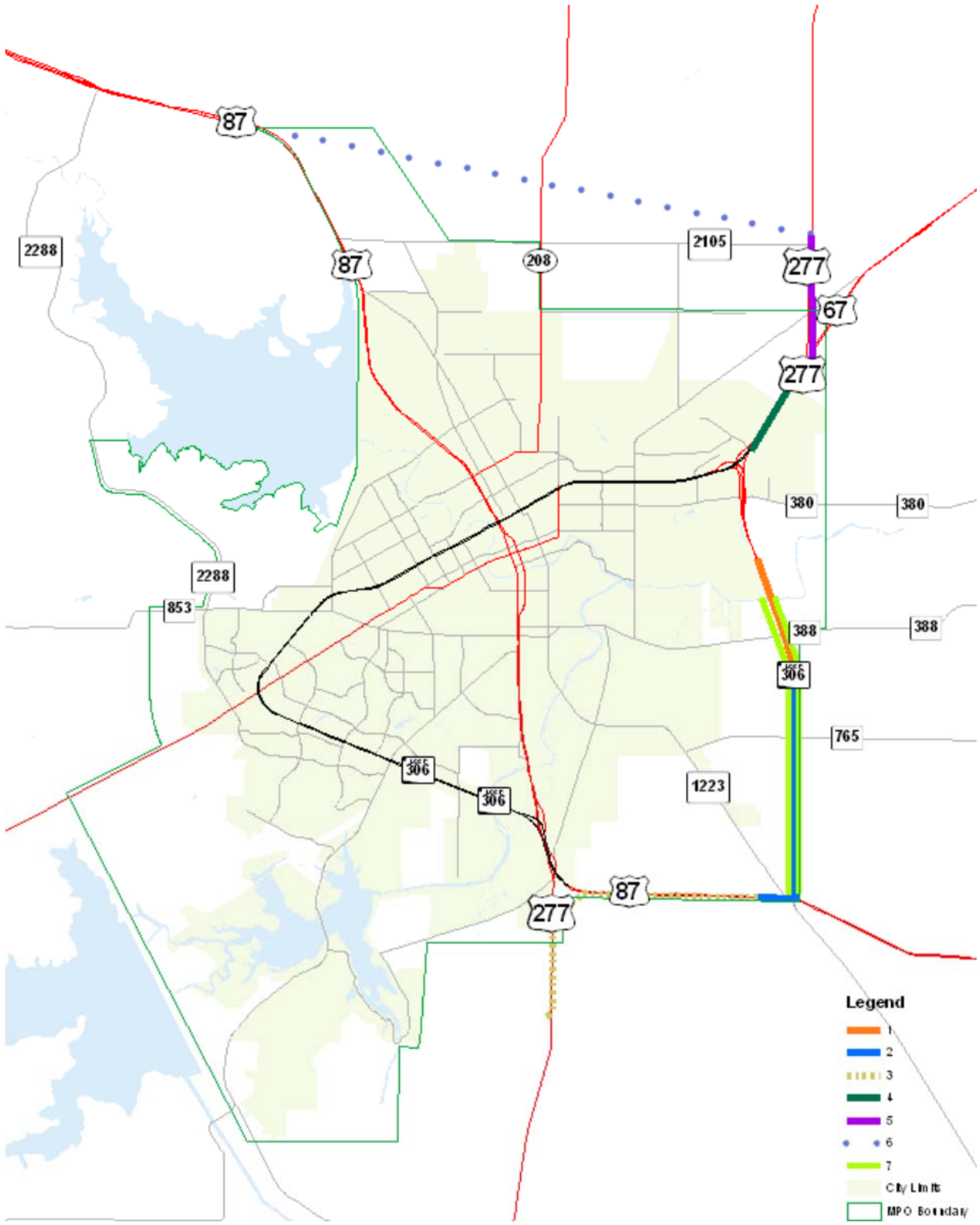
Current roadway congestion in the region is minimal except for some roads in the major cities of Abilene and San Angelo. However, adequate maintenance of the current infrastructure is a concern for the region because of limited road funding options. For example, the use of Farm-to-Market roads for hazardous material transport (see Figure A13) creates a need for adequate maintenance of these roadways. Stakeholders expressed their fear of roadway funding being shifted to other areas in the state because of the current good state of the region's road network. They feared that without adequate funding coming into the region, the region's road network might deteriorate in the future. Stakeholders were also curious to know when US 277 and Loop 306 will be completed.

According to the San Angelo Metropolitan Planning Organization (MPO), the development of the Texas Trunk System and the Ports-to-Plains initiative highlights the need for a San Angelo relief route to fulfill the mobility objectives of both systems. The route, which will connect US 277 to US 83, as illustrated in Figure A14, is designated as the most favorable path based upon mobility, cost, environmental, and public input measures (San Angelo MPO 2010).



Source: San Angelo MPO, 2010

Figure A13: Hazardous Materials Route Map



Source: San Angelo MPO, 2010

Figure A14: San Angelo Relief Route Map

Rail concerns in the region include insufficient rail capacity, especially during peak period shipping (e.g., harvest season), and the poor condition of the SORR route. According to the San Angelo MPO, San Angelo is served by a single short-line railroad but the line is in need of repair and upgrades. Of the 61 railroad crossings in San Angelo, 55% were ranked as poor or worse based on their condition. Conditions ranged from exposed spikes, broken timbers, sunken in holes, and missing timbers, to unpleasant travel conditions, as illustrated in Figure A15 (San Angelo MPO, 2010). Insufficient siding space at San Angelo Junction also limits the number of railcars hauled by the Class I railroads. The current siding has a capacity of only 45 railcars.

Stakeholders also noted that that rail congestion in Houston, Fort Worth, and El Paso impacts the Central Texas region. Shippers experience delays when these cities are back logged. Stakeholders reported that shipments sometimes arrived quicker when shipped to Los Angeles, California, than to some cities in Texas. Insufficient labor by the short line rail line also limits the number of trips that can be made during the peak period. This need was cited by stakeholders in the grain production industry as this industry sees the need to ship agricultural products to their destinations as soon as they are harvested. Currently, there are only two full-time rail engineers, and stakeholders mentioned the need to hire additional full-time hands during peak seasons.

Another need identified by stakeholders pertains to rail cars not being readily available during peak periods. Stakeholders stated that this situation limits their ability to ship commodities and raw materials on time, making it difficult for businesses to expand in the area. They said that the current state of the rail infrastructure is having a negative effect on industries in the region, especially the San Angelo area. In addition, stakeholders mentioned a need for better communication with the Class I railroads regarding investment needs in the region as there is currently no UP/BNSF interchange in the region, despite the rail lines crossing each other at Sweetwater, which is approximately 70 miles from San Angelo and 40 miles from Abilene. Also, in Abilene, there have been calls for grade-separated rail crossings between downtown Abilene and US 83. All but six minor arterials do not have grade-separated crossings.

Source: San Angelo MPO, 2010

Figure A15: Snapshots of some South Orient at-grade crossings at San Angelo's Bell Street (#21 482K)

Policies and Strategies to Address Needs

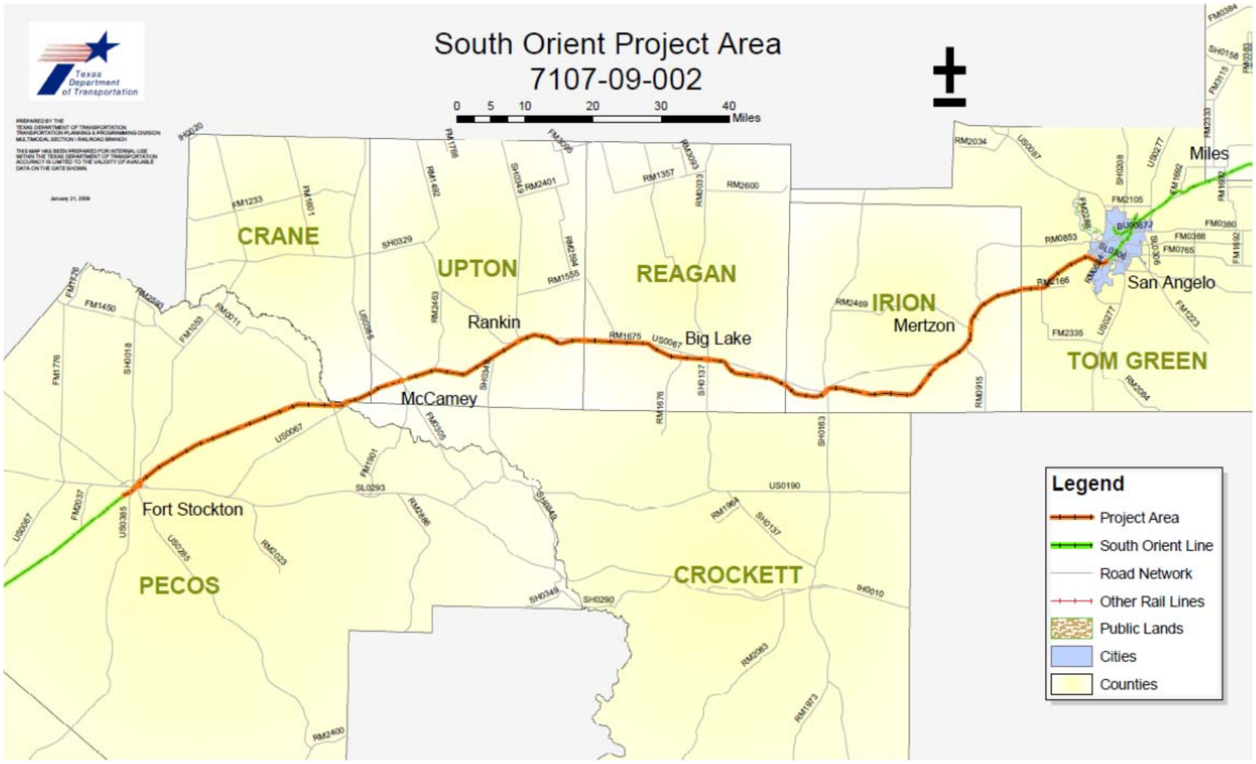
To address the needs in the region stated earlier, the MPOs of San Angelo and Abilene listed some of the policies and strategies currently being undertaken to address the region's needs.

In San Angelo, the MPO has been with working with Texas Pacifico and TxDOT to replace the rest of the railroad crossings in San Angelo. In July 2009, through the efforts of U.S. Representative Mike Conaway, the City of San Angelo received $1 million dollars in funding for these crossings from the Subcommittee on Transportation, Housing and Urban Development Appropriations Committee (San Angelo MPO, 2010). According to the San Angelo MPO, 42 at-grade crossings are expected to be completed by the end of 2010.

In addition, through the American Recovery and Reinvestment Act (ARRA), the Texas Pacifico/SORR with the help of TxDOT will be upgrading the tracks from San Angelo to San Angelo Junction (near Coleman). This improvement will upgrade/restore the existing rail line and replace the rail bridge in Ballinger to improve the speed of the trains and increase opportunities to move freight by rail (San Angelo MPO, 2010). This project is seen as vital to the area due to the establishment of a new wind energy systems company, Martifer Energy Systems Group, which will be utilizing the railroad line for transport of wind turbines and providing 255 new jobs (San Angelo MPO, 2010).

The Railroad Coalition, established in September 22, 2009, by the San Angelo City Council, also seeks to promote the development of the SORR rail line from San Angelo Junction to Presidio (San Angelo MPO, 2010). The purpose of the coalition will be to strengthen the dialogue between communities, explore opportunities for collaboration and delivery of services, research economic opportunities, preserve mobility options, improve safety of the railroad, enhance an existing transportation facility to optimize its performance, and develop short- and long-term recommendations for future needs and coordinated corridor development (San Angelo MPO, 2010). The coalition will also seek to strengthen the rail component of the Ports-to-Plaints Trade Corridor Coalition. The San Angelo MPO is also exploring the feasibility of an intermodal facility in San Angelo due to the SORR rail line and the Ports-to-Plains Trade Corridor meeting in the city.

In August of 2010, a $19,310,000 TIGER II grant application was submitted by TxDOT for the rehabilitation of a portion of the SORR rail line from railroad milepost 721.52 in Tom Green County (near Knickerbocker Road west of San Angelo) to milepost 882.84 (near US 385 west of Fort Stockton) in Pecos County (see Figure A16). Rehabilitation works include installation of crossties and ballasts, surfacing and alignment of track, replacing of at-grade crossings, and multiple bridge repairs (TxDOT, 2010). The rehabilitation of the line from Fort Stockton to San Angelo will allow train operations at 25 mph speeds from Fort Stockton to San Angelo Junction, where the SORR interchanges with the BNSF Railway and Fort Worth & Western Railroad, which owns trackage rights on the BNSF line. The rehabilitation will also facilitate efficient movement of hazardous materials, particularly petroleum and natural gas products, along the route (TxDOT, 2010). The current 45 rail car siding capacity at San Angelo Junction is also expected to be increased to 110 in the next 2–3 years.



Source: TxDOT, 2010

Figure A16: South Orient Project Area

The City of San Angelo also plans to develop an intermodal freight facility in the region. The intersection of the Ports-to-Plains Corridor and the SORR line provides an opportunity for an alternative trade corridor in the U.S. to serve industries between Mexico and Canada (see Figure A17). It will also provide support services to the growing wind energy industry in West Central Texas (City of San Angelo, 2010).

In Abilene, there are currently plans to relocate industrial and freight-intensive activities away from the central parts of the metropolitan area into industrial areas along transportation facilities in outer portions of the urban area (Abilene MPO, 2010). There is also continued development of the Five Points Business Park owned by the Development Corporation of Abilene, located in northwest Abilene between IH 20 and Business IH 20. Five Points offers direct access to the UP railroad and is less than 10 miles from Abilene Regional airport (Abilene Industrial Foundation, nd).

According the Abilene MPO, community leaders have actively advocated the completion of Loop 322 as an urban expressway connecting US 83 and IH 20 for several years. Construction has been completed on three phases to add capacity: the first phase from the US 83 interchange to FM 1750 is complete, the second phase from FM 1750 to ST 36 is complete, and the final phase from SH 36 to IH 20 is complete in its current form. Additional improvements for the Loop include providing frontage bridges across Lytle Creek to improve connectivity and mobility, changing frontage road operations, improving ramps to improve safety and operation efficiency, and extending Loop 322 to SH 351—initially as a two-lane roadway—to improve connectivity and mobility, Reconstruction of the interchange with IH 20 to provide direct connections has also been proposed but is currently not of high priority (Abilene MPO, 2010).

Source: City of San Angelo, 2010

Figure A17: City of San Angelo Intermodal Facility

The Dyess Air Force Base Access Improvement Project, which was a high priority project, resulted in major improvement of access to and from Dyess AFB for personnel, visitors, and freight. Improvements included redirecting military freight from IH 20 through FM 3438 via access ramps and frontage road, making improvements to the FM 3438 and BIZ 20 interchange with a grade separation at the UP railroad line, and reconstructing Military Drive (Abilene MPO, 2010).

B: North Coastal Texas

Introduction

The North Coastal region of Texas is an area economically and socially dominated by the city of Houston. Other metropolitan areas in the region, most notably Galveston and the Golden Triangle (Beaumont, Port Arthur, and Orange) have economies and transportation networks that are closely tied to those of Houston. In order to understand the freight transportation demand and needs in the entire region, it is necessary to consider Houston and its effect on the surrounding cities.

Currently, a great deal of freight infrastructure exists in the region. Highways, particularly IH 10, carry large volumes of truck traffic, and rail traffic in the region generally has either its origin or destination in the Houston metropolitan area. Houston is also home to the fourth-largest port in the country and the eleventh-largest cargo airport in the country. Because of the strong existing supply of freight infrastructure, most of which is less congested than other major freight hubs around the country (particularly on the West Coast), demand is expected to grow markedly over the next decades.

Existing demand for freight movement in the region is largely controlled by the economy of Houston, and to a smaller extent, the economies of Galveston and the Golden Triangle. Energy is a dominant factor in each of these economies, as Houston has been and likely will continue to be a major national source of oil and natural gas, as well as the expertise needed for each of these energy sources. While the economies are still known for dominance in the energy market, Houston and the surrounding metropolitan areas have begun to diversify into many other markets, including chemicals, biotechnology, aerospace, and healthcare. This diversification and the growth of non-energy-related fields will continue to increase the freight demand in the North Coastal region. In order to handle this increased demand and provide benefits to the regional economy, both new and improved strategies are needed to manage the regional freight transportation infrastructure.

Economic Profile and Freight Movements

The major economic generators in the North Coastal region of Texas are energy, chemical production, health services, and tourism. Many of these activities take place in Houston, Galveston, and the Golden Triangle cities of Beaumont, Port Arthur, and Orange.

Three major trends can be identified in North Coastal Texas's recent economic history: the international oil crisis of 1973, the oil bust in the 1980s, and the diversification that has occurred over the past couple decades.

Boom during 1973 Oil Crisis

During the 1973 oil crisis, Houston and southeast Texas enjoyed a booming economy. As imported oil was being restricted and prices rose, the major oil-producing region of the United States worked to make up the difference. Houston's physical landscape changed, with new skyscrapers designed by Philip Johnson and I.M. Pei, into its modern skyline (Houston: History 2009). Many industrial workers came to Houston and southeast Texas, hoping to take part in the explosive growth. Jobs were plentiful for these workers, as 150,000 jobs were created in the business of oilfield development (Romero 2005). Oil was driving the economy; eight of the ten largest energy companies in the world had their headquarters in Houston (Houston: History 2009).

1980s Oil Bust

The growth of the 1970s was impossible to maintain, and in the early 1980s, Houston experienced an economic slump. Because Houston is clearly the economic engine of the North Coastal Texas region, other cities and towns suffered in much the same manner. The excesses in Houston were based on the assumption that the world was running out of oil, leading to continually rising prices of oil. These assumptions led to speculative oil and residential prices, overheating the economy. A 5-year decline began in 1981 and cost Houston one-eighth of its total employment (Houston Business 1999). Approximately 3,000 homes per month went into foreclosure (Hall 2009), one of the many statistics describing Houston's worst economic period thus far.

Diversification

Today, Houston's economy is only somewhat dependent on oil. Other forms of energy, including wind and natural gas, have helped the energy sector to diversify. As the interest in "green energy" increases rapidly, Houston is well-poised to be a leader in wind, solar, and nuclear energy, as well as traditional oil-based energy. Among other energy initiatives, the largest solar array in Texas will be built in Houston (Souder 2009). Other sectors of Houston's economy have expanded; for example, Houston's Medical Center is now world-renowned. The medical field is also relatively recession-proof, insulating Houston against economic downturns such as that felt nationwide in 2008 and 2009.

Houston Today

Houston is the fourth-largest city in the United States by population and is home to the headquarters of more Fortune 500 companies than any other city except New York (Fortune 500 2008). It is the economic powerhouse of the North Coastal Texas region and has significant effects on the cities and towns nearby. Houston's economic dominance is shown in its Gross Area Product (GAP) of $308.7 billion in 2005; only 29 nations have Gross Domestic Products higher than Houston's GAP (Houston Law Firms 2009). The area's economy used to be based almost primarily on oil and refining; however, changes over the last few decades have resulted in a much more diversified economy.

As shown in Table B1 from the 2007 Commodity Flow Survey, the majority of commodities originating from the Houston-Baytown-Huntsville area were coal and petroleum products, chemical products, base metal and machinery, furniture, grains, and other commodities. The high volume of coal, petroleum, and chemical products can be attributed to the active petro-chemical industry in the area. In terms of value, only electronic products rank in the top five commodities aside the ones listed earlier.

A review of the area's industries from 2000 to 2010 in Figure B1 shows that the greatest number of employees worked for the service-providing industry, which experienced a rapid growth from 2000 to 2008, before declining slightly from 2009 to first quarter of 2010. Aside from the service-providing industries, other major industries in the area as of 2010 are goods-producing, professional and business services, education and health services, retail trade, local government, and manufacturing, as shown in Figure B2. The goods-producing industry experienced a decline from 2001 to 2004, grew from 2005 to 2008, and declined again by less than 10% from 2009 to date. A similar trend can be seen with some of major freight producing industries such as manufacturing and construction.

The Houston-Baytown-Huntsville area, with a highly diverse economy, maintained a relatively low unemployment rate until the economic recession in 2008 and 2009. As shown in Figure B3, the area's labor force increased by 19% from 2000 to 2009. However, unemployment increased from 4.3% to 6.7% from 2000 to 2003, declined from 2004 to 2007, and increased again 7.6% in 2009, the highest unemployment rate of the decade (see Figure B4).

Energy

Houston is considered to be the energy capital of the world with regard to both oil and natural gas. More than 5,000 energy firms, including ExxonMobil, ConocoPhillips, Shell, Reliant, ChevronTexaco, and many others, do a substantial part of their business in the city. The proportion of the city's economy based on energy has decreased substantially over past decades, from 65% to about 35% (Cash, 2008); however, given the combination of natural resources and technical expertise available in and around Houston, energy will likely continue to be a driving factor in its economy. Nearly one-third of all jobs in oil- and gas-related fields are located in Houston, and each day, the Texas Gulf Coast is capable of producing 3.853 million barrels of refined petroleum products, accounting for 23% of the U.S. daily total (Chemical and Biomolecular Engineering, 2009).

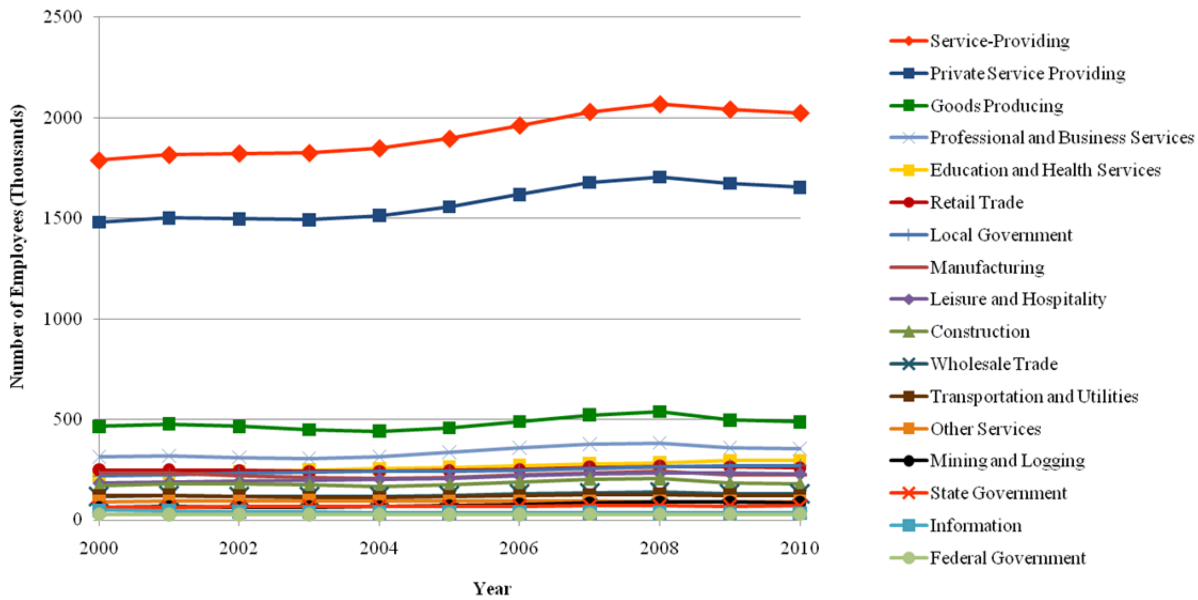
The Offshore Technology Conference, which is billed as the "world's foremost event for the development of offshore resources in the fields of drilling, exploration, production, and environmental protection," is held yearly in Houston. Attendance routinely tops 50,000, with representatives from more than 110 countries arriving to discuss offshore resources and technologies (OTCnet, 2009).

Petro-Chemical Industry

Houston produces a great deal of chemicals, including petrochemicals. The petrochemical facility located at the Houston ship channel is the largest in the country and among the largest in the world (Port of Houston Delivers 2009). The Houston area contains more than 400 chemical plants—nearly every major chemical company has a plant in the city—employing more than 35,000 people (Houston Economy 2009).

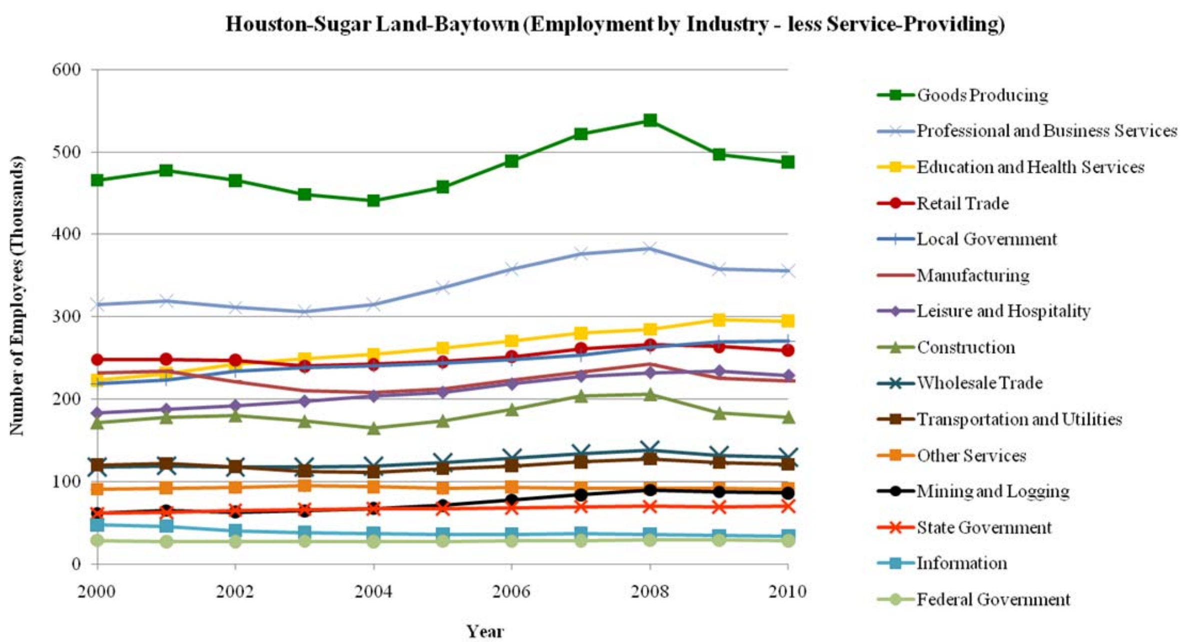
Table B1: 2007 Commodity Flow Survey Data for Houston-Baytown-Huntsville, TX

Meaning of Commodity code	Tons (thousands)	% Tons	Value ($mil)	% Value
Coal and petroleum products	197,770	44%	117,957	29%
Basic chemicals, chemical, and pharmaceutical products	99,762	22%	119,306	29%
Base metal and machinery	55,779	12%	62,729	15%
Furniture, mixed freight and misc manufactured products	21,302	5%	26,154	6%
Grains, alcohol, and tobacco products	10,551	2%	12,057	3%
Electronic, motorized vehicles, and precision instruments	5,291	1%	55,434	14%
Logs, wood products, and textile and leather	5,185	1%	6,132	1%
Agriculture products and fish	N/A	N/A	9,088	2%
Stones, nonmetallic minerals, and metallic ores	N/A	N/A	1,475	0%
Commodity Unknown	N/A	N/A	N/A	N/A
All Commodities	450,997		410,343	



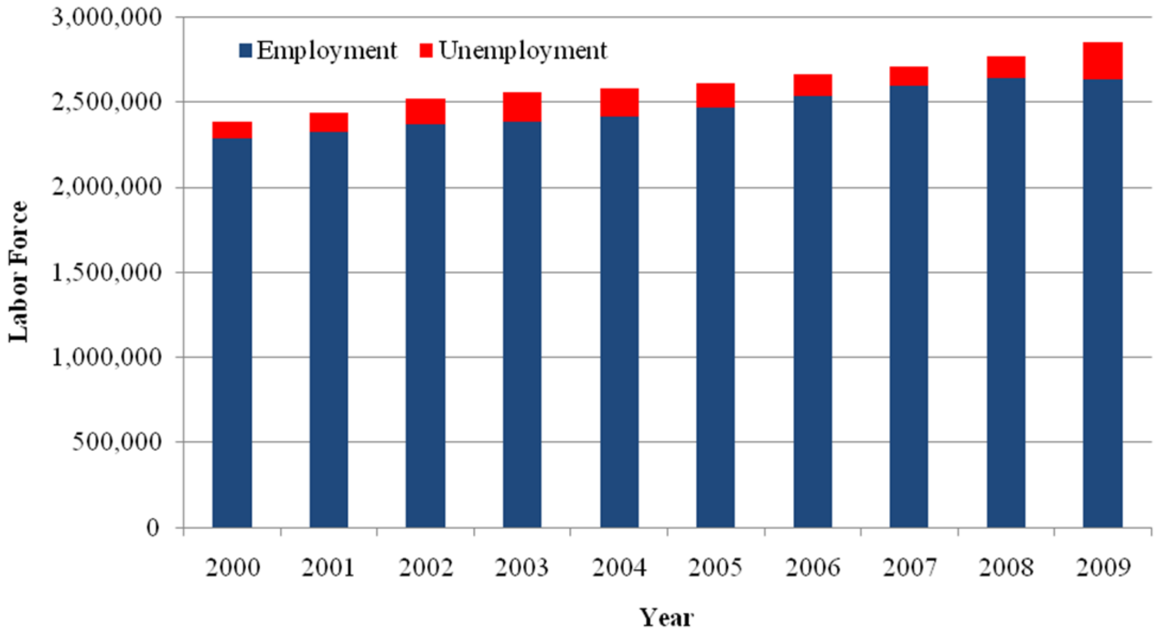
Source: (Bureau of Labor Statistics, 2010)

Figure B1: Houston-Baytown-Sugar Land MSA Number of Employees by Industry, 2000 to 2010



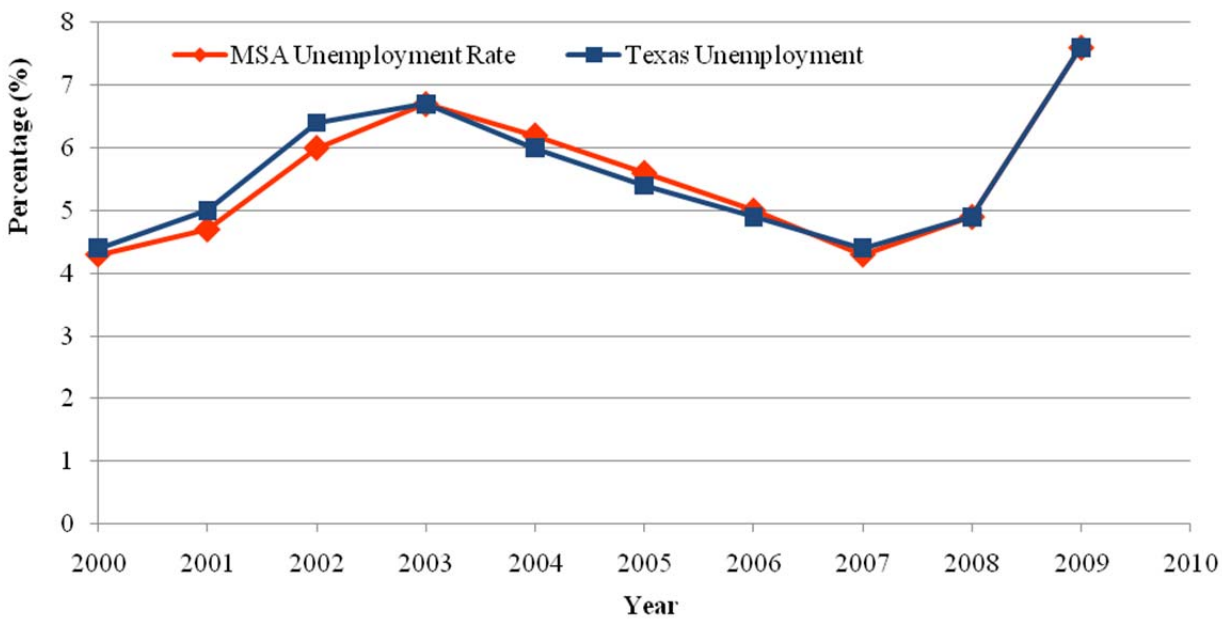
Source: (Bureau of Labor Statistics, 2010)

Figure B2: Houston-Baytown-Sugar Land MSA Number of Employees by Industry less Service-providing, 2000 to 2010



Source: Texas Workforce Commission, 2010

Figure B3: Houston-Baytown-Sugar Land MSA Labor Force 2000–2009



Source: Texas Workforce Commission, 2010

Figure B4: Houston-Baytown-Sugar Land MSA Unemployment Rate 2000–2009

Aerospace

Since the opening of the Johnson Space Center (JSC) of the National Aeronautics and Space Administration (NASA) in 1962, Houston has been a worldwide leader in the aerospace industry. JSC is a $1.5 billion complex (Aerospace, 2008), which employs 17,000 engineers, scientists, administration, and contractors (JSC People, 2008). The International Space Station and NASA's Space Shuttle missions are simulated and controlled from this location, as were the Mercury, Gemini, and Apollo missions of previous decades. In addition to NASA's operations, the United Space Alliance (USA) is also headquartered in Houston. One of the world's largest space operations companies, USA provides space operations, services, and technologies to its customers—primarily NASA. USA's revenues were nearly $1.9 billion in 2007 (USA Quick Facts, 2009). The aerospace and defense firms of Raytheon, Boeing, and Lockheed Martin all have significant operations in Houston and work closely with NASA. The total trade of aircraft, spacecraft, and parts in Houston reached $1.4 billion in 2007 (Aerospace, 2008).

Biotechnology and Healthcare

The Texas Medical Center (TMC), located in Houston, accounts for another substantial part of the regional economy. TMC consists of 47 non-profit institutions, which include 13 hospitals, two specialty institutions, two medical schools, four nursing schools, and schools of dentistry, public health, and pharmacy; altogether, this group makes up the largest medical center in the world (Economic Impact 2001). TMC is a transplant center of world renown; more heart transplants are performed here than anywhere else in the world. Nearly 75,000 people are employed within the 47 institutions, and these facilities see and treat more than five million patients yearly. TMC is a $14 billion institution with another $1 billion in annual research expenditures (2008 Facts and Figures).

Golden Triangle (Beaumont, Port Arthur, Orange)

The southeast corner of Texas, anchored by the cities of Beaumont, Port Arthur, and Orange, is often referred to as Texas's "Golden Triangle." These cities became quite wealthy after the Spindletop oil strike in 1901, and enjoyed their position at the center of Texas's oil boom, leading to their "golden" nickname. Today, oil is still a significant part of the economy for the area, but other industries play a part as well.

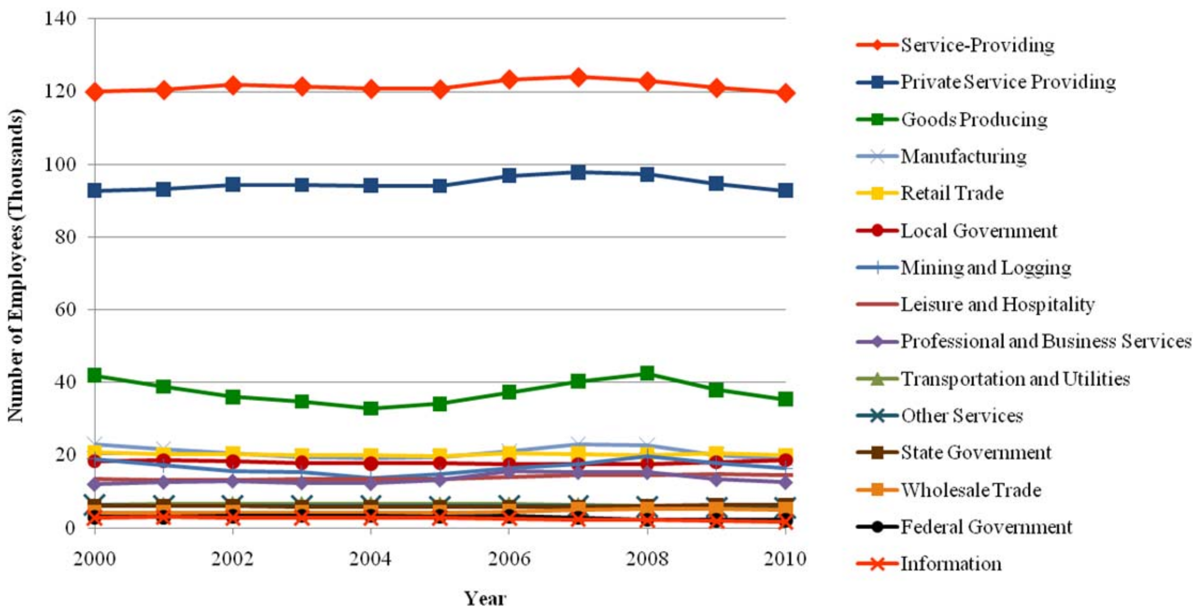
As shown in Table B2 from the 2007 Commodity Flow Survey, the majority of commodities originating from the Beaumont-Port Arthur area in both tonnage and value were coal and petroleum products, chemical products, base metal and machinery, logs, wood products, and other commodities.

A review of the area's industries from 2000 to 2010 in Figure B5 shows that the greatest number of employees worked for the service-providing industry as in other parts of Texas. However, this sector experienced a slight decline from 2007 to first quarter of 2010. Aside from the service-providing industries, other major industries in the area as of 2010 are goods-producing, manufacturing, retail trade, local government, and the mining and logging industry, which includes the petroleum industry (see Figure B6). Freight-producing industries in the area experienced a trend similar to that of those of the Houston-Baytown-Sugar Land areas from 2000 to 2010. The goods-producing industry, for example, experienced a decline from 2001 to 2004, grew from 2005 to 2008, and declined again by less than 10% from 2009 to date. A similar trend can be seen with some of the major freight-producing industries such as manufacturing, mining, and logging.

Labor force in the Beaumont-Port Arthur area varied significantly from 2000 to 2009. Despite the increase in labor force from 2006 to 2009, unemployment rate remained very high, increasing from 5.3% in 2007 to 9.6% in 2009 (see Figures B7 and B8).

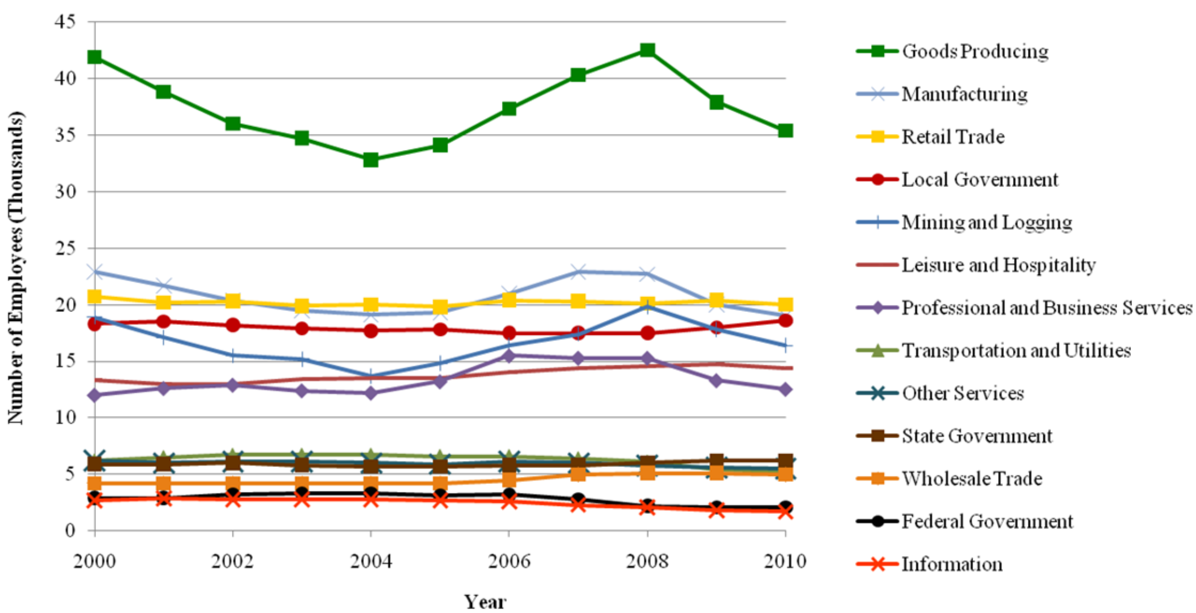
Table B2: 2007 Commodity Flow Survey Data for Beaumont-Port Arthur, TX

Meaning of Commodity code	**Tons (thousands)**	**% Tons**	**Value ($mil)**	**% Value**
Coal and petroleum products	69,122	61%	50,668	63%
Basic chemicals, chemical, and pharmaceutical products	27,458	24%	22,901	29%
Base metal and machinery	2,462	2%	2,183	3%
Logs, wood products, and textile and leather	1,934	2%	681	1%
Grains, alcohol, and tobacco products	282	0%	289	0%
Electronic, motorized vehicles, and precision instruments	22	0%	572	1%
Agriculture products and fish	N/A	N/A	N/A	N/A
Stones, nonmetallic minerals, and metallic ores	N/A	N/A	N/A	N/A
Furniture, mixed freight and misc manufactured products	N/A	N/A	1,113	1%
All Commodities	**114,242**		**79,852**	



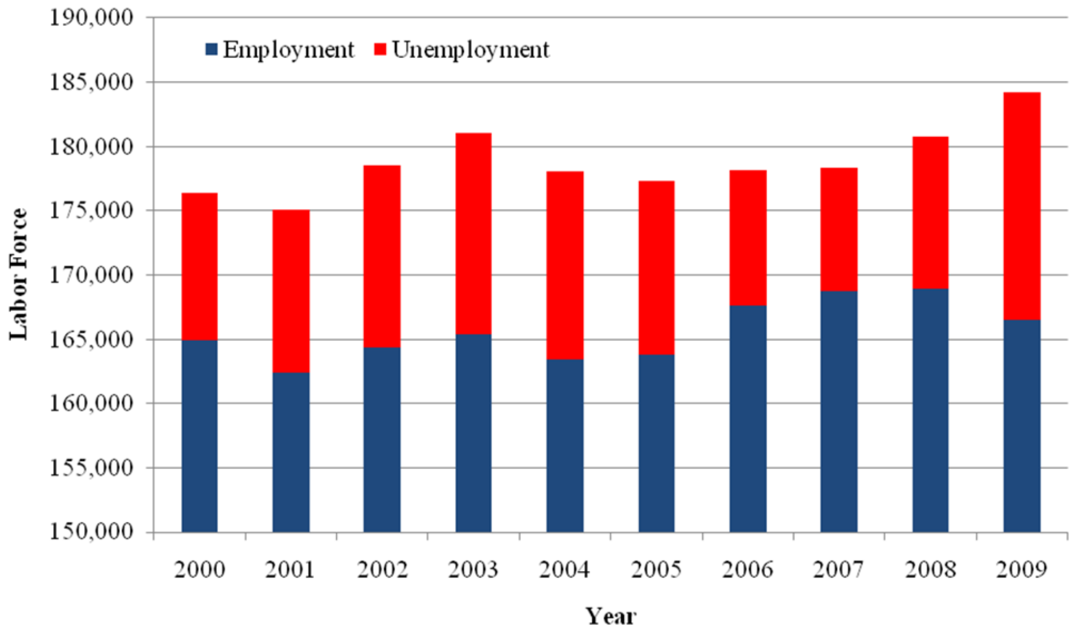
Source: (Bureau of Labor Statistics, 2010)

Figure B5: Beaumont-Port Arthur MSA Number of Employees by Industry, 2000 to 2010



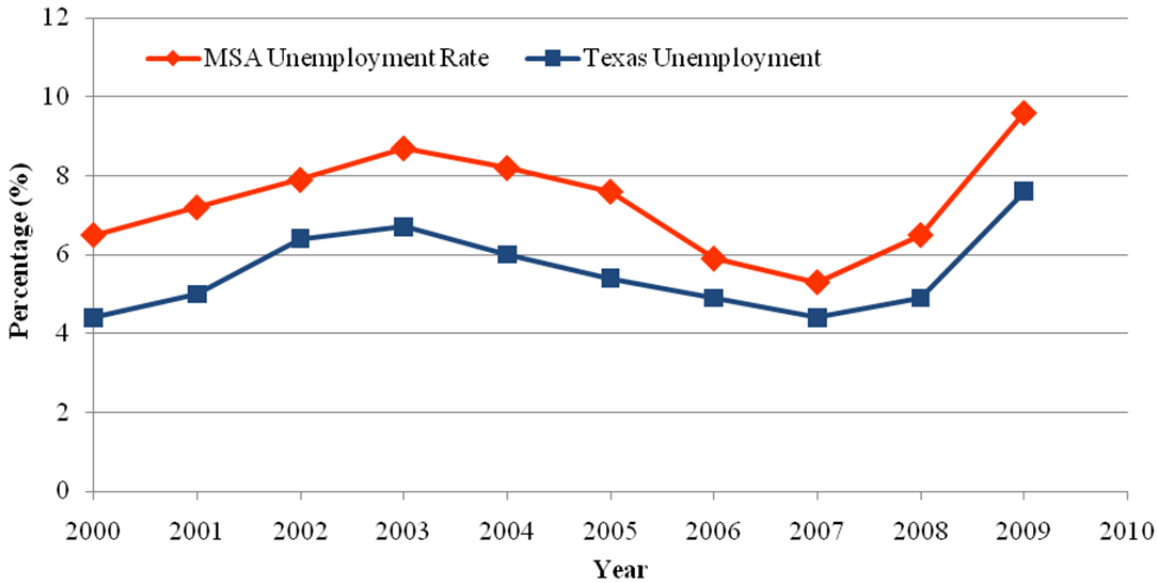
Source: (Bureau of Labor Statistics, 2010)

Figure B6: Beaumont-Port Arthur MSA Number of Employees by Industry less Service-providing, 2000 to 2010



Source: Texas Workforce Commission, 2010

Figure B7: Beaumont-Port Arthur MSA Labor Force 2000–2009



Source: Texas Workforce Commission, 2010

Figure B8: Beaumont-Port Arthur MSA Unemployment Rate 2000–2009

Energy

Much like in Houston, energy is a major part of the economy in the Beaumont region, as there are a large number of oil and natural gas refineries in the area. This area of the country is also well known for its oil production; Spindletop, the oil well drilled in 1901 that heralded the beginning of the petroleum boom in Texas, was located just outside of Beaumont (Oil in Southeast Texas 2000). Valero, BASF/Fina, and Motiva Enterprises have all undertaken large scale expansions of their refining options; Motiva's expansion, to be completed in 2010, will create the largest refinery in the nation, and is expected to generate $17 billion in economic activity for the Southeast Texas region (Project Info, 2009).

Natural gas also plays a prominent role in the energy economy. Much like the oil refineries, natural gas sites are also undergoing significant expansions. Golden Pass Liquefied Natural Gas (LNG) is building a LNG receiving terminal at Sabine Pass; this location was chosen due to its access to a deepwater port as well as the existing pipeline infrastructure that will allow the LNG to be easily transported throughout the country. The Golden Pass terminal will be completed in 2010 and represents a $1 billion investment (The Terminal Investment, 2009).

Other Economic Activity

The Port of Beaumont is the busiest military port in the United States (Macias 2006). The port is also the headquarters of the U.S. Army's 842nd Transportation Battalion, specializing in port logistics (Facilities and Services, 2009). Several pulp and paper companies are located in the wooded areas just north of the metropolitan areas, and rice is also grown nearby.

Galveston

In the late 1800s, the city of Galveston was the largest and most important city in Texas. Its position along the Gulf of Mexico allowed it to become one of the largest ports on the Gulf, in close competition with New Orleans. Galveston also served as a popular point of entry to the United States, becoming known as the "Ellis Island of the West" (Gateway, 2007). However, after the Hurricane of 1900, which devastated the city, Galveston never regained its earlier prominence and prosperity; instead, the nearby city of Houston began to dominate the region.

Today, Galveston's economy is centered on tourism, healthcare, and its port, which continues to be a strong competitor in the Gulf region.

Tourism

Tourism is one of the most important sectors of Galveston's economy. In 2007, 5.4 million visitors brought in $808 million to the local economy, and nearly one-third of Galveston's workforce is employed in the tourism industry (Lozano 2009). Tourists come to Galveston for the beach, its museums and parks, and to visit the historic Strand district. The Galveston cruise port ranked as the fourth-largest cruise port in the United States, and the eleventh largest in the world (Historic City, 2009).

Health Care

Galveston is home to the University of Texas Medical Branch (UTMB), the oldest medical school west of the Mississippi River. UTMB's campus currently contains seven hospitals, four schools, a network of clinics, and a wide variety of research laboratories. Its yearly budget is approximately $1.4 billion. UTMB also serves a large number of indigent patients, including approximately 80% of the Texas's inmate population (Correctional Managed Care 2009); the Shriner hospitals on site account for a large part of this charitable work. Despite being heavily damaged by Hurricane Ike on September 13, 2008, the hospitals, medical and nursing schools, clinics, and research facilities are largely back in operation thanks to $1.4 billion for repair and rehabilitation efforts.

Inventory of Freight Facilities

Freight demand is driven by the economy of North Coastal Texas, and Houston is the driving economic generator in the region. This region of Texas has historically been dominated by the energy industry. In recent years, the economy has diversified, though energy is still a major player. In Houston, energy, chemical production, aerospace, and health services are the major economic industries. Tourism is also a significant economic contributor, with much of this activity focused in Galveston with its beaches and cruises.

The major trade corridors in the region consist of waterways connecting the Texas marine ports with the world, and land-based corridors that connect Houston and its surrounding area with other major metropolitan regions within Texas, the eastern United States, Canada, and Mexico. In the future, freight transportation in the region is expected to grow due to increasing congestion at West Coast ports, increasing energy prices, and potential additions to the freight transportation network, within and outside Texas.

Highways are the dominant mode of freight travel throughout Texas. Trade due to the NAFTA is primarily highway-based, although a majority of this particular trade type travels along IH 35 between Mexico and Dallas. North Coastal Texas is served by two primary interstate highways: IH 45 and IH 10. Both of these highways see high volumes of passenger and freight traffic.

Table B3 shows statistics about the quantities of highway miles under TxDOT's control in the North Coastal Texas region. These highway miles are largely non-freight, although freight traffic certainly does use these TxDOT roadways. As seen in the table, the majority of daily vehicle miles are generated within the Houston District.

Table B3: TxDOT Highway Miles in North Coastal Texas

Source: TxDOT 2009, District Statistics

	Lane Miles	Centerline Miles	Daily Vehicle Miles (DVM)	Percent of Total DVM
Houston District	10,220	3,134	84,010,443	75.0
Beaumont District	5,721	2,375	16,300,231	14.2
Yoakum District	8,102	3,588	12,381,535	11.8
Total	**24,043**	**9,096**	**114,692,209**	**100.0**

One of the most common measures used to improve traffic flow on Houston-area highways is the restriction of truck traffic to certain lanes. Large trucks are not permitted in the left-most lanes of IH 10, IH 45, and US 290 (HGAC, 2007). While this serves to improve general flow and passenger efficiency, it is not necessarily beneficial to freight traffic.

Roadway Infrastructure

IH 10 stretches from Houston west to Los Angeles, California, and east to Jacksonville, Florida. The majority (70%) of the freight traveling along this corridor in Texas is shipped by pipeline, but the majority of the remaining 30% travels by truck (Villa et al., 2008).

Interstate 45 connects the Galveston, Houston, and Dallas metropolitan regions and is 285 miles long. A large amount of the traffic along IH 45 is intercity traffic, with vehicles traveling to and from these three cities. Average speeds and reliability are quite volatile along this highway; nonetheless, the average speed along the entire length of IH 45 during 2005 was 54 mph (Freight Performance Management, 2006).

US 59, running from Laredo, Texas to Shreveport, Louisiana, serves the Houston metropolitan area. State highways 225, 36, and 146 accommodate truck traffic moving in and out of the regional ports. Additionally, Loop 610 and Beltway 8 both encircle Houston and serve as bypasses for traffic traveling through the region.

Table B4 displays data on truck and rail volume for the Texas International Trade Corridors.

Table B4: Texas International Trade Corridors by Truck/Rail Volume (millions)

Source: Saenz, 2008

Corridor	Truck 2002		Truck 2020		Rail 2002		Rail 2020	
	Tons	Ton-Miles	Tons	Ton-Miles	Tons	Ton-Miles	Tons	Ton-Miles
I-35 N/S; Laredo & San Antonio	21.97	3,428	38.35	5,983	14.02	2,187	25.18	3,929
I-35 N/S; San Antonio & Dallas	15.50	4,247	27.01	7,402	11.65	3,191	21.30	5,835
I-10 E/W; Houston & the Louisiana border	9.71	1,068	16.36	1,799	3.07	338	5.18	570
I-30 E/W; Dallas & Arkansas	9.15	1,783	15.83	3,086	6.08	1,185	10.70	2,086
I-10 E/W; San Antonio & Houston	7.00	1,379	11.77	2,319	2.02	398	3.37	665
I-10 E/W; El Paso & San Antonio	5.79	3,184	10.12	5,564				
I-45 N/S; Houston & Dallas	3.52	842	5.94	1,420	1.72	412	3.32	794
US 59 N/S; Houston & Arkansas	3.36	995	5.71	1,689	1.98	587	3.09	915
US 75 N/S; Dallas & Oklahoma	3.23	262	5.70	462	2.24	182	4.13	334
US 59 N/S; US 77 & Houston	2.82	360	4.83	618	n/a	n/a	n/a	n/a
US 77 N/S; I-37 & Victoria	2.80	241	4.80	412	n/a	n/a	n/a	n/a
US 77 N/S; Brownsville & I-37	2.80	422	4.80	724	n/a	n/a	n/a	n/a
I-35 N/S; Dallas & Oklahoma	1.98	158	3.48	278	3.18	254	6.29	503
US 281 N/S; Texas Valley & I-37	1.70	277	2.97	484	n/a	n/a	n/a	n/a
I-37 N/S; Corpus Christi & San Antonio	1.68	246	2.94	429	n/a	n/a	n/a	n/a
I-20 E/W; El Paso & Dallas on to Shreveport, Louisiana	1.60	1,019	2.73	1,742	n/a	n/a	n/a	n/a
US 59 N/S; Laredo & I-37	1.10	128	1.93	223	1.80	209	3.15	365
I-40 E/W; through Amarillo & Texas Panhandle	1.06	195	1.89	349	0.98	181	1.85	343
US 287 N/S; Dallas & Amarillo	0.90	180	1.49	298	0.18	36	0.29	58
US 57 E/W; Eagle Pass & San Antonio	0.67	59	1.34	118	1.04	92	3.12	275
Ports to Plains I-27/US 87 N/S; I-10, Amarillo, & north	0.52	196	0.97	366	n/a	n/a	n/a	n/a
US 69 N/S; Beaumont & US 75	0.40	74	0.67	124	n/a	n/a	n/a	n/a
Ports to Plains US 277 N/S; Del Rio & I-10	0.28	25	0.56	50	No International Rail Connection			
Motran La Entrada US 67 N/S; Presidio & I-10	0.08	11	0.32	43	0.10	13	0.25	34
US 83 N/S; Laredo & the Texas Valley	0.02	4	0.03	6	0.00	0	0.01	1
I-45 N/S; Galveston & Houston	0.02	1	0.04	2	n/a	n/a	n/a	n/a
US 288 N/S; Freeport & I-45	0.02	1	0.04	2	0.10	6	0.25	15

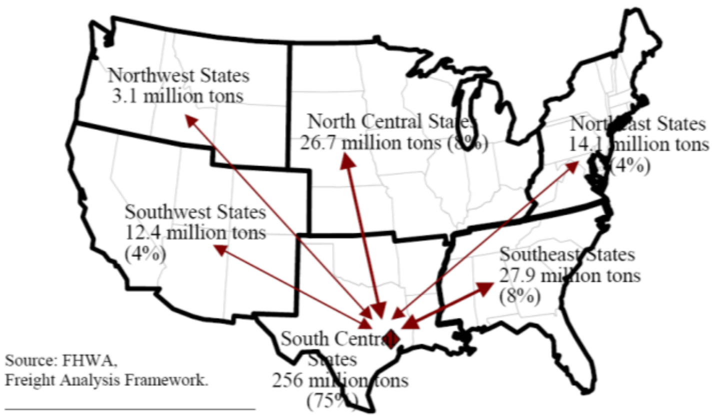
Rail Infrastructure

The Houston-Galveston region acts as a major rail hub for the Gulf Coast region. Freight trains serve the Houston, Dayton, Baytown, Bayport, and Beaumont industrial complexes. Traffic is predominantly local business for local customers (Houston Region, 2007). Five rail yards are located in the area, with the rail network being dominated by UP and BNSF. UP trains transport the majority of the tonnage on the rail system (HGAC, 2007) and UP has an intermodal facility at the Port of Houston. BNSF has two intermodal facilities in the region: one near Hobby Airport and one near the Port of Houston. BNSF also serves the ports of Galveston and Texas

City (HGAC, 2007). Kansas City Southern Railway Company (KCS) has contracted to operate its trains on UP and BNSF tracks.

Altogether, approximately 2,200 trains per week travel within the Houston regional rail network, which consists of over 800 miles of mainline tracks and 21 miles of railroad bridges (Houston Region, 2007). Of these trains, 84% are carrying chemicals and/or heavy bulk commodities such as coal, grain, rock aggregate, and coke. Of all the trains in the network, 48% are local trains and rail yard engines, and less than 5% of all trains in the region travel straight through without stopping to pick up or drop off cargo (Houston Region, 2007).

This locality of Houston-area freight transportation is emphasized in Figure B9 where 75% of all tonnage flowing within Houston is headed to or from the south central states (Texas, Oklahoma, Arkansas, and Louisiana). The rest is spread throughout the country, with the smallest fraction (about 4%) intended for or coming from the Northwest states (Washington, Oregon, Idaho, Montana, and Wyoming).

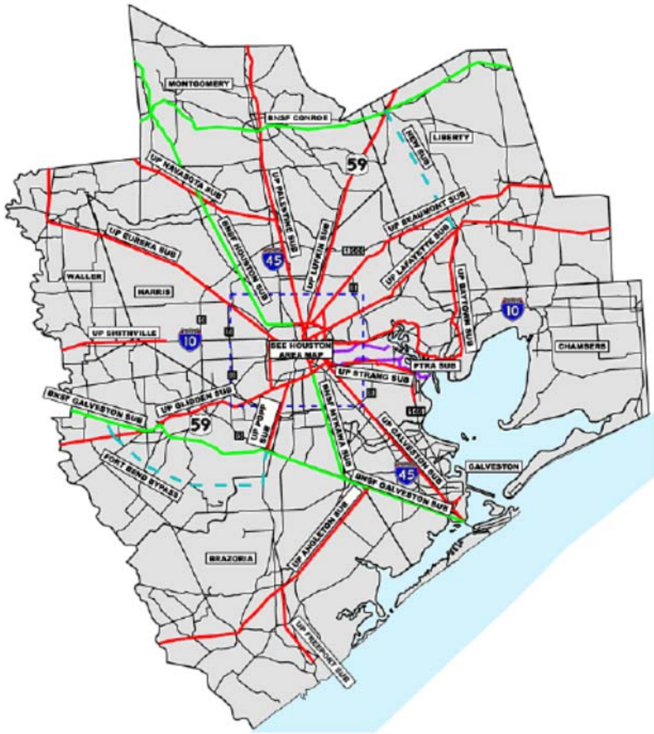


Source: HGAC, 2007

Figure B9: Rail Commodity Flows To and From Houston, 2003

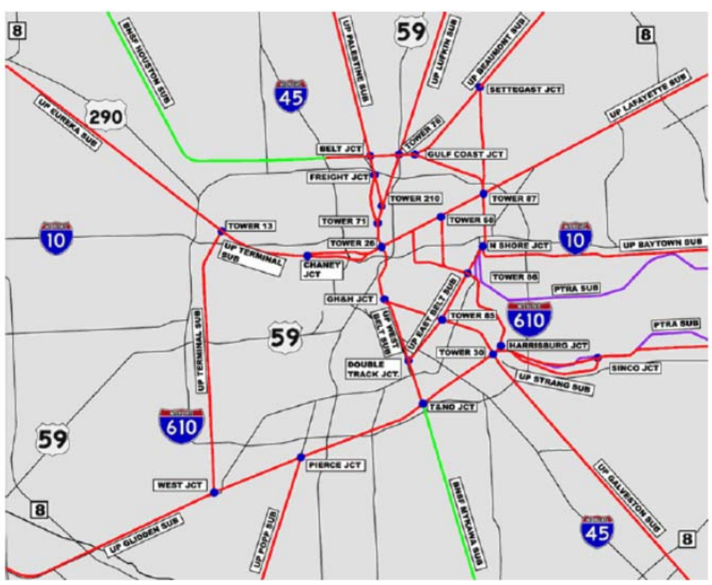
Houston's freight movement is forecasted to approximately double by 2025 (Houston Region, 2007). This will require significant and careful planning of the expansion of rail facilities in order to handle such an increase. Identified bottlenecked locations include single track bridges that connect double mainline tracks. There are over 1,200 roadway railroad crossings with a daily volume of almost 5 million vehicles in the area (Houston Region, 2007). The Houston Region Freight Rail Study was commissioned by the Texas Transportation Commission in order to assist the Texas legislature in understanding the state's rail infrastructure needs and the resulting investment that would be required (Houston Region, 2007). This report found that $3.4 billion dollars of improvements will be needed for the eight-county Houston region (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties). Figures B10 and B11 map these improvements, which can be broken down as follows:

1. Improvements to existing railroad infrastructure: $1.4 billion;
2. New railroad corridors: $1.1 billion;
3. Grade separations: $808 million;
4. Grade crossing closures: $5.2 million.



Source: Houston Region, 2007

Figure B10: Regional Improvements Map



Source: Houston Region, 2007

Figure B11: Houston City Improvements Map

Houston is not the only city with intermodal rail access at its ports. The Port Arthur International Public Port has a dockside capacity of 150 cars on three wharf tracks for direct rail transfer and high-quality storage and transit sheds to facilitate the transfer of goods (About the Port, 2009). This port is also connected directly to KCS rail lines and is easily accessible from state and interstate highways.

Air Infrastructure

The dominant airport in the North Coastal Texas region is George Bush Intercontinental, located in North Houston. It acts as both a passenger and cargo facility and is one of the largest airports of both types in the country. Other regional airports include Houston Hobby, Southeast Texas Regional, and Scholes International in Galveston; these airports handle some cargo, but are primarily passenger airports. In addition to these major airports, there are many other airports in this region. For example, Ellington Field, located just outside of Houston, serves as an overflow airport in cases of bad weather or flawed scheduling for George Bush Intercontinental and Hobby airports. There are also various executive and private airfields. However, as these serve essentially no freight cargo, they are not included in this discussion of airports as they relate to domestic and international trade.

George Bush Intercontinental Airport: The largest cargo airport in the North Coastal Texas region is George Bush Intercontinental Airport (airport abbreviation IAH), which contains a $125 million air cargo complex (Air Cargo, 2009). The airport, which has five runways, is the second largest in Texas, after Dallas/Ft. Worth International Airport, and the eighth busiest for total passengers in 2008 (Community Profile, 2009). Worldwide, the airport is recognized for its high-quality air cargo facilities; it has received Air Cargo World's Air Cargo Excellence Award for five consecutive years as of 2009 (The Cargo Operation, 2009). In 2007, more than 387,000 metric tons of air cargo passed through IAH, representing an increase of 5.4% over the previous year (52 Million Travelers, 2008).

Between 1999 and 2004, IAH invested more than $3.1 billion in its infrastructure. This total included a $180 million air cargo distribution center. Currently, the IAH CargoCenter provides 800,000 square feet of warehousing and space for more than 20 wide-body aircraft (Air Cargo, 2009). In addition to the CargoCenter, IAH has continued to expand with the Fresh Cargo Center.

This new facility is a 60,000 square foot perishable (cold-storage) cargo handling facility that provides direct ramp access for cargo airlines and is located next to the Federal Inspection Services Center (New Perishable Cargo Facility, 2006). The facility is scheduled to open in November of 2009 (IAH Fresh Cargo Center, 2009). IAH also provides a full-service animal and plant inspection facility as well as a livestock export facility (Air Cargo, 2009).

In 2006, China Airlines began cargo operations, flying twice weekly from Taipei to Houston. This served as the first Asian cargo airline to begin doing business at IAH (China Airlines, 2006). Other Asian cargo airlines that joined IAH include EVA Air Cargo (based out of Taiwan) and Korean Air Cargo (EVA Air Cargo, 2007). Most recently, in March of 2009, Cathay Pacific began operations at IAH with thrice weekly services from Houston to Hong Kong. Air cargo loaded in Houston includes oil and gas equipment, industrial machinery, and high-tech components, which are then distributed through Hong Kong to Singapore, Japan, India, China, and Australia (George Bush Intercontinental Airport Welcomes, 2009). Today, IAH serves 38 cargo airlines, which represent a broad array of international interests (Cargo Airlines, 2009).

William P. Hobby Airport: William P. Hobby Airport is located seven miles south of Houston's central business district and served as the city's primary airport until the opening of IAH in 1969 (About William P. Hobby, 2009). Today, its primary focus is on passenger flights and corporate/executive flights; Southwest Airlines handles the majority of the daily flights to and from the airport, and other low-cost carriers have a significant presence here. As the 43rd busiest airport in the U.S. for total passengers, Hobby Airport served nearly 9 million people in 2008 (About William P. Hobby, 2009). Hobby has four runways. Air cargo traffic at Hobby has increased noticeably in the last few years; since 2005, air cargo traffic rose 37%.

Scholes International Airport: Scholes International Airport, located on Galveston Island, has 2 runways on which an average of 167 daily flights occur (Scholes, 2009). U.S. Customs agents are on call 24 hours per day in order to facilitate the movement of international cargo through the airport. This is the primary landing field for airplanes and helicopters transporting patients to the Shriner's Burn Center, also located on Galveston Island. Among the most common activities at the airport is that of helicopters supporting the offshore petrochemical industry.

Southeast Texas Regional Airport: The Southeast Texas Regional Airport (SETRA) serves the cities Beaumont and Port Arthur in southeast Texas. SETRA serves approximately 100,000 passengers per year with an average of 20 flights per day on 2 runways (Southeast Texas Regional Airport, 2009). In addition to its passenger facilities, more than 30 trucking companies and 3 Class A rail lines also serve this airport. The rail lines have direct connections to the ports of Beaumont, Port Arthur, and Orange, allowing easy transfer of cargo from seaport to airport.

Marine Infrastructure

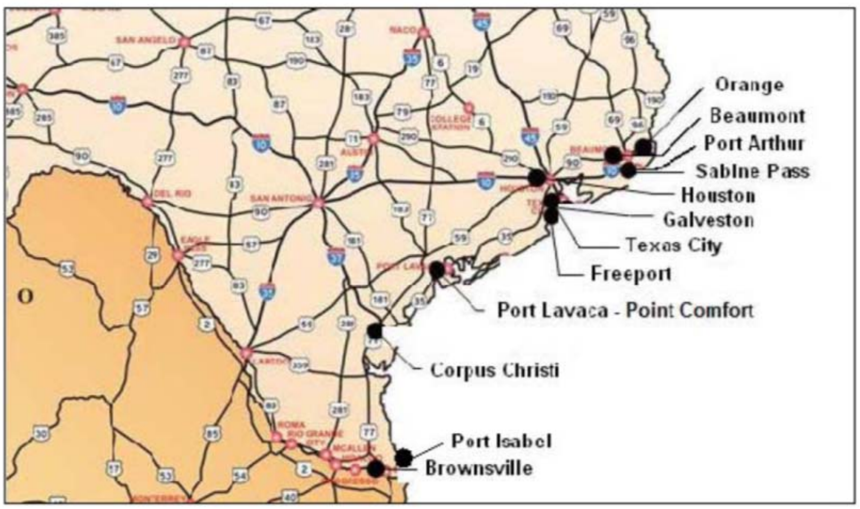
The deep draft[4] ports in the North Coastal region of Texas include, from north to south, Orange, Beaumont, Port Arthur, Sabine Pass, Houston, Galveston, Texas City, Freeport, and Port Lavaca-Point Comfort. Table B5 shows exports and imports, in millions of tons, which were moved through Texas ports in 2006. Ports in the North Coastal region are in black text, and ports outside this region are in grey text. Of the top nine ports in Texas (in terms of tonnage), seven are located in the North Coastal region. Houston is the largest port in Texas by far, and Beaumont ranks second in both tonnage and value. Both of these ports are located in North Coastal Texas, emphasizing the importance of marine trade for the region. The Gulf Intracoastal Waterway connects all of these ports and is a vital part of the shipping trade (see Figure B12).

[4] Ports that can accommodate the largest vessel size that is able to pass through the Panama Canal.

Table B5: North Coastal Region Texas Ports: 2006 Foreign Trade in Million Tons

Source: U.S. Army Corps of Engineers, 2006

Seaport	Exports	Imports	Total
Houston	46	106.9	152.9
Beaumont	5.5	51.8	57.3
Corpus Christi	8.5	45.3	53.8
Texas City	3.3	32.5	35.8
Freeport	3	24.1	27.1
Port Arthur	5.9	13	18.9
Port Lavaca	1.4	6.8	8.2
Brownsville	0.4	3.9	4.3
Galveston	4.1	1.2	5.3



Source: Villa et al., 2008

Figure B12: Texas Deep Shaft Ports

Port of Houston: The Port of Houston opened in 1914 and quickly became a major economic part of Houston. Due to World War I and the rapid growth of automobile ownership in the years after the port opened, oil was in high demand, leading to strong growth of the Houston Port. Today, the port is ranked first in the country in foreign waterborne tonnage and second in total tonnage (Overview 2009). It has 70% of container market share in the Gulf of Mexico, and 94% in Texas (Villa et al. 2008). The container ship facilities at Barbours Cut in Houston make up the largest container port on the Gulf Coast (Facilities 2009) and handled 1.8 million 20-ft equivalent units (TEUs) in 2008 (Trade Development Division 2009). The port's new terminal, Bayport, will add 300,000 TEUs per year of capacity after phase II is complete, and 2.3 million TEUs per year when the project is fully complete in approximately 20 years.

The Port of Houston is connected to 2 major railroads and more than 150 trucking companies, and has easy access to the 2 large Houston airports (IAH and Hobby) in addition to inland and intracoastal waterways. Petroleum and petroleum products account for the largest fraction of imports and exports, but the Port of Houston also handles large numbers of chemicals, automobiles, machinery, and iron and steel (Trade Development Division 2009).

The Houston Region Freight Transportation Study (2007) has identified the following land connections to the Port of Houston as being critically in need of improvement for access to the port:

- State Highway 146
- State Highway 225
- Port Drive (Plans are underway to widen Port Drive from two lanes to six lanes with a raised median [Transportation Study, 2009])
- Barbours Cut Boulevard
- Spencer Road
- Red Bluff

The Houston Ship Channel is a limiting feature of the Port of Houston. At 45 feet deep and 530 feet wide (when properly dredged), it can be a tight squeeze for two ships to pass one another. Widening the channel further, however, will be difficult because the surrounding area is largely built up[5].

__Port of Beaumont__: The Port of Beaumont is the second largest U.S. military port in the world. According to the Port website, about 48% of military cargo shipped overseas for operations in Afghanistan and Iraq passed through the port, and more than 400 vessels called at the Port of Beaumont in 2008. The total combined cargo moved by ships, 7,700 trucks, and 24,000 railcars amounted to than 3.2 million tons (Port of Beaumont, nd). The Port is accessible from the Gulf of Mexico and Intracoastal Waterway via the federally maintained Sabine-Neches Ship Channel, 42 miles upstream from the Gulf. The Sabine-Neches Channel is a minimum of 400 feet wide and maintained at a depth of 40 feet. Air draft is 136 feet (Port of Beaumont, nd). The Intracoastal Waterway and Mississippi River connect Beaumont with a vast inland waterway system serving such cities as Minneapolis, Chicago, St. Louis, Kansas City, Louisville, Omaha, and Memphis (Port of Beaumont, nd). Goods flowing through the port were exported to 37 countries in 2008, and imports were received from 21 countries. Canada, India, Iraq, Russia, and Norway were the top five points of origin for cargo imported to the Port of Beaumont in 2008, and South Africa, Venezuela, Iraq, Qatar, and Italy were the top five destinations for cargo leaving the port in 2008 (Port of Beaumont, nd). According to the Port, recent economic impact statistics show that the Port of Beaumont produces more than 1,860 jobs, and

[5] The ship channel may be considered a terrible neighbor in another way; according to studies undertaken by the University of Texas, children living within 2 miles of the ship channel have a 56% higher risk for childhood leukemia than those living more than 10 miles away (Cahill, 2007).

generates more than $129 million in personal income for Southeast Texans, with Port business activities generating about $11.6 million in state and local taxes and $23.3 million in federal tax revenue (Port of Beaumont, nd).

Port of Galveston: The Port of Galveston consists of 850 acres of facilities located on the Gulf Intracoastal Waterway. While it was once the second-largest port in the country, after New York, the port today handles cruise passengers nearly as often as it does cargo. Galveston sees more than 600,000 cruise passengers yearly and can also handle all types of cargo: containers, bulk, break-bulk, and roll-on/roll-off. Drydock and rig repair facilities are also located at the port (Facilities and Maps 2009). In 2008, the port's revenues were nearly $21 million, very nearly its record 2007 revenues, despite undergoing significant damage from Hurricane Ike (Texas Ports, 2009).

Port of Texas City: The Port of Texas City is privately owned and managed as a for-profit entity. This port handles primarily bulk liquid products, such as chemicals and crude oil (HGAC, 2007). The Port of Beaumont is connected to inland distribution centers by three rail carriers (UP, BNSF, and Sabine River), five major roadways, and global steamship lines (Facilities and Services, 2009). The nearby Port of Orange is served by the same three rail carriers and also provides intermodal access via its network of highways and surface streets.

The Gulf Intracoastal Waterway: The Gulf Intracoastal Waterway (Figure B13), which is a 1,300-mile-long man-made canal running from Texas to Florida, links all of the Gulf Coast ports and also allows ships access to the inland water system of the United States. The Texas portion is 423 miles long, and moved 72 million tons of cargo in 2004 (HGAC, 2007). Designed in 1949, the waterway is no longer suited for today's barge and ship activity and is in need of rehabilitation. The area to the west of Galveston Bay is of particular concern; here, the waterway crosses under dual IH 45 bridges and the Galveston Island Railroad Bridge. At this point, the waterway is only 120 feet wide. Industry experts have identified this location as the most hazardous and problematic along the entire Gulf Intracoastal Waterway (HGAC, 2007).

Source: TxDOT, 2008

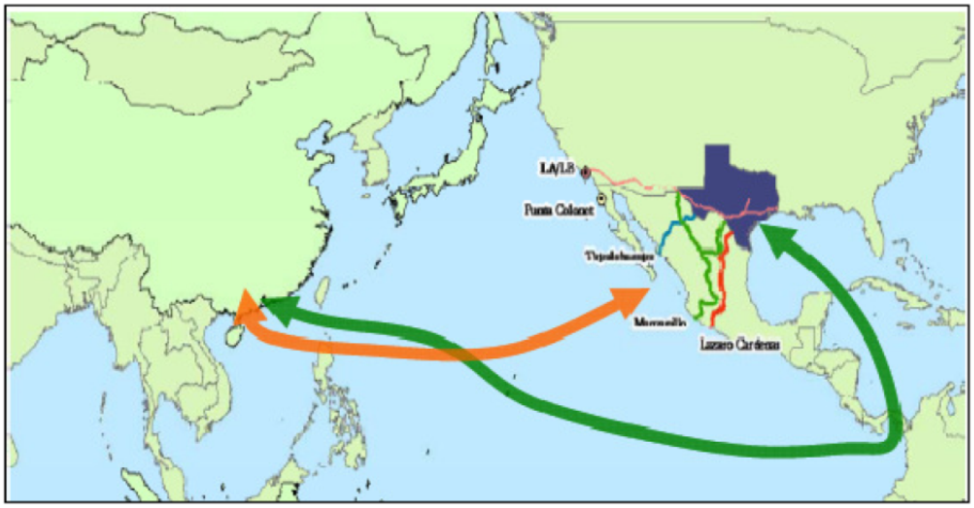
Figure B13: Gulf Intracoastal Waterway in Texas

The Future of Commodity Flow

It is expected that increasing congestion at the ports in Long Beach and Los Angeles, California, rising energy prices, and new construction affecting major trade corridors will all impact commodity flow in the North Coastal region of Texas. New construction includes expansion of the Panama Canal, development of the IH 69 freeway extension from Mexico to Canada, and a new Mexican port, Punta Colonet, that is expected to open during the next decade.

The ports of Long Beach and Los Angeles are the two largest ports in the United States, and have limited ability to increase their capacity (Villa et al., 2008). With no new corridor development, the current alternate route (Figure B14) for containers with a U.S. destination and Asian origin is to travel through Mexico and enter the U.S. through a land port along the U.S.–Mexico border.

Recent rising energy prices have encouraged companies to reevaluate their supply chains to fit with the increasing transportation costs (Villa et al., 2008). As this trend continues, it is expected that business normally directed to Asia may move to Mexico to cut shipping distances, cost, and energy consumption.



Source: Saenz, 2008

Figure B14: Potential Trade Corridor Alternatives to LA/Long Beach

Construction of new facilities and expansion of old facilities are also expected to impact commodity flow through North Coastal Texas. The existing Panama Canal will be widened to accommodate larger ships by 2014, a new major port in Mexico is expected to open in 2014, and there is a possibility that IH 69 will be extended south from Indiana to Mexico.

<u>Panama Canal</u>*:* There are two primary routes for cargo being shipped from northeast Asia to the eastern United States: the Panama Canal, and intermodal coast-to-coast travel. Currently, the Panama Canal has approximately 38% of this market, while the intermodal U.S. route holds the remaining 62% (ACP 2006). The Panama Canal route is less expensive and more reliable, but generally takes more time than the U.S. intermodal route.

In addition, larger vessels cannot fit through the Panama Canal and therefore must take the intermodal U.S. route. In 2006, 27% of the world's vessel TEU capacity was in post-Panamax vessels[4], and this is expected to grow to 37% by 2011 (ACP, 2006). Over time, fewer and fewer vessels would have the option of taking the Panama Canal, and congestion at U.S. West Coast ports would experience additional increase. The expansion of the Panama Canal, when complete in 2014, will provide an all-water route for post-Panamax vessels from Asia to the eastern United States. This is expected to attract some carriers that are currently using the intermodal U.S. route, thus increasing shipments that are entering the U.S. through Texas ports (Villa et al., 2008).

<u>Punta Colonet</u>*:* The Punta Colonet is a privately funded project that consists of development of a new port that will open in the next decade and is expected to have a capacity of 2 million TEUs per year. In addition, a rail line will be constructed between this port and the U.S. border, offering an efficient land-based mode of transporting goods through Mexico into Texas (Villa et al., 2008). Construction has recently slowed on Punta Colonet, however, as involved parties struggle to resolve land issues (Lindquist, 2006).

IH 69 - Interstate 69 is a north/south freeway that stretches from Port Huron, Michigan to Indianapolis, Indiana. Also referred to as a NAFTA superhighway, it has been proposed that this freeway be extended south to the Mexico border for an overall length of 1,600 miles (TxDOT, 2009). The extension would involve eight states, and the Texas portion, if developed, would stretch between Texarkana and either Laredo or Rio Grande Valley (Figure B15). This highway would further improve land connections between Mexico, the United States, and Canada, increasing the efficiency and viability of NAFTA trade, and would be the shortest route from Mexico to the industrial powers of the northeastern United States. In addition to the improved land-based freight traffic, 16 of the nation's largest air cargo airports would be located along the route of IH 69 (Interstate 69 Texas 2009). A previously considered project, referred to as the Trans-Texas Corridor (TTC), was to be the Texas portion of this interstate, providing very wide rights-of-way and vehicle separations. While the full TTC project is no longer under consideration, the basic concept of IH 69 in Texas is still being proposed.

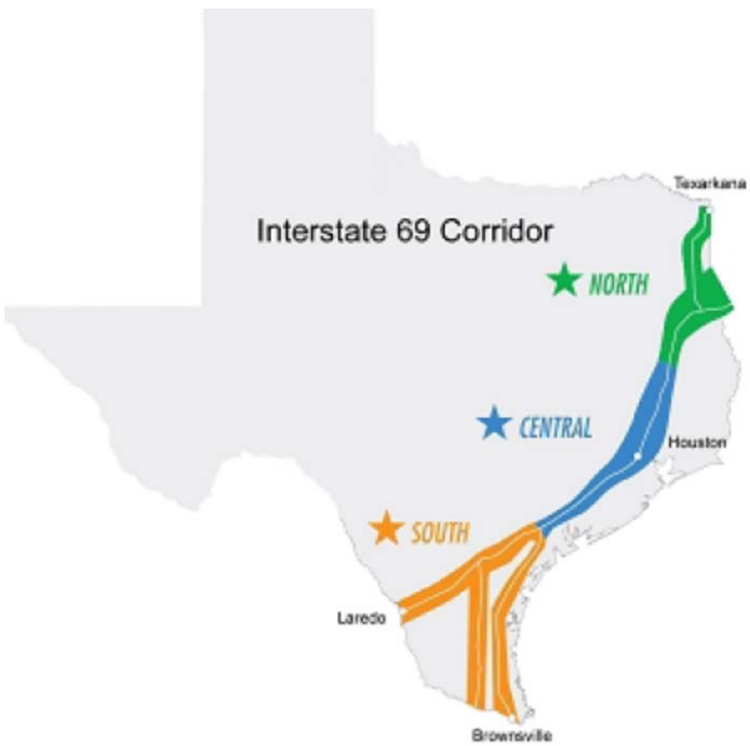


Figure B15: Proposed IH 69 Extension in Texas

Source: FHWA, 2004

Critical Freight Needs and Issues

Roadways

Highways in the Houston region have a valid reputation for being routinely gridlocked. As IH 10 crosses through the city on its way from California to Florida, carrying a large proportion of the nation's freight, its traffic slows to a crawl for much of the day. This limits the ability of freight to move easily through the metropolitan area and increases costs (financial, environmental, and social) to both transporters of goods and residents of the region. The Texas Department of Transportation is currently undertaking road widening projects in the North Coastal Texas region, including a recent increase of IH 10 to as much as 22 lanes: 12 main lanes, 4 lanes of access roads, and 4 to 6 mid-freeway toll lanes (Schematic Layout, 2003).

IH 10 is not the only source of needed improvements in this region, although it does carry more freight traffic than the other interstates serving the Houston-Galveston-Beaumont districts. US 59, which enters the North Coastal region from Laredo, also carries a large amount of freight traffic, particularly NAFTA traffic crossing into the United States from Mexico. To the south of Houston, US 59 is called the Southwest Freeway, and is one of the busiest stretches of freeway in the country with average traffic counts of more than 330,000 vehicles per day outside of Houston's beltway (Statewide Planning Map, 2009).

A concern among freight stakeholders in the region is the maintenance of the existing infrastructure. With budget shortfalls and limited transportation funding, alternative forms of transportation funding might become necessary to maintain the current infrastructure in the region. Also, there are limited options to move oversize and overweight freight in region, which can be attributed to roadway weight restrictions.

Rail

The Texas Rail Relocation and Improvement Fund was created by the Texas Legislature and approved by voters in November of 2005. TxDOT does not have the authority to spend money derived from the state gas tax on rail projects, so a separate fund was needed and thus the creation of the Texas Rail Relocation and Improvement Fund. TxDOT has performed several studies to determine where the money from the fund should be best spent.

Safety is a primary concern for rail improvements. Texas ranks first in the nation for injuries caused by train accidents, with more than 10% of all injuries reported in 2009 (Overview Charts by States, 2009). Most major rail lines currently travel through dense urban areas, increasing the number of potentially dangerous at-grade crossings. As a result, safety improvements that are needed include the removal of at-grade crossings and improvements of railroad crossing signals.

Freight stakeholders also expressed concern over hazardous material (hazmat) movement in the area. Harris county ranks first in the top five counties where hazmat originate or terminate in Texas (see Table B6).

TableB6: Top Five Counties Originating or Terminating Hazardous Materials in 2005

Source: Warner et al., 2009

	Originating	Terminating
1	Harris	Harris
2	Brazoria	Chambers
3	Jefferson	Galveston
4	Galveston	Brazoria
5	Gregg	Jefferson

Capacity and connection improvements are also needed. TxDOT's Houston Region Freight Rail Study has suggested a variety of needed improvements throughout the Houston metropolitan area. These needed improvements were shown in Figures B10 and B11. Lines shown in red, green, and purple are those in need of improvement, with red lines representing rail lines belonging to UP and green lines belonging to BNSF. Purple lines represent those owned by the Port Terminal Railroad Association, an organization formed in 1924 as an association of all railroads entering the Houston port complex. In Figure B11, blue dots represent junctions in need of upgrading. These junctions are located primarily within Loop 610, emphasizing the density of freight rail located within Houston's urban core. Because 95% of Houston's rail traffic is not through traffic but instead has an origin, destination, or intermediate stop somewhere within the region, relocating tracks to the outskirts of the cities is not a viable solution. Instead, improved capacity and connections are needed along existing rail alignments.

Airports

Houston's George Bush Intercontinental Airport has a strong freight component and is one of the leading cargo airline destinations in the southern United States. In addition, it is routinely recognized for its freight handling by the awarding of Air Cargo World's Award for Excellence (The Cargo Operation, 2009). The airport is planning a series of upgrades to improve its handling of passengers (underground shuttles and renovations of terminals) but does not have future freight improvements planned. However, George Bush Intercontinental has recently completed a series of cargo improvements, including a new refrigeration storage area and improved air cargo distribution centers.

As strong as the George Bush Intercontinental airport may be in its management of cargo, it is the only airport in the North Coastal Texas region that is a viable contender for freight handling. The other airports in the region (Houston Hobby, Scholes International, and Southeast Texas Regional) all predominantly serve passengers. International shippers, particularly those coming from Mexico and other Latin American countries, may be well-served by the availability of an alternate airport for air cargo deliveries. Houston's traffic congestion issues serve as a disincentive for some smaller airlines to use Houston as a central delivery point for cargo. Improvement of freight facilities at other airports in the region could increase the number of smaller players in the air cargo arena. In particular, the Southeast Texas Regional Airport is likely to be well-suited for an expansion of its cargo handling. Because of its current use by large military planes, the airport has shown its ability to handle larger planes and non-passenger flights. Far from the congestion issues in the Houston metropolitan area, the Southeast Texas Regional has the opportunity to become a secondary cargo hub for North Coastal Texas.

Ports and Waterways

The Houston Ship Channel, which leads to the Port of Houston complex, is currently 45 feet deep, 530 feet wide, and 50 miles long. It has islands throughout its length that are created from the sediment pulled up by dredging the Channel to its intended depth. Funding in the amount of $98.3 million has been provided for improvements to the Channel by ARRA, commonly referred to as stimulus money (The Port Report, 2009). This funding will largely close a 5-year funding shortfall for infrastructure improvements.

The Gulf Intracoastal Waterway was completed in June of 1949. While intended mainly for barge traffic due to its standard depth of 12 ft, its facilities have generally not been updated much, if at all, since the Waterway's opening. Erosion is also a serious concern along the Waterway's length, as the volume of recreational boaters using the space increases. Because of these issues, commercial traffic has been slowed significantly over the past few decades. Nonetheless, more than $25 billion worth of goods were moved along the Waterway, highlighting its importance for the regional economy (Gulf Intracoastal Waterway, 2004). There are two particular infrastructure concerns facing the Waterway in the North Coastal Texas region. These include the relatively narrow (75 ft) dimensions of the Brazos River Floodgates, which requires barge operators to separate their barges and move them through the floodgates separately, then reassemble on the other side, at an estimated cost of $2 million per year (Gulf Intracoastal Waterway, 2004). Also, the Galveston Island Railroad Bridge, which crosses over West Galveston Bay and the Waterway, allows for a width of only 105 ft. The size restrictions cause damage to both the barges and the bridge supports as barges attempt to pass through the narrow opening. This location has been identified as the greatest hazard to navigation along the entire 1,300 miles of the Waterway (Gulf Intracoastal Waterway, 2004).

Policies and Strategies to Address Needs

In North Coastal Texas, truck traffic accounts for approximately 9% of total VMT in the Houston area (H-GAC, 2007), the Port of Houston is a major player in both Texas and U.S. international trade, and Houston is a major freight rail hub for BNSF and UP. Clearly, freight transportation is very important in this region of Texas, and will become even more important in the future as freight traffic of all modes experiences significant increases. Despite this clear and significant presence of freight transportation, the current transportation plans include concerns of freight mobility as an afterthought.

The stated benefits of the Houston-Galveston 2035 Regional Transportation Plan do not mention the impact to freight mobility. In addition, the four main strategies of this plan do not directly address freight transportation:

- increase highway and transit capacity,
- reduce peak period travel,
- improve the efficiency of existing facilities,
- and coordinate land use and transportation investments.

Although there is mention of utilizing managed-lane strategies in the future, it appears that only management of passenger vehicle lanes is being considered (e.g., high-occupancy vehicle lanes, high occupancy toll lanes) but not management of truck lanes (e.g., truck-only toll lanes).

Of course, freight mobility will likely improve to some extent as a result of transportation planning that focuses on passenger transport. However, in a region where the network is handling such a large amount of freight, it would be wise to invest some time in planning strategies that directly target the movement of this freight. At the May 2003 Freight Stakes Workshop, several strategies were identified for improving the inclusion of freight mobility in the Houston-Galveston transportation planning process, such as:

- enhancing efforts to engage freight operators and stakeholders in regional planning,
- ensuring that the planning process considers freight mobility needs,
- expanding freight movement data collection,
- examining strategies for more efficient truck use of under-utilized toll facilities (peak period diversion strategies),
- and looking for “quick-fix” projects with high benefits.

In addition to these, the Houston-Galveston Regional Transportation Plan mentions considering policies that give incentives to truck drivers for traveling during off-peak periods. More specific recommendations have been developed by various groups to improve the various modes of freight transportation. Truck-lane restrictions have been implemented on several highways in this region, with the intent of increasing safety. A Texas Transportation Institute study found this strategy to be effective in reducing truck-related crashes by 68%. Despite the success of this strategy, it is not recommended that this be expanded to include the entire Houston area. This extent of lane restrictions may not be feasible, and would likely cause those freight lanes to be congested with trucks, and consequently hinder passenger vehicle travel. Some strategies identified to improve the safety and efficiency along this corridor include widening the corridor, implementing intelligent transportation systems (ITS), separating freight and passenger vehicle traffic, developing a multimodal waterway corridor, creating an urban truck bypass, and creating freight villages.

The Port of Houston has identified the following roadway connections to the Port of Houston as being critically in need of improvement for access to the port (H-GAC, 2007): State Highway 146, State Highway 225, Port Drive[6], Barbours Cut Boulevard, Spencer Road, and Red Bluff. Similarly, Port Freeport recommends improving State Highway 36 to handle projected growth.

Houston’s freight movement is forecasted to approximately double by 2025 (Houston Region, 2007). This will require significant and careful planning of the expansion of rail facilities in order to handle such an increase. The Houston Region Freight Rail Study found that $3.4 billion dollars of improvements will be needed for the eight-county Houston region (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties) (Houston Region, 2007), including:

- improvements to existing railroad infrastructure: $1.4 billion;
- new railroad corridors: $1.1 billion;
- grade separations: $808 million; and

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[6] Plans are underway to widen Port Drive from two lanes to six lanes with a raised median (Transportation Study, 2009).

- grade crossing closures: $5.2 million.

This study also identified specific rail crossings in need of improvement based upon minutes of vehicle delay (Table B7).

Table B7: Problematic Rail Crossings in Order of Vehicle Delay

RR	RR Subdivision	Street	Trains	Minutes Blocked	Train Length (ft)	Vehicle Min of Delay
UP	East Belt	Hirsch	42	167	7000	57,134
BNSF	Mykawa	Griggs Rd	30	119	7000	53,443
BNSF	Mykawa	Long Dr	30	119	7000	51,840
UP	East Belt	Harrisburg	33	94	5000	42,063
UP	Seabrook Indus	Fairmont Pkwy	14	80	5000	40,662

In addition to these crossings, the Houston-Galveston transportation plan identified the following rail crossings as problematic due to safety concerns (historically high accident locations):

- FM 1960 east of SH 249,
- Hillcroft Street near Main Street (US 90A),
- Bellfort near Mykawa Rd,
- Almeda-Benoa near Mykawa Rd,
- Antoine Drive near Tidwell, and
- Park Terrace near Galveston Rd.

In May of 2007, the Ports of Houston and Galveston signed a memorandum of understanding to explore development opportunities on Pelican Island. This island, located just north of the Port of Galveston, is under consideration for a future container-handling facility (The Port of Houston Authority, 2007). If developed, this new facility would free up space in both the Houston and Galveston ports, which may become even more important as the Panama Canal expansion is completed and global shipping routes evolve. In addition, the Gulf Intracoastal Waterway's most significant bottleneck occurs at the IH 45 bridge to Galveston Island. The bridge currently limits the opening to 800 feet, and is in need of replacement to remedy this issue.

Several policies and strategies that have been suggested by a variety of sources have been listed here. These ideas, though accurate and helpful, will have limited effectiveness as a patchwork. Instead, it would be much more effective if these various interested parties (e.g., Houston-Galveston Area Council, port authorities, City of Houston, TxDOT, and freight rail and trucking companies) would collaborate as a group to identify critical needs for the freight transportation network, and to prioritize these needs in a way that will achieve the greatest improvement for freight mobility, while not having an adverse impact on passenger travel. Furthermore, the group would ideally monitor the success of their chosen strategies using freight-centered performance measures, and report on the current status of and future plans for the regional freight network on a regular basis.

C: North IH 35 Corridor

Introduction

The North IH 35 Corridor is one of the most diverse corridors in Texas, beginning from the Oklahoma–Texas border into the heart of Texas. The corridor includes the Austin, Fort Worth, Dallas, Waco, Killeen, and Wichita Falls metropolitan areas, which cover a total of 44 counties (Table C1).

Table C1: Metropolitan Areas and Counties in the North IH 35 Corridor

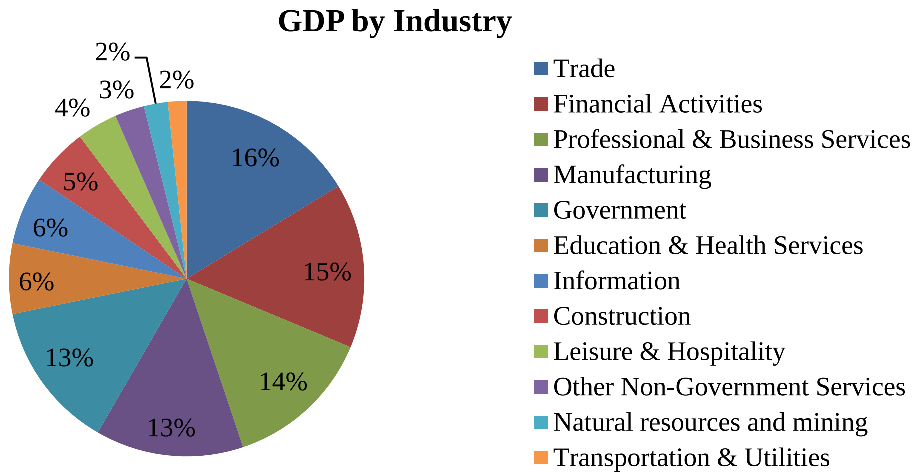
Metropolitan Area	Counties
Austin	Bastrop, Blanco, Burnet, Caldwell, Gillespie, Hays, Lee, Llano, Mason, Travis, Williamson
Dallas/Ft. Worth	Collin, Dallas, Denton, Ellis, Erath, Hood, Jack, Johnson, Kaufman, Navarro, Palo Pinto, Parker, Rockwall, Somervell, Tarrant, Wise
Waco/Killeen	Bell, Bosque, Coryell, Falls, Hamilton, Hill, Limestone, McLennan
Wichita Falls	Archer, Baylor, Clay, Cooke, Montague, Throckmorton, Wichita, Wilbarger, Young

This report covers economic generators and trends in the North IH 35 region, an inventory of the region's freight facilities and their current condition, and freight movement characteristics in the region. It also discusses the critical needs and issues that influence freight movement and reviews policies and strategies being pursued to address these needs.

Economic Profile and Freight Movement

Austin Region

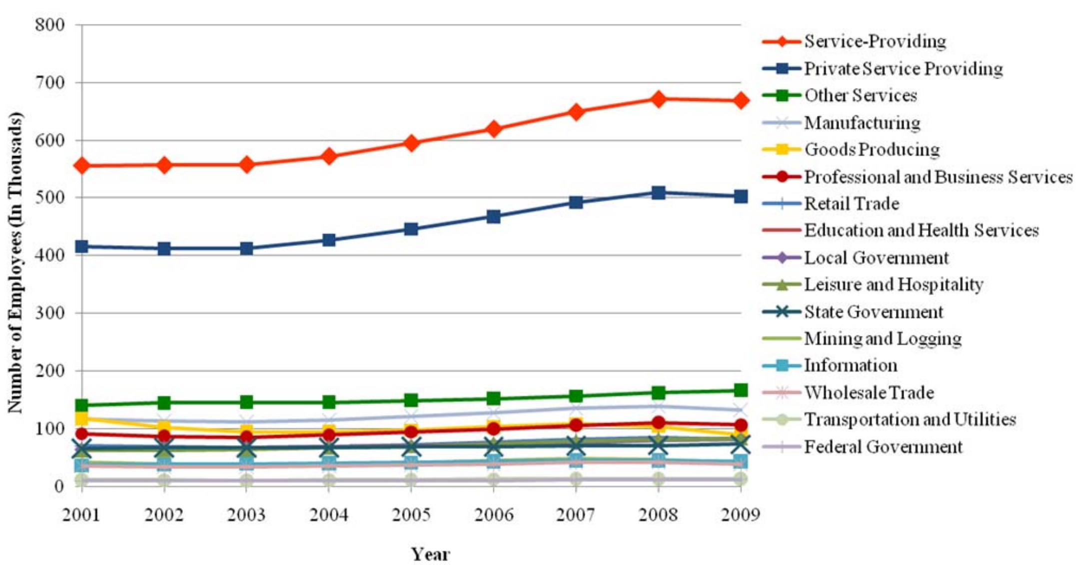
The Austin/Round Rock MSA's economic base is rather close to what one might expect for a state capital, with government accounting for a strong portion of the overall MSA's gross domestic product (GDP) (Figure C1). Trade, both retail and wholesale, accounts for the largest portion at 17%, which is easily reinforced with a quick ride around the region, witnessing the explosion of shopping centers and malls. Perhaps the most surprising is a strong showing by the manufacturing sector, ranking among the top five and at a similar percentage to the rest of the top five. However, one of the subsectors factored into manufacturing is computer and electronic product manufacturing, which undoubtedly accounts for most of the GDP, given Austin's history as a high-tech hub and the commodities data for the Austin MSA that follows the chart below. The exact impact of some of the subsectors within each industry cluster isn't fully known, as their numbers are withheld "in order to avoid the disclosure of confidential information; estimates are included in higher level totals" by the Bureau of Economic Analysis (BEA). However, these values are factored into the higher level figures, such as the cluster totals and the overall GDP of a region.



Source: Bureau of Economic Analysis Gross Domestic Product by MSA, 2009

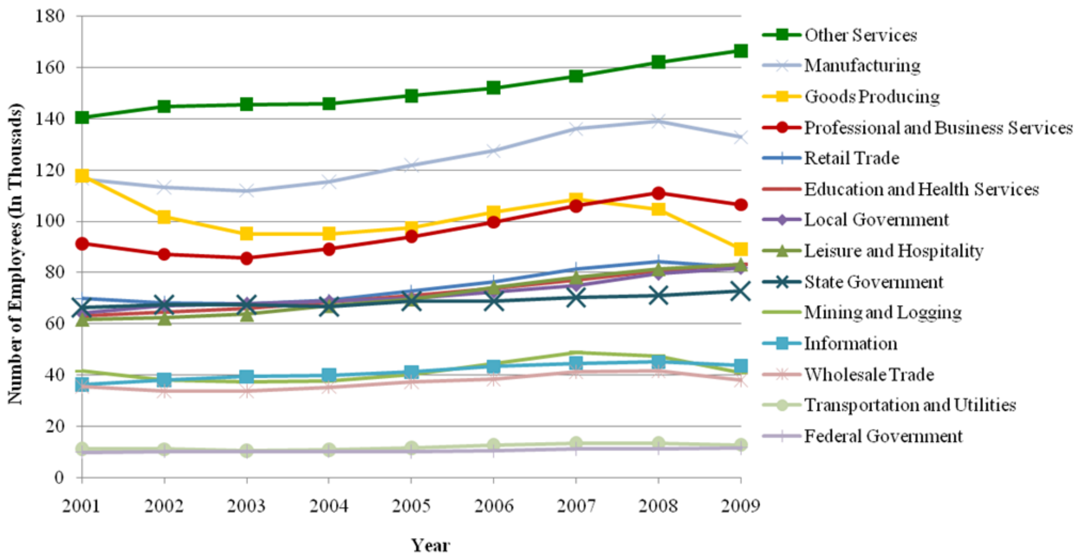
Figure C1: 2007 Austin/Round Rock MSA GDP by Industry Cluster

The employment breakdown of the region, albeit with slightly different categories but mainly the same, is somewhat similar to the GDP breakdown, but there are also some significant differences. As shown in Figure C2, the service-providing industries are the leading employers in the area, employing more than 600,000 people. A further review of the area's industries, as shown in Figure C3, demonstrates that manufacturing, goods-producing, and retail trade are some of the other top employers. Notable manufacturing companies include Apple, AT&T, National Instruments (HQ), Texas State University, IRS, 3M, CapMetro, Samsung, Sears, State Farm, Whole Foods, Time Warner, and various other state and local government and education entities. Table C2 lists the area's top employers with employees of more than 6,000 as at 2009.



Source: Bureau of Labor Statistics, 2010

Figure C2: Austin, Round Rock, San Marcos MSA Number of Employees by Industry, 2001 to 2010



Source: Bureau of Labor Statistics, 2010

Figure C3: Austin, Round Rock, San Marcos MSA Number of Employees by Industry less Service-providing, 2001 to 2010

Table C2: Austin Area Employers with 6,000+ Employees

Source: Greater Austin Chamber of Commerce Business & Industry, 2009

Company	**Sector/Description**
Austin School District	Education
City of Austin	Government
Dell	High-tech mfg., trade, and admin
Federal Government	Government
IBM	High-tech mfg., trade, and admin
Seton Healthcare Network	Health care (HQ)
State of Texas	Government
University of Texas at Austin	Education
AMD	High-tech mfg., trade, and admin

There are also various relocations and expansions planned within the Austin area despite the economic slowdown. These specks of growth surprisingly include a large amount of manufacturing, though unsurprisingly most are high-tech related. Software and multimedia development are also prevalent on the list[7].

In addition to specific employers, the breakdown of business establishments per county within the region also shows how centrally oriented the region is to its MSA. The Greater Austin Area Chamber of Commerce breaks out the establishment count for 5 of the Austin region's counties, with only Travis (26,614 establishments) and Williamson (6,651 establishments) containing a significant amount, and Hays County coming in at a distant third. Travis and Williamson also contain the highest number of large-employment establishments, with all but 4

[7] For list of proposed business growth go to the Greater Austin Chamber of Commerce Announcements & Local Expansions Log webpage http://www.austin-chamber.org/DoBusiness/MediaCenter/Announcements.html.

institutions with 500+ employees residing in the 2 counties (Greater Austin Chamber of Commerce Business & Industry, 2009).

The greater Austin area has experienced an impressive growth over the past 30 years, especially in GDP and employment (Window on State Government Economic Trends Outlook for the Capital Region, 2009). For the period from 1990 to August 2009, employment data shows that most industries saw growth, ranging from substantial growth to very slow but steady growth. Manufacturing and information are the only two sectors to see a substantial decrease, both occurring shortly after start of the recession in 2001. Manufacturing has seen the majority of contraction though, which may be due to more efficient high-tech production and leasing of other high-tech production to foreign competitors, such as Southeast Asia. Some other sectors saw a decrease during that period as well, but have since returned to growth. Until recently, the early 2000s recession was the only bump in the road for sectors like government, trade, and business/professional services. In 2009 and 2010 most of the sectors experienced a decline due to the current recession.

Austin is well known for its technology production, which is clearly visible within its commodity flow analysis. However, its dominance is purely value based, as mining-related production and base metal/machinery production make up the majority of tonnage exported from the area (see Table C3).

Table C3: 2007 Shipment Characteristics by Commodity Group Originating in the Austin/Round Rock MSA

Source: 2007 Commodity Flow Survey

Commodity	**Value**		**Tons**	
	2007 (millions $)	% of Total	2007 (thousands)	% of Total
Base metal and machinery	5,002	8.91%	12,645	18.49%
Basic chemicals, chemical, and pharmaceutical products	2,259	4.02%	367	0.54%
Grains, alcohol, and tobacco products	2,228	3.97%	-	-
Furniture, mixed freight and misc. manufactured products	2,014	3.59%	594	0.87%
Logs, wood products, and textile and leather	1,637	2.91%	-	-
Stones, nonmetallic minerals, and metallic ores	354	0.63%	46,731	68.34%
Agriculture products and fish	219	0.39%	-	-
Coal and petroleum products	-		-	-
Commodity Unknown	-		-	-
Electronic, motorized vehicles, and precision instruments	-		597	0.87%
All Commodities	56,170		68,385	100.00%

A review of mode share shows that truck movement dominates about 90% by tonnage of goods moved (see Table C4). Of the single truck movement, private truck movement accounted for 74% of commodities moved by tonnage. Data for rail movement by tonnage is withheld by the reporting agency because estimates did not meet publication standards.

Table C4: 2007 Shipment Characteristics by Mode Originating in the Austin/Round Rock MSA

Source: 2007 Commodity Flow Survey

Meaning of Mode category	Value (millions $)	Ton (thousands)	Ton-miles (mil)	Average miles
All modes	56,170	68,385	4,676	923
Single modes	49,105	67,316	4,398	209
Truck	41,847	61,793	3,319	182
For-hire truck	-	11,257	1,623	835
Private truck	13,877	50,537	1,697	36
Rail	33	-	-	194
Air (incl. truck and air)	-	8	11	1,101
Multiple modes	6,310	-	267	1,293
Parcel, U.S.P.S. or courier	6,237	83	81	1,292
Truck and rail	48	-	175	-
Truck and water	-	-	-	-
Other and unknown modes	755	266	-	-

When looking strictly at commodities shipped and received by truck (see Table C5), stones, nonmetallic minerals, and metallic ores account for the largest quantity of materials transported in the region in 2007, followed by base metal and machinery products such as nonmetallic mineral products, base metal in primary or semi-finished forms and in finished basic shapes, and machinery.

Table C5: 2007 Shipment Characteristics by Truck Originating in the Austin/Round Rock MSA

Source: 2007 Commodity Flow Survey

Commodity	Value		Tons		Ton-Miles
	2007 (millions $)	% of Total	2007 (thousands)	% of Total	
Base metal and machinery	3,964	9.47%	12,188	19.72%	947
Grains, alcohol, and tobacco products	2,219	5.30%	-	-	-
Furniture, mixed freight and misc. manufactured products	1,356	3.24%	579	0.94%	157
Logs, wood products, and textile and leather	996	2.38%	-	-	60
Stones, nonmetallic minerals, and metallic ores	325	0.78%	40,779	65.99%	1,170
Agriculture products and fish	216	0.52%	-	-	-
Coal and petroleum products	-	-	-	-	-
Basic chemicals, chemical, and pharmaceutical products	-	-	320	0.52%	-
Electronic, motorized vehicles, and precision instruments	-	-	516	0.84%	-
Commodity Unknown	-	-	-		-
All Commodities	41,847	100.00%	61,793	100.00%	3,319

For rail movement, stones, nonmetallic minerals, and metallic ores once again account for the largest quantity of materials transported in the region in 2007, followed by base metal and machinery products such as nonmetallic mineral products, base metal in primary or semi-finished forms and in finished basic shapes, and machinery (see Table C6).

Table C6: 2007 Shipment Characteristics by Rail Originating in the Austin/Round Rock MSA

Source: 2007 Commodity Flow Survey

Commodity	Value		Tons		Ton-Miles
	2007 (millions $)	% of Total	2007 (thousands)	% of Total	
Stones, nonmetallic minerals, and metallic ores	19	57.58%	-	-	1,041
Base metal and machinery	6	18.18%	-	-	22
Agriculture products and fish	-	-	5,412	-	-
Grains, alcohol, and tobacco products	-	-	87	-	-
All Commodities	33	100.00%		-	-

The Austin region's retail consumption, in terms of dollars, is dominated by general merchandise retailers, grocery, and auto dealers. Building supplies and food and drink establishments also post respectable numbers. Furniture/appliance and apparel locations show their strength with high quantities of locations.

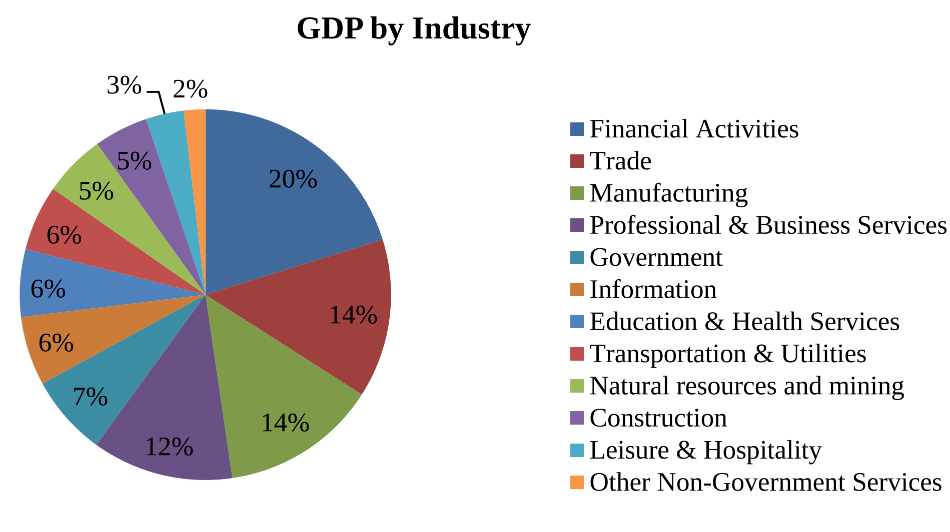
Dallas/Ft. Worth Area

The Dallas/Ft. Worth area has experienced an increase in population, gross regional product (GRP), and employment since the 1990s, although the recent economic recession has dampened the growth. The DFW metropolitan area's GDP placed it in the highest quintile of metropolitan areas in the U.S. in 2006 (Figure C4), alongside the Austin metropolitan area. The double-digit growth in computer and electronic product manufacturing in 2006 contributed to the regions of Austin/Round Rock and Dallas/Ft. Worth/Arlington growth in GDP (Bureau of Economic Analysis, 2008).

The north central Texas area is known for oil and aerospace, and so it comes as no surprise to find that, according to location quotient statistics provided by the State Comptroller of Public Accounts, the north central Texas area specializes in petroleum, communications, aerospace, navigation and railroad equipment, electronic components and accessories, investment offices, and air transportation. The presence of Lockheed Martin, American Airlines, and Southwest Airlines as major employers for the area provides the foundation of north central Texas as a hub for aerospace and air transportation.

Data for 2007–08 was incomplete for some key industries, such as professional and business services, due to reporting restrictions; however, the data provided for all other industries and for the total GDP show a similar pattern of percent contributions by industries and of growth in the GDP, though there was a slight dip in manufacturing GDP between 2007 and 2008.

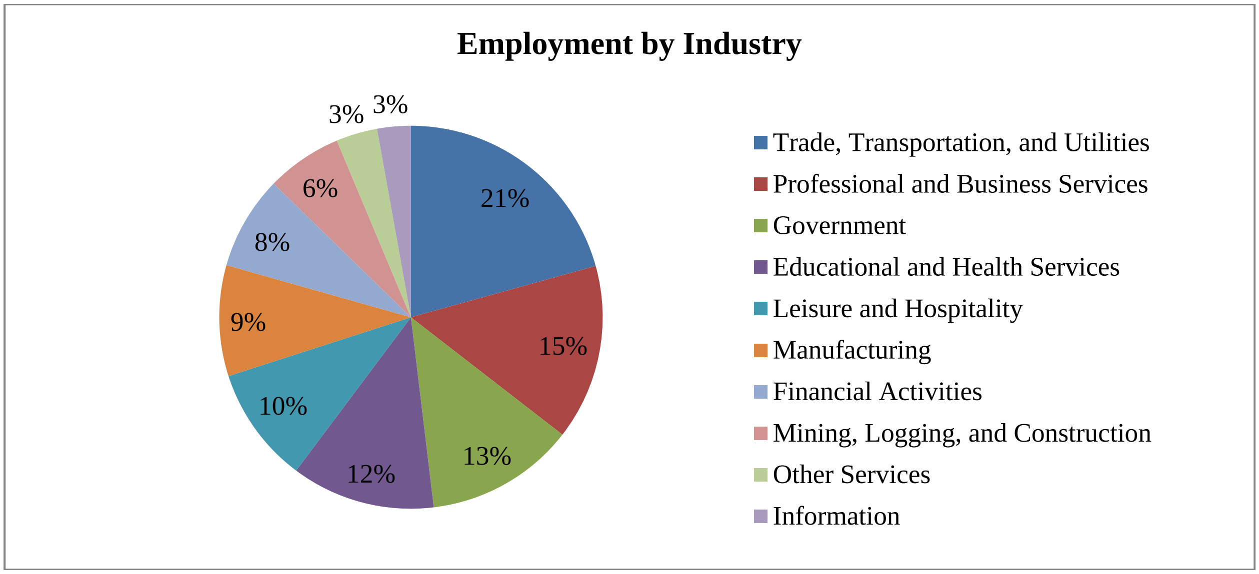
The Dallas/Ft. Worth MSA and the Austin/Round Rock MSA share similar percentages of industry contributions to the GDP, except for two key differences. As the state capital for Texas, the percentage of GDP contributed by government in Austin is double that found in the Dallas/Ft. Worth area. Conversely, north Texas's tradition in agriculture and oil production reveals itself with a GDP percent contribution from natural resources and mining (5.4%) compared to the Austin/Round Rock MSA (2.2%).



Source: Bureau of Economic Analysis Gross Domestic Product by MSA, 2009

Figure C4: 2006 Dallas/Ft. Worth MSA GDP by Industry Cluster

The Dallas/Ft. Worth employment opportunities are diverse, as evident in Figure C5. Trade, transportation, and utilities ranks number one for employment despite its weaker contribution to the GDP compared with other industries. Other industries with strong employment, but less percent contribution to the GDP, are government, education, and health services (however, those three industries are the only ones experiencing growth during the recent recession).



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C5: August 2009 Dallas/Ft. Worth MSA Employment by Industry Cluster

Other top employers in the NCTCOG area are either in manufacturing (Texas Instruments), transportation, healthcare, finance, or education, which is consistent with the GDP findings. The University of North Texas and the University of Texas at Arlington together employ more than 12,000, while large health care establishments like Parkland Health and Hospital System, the UT Southwestern Medical Center, Baylor University Medical Center at Dallas, and the Children’s Medical Center of Dallas employ 28,422.

Table C7 lists the largest employers specifically in the metropolitan area of Dallas/Ft. Worth, all in industries contributing to the region’s GDP.

Table C7: Dallas/Ft. Worth Region Major Employers
(Dallas Regional Chamber Major Employers)

Company	Product/Service	2007 Employment
Wal-Mart Stores	Retail	32,800
AMR Corp.	Transportation & Utilities	25,150
Dallas independent School District	Education	19,871
Texas Health Resources	Health Care	17,000
AT & T	Information	16,600
Baylor Health Care System	Health Care	16,000
Verizon Communications	Information	14,000
Lockheed Martin	Manufacturing/Aerospace	13,647
HCA, Inc.	Health Care	12,130
Fort Worth Independent School District	Education	10,031
Countrywide Home Loans	Finance	11,170
Citigroup	Finance	11,000

Economic Trends

Growth and continued growth are descriptions used frequently in economic reports for the Dallas/Ft. Worth area; however, since 2008 the annual growth rate in non-agricultural employment has been negative. The recent economic recession has been felt in the Dallas/Ft. Worth area, with industries like manufacturing, business services and retail experiencing a decline. However, just as with Austin/Round Rock MSA, government, education, and health services continue to grow.

The top five sectors in the Metroplex area for employment growth between 1980 and 2000 occurred in trade, transportation and utilities, business services, healthcare, leisure and entertainment and personal services. Employment in other sectors like agriculture, finance, construction, and local government also grew at an annual average rate of 3%. An expansion of the local government and trade industries is expected for a region experiencing an increase in population from about 3.25 million in 1980 to about 5.25 million in 2000 and resulting in an increased demand for city services.

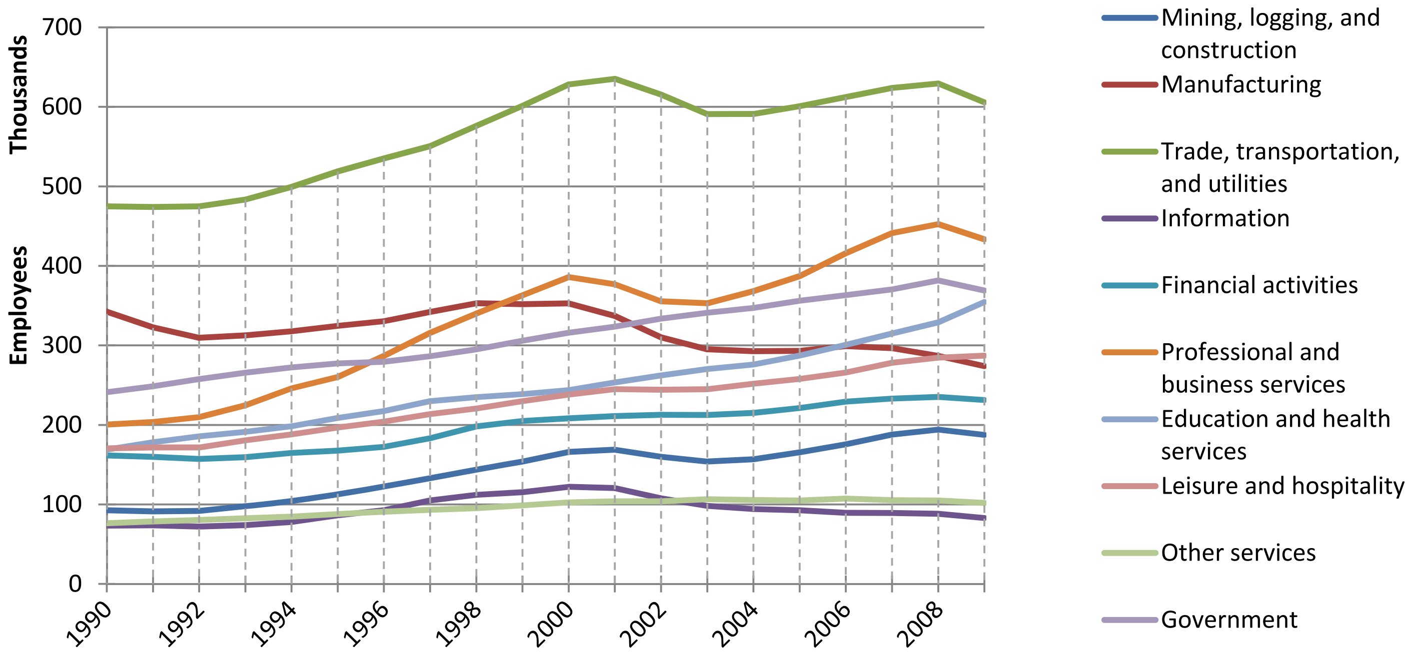
A September 2002 report by the Texas Comptroller of Accounts, defining the Metroplex region as the Dallas/Ft. Worth MSA and the Denison/Sherman MSA (not part of the North IH 35 corridor), proclaimed that “Services to Business” ranked as the fastest growing economic sector in the Metroplex region because more companies were using contracted labor and services instead of including them as part of the company structure. Employment in the business services sector grew with an average annual rate of 7.5% between 1980 and 2000 (Window on State Government Economic Trends Outlook for the Metroplex Region). Recent data shows that the sector no longer enjoys that growth, and is now at an annual rate of change of -2% in Fort Worth and -6.3% in Dallas; however, it still ranks second in percent of total employment (Texas Workforce Commission Labor Market & Career Information - TRACER).

Healthcare ranked as the second fastest growing employment sector, posting a 4.9% average annual growth rate between 1980 and 2000. As mentioned earlier, 4 of the top 10 employers in the NCTCOG region are major medical centers, and many other healthcare establishments are in the top 100 employers list. This trend towards additional healthcare employment may be due to a rise in population ages and incomes, thus causing an increase in health care spending. Technological innovation could potentially result in higher productivity per employee, therefore lowering employment opportunities. However, that is not necessarily the case in the medical field where specialized equipment requires trained individuals at a one-to-one ratio of employee-to-equipment, thus possibly contributing to positive employment gains in healthcare.

Since real incomes in the DFW region have been increasing, the result is more people spending money on leisure, entertainment, and personal services, and so employment in those sectors increased on average by 4.8% annually between 1980 and 2000 and continued to rise between 2000 and 2008. Rising incomes can come from technology fields, and indeed the high tech, communications, aviation, and electronics sectors employed on average 3.5% more people annually between 1980 and 2000. The development of the Dallas/Ft. Worth International Airport in the 1980s and the growth in telecommunications during the 1990s contributed to this growth. Just in the communications industry alone, the average annual employment growth was 6% between 1980 and 2000. A shift share analysis that compares industry growth over time at the state level with that at the national level revealed that there has been a significant growth in concentration of communications employment in the Metroplex region (Window on State Government Economic Trends Outlook for the Metroplex Region).

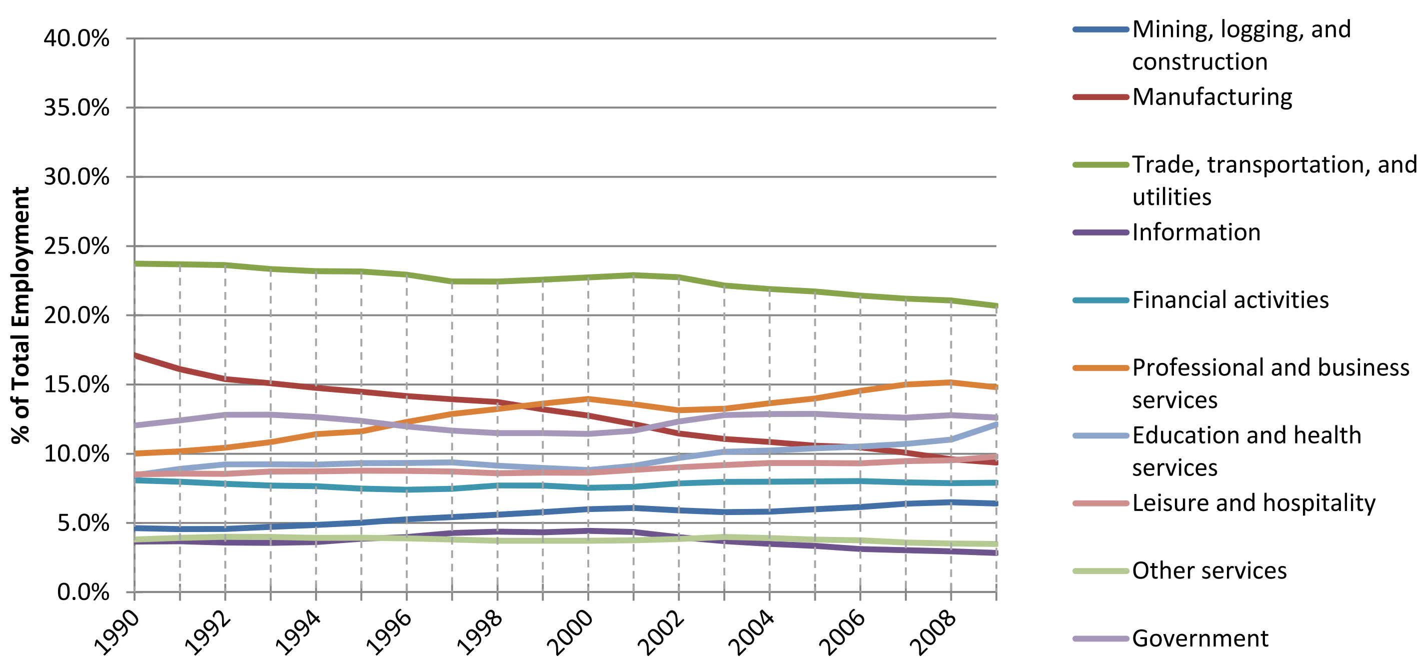
Despite the association of the Dallas area with oil and gas, those industries actually saw an average annual decline in employment of -1.8% between 1980 and 2000, although that is a better showing compared with the national average annual rate of -4.9% between 1990 and 2000. The decline suggests either that sector's importance in this region is declining and/or improved technology that enhances efficiency reduces demand for workers. *Location quotient* is a cross-sectional measure that compares state industry employment percentages with national industry employment percentages. The location quotient of 4.6 for petroleum, natural gas, and gas liquids reveals that the stereotypical portrayal of the Metroplex region as a region specializing in oil and gas still holds true. The latest reports indicate petroleum and gas industry employment has increased.

Not surprisingly, as the trend in the U.S. is shifting away from manufacturing to services employment, the average annual growth in manufacturing employment in the DFW region remained fairly flat at 0.6-0.7% between 1980 and 2000, but in the past 9 years employment in manufacturing and its percentage of total employment in the region has declined. Growth in electronics manufacturing may have kept manufacturing afloat and contributed to the electronic and other electrical equipment and components and office equipment industry being the leading commodity shipment by value originating from Texas in 2002 (Research and Innovative Technology Administration). Figures C6 and C7 show the Dallas/Ft. Worth industry cluster graphs.



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C6: Dallas/Ft. Worth MSA Industry Cluster Employment (1990–Aug. 2009)



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C7: Percent of Dallas/Ft. Worth MSA Employment by Industry Cluster (1990–Aug. 2009)

Electronics manufacturing is the largest commodity exported in terms of value (see Table C8). Some of the exported goods are shipped by rail, but most is exported by truck. The majority of rail commodity flow to and from Dallas/Ft. Worth is within the south central states (including Texas, 12.3 million tons, 37%), between the north central states (9.1 million tons, 27%), and southwest states (7.5 million tons, 23%). The northwest, southeast, and northeast collectively are less than 15% of the in-out flow (ICF Consulting for the U.S. Federal Highway Administration).

Table C8: 2002 Shipment Characteristics by Commodity Group Originating in the Dallas/Ft. Worth MSA

Source: (Research and Innovative Technology Administration)

	Value		Tons	
Commodity	**2002 (millions $)**	**% of Total**	**2002 (thousands)**	**% of Total**
Agriculture products and fish	7,038	3.9	S	S
Grains, alcohol, and tobacco products	10,852	6	8,262	6
Stones, non-metallic minerals, and metallic ores	128	-	11,859	8.7
Coal and petroleum products	3,426	1.9	S	S
Pharmaceutical and chemical products	32,672	18.2	6,723	4.9
Logs, wood products, and textile and leather	12,986	7.2	12,314	9
Base metal and machinery	31,130	17.3	47,907	35
Electronic, motorized vehicles, and precision instruments	47,261	26.3	6,168	4.5
Furniture and miscellaneous manufactured products	34,175	19	11,508	8.4
Commodity Unknown	152	-	168	0.1

S = Estimate does not meet publication standards because of high sampling variability or poor response quality.

Dallas County ranked 5th ($103,705 million), Tarrant County ranked 23rd ($44,443 million), and Collin County ranked lower but in the top 100 ($18,632 million) in total compensation in the U.S. in 2007, thereby providing the fuel needed for consumption of goods in the region (Highfill, Tina and Mauricio Ortiz, Bureau of Economic Analysis). As can be expected for a large, southern, car-oriented city, transportation costs are the highest expenditures in households in the Dallas/Ft. Worth MSA. See Table C9.

Table C9: 2008 Dallas/Ft. Worth MSA Annual Consumer Expenditure

Source: (Consumer Expenditure Survey 2007-08 MSA Tables Selected Southern MSAs)

Retail Sector	% of Total Household Expenditures
Food	6.6%
Food away from home	5.1%
Alcoholic beverages	0.7%
Apparel and services	3.4%
Personal care products and services	1.4%
Transportation (gas, motor oil, vehicle purchases and expenses)	19.1%
Healthcare	5.3%
Entertainment	5.1%
Education	1.5%

Waco/Killeen Region

Unfortunately, neither the Waco nor the Killeen region are covered by the commodity flow survey like Austin, Dallas, and Fort Worth have been. Therefore there is insufficient data available to produce commodity involvement within the region.

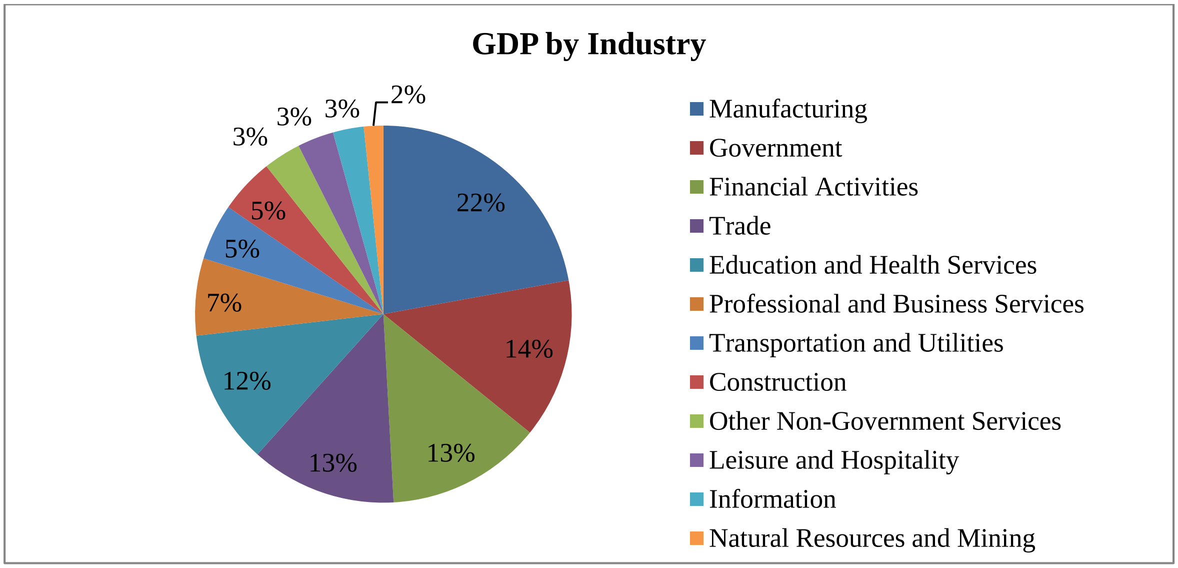
Previous findings indicate that the Waco area has been undergoing a transformation from a manufacturing center to an area specializing in education and health services, along with an increased role by government and a relatively steady concentration of trade, transportation, and utilities.

Employment figures since 1990 show the dramatic shift between manufacturing and education, health services, and government started around 2000 and has been on this path since. Thus internal and to/from freight transportation demand has likely seen a decline with less production. Waco's 2030 plan that was created in 2005 even cites the reduction of major industries as a main factor in excess roadway capacity appearing in eastern portions of Waco. Despite this shift, the Waco MPO notes that roadway travel overall is still the primary mode used in the region. IH 35 is the main route in the area, with SH 6 and US 84 being major routes as well. These also make up most of the area's congested segments as of 2002 according to the 2030 plan. Due to Waco's location between San Antonio, Austin, and Dallas/Ft. Worth, the area surely sees a large amount of pass-through traffic using IH 35.

Killeen's demand is heavily driven by the Ft. Hood military installation, with government accounting for about half of the area's GDP (Bureau of Economic Analysis, 2009). This also drives the service-related industries due to the large concentration of personnel. This in turn likely creates a demand on roadways to bring in goods for the service industries. The military is likely a heavy user of highways as well, while rail is surely used for bulk materials and industrial equipment needed for such an operation.

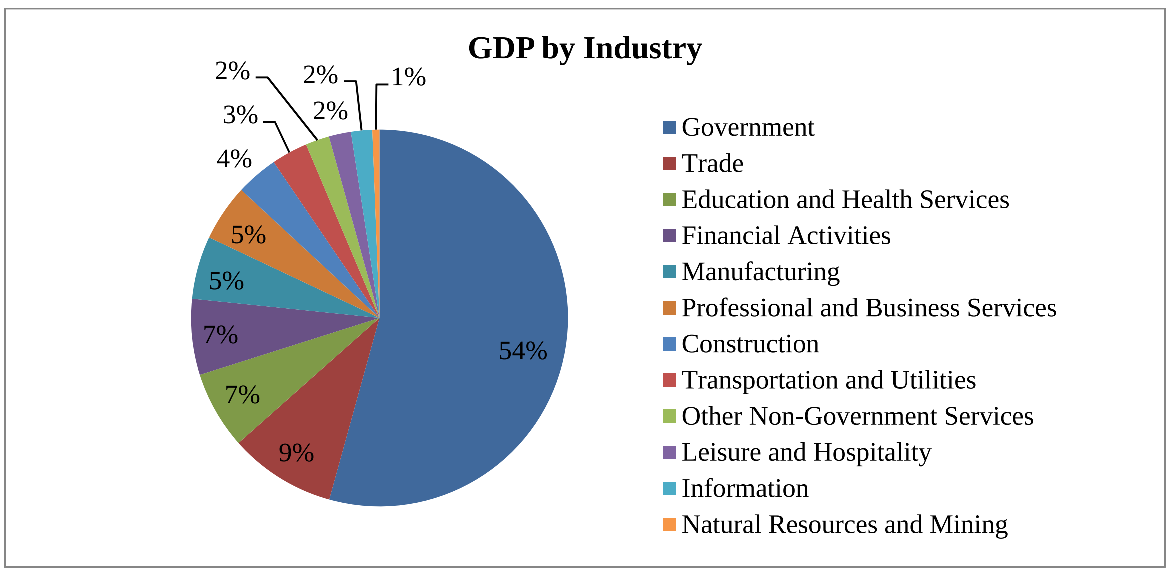
Economic Generators

The Waco MSA accounts for only roughly 0.65% of Texas's overall GDP for 2008 (Figure C8), posting at $7.9 billion, while the Killeen MSA (Figure C9) accounts for almost twice that much (Bureau of Economic Analysis Gross Domestic Product by MSA). Waco's economic base has a significantly larger portion of its GDP comprised of manufacuring compared to Austin/Round Rock; however, its education and health sectors play a large part in its GDP. This is probably heavily influenced by the fact that Waco has a much smaller overall GDP than Austin, yet still has a large education institution in Baylor University. Government also plays a large role in Waco, but not as large of a role as in Killeen, which sees over 50% of its GDP generated by the sector (Bureau of Economic Analysis Gross Domestic Product by MSA). Undoubtably this is mainly influenced by the Fort Hood operation, which is considered "the largest active duty armored post in the United States Armed Services" (U.S. Army, Ft. Hood). Fort Hood's presence also explains why the next three closest sectors are services related, as a large operation like Fort Hood means there are a lot of people in need of servies.



(Bureau of Economic Analysis Gross Domestic Product by MSA)

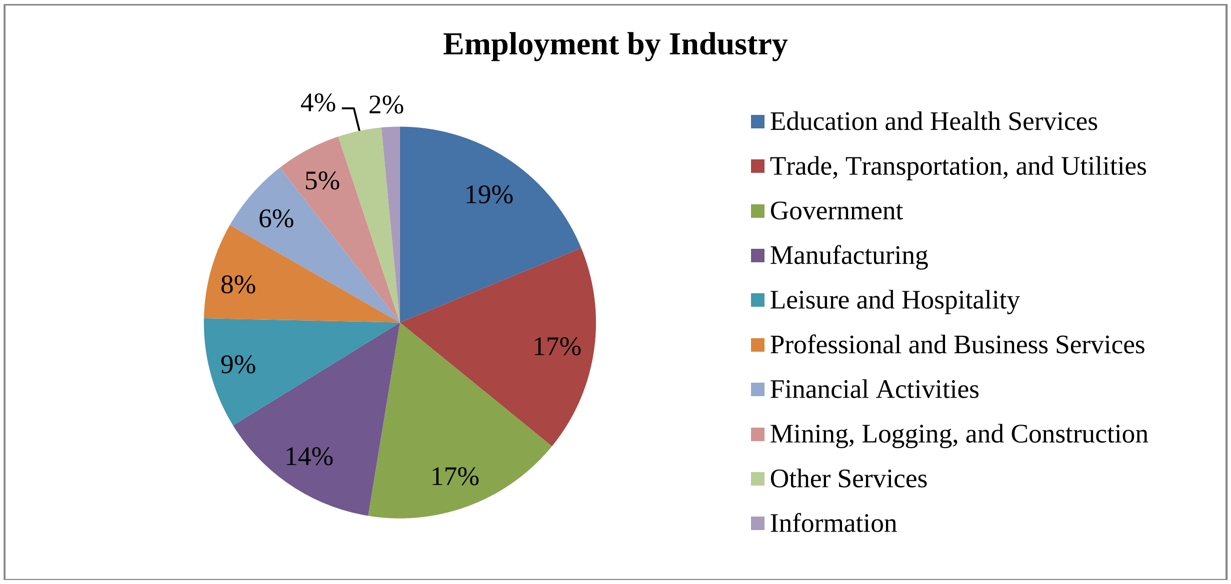
Figure C8: 2008 Waco MSA GDP by Industry Cluster



(Bureau of Economic Analysis Gross Domestic Product by MSA)

Figure C9: 2008 Killeen MSA GDP by Industry Cluster

The employment breakdowns of the regions are fairly similar to their GDP breakdowns. Four of the five top Waco GDP generators appear in its top five employment sectors, while government still reigns supreme in Killen, but without as staggering of a gap as its GDP breakdown. Its other top GDP sectors take larger shares of the area's employment in comparison, which may be caused by the fact that Fort Hood's employment of people who live in the area may not be equal to the overall employment total, as its operations are almost certainly variable due to its military operations (Figure C10).



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C10: August 2009 Waco MSA Employment by Industry Cluster

The Waco region's major economic generators certainly align with the area's GDP and employment breakdowns when it comes to government, health care, and education, but manufacturing's larger presence in the area is not reflected within the top employers. Analysis of the area's employer list shows that most manufacturers in the region are small in size and large in quantity (Table C10).

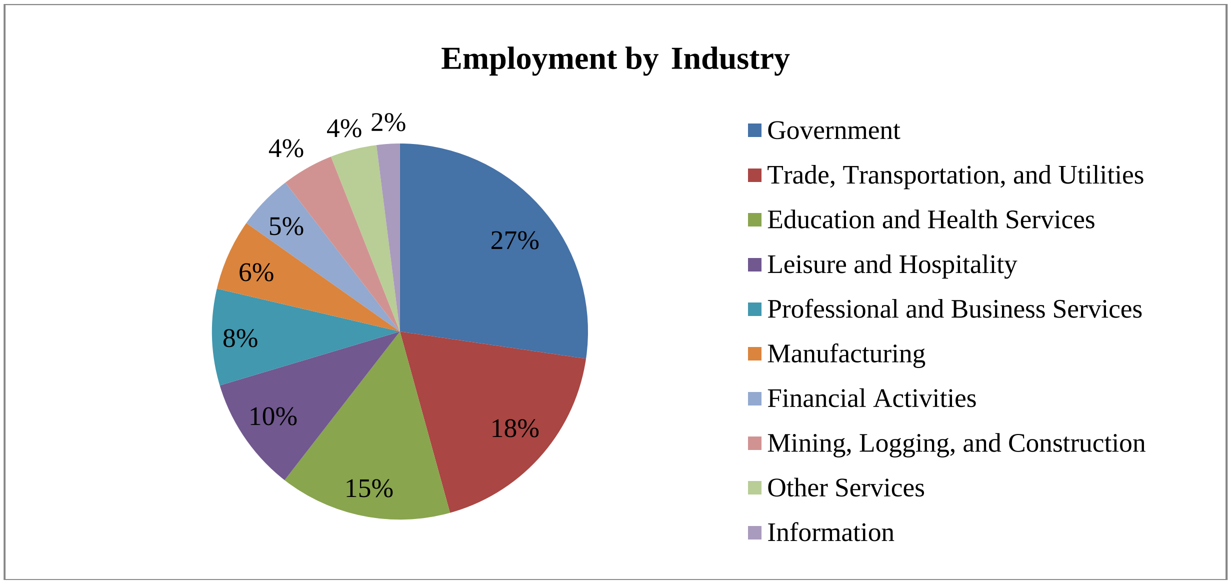
Table C10: Waco Area Employers with 1,000+ Employees

Source: (Greater Waco Chamber of Commerce Business Environment)

Company	**Sector/Description**
Providence Healthcare Network	Health care
Baylor University	Education
Waco I.S.D.	Education
City of Waco	Government
Hillcrest Health System	Health care
L-3 Integrated Systems	Aerospace modification
H.E.B. (area stores)	Retail
Wal-Mart (area stores)	Retail
Sanderson Farms, Inc.	Food processing

The Waco region has a smaller amount of future commitments for expansion compared to other larger regions—5 in 2009 and about 15 in 2008 (it is unclear how many of these materialized due to the recent economic recession). See Figure C11. Of these expansions, most align with the logistics, manufacturing, and other related sectors[8].

For the Killeen area, Fort Hood and the Civilian Personnel Office together employ over 60,000 people and there are various other entities similar to those in Waco that employ 1,000+ individuals (Greater Killeen Chamber of Commerce Major Employers). Fort Hood alone has an estimated $7.1 billion impact on the central Texas area (Greater Killeen Chamber of Commerce Facts About Fort Hood).



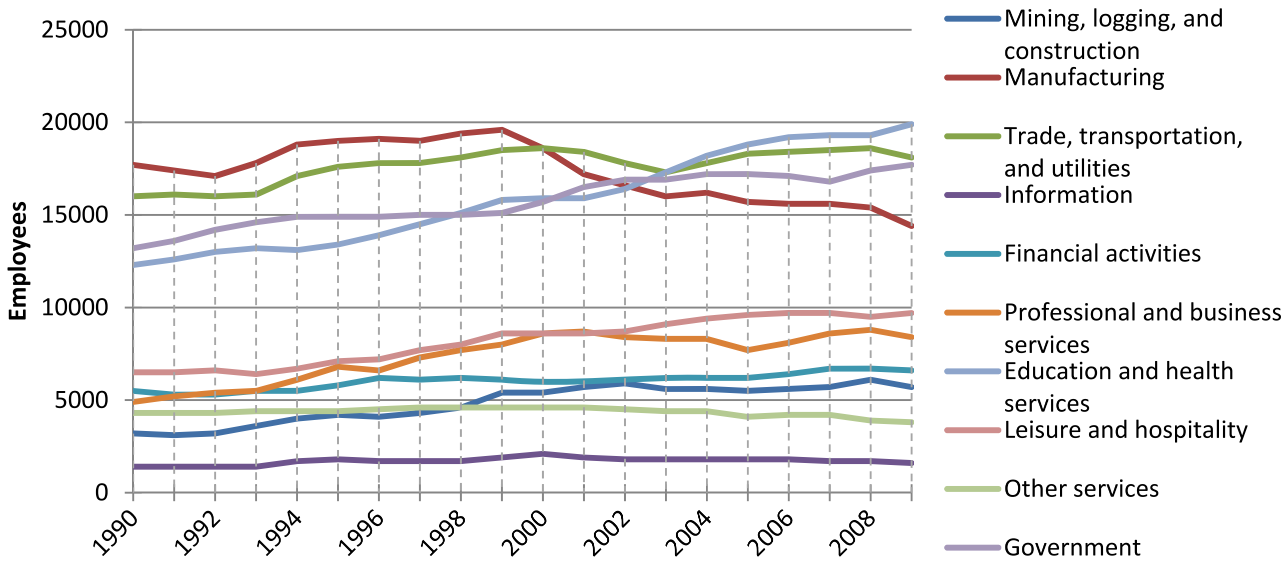
(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C11: August 2009 Killeen MSA Employment by Industry Cluster

Economic Trends

From 1990 to August 2009, Waco has mostly experienced growth within its sectors, albeit relatively slow growth compared to a region like Austin. Manufacturing, as in many other regions, is the only industry that has clearly experienced a considerable fall in employment. Other services have also seen a slight decline over time but these are very minor. Also as in other regions, the current recession has caused sharp changes in the industries over the past year. Approximately half of the sectors are experiencing a decline in employment while others such as the government are experiencing a spike in employment (Figure C12).

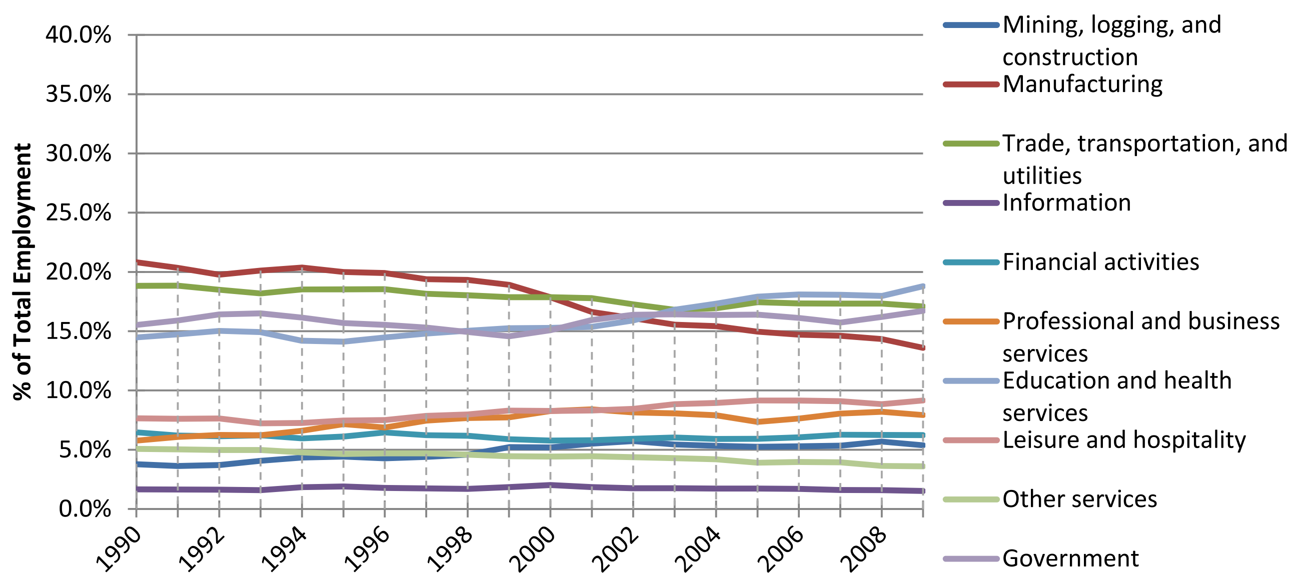
[8] For a full list of expansion announcements, visit the Greater Waco Chamber of Commerce's Business & Industry webpage < http://www.wacochamber.com/businessindustry.php>.



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C12: Waco MSA Industry Cluster Employment (1990–Aug. 2009)

Waco's employment market corresponds almost identically to the employment totals for its sectors (Figure C13). Perhaps this is due to Waco's smaller market with a smaller gap between large employers and small employers, thus growth might be closer linked to market share (Greater Waco Chamber of Commerce Business Environment).



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C13: Percent of Waco MSA Employment by Industry Cluster (1990–Aug. 2009)

Killeen also experienced employment growth more similar to Austin than to Waco. All sectors have seen fairly healthy growth over the past two decades, with only manufacturing seeing a consistent decline. Fort Hood again is the most likely source for much of this growth, at least certainly for the government, with wartime conditions existing in the early 1990s and in the 2000s. Unlike the actual employment numbers, the percentage of each sector's makeup of the employment market has been relatively flat for each sector, except for the inverse conditions between manufacturing and business/professional services. See Figure C14 and C15.

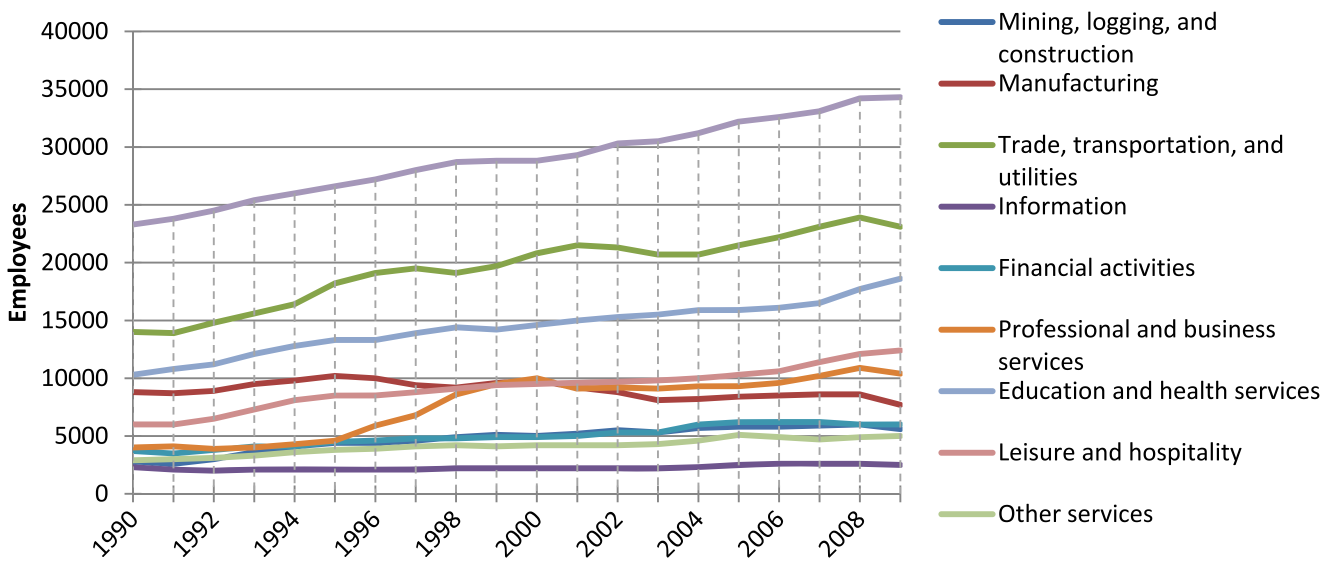


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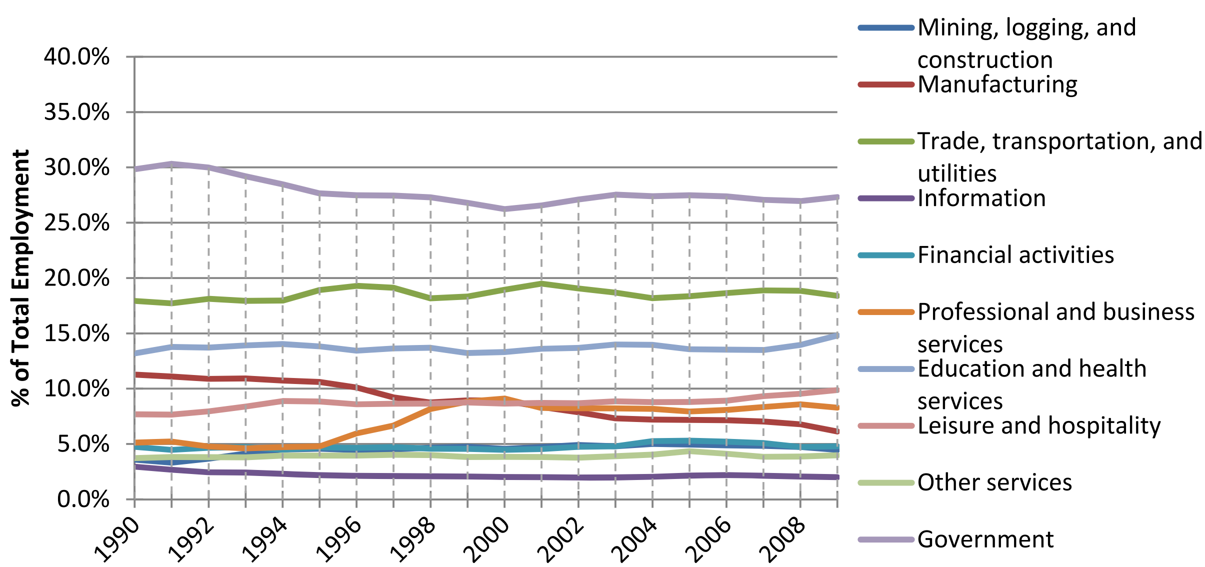
Figure C14: Killeen MSA Industry Cluster Employment (1990–Aug. 2009)



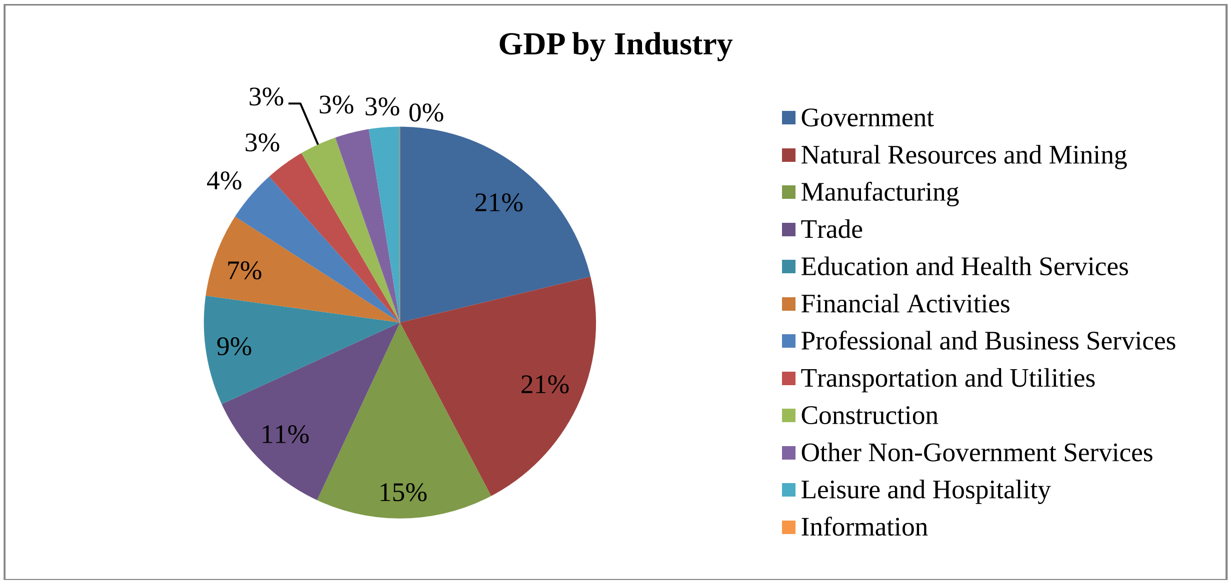
(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C15: Percent of Killeen MSA Employment by Industry Cluster (1990–Aug. 2009)

Wichita Falls Region

Economic Generators

An air force base, local government, and state offices contribute to making government the highest shareholder industry for the Wichita Falls GDP (Figure C16), while oil and gas production are a close second. The presence of an Alcoa manufacturing plant, one of the region's largest employers, gives the manufacturing industry a boost in its contribution to the region's GDP.



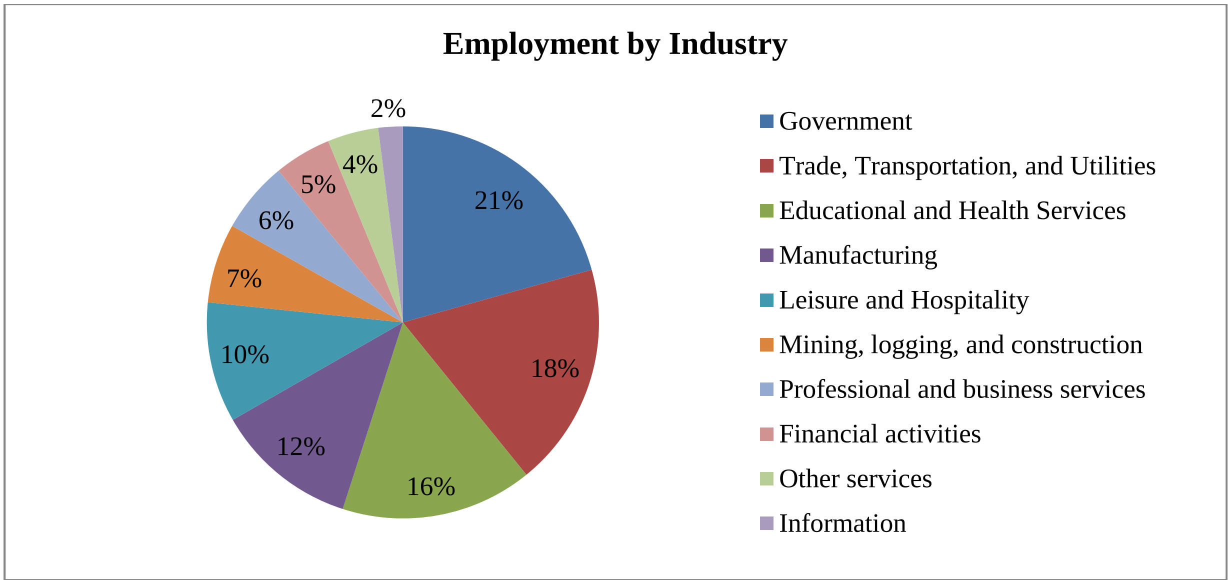
(Bureau of Economic Analysis Gross Domestic Product by MSA)

Figure C16: 2007 Wichita Falls MSA GDP by Industry Cluster

*Wichita Falls's Information sector's share of GDP is consistently withheld each year.

†Wichita Falls's Other Services sector's share of GDP is derived from an average of 2006 and 2008, as 2007's was withheld.

Wichita Fall's employment base rests on three similarly sized industries of government, education and health services, and trade, transportation and utilities, a base typical for a smaller MSA (Figure C17).



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C17: August 2009 Wichita Falls MSA Employment by Industry Cluster

The largest employers are primarily in the government, education, and healthcare industries (see Table C11), consistent with the finding that those industries form the base of the Wichita Falls region.

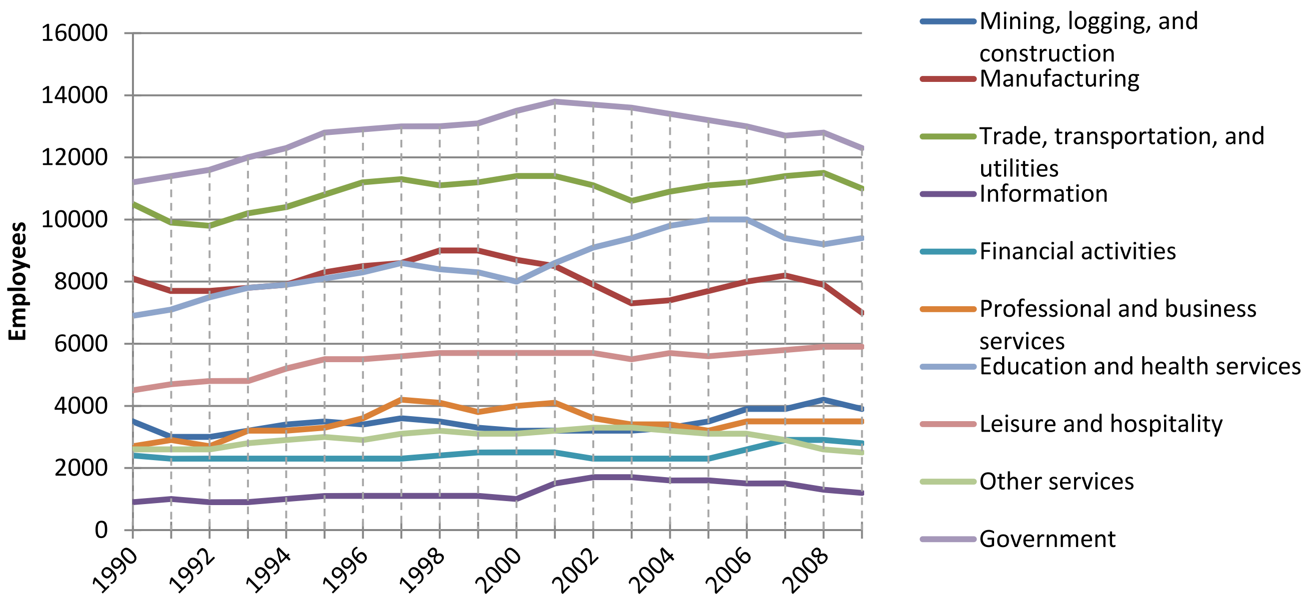
Table C11: Wichita Falls Major Employers

Source: (Wichita Falls Chamber of Commerce Regional Profile)

Company	Product/Service	2008 Employment
Sheppard Air Force Base	Government	12,201
Wichita Falls ISD	Education	2,000
North Texas State Hospital	Health Care	1,987
United Regional Health Care Sys.	Health Care	1,794
City of Wichita Falls	Government	1,576
Midwestern State University	Education	1,222
Wal-Mart (3 locations)	Retail	1,188
Howmet Castings Alcoa	Manufacturing	1,020

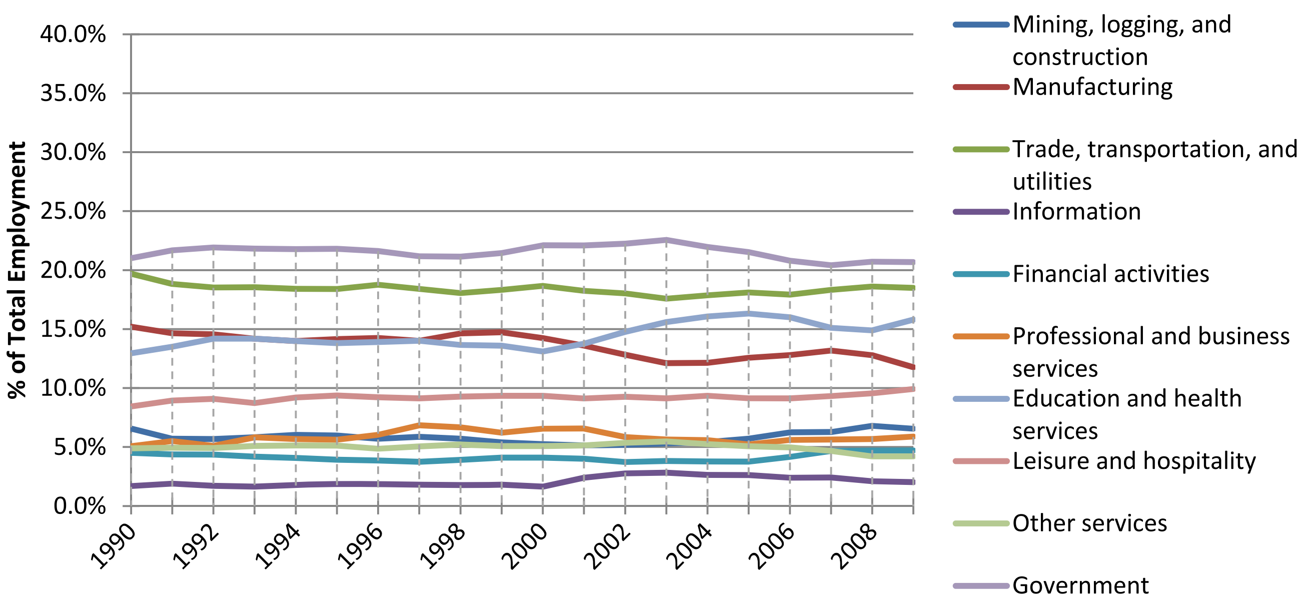
Economic Trends

The Wichita Falls area has had to recover from the economic impact of the world oil price decrease in the 1980s, when its employment and GDP decreased substantially from 1985 to 1990 (employment dropped by 50%). Since the early 1990s, Wichita Falls has bounced back and continues to increase its population, GDP, and employment. As with the Dallas/Fort Worth area, business services have shown the greatest increase (3.8%) in employment between 1980 and 2000; however, that has since leveled off. Education and health services have shown the highest gains in employment since 1990. The recent economic recession has hit Wichita Falls, with over 2,000 jobs lost since August 2008 in every industry except in the still-growing industries of government, education, and health care, which are the economic bases of the area (Texas Workforce Commission Labor Market & Career Information - TRACER). See Figure C18 and C19.



(Texas Workforce Commission Labor Market & Career Information - TRACER)

Figure C18: Wichita MSA Industry Cluster Employment (1990–Aug. 2009)



(Texas Workforce Commission Labor Market & Career Information - TRACER)

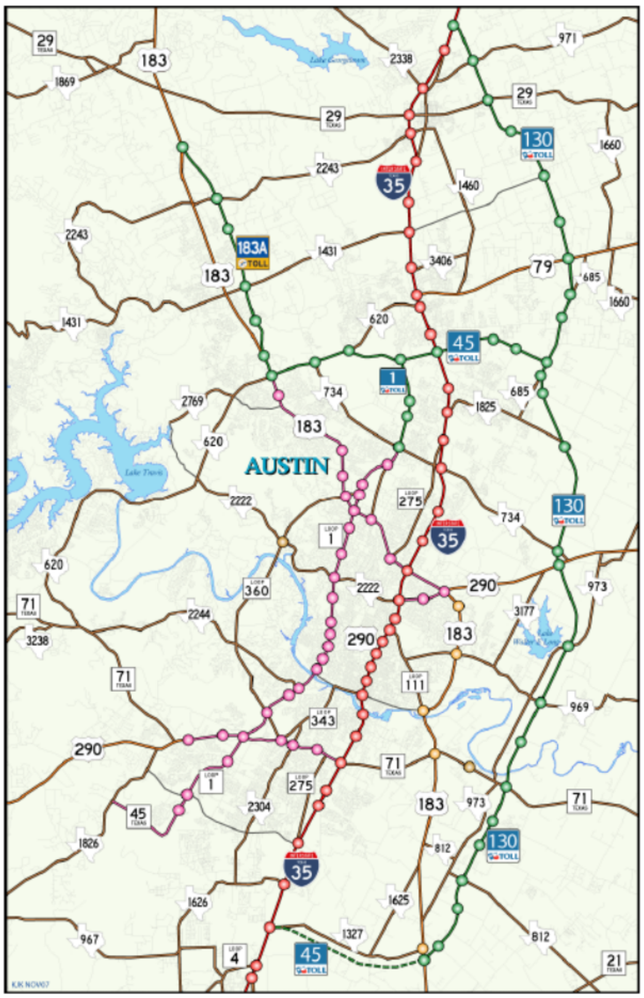
Figure C19: Percent of Wichita MSA Employment by Industry Cluster (1990–Aug. 2009)

Inventory of Freight Facilities

Austin Region

Roadway Infrastructure

The Austin region's freight infrastructure and facility inventory consists mainly of roadways, with minimal railroad facilities and an air cargo center at Austin's airport. As of the end of 2007, the 11 counties that make up the region were home to 3,345.352 centerline miles of road, which translates to 9,104.697 lane miles. See Figure C20 for map of Austin roadways. Travis and Williamson counties account for the majority of these roadways, combining to contain just over a third of the centerline miles and almost 40% of the lane miles (TxDOT, 2007). The region's figures include portions of the new toll road system around the Austin area, but do not include segments added after 2007. As of 2009 the system has added over 75 miles of roadway to the Austin region, including the SH 130 bypass tollway (Central Texas Regional Mobility Authority, 2009). These additions may account for the higher estimate of lane miles reported in the Capital Area Metropolitan Planning Organization's (CAMPO) 2008 Austin Area Freight Transportation Study, which lists approximately 9,730 lane miles for the Austin MSA area alone. Using the roadway system are over 60 freight forwarders that have facilities within the area (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008), including a FedEx Freight location in Round Rock and a UPS Freight location in Pflugerville. Austin also has over 60 million square feet of warehouse/distribution space, primarily located along the IH 35 corridor (Greater Austin Chamber of Commerce, 2009).



Source: AA Roads and Kelly Krapp, 2009

Figure C20: Map of Major Roadways in the Austin Area

Austin's main trade corridors are the IH 35 Corridor, also referred to as the NAFTA highway (Interstate Guide Interstate 35), and the Mid Continent Trade Corridor (Manitoba Business Facts Mid Continent Trade Corridor Map). These corridors run from the Texas–Mexico border in Laredo and continue northward via

IH 35. Rail is also a part of this corridor and mostly follows the interstate's path (Saenz, 2008). US 290 also provides a link between Austin and Houston thus connecting Austin to the Gulf Coast Corridor.

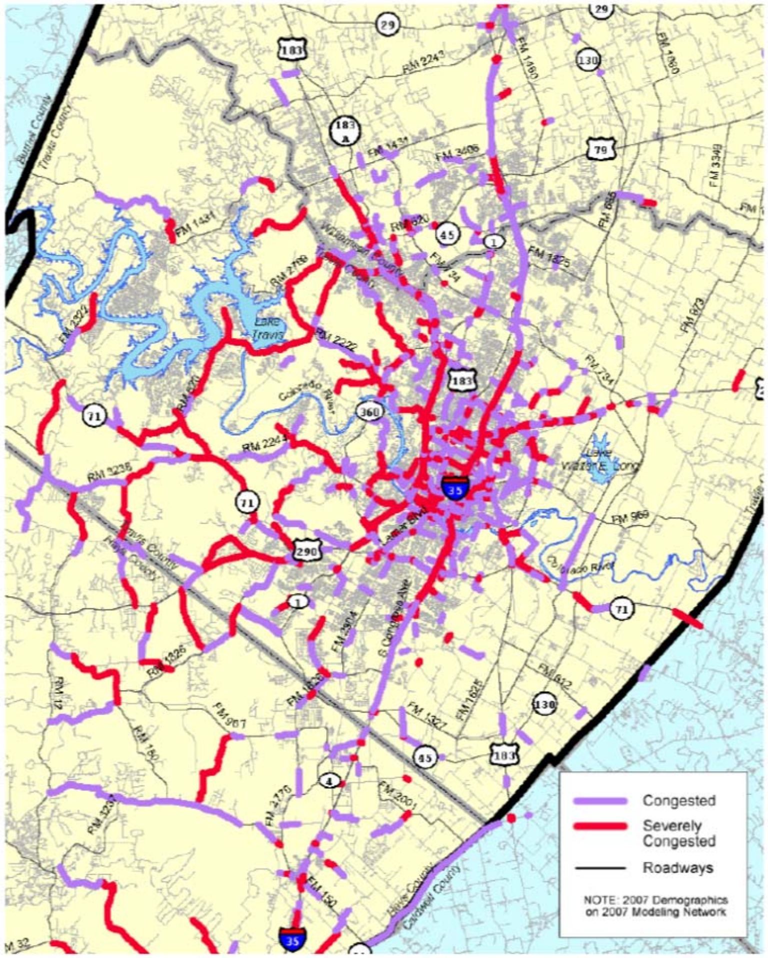
Due to heavy reliance on roadways, congestion has been a concern in the area. Between the winter of 2006 and spring of 2007, 27% of studied roadways within CAMPO's Congestion Management Process Report were listed as congested during AM hours, while 29% were similarly classified during PM hours (see Table C12). As illustrated in Figure C21, many of the most congested segments during both of these periods were associated with freeway/expressway crossings/segments (mainly IH 35 and MoPac) and major local roadways that have few alternatives (Capital Area Metropolitan Planning Organization, 2007). The Federal Highway Administration even lists an Austin interchange (IH 35 C MLK) as one of the top 25 highway bottlenecks in the U.S. as of 2004 (Federal Highway Administration, 2009).

Table C12: Austin Summary of Study Roadways in Terms of Congestion Index for AM and PM

Source: Capital Area Metropolitan Planning Organization, 2007

Period	Free Flow	Stable	Congested
AM	30%	43%	27%
PM	28%	44%	29%

As of 2005, the capacity use of the Austin MSA's roadways was predominately moderate throughout the major segments, with some stretches of moderate to high. The 2007 models showed that congestion was soon to be on the rise, causing an increase in highly congested segments (Figure C21).



Source: Capital Area Metropolitan Planning Organization, 2007

Figure C21: Austin Area Roadway Congestion in 2007

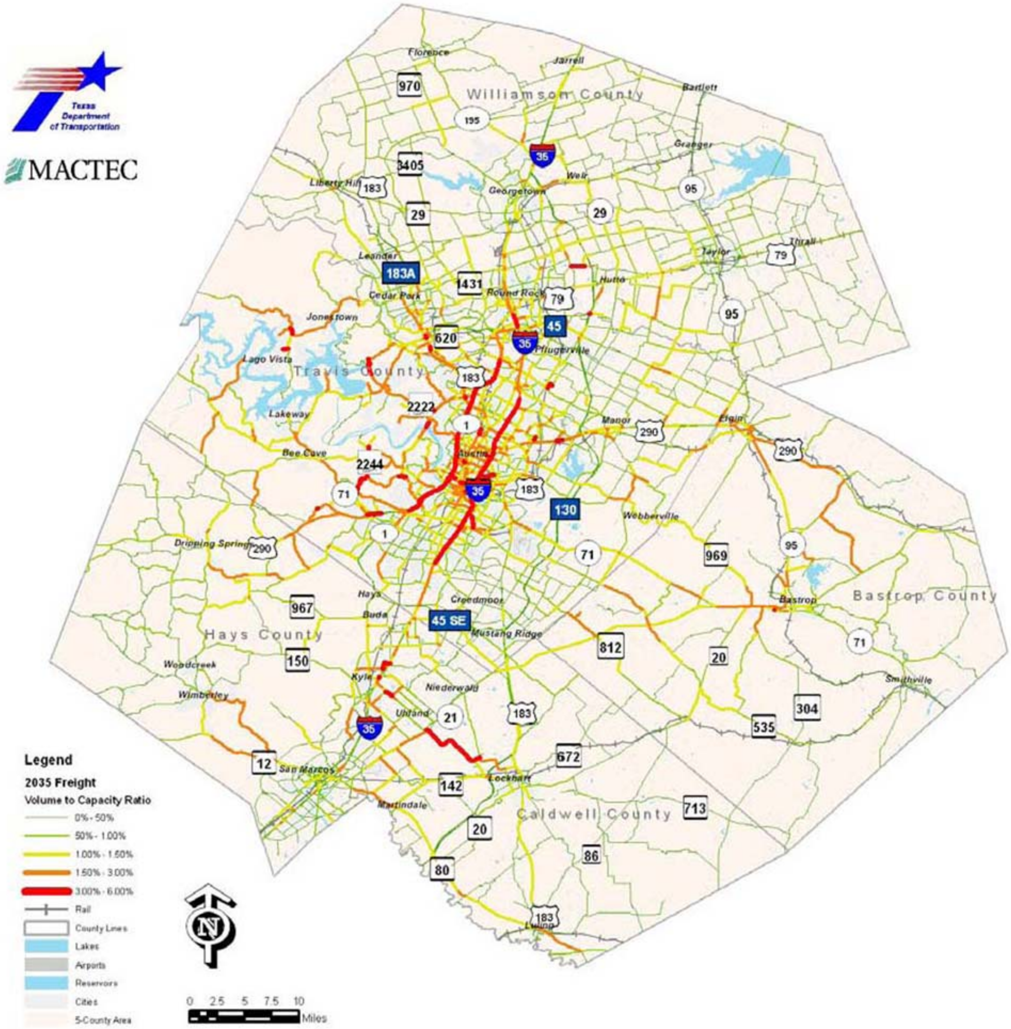
Austin's primary shipping mode is trucking, which accounts for about 95% of all freight tonnage movement in the area (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008). Despite manufacturing's influence in the area decreasing (Table C13), high-value products are still produced and consumption items are in large demand, which is what likely fuels this dependence on roadways. And the fact that Austin's position is within a few significant trade corridors, including the ever important NAFTA corridor, adds to roadway demand for pass-through truck traffic. However, the vast majority of the roadway travel is classified as internal, with over 70% of both freight-vehicle-hours-traveled (FVHT) and freight-vehicle-miles-traveled (FVMT) internal to the Austin MSA in 2005. Roughly similar figures are expected by 2035, although pass-through traffic is expected to see the largest FVMT increase among the three transportation distinctions.

Table C13: FVHT & FVMT by Trip Types—2005 Observed vs. 2035 Expected

Source: MACTEC Engineering & Consulting Inc. and Alliance Transportation Group Inc., 2008)

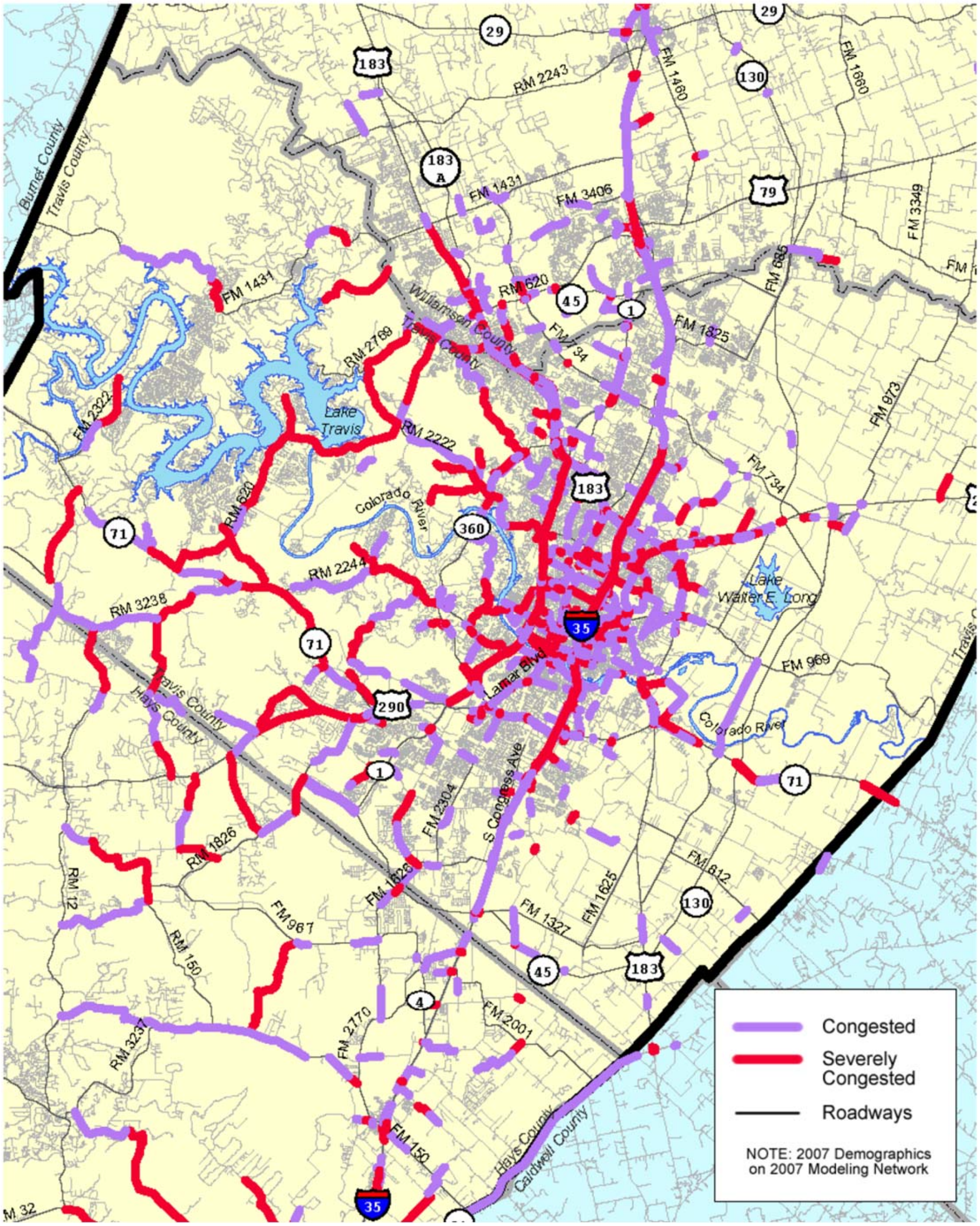
		External to Local Trips (FVHT)	External to Local Trips (FVMT)	External but Through Trips (FVHT)	External but Through Trips (FVMT)	Internal Trips (FVHT)	Internal Trips (FVMT)
2005	**Total**	9,000	351,000	6,000	247,000	47,000	1,528,000
	% of Total	14.20%	16.50%	96%	11.60%	76.10%	71.90%
2035	**Total**	40,000	1,149,000	39,000	1,351,000	306,000	5,742,000
	% of Total	10.50%	13.90%	10.10%	16.40%	79.50%	69.70%
2005 vs. 2035	**Change in % of Total**	-3.70%	-2.60%	0.50%	4.80%	3.40%	-2.20%
	% Increase	300%	227.40%	550%	447.00%	551.10%	275.80%

Although Austin has various highway facilities within its boundaries, the demand appears to be sprinting ahead of the supply. The IH 35 corridor passing through the city is a prime example of this, as well as in many other cities in Texas and the rest of the country. Prediction maps in both the CAMPO 2008 Austin Area Freight Transportation Study and CAMPO Mobility 2030 Plan, which take into account planned roadway infrastructure projects, do not create a better picture for the area's congestion issues. In Figures C22 and C23, it can be observed that most of the roadways advance from congested to severely congested. Thus, even given planned improvements, the area is expected to see additional congestion.



Source: MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc, 2008

Figure C22: 2005 Austin MSA Overall Traffic Volume to Capacity Ratio

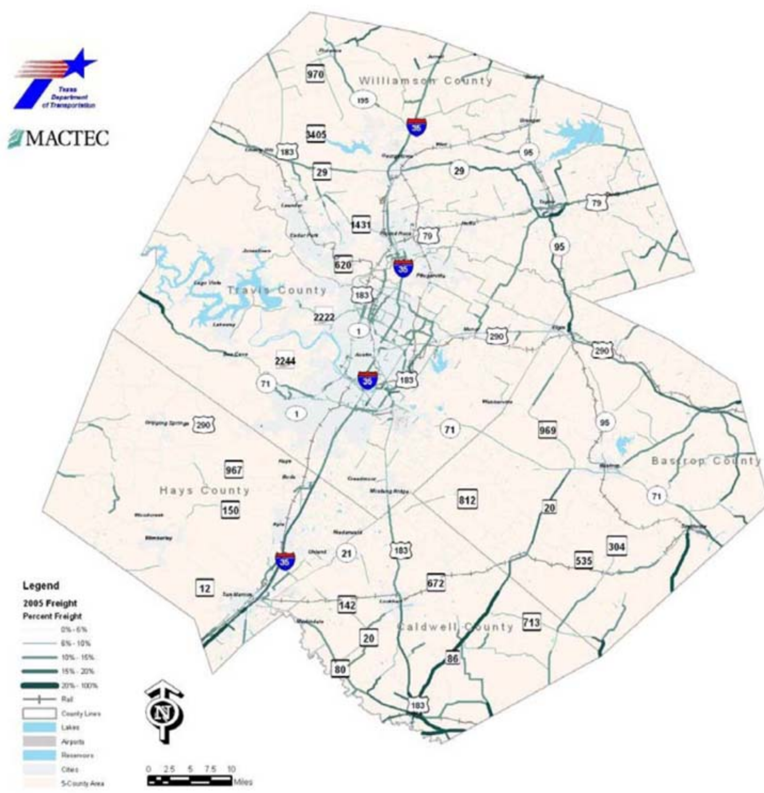


Source: Capital Area Metropolitan Planning Organization, 2006

Figure C23: Austin Area Forecasted Roadway Congestion in 2030

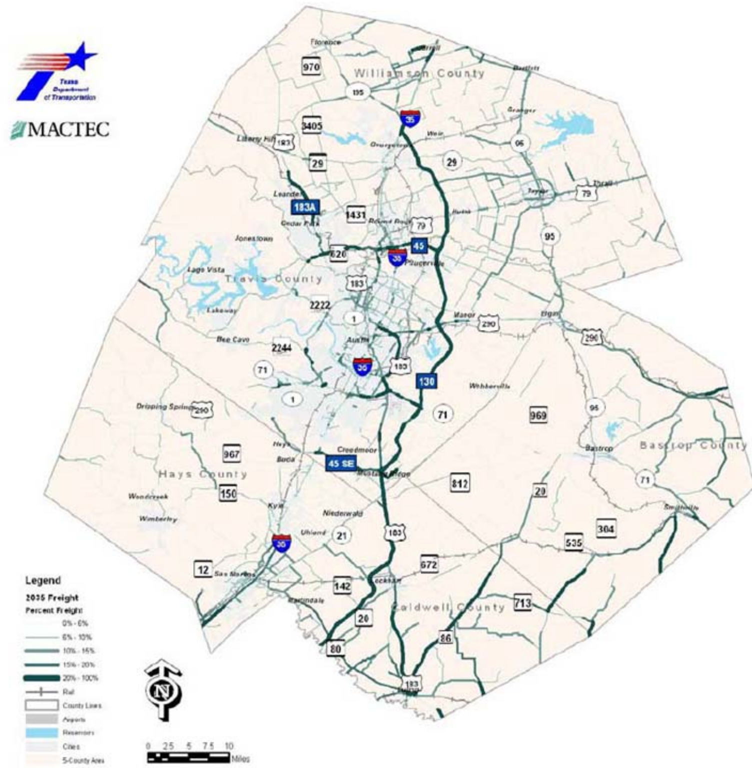
Freight is undoubtedly a significant element in this dramatic increase in congestion, as roughly 95% of Austin's freight movement was done via roadways in 2003. Over the next 20 to 25 years, all major highways and arterials are forecasted to be experiencing a much higher volume of freight vehicles, mainly due to increase in population and trade through NAFTA (Capital Area Metropolitan Planning Organization). Note in the forecast maps that despite the inclusion of the new toll road system in the area, IH 35 continues to experience a major increase in volume (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008). It’s unclear when the model was created and what data it used to complete the prediction, but one of the factors that may be contributing to SH 130’s lack of volume is its toll charge for large trucks bypassing the area. As of 2009, it would cost the average 4-axle freight truck $20.25 to bypass Austin, and almost $34 for a 6-axle freighter (both assume the use of a TxTag). Thus, trucks passing through the area will have to balance the cost of time lost by using IH 35 versus toll costs of using SH 130 (TexasTollways).

Despite SH 130’s lack of predicted freight volume in CAMPO’s model, a model of freight as a percentage of a roadway’s use shows SH 130’s main utilization being freight. Feeding SH 130 is US 183 from the south, likely coming from areas south near IH 10. Traffic on US 183 coming into the center of Austin from the south is also predicted to be heavily freight, along with SH 71 and SH 45 feeding the southern and northern areas. Based on the volume predictions and percentage use predictions (see Figure C24 and C25), one could theorize that smaller, short-haul oriented truck flow will continue and increase dramatically into the central city area of Austin, serving the expected growth of the area, while long-haul trucking may divert some traffic to SH 130 to avoid the predicted congestion of the IH 35 corridor despite the toll expenses.



Source: MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008

Figure C24: 2005 Austin MSA Percent of Traffic as Freight



Source: MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008

Figure C25: 2035 Austin MSA Percent of Traffic as Freight

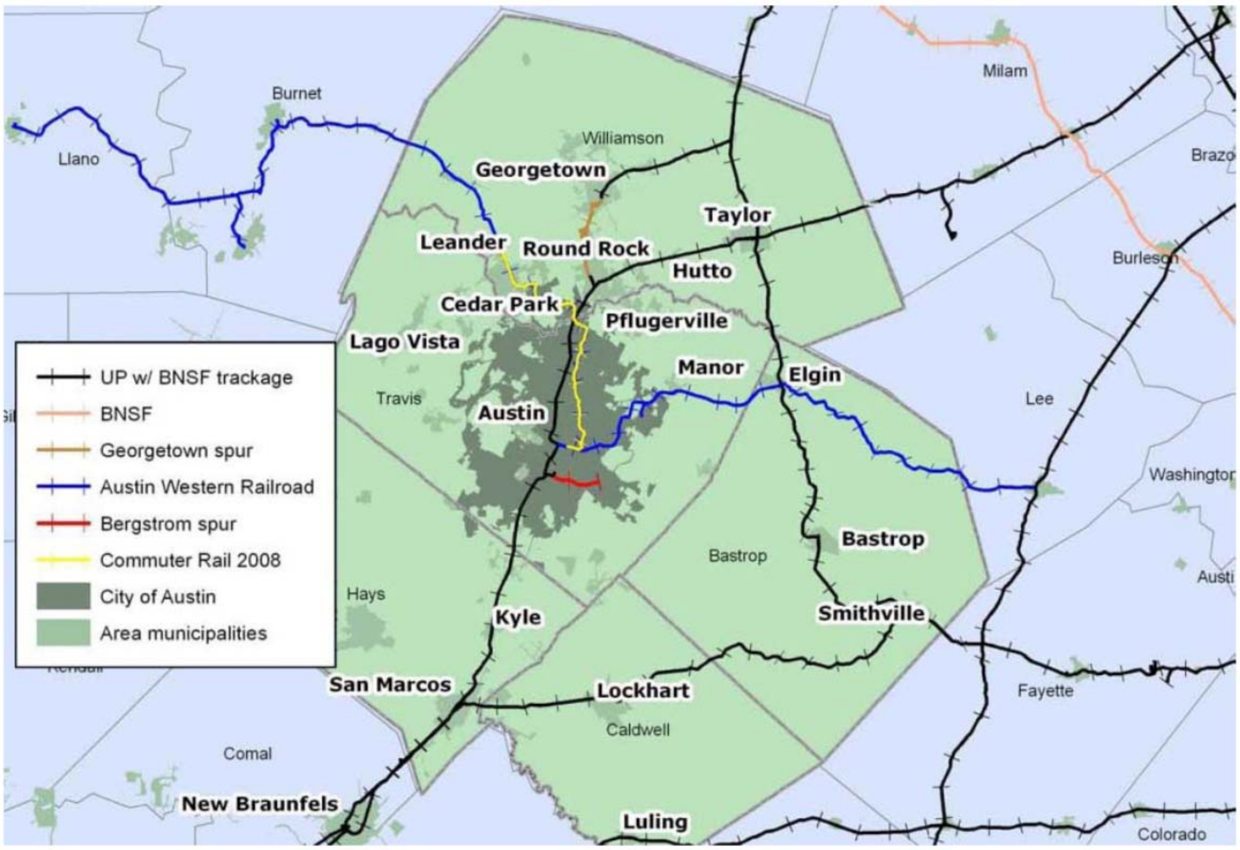
Rail Infrastructure

The Austin region's rail characteristics aren't as well defined as its roadway system, which is reflected in the facilities available. The region is served by two Class I railroads in BNSF and UP, and is also serviced by a couple of local railroads (Austin Western Railroad and Georgetown Railroad), totaling roughly 425 track miles within the Austin MSA. There are no rail yards associated with Class I railroads; however, there are two interchange yards (McNeil Road and inside Round Rock city limits) that allow transfers from Class I railroads to local service railroads (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008). As illustrated in Figure C26, there are also two noted spurs in the region, one connecting Austin-Bergstrom airport and the other in Georgetown (Greater Austin Chamber of Commerce, 2009). Unfortunately, it appears that the Bergstrom spur is no longer being used for freight purposes and is instead being discussed as a possible route for passenger rail (Gregor, 2008). UP also has a number of grain elevator facilities located in the region, with most appearing in the rural areas of eastern Williamson County (see Table C14).

Table C14: Austin Region Grain Facilities

Source: Union Pacific, 2009a

Municipality	County	Railroad
Bartlett	Williamson/Bell	UP
Elgin	Bastrop/Travis	UP
Granger	Williamson	UP
Hutto	Williamson	UP
Lockhart	Caldwell	UP
Taylor	Williamson	UP
Thorndale	Williamson	UP
Thrall	Williamson	UP
Weir	Williamson	UP



Source: Greater Austin Chamber of Commerce, 2009

Figure C26: Greater Austin Rail Infrastructure

According to CAMPO's Mobility 2030 Plan, UP's track in the area was running at roughly 90% capacity in 2005, which includes Amtrak services and 20–25 through trains operated by UP. The plan discusses issues such as the single-track bridge over the Colorado River as in need of attention and rerouting of current track in order to address capacity and speed concerns, with the idea of freeing up track for potential passenger rail services (Capital Area Metropolitan Planning Organization, 2006). There are also concerns surrounding road-rail grade crossings, as there were roughly 764 such crossings as of 2005 within the Austin MSA area (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008). Lastly, worth mentioning are the physical restraints on the infrastructure in terms of weight capacity and railcar restrictions, as Austin's Class I tracks can accommodate trains up to 268,000 lbs. (143 tons) and permits cars and unit trains (Union Pacific, 2009b). The Austin Western Railroad has a slightly variable weight capacity, but is roughly the same as UP's. Capacity information was not available for the Georgetown Railroad, but due to its location on main rail lines, it is safe to assume that it is similar to surrounding rail.

Despite Austin's road-centric freight demand, the area's railroads are also experiencing heavy usage. Although local train traffic is light, consisting of stone extraction being shipped out and beer, lumber, paper, plastics, and some chemicals coming in, pass-through usage is quite high and expected to significantly increase. As of 2005, UP through the region was running at 90% capacity (Capital Area Metropolitan Planning Organization), while in 2007 the National Rail Freight Infrastructure Capacity and Investment Study predicted that between 2005 and 2035 there would be a 100% to 2500% increase in trains ran per day in the area.

Not much has been discussed about Austin's future freight movement via rail, as most rail traffic in the area is not destined for or originating out of Austin (Capital Area Metropolitan Planning Organization, 2006). However, the pass-through traffic, especially the south-to-north traffic, is expected to continue on an upward trend, lending to increased congestion in the area.

Air Freight Infrastructure

Freight-related airport infrastructure for the region is located at the Austin-Bergstrom International Airport (ABIA) as illustrated in Figure C27. According to the Greater Austin Chamber of Commerce, the airport has a "$20 million state-of-the-art cargo facility" and has been "recognized in the freight industry for its highly effective cargo port design." Many air freight companies provide service at ABIA, including UPS, FedEx, and DHL, along with commercial airlines providing cargo services (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008). CAMPO's 2008 Austin Area Freight Transportation Study suggests that other general aviation airports in the region handle freight as well, but no additional data could be found to provide any specifics. Some of the larger general aviation airports in the area include Georgetown Municipal Airport, Taylor Municipal Airport, and San Marcos Municipal Airport.

Capacity for ABIA in terms of freight is a little bit difficult to determine, but the airport's master plan (P&D Aviation, 2003) sheds some light on related specifications as recent as 2003. ABIA was seeing 28 flights per hour during peak times, but could handle anywhere from 89 to 121 flights per hour as a maximum depending on the conditions. It contains two runways, one that is 9,000 feet long and the other 12,250 feet long, located next to the cargo/freight facilities. These runways have a weight-bearing capacity between 75,000 lbs. and 618,000 lbs. depending on the aircraft's landing gear setup.

Source: Austin-Bergstrom International Airport, 2009

Figure C27: ABIA Cargo Facility Map

The facilities for all-cargo planes contained 226,908 square feet of storage space and 1.5 million square feet of apron parking space, while belly freight facilities (for passenger planes carrying freight) offered 75,652 square feet of space. The master plan marks out different levels that the airport would desire to expand to. Which expansions have been fully or partially implemented since 2003 is uncertain, although all levels beyond the current capacity are planned for beyond 2009. Also uncertain from the 2003 master plan was the cargo/freight handling capacity; however, its peak handling for a given year has been 357.3 million pounds, which is roughly 150 million more pounds than what was handled in 2008 (Greater Austin Chamber of Commerce, 2009).

Air freight handling at ABIA grew dramatically during the 1990s, but has been on the decline since 2000. The mode's importance in freight movement is heavily dependent on Austin's tech industry, which accounts for a high portion of the region's air freight (Capital Area Metropolitan Planning Organization). Despite the most recent trend, it is predicted that air freight out of Austin will grow between now and 2020 (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008). This, however, does not take into account the recent economic recession. Recent data from the airport's website shows monthly cargo handling metrics to be down significantly compared to the past, and has indeed been on a decline in terms of poundage handled (Austin-Bergstrom International Airport, 2009).

Intermodal Infrastructure

Although there are no reported intermodal facilities for truck and rail, intermodal activity is mentioned by CAMPO's 2008 Austin Area Freight Transportation Study as occurring at ABIA. This is likely truck-to-air transfer due to the fact that the Bergstrom rail spur appears to no longer be in service, as mentioned earlier.

Dallas/Ft. Worth Region

Though landlocked, the Dallas/Ft. Worth region of the IH 35 corridor still manages to rank high as a major freight gateway for the United States. Instead of a sea port, the north Texas movement of goods relies on air cargo facilities, an extensive freight rail system, and highways for freight trucks. It is an inland hub of truck and rail trade corridors for the state of Texas, lying within various trade corridors such as the Mid Continent Trade Corridor (Manitoba Business Facts Mid Continent Trade Corridor Map), NAFTA Corridor, and Plains-to-Prairies Corridor (North American Forum on Integration North American Trade Corridors). From within this inland hub, rail lines lead along a “River of Trade” to the Los Angeles/Long Beach port, the largest container port in the U.S. IH 45 and rail connects Dallas with Houston, the largest port in Texas. IH 35 also links Dallas to Mexico and Canada. Since the start of NAFTA, trade from the Dallas/Ft. Worth Metropolitan Area to Mexico and Canada has almost doubled to $1.46 billion (North Central Texas Council of Governments, 2009). Table C15 lists all the international trade corridors that run through the Dallas/Ft. Worth area.

Table C15: Texas International Trade Corridors by Truck Volume (Imports & Exports in Millions)

(Saenz, 2008)

Texas International Trade Corridor	**2002 Tons**	**2020 Forecasted Tons**
IH 35 N/S between San Antonio & Dallas	15.50	27.01
IH 30 E/W between Dallas & Arkansas	9.15	15.83
IH 45 N/S between Houston & Dallas	3.52	5.94
US 75 N/S between Dallas & the Oklahoma border	3.23	5.70
IH 35 N/S between Dallas & the Oklahoma border	1.98	3.48
IH 20 E/W between El Paso & Dallas on to Shreveport, Louisiana	1.60	2.73
US 287 N/S between Dallas & Amarillo	0.90	1.49
Ports-to-Plains/IH 27/US 87 N/S between IH 10, Amarillo, & North Texas	0.52	0.97

Roadway Infrastructure

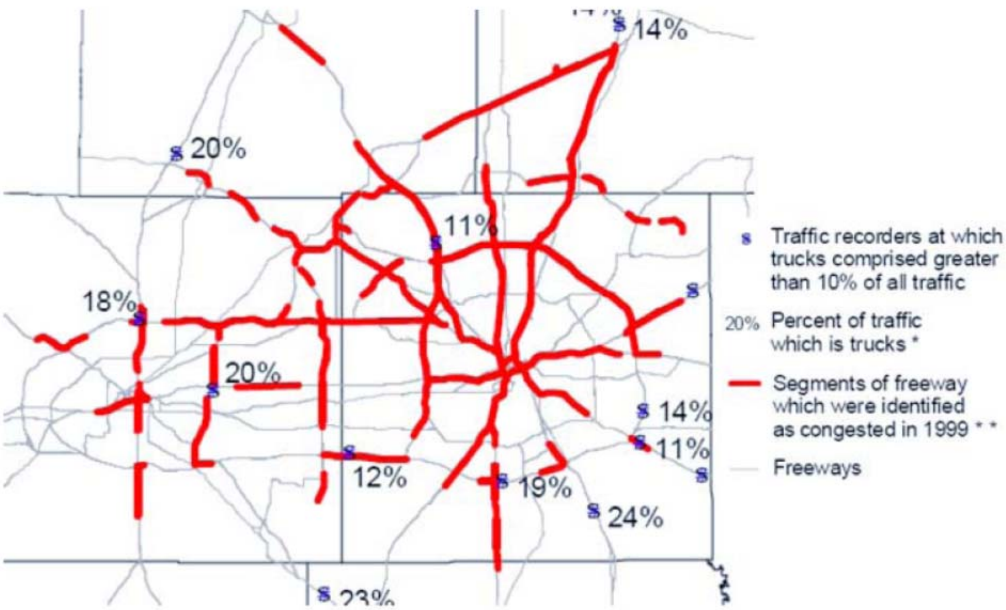
Trucking is the primary mode of freight movement in the north Texas region; in the Dallas/Ft. Worth area, trucking moves over a network of more than 550 miles of interstate and other highways and almost twice as many miles on arterial roadways. The commonly used roadway facilities in the region are listed in Table C16.

As trucks enter the Dallas/Ft. Worth metropolitan area, they encounter congestion on the highways, as evidenced by the wide, red lines on the map in Figure C28. The Regional Transportation Commission, the MPO for the Dallas/Ft. Worth area, proclaimed a need for addressing freight traffic in the 1980s and suggested an outer loop bypass to allow freight traffic (rail and truck) to travel around the Dallas/Ft. Worth metropolitan area to avoid the central congested areas. Despite this recommendation, the outer loop was never constructed. Interest in an outer loop renewed with the announcement of the TTC, but the TTC program has been canceled and thus the outer loop remains un-built. The outer loop concept earned its own chapter in the Mobility 2030 transportation plan prepared for the Dallas/Ft. Worth area, and incremental steps, such as environmental reviews and consideration of public-private partnerships, have been conducted for portions of the loop.

Table C16: Commonly Used Roadway Facilities in North Texas

North Texas Area
IH 35 (“NAFTA Superhighway”), between Mexico border and Canada near Lake Superior
IH 20, runs east-west from South Carolina to western Texas (El Paso)
IH 45 from Houston
IH 30 to Little Rock, AR
US 75 between Dallas and the Oklahoma border
US 287 between Dallas and Colorado (includes Wichita Falls), major truck corridor
US 87 between IH 10, Amarillo and North Texas
Wichita Falls
IH 44 (shares ROW with US 277 and US 281)
US 82
US 277
US 281
Business Routes 277 and 287

Figure C28 shows how truck volumes are the highest on highways identified as congested in 1999. The hub and spoke system of interstate highways directs incoming goods traffic into the city, where commuters also travel. NCTCOG monitors routes used for goods movement to identify areas needing infrastructure improvements. Figure C29 also shows congestion levels in the area.



Source: NCTCOG, 2009

Figure C28: Congested Highways in the Dallas/Ft. Worth Area

Source: NCTCOG, 2009

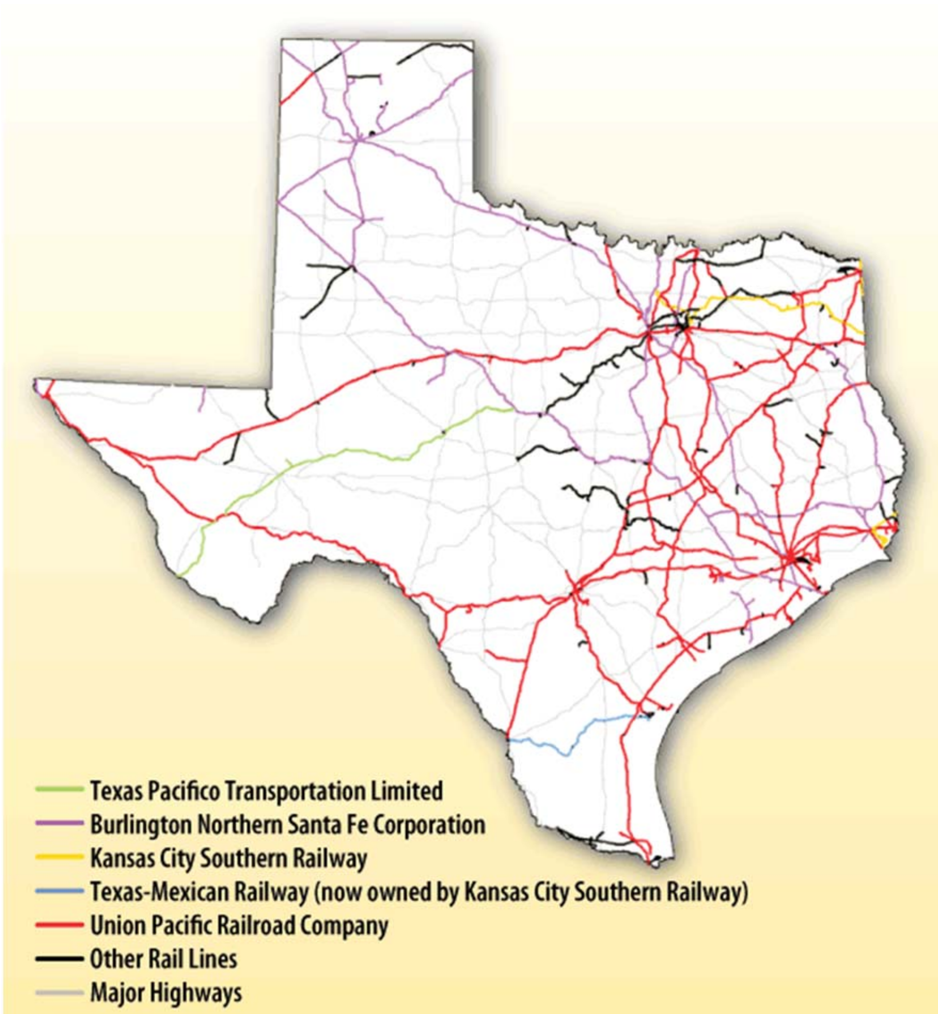
Figure C29: Map of Dallas/Ft. Worth Freeway Congestion Levels

Wichita Falls is located between two major high-flow international trade corridors and located on an intermediate-flow international trade corridor. To the west lies the "Port to Plains" international route connecting the commodity producers of the plains with the ports along the Texas coast. To the east is the IH 35 NAFTA corridor. Freight movement is expected to increase for both corridors. Connecting those two corridors is US 287, the intermediate trade corridor, a highway that runs through Wichita Falls between Dallas/Ft. Worth and Amarillo, Texas. IH 40 to the north and IH 20 to the south are also in close proximity. The BNSF and UP rail lines in Wichita Falls send cargo to the western part of the U.S.

Rail Infrastructure

Three Class I railroad companies—UP, BSNF, and KCS—form the rail network in north Texas, with supplemental links from a few smaller Class III and short line railroads. The rail lines weave within the north Texas region and emanate out in all directions to serve all parts of the U.S.

UP operates on a 32,012 mile network west of the Mississippi River, of which it owns 26,171 miles. UP owns five rail corridors headed in all directions (north, south, east, and west) from the Dallas/Ft. Worth area and has trackage rights on BNSF's two rail corridors that head north. One of the corridors heads northwest to Colorado and the other heads north through Oklahoma to Chicago (see Figure C30) (Union Pacific, 2009).



Source: TxDOT

Figure C30: Railroads in Texas

BNSF owns several rail corridors that are connected to a network of intermodal facilities throughout the U.S. (see Figure C30) and operates an intermodal hub near Fort Worth Alliance Airport 24 hours a day, 7 days a week. The Class I rail company is also looking at adding another intermodal facility in the Dallas Logistics Hub located south of Dallas and next to an existing UP facility.

The smallest of the big three railroads in north Texas, KCS serves the central and south central part of the U.S., operating on 3,226 miles of track. KCS offers a direct line from Dallas to Shreveport and New Orleans.

In Wichita Falls, BNSF provides direct rail service from its Alliance intermodal facility and routes to Oklahoma with sidings and storage yards for interchange services with the Rio Grande Pacific Corporation's short line rail unit, the Wichita, Tillman, Jackson (WTJ) Railroad. UP also works with WTJ to deliver goods between Wichita Falls and a rail yard in Fort Worth for transfer to truck or train in order to deliver it to the final destination. According to the Wichita Falls report, Wichita Falls "has sufficient capacity to serve the already strong customer base, as well as any future large scale customers." The WTJ interchange facility with UP currently has a capacity of more than 300 rail cars and total WTJ interchanges with UP and BNSF occur for more than 150,000 cars annually in the eight states WTJ operates in (Wichita Falls MPO, 2009).

With all the railroads operating in north Texas, it is perhaps inevitable that a bottleneck forms (see Figure C31). At "Tower 55," an intersection of several rail lines by the IH 30 and IH 35 West interchange in Fort Worth for UP and several other rail lines, over 100 freight trains per day pass through and on average wait 15 minutes after coming to a complete stop to pass through the intersection and as much as 90 minutes to pass through during peak periods (North Central Texas Council of Governments, 2009). The NCTCOG's Freight Bottleneck Study led to the creation of the Goods Movement Regional Mobility Initiative in January 2006 that identified Tower 55 as a major congestion issue. The NCTCOG has been actively involved since 2003 in working with all the stakeholders affected by the congestion at Tower 55 to arrive at a solution. Some of the options currently being considered include at-grade or grade-separated improvements or bypasses. Figure C32 also shows the rail lines going into north central Texas currently near capacity, and in 2035 exceeding capacity.

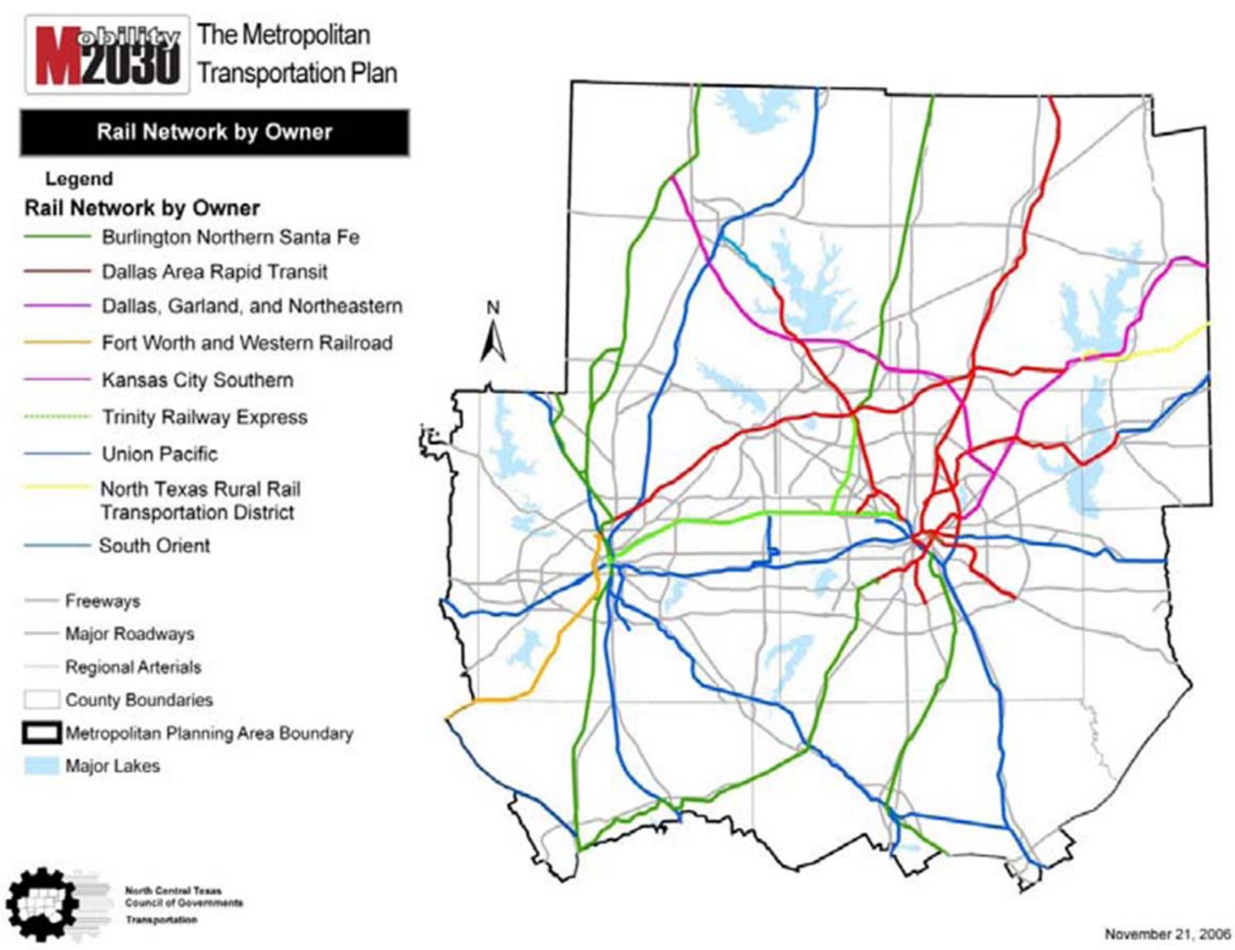
Information about the length, usage, and condition of some of the railroad corridors in north Texas was compiled by NCTCOG into "Rail North Texas Corridor Fact Sheets." The fact sheets presented the results of evaluations of freight corridors identified as potential passenger, commuter, and light rail routes (see Figure C33). Demand and advocacy for additional passenger rail lines in the Dallas/Ft. Worth area increases pressure for use of the freight rail lines for non-freight purposes. There is potential conflict between the forecasted increase in goods movement and increased demand for passenger rail.

Table C17 lists all the freight rail facilities in the north Texas area. The long-term plan to share or convert some existing freight lines to passenger rail requires upgrades to the rail infrastructure. Inclusion of passenger rail as another transportation option for north Texas is seen as a way of reducing demand on the congested highways, thus helping with the movement of freight by trucks. Table C17 includes a column indicating upgrades needed to accommodate passenger rail service in the corridor. Upgrade needs are coded as follows:

- Rebuild track.
- Need double track.
- Need additional sidings.

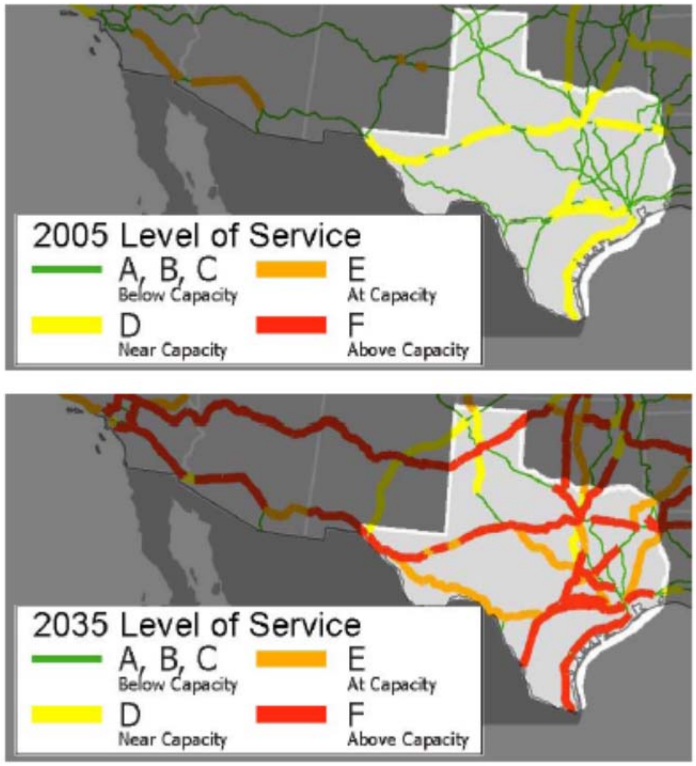
The evaluations of the freight corridors for passenger rail indicate the probable condition of the remainder of the freight rail corridor.

The expectations of continued increases in freight movement are also expected in areas outside of the major metropolitan region of Dallas/Ft. Worth. On US 287, a roadway linking Colorado and Dallas/Ft. Worth through the Wichita Falls region, the truck traffic volume is expected to increase, partially because of the establishment of additional manufacturing businesses in north Texas, such as Lockheed Martin's fighter jet manufacturing plant in Fort Worth.



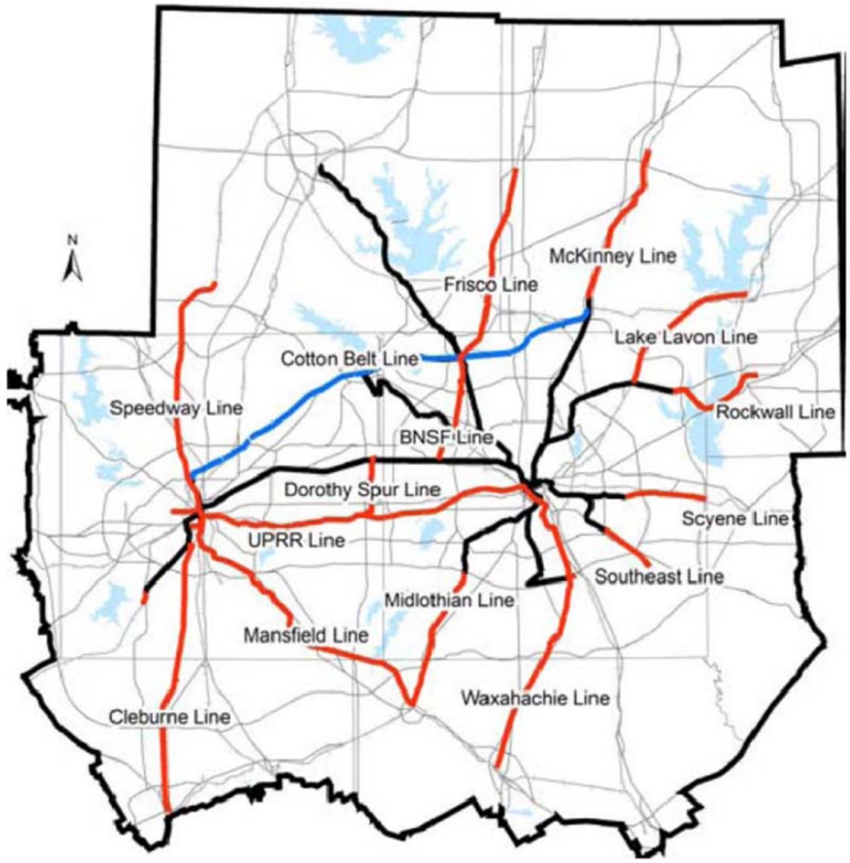
Source: NCTCOG, 2006

Figure C31: North Texas Railroad System



Source: Cambridge Systematics, 2007

Figure C32: Train Volumes Compared to Current Train Capacity 2005 v. Forecasted 2035



Source: NCTCOG, 2006

Figure C33: Map of the Existing Freight Corridors Proposed for Passenger Rail

Table C17: Characteristics of Rail Facilities in North Texas

Source: NCTCOG, nd

Rail Facilities	**Miles**	**Freight Usage**	**Condition**	**Passenger Rail Upgrades**
Class I Railroads				
BNSF				
BNSF Wichita Falls (Primarily used for transporting coal through Wichita Falls)	Between Fort Worth and Wichita Falls (continues past Amarillo to former Colorado & Southern)	Moderate	?	n/a
BNSF Corridor (Carrollton to Irving)	*10 miles	Moderate to High	Good/Fair	?
BNSF Alliance				
BNS Cleburne Corridor (from Fort Worth to Cleburne Intermodal Terminal)	*27 miles	Moderate to High	Good	2
From DART Blue Line terminus to Midlothian	*13 miles	Light	Fair/Poor	1,3
Between Carrollton to Frisco (Frisco Corridor)	*19 miles	Moderate to High	Good	2
Between ITC to Texas Motor Speedway	*24 miles	Light	Fair/Poor	2,3
Between South Port and Waxahachie	*19 miles	Moderate to High	Good	2
Union Pacific				
Between Downtown Fort Worth (Midlothian (Mansfield corridor).	*30 miles	Light	Fair/Poor	1,3
Between Fort Worth and Dallas	*37 miles	High	Good	2,3
UP — Operates via track rights over BNSF (Wichita Falls MPO)	Between Fort Worth and Wichita Falls and Fort Worth to Dalhart	Moderate	?	n/a
Kansas City Southern				
Lake Lavon Corridor (between Garland and Wylie)	*9 miles	Light	Fair/Poor	1,3
From Dallas to Meridian, Mississippi	Between Dallas and Meridian, Mississippi	?	?	n/a
* evaluated for passenger rail				

Table C17 continued: Characteristics of Rail Facilities in North Texas

Rail Facilities	Miles	Freight Usage	Condition	Passenger Rail Upgrades
Short Line Railroads				
Rio Grande Pacific Corporation's Wichita, Tillman & Jackson (WTJ)				
The railroad's name identifies the counties it operates in Texas (Wichita) and Oklahoma (Tillman & Jackson). This line connects to the BNSF on the north side of the Wichita River and then runs annually in a generally north direction to the city of Burkburnett and the Red River (Wichita Falls MPO).	Between Wichita Falls and Altus, OK	Interchanges 150,000 cars with UP and BNSF annually	?	n/a
* evaluated for passenger rail				

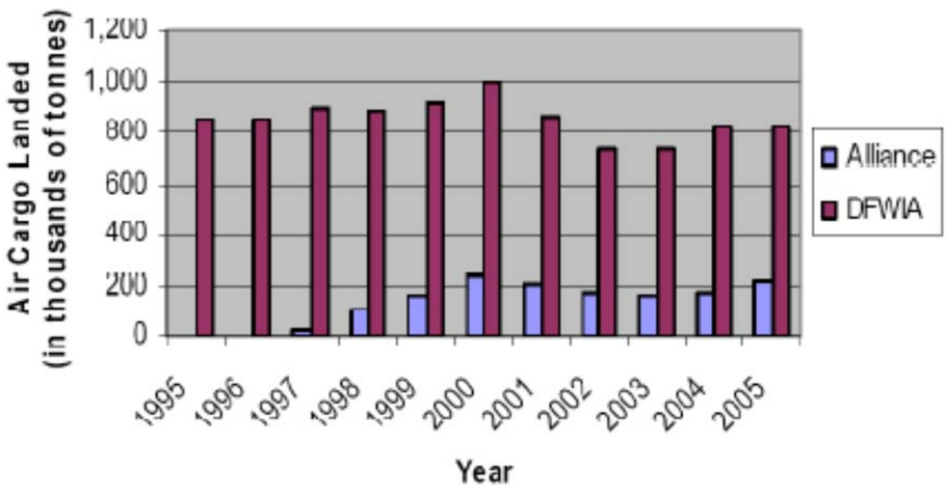
Air Freight Infrastructure

Of the air cargo facilities in north Texas, it is not the Ft. Worth Alliance Airport (a 100% industrial, non-passenger facility) that processes the most cargo; rather, it is the Dallas/Ft. Worth (DFW) International Airport. DFW ranked 20th in 2003 and 2004 for the value of imports and exports going through compared to all other freight gateways (air, sea and land ports) in the United States. Typically air cargo consists of high-value commodities, so although the tonnage of goods is small, their value is high. In the case of DFW, the most common commodities flowing through are high-tech products like semiconductors, computer equipment, aircraft parts, and medical and electrical equipment. Between 1999 and 2003, the value of shipments passing through DFW grew the most (by over 68%) compared to the other top 25 air, land, and sea gateways in the United States (Bureau of Transportation Statistics).

Table C18 lists the five major airports in the North Texas region with freight tonnage and their airspace capacity, existing infrastructure, and condition. Figure C34 shows how DFW has dominated the landing of air cargo in the north Texas region, even when Fort Worth Alliance entered the scene and began to increase tonnage landed. Passenger carriers include cargo on their planes, which may explain the higher tonnage being processed at DFW. Interestingly, the tonnage of air cargo landing at DFW has not increased but has fluctuated above and below 800,000 tons since 1995, suggesting either a maximum capacity has been reached or further efficiencies could be realized to increase the tonnage. Though not number one in the region for air cargo, Fort Worth Alliance Airport does rank as the number one industrial-only airport for tons of air cargo handled.

Table C18: Characteristics of Airport Facilities in North Texas

Airport Facilities	Freight Tonnage	Airspace Capacity	Infrastructure	Condition
Dallas/Ft. Worth International Airport	748,000 US tons of cargo in 2008 (international cargo: 292,000 metric tons in 2007)		Seven runways	Good
Ft. Worth Alliance Airport	242,656 US tons (enplaned and deplaned)	3,600 daily flights maximum capacity (in 2005, 1,950 daily flights)	Two runways (9,600 feet and 8,220 feet). An extension to 11,000 feet planned to accommodate larger international air cargo planes.	Good
Dallas Love Field	Limited air cargo	918 daily flights (in 2005, 643 daily flights)	Three runways: 8,800 ft long; 7,752 feet long; 6,147 feet long (all 150 feet in width); opportunity to develop additional runways to accommodate future demand does not exist.	Good
Wichita Falls Municipal Airport (Leases space and runways at Sheppard Air Force Base)	Limited air cargo	Daily use: 6–8 passenger flights	Capacity could increase at the air force base; 7,021 foot asphalt runway	Good
Kickapoo Downtown Airpark (Wichita Falls)	No scheduled air cargo flights	?	4,450 foot concrete runway (Wichita Falls MPO)	?
Lancaster Airport (Supports the Dallas Logistics Hub)	No scheduled air cargo flights	?	One runway, planned and FAA funded expansion of runway to 6,500 feet	?



Source: NCTCOG, 2006

Figure C34: Comparison of Air Cargo Landed at Alliance and DFW

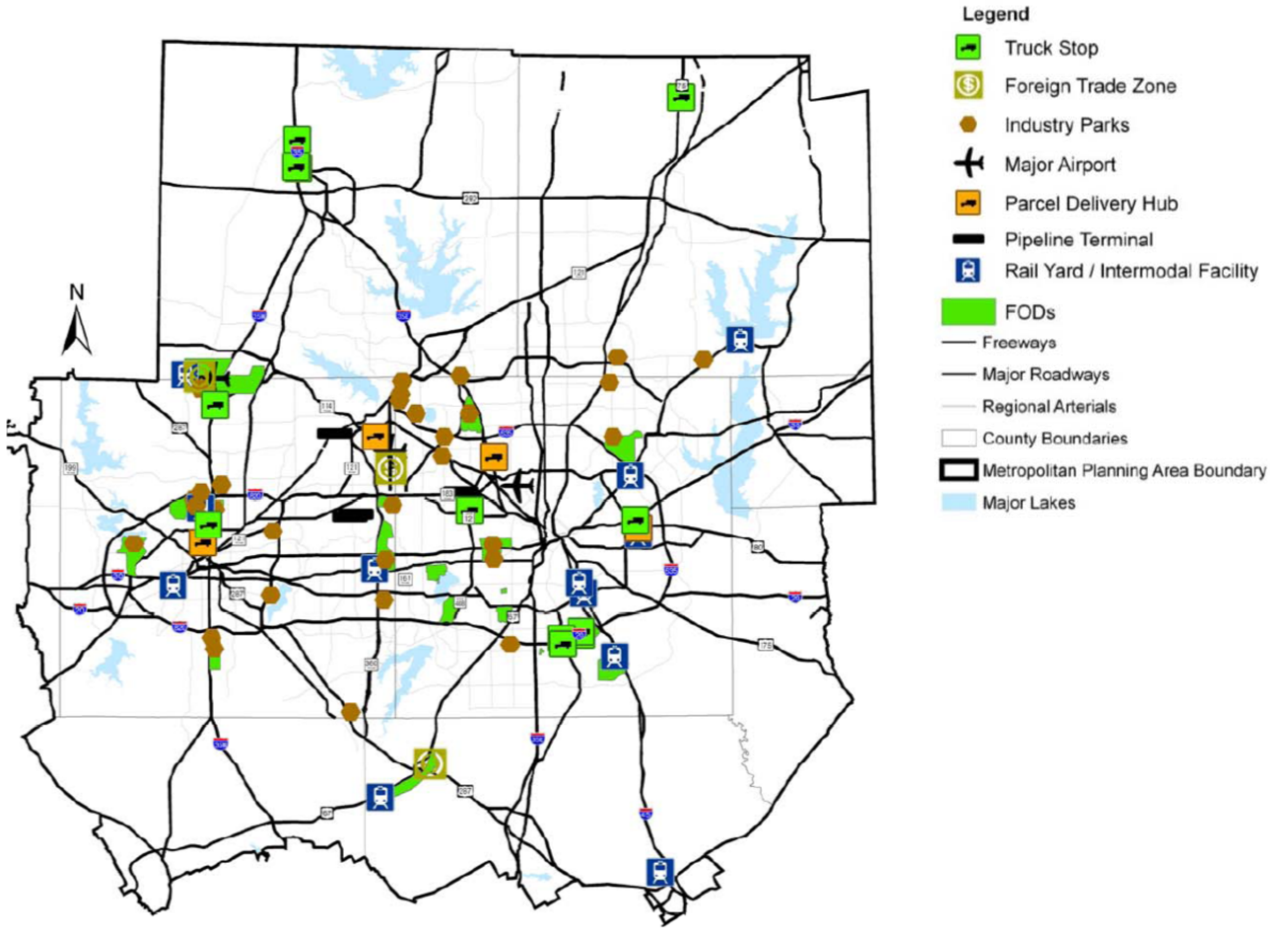
Intermodal Infrastructure

The website for BSNF's Alliance Intermodal Facility boasts a "1 day drayage to 48 million U.S. residents and 2 day drayage to 111 million U.S. residents," thus explaining why the Dallas/Ft. Worth area contains the most intermodal facilities within the IH 35 corridor area. Table C19 lists the major intermodal facilities in the Dallas/Ft. Worth area.

Table C19: Characteristics of Intermodal Facilities in North Texas

Intermodal Freight Centers	Service	Current Use	Forecasts/ Expansions
BSNF Intermodal and Carload Transportation Center at Alliance Airport	Direct Asian import/export from the West Coast. Includes FedEx Southwest Regional Sort Hub with daily flights to Asia.	540,000 container lifts in 2008; 13 double-stacked trains daily (AllianceTexas.com) 55 miles of track	Planned expansion to allow 2 million annual lifts.
Kansas City Southern intermodal terminal (Garland, TX)	KSC's line from Dallas leads to the Meridian Speedway, a rail corridor ending in Meridian, Mississippi.	Information unavailable.	Unknown.
Union Pacific Dallas Intermodal Terminal (adjacent to Dallas Logistics Hub, south of Dallas on IH 45)	Union Pacific rail services; 10-lane Automated Gate System entrance to reduce truck congestion; 24/7 operation. Most containers are overseas shipments arriving by UP train from LA/Long Beach port.	365,000 annual lift capacity; 294,000 annual lifts reported by UP to federal government in 2008	An additional intermodal facility operated by BNSF. Expandable to 600,000 annual lifts.
Union Pacific Intermodal truck-rail facility (Mesquite, TX and Arlington TX)	Serves General Motors (in Arlington) and Chrysler and Nissan (in Mesquite) automobile manufacturers.	Focus on auto lifts.	Unknown.
Union Pacific Miller Intermodal Facility (south of downtown Dallas, north of Dallas Logistics hub)	Union Pacific Dallas Intermodal Terminal replaces the smaller UP Miller facility.	Closed down.	N/A
Railport (south of DFW in Midlothian)	BNSF and UP and several freight carriers provide service.	A business and industrial park. Container stats not available.	Expansion of business park planned.

The National Highway System (NHS) Intermodal Connectors inventory lists roadways important for intermodal access to airports and other transportation facilities, such as Harmon Road at Ft. Worth Alliance Airport, Mockingbird Lane between IH 35 East and Dallas Love Field, and International Parkway at Dallas/Ft. Worth International Airport (Figure C35 and Table C20).



Source: NCTCOG, 2006

Figure C35: Map of Freight-Oriented Facilities in Dallas/Ft. Worth Area

Table C20: Demand and Capacity Comparisons of Selected Facilities in North Texas

Source: NCTCOG

Facility/Infrastructure	Current Demand	Current Capacity
Airports		
Ft. Worth Alliance Airport (Southwest Regional FedEx Sort Hub)	20 flights/day	Not exceeded.
Dallas-Ft. Worth International 47.9% air cargo handled by integrated carriers 32.1% handled by all-cargo carriers 19.7% by passenger carriers	1,950 flights/day	3,600 flight/day
Dallas Love Field Cargo from belly of Southwest Airlines and cargo on integrated carrier DHL planes.	643 flights/day	918 flights/day
Arlington Municipal Airport	Averages 1-2 flights per week for just-in-time materials for the GM assembly plant.	Not exceeded.
Other (smaller general aviation airports: Corsicana, Granbury, Grand Prairie and Lancaster)	None or very infrequent demand.	Runway length and/or strength restrict airport's air cargo capacity.
Intermodal Facilities		
BSNF Intermodal and Carload Transportation Center at Alliance Airport	600,000 container lifts	Current capacity of 1 million (North Texas Commission) and a planned expansion increasing capacity to 2 million annual lifts.
Union Pacific Dallas Intermodal Terminal (adjacent to Dallas Logistics Hub, south of Dallas on IH 45)	350,000 annual lifts	365,000 annual lift capacity
Right-of-Way		
Rail lines	See *Diagram 1* for current level of service for rail.	See *Diagram 1* for current level of service for rail.
Highways	See *Diagram 2* showing intra-city routes with a high percentage of truck traffic. *Table 4* shows the long haul demand.	See *Diagram 3* showing the congested routes, revealing where demand exceeds capacity within the city. *Table 4* show the capacity of roadways used for long haul routes.

Waco/Killeen Region

Waco and Killeen do not have any unique trade corridors. However, due to their proximity to IH 35 (Killeen is easily accessible to IH 35 via US 190) and their position between Austin and Dallas/Ft. Worth, these two cities reside within the same trade corridor as Austin.

Roadway Infrastructure

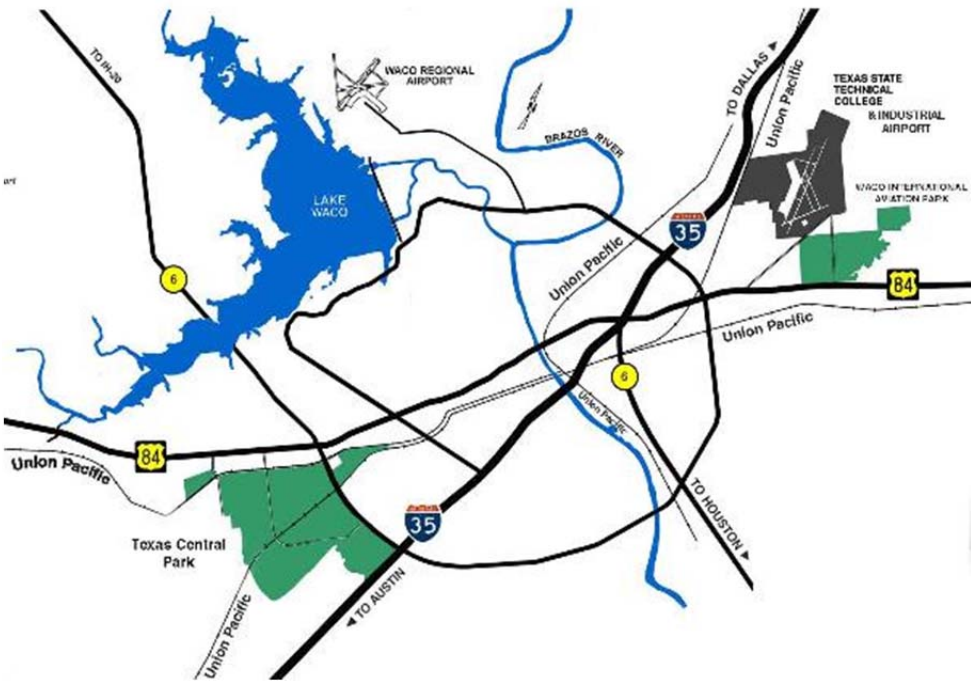
The Waco/Killeen region's infrastructure inventory consists primarily of roadways, with some rail facilities and small-scale, but multi-option, air freight infrastructure. As of the end of 2007, the area actually had more centerline miles than its neighbor to the south (3,430.562 miles), but had fewer lane miles at 7,716.202. Also like the Austin region, the two most populous counties, McLennan and Bell, account for over a third of the centerline miles and over 40% of the lane miles (TxDOT, 2007). As of 2005, the majority of lane miles within the Waco MSA were local streets (69.2%), while only 3.2% were of either interstate or expressway classification (Table C21). Using this infrastructure is over 30 motor carriers with facilities in the Waco MSA (Greater Waco Chamber of Commerce, 2009) (see Figure C36).

Table C21: Waco MSA Lane Miles Classification Percentage (2005)

Source: Waco Metropolitan Planning Organization, 2005

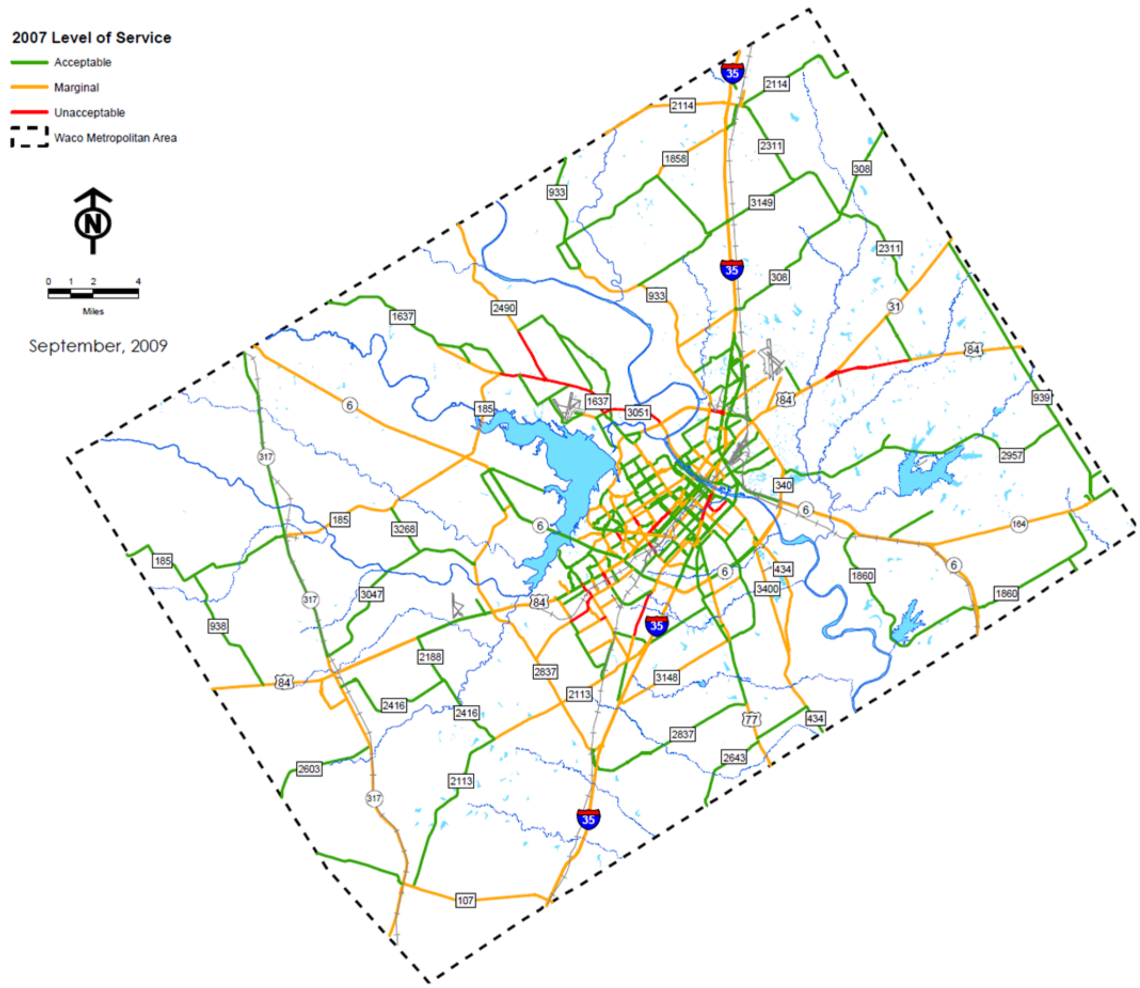
Classification	% of Lane Miles
Interstate (Main Lanes Only)	2.60%
Other Expressways (Main Lanes Only)	0.60%
Principal Arterials	4.89%
Minor Arterials	7.00%
Collectors	11.60%
Frontage Roads	4.30%
LxaI Streets	69.20%

According to the Waco 2035 plan, the Waco MSA's road system ranked mainly between a grade of marginal and acceptable as of 2007, meaning the roads lie between free flowing and congested. A smaller portion of roads, mainly freeway or major arterials and within suburbs on the periphery of the MSA, were classified as heavily congested as illustrated in Figures C36 and C37.



Source: Greater Waco Chamber of Commerce, 2009

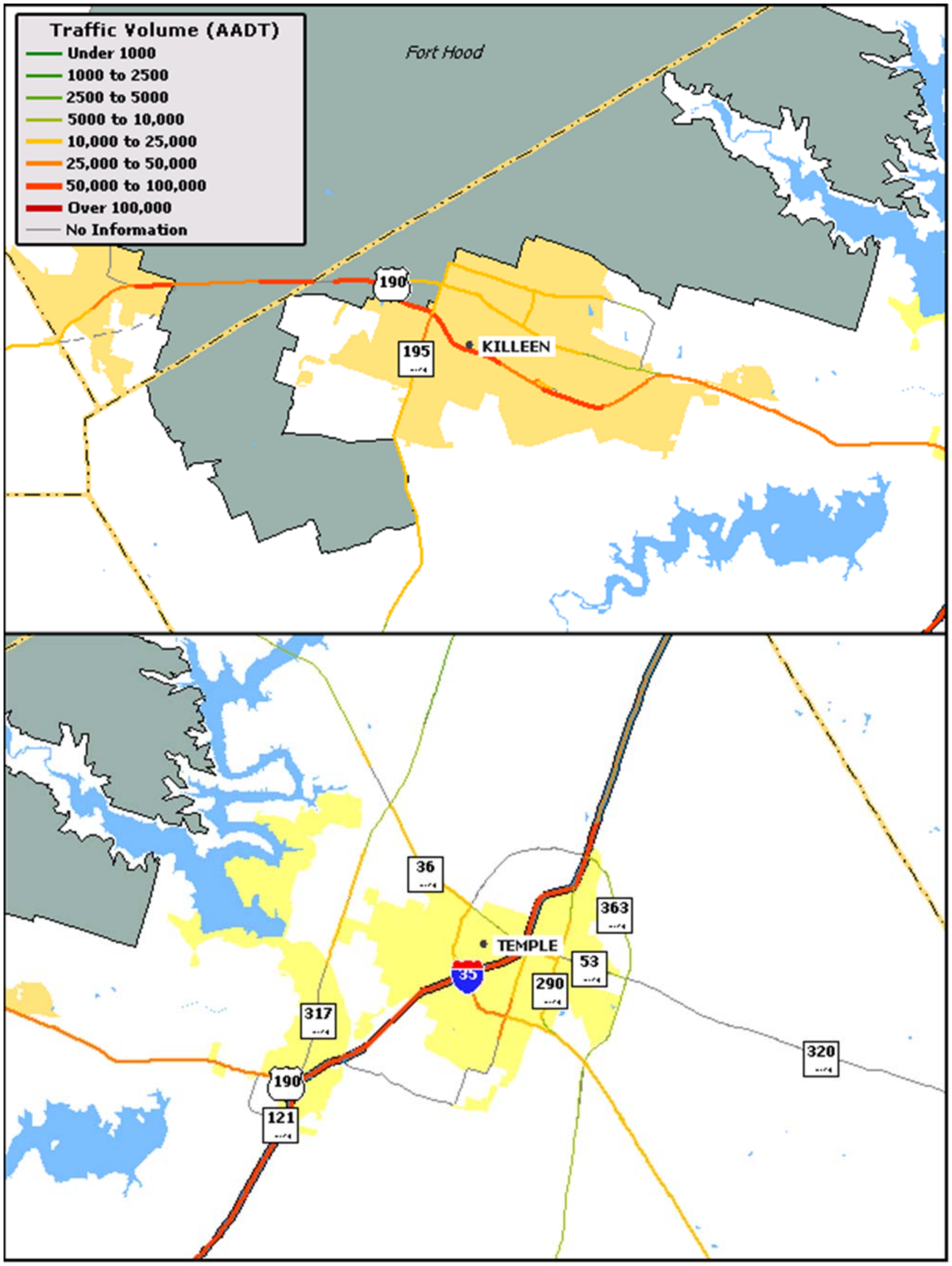
Figure C36: Map of Major Transportation Networks in Waco Area



Source: Waco Metropolitan Planning Organization, 2010

Figure C37: Waco 2007 Roadway Level of Service

The Killeen/Temple MSA does not have as much detailed information pertaining to capacity and level of service; however, the Federal Highway Administration's (FHWA) Office of Planning, Environment, and Realty Executive Geographic Information System (HEPGIS) maps volume data in map form for the entire U.S., including the Killeen area. The data is subject to the color ranking system that the FHWA uses and is limited to major routes, but it does give some insight into the MSA's general status as being intermediately congested on the freeways/expressways (see Figure C38).



Source: Federal Highway Administration, 2005

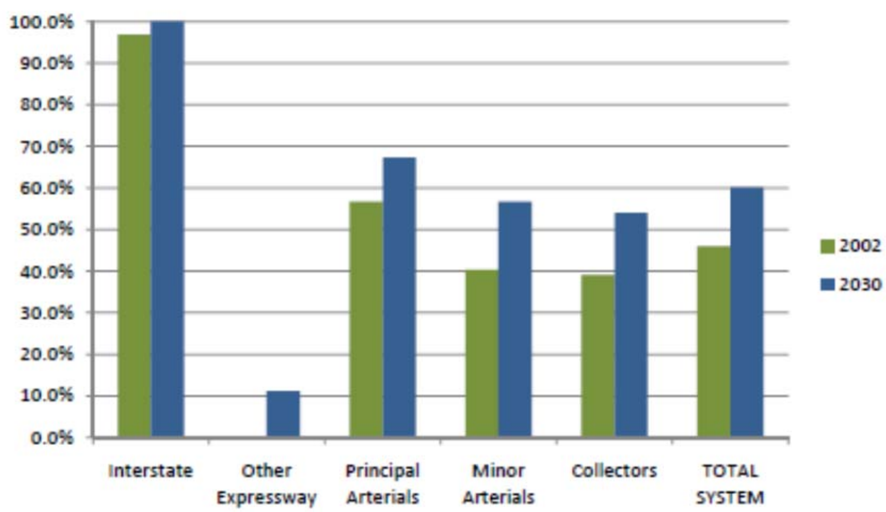
Figure C38: Killeen/Temple 2005 Traffic Volumes

Like the rest of the IH 35 corridor, the Waco/Killeen region is predicted to see an increase in both truck and rail traffic traveling through the area. Like Austin, little of this freight is likely leaving or arriving in the area, instead passing through between major markets. Transport between San Antonio and southward to the Dallas Fort Worth MSA is the prime reason for this, seeing almost a doubling in tons shipped along the IH 35 corridor by 2020 for both truck and rail freight, as shown in Figure C39 (Saenz, 2008).

Source: Saenz, 2008

Figure C39: Truck Shipments by Weight Forecasted for 2020

Waco's 2030 plan predicts that without significant capacity additions, these freight trends and other growth will cause the roadway system to see a drastic rise in heavily congested roads and additional marginal grades. As with other cities, major routes are what will make up most of the heavily congested sections. See Figure C40.



Source: Waco Metropolitan Planning Organization, 2006

Figure C40: Waco MSA Marginal/Unacceptable Level of Service Breakdown 2002 vs. Projected 2030

Rail Infrastructure

The region is served by two Class I railroads in BNSF and UP, and is also serviced by the local railroad Temple & Central Texas Railway (TC). There are no figures as to the amount of track infrastructure in the Waco region; however, the TC local line states it operates over 10 miles of track that link the Central Pointe Rail Park in Temple to Class I rail (Patriot Rail Corp., 2009). The Waco 2030 plan does sum the number of grade intersections in McLennan County in 2005, noting 95 at-grade intersections and 22 grade-separated intersections (Waco Metropolitan Planning Organization, 2005). Lastly, both BNSF and UP do have a fair amount of grain elevator facilities in the region, most likely due to its more rural characteristics. See Table C22.

Table C22: Waco Region Grain Facilities

Source: UP, 2009a; BNSF, 2009

Municipality	County	Railroad
Bartlett	Bell/Williamson	UP
Clifton	Bosque	BNSF
Crawford	McLennan	BNSF
Eddy	Falls/McLennan	UP
Heidenheimer	Bell	BNSF
Hillsboro	Hill	UP
Holland	Bell	UP
Itasca	Hill	UP
McGregor	McLennan	BNSF
Moody	McLennan	BNSF
Temple	Bell	UP
Waco	McLennan	UP
West	McLennan	UP

There are also no statistics in terms of traffic capacity; however, the Waco 2030 plan does give some statistics on the number of trains running in McLennan County as of the time of the report. Roughly 81 Class I trains run through the county per day, averaging roughly 15.8 trains per major lines defined in the study (Waco Metropolitan Planning Organization). In terms of weight capacity of the rail, UP's tracks handle anywhere from 268,000 lbs. (143 tons) to 315,000 lbs. (158 tons) and permits cars and unit trains (Union Pacific, 2009b), while BNSF's range in capacity depends on the setup of the train (see Table C23).

Air Freight Infrastructure

The region has a surprisingly diverse aviation network, especially for its size. There are two commercial airports, with one in Killeen (Killeen-Fort Hood Regional Airport) and one in Waco (Waco Regional Airport, 2009), and several smaller local airports that have freight impacts as well. The Killeen airport contains a 10,000 ft. runway in order to handle military, space shuttle, and government planes and has three air freight companies onsite (Copperas Cove Economic Development Corporation).

Table C23: Waco/Killeen Region BNSF Weight Capacity Map

Source: BNSF, 2009

Setup	Map	Capacity (for 4 axle cars)
C6 Hoppers, Jumbo Tank, CoilCare, Flats, Gondolas		315,000 lbs. (pink) : min. length of 49'6" 286,000 lbs. (blue) : min. length of 44'11"
Hoppers, Tank Cars, Gondolas		286,000 lbs. (blue) 272,000 lbs. (yellow) car lengths between 43'0" and 44'10"
Cement Hoppers, Tank Cars		286,000 lbs. (blue) 268,000 lbs. (red) car lengths between 41'0" and 42'11"
Hoppers, Tanks, Ore Gondolas (39' to 40' 11" in length)		286,000 lbs. (blue) 263,000 lbs. (green) 246,000 lbs. (orange) car lengths between 39'0" and 40'11"
Hoppers, Tank Cars (37' to 38' 11" in length)		282,000 lbs. (light blue) 246,000 lbs. (light green) 234,000 lbs. (light orange) car lengths between 37'0" and 38'11"
Hoppers, Tank Cars (35' to 36' 11" in length)		268,000 lbs. (red) 234,000 lbs. (light green) 220,000 lbs. (light blue) car lengths between 35'0" and 36'11"

The airport is reported to have processed 775,920 pounds of inbound/outbound freight in 2008, of which it is not clear if this figure includes any military freight (Bureau of Transportation Statistics, 2008).

The Waco airport is relatively small compared to Killeen, with its largest runway measuring 6,600 feet and its inbound/outbound freight totaling only 8,467 pounds in 2008 (Bureau of Transportation Statistics, 2008). This is probably due to there being two other local airports offering air freight services. The Texas State Technical College Airport (8,600 ft. and 6,400 ft. runways) is home to a regional freight facility for DHL, while the McGregor Executive Airport (5,100 ft. and 3,400 ft. runways) contains a limited regional air freight facility for UPS (Waco Metropolitan Planning Organization, 2005). Freight weight reports were not available for these airports.

Intermodal Infrastructure

Other than air-to-truck transport at cargo handling airports, no documented intermodal-dedicated facilities were found in the area.

In a study done to designate critical freight corridors in Texas for prioritizing deployment of Intelligent Technology Systems (ITS) systems, all counties were evaluated by weighted criteria designed to identify counties with freight-oriented economies (Craig and Walton). The selection criteria assumed that counties with freight transport facilities and high levels of income from the manufacturing, farming, mining, retail, and wholesale industries relative to other counties should be considered part of a critical freight corridor. Industry income data originated from the Regional Economic Information System (REIS). Those five industries included in the selection criteria are considered to have a high demand for freight transportation. Table C24 presents the weighting of each criteria and the reason for their inclusion. The selected industries capture some of the types of commodities included in the trip generation step of the State Analysis Model, mentioned earlier confirming the significance of those industries in generating demand for freight transportation.

Table C24: Industry and Freight Facility Criteria for Designating Economically Significant Counties

Source: Craig and Walton, 2002

Type	**Results Relevant to Central and North Central Texas Region Economic Activity**
Economic Activity	
Manufacturing	Counties in and around Dallas/Ft. Worth, Wichita Falls and Austin were part of the group with the highest manufacturing income. Mentioned in the first of this series of reports is the finding that electronic, motorized vehicles and precision instruments ranked as the highest in value originating from the Dallas/Ft. Worth MSA, and base metal and machinery the highest in tonnage, coinciding with the high manufacturing ranking.
Farming	Counties with relatively high farming income reside in the Panhandle and east Texas region, and not in this region
Mining	The area from Dallas to Longview contains a cluster of counties with a high mining income.
Retail	Not surprisingly, the counties with the highest retail income also have large populations. Dallas and Austin easily received high scores for income from this industry with the north central region of Texas containing the largest cluster of high-retail income counties
Wholesale	Counties along the lH-35 corridor in central and north central Texas scored high in wholesale income, even in the rural areas.
Intermodal Facilities	
Port	In central and north central Texas, there are no marine ports, but the Alliance intermodal facility near Ft Worth is considered an inland port.
Airport	Dallas and Tarrant counties and Travis counties received the highest scores for having a major airport.
Truck/Rail	Only Dallas and Tarrant counties in the study region received the highest score for truck/rail facilities. Central Texas does not have intermodal facilities like north central Texas.
Border Crossing	Not applicable to central and north central Texas region.

Overall, counties in the central and north central Texas region, especially around the IH-35 corridor and Wichita County, where the city of Wichita Falls is located, scored very high and as expected were included in the designated critical freight corridors. The statewide rankings of the counties confirm the importance of the central and north central region of Texas in the transport of goods and freight demand.

Critical Freight Needs and Issues

Austin Region

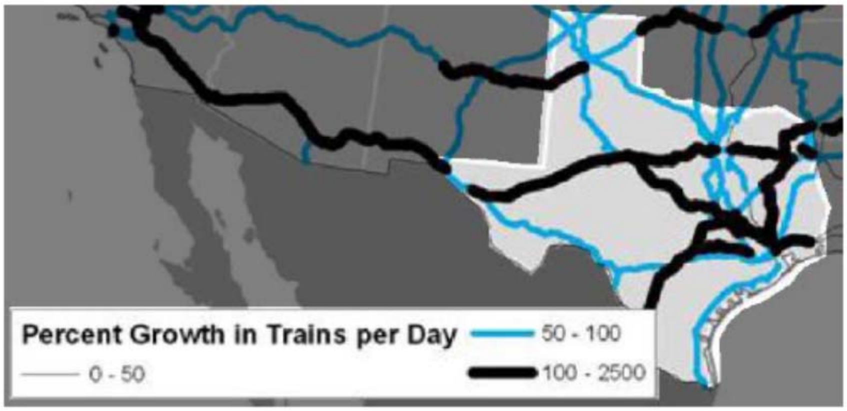
Roadway networks are the central concern of the Austin region. Prediction maps from both CAMPO's freight study and mobility plan show an increase in congested and severely congested segments. Although the base years used in both the congestion maps and freight traffic maps do not include new toll ways in the area, the prediction maps do include new toll roads, which may make the situation even more alarming.

The Bureau of Transportation Statistics shows that Austin's travel time index (TTI) has been steadily increasing between 1982 and 2005 (Bureau of Transportation Statistics, 2007), which coupled with the previously mentioned congestion maps paints a disturbing trend. Probably the leading roadway concern for the area is IH 35's congestion, especially in terms of trucking volume. One of the goals for the creation of the SH 130 bypass was to reduce truck traffic on IH 35, allowing for a better flow of traffic. However, while CAMPO's freight report documents that SH 130's percentage of traffic will be heavily composed of trucks, the volume on SH 130 in comparison to IH 35 is significantly lower in the 2035 prediction. TxDOT has previously stated that toll usage is above expected levels, although there is little data available as to actual truck usage of the bypass due to completion of the route just recently. Anecdotal evidence suggests that truck traffic has not been as high as expected.

Although IH 35 is certainly the region's primary bottleneck for all types of freight movements, areas that most likely handle intra-city and to/from shipments also see significant congestion. Currently there is no free-flowing access from IH 35 to MoPac on the southern end of Austin, putting pressure on local arterials and access roads to gain access to the western side of the Austin region. This issue has been addressed on the northern end of the area with the addition of the SH 45 tollway and tolled extension of MoPac connecting to SH 45, but no such flow exists between MoPac and IH 35, US 290, or Loop 360 in the southern half of the region. Forecasts again predict that by 2035 many important east/west arterials will be seeing significant freight vehicle volume, which is likely due to the access issue presented here. In addition, areas west of Austin, between MoPac and Lake Travis, that are experiencing significant growth are expected to contain many of Austin's congested roadways by 2030. Roads such as RM 2222, RM 620, and the area containing the merger of US 290/SH 71/MoPac already are classified as congested and will contribute to the western area's abundance of congested roadways according to the previously mentioned 2030 predictions.

Austin is serviced by two Class I railroads (BNSF and UP) and two regional railroads. Its airport, Austin-Bergstrom, contains a "state-of-the-art" cargo facility and has serviced up to 357.3 million pounds of cargo within a given year (Greater Austin Chamber of Commerce Transportation, 2009c).

The Austin region's rail concerns are similar to its roadway concerns, except the infrastructure currently in play is far less prevalent than that of the roadway system. UP is the dominant carrier in the area and is the focus of most of the discussion when it comes to rail concerns for Austin. Oddly enough, capacity and usage is not what appears to drive this discussion, even though it is predicted to be a major issue in the years to come. Rather, the desire to implement a regional commuter rail between Georgetown and San Antonio is what has spurred the debate over UP's rail. Either way, rail through the area is in need of attention, as the usage is expected to rise significantly, as Figure C41 shows. Much like the rest of Texas, the National Rail Freight Infrastructure Capacity and Investment Study anticipates the area's rail to decrease from an already concerning "D" average rating for its capacity vs. usage to a critical "F" rating, which is the lowest score given. CAMPO's 2030 mobility report lists sharp turns, poor grades, and single-track segments (specifically on the Colorado River bridge) as the main contributors to slow speeds required for passing through Austin, which ultimately reduces the capacity and frequency of trains on the network at a time when demand is expected to surge.



Source: Cambridge Systematics, 2007

Figure C41: Percentage Growth in Trains per Day from 2005 to 2035 by Primary Rail Corridor

In 2008, CAMPO and TxDOT commissioned a freight transportation study to analyze freight capabilities and needs (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008). The study included rail, air, and roadway transportation, but most of the focus is mainly on roadway transportation structure due to the majority of freight being moved via roadway. Some of the main points identified in the report that pertain to transportation needs include:

- The area is served by Class I railroads, yet there were no rail yards for them as of the time of the report. Local short line railroads must perform transfers at interchange yards in the area.
- Rail traffic through the area, mainly to/from Mexico, has increased without any increased rail structure.
- Despite a decrease in air cargo since 2000, an average increase of 7% is expected through 2020.
- Almost 95% of freight tonnage within the area was moved via truck in 2003.
- Major roadway capacity, roadway width, ramp/interchange access, and accident concern were the top concerns of a survey of roadway freight organizations.
- By 2035, most major roadway routes for freight will be used beyond the defined capacity, even with planned improvements.
- Safety of at-grade railroad crossings has been questioned.

Roadways are the primary concern for the area when it comes to increasing freight transportation capabilities. Ideally the creation of SH 130 will reduce the area's reliance on IH 35 for pass-through freight transportation; however, the study shows that IH 35 will remain as the primary freight route in terms of freight vehicles per day (MACTEC Engineering & Consulting, Inc. and Alliance Transportation Group, Inc., 2008).

Although the study does not directly state that additional rail freight capabilities should be expanded, the inclusion of Class I rail yards may help in increasing the use of rail vs. roadway transport. These facilities could be designed to be more intermodal between truck and rail, which would be much more efficient than local rail transfers. Contributing to other rail-related infrastructure may also be helpful given the estimated shipments by weight in 2020 (Saenz, 2008).

Air cargo capacities appear to be of little concern compared to road and rail. As mentioned earlier, Austin-Bergstrom's cargo capacity is over 300 million pounds, which would be sufficient to handle the predicted increase formed in the study.

North Texas Region (Dallas/Ft. Worth and Wichita Falls)

The north Texas region's major freight issue is congestion caused by bottlenecks and the shared high demand of passenger and freight traffic on the ground (road and rail). Trucks dominate in the North Texas movement of goods. Most trade movement (83% of the $87.8 billion trade value) between the U.S. and Mexico predominately occurs by truck, and the northbound truck traffic from Mexico through the U.S. continues to increase at a rate of 3.76% (Saenz, 2008). The primary highway route used is IH 35, which runs from the Mexico border to Canada through Austin, Waco, and Dallas/Ft. Worth, make it the major NAFTA trading corridor. Though rail's share of the international trade movement is less, use of rail increased steadily between 2003 and 2006 with an average annual rate of about 10%. For both modes, parts of the North IH 35 area present challenges for the growing freight rail and truck movement. IH 35's current congestion levels and the recent and forecasted growth of goods movement means the region must respond either by accommodating the additional growth or by restricting or diverting the movement away from the congested highway corridor or a combination of both.

This section of the report outlines the major freight transportation needs in north Texas, as identified primarily by the extensively researched NCTCOG Mobility 2030 report. The amount of staff and resources at the NCTCOG dedicated to freight planning reflects the region's importance in the movement of goods. The Bureau of Transportation Statistics ranks the top 25 U.S. freight gateways ranked by value of shipments, and in 2006, Dallas/Ft. Worth ranked 17th. Only the international port cities of Laredo (6th), Houston (7th), and El Paso (14th) in Texas ranked higher (Research and Innovative Technology Administration, 2004). As the home to Alliance, the largest inland port in the U.S. and a major node on the IH 35 trade corridor route, the freight transportation needs in the Dallas/Ft. Worth area command attention. The top four issues are listed below.

1. Removing bottlenecks for rail, especially at Tower 55: A freight rail intersection called Tower 55, located underneath the IH 35W and IH 30 interchange, is a major bottleneck for freight rail in north Texas. Through and turning movements at the intersection made by the 100 to 120 freight trains going through Tower 55 result in delays of up to 90 minutes per train to cross the intersection (North Central Texas Council of Governments). NCTCOG has initiated a "Tower 55 Rail Reliever Study" to explore solutions to a problem affecting several public and private sector users of the intersection and NCTCOG plans on conducting a full formal environmental study to evaluate the

feasibility of various solutions. Some of the solutions include new rail bypasses and at-grade improvements.

2. Reducing congestion and bottlenecks experienced by truck traffic: Trucking is the dominant mode of intercity commodity transport in the Dallas/Ft. Worth area. Landlocked Dallas/Ft. Worth does not have marine freight transportation, so trucks move 87% of the goods (237,442,000 tons), railroads 12% (33,454,000 tons), and aircraft 0.3% (840,000 tons) (Federal Highway Administration, 2009a). Cars are the dominant mode of transport in the area so congestion created by passenger and freight traffic sharing road facilities is one of the major challenges facing the area is congestion. According to NCTCOG, truck traffic is increasing twice as fast as automobile traffic. The Regional Transportation Council, the policy board for the North Central Texas Metropolitan Planning Organization, recommends an Outer Loop/Rail Bypass Corridor to relieve freight rail and truck congestion (North Central Texas Council of Governments, 2009).

3. Reducing hazardous materials freight movement incidents and improving safety protocol: In 2007, though the amount of hazardous waste transported in the Dallas/Ft. Worth area does not come close to the large amounts transported around the Houston area, the county of Dallas experienced the highest number of hazardous material incidents, some of which occurred on roadways (see Table C25). There is currently a need for a transportation plan that will improve the safe transport of hazardous material in the area.

Table C25: 2007 Top 10 Texas Counties in Hazmat Incidents

Source: Texas Transportation Institute

Rank	County	# Incidents	%
1	Dallas	516	33%
2	Harris	301	19%
3	Tarrant	118	8%
4	El Paso	117	8%
5	Bexar	57	4%
6	Lubbock	35	2%
7	Webb	33	2%
8	Jefferson	32	2%
9	Guadalupe	24	2%
10	Taylor	24	2%
Total		1,257	81%

4. Long-term international shipping changes and the impact on freight movement in Texas: IH 35 serves as a major artery for the truck traffic associated with international goods movement, and that highway extends through the middle of the Central Texas and Metroplex regions. Any additional trade movement originating from Houston and Laredo will affect the region. The “International Trade Corridor Plan” prepared by the Texas Transportation Institute (TTI) showed that the truck and rail ton and ton-miles volume in 2002 and 2020 are forecasted to increase for all routes include that of Dallas. TTI expects the tons of imports and exports traveling between Houston to Dallas to increase from

3.52 million tons to 5.94 million tons. Rail and truck traffic between Laredo and Dallas is forecasted to increase 77% between 2002 and 2020 (Saenz, 2008). The forecasted doubling of tons characterizes all the truck highway routes from major cities to the Dallas area.

Changes occurring in other parts of the United States are anticipated to affect the north Texas area. The lure of economies of scale is increasing ship size and pushing for the expansion of the Panama Canal, thus opening up an all-water route between the Gulf Coast and Asia. This expansion may cause Gulf Coast ports to start seeing additional international container traffic, with those containers expected to flow through the Dallas/Ft. Worth area. The NCTCOG's efforts in removing known bottlenecks and addressing congestion reveal the region's awareness of the anticipated growth in freight movement.

Despite the proximity of Wichita Falls MSA to IH 35, truck congestion is currently not an issue in the area. UP and BNSF also have rail lines going through the area. The Wichita Falls MPO specifically states freight planning is a priority for their organization and will focus on monitoring the movement to evaluate its impact, growth, and needs (Wichita Falls Metropolitan Planning Organization, 2009). The Wichita Falls MPO Mobility Plan did not mention any specific freight transportation needs, except for monitoring the transport of hazardous material in the region to determine if hazardous material routes should be designated (Wichita Falls Metropolitan Planning Organization, 2009).

Waco/Killeen Region

In 2005 the Waco MPO predicted by 2030 roughly 60% of the roadways in the area would be at an unacceptable level of service (Waco Metropolitan Planning Organization, 2005). Leading the way is IH 35, which is predicted to see the lowest level of service for its entire stretch through the Waco area by 2030 if vast improvements are not made. This is most certainly due to pass through traffic between southern portions of Texas and Dallas/Ft. Worth. Aside from service levels for IH 35, a few of the area's structurally deficient bridges also put attention on IH 35.

In addition to IH 35, US 84 west of Waco and SH 6 east of the area, which were both starting to see low levels of service in 2002, are expected to see worse service grades as well. The central area of the city and the northwest quadrant are also expected to join this group of poor service. The northwest sector will likely see congestion issues arise due to the location of the region's commercial airport and lack of major roadways to access the airport. However, this should not have a significant impact on freight transport, as the Waco Regional Airport has seen a dramatic decline in cargo handling with the emergence of the TSTC Airport and the smaller McGregor Executive Airport that handle the area's air freight. However, despite these two airports being located on some of the Waco region's major highways, they may be a source of some of the decrease in service predicted for IH 35 and US 84, which are the roadway links to the airports.

The Waco area is serviced by two railroads, BNSF and UP, and over 30 motor companies (Greater Waco Chamber of Commerce, 2009), while Killeen is serviced only by BNSF for rail and a few roadway freighters. Most of the Waco region's transportation planning and anticipation is created by the 2030 Waco Metropolitan Transportation Plan, which is produced by the Waco Metropolitan Planning Organization (Waco Metropolitan Planning Organization, 2005). The plan does not specifically mention any freight-specific plans related to roadways, but does provide a small amount of coverage in respect to rail services. Air cargo considerations do not appear to be a concern.

Although roadways are not analyzed with freight in mind, vehicle volume is expected to increase to the point where "60% of the system is projected to be operating at a marginal or unacceptable level of service" (Waco Metropolitan Planning Organization, 2005). Just like in most of the regions within the IH 35 Corridor, the interstate is the main focus.

Killeen is somewhat of a spur location due to its location off of IH 35. Thus the major connector, US 190, sees the bulk of the traffic and is the main source of volume. Although this route has been made into an expressway, at-grade access by crossing roads and entrance ways still exists and may be an issue with the volume of traffic traversing between Killeen and IH 35. Temple and Belton, which straddle IH 35 in the area of where US 190 connects, have similar volume concerns as Waco and other IH 35 cities, while also sharing the same concerns the Killeen area has with US 190. Killeen's freight transportation needs are heavily dependent upon the military's utilization of the base. Fortunately, US 190 between the area and IH 35 has been developed into a freeway to allow better access.

Rail concerns in the area are similar to that of Austin and other parts of the state. As shown earlier, Texas railroads are expected to see a significant percentage jump in trains per day, and the Waco/Killeen area is no exception. Most of the rail in the area saw relatively good levels of service as of 2005, scoring between an "A" and a "C." Despite this above-average level compared to Austin and Dallas, service grades are expected to plummet to "E" and "F," which is on par to what Austin and Dallas are expected to see.

As mentioned earlier, the airports in the region are not of much concern when it comes to freight issues. Waco has two airports that handle freight, of which one has a relatively large installation (TSTC), while Killeen and Fort Hood appear to utilize the Killen-Fort Hood Regional Airport quite well. Road access may be the main concern for the two regions, as all three airports lie on segments that see high traffic volume. Also, no airport appears to have rail access capabilities despite two of them (Killeen and TSTC) being located very close to Class I rail.

Policies and Strategies to Address Needs

Austin Region

As discussed earlier, one of the glaring disconnects in roadway shipping is the high truck volume utilizing IH 35 but low predicted volume of truck traffic utilizing the new SH 130 bypass system. To combat some of the previously mentioned issues surrounding this network concern, transportation authorities could investigate or implement some of the following:

1. <u>Reduced truck toll rates on SH 130 during peak congestion:</u> The likelihood of toll rate reductions being instituted across all types of vehicles is unlikely, as the system has undoubtedly been priced in order to keep the toll system financially viable. But reducing the toll rates for trucks during peak congestion periods could entice truck drivers to utilize the bypass, thus keeping slow moving trucks out of the high volume of passenger vehicles using IH 35 during these periods. This approach could potentially increase revenue for the bypass as well, as there may be a demand/supply rift with the current pricing model.

2. Provide travel time and fuel savings estimate comparisons: If using the bypass during congested periods would result in the saving of time and fuel, less stopping, and a more consistent speed profile, adding an electronic notification sign ahead of the bypass (on either end) could better inform truckers of a more economical option. Larger trucking companies may already calculate such situations, but this is not a guarantee and may exclude the many smaller trucking companies and independent drivers. Thus, such a system could help eliminate a lack-of-data issue that may exist.

3. Implement electronic tolling on IH 35 during congestion periods: Instituting what has been deemed as a "smart" tolling system on IH 35 could convince all pass-through travelers to consider SH 130 as a better option. However, this may place a heavy burden upon travelers and shippers whose destination is Austin. For freight, this could have a negative impact on the local economy, as it could cause an increase in prices of goods sold within the area or leaving the area, making them less economically competitive. It is suggested that the first option on this list be explored first, as it could achieve the same effect without similar consequences. Additionally, this approach would certainly receive a very harsh response from the many users in the area and beyond. The application of tolls to existing infrastructure in central Texas has been met with significant displeasure, as exemplified by efforts to toll Loop 1604 in San Antonio. Even if all of these concerns were eliminated, the next bullet point would almost certainly need incorporation to handle travelers whose destination is the greater Austin area.

4. Provide better access from SH 130 into the city: Increasing the capabilities of connector routes from SH 130 into Austin may make the tollway a more viable option for those whose destination is the Austin area. Currently there is only one freeway connection between SH 130 and urban areas (SH 45 in Round Rock). There exist other major area highways and arterials, but they are not free of things such as traffic signals and cross-traffic. Potential candidates for such development would include US 183 southeast of IH 35, US 290 east of IH 35, and SH 71 between East Riverside Dr. and SH 130 (which includes the small interchange between US 183). According to the Central Texas Regional Mobility Authority (CTRMA) through its Manor Expressway website, US 290 is going to be experiencing expansion expected to begin in 2010 and be completed in 2012 thanks in part to a dedication of federal stimulus funds. CTRMA does list the segments of US 183 and SH 71 listed above as planned tolled upgrades for future development, but funding restraints have kept these projects in the planning stages.

5. Investigate supply and demand of refueling stations as a deterrent to trucks using the bypass: Through anecdotal experience and simple searches via Google Maps, SH 130 appears to lack frequent accessibility to trucking refueling stations compared to IH 35. There are large truck stops to the north and south of Austin, but if SH 130 is meant to be a major truck carrying route it would be potentially wise to encourage refueling stations that cater to trucking. If such an option would be deemed beneficial, additional consideration would need to be given to eliminating or reducing toll charges for accessing these facilities, as that could be a considerable barrier to their use even if there is a demand.

As a note, some of these ideas were briefly discussed by TxDOT, but it is unknown what became of them (TxDOT–Austin District). Aside from IH 35 and SH 130 concerns, additional roadway considerations for the Austin region's movement of freight could include:

6. Expand semi-rural highway capacity west of Austin: Expanding/upgrading important routes west of Austin such as RM 2222, Loop 360, RM 620, US 290, and SH 71 and the interchanges between them are important to avoid predicted increases in congestion, as the area has already grown to the point where these facilities are considered congested to some degree in 2007. This is especially true in the southwest region of Austin where US 290 and SH 71 merge/split, which is fed by MoPac traffic as well.

7. Promote small truck delivery in western Austin: Expanding roadway facilities in western Austin, as mentioned above, is almost certainly required, but other factors may play into what types of vehicles are allowed to traverse the region. There are a fair number of environmentally sensitive areas in this region, plus there are some topographic challenges as well. These concerns may require interchange facilities to downsize large tractor trailers into smaller trucks that can more easily and safely transport cargo within the area. However, this may end up placing more vehicles into the system if they cannot handle the demand, which would in turn contribute even more to the issues raised. Significant research would be required to ensure undesired consequences are not created from polices that were actually meant to protect and better serve the area.

8. Continue study into passenger rail: Although intra-city light rail came online in Austin in 2010, which could have an impact on localized passenger traffic, regional passenger rail options should continue to be studied. This could help take some passenger vehicles off of the heavily used IH 35 corridor between Austin and San Antonio, providing some ease to traffic encountered by freight vehicles. Further discussion as to the impact and consequences of commuter rail on freight rail will be discussed below.

Rail issues are somewhat tricky due to the convergence of public and private ownership and rights. However, with assistance from the Rail Relocation Fund and a growing desire for a commuter rail line between Georgetown and San Antonio on the existing UP line in between, Austin may be able to address some of its rail-related issues. The following are some suggestions should the rail be relocated from its current path:

1. Install double-line track: Although it may only be for the stretch from Georgetown to San Antonio, addressing the predicted capacity crisis between south and north Texas must start somewhere. As noted earlier, service through the area is expected to be graded within the lowest category, and single-track rail is already listed as being an issue over the Colorado River.

2. Straighten route and avoid at-grade crossings: Both are listed as issues within the Austin area, especially around the downtown area. Efforts should be made in order to select a new route that will reduce the amount of curves and at-grade road crossings in order to

bolster the average speed, while also increasing the safety of travel in the area. Because of the terrain west of Austin, areas around SH 130 may be the best option for relocation.

It is important to mention that no agreement has been made between government agencies and UP in regards to relocating the line. However, the railroad and the Lone Star Rail District, the body tasked with the commuter rail project, have agreed to produce an initial feasibility study to investigate the viability of building a freight rail bypass of Austin. Additionally, the Texas Legislature has appropriated funds for engineering and environmental studies to take place (Lone Star Rail District).

Although a positive step, UP has said that it will only be interested in an alternative route if existing customers can be served without significant adjustment. UP cites that trucks would have to be used to complete the connection between the new line and existing customers, thus putting more freight vehicles into the Austin MSA's traffic network. UP also states its disdain for the idea of sharing track with commuter trains, citing safety concerns of such a partnership despite examples of such partnerships existing elsewhere in the U.S. (Phinisee).

Although the air freight shipping option in the Austin region is well equipped by the highly praised ABIA, excess capacity in terms of freight handling and flight numbers potentially indicates an unrealized opportunity to increase the area's intermodal capabilities. Trucking already takes advantage of ABIA, as it is required to move freight to and from the airport, but rail is currently left out of the equation. Although further evaluation would be required to estimate the viability of the need for rail connection at ABIA, doing so would put it on the map next to such places as Alliance in Ft. Worth. It would also be a step ahead of the Port of San Antonio, which combines rail and trucking services while delegating air services to San Antonio International Airport. Right-of-way is available along the former Bergstrom spur, but some significant obstacles do come into play. Removed sections of rail, the interest of commuter rail to the airport along the spur, and the fact that the spur would require backtracking to reconnect with the nearest mainline if the current available path is used are all roadblocks to utilizing the spur for freight purposes. However, the idea may be worth investigating to take advantage of Austin's advanced air freight capabilities and the lack of a three-mode intermodal facility in central and southern Texas. Again, further analysis into such things as what is shipped via rail through the area would need to be investigated to determine the demand for such a facility in the area.

North Texas Region (Dallas/Ft. Worth and Wichita Falls)

This section outlines projects and initiatives currently in place to address some of the critical freight issues as well as others not yet considered by agencies in north central Texas:

1. Freeway Incident Management Training: To provide a coordinated response to traffic incidents, improved freeway incident management is intended to enhance safety and improve efficiency of transportation system.

2. Intelligent Transportation Systems (ITS): Implemented throughout the Dallas/Ft. Worth area, ITS currently includes dynamic message signs and speed detectors, and additional dynamic message signs to provide real-time traffic information are planned.

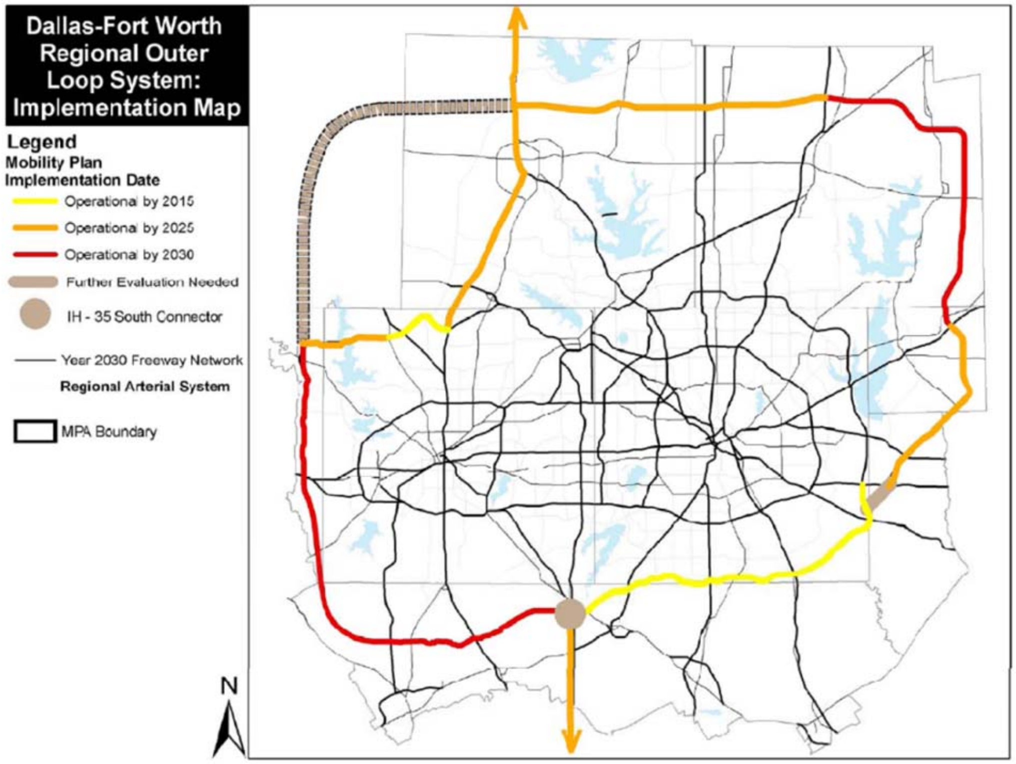
3. Dedicated Truck Lanes: NCTCOG is studying the possibility of designating lanes on highway facilities as truck-only lanes (either as tolled or non-tolled facilities) because of

highway congestion affecting goods movement, driver shortages, pavement wear, passenger and truck safety concerns, and efficiencies gained from using larger trucks to move more goods per vehicle,

4. HazMat Incident Mapping and Truck Planning Routes Projects: Dallas County has the highest hazardous materials incidence rate in Texas, even though only a small percentage of hazardous material originates or terminates in the county (Warner et al., 2009). The NCTCOG began a mapping project to identify patterns in hazmat. Strategies to reduce the number of hazardous material incidents include public education to raise awareness of the need for passenger vehicles to give enough clearance and space between their vehicles and trucks. In addition, NCTCOG is reevaluating hazardous materials routes to minimize the exposure of the population in developing areas to intercity hazardous materials movement.

5. Crash and Fatality Incident Location Mapping Project: This project helps identify areas with high crash and fatality rates that might need improvements. A map of crashes shows the location of crashes, many of which are located on or near the highways (North Central Texas Council of Governments, 2009).

6. Auto and Truck Outer Loop and Freight Rail Bypass: The need and concept of an outer loop highway and rail bypass to direct intercity freight movement not needing to go through the Dallas/Ft. Worth urban area is incorporated in the MPO's transportation plan. A Tier 1 Environmental study and Master Development Plan have been completed. Additional environmental studies and private financing arrangements are pending and the recent announcement of the cancellation of the Trans Texas Corridor program increases the uncertainty about the prospects for implementation. Figure C42 shows the proposed outer loop/rail bypass.



Source: North Central Texas Council of Governments, 2009

Figure C42: Proposed Rail Bypass and Highway Loop

7. Tower 55 Rail Reliever Study: A major freight rail intersection called Tower 55, located underneath the IH 35W and IH 30 interchange in Fort Worth, is the bottleneck for freight rail in north Texas. Through and turning movements at the intersection made by the 100 to 120 freight trains going through Tower 55 result in delays of up to 90 minutes per train crossing the intersection (North Central Texas Council of Governments, 2009). NCTCOG initiated a "Tower 55 Rail Reliever Study" to explore solutions to a problem affecting several public and private sector users of the intersection. NCTCOG plans on conducting a full formal environmental study to evaluate the feasibility of various solutions. Some of the solutions include new rail bypasses ($50 million to $4.2 billion), a trench ($850 million), and at-grade crossing improvements ($25 million).

Waco/Killeen Region

Many of the issues highlighted in the previous section for the Waco and Killeen areas are documented as being in progress or, at minimum, logged as projects awaiting funding and budget room in order to execute according to TxDOT's list of projects for the area. Unsurprisingly, IH 35 has a grip on a large portion of these projects, as it is being expanded through the area in order to handle the expected continued increase of pass-through volume. Additionally, the bridges along IH 35 mentioned earlier are marked for replacement as well. SH 6 is anticipated to have additional lane capacity in the eastern portion of Waco and US 84 is expected to receive some attention as well.

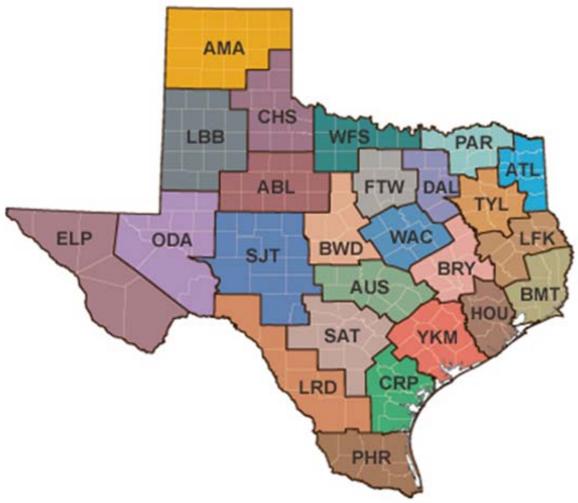
Data for freight-specific travel in the area is not composed into reports like other larger MSAs, such as Austin's freight analysis study, so it is somewhat difficult to recommend additional steps beyond what TxDOT has already proposed to accomplish. However, it's clear that US 190 from IH 35 to Killeen will remain an important route due to Fort Hood having little access to IH 35 from any other roadway route. Should volume continue to increase, this route may need to be considered for upgrading to freeway design. If further access to the region is needed, the only other option is to build a southeasterly access point, as Fort Hood and Belton Lake box in Killeen to the north and northeast. As for Waco, if the increase in capacity for IH 35 is insufficient in handling future traffic, a bypass similar to SH 130 in Austin may need to be considered. SH 6 and SH 31 already create a partial loop-like bypass along the eastern side of Waco and may be the optimal location for such a project. The western side of the area is limited by Waco Lake and the majority of development in the city.

Although railroad relocation is mainly a topic in the southern neighbor of Austin (San Antonio), railroad relocation may need to be considered in the Waco region as well in order to deal with the previously discussed increase in volume that is expected. Again, the eastern side of the city is a likely candidate for such relocation, and combining it with a toll bypass could be the best option. This could also give better access to the TSTC Airport, which is already close to a rail line.

D: Panhandle

Introduction

The Panhandle region of Texas includes the Amarillo (AMA), Lubbock (LBB), and Childress (CHS) TxDOT districts (see Figure D1).



Source: TxDOT

Figure D1: Map of TxDOT Districts

As for the rest of the state, the Pandhandle region is expected to experience an increase in population. From 2000 to 2030, the Panhandle region is expected to grow from 402,862 people to 505,252 people (Potter County, nd). If the current trends continue, it is anticipated that the transportation system will not be able to handle the increase in freight movements. Some of the top industries in the Panhandle include agriculture, livestock, and energy production (i.e., wind and ethanol). All three industries are expected to increase production over the next 15 years (TxDOT, 2008). Agricultural production alone is expected to increase by 151%. Therefore, the overall freight rail tonnage is projected to more than double and overall truck tonnage is also expected to nearly double by 2025 (TxDOT, 2008). This appendix provides insight into the major industries in the region, the current transportation infrastructure and its needs, and policies and strategies to address those needs.

Economic Profile and Freight Movement

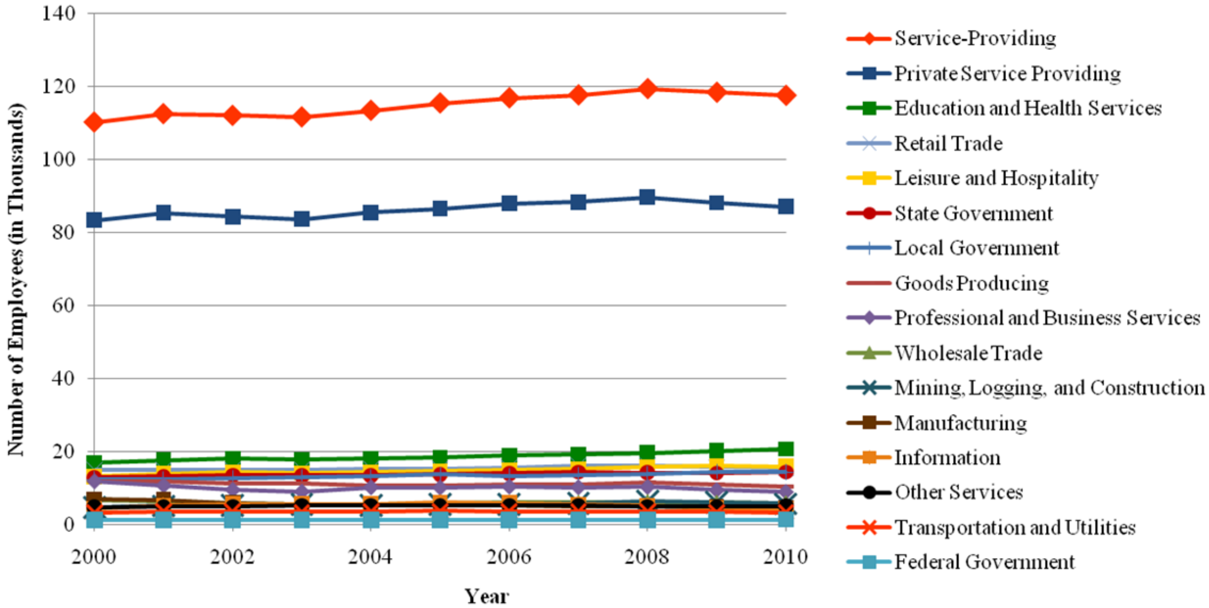
The Panhandle region consists of 26 counties; the largest areas (with 100,000 people or more) are Amarillo, Lubbock, and Childress. The top freight generators in the Panhandle are agriculture, livestock, oil and gas, and wind. The Panhandle and west Texas region is the one of the leading producers of cotton for the state and nation. In 2008, Texas produced approximately 4.5 million 480-pound bales of cotton (US Department of Agriculture, 2008). The cotton is typically transported via rail in containers. The existing logistics operations for cotton are insufficient; for example, Dreyfuss Logistics, which oversees cotton logistics in Lubbock, has a handling capacity for only 10,000 containers a year. As the Panhandle produces approximately

25,000 and 35,000 containers of cotton annually, there is a shortage of 15,000 containers (Lubbock MPO, 2006). The containers typically idle in a warehouse or storage facility until a short line rail is available to bring the containers to a larger rail facility. Grains such as corn is also produced year-round in the Panhandle

The Panhandle is considered to be one of the top five wind energy producing zones located within Texas. Currently, only 240 MW of energy are produced there (Electric Reliability Council of Texas, 2008). However, the area has the producing capability of anywhere from 1,200 to 8,000 MW of wind energy (Electric Reliability Council of Texas, 2008). It is projected that by 2025, Texas is going to need an additional 50,000 to 79,000 MW of energy (Electric Reliability Council of Texas, 2008). The Panhandle would be able to produce some of this energy and transmit it to the larger cities, such as Dallas or Houston. However, there are no current transmission lines to support sending that much energy to the larger cities.

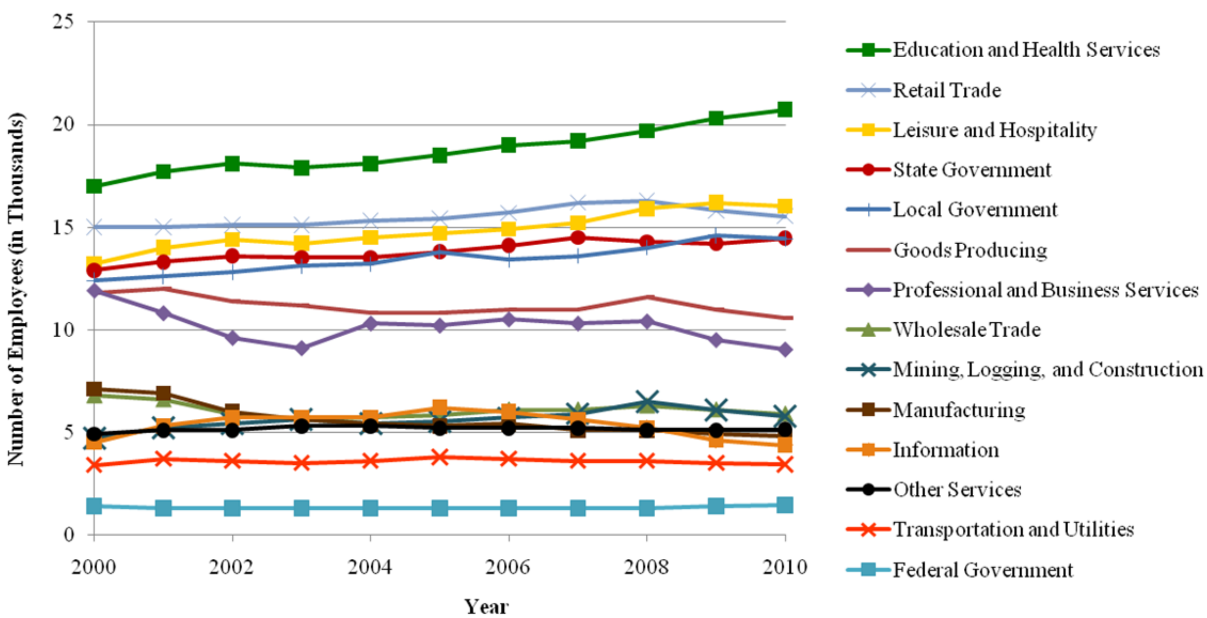
According to a 2008 Texas Department of Transportation freight study, the movement of agricultural products is projected to increase by approximately 151% (in terms of tonnage), due in part to the large growth in the agriculture industry that includes corn grain, ethanol plants, feed supplements, dairy industry, and cotton (TxDOT, 2008). Food products are also projected to result in high growth rates. Although high percentages of growth are projected for wood, building materials, textiles, machinery, chemical/petroleum, and secondary products, they result in a small portion of the overall commodity rail movement (TxDOT, 2008).

The Panhandle of Texas employs their residents in many different fields of work. As shown in Figures D2 and D4, the service-providing industries are the leading employers in the area, employing more than 80% of the areas work force. (Figure D5 provides the employer count without the service industries.) A further review of the Lubbock area industries as shown in Figure D3 demonstrates that education/health services, retail trade, leisure/hospitality and state and local government agencies are the top 5 employers. Freight generating industries like goods-producing, wholesale trade, mining/logging/construction, and manufacturing have, however, been experiencing a decline in the total number of employees since the beginning of the recession in 2008.



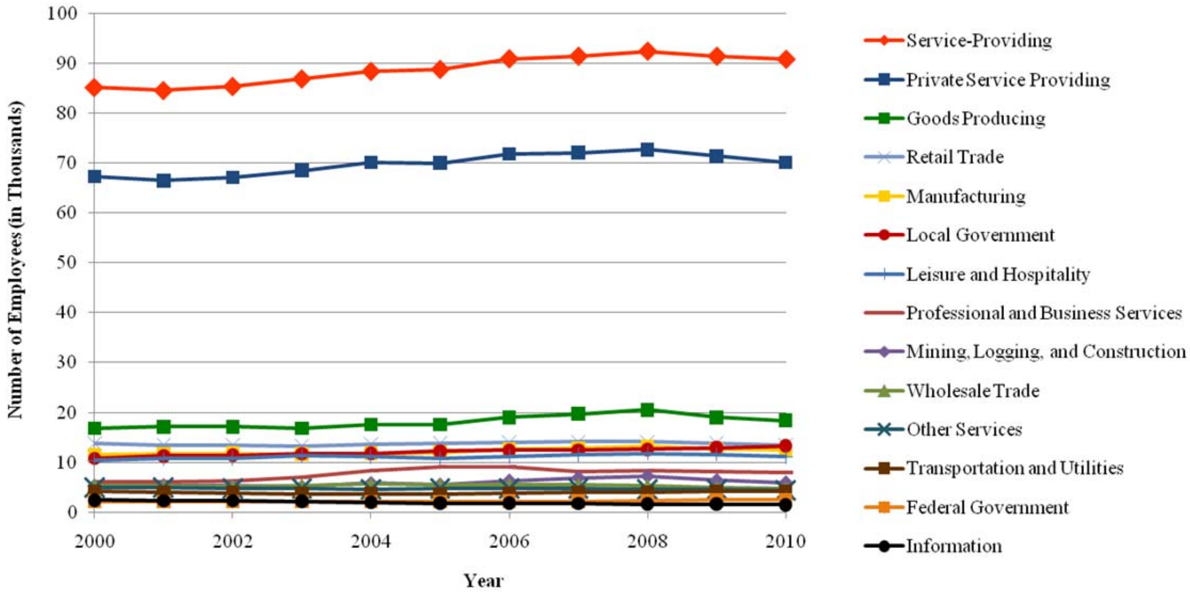
Source: (Bureau of Labor Statistics, 2010)

Figure D2: Lubbock MSA Number of Employees by Industry, 2000 to 2010



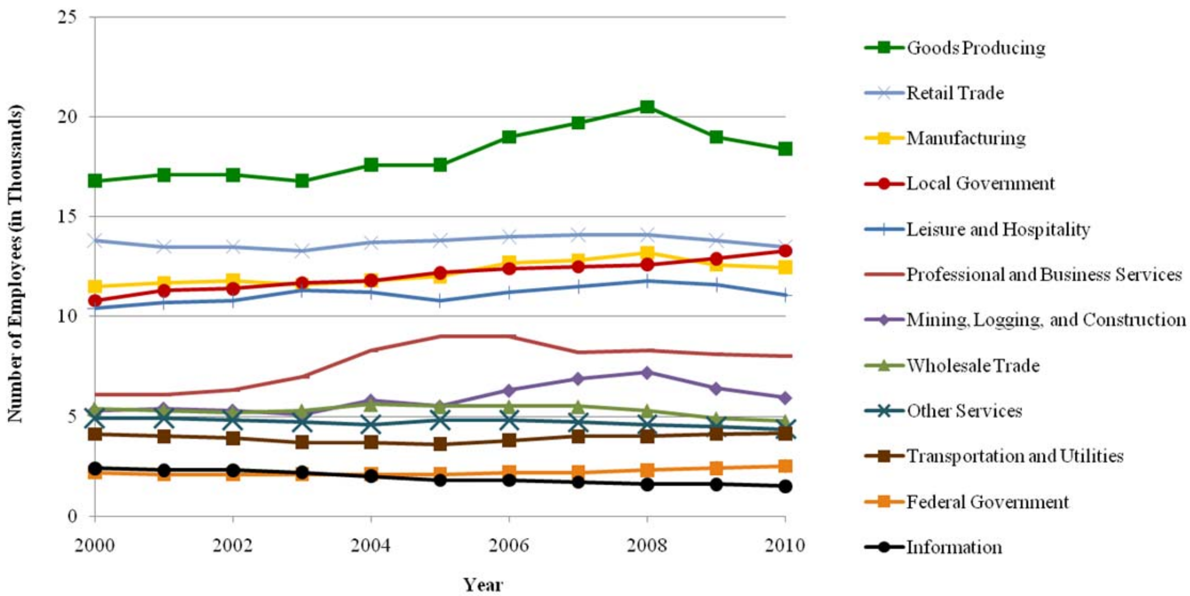
Source: (Bureau of Labor Statistics, 2010)

Figure D3: Lubbock MSA Number of Employees by Industry less Service-providing, 2000 to 2010



Source: (Bureau of Labor Statistics, 2010)

Figure D4: Amarillo MSA Number of Employees by Industry, 2000 to 2010



Source: (Bureau of Labor Statistics, 2010)

Figure D5: Amarillo MSA Number of Employees by Industry less Service-providing, 2000 to 2010

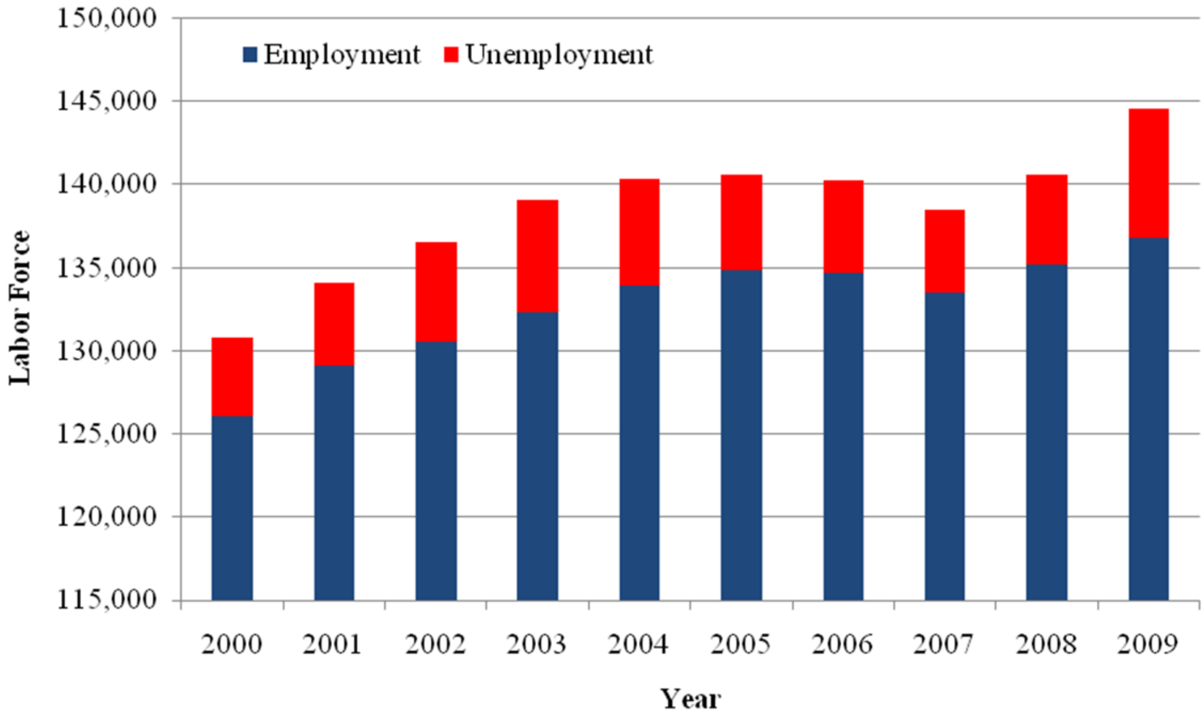
In the Amarillo area, goods-producing, retail trade, manufacturing, local government and leisure/hospitality industries are the top five industries in the area. Similar to the Lubbock area, the freight producing industries (i.e., goods-producing, manufacturing, mining/logging/ construction) have experienced a decline in total number of employees since 2008.

Even though agriculture/ranching and oil/gas extraction employ only a small percentage of the residents, these two industries are the major economic generators in the region. For example, one of the areas in the Panhandle, Hereford, is known as the cattle capitol of the world with more than one million head of cattle and 100,000 dairy cows located within a 100-mile radius of the town. According to the State Energy Conservation Office (SECO), almost half of the state's corn is grown in the northwestern part of the Panhandle. It is mostly used for feed. Because the area is prone to drought, they grow sorghum, also known as milo. It is a drought resistant plant that is often added to corn for livestock feed. There were plans to establish an ethanol plant in Hereford, which would be supplied with fuel from cattle manure. Between 500 and 600 workers were needed to construct the plant. Once it is running, it would need about 60 people employed there. The plant was expected to produce 100 million gallons of ethanol fuel each year but as of the beginning of 2009, construction problems and delays have forced the facility to be put up for sale (Farrell, 2010).

The amount of livestock raised in the Panhandle produces a substantial amount of manure. Often, the farms have to pay for a company to haul it away from their property. Also, the Panhandle cannot grow enough corn to feed the livestock. They still have to bring in corn from the Midwest. Another promising economic development is the use of wind power. The Panhandle has been called one of the fastest growing wind power producing regions in the nation. The area is also known for its oil and gas production. The Panhandle Hugoton field is one of the largest-volume gas fields in the United States, stretching from southwest Kansas to the panhandles of Texas and Oklahoma. The natural gas in these fields contains unusually high percentages of helium that is separated as a byproduct from the produced natural gas. Helium from this region is stored at the National Helium Reserve located in Amarillo.

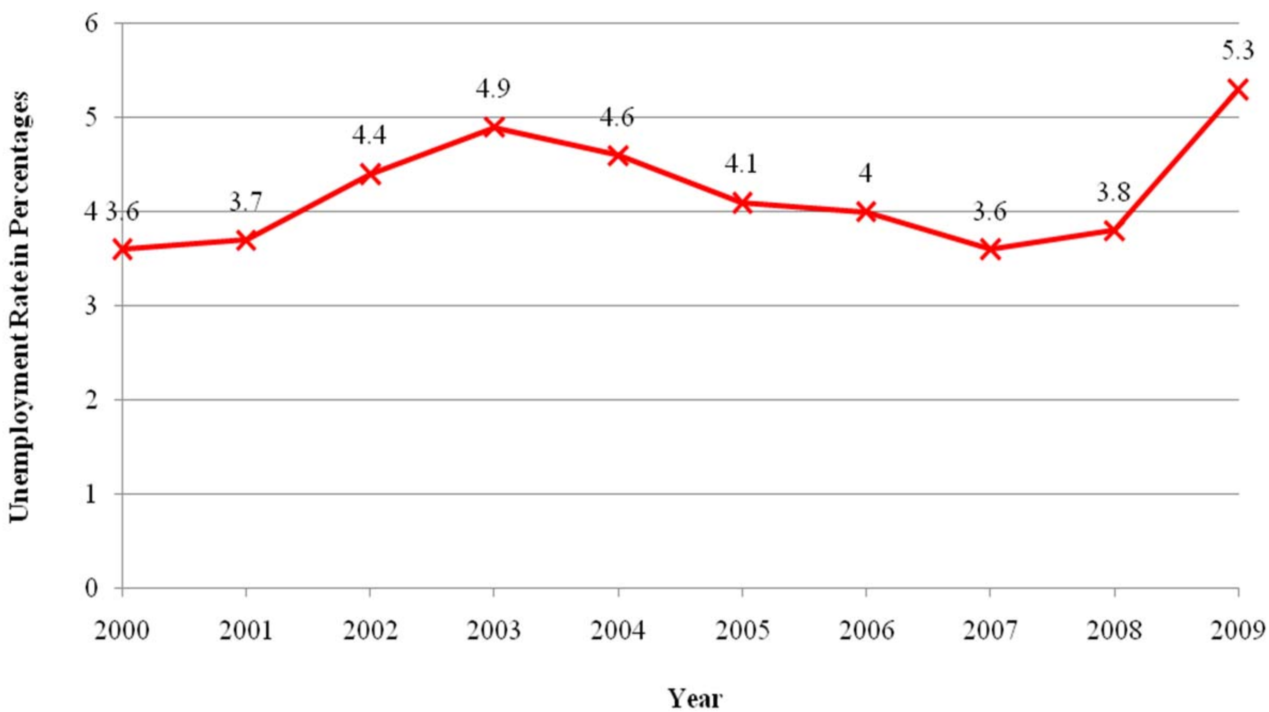
The Panhandle is also a large livestock producer. According to 2007 agriculture Census Data, the Panhandle of Texas produces 7,106 poultry, 2,832 hogs, 117,813 milk cows, and 188,907 beef cows a year (Feedstuffs, 2009). The animals have to be shipped to slaughter houses; the dairy must be shipped to a processing plant. Once there, the finished products must be shipped to distributors. Dairy must be shipped in special refrigerated trucks or containers. The livestock industry is continuing to grow in the Panhandle. The city of Dalhart just added new feed yards, dairy plants, and a cheese factory (TxDOT, 2008). This continued growth is expected especially in the feed and dairy industry.

Both Lubbock and Amarillo recorded their highest labor force in the decade in 2009 at 144,541 and 130,812 respectively (see Figures D6 and D8). Unemployment rates in Lubbock and Amarillo also remained similar since 2000, with the lowest employment rate being 3.4% for Amarillo and 3.6% for Lubbock in 2007 (see Figures D7 and D9). In 2009, unemployment rate for both areas was the highest in the decade at 5.3%.



Source: Texas Workforce Commission, 2010

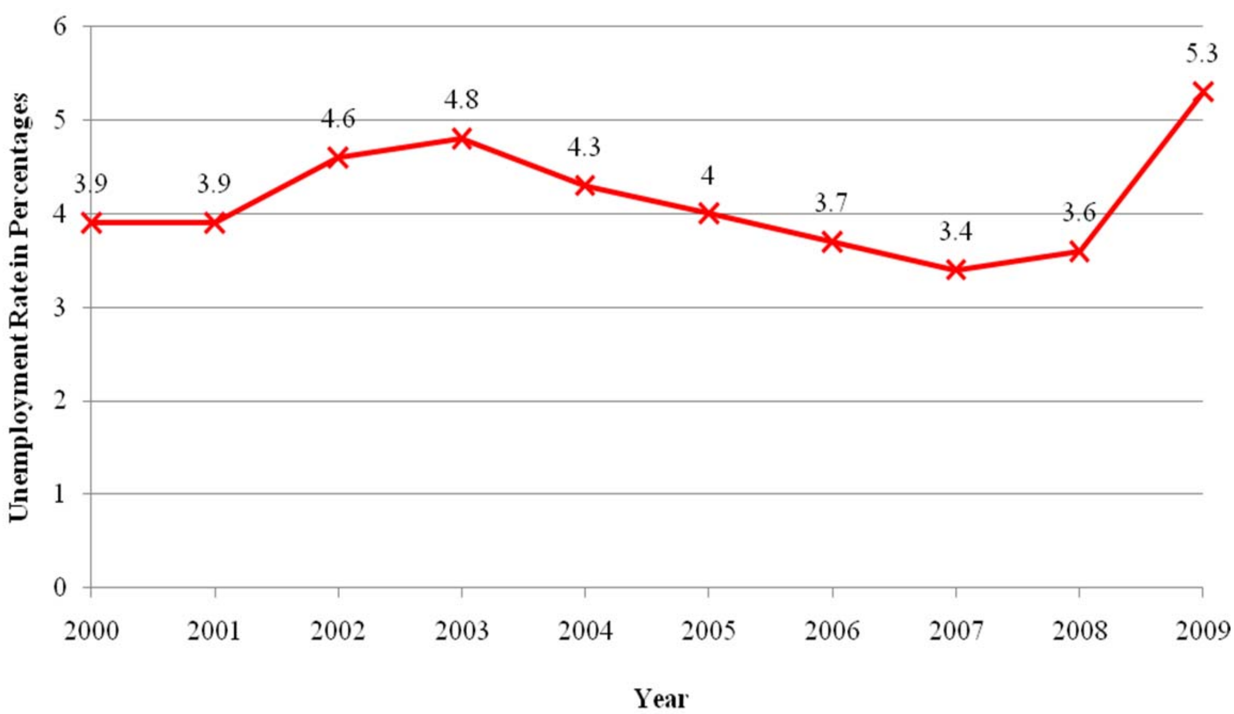
Figure D6: Lubbock MSA Labor Force 2000–2009



Source: Texas Workforce Commission, 2010

Figure D7: Amarillo MSA Unemployment Rate 2000–2009

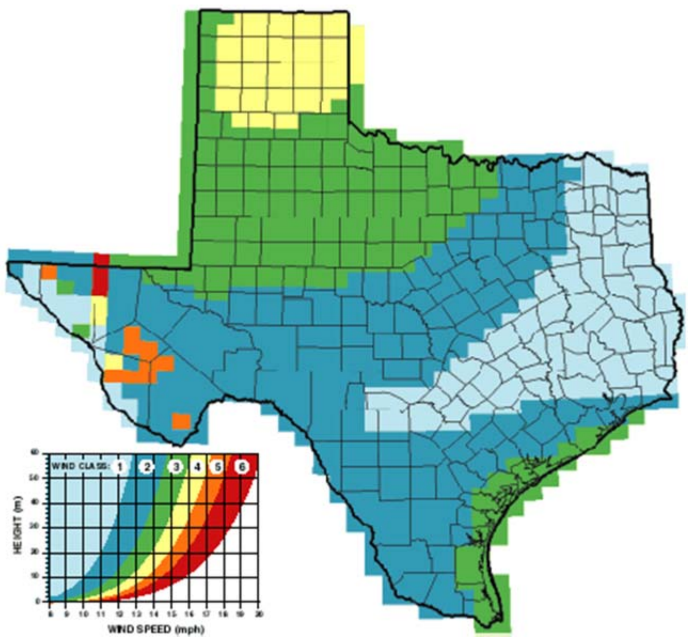
Figure D8: Amarillo MSA Labor Force 2000–2009



Source: Texas Workforce Commission, 2010

Figure D9: Amarillo MSA Unemployment Rate 2000–2009

The Texas Panhandle is positioned to be not only a regional leader but a national model in the development and utilization of wind energy (Figure D10). It contains the state's greatest expanse with high quality winds (State Energy Conservation Office, nd). The geographic location of the region allows it to be a stronghold in providing sites to develop such renewable energy, and the Panhandle already has numerous wind sites covered with thousands of powerful turbines. Even more wind sites are planned for further growth and expansion of this industry in the Panhandle, and one proposal suggests a $1.5 billion “Panhandle Loop” that would transmit wind power from this area to the main Texas power grid. The area is very optimistic about the economic opportunities of the wind energy industry.



Source: State Energy Conservation Office, nd

Figure D10: Texas Wind Energy Classification

Inventory of Freight Facilities

Roadway Infrastructure

The Bureau of Transportation Statistics maintains records of highway miles near urbanized cities in the United States. It contains information on the roadway miles of the areas surrounding Amarillo and Lubbock (see Table D1).

Table D1: Highway, Demographic, and Geographic Characteristics of Urbanized Areas in Texas

Source: Bureau of Transportation Statistics, 2000

Federal-aid urbanized area*	Total roadway miles**	Total DVMT (thousands)	Total estimated freeway lane miles	Average daily traffic per freeway lane mile
Amarillo	1,250	4,742	166	8,261
Lubbock	1,380	5,007	183	5,066

*"Federal-aid urbanized area" is an area with 50,000 or more persons that, at a minimum, encompasses the land area delineated as the urbanized area by the U.S. Census Bureau.
** Lane miles estimated by the FHWA

Major highways in the region that move freight are IH 40 (177 miles in Texas) and IH 27 (124 miles), and the United States highways US 87 (660 miles) and US 287 (504 miles) (TxDOT, nd). Figure D11 depicts several of the major highways in the Panhandle region. Trucking in Amarillo and Lubbock is primarily used to transport low value, bulk materials such as food and building materials. Additionally, the industry growth in bulk commodities such as corn and cotton is expected to generate a trucking increase in the region, which in turn will result in a population increase and subsequent building materials (TxDOT, 2008). Current highway and infrastructure conditions in the Panhandle are overall good, with 2009 pavement scores of 87.41 in Amarillo, 86.40 in Lubbock, and 91.48 in Childress (compared to 85.94 statewide)[9] (TxDOT, 2009).

The Panhandle is not anticipated to experience an increase in highway congestion that would significantly hinder truck freight traffic (TxDOT, 2008).

[9]With regards to pavement conditions, the conditions score is the combination of ride and distress scores, and it ranges from 1 (worst condition) to 100 (best condition). It takes traffic and speed limit into consideration.

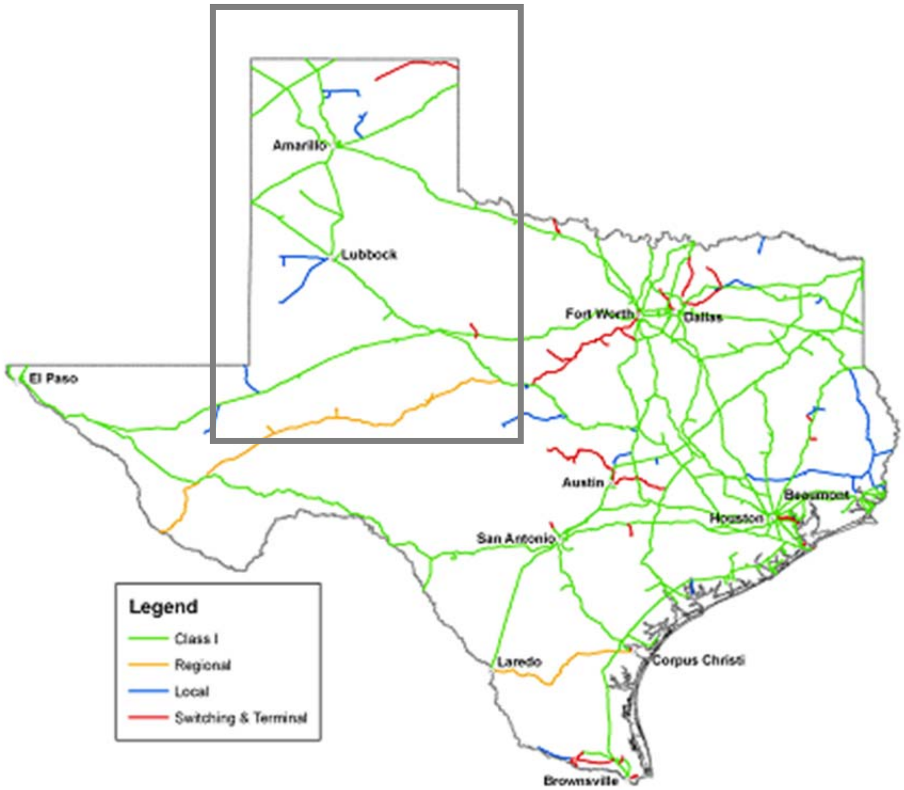
Source: AAccessmaps.org

Figure D11: Highway Map of Texas Panhandle

Rail Infrastructure

Rail is an especially critical component of the freight infrastructure in the Panhandle. Rail is usually dependent on the type of commodity being shipped, and typically carries low-cost, bulk commodities such as raw materials, agriculture, and building materials throughout the region (TxDOT, 2008). There are three railroads in the region: BNSF (a Class I railroad), West Texas and Lubbock Railway (WTLC), and Panhandle Northern Railroad (PNR), both short line railroads. BNSF has about 1,320 total miles of track line servicing the Amarillo and Lubbock region (BNSF, nd), and WTLC has about 262 miles of short-line rail (TxDOT, 2008). WTLC connects with BNSF and UP[10] railroads at Lubbock, and with BNSF at Plainview. PNR operates on 31 miles of track and runs between the towns of Panhandle, TX, and Borger, TX. PNR handles carbon black, liquid petroleum gas, chemicals, petroleum products, scrap metal, fertilizer and grain, and serves Agrium, Chevron Phillips, ConocoPhillips, Degussa Engineered Carbons, Sid Richardson, Texas Pipe, and Van Waters among others (Omnitrax, 2007). Figure D12 depicts a picture of the current Texas rail system by classification with the Panhandle region highlighted.

[10] Union Pacific has track rights on the BNSF line.

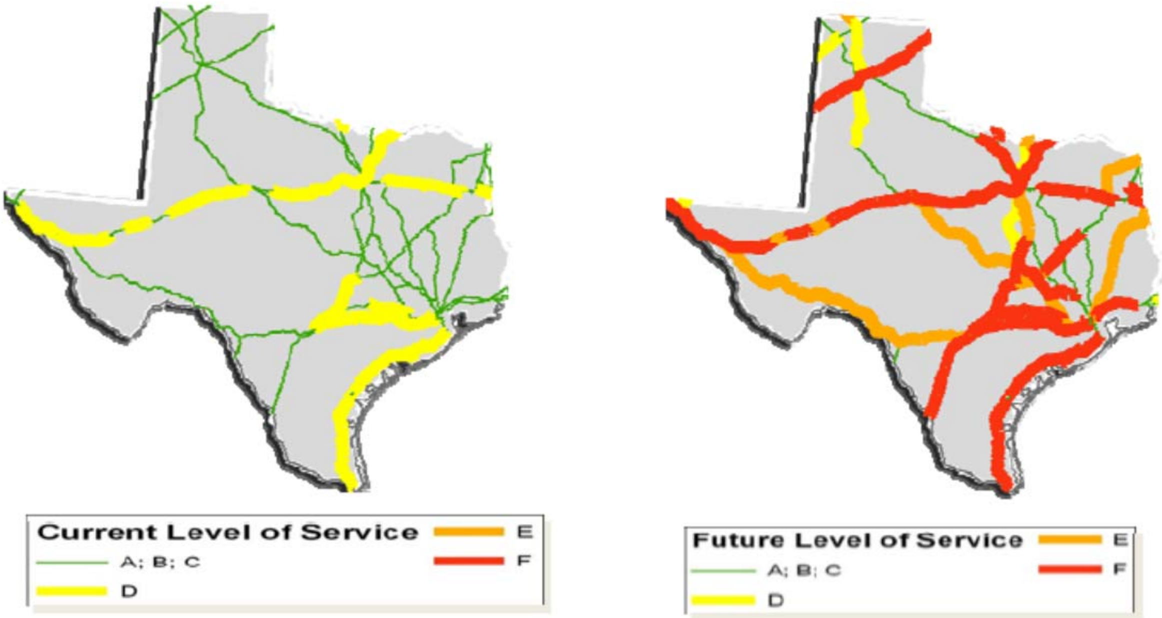


Source: Warner and Terra, 2005

Figure D12: Texas Rail System by Classification

The current national railway system in the Panhandle is in good condition to maintain the flow of goods across the country. The same cannot be said for the short line railroads, where poor conditions have resulted in dramatically reduced speed limits of 15 mph; 47% of the short line railroad miles currently operating in Texas will need an infrastructure upgrade to accommodate the larger railcars currently in use (Warner and Terra, 2005).

Rail systems are graded using a classification of A to F. An 'A' generally means free of congestion and operating below capacity. The classification gets worse moving toward an F, which generally means there is too much congestion and the train schedule is no longer reliable. Figure D13 shows the current level of service for rail, and the future level of service if no improvements are made. The Panhandle area is expected to move from having satisfactory rail service levels A, B, or C to having levels D and F in 2025 if no improvements are made to the current rail system.



Source: 2030 Committee on Texas Transportation Needs

Figure D13: Current and Estimated Future Major Rail Line Levels of Service in 2005 and 2035 without Capacity Expansion

Air Infrastructure

Airports are classified into different categories based on their airport activity; the categories are

- Commercial Service Airports (defined as publicly owned, having more than 10,000 passenger boarding in a year),
- Cargo Service Airports,
- Reliever Airports, and
- General Aviation Airports (this includes airports that are privately owned and available for public use).

The Texas Panhandle has two commercial service airports, the Amarillo International Airport and the Lubbock International Airport. Both the Amarillo International Airport and the Lubbock International Airport have air freight services including freight carriers and warehouse facilities for companies such as FedEx, Airborne Express, and UPS. The Lubbock International Airport in particular is an International Customs and Border Patrol Port of Entry, and serves as the center for cargo shipments (Lubbock MPO, 2006). Because the region is mainly known for low-price, bulk commodities such as the corn and cotton, there is little need to utilize air as a critical supply for freight movement, as air freight is typically reserved for transporting expensive, time sensitive materials. There are 14 general aviation airports, and 20 other public-use airports not recorded in the NPIAS.

Trade Corridors

Source: www.portstoplains.com

Figure D14: Map of Ports-to-Plains Corridor

Ports-to-Plains Trade Corridor: The Ports-to-Plains Trade Corridor Alliance (Figure D14) is a federally designated High Priority Corridor that runs from the Mexican border to Colorado. It is an alliance of nine states in conjunction with Canada and Mexico. The goal of the Ports-to-Plains Trade Corridor is to optimize trade opportunities to maximize energy and agricultural commodities in North America. The corridor is particularly interested in agriculture products, dairy, installed and potential wind energy, and ethanol. It is one of the most critical trade corridors in North America.

For the Texas Panhandle, the Ports-to-Plains Corridor is focused on the city of Dumas, located near Amarillo. The city has been identified as the fastest growing city in the Texas Panhandle. What is even more important, however, is its location in the corridor. Dumas is located at a critical junction in the Ports-to-Plains corridor that connects US 287 and 87, along with Interstates 27, 40, and 25. These highway facilities provide access to major urban areas at Albuquerque, Denver, and Oklahoma City. In addition, the city is within a short distance of the international airport at Amarillo, making it available for air freight as well.

In the Texas Panhandle, the corridor utilizes IH 27, which runs through Lubbock County as well as Amarillo. Recently, TxDOT conducted a study to determine the feasibility of an extension of IH 27 to connect to the Mexican border on the south. In addition, the city of Amarillo is particularly interested in a potential bypass around or through the central business district that will connect to the corridor route.

Critical Freight Needs and Issues

Existing rail and trucking freight infrastructure in the region appears to be capable of supporting current freight needs. The road infrastructure is in generally good condition and there is little no congestion along majority of the major routes. Seasonal congestion on some Farm to Market (FM) roads connecting to elevators, however, do exist during the harvesting season. The planning agencies in this region have been very proactive by ensuring the provision of adequate transportation infrastructure in the area. However, concerns do exist about the maintenance of the existing infrastructure, and the impact of the movement of wind energy equipment on the FM and county roads.

A major issue among shippers in the region is an efficient rail transport system. A recent study by the Texas Transportation Institute has highlighted the importance of the Texas short line railroad system to the freight transport of bulk agriculture commodities, and the improvements needed to address the shortcomings in the overextended system (Warner and Terra, 2005). A more efficient short haul rail system that will make rail movement competitive with trucking is highly desired in the region. Poor condition of rail tracks results in slower operating speeds, inability to invest in large rail cars, and inadequate capacity to move containers during the cotton harvest. Existing rail lines are able to carry only a third to a half of the containers of the cotton generated in the region in a year, leaving the remaining containers to idle in a warehouse or a storage yard away from the rail transfer facilities (Lubbock MPO, 2006).

A lack of an intermodal facility in the region for assembling and loading containers onto rail also negatively impacts shippers in the region. For example, the majority of cotton shipped to the west coast from the Panhandle is primarily sent east to Dallas and Fort Worth for assembling and loading. This results in additional shipping costs and travel time that impacts the profitability of the industry (TxDOT, 2008).

Safety of hazardous material transport in the area is also a concern as 20 and 30% of the total freight cargo moved by rail in the Panhandle area are hazardous materials rail lines (Lubbock MPO, 2006). Table D2 shows the top ten counties with hazmat incidents in Texas in the year 2007. Lubbock was among the top ten, contributing to 2% of the statewide total.

Table D2: Top Ten Texas Counties with Hazmat Incidents in 2007

Source: Warner and Terra, 2005

Hazmat Incidents Texas 2007		
County	**No. Incidents**	**%**
1 Dallas	516	33
2 Harris	301	19
3 Tarrant	118	8
4 El Paso	117	8
5 Bexar	57	4
6 Lubbock	35	2
7 Webb	33	2
8 Jefferson	32	2
9 Guadalupe	24	2
10 Taylor	24	2
Total	1,257	81

Similar to cotton, hazardous materials generated from the Panhandle are generally transported via truck or rail to other regions with larger distribution centers that then transfer the commodities onto major rail lines out of state or to the Texas ports. Because these major rail lines typically run through major metropolitan areas, another major freight is the safe and timely transport of the hazardous materials and containers on the rail system.

Policies and Strategies to Address Needs

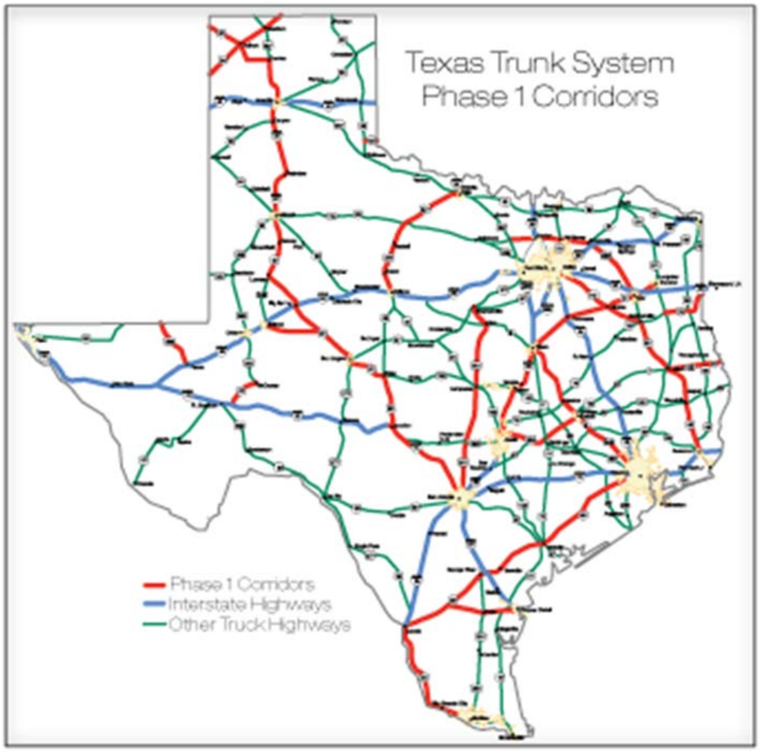
In response to the critical freight needs and issues facing the Panhandle, several key policies and strategies can be recommended to maximize the rail facilities and improve the transport of the agriculture commodities. Critical needs were identified in improving the short line railroad system to support the cotton and corn industry. Policies and strategies for these freight issues in the Texas Panhandle include limiting hazardous material movements to certain rail paths, investing in the Ports-to-Plain corridors, upgrading short line railroad load capacity, and building intermodal facilities

The special transfer of hazardous materials is a critical need that can be addressed with the diversion of such commodities to select, planned routes in major metropolitan areas. The majority of trains carrying hazardous materials use the same rail lines as other trains carrying bulk products and typically run through the urban, heavily populated regions of a metropolitan area (Lubbock MPO, 2006). As a result, outdated urban rail networks are often susceptible to hazmat incidents that are dangerous to local inhabitants and costly to clean (Lubbock MPO, 2006). The relocation of hazardous material movement to specific routes is one policy that can assuage concerns over safety. The Lubbock County Emergency Planning Committee is currently performing a feasibility study to assess the economic viability of diverting hazmat transport to certain federal and state highway routes away from populated areas in the county (Lubbock MPO, 2006).

The Texas Trunk System is also planned to connect parts of the state and integrate rural communities with a high quality highway network. TxDOT wants to provide a rural four-lane divided (or better) highway network to improve mobility, connect major activity centers within Texas, and provide access to major points of entry to Texas through the Trunk System. The Panhandle region will be part of the first phase of new corridors. Figure D15 shows the Phase I corridors for the state. An extension of IH 27 to the Mexico border is also one of the strategies being explored by the Ports-to-Plains Corridor alliance. A bypass around Amarillo is also being considered.

Investment in short line rail system is also necessary. There are efforts to extend the current WTLR line to the Port of Del Rio, and possibly connect to one of the Pacific seaports in Mexico. This will serve as an alternative north-south route through West Texas to divert traffic from California. Upgrade and repair of the current system to handle larger rail cars and allow for faster trains speeds is also an investment worth pursuing in the region.

The Reese Technology Center is located at a deactivated U.S. Air Force Base, west of Lubbock. It is a 2,500-acre site with multiple businesses and employment positions (the estimated economic impact is $27 million) (Reese Technology Center, nd). The Lubbock Economic Development Alliance wants to help elevate some of the freight concerns in the region by establishing a transload terminal at the Reese Center.



Source: www.keeptexasmoving.com

Figure D15: Texas Trunk System Phase 1 Corridors

According to the West Texas Freight Study, the Reese Technology Center's transload terminal will have the ability to directly access rail freight; store various commodities; potentially serve as a "safe zone" for truckers; and be used as a possible truck driving training facility located west of the city of Lubbock (TxDOT, 2008). It will be designed to handle as many as 45,000 rail containers for the cotton industry along with other local manufactures (potential revenue could be as much as $60 million). The current regional container yard has a capacity to handle 10,000–11,000 containers of cotton per year. Between 12,000 and 15,000 loaded cotton containers get shipped between Lubbock and Dallas on 18-wheel trucks (TxDOT, 2008). These are then loaded onto trains and shipped to the West Coast. The transload facility will allow these containers to bypass Dallas and just ship directly from Lubbock to the West Coast. Designated as a free trade zone, the Reese Technology Center will be able to allow merchandise to be admitted without paying customs duties or excise taxes (Reese Technology Center, nd).

The Reese facility would have the ability to receive and ship unit trains between the short line and the national rail lines; therefore, the Class I railroads could incorporate the trains into their schedules without multiple stops (TxDOT, 2008). The facility is serviced by WTLC, which has access to the BNSF line at Lubbock. The rail network from Reese is being considered for extension south to Seminole, Texas then west to Hobbs, New Mexico, connecting to the Texas–New Mexico Railroad (TNMR). This extension is expected to provide the Lubbock and West Texas area with rail access to the UP mainline through El Paso, Texas (TxDOT, 2008). As of 2008, the WTLC served both the UP and the BNSF three days per week at the BNSF rail yards in Lubbock, Texas (TxDOT, 2008). The Reese facility would have the ability to receive and ship unit trains between the short line and the national rail lines without considerations for multiple stops and set-out moves (TxDOT, 2008).The approximate route is shown in Figure D16.

Legend
A) Reese Center
B) Seminole, TX
C) Hobbs, NM
D) Monahans, TX

Source: Google Maps

Figure D16: Southern Rail Network from the Reese Technology Center

E: Piney Woods

Introduction

The economy of the Piney Woods region of Texas is diverse and steadily growing. Such growth depends directly on the local infrastructure and its capacity and efficiency. As in any other region, it is vitally important to maintain freight infrastructure and trade corridors, which are the life-lines of the local economy. As the region's population increases, the volume of freight and local traffic will also increase.

The diversity of the area's economic interests has allowed the Piney Woods region to maintain a competitive share of the state's economy. The Piney Woods region is home to the original Texas oil and natural gas fields, as well as numerous lignite coal mines. These natural resources provided the region with economic prosperity through troubled times like the Great Depression. Another natural resource that has kept the region's economic base stable is the plentiful pine forests that were once heavily logged. Wood manufacturing is therefore an important industry, with products such as lumber, plywood, trusses, and flooring, and services of sawing, planning, and assembling of products.

The city of Tyler is also known as the Rose capital of the nation. In Smith County, about one fifth of the nation's roses are produced, and over one half of the nation's roses are packaged and shipped from the area. Tyler holds an annual Rose Festival, which attracts thousands of people from across the country every year and generates millions in tourist revenue to the local economy (Tyler Rose Museum, 2009). Clearly, this economic generator will create the need for a high volume of outgoing products that must be shipped very quickly. These products must also be temperature controlled, so the mode by which they travel must be able to accommodate this condition. Due to the large number of visitors at the Rose Festival in Tyler, the transportation in the surrounding area must also be able to function under the pressure of higher volumes.

Ensuring efficient movement of these natural resources from the Piney Woods region to other locations where it will be used is important not only to the companies who are sending the products, but also to the consumers who will receive them and the local economy that they are supporting. The freight corridors are under intense scrutiny to see how they are standing up under increasing volumes. As the population continues to increase, not only in northeast Texas but across the country, these highway systems will be under ever-rising pressures to remain efficient, safe, and reliable trading routes. Currently, the two interstates that run through the region are at or below capacity. However, they are forecasted to be at or above capacity within the next 30 years, which will force difficult decisions to be made. Freight can be removed from highways by instead using railroads, but an increased volume on rail will also need to be addressed. The current rail capacities in Texas show that for the time being, the region's rail facilities are below or near capacity.

Economic Profile and Freight Movement

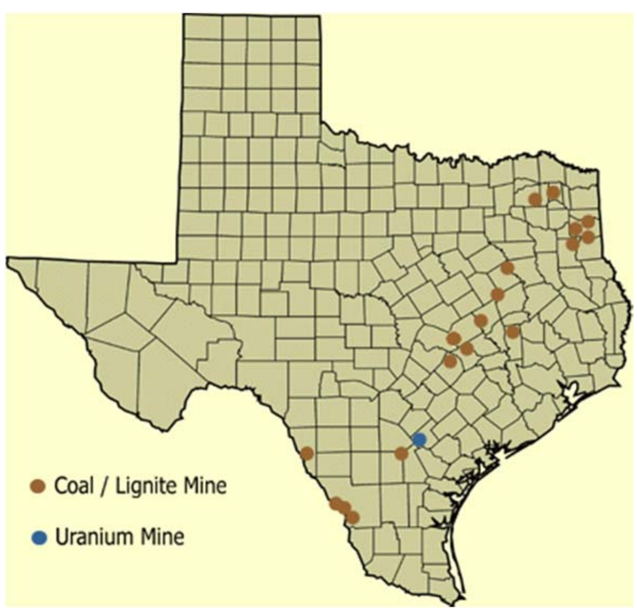
The Piney Woods region of Texas, located in the northeast corner of the state, encompasses 47 of the state's 254 counties. None of the state's major cities are located here, but the region is home to three of the state's national forests: Davy Crockett, Angelina, and Sabine. The area is mostly woodlands that are heavily logged and is home to some of Texas's top producing oil and natural gas fields, which can be seen in Figure E1. The East Texas oil field is one of the largest in the United States, producing 5.2 billion barrels of oil since its discovery in

1930. It is believed to have another 2 billion barrels yet to be harvested. Natural gas is also plentiful in the region. The region generated more than 15,000 jobs directly from the industries based on these natural resources (Texas Comptroller of Public Accounts, 2008).

Source: Texas Legacy Project, 2008

Figure E1: Active Oil and Natural Gas Fields in the Piney Woods Region (Red for Natural Gas and Green for Oil)

Lignite coal reserves are extremely abundant in the Piney Woods region, as seen in Figure E2. Lignite is the lowest quality coal that is used a great deal in electricity generation or heat generation for industrial processes. Six of the 13 operating lignite coal mines in Texas are located in the Piney Woods region, 3 of which are among the 50 top producing mines in the country. The lignite mines in the Piney Woods region account for about 52% of the total for the entire state of Texas's coal production. Also in the year 2007, the regional coal mining industry supported about 1,200 jobs and produced more than 21 million tons of coal, amounting to over $21 million of revenue (Texas Comptroller of Public Accounts, 2008).



Source: Texas Coal, Lignite, and Uranium, 2009

Figure E2: Location of Coal and Lignite Mines

Table E1 illustrates the production values associated with some of the mines located in Figure E2.

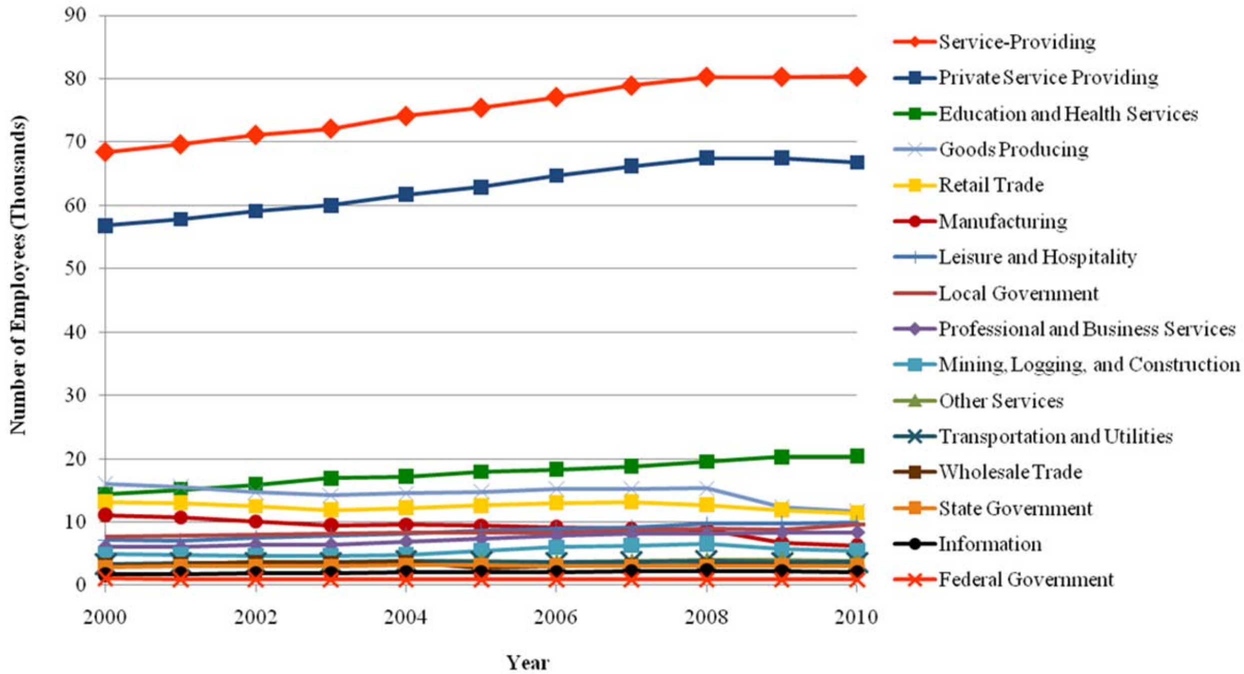
Table E1: Active Coal Mines Upper East Texas Region, 2007

Source: Texas Comptroller of Public Accounts, 2008

Name	**Location**	**Production (million tons)**
Martin Lake Mine	Rusk and Panola counties	7,677,112
South Hallsville No. 1 Mine	Harrison County	4,153,485
Oak Hill Mine	Rusk County	3,761,434
Monticello Winfield Mine	Franklin and Titus counties	3,502,720
Monticello Thermo Mine	Hopkins County	2,090,370
Darco Mine	Harrison County	0
Upper East Total	**–**	**21,185,121**
Texas Total	**–**	**40,785,403**

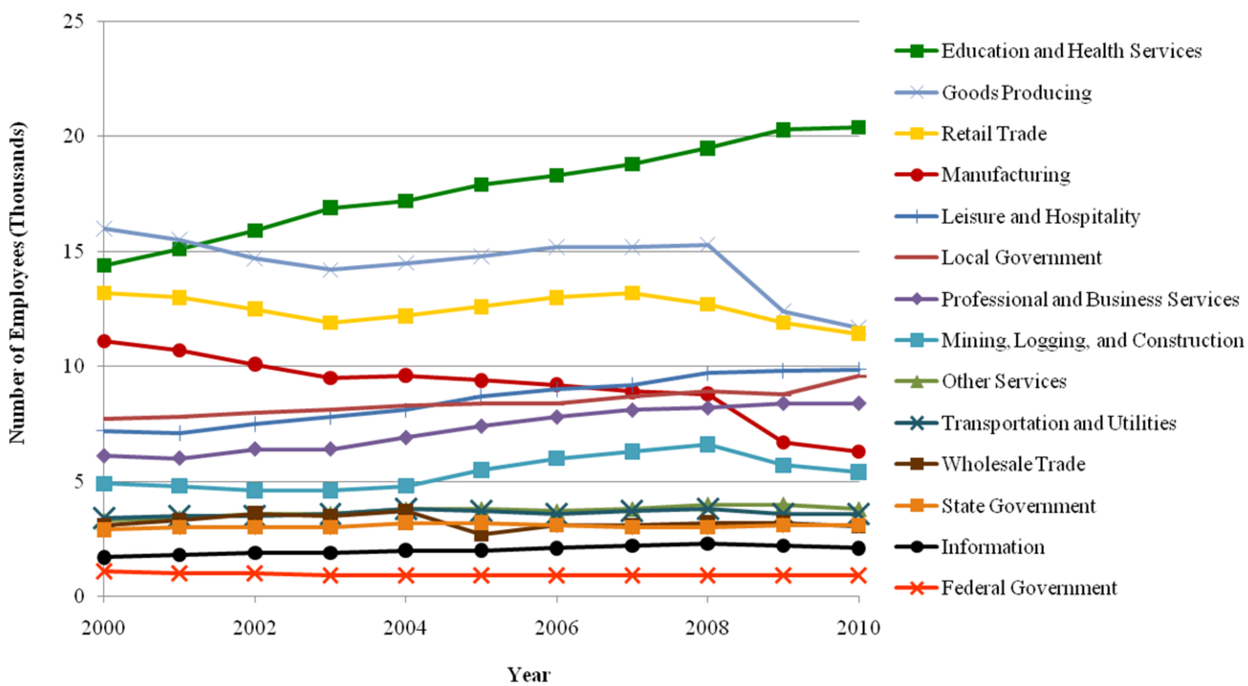
The Piney Woods region also has a strong economic base in the wood processing industry. This includes wood production of lumber, plywood, and wood trusses and flooring, as well as processes such as sawing, planning, and assembling of products. In 2008, wood products were Texas's 25th largest export, and the industry accounts for about 23,500 jobs in the entire state. Three of the top five major industry employers are located in cities in the Piney Woods region, including Diboll, Pineland, Camden, Corrigan, and Center (Texas Comptroller of Public Accounts, 2008).

The main economic generators in the region are service-providing industries as shown in Figures E3, E5, and E7. When the service-providing industries are not accounted for, the other prominent industries in the region are education and health services, goods-producing, retail trade, manufacturing, leisure and hospitality, and local government jobs (see Figures E4, E6, and E8). An increase in healthcare related jobs reflects the national trend. Increasing wealth and aging populations mean more money will be spent on healthcare. Jobs in local government were on the rise in 2000 because of newly opened jail facilities in the region. Jobs that were once manufacturing based have shifted to be technical contract labor as the manufacturing industry has slowed (Rylander, 2000). The goods-producing, manufacturing, and mining/logging/ construction industries have experienced a decline in total number of employees since the beginning of the economic recession in 2008. Lone Star steel, a once dominant producer of high grade steel in the region, was also sold to US Steel in 2007 and has since experienced a decline in its number of employees. An army and ammunition plant, Lone Star Army Ammunition Plant, in Texarkana was also officially deactivated September 30, 2009, as part of the 2005 Base Realignment and Closure by the Department of Defense (Montgomery, 2009). It was expected that as a result of the plant's closure, 229 jobs (149 direct and 80 indirect) will be affected over the period of 2006–2010 in the Texarkana, TX–Texarkana, AR Metropolitan Statistical Area (GlobalSecurity.org, 2010). Other industries like retail trade also started to decline in 2007.



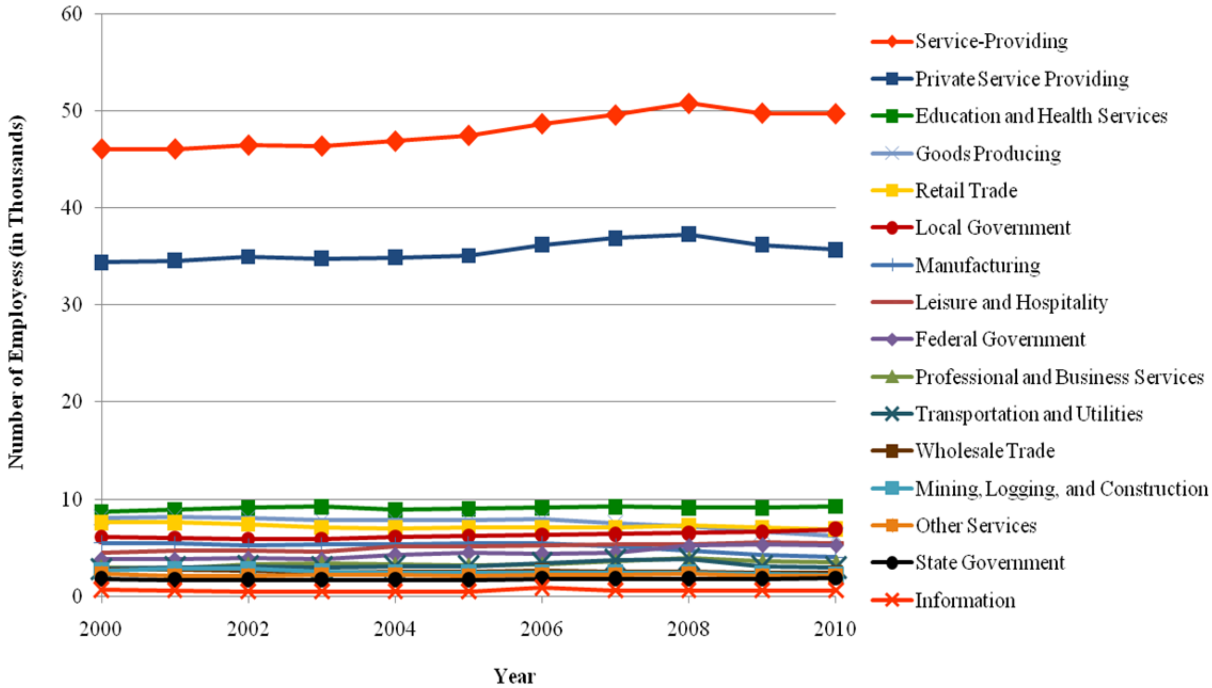
Source: (Bureau of Labor Statistics, 2010)

Figure E3: Tyler MSA Number of Employees by Industry, 2000 to 2010



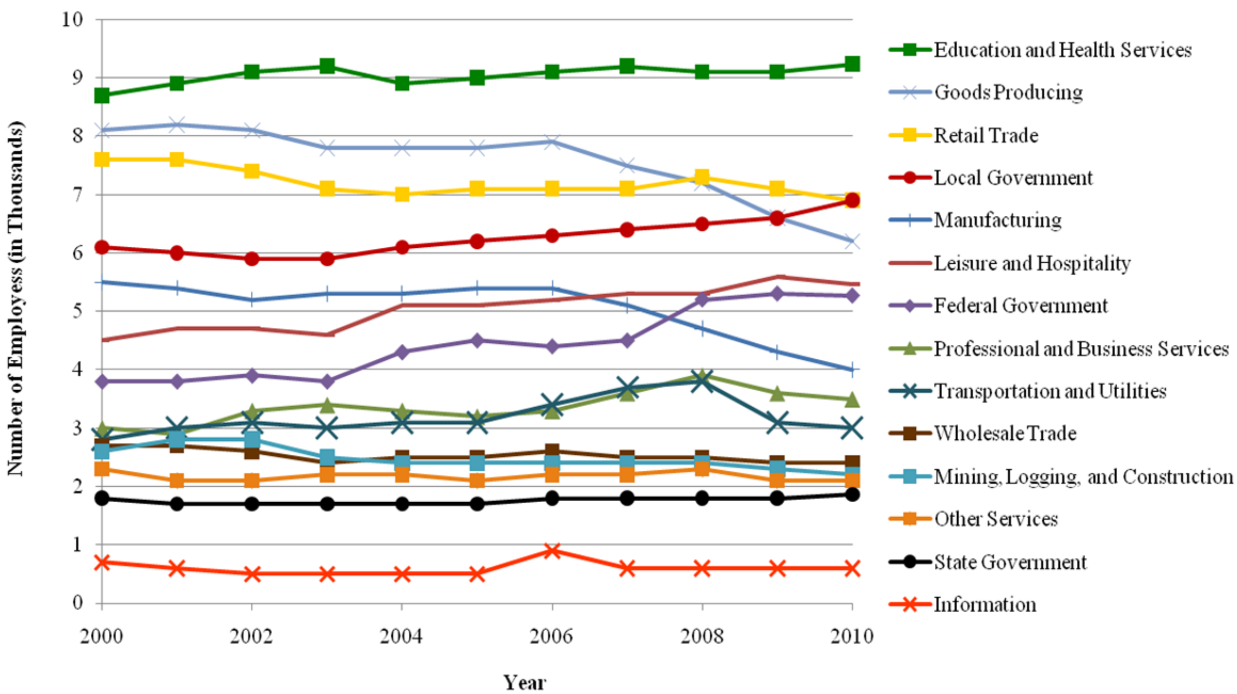
Source: (Bureau of Labor Statistics, 2010)

Figure E4: Tyler MSA Number of Employees by Industry less Service-providing, 2000 to 2010



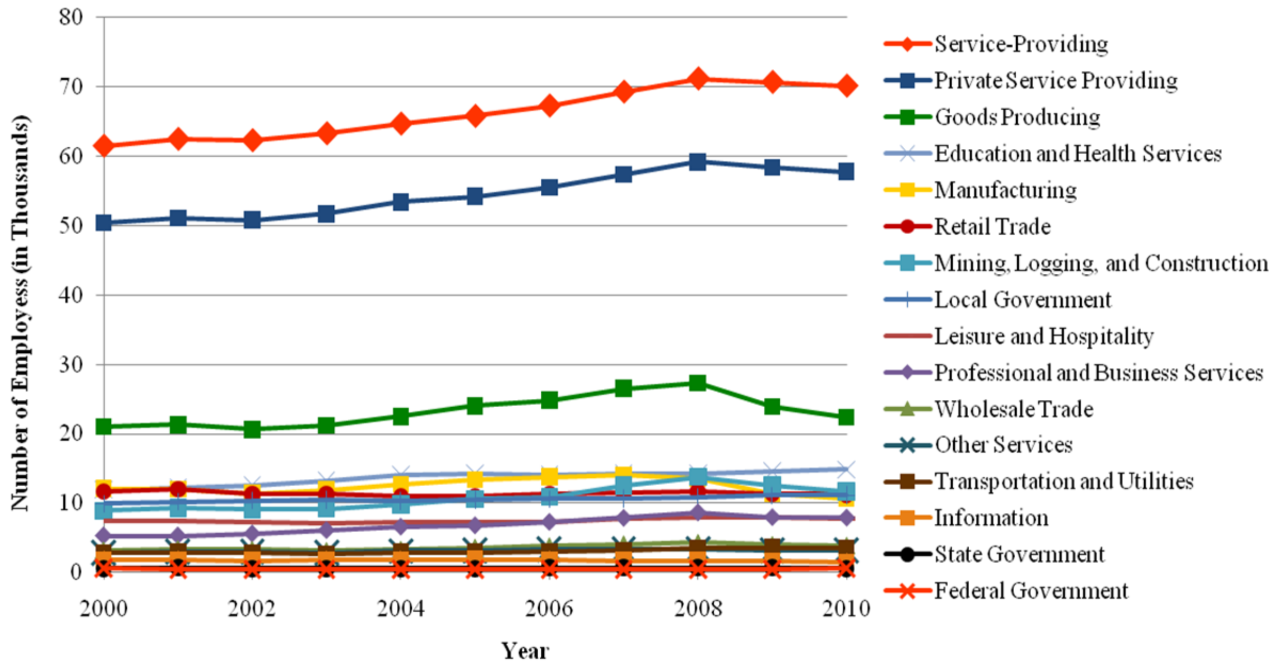
Source: (Bureau of Labor Statistics, 2010)

Figure E5: Texarkana MSA Number of Employees by Industry, 2000 to 2010



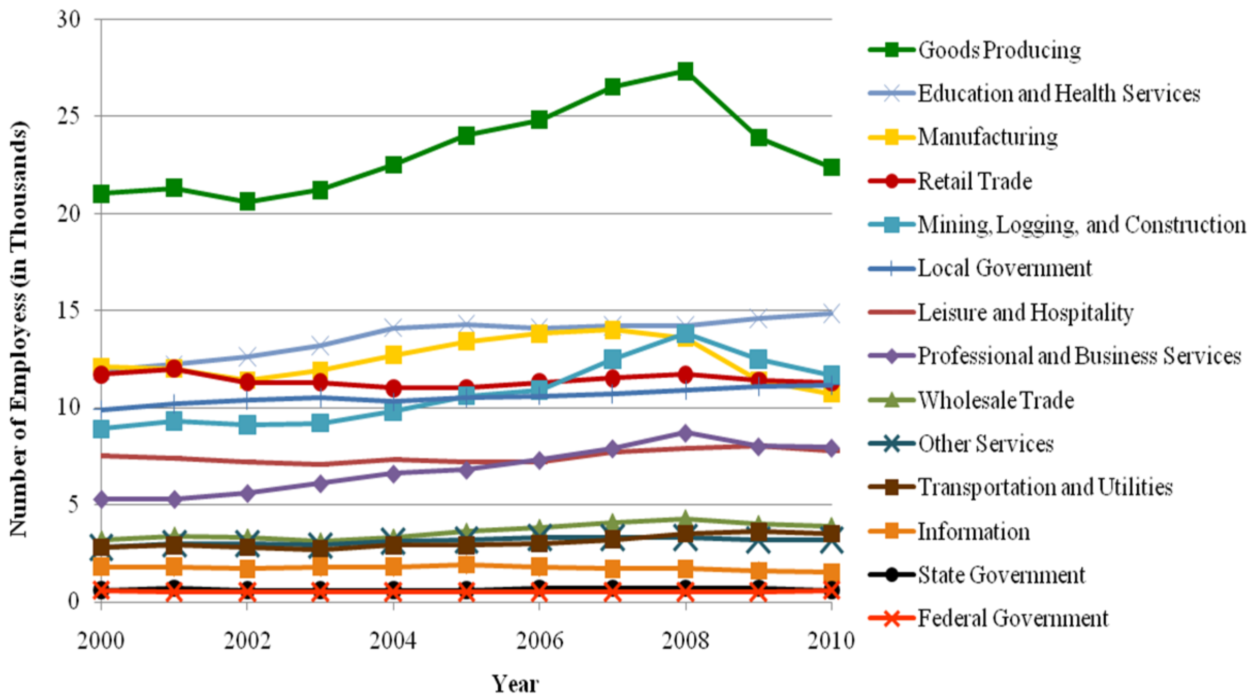
Source: (Bureau of Labor Statistics, 2010)

Figure E6: Texarkana MSA Number of Employees by Industry less Service-providing, 2000 to 2010



Source: (Bureau of Labor Statistics, 2010)

Figure E7: Longview MSA Number of Employees by Industry, 2000 to 2010



Source: (Bureau of Labor Statistics, 2010)

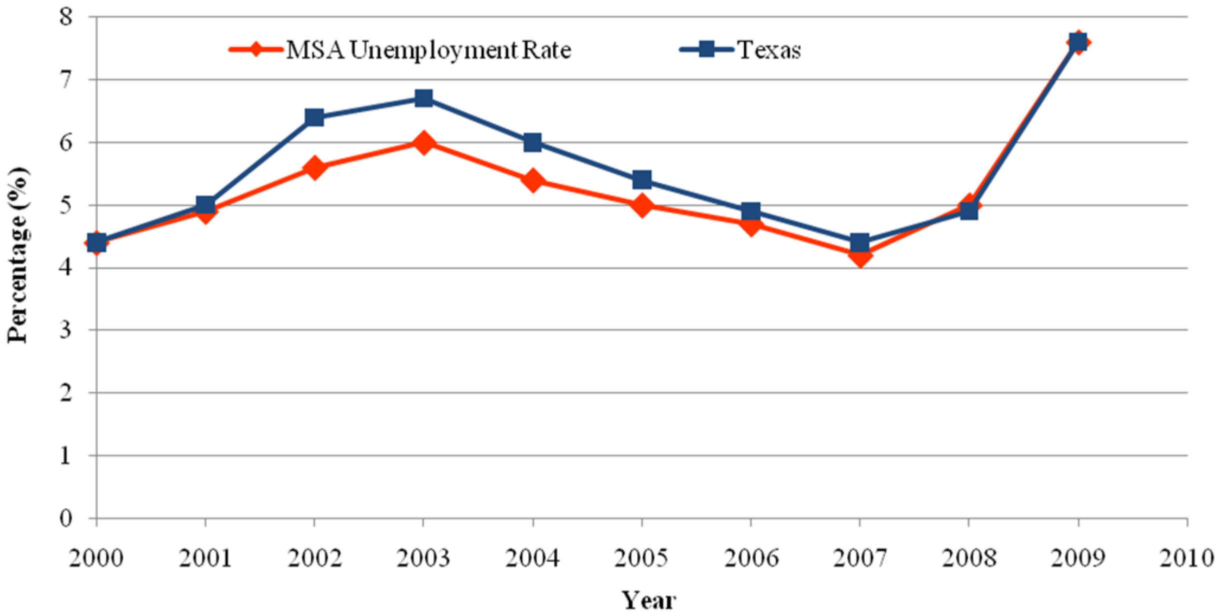
Figure E8: Longview MSA Number of Employees by Industry less Service-providing, 2000 to 2010

The growth of the education and health service industries can be attributed to the presence of the University of Texas at Tyler. UT Tyler has both a College of Engineering and a College of Nursing and Health Sciences. The university also has two separate campuses within the Piney Woods region in Longview and Palestine, TX (University of Texas at Tyler, 2002). Construction is fueled by the area's numerous forests, and the local government jobs increased because of the opening of a new prison in Texarkana. Healthcare positions are increasing, and employee specialization in the field is accelerated by the educational opportunities at the University of Texas–Tyler campuses in the region (Texas Comptroller of Public Accounts, 2008). The other fast growing industries include computer and data processing services, residential care, transportation services, and water and sanitation. These jobs require an educated and well-trained workforce to continue to meet the growing demand (Texas Comptroller of Public Accounts, 2008).

The population of the region increased steadily since the 1930s oil boom, which made the area wealthy and prosperous. Today, the population continues to grow, though more slowly, and the region continues to thrive economically. Oil prices fell in the 1980s, which contributed to a recession in the area's economy. The economy recovered in the 1990s with increased job growth, despite losses in the apparel manufacturing industry. Through the 2000s the area has had steady job growth, even through federal defense related closures (Texas Comptroller of Public Accounts, 2008). From Figures E9, E11,and E13, it can be observed that the labor force increased steadily in the region from 2000 to 2009. Unemployment, however, increased sharply from 2007 to 2009 because of the economic recession but it still remained at par or lower than the Texas average (see Figures E10, E12, and E14). This can be attributed to the recession proof industries like the education and healthcare, which experienced an increase in the number of employees during that time period.

Source: Texas Workforce Commission, 2010

Figure E9: Tyler MSA Labor Force 2000–2009

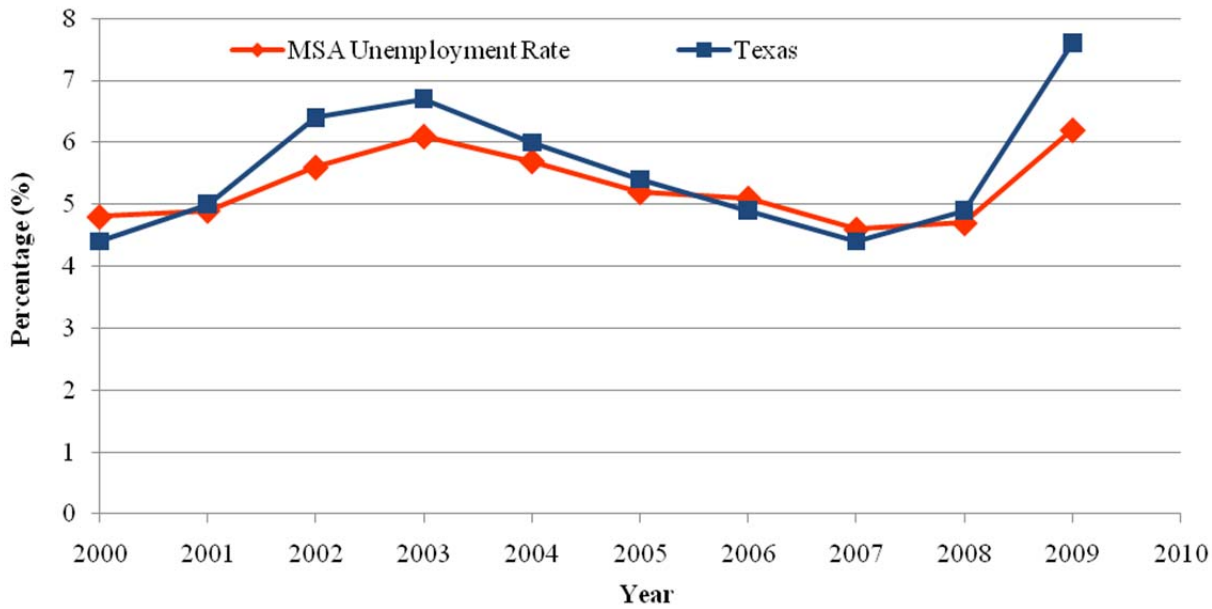


Source: Texas Workforce Commission, 2010

Figure E10: Tyler MSA Unemployment Rate 2000–2009

Source: Texas Workforce Commission, 2010

Figure E11: Texarkana MSA Labor Force 2000–2009

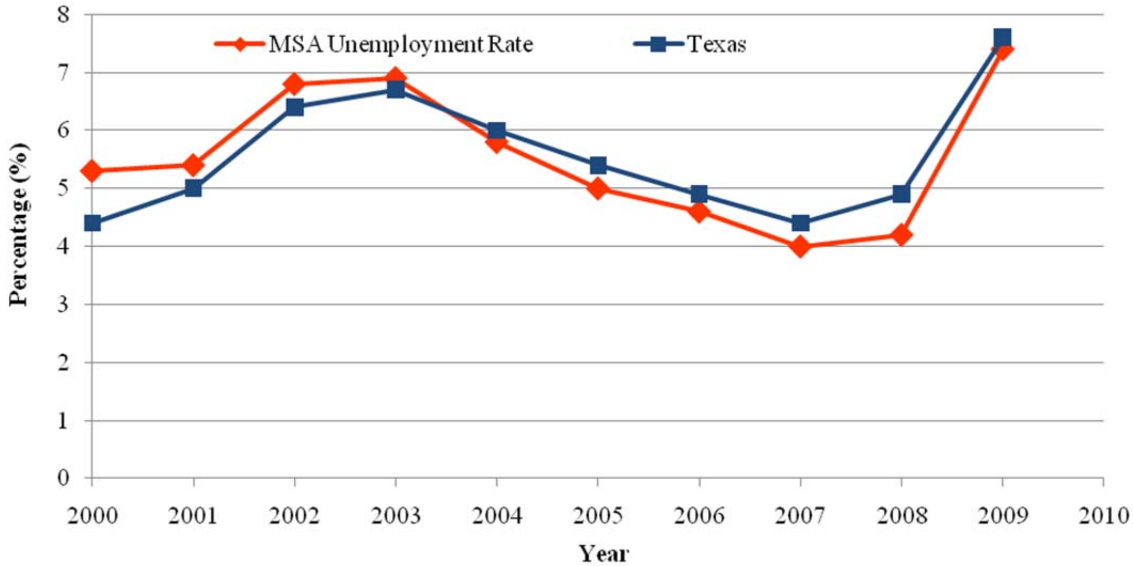


Source: Texas Workforce Commission, 2010

Figure E12: Texarkana MSA Unemployment Rate 2000–2009

Source: Texas Workforce Commission, 2010

Figure E13: Longview MSA Labor Force 2000–2009

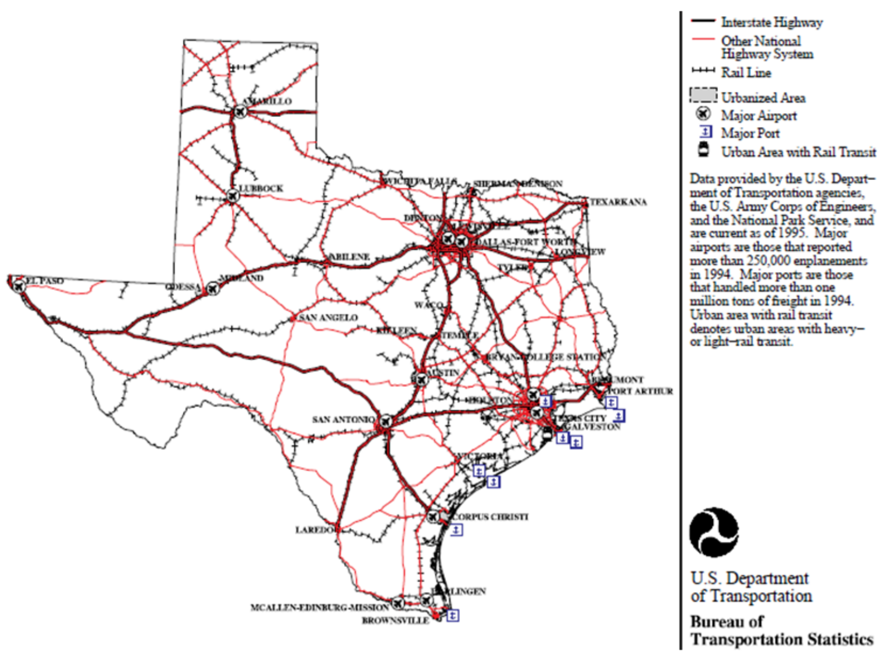


Source: Texas Workforce Commission, 2010

Figure E14: Longview MSA Unemployment Rate 2000–2009

Inventory of Freight Facilities

Freight can be moved via multiple transportation modes. In the Piney Woods region of Texas, only two of these modes are available—rail and truck. Rail is prevalent in the eastern part of the state, which includes the Piney Woods, containing over 2,000 miles of Class I railroads. Trucking is also used extensively in the region, despite having few major trade corridors. Figure E15 displays Texas's highways and railroad lines.



Source: Texas Comptroller of Public Accounts, 2008

Figure E15: Freight Transportation Routes in Texas

The demand for freight movements and the supply of freight infrastructure in the Piney Woods region is currently below equilibrium. While the demand for freight movements is expected to increase, especially after the Panama Canal expansion project, demand is still below supply in both rail and truck transportation infrastructure.

Air demand for cargo is low and has plenty of room for growth. Air supply of cargo is also low, as most of the airports in the Piney Woods region are not well-equipped for cargo transport and are instead general aviation airports. Increased demand would spur more attention on the lack of supply, which could then encourage the airports to take on more cargo.

Road Infrastructure

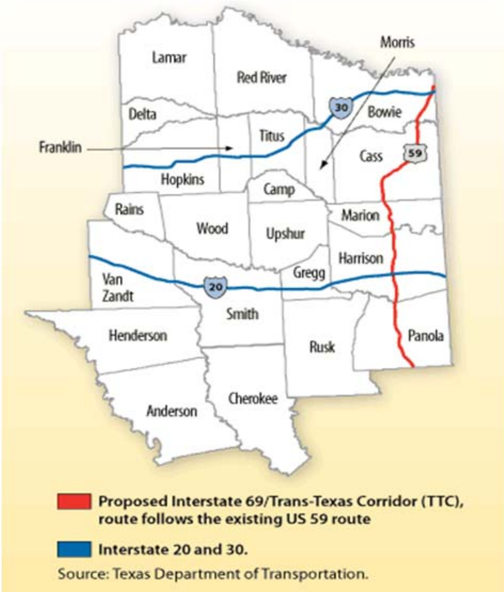
Currently, IH 20 serves to connect Dallas to the Eastern part of Texas as well as Louisiana and other states to the east. IH 30 connects Dallas to Arkansas and then on to Tennessee. US 59 connects the trade areas and ports of South Texas all to way to Kansas City, which then has roads connecting to Chicago. The region has options for relieving the predicted congestion on interstates 20 and 30. While IH 20 and IH 30 will likely remain as the vital east-west arteries, there are no existing major highways to traverse north and south through the region. TxDOT has suggested the creation of IH 69 from the existing US 59, which will run north-south as the Trans-Texas Corridor and can be seen in Figure E16.

There are about 15,700 centerline miles of roadway in the Piney Woods region, most of which are local roads. Alternately, there are around 35,700 lane miles in the region. Only about 270 centerline miles are interstates, namely IH 20 and IH 30, which run east and west through the state. Of the 43 counties in the region, Smith County contains the highest percentage of centerline miles—at almost 4% of the Piney Woods' miles (Texas Comptroller of Public Accounts, 2008).

When examining the projects that are to receive funding under Proposition 14 in the Piney Woods region, the conclusion can be made that the majority of these projects involve the widening of roadways. This indicates the need for an increased capacity to improve traffic flow throughout the region. Since many of these projects already address capacity issues, once they have been completed we do not believe there will be a concern with highway capacity. However, once the Panama Canal Expansion has been completed in 2014, there will inevitably be vast changes to the transportation demands in the region because of its proximity to the Gulf Coast. Once the Panama Canal has been expanded, there will most likely be a need to reassess the roadway and rail capacity of the region in order to ensure that it can handle the increased volume of trade being transported through the region.

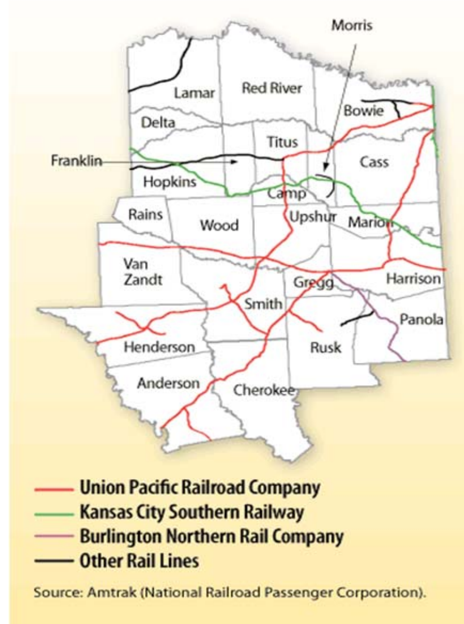
Rail Infrastructure

Texas has more miles of rail than any other state. Figure E17 illustrates the major rail lines located in the Piney Woods region of Texas. Of these railroad companies, there are three Class I, one regional, and two local railroads. The majority of these railroads operate parallel to Interstates 20 and 30.



Source: Texas Comptroller of Public Accounts, 2008

Figure E16: Interstates and Proposed Trans-Texas Corridor in the Piney Woods Region



Source: Texas Comptroller of Public Accounts, 2008

Figure E17: Upper East Texas Rail Lines, 2005

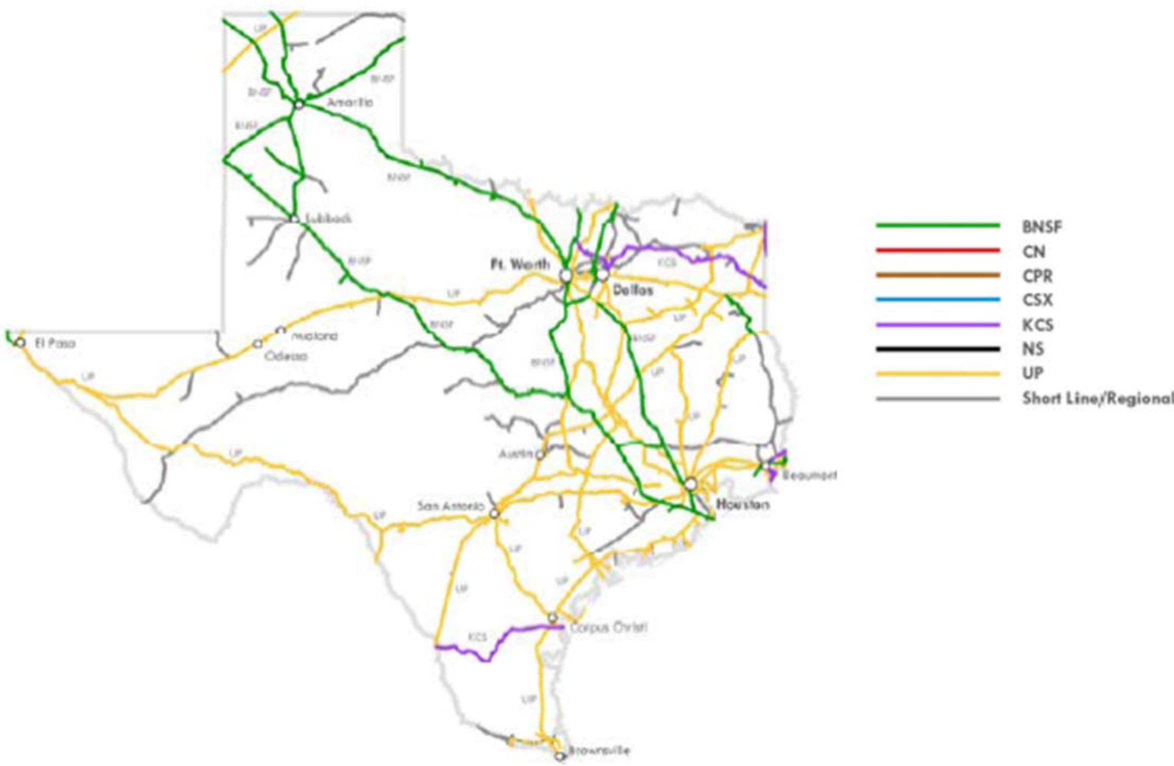
The UP Railroad owns the majority of the railroads in the Piney Woods region, with routes between Dallas, Paris, Texarkana, Tyler, Longview, Beaumont, College Station, and Houston. These routes make up roughly 20% of the state's 10,804 miles of railroad (Union Pacific). The Central Region, Gulf Division of BNSF also operates in the region. BNSF connects Silsbee, Longview, and Houston. Approximately the same number of miles—roughly 2,000—is also used by BNSF, which indicates that some of the rail lines in the Piney Woods region are shared between the two companies. BNSF owns trackage rights between Houston and Texarkana, as well as Houston to Shreveport, LA, overlapping tracks with UP (Burlington-Northern Santa Fe). Table E2 displays some of the track miles between cities in the Piney Woods region, provided by UP (Union Pacific).

KCS also operates in the Piney Woods, but with much fewer rail miles than BNSF and UP. KCS has one route in the region, spanning 200 miles from the Texas border near Shreveport, LA to Dallas (Kansas City Southern). Figure E18 shows the active rail lines in Texas, with KCS, BNSF, and UP being the only major companies in the Piney Woods region.

Table E2: Union Pacific Rail Miles between Cities in the Piney Woods Region

Source: Union Pacific

Origin	Destination	Miles
Texarkana	Longview	89
Dallas	Texarkana	211
Longview	Tyler	45
Longview	College Station	200
Longview	Beaumont	309
Beaumont	College Station	171
Texarkana	Paris	90
Longview	Dallas	128
Tyler	Dallas	125
Longview	Paris	179
Longview	Houston	233
Tyler	College Station	184
	TOTAL	1,964



Source: Association of American Railroads, 2007

Figure E18: Railroad Companies and Routes in Texas

The rail lines in the Piney Woods region are greatly utilized by the coal, wood, and manufacturing industries. These industries are all very prosperous in the region, and they choose to use rail as their primary means of transport and distribution. Rail is typically the least expensive and most efficient, and considering that the value of the commodities being shipped in the region is relatively low, rail is naturally the chosen method of transport (Texas Comptroller of Public Accounts, 2008).

Figure E19 shows the current rail volumes and capacities in Texas. From this image, we can see that in the northeast region of Texas, which is where the Piney Woods region is located, all of the rail lines are either green or yellow colored. This indicates that these rail lines are operating below capacity (green) or near capacity (yellow). The corresponding levels of service for these characterizing capacities are shown in the legend to the right of the figure. From this figure, it can conclude be inferred that the current rail system is in good condition and operating near or below capacity since this data was collected in 2007. Since this time, freight traffic volumes have decreased somewhat due to the recession, so this assumption still holds true for the present year.

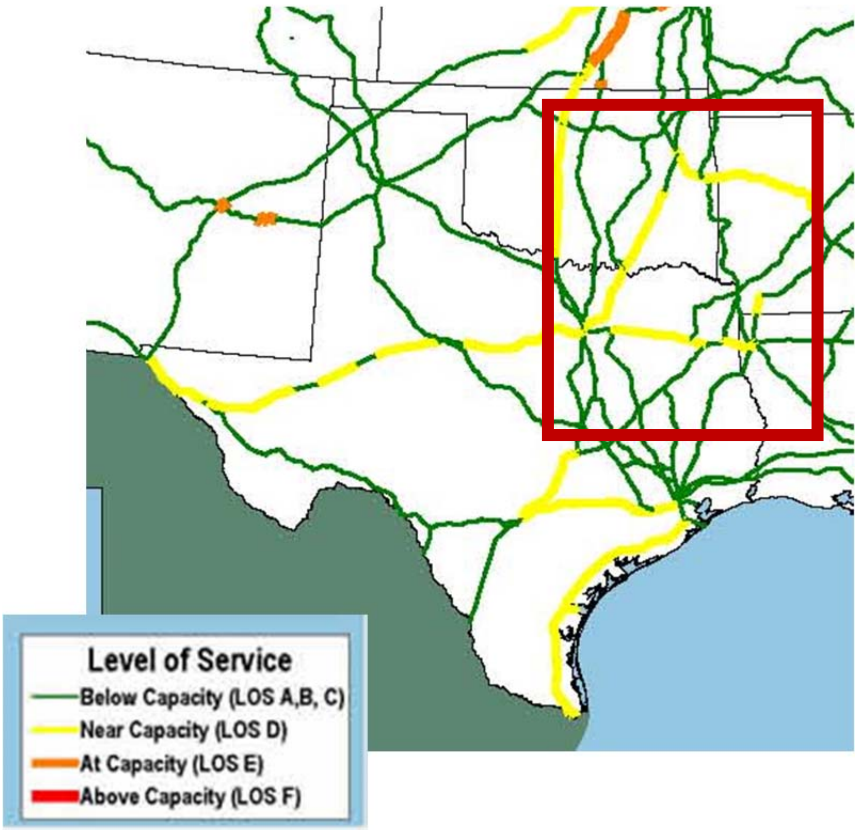


Figure E19: Texas's Current Train Volumes and Capacities

Source: Federal Highway Association, 2007

Air Infrastructure

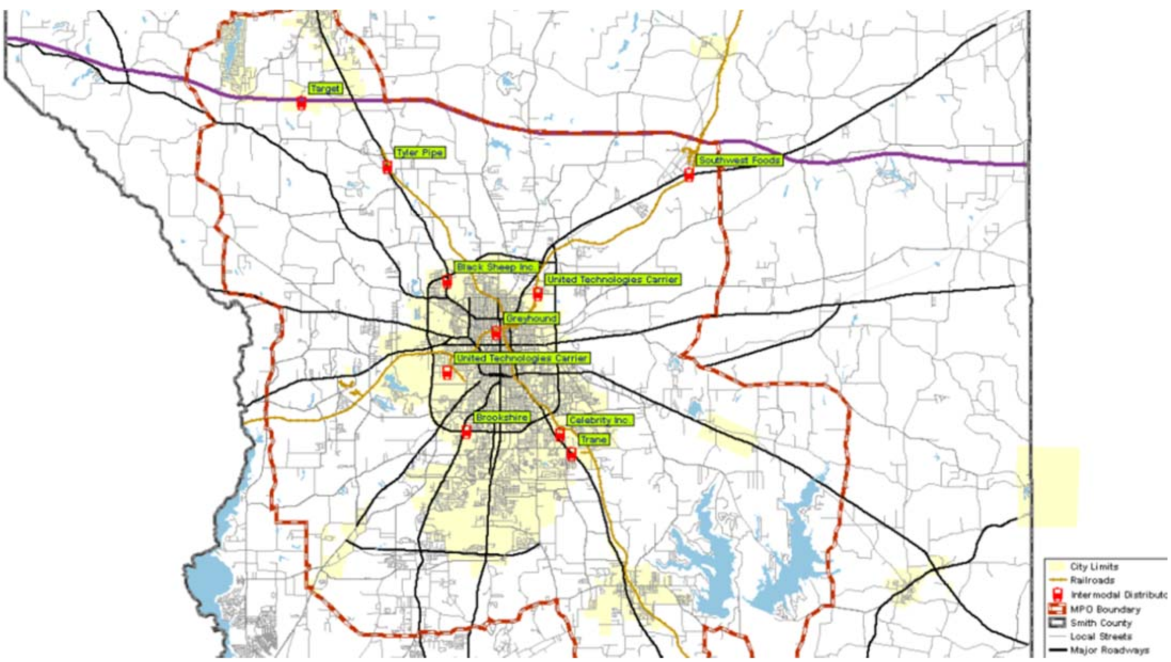
There are three airports located in the Piney Woods region that are categorized as primary aviation facilities. The Tyler Pounds Regional Airport has three operating runways and eight taxiways. A new terminal was added in 2002 that was twice the size of the initial airport, and improvements have been made to the runways and taxiways since then to enhance and prolong the life of the pavement. The most enplanements this airport has seen was just over 86,000 enplanements in the year 2005 (Tyler Area Metropolitan Planning Organization). All three runways have been deemed to have surfaces and markings that are in good condition, with the exception of one runway with a surface condition that was only fair (AirNav.com). However, overall this facility seems to be in good condition that is extremely beneficial to the Piney Woods region because this is the largest primary aviation airport in the area.

The Easterwood Airport is located in College Station, Texas. This facility also has three runways, with the longest measuring 7000 feet long; they recorded 51,462 enplanements for the year 2009 (Easterwood Airport). The runways all have surface and marking conditions that have been recorded as good or even excellent in some cases (AirNav.com).

The East Texas Regional Airport is located in Longview, Texas. This facility has three runways with the longest measuring 10,000 feet long; it has recorded 25,353 enplanements in the year 2006 (East Texas Regional Airport). The surface and marking conditions for all four runways are all recorded to be good (AirNav.com). The East Texas Regional Airport has just received $3.2 million dollars in the form of a federal grant to resurface one taxiway and rebuild another (East Texas Regional). The East Texas Regional Airport is capable of handling a variety of types of aircraft, including Air Force One, and also operates as an alternate landing site for the space shuttle as well as a military training facility (Real East Texas Living - Longview).

Intermodal Facilities

Intermodal facilities are those in which people or goods are transferred between modes of transportation, such as truck to train, and it helps the efficiency of people and freight movements. Figure E20 shows the intermodal facilities located in the Tyler and Smith counties in the Piney Woods region.



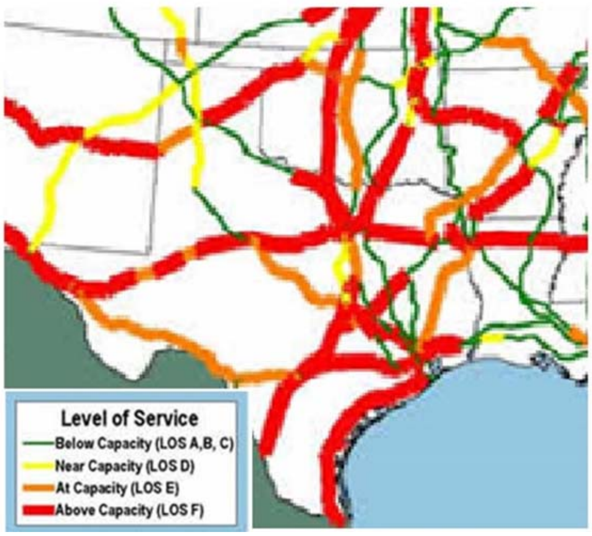
Source: Tyler Area Metropolitan Planning Organization

Figure E20: Existing Intermodal Facilities in Tyler

The majority of these facilities consist of the key distributors in the Tyler area, such as the Target Distribution Center, but most intermodal facilities are located inside of Loop 323. In order for all separate modes of transportation movement (air, rail, truck) to support the economic competitiveness and attractiveness of the region, there must be additional efforts to improve intermodal facilities and to create an integrated system.

Critical Freight Needs and Issues

The predictions for future transportation needs in any region in proximity to the Gulf Coast are inevitably going to involve increases in all modes of transport. With increased volume of container ships trafficking the ports in the Gulf Coast, there will be an increased demand for the distribution of imported products by truck and rail. This will also cause the need for an increased capacity of rail and intermodal facilities. Figure E21 shows the projections of future train volume and capacity conditions in Texas in 2035.



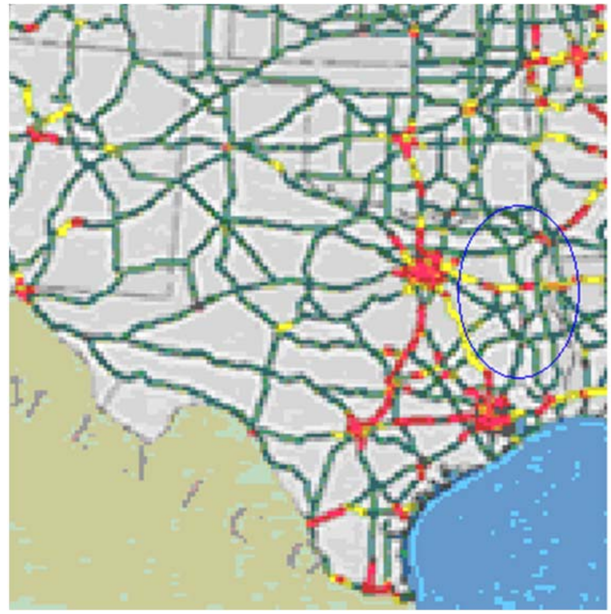
Source: Federal Highway Administration, 2008

Figure E21: Train Volumes and Capacities for Texas in 2035

Figure E21 demonstrates drastic changes from the current capacity illustration shown in Figure E19. In the Piney Woods region, there are still currently a few rail lines operating below capacity. However, the majority of the rail lines will operate at or above capacity by the year 2035 in this region. Rail lines operate above capacity with a level of service of F, which is not acceptable and is certainly not efficient. If the Piney Woods region wants to remain economically competitive, they must prepare for this congestion and improve their rail capacity before 2035.

A possible option available that will enable railroad capacities to increase is to reestablish previously existing rail lines that may have been abandoned or fallen into disrepair. By revitalizing these corridors, railroad companies limit the funds they will have to dedicate to creating an entirely new track, since many still have the rails but are not in the shape to be used immediately. These abandoned tracks could provide a simple alternative to laying new tracks, which would be costly in both time and money. Another feasible option would be to double-stack more trains in the region. Because there are no tunnels and the grade is relatively flat, double-stacked trains are possible and can double the capacity of each train. Freight stakeholders also reported on the difficulty of dealing with the Class 1s especially concerning movement of small volumes of goods. They expressed the need for the development of short line railroads in the area to accommodate the movement of goods from the region.

The most critical issue with freight in the Piney Woods region is the Panama Canal expansion. The expansion project will allow wider, deeper ships to pass between the Atlantic and Pacific Ocean, which means container volume is expected to increase. The concern amongst stakeholders in the region is how the Panama Canal expansion may impact the regions infrastructure due to increased number of truck volumes. While it is too early to speculate exactly how much of a change the Panama Canal expansion project will cause to the region's congestion problems, it would be prudent to assume that volumes will increase and so will congestion.



Source: Federal Highway Administration, 2008

Figure E22: Future Roadway Capacity in 2020

The Piney Woods region is identified by the blue oval in Figure E22. As seen in the figure, the majority of the roadway capacities will be operating at or below capacity. Few segments are highlighted in orange or red, indicating that they are above capacity. However, these issues are caused mostly by bottleneck interchanges, and can be remedied. If an entire corridor in the region was highlighted in red, as the I-35 corridor between San Antonio and Dallas is, this would be indicative of a major problem that would require more immediate action.

Policies and Strategies to Address Needs

The Piney Woods region does not have a critical highway capacity issue now or in the future, as shown in Figure E22. However, there are certain target locations that could be examined to improve traffic flow in these areas. The TxDOT proposal to create an Interstate 69 from US 59 will increase capacity on the existing roadway. This interstate will also help to create an established road corridor in the north-south direction throughout the Piney Woods region. This will benefit the region because there is no existing interstate traveling from north-south, only IH 20 and IH 30 that lie in the east-west direction.

The North East Texas Regional Mobility Authority (NET RMA) has also issued a Request for Qualifications to complete the implementation of the Toll 49 Project, which is located near Tyler, Texas. The NET RMA has recognized the need for increased capacity and efficiency of the roadway due to the expansion rate of the area. The rate of expansion has been 1.8% per year from 1970 to 2000, and 4% a year since the year 2000 (NET RMA, 2009). Toll 49 went from an average of 1,379 daily transactions on its one-year anniversary in August 2007, to just over 5,000 transactions per day in August of 2009—an increase of 237% in three years, and 96% since tolling began on the second segment (Texas Department of Transportation, 2009). Figure E23 illustrates the locations where the Toll 49 Project is designed to be implemented.

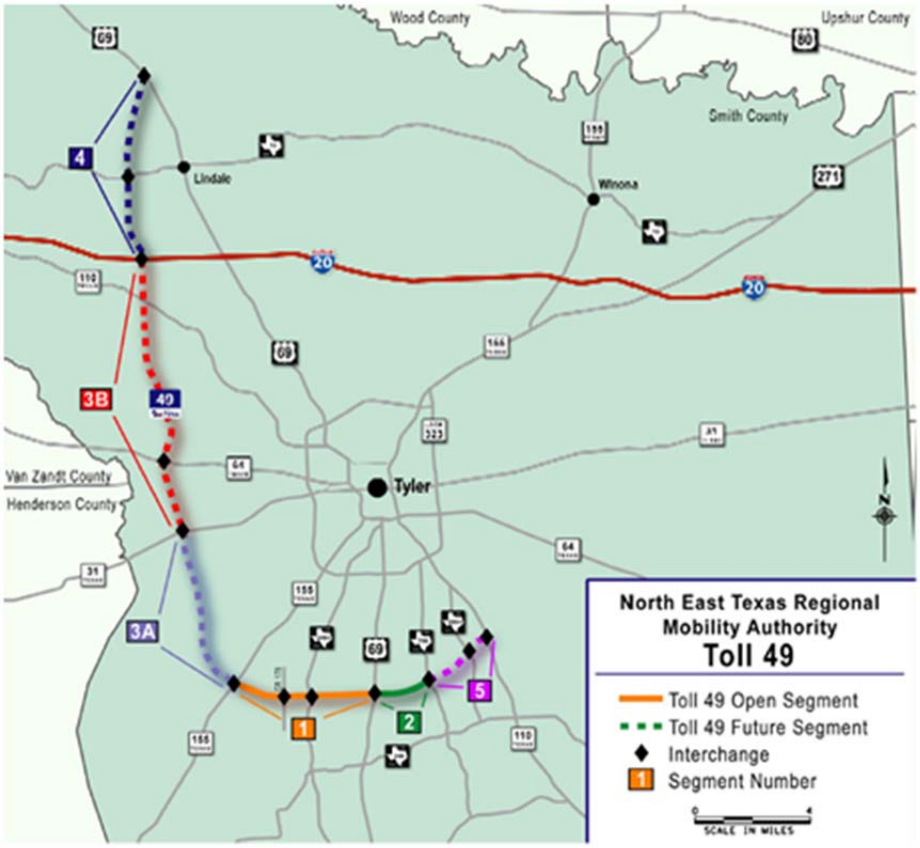


Figure E23: Proposed Locations of Toll 49 Project

Source: NET RMA, 2008

When examining the critical freight needs and issues along with the existing facilities, there appears to be a lack of facilities to conduct intermodal operations. It could be extremely beneficial to establish an intermodal hub nearby to the existing Tyler Pounds Regional Airport. The inclusion of this type of facility would aim to create a more efficient intermodal system for the city of Tyler. By centralizing intermodal activities in the area and creating more space for containers, transportation of goods within the Piney Woods region will become overall more efficient. This may also help to take the pressure off of cities like Dallas and Houston, whose intermodal operations must accommodate much of the freight traffic traveling north from the Gulf Coast.

There is motivation behind locating an intermodal hub near the Tyler Pounds Regional Airport. Firstly, it is typically most beneficial for an intermodal facility to be able to accommodate freight traveling in all modes of transportation. Currently, the Tyler Pounds Regional Airport does not conduct any substantial air freight operations. In a study done by a research team at The University of Texas at Austin, the Tyler Pounds Regional Airport was ranked 26th out of 33 in origin airports serving domestic air cargo in the year 2003. They did not carry any pounds of enplaned freight, and carried slightly less than 14,000 pounds of enplaned mail. Tyler Pounds ranked 33rd out of 36 in destination airports serving domestic air cargo, with just less than 5,000 pounds of enplaned freight, and only 624 pounds of enplaned mail (Thompson et al., 2006). This data indicates that the Tyler Pounds Regional Airport is far from being a leader in air cargo transportation in Texas. They currently enplane a very minimal amount of air cargo in comparison with the rest of the state. Currently, the airport consists mainly of commercial air traffic.

If the Tyler Pounds Airport were to increase its capacity to be able to accommodate a larger portion of air cargo compared with the total air traffic, the benefits to the surrounding economy could be substantial. In fact, the Tyler Pounds Regional Airport's Master Plan Update projects that the total air cargo, the combination of enplaned freight and mail, will grow from 7.8 tons in 2000 to 26.9 tons in 2024. Overall, this represents a total increase of air cargo tonnage by 19.1 tons (City of Tyler, 2006). In particular, increased activity in this area would provide benefits to the healthcare industry because much of this industry relies on the efficient transport of high value objects, such as equipment and pharmaceutical products. However, an increase in air cargo would not solely benefit this industry, but also any others that involve high value and low volume products.

With an intermodal facility located adjacent to the Tyler Pounds Regional Airport, along with an increase in air cargo activity, there is the potential to combine the efforts of the two facilities. The intermodal facility could become an inland port if it includes the airport's cargo transport in its operations. A facility qualifies as an inland port if it can conduct its own customs procedures, which could be incorporated into the airport's operations and therefore the entire facility. If Tyler were to establish its own inland port, intermodal operations between all modes of transport would become much more centralized and efficient. Development of the surrounding areas would also increase, and the economy of the city of Tyler would benefit a great deal as well. However, the city of Tyler is not the only area that would benefit from such a facility—it would also be advantageous for the entire Piney Woods region. With a more efficient intermodal facility there would be a more organized and effective way of transporting goods to and from the region. Having an inland port would also reduce costs for individual intermodal activities because it is more centralized and operates more efficiently compared with having multiple separate intermodal locations. Additionally, as previously mentioned, an inland port at Tyler could help to relieve some of the volumes at the intermodal hubs in Dallas and Houston if it indeed was successful and became established as a viable location for inland port operations.

Another option for addressing the future critical freight needs is one that is aimed to relieve the pressure of additional rail volumes. In Figure E21, which displays the future capacities of the rail lines of Texas, the majority of these lines in the Piney Woods region will be operating above capacity. Figure E24 depicts the inventory of rail lines in the state of Texas as outlined by a study done by TxDOT.

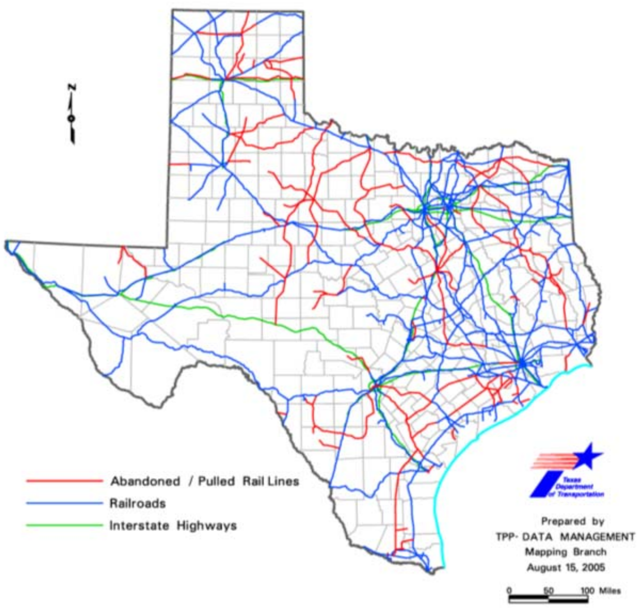


Figure E24: Abandoned Rail Lines in Texas since 1953
Source: TxDOT, 2005

In Figure E24 the abandoned railroads are highlighted in red and the existing railroads currently being utilized are in blue. As seen in the right side of the figure, which is zoomed in to the Piney Woods region in the northeastern part of Texas, there are a substantial number of rail lines that are highlighted in red. This means that there are abandoned rail lines located in the Piney Woods region and that the rehabilitation of these rail lines could be an option. By restoring abandoned rail lines, much needed capacity will be added very quickly to the rail system within the region. Restoring abandoned rail lines is much more economical than laying down new tracks. When a new railroad is constructed, there is a great deal of capital cost that must be spent. However, this money is saved when abandoned tracks are reutilized, as well as time that would be spent laying new tracks.

Because the Piney Woods region is forecasted to have rail lines operating above capacity in the future years, the restoration of abandoned rail lines is an extremely viable option. By making these rail lines usable again, the addition of the lines will only strengthen the rail network in the region and help it to develop and to prosper economically. This expanded rail network will also support the addition of a new intermodal facility in Tyler if it is instituted. Additionally, if the airport eventually combines forces with the intermodal hub and provides air cargo services to make the facility an inland port, an extended rail network will indefinitely help this facility.

F: South Coastal Texas

Introduction

As intermodal freight activity increases in Texas, the South Coastal region freight infrastructure feels the impact of freight movement. The four major modes of freight transportation—air, marine, truck, and rail—are all experiencing increasing use due to increasing NAFTA trade with Mexico, and import of bulk cargo to land and marine ports in Brownsville and Corpus Christi respectively. Since the introduction of NAFTA in 1994, increased trade with Mexico has caused rail and highway networks in the South Coastal region to exceed capacity and border crossings to slow down. As cities like McAllen experience intense population growth, airports in the region are working to expand facilities to accommodate more passenger and cargo flights. The region’s deep water ports at Corpus Christi and Brownsville are adding infrastructure to accommodate larger bulk cargo that is anticipated to come after the expansion of the Panama Canal.

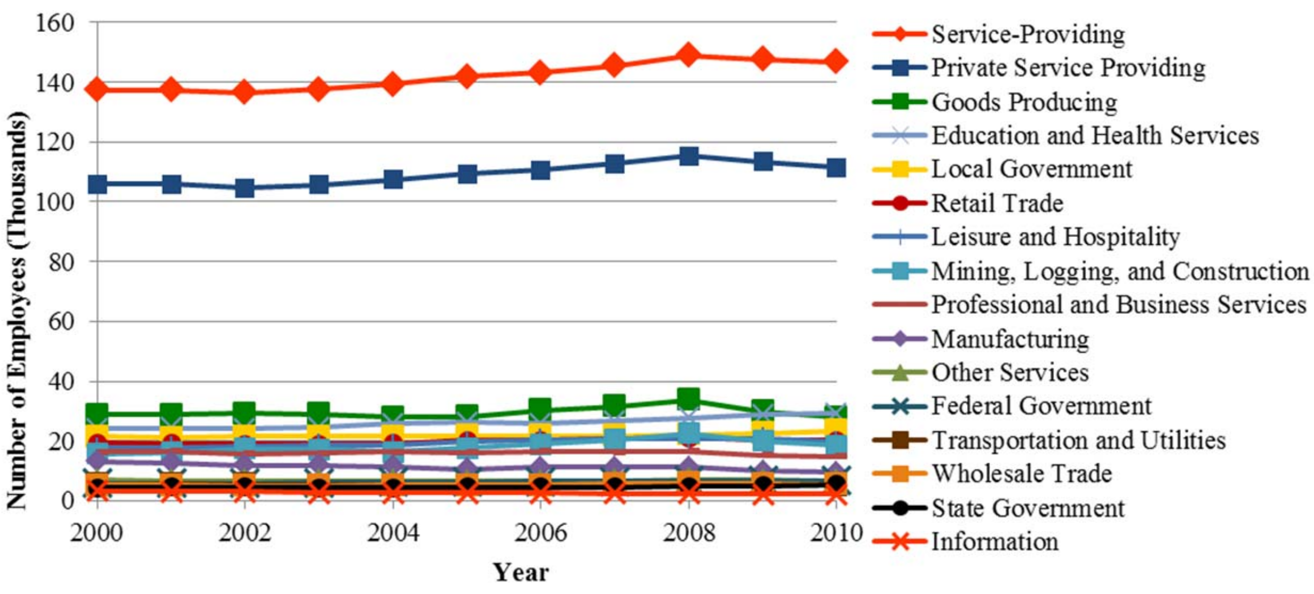
This report outlines the current and projected demand for freight movements, the supply of freight infrastructure in the Texas South Coastal region for each of the four major modes of transportation, the critical freight needs and issues of the region, and policies, initiatives, and strategies to help combat increased freight use. Four main initiatives are recommended to help overcome the issues that have arisen as transportation demand exceeds infrastructure supply. These initiatives include the creation of IH 69/TTC 69, investment in new railroads and railroad maintenance, the promotion of short sea routes, and the creation of an intermodal facility at Corpus Christi. The effects of these initiatives can be evaluated using performance measures recommended by the FHWA and other sources including monitoring travel time, border crossing delay and applying both traditional and unique port performance indicators and measures.

The counties considered to be within the South Coastal region are Kennedy, Aransas, Zapata, Brooks, Jim Hogg, Kleberg, Refugio, Willacy, Starr, Goliad, Jim Wells, Bee, Karnes, San Patricio, Live Oak, Nueces, Cameron, and Hidalgo (Figure F1).

Figure F1: A map of the counties within the South Coastal region

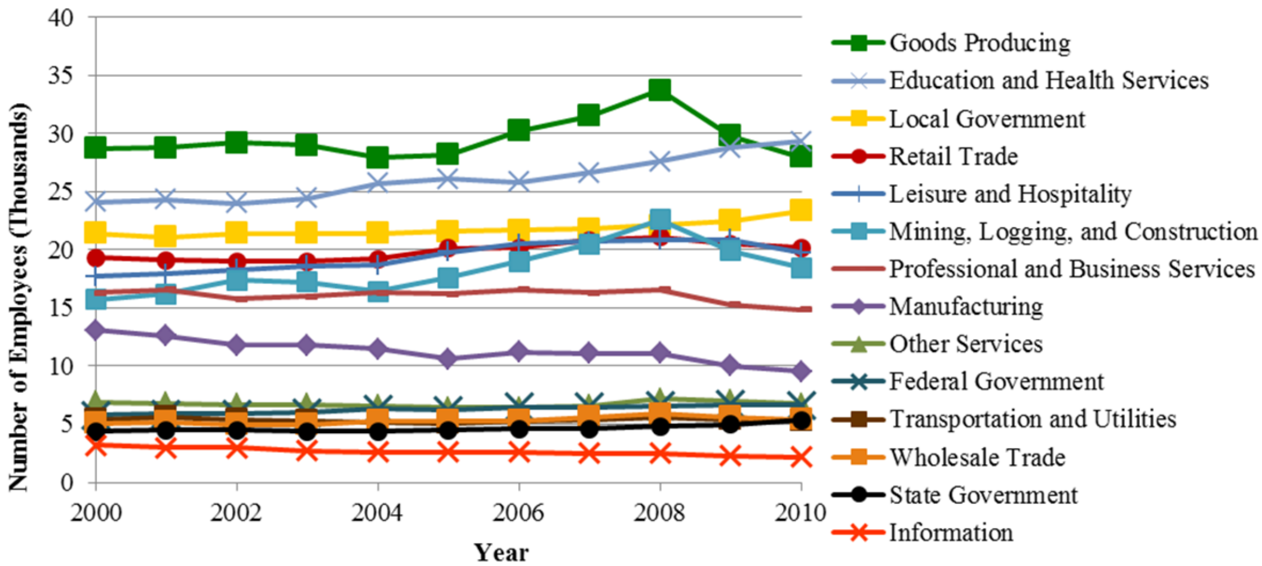
Economic Profile and Freight Movements

Employment is an easy indicator of the economic impact of a company when an in-depth study is not available. According to the Texas Comptroller, the leading private employers in south Texas are in the service, transportation, and agriculture/fishing industry. In the major cities, the largest private employers are involved in the transportation, construction, and service industries. Although the manufacturing industry has suffered across the United States, the South Texas region has been able to retain jobs in the area. This is especially true for the food processing industry because of the strong demand by consumers in the region. International trade is also a large part of the economy because Mexico is so close to the region. In 2007, trade between Mexico and the South Texas region generated nearly $162 billion. Truck transportation accounted for 77% of this total helping make it the primary industry of the transportation sector of the South Texas region. Rail is second to truck transportation and accounted for 22% of the remaining total. Service industries important to the region's economy include education and health. A further review of the number of employees in the region shows that in Corpus Christi MSA, the goods-producing industry was the largest employer until the economic downturn in 2008, which saw a 5% decrease in the number of employees from 2008 to 2010. The education and health services have experienced a gradual increase in the number of employees from 2000 to 2010—a 22% increase. Freight related industries such as mining/logging/construction (petroleum) and manufacturing, however, experienced a similar decline in the number of employees as the goods-producing industry from 2008 to 2010 (see Figures F2 and F3).



Source: Bureau of Labor Statistics, 2010

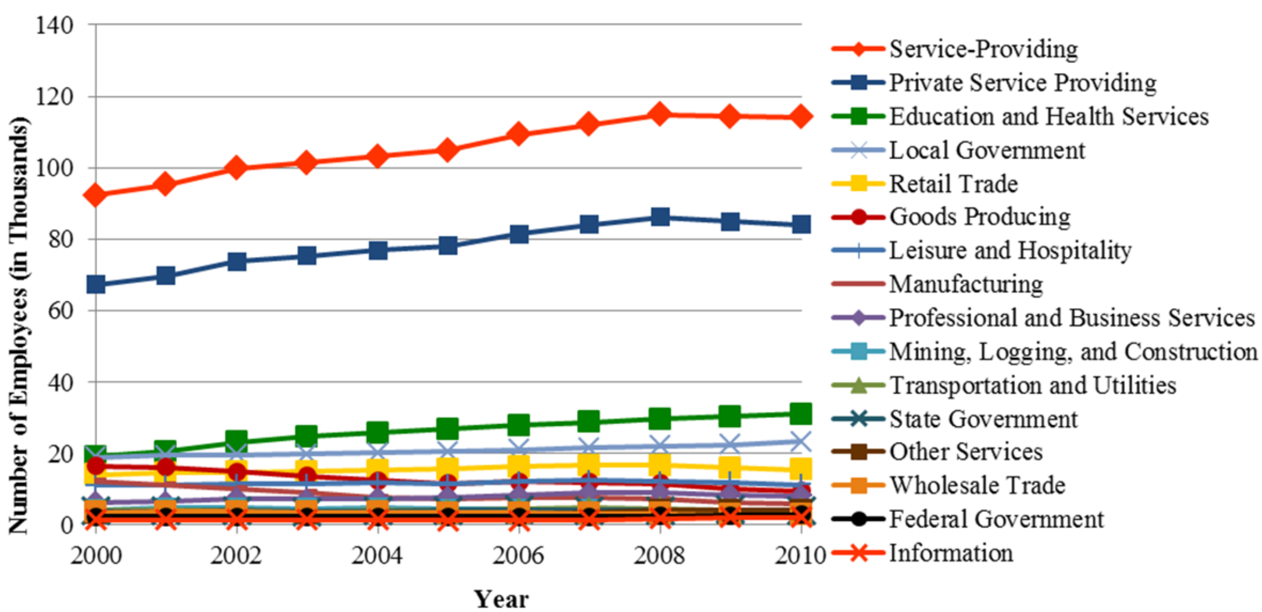
Figure F2: Corpus Christi MSA Employment by Industry, 2000 to 2010



Source: Bureau of Labor Statistics, 2010

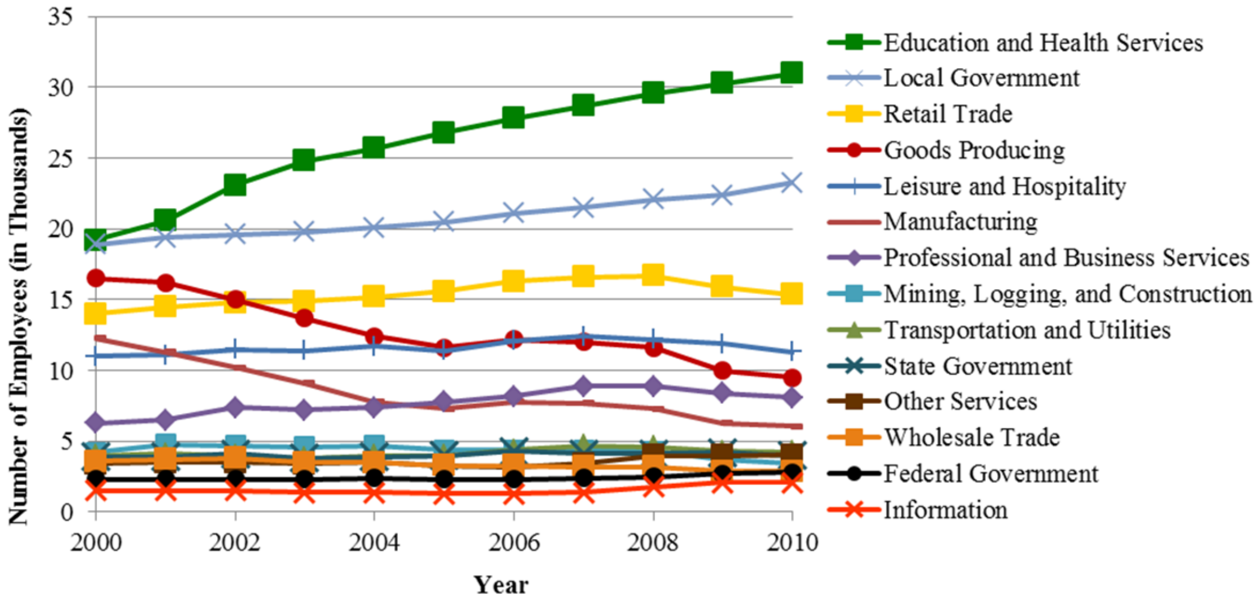
Figure F3: Corpus Christi MSA Employment by Industry less Service-providing, 2000 to 2010

A review of the Brownsville-Harlingen MSA (see Figures F4 and F5) shows that the education and health services have the highest number of employees and experienced the most growth from 2000 to 2010. The number of employees for the freight generating industries such as goods-producing and manufacturing industries have been on the decline since 2000 but the mining/logging/construction industry has remained relatively stable throughout the past decade.



Source: Bureau of Labor Statistics, 2010

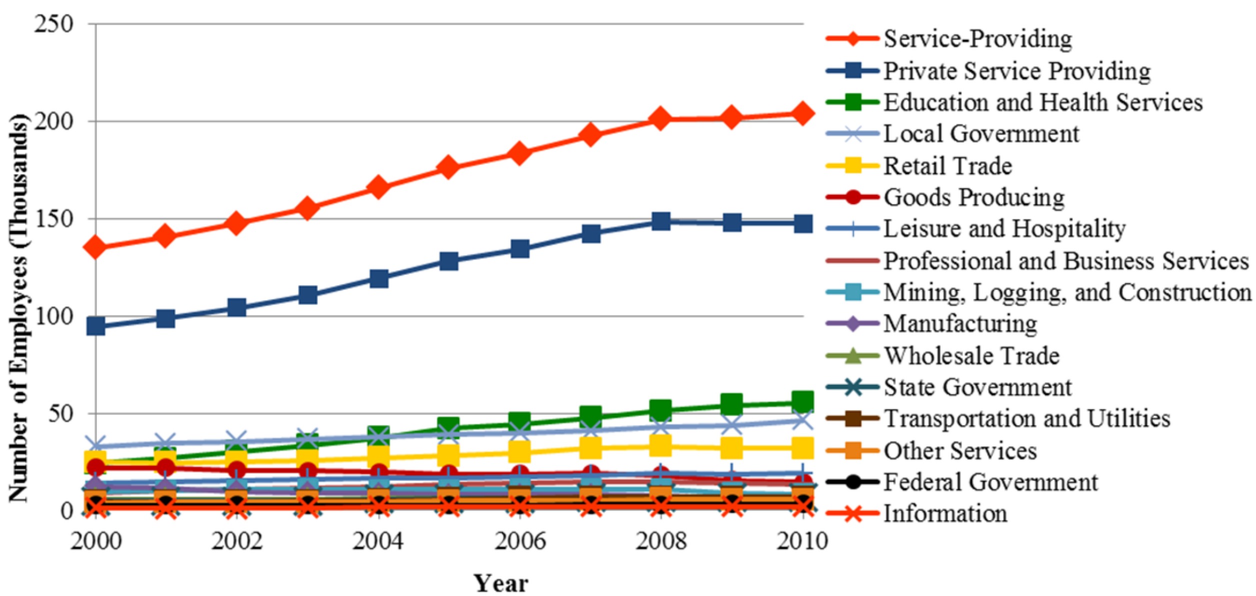
Figure F4: Brownsville-Harlingen MSA Employment by Industry, 2000 to 2010



Source: Bureau of Labor Statistics, 2010

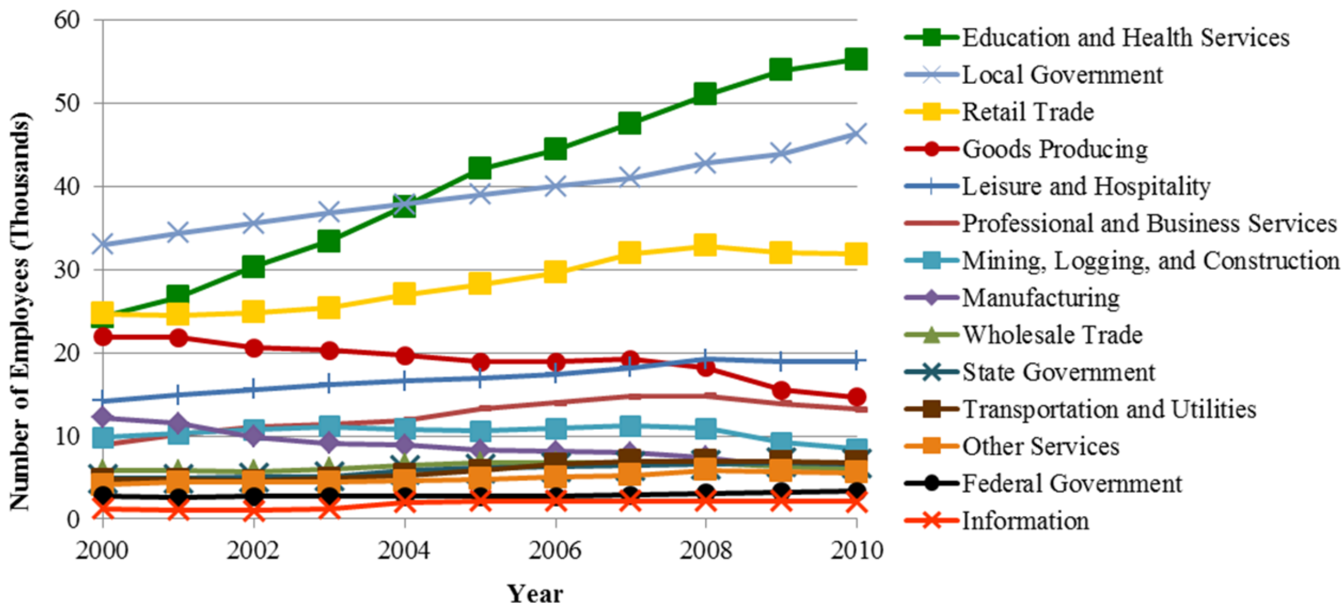
Figure F5: Brownsville-Harlingen MSA Employment by Industry less Service-providing, 2000 to 2010

The McAllen-Edinburg-Mission MSA economic profile is similar to that of Brownsville-Harlingen MSA (Figures F6 and F7). Education and health service industry is the highest employer followed by local government and retail trade. The goods-producing industry that once accounted for the fourth largest number of employees has been experiencing a decline in number of employees from 2000 to 2010. The mining/logging/construction (petroleum) and manufacturing industries also experienced a decline in employee numbers from 2000 to 2010.



Source: Bureau of Labor Statistics, 2010

Figure F6: McAllen-Edinburg-Mission MSA Employment by Industry, 2000 to 2010



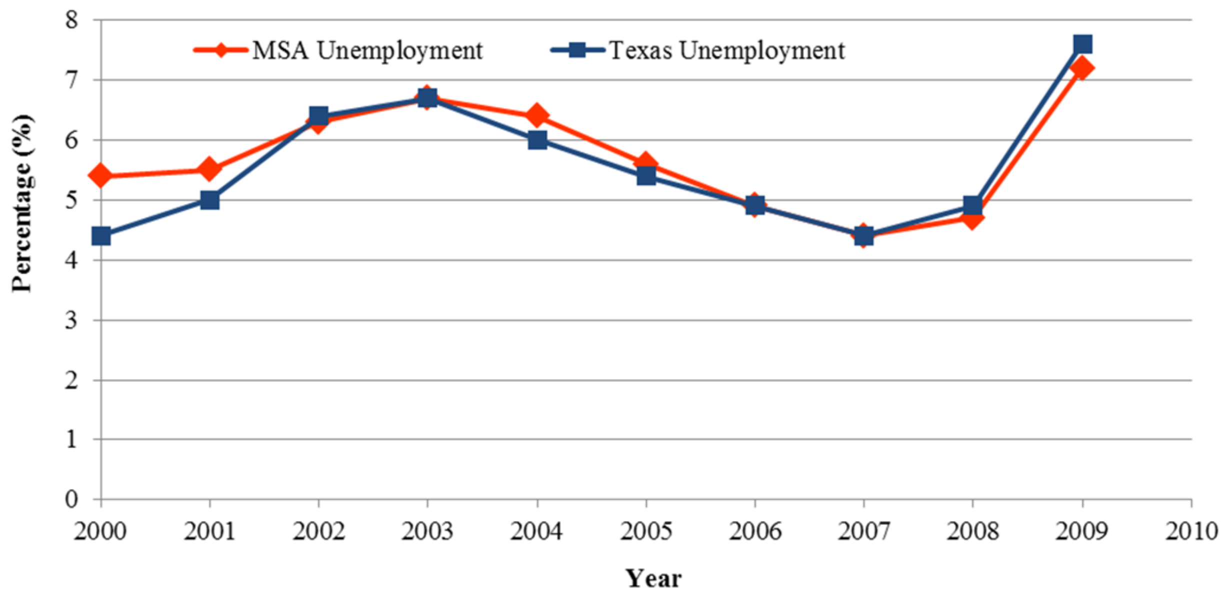
Source: Bureau of Labor Statistics, 2010

Figure F7: McAllen-Edinburg-Mission MSA Employment by Industry less Service-providing, 2000 to 2010

In terms of labor force and employment, the labor force for all three MSAs experienced increased steadily from 2000 to 2010 but experienced some of their highest unemployment rates in 2008 and 2009 (see Figures F8 to F13). Employment in Corpus Christi remained about the same as the Texas average throughout the past decade but that of Brownsville-Harlingen and McAllen-Edinburg-Mission MSAs remained higher during the same period of time. As reviewed earlier, the goods-producing, manufacturing, and mining/logging/construction industries suffered the most loss in employees from 2000 to 2010, and it can thus be said that these industries account for a large percentage of the unemployment numbers from 2008 to 2009.

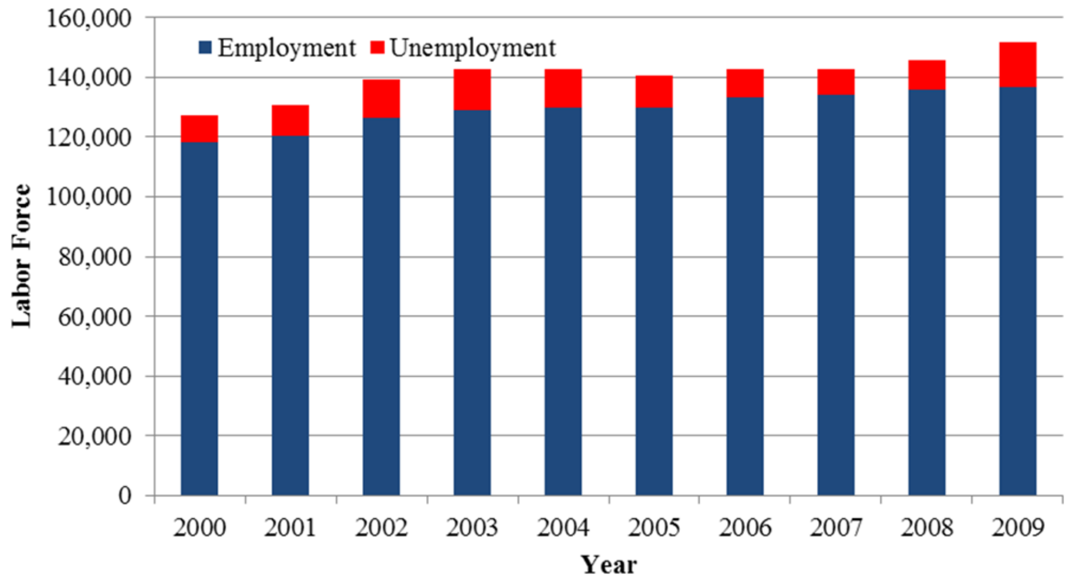
Source: Texas Workforce Commission, 2010

Figure F8: Corpus Christi MSA Labor Force, 2000 to 2009



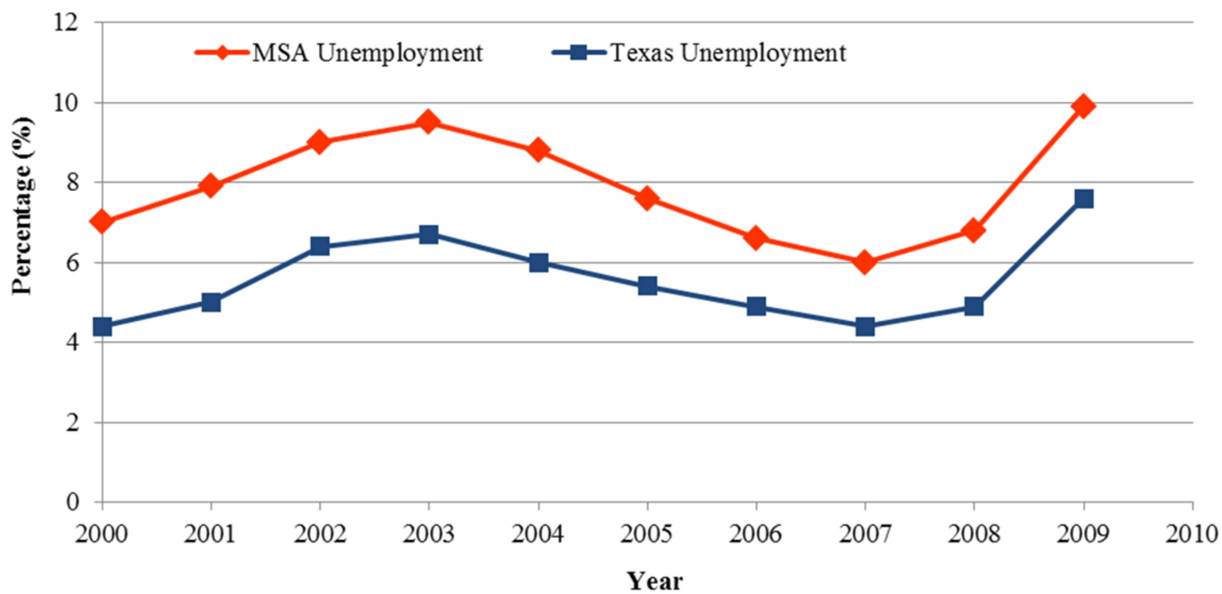
Source: Texas Workforce Commission, 2010

Figure F9: Corpus Christi MSA Unemployment Rate, 2000 to 2009



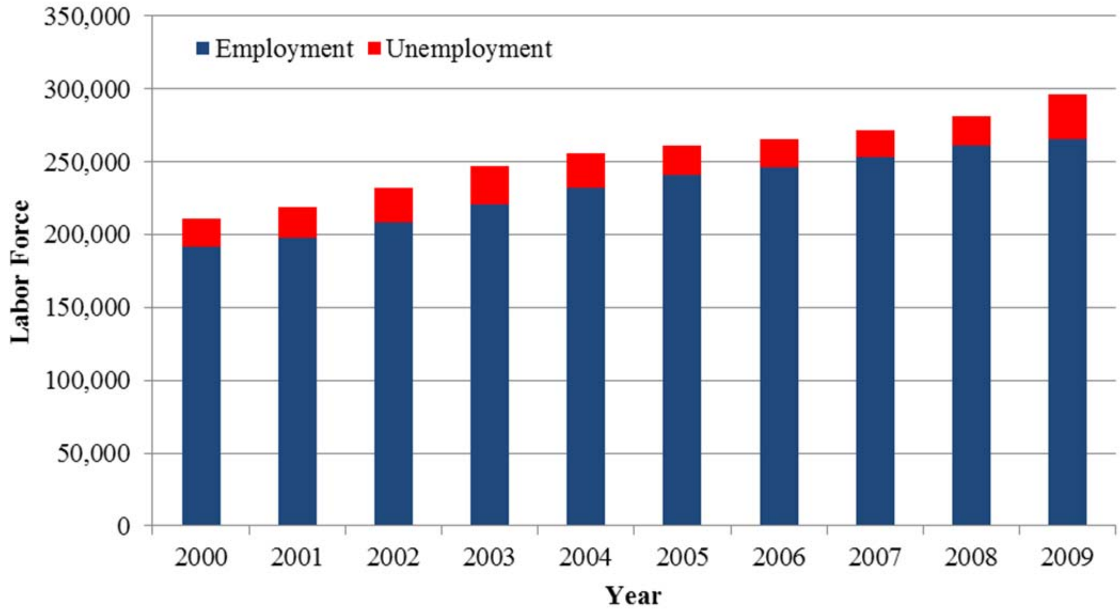
Source: Texas Workforce Commission, 2010

Figure F10: Brownsville-Harlingen MSA Labor Force, 2000 to 2009



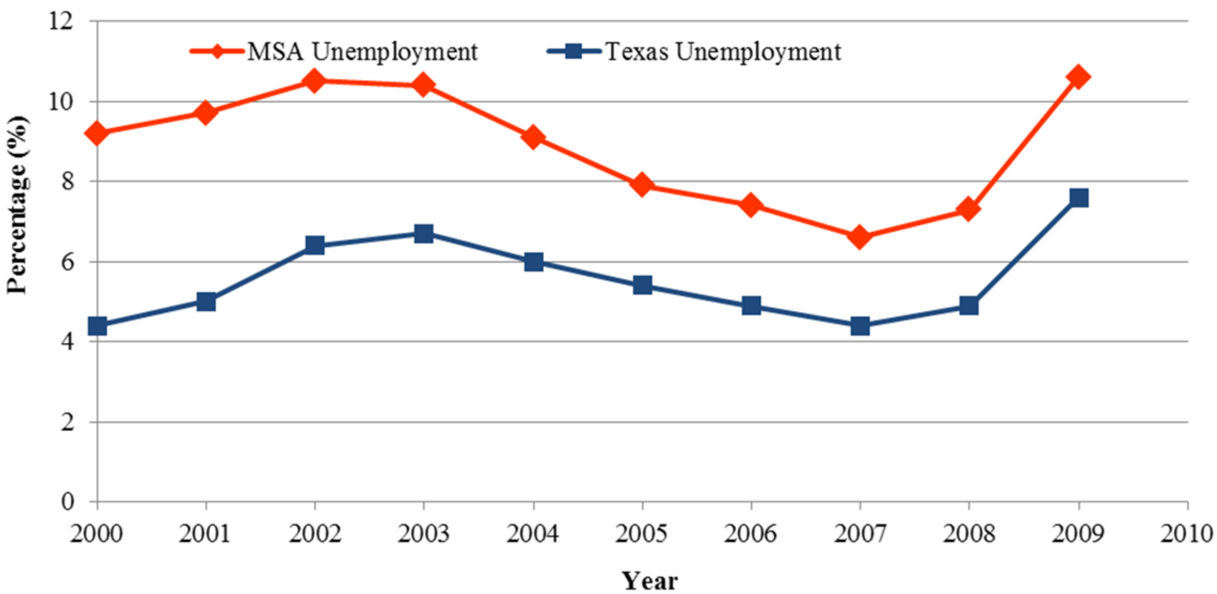
Source: Texas Workforce Commission, 2010

Figure F11: Brownsville-Harlingen MSA Unemployment Rate, 2000 to 2009



Source: Texas Workforce Commission, 2010

Figure F12: McAllen-Edinburg-Mission MSA Labor Force, 2000 to 2009

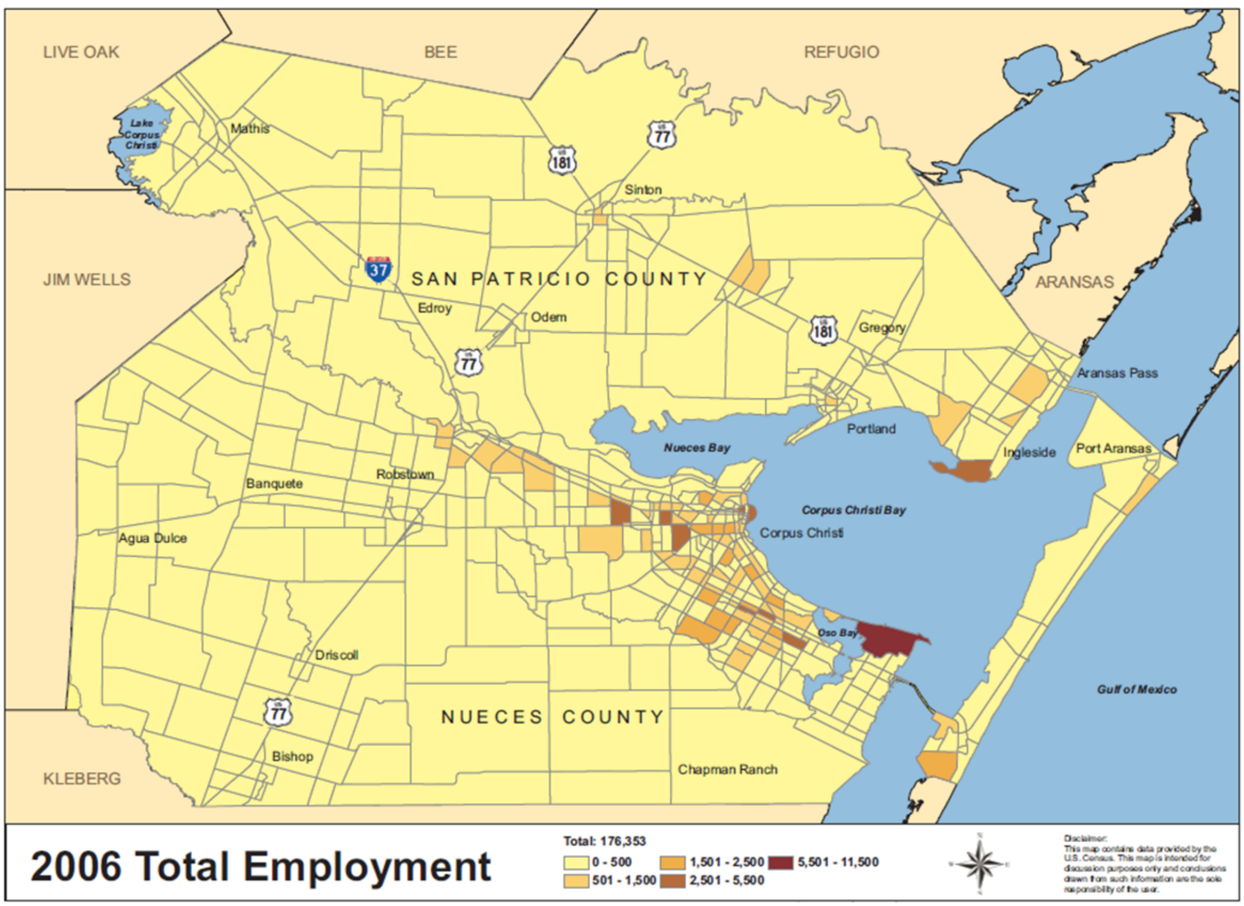


Source: Texas Workforce Commission, 2010

Figure F13: McAllen-Edinburg-Mission MSA Unemployment Rate, 2000 to 2009

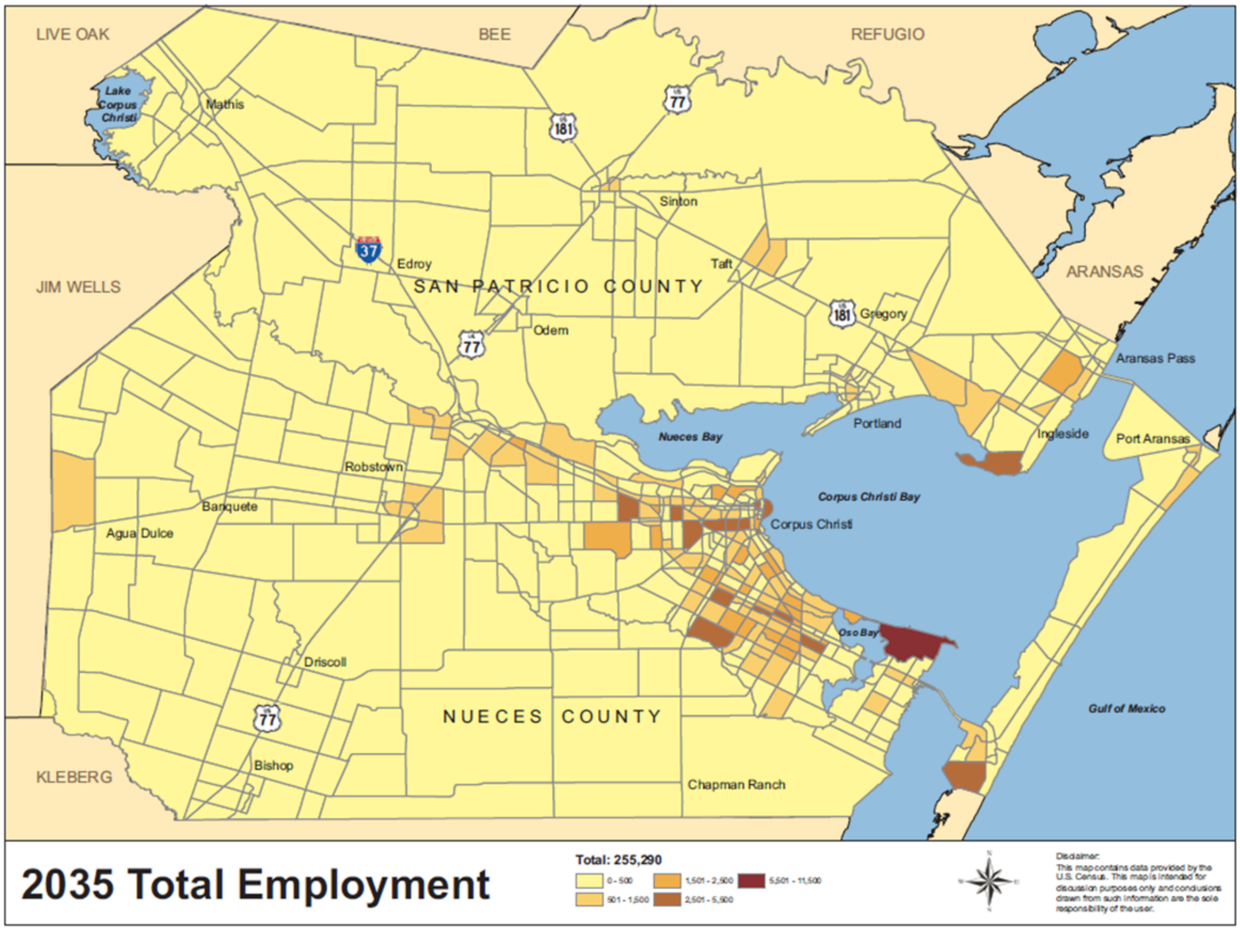
In Corpus Christi, new industries are expected in the area in the short to medium term with Ingleside (see Figure F14 and F15) expected to grow in the coming years. According to stakeholders from the workshops conducted, a $3 billion power plant facility is expected to be built in the area and the northern side of Corpus Christi is anticipated to grow much more significantly than indicated in Figure F15. Another major company, Chinese firm Tianjin Pipe Group, is in the process of building a $1 billion plant, the largest-ever Chinese-built factory in the U.S., in the Portland area to manufacture seamless pipe for oil drilling. The plant is expected to employ 600 Texans by 2012 and to provide an estimated $2.7 billion to the local economy over the next decade (Prasso, 2010). It also expected to generate 700,000 metric tons of steel pipes, mainly for the North American market and utilize the rail, ship, barge, and truck transportation modes available in Corpus Christi.

Harbor Sunrise Industrial Wind Power also plan on building a 35-megawatts wind generating plant within the inner harbor of the Port of Corpus Christi. This plant is expected to provide energy for approximately 11,000 homes and create approximately 14 full time jobs, and 50 construction jobs (Harbor Sunrise Industrial Wind, 2008). Stakeholders in the region were also interested in the impact of the Panama Canal expansion on the region as the expansion may increase the flow of larger ships into the Gulf region.



Source: Corpus Christi Metropolitan Planning Organization, 2006

Figure F14: Corpus Christi 2006 Total Employment by Location



Source: Corpus Christi Metropolitan Planning Organization, 2006

Figure F15: Corpus Christi 2035 Total Employment by Location

Inventory of Freight Facilities

Roadway Infrastructure

The Texas highway system is the most important freight infrastructure link between the United States and Mexico (Cambridge Systematics, 2007). Considering that the region is home to 19 of the state's 27 border crossings, the region's highway system carries much of the truck movement and facilitates trade between the United States and Mexico (Texas Comptroller of Public Accounts, 2008b). The Texas South Coastal region has approximately 5,207 centerline miles of highway, the most developed county being Hidalgo, which accounts for 796 miles of highway. Table F1 shows the distribution of highway miles by county (Texas Department of Transportation, nd).

Border crossings in the South Coastal region may be owned and operated by the Texas government, the State of Texas, local governments, or private entities (Cambridge Systematics, 2007). Table F1 shows NAFTA Gateway truck crossings for 2005. Truck crossings located in the South Coastal region include those in Brownsville, Pharr-McAllen, and Rio Grande City-Roma. The bridges at these crossings are the Veterans International Bridge in Brownsville, the Progreso International Bridge in Progreso, the Pharr-Reynosa International Bridge in Pharr, the Rio

Grande City Camargo Bridge, the Lake Falcon Dam Crossing in Falcon Heights, and the Roma-Ciudad Miguel Aleman Bridge in Roma. Table F2 also shows the northbound traffic handled by these bridges in 2005 and the percentage of total northbound truck traffic it accounted for (Cambridge Systematics, 2007). Although the majority of trade passes through crossings not in the South Coastal region (Laredo, El Paso), a significant portion of trucks enter the Brownsville, Harlingen, and Roma region—over 1.5 million trucks in 2005.

Table F1: South Coastal Region Highway Miles by County

Source: Texas Comptroller of Public Accounts

Highway Miles by County (in Centerline Miles)			
Kenedy	46.948	Goliad	248.700
Aransas	82.992	Jim Wells	273.423
Zapata	118.961	Bee	291.259
Brooks	121.374	Karnes	337.427
Jim Hogg	143.055	San Patricio	365.133
Kleberg	151.102	Live Oak	419.167
Refugio	194.021	Nueces	522.100
Willacy	220.983	Cameron	641.642
Starr	233.002	Hidalgo	795.543
Total:		5206.832	

Table F2: South Coastal Region Vehicle Border Crossings

Source: Cambridge Systematics, 2007

Bridge	U.S Gateway	Mexico Gateway	NB Traffic	NB Truck Lanes	Percentage of Total NB
Veterans International Bridge	Brownsville	Matamoros	192,060	1	6.1%
Free Trade Bridge	Los Indios	Lucio Blanco	42,580	1	1.3%
Progreso International Bridge	Progreso	Nuevo Progreso	23,807	1	0.8%
Pharr-Reynosa Int. Bridge on the Rise	Pharr	Reynosa	483,889	2	15.3%
Rio Grande City-Camargo Bridge	Rio Grande City	Camargo	46,308 -		1.5%
Roma-Ciudad Miguel Aleman Bridge	Roma	Ciudad M. Aleman	8,269 -		0.3%
Lake Falcon Dam Crossing	Falcon Heights	Ciudad Guerrero	76 -		0.0%

Seven Texas highways carry 83% of NAFTA truck traffic. Three of these highways run through the South Coastal region: US 77, US 59, and US 281 (Cambridge Systematics, 2007). US 281 is one of the important NAFTA corridors in the South Coastal region because it connects the maquila cluster located in the region of Reynosa, Tampaulipas with U.S. consumer markets and industries. US 77 connects border crossings in the Lower Rio Grande Valley with other corridors. US 59 feeds off US 59 and 281, and connects the South Coastal region to the Houston area. IH 37 also connects Corpus Christi to San Antonio. See Table F3.

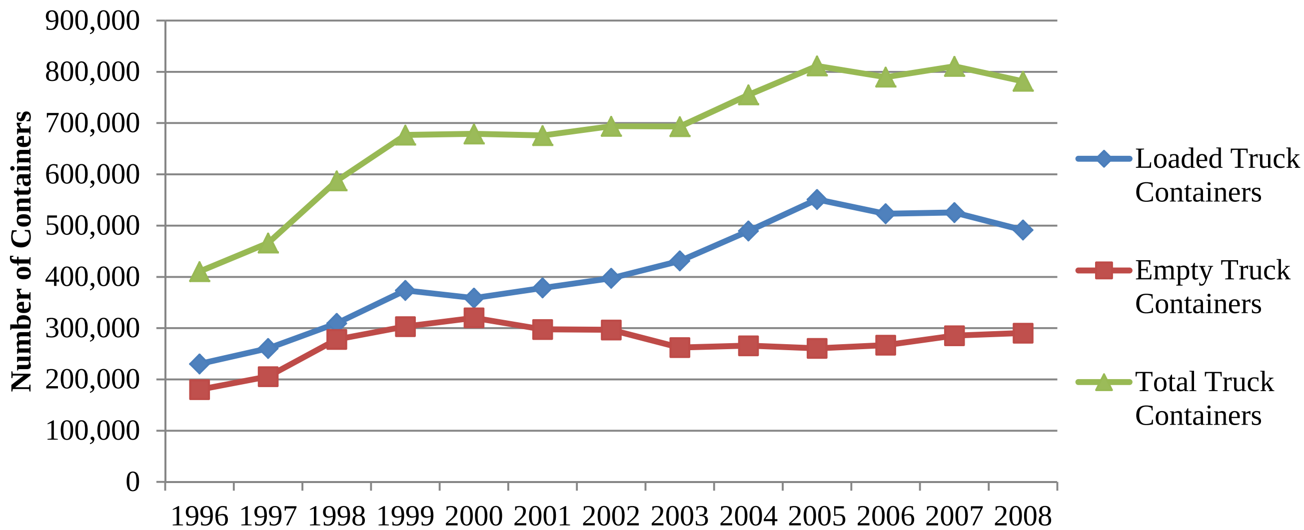
Freight moving across the border is usually raw materials coming from all over the United States. Production using the raw materials is done in the border regions and other more inland part of Mexico. The assembled products are then shipped back to the United States. Commodities being shipped southbound include auto parts, electrical components, textiles, aluminum, and steel from the U.S. Raw materials imported into the United States include paper, packaging materials, chemicals, heavy machinery and building materials. Finished products imported into the United States include computers, auto parts, appliances, frozen and fresh produce, building materials, and some handicrafts. The northbound shipments are then shipped all over the U.S. through Texas.

A major commodity moved by rail and truck in the South Coastal region are hazardous materials including ammonia, chlorine, hydrogen chloride, hydrogen fluoride, hydrogen sulfide, sulfur dioxide, and LP Gas. Most hazard material movement is made up of about 20,000 truckloads per year of LP gas and 10,000 truckloads per year of molten sulfur. Additional hazardous material movement is 100 truck loads per year of ammonia, hydrogen chloride, hydrogen fluoride, and sulfur dioxide. Each truck contains about 40,000 pounds of material. These materials travel along Highway 281 and Highway 77 in the South Coastal Region (Corpus Christi Metropolitan Planning Organization, 2006).

Table F3: NAFTA Truck growth (note IH 10, IH 20, Cambridge Systematics, 2007)

	2003				2030				2003 to 2030 Growth	
Corridor	Total Truck V1T *(Daily)*	NAFTA Truck VMT *(Daily)*	NAFTA Truck Percent of Total Trucks in corridor	Percent of Total Statewide NAFTA Truck VMT	Total Truck VMT *(Daily)*	NAFTA Truck VMT *(Daily)*	NAFTA Truck Percent of Total Trucks in corridor	Percent of Total Statewide NAFTA Truck VMT	Total Truck VMT % Growth *(Daily)*	NAFTA Truck VMT % Growth *(Daily)*
IH 35	5,314,072	1,451,922	27.3%	36.6%	13,102,996	6,431,449	49.1%	37.7%	147%	343%
1.H. 10	6,081,728	881,498	14.5%	22.2%	11,042,430	2,979,738	27.0%	17.5%	82%	238%
US 281	929,295	234.969	25.3%	5.9%	2,543,045	1,390,817	54.7%	8.2%	174%	492%
US 59	2,466,933	224.596	9.1%	5.7%	4,438,198	1,228,074	27.7%	*7.2%*	80%	447%
IH 20	3,484,420	183.107	5.3%	4,6%	6,271.503	669,922	10.7%	3.9%	80%	266%
IH 30	1,456,930	167.481	11.5%	4.2%	3,924,048	1,048,206	26.7%	6.1%	169%	526%
US 77	970,054	142.839	14 1%	3.6%	1,757,992	701,373	39.9%	4.1%	81%	391%

NAFTA border crossings primarily function as support centers for transportation of locally produced manufactured goods or a service centers for goods traveling long distances. McAllen is an example of a crossing that supports the former. Each community surrounding these border crossings typically has large industrial parks and distribution centers. In the case of both northbound and southbound movements, cargo is dropped off by trucks to industrial parks and then taken across the border by a local drayage carrier and stored at a similar facility (Cambridge Systematics, 2007). Figure F16 shows annual truck container movement across the SRC border crossings for the past two decades.



Source: Bureau of Transportation Statistics, 2009

Figure F16: Truck Container Border Crossings for the South Coastal Region

Traffic at these border crossings largely increased with the introduction of NAFTA in 1994 (Cambridge Systematics, 2007). Between 1994 and 2001 alone trade between the U.S. and Mexico increased by 90% (Texas Comptroller of Public Accounts, 2008b). The South Coastal region's rail and highway networks were originally developed for east-west trade. Because of this, the increased trade spurred by the implementation of NAFTA has put much stress on these networks causing congestion (Texas Comptroller of Public Accounts, 2008b). Carriers and supply chain participants report that capacity issues infringe on NAFTA trucking operations (Cambridge Systematics, 2007). Essentially, the use of the existing system is increasing faster than the system grows. For instance, from 1990 to 2003, the number of lanes of public roadway increased 4% while vehicle miles traveled increase by 52.8%. In 2003, it was estimated that Texas highways handled 83% of all truck trade between U.S. and Mexico (Texas Comptroller of Public Accounts, 2008b). Although those interviewed for a Texas NAFTA study say highway links to Mexico are not currently congested enough to condone the development of non-Interstate roads truck traffic will only continue to increase (Cambridge Systematics, 2007). TxDOT predicts medium to heavy truck mileage by trucks weighing 10,000 pounds will increase by 330% by 2030 (Texas Comptroller of Public Accounts, 2008b).

The increase in NAFTA trucking has not only led to highway congestion but border congestion as well. Congestion often corresponds with production shifts at large border maquiladoras in Mexico. Border crossing delays are currently being tolerated but projected increases in truck traffic will no doubt increase these delays (Cambridge Systematics, 2007).

Rail Infrastructure

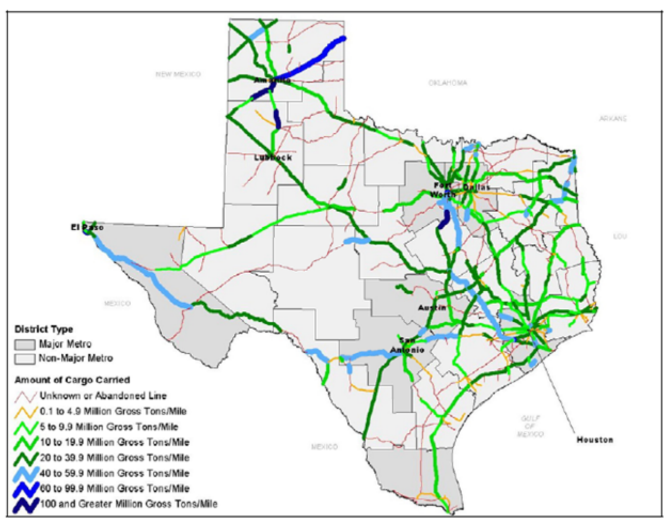
The Texas South Coastal region has a network of rail facilities that serve primarily to move cargo to and from Mexico. Currently, three companies operate railroads in the area: BNSF, UP, and KCS. The spine of the rail network is the Brownsville line that connects Brownsville to Harlingen and then runs north to Corpus Christi. At Harlingen, another track extends west to McAllen, allowing trains to cross the border near Hidalgo. Corpus Christi acts as a major hub for rail. Rail can be redirected from Corpus Christi to Laredo, San Antonio, and Houston via direct lines (Texas Comptroller of Public Accounts, 2008a).

Rail activity takes place mainly at the Port of Brownsville with some activity at the Port of Corpus Christi. The Port of Brownsville is serviced by The Brownsville Rio Grande International Railroad (BRG) and provides connections to the UP and Transportacion Ferroviaria Mexicana (TFM). The port provides rail service to warehouses, local industries, and all docks in the region. The storage capacity of the port is about 500 rail cars facilitated by four cargo docks (Bureau of Transportation Statistics, 2009). The Corpus Christ Terminal Railroad operates the port’s 26 miles of rail lanes. The port is serviced by BNSF, Texas Mexican Railway Company, and UP Railroad (Corpus Christi Metropolitan Planning Organization, 2006). The port handles 1.5 million tons of rail traffic per year (Texas Department of Transportation, 2005).

The railroads in the South Coastal region primarily move bulk items like petroleum, chemicals, metal ores, and grains to other railroads along the IH 37/IH 35 (Dallas/San Antonio) or US 59 corridor (Houston). Though Mexican rail containers only enter the South Coastal region through Brownsville, there are container rail/truck combo stations in Brownsville and McAllen. In 1999, Brownsville had 17,000 train containers pass through, but since 2001 the number has fluctuated around 7,000 containers.

In addition to the major rail lines above, there are several abandoned rail lines in the region, most of which run parallel to the existing tracks. However, one abandoned track connects McAllen to San Antonio directly. If this route were repaired and used, trains bound to San Antonio could bypass track changes in Harlingen and Corpus Christi.

Figure F17 shows statewide rail commodity flows for the state of Texas. This map confirms that the rail line in the South Coastal region that runs along the Gulf Coast is the most active, carrying 5 to 9.9 million gross



Source: Compiled by Texas Department of Transportation, Transportation Planning and Programming Division from Bureau of Transportation Statistics (BTS) data, 2000.

Source: TxDOT, 2005

Figure F17: Statewide Rail Commodity Flows tons per mile on some stretches and 10 to 19.9 million gross tons per mile on others. Other active rail lines in the region carry 0.1 to 4.9 million gross tons per mile (Texas Department of Transportation, 2005).

Figure F18 shows percent growth in trains per day for the state of Texas. The region's major rail line percentage growth in trains per day falls in the 50–100% range. This percentage growth will eventually lead to increased railway congestion. Cambridge Systematics projects that without rail improvements about 30% of all primary route-miles could fall to a level of service grade of F (Cambridge Systematics, 2008). Top intermodal rail commodities moving between the U.S. and Mexico are shown in Table F4.

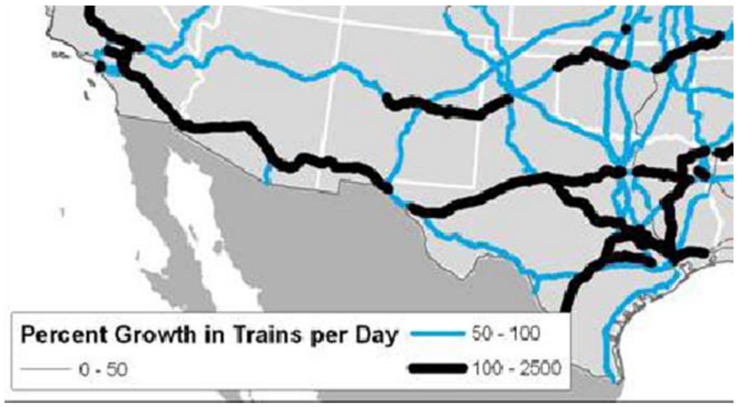


Figure F18: Percentage Growths in Trains per Day

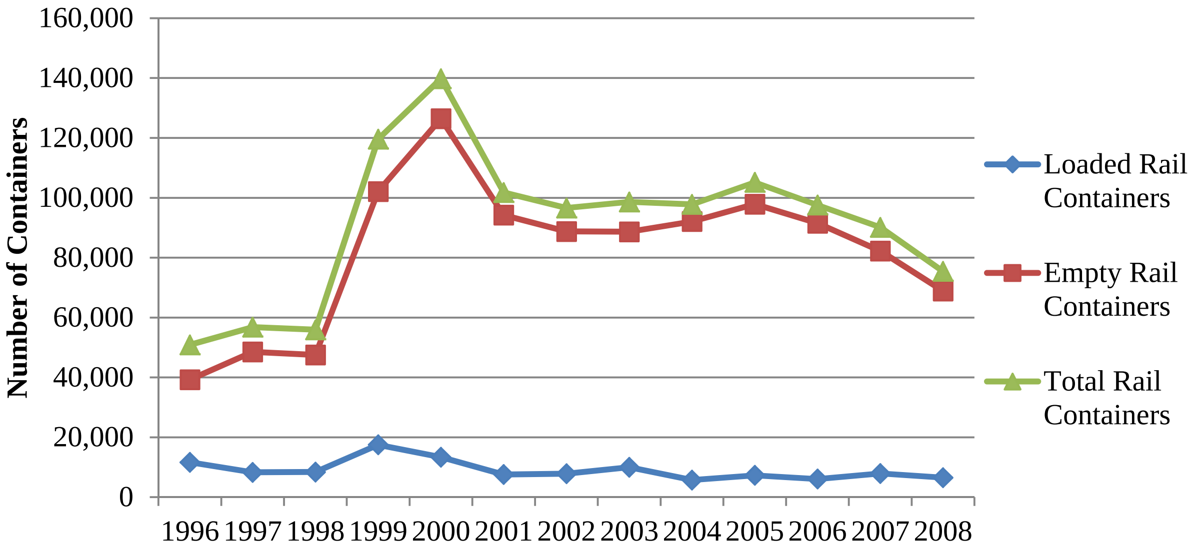
Source: Cambridge Systematics, 2008

Table F4: Texas/Mexico Trade—Top Intermodal Commodities

Source: Cambridge Systematics, 2007

Commodity	**Intermodal Units**
Food/Kindred	30,044
Pulp/Paper/Allied	5,767
Chemicals/Allied	5,423
Nonmetallic Minerals	2,443
Machinery Ex. Electrical	2,294
Rubber/Plastics	1,823
Waste/Scrap Materials	1,680
Primary Metal	1,606
Clay/Concrete/Glass/Stone	1,001
Fabricated Metal	541

The Bureau of Transportation Statistics reported that in 2008, 6,522 loaded and 68,897 empty rail containers entered the United States from Mexico through the Port of Brownsville. By the end October of this year, 3,612 loaded and 17,611 empty rail containers had come through the Port of Brownsville from Mexico (Bureau of Transportation Statistics, 2009). Figure F19 shows rail container data from the past two decades.



Source: Bureau of Transportation Statistics, 2009

Figure F19: Rail Container Border Crossings for the South Coastal Region

Airports and Air Cargo

The South Coastal region is home to four major international airports: Brownsville-South Padre, McAllen-Miller, Corpus Christi International, and Valley International Airport in Harlingen. In the past year, the four airports have handled over 250,000 combined movements on 8 commercial runways (GCR & Associates, Inc, 2009). Because the region contains no major air inland port, these four commercial airports are responsible for handling freight and commercial cargo that enters the region. Because of their location, connection to intermodal facilities, and Foreign Trade Zones, Corpus Christi and McAllen are poised to become regional leaders in air freight. See Table F5 and F6.

Table F5: List of Airport Facilities in the South Coastal Region

Source: GCR & Associates, Inc, 2009.

Major Airport	Gates	Commercial Runways	Movements per Year
Corpus Christi	6	2	109,830
McAllen-Miller	5	1	63,325
Brownsville-South Padre	4	2	31,235
Valley International (Harlingen)	7	3	49,683

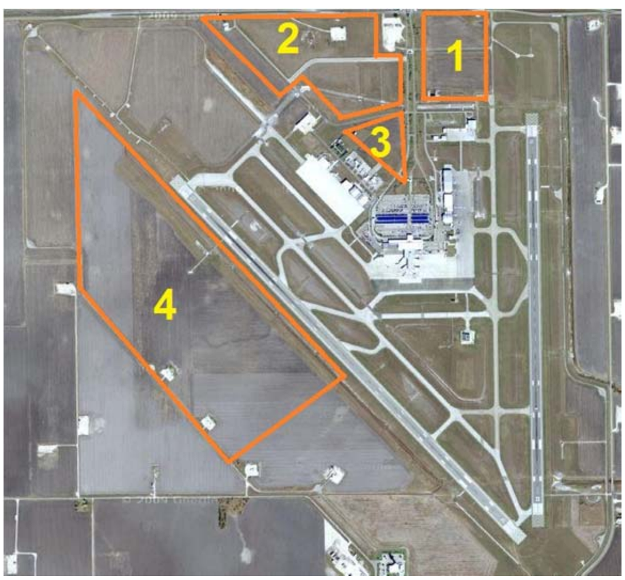
Table F6: Airplane Movements by Type

Source: GCR & Associates, Inc, 2009

Major Airport	Gen. Aviation	Military	Air Taxi/Carriers	Total
Corpus Christi	23,320	62,647	23,863	109,830
McAllen-Miller	42,671	7,520	13,034	63,325
Brownsville-South Padre	17,909	8,950	4,983	31,235
Valley International (Harlingen)	16,346	18,126	15,211	49,683

Corpus Christi International: Corpus Christi International Airport (CRP) is a publicly owned airport located 10 miles from the Port of Corpus Christi. CRP is the region's busiest airport with 109,000 movements since November 2008, a majority of which are military flights (GCR & Associates, Inc, 2009). The airport has two runways of 7,508 feet and 6,080 feet that serve the airport's central terminal (Federal Aviation Administration, 2009). The airport has direct access to IH 37, the Port of Corpus Christi, and a major BNSF rail line. Cargo movement at CRP is served by the commercial carriers Southwest Airlines Cargo, DHL Express, and UPS (GCR & Associates, Inc, 2009), which together account for about 15% of all movements at the airport (GCR & Associates, Inc, 2009).

CRP has a unique competitive advantage among other airports—it has the ability to expand its current infrastructure without purchasing prohibitively expensive land. This is in part because the airport is located opposite of Corpus Christi's directional growth, so the nearby land is not being developed. The airport master plan includes the addition of a 10,000 ft long, 150 ft wide runway to accommodate large cargo planes in development zone 4, shown in Figure F20 (Port of Corpus Christi, nd). The airport is currently undergoing expansion efforts to increase its competitive position as a freight hub. The Corpus Christi Regional Economic Development Committee (CCREDC), a publicly owned entity, plans to increase the airport's cargo activity by offering airport-adjacent lots specifically for development as light industrial and intermodal facilities. With a $36 million project grant from the Federal Aviation Administration, the project broke ground in November 2009 and includes an effort to widen the existing runways to handle larger international cargo planes (Bryan, 2009).



Source: City of Corpus Christi, nd

Figure F20: A map of Corpus Christi International's expansion zones, as outlined in the CRP Airport's master plan.

McAllen International Airport: The McAllen International Airport (MFE) is located in a MSA that is among the fastest-growing areas in the nation in terms of population and job growth. The airport is dominated by general aviation freight movements—in 2003, the airport had only 1,300 air cargo movements compared to over 42,600 general aviation flights (GCR & Associates, Inc, 2009). This is in part because MFE has only one full length runway of 7,120 feet, which is well-suited for commercial planes but cannot accommodate for large cargo planes. The region's population of 2.5 million is similar to that of Denver today and by 2024 the region is projected to have 3.4 million residents. With such explosive projected population growth, the MFE is facing growing concerns that it will not be able to meet the region's general aviation and freight needs (HNTB Corporation, 2005).

Among the most pressing concerns are the lack of available land for expansion, increasing demand for general aviation flights, and increasing air cargo movements between McAllen and Mexico. Today, the airport operates at

40% of its maximum capacity and handles around 63,000 flights per year, but that number is expected to grow in the next decade due to recent improvements made at Mexican airports across the border and improvements to the IH 69 corridor (HNTB Corporation, 2005). Considering the region's population growth, general aviation capacity is McAllen airport's top priority, but a 2003 forecast shows the amount of cargo handled at MSA increasing eight-fold to 10,900 movements by 2024 as shown in Table F7. This is a conservative estimate, because the airport currently handles an insignificant amount of cargo, making it difficult to estimate the proportion of inbound Mexican cargo McAllen will receive in the future.

Table F7: Forecast of McAllen Airport Activity

Sorce: HNTB Corporation, 2005

Forecast	**2003**	**2024**
Passengers	570,000	970,000
Aircraft Landings and Takeoffs		
Commercial Passenger	7,600	13,200
Commercial Air Cargo	1,300	10,900
General Aviation	47,700	55,100
Military	8,300	8,300
Total Landings and Takeoffs	64,900	87,600
Cargo Tonnage (Belly and All Cargo)	3,400	114,300

Sea Ports and GIWW Movements

The South Coastal region contains two major ports that primarily handle bulk and general cargo: the Port of Corpus Christi, and the Port of Brownsville. Together, the ports moved over $35 billion in cargo in 2008, ranking them among the largest bulk ports in the nation. The region has several smaller ports that serve their respective hinterlands, including ports located at Harlingen, Port Isabel, Mansfield, Lavaca, and Comfort. All of the region's ports are connected to each other via the Gulf Intracoastal Waterway (GIWW), which provides a safe and reliable way to move inter-port cargo. Although the ports in the South Coastal region do not handle a large number of containers, they do oversee the transfer of billions of dollars in raw materials like petroleum, ore, and grain to rail cars and trucks for processing at nearby refineries and factories.

Port of Corpus Christi: The Port of Corpus Christi is the largest port in the South Coastal region and the nation's sixth largest port in terms of cargo tonnage moved according to the AAPA (International Trade Group, 2009). The Port has terminals designed for dry bulk, liquid bulk, and general cargo. The general cargo terminals provide covered storage and loading facilities, including dock-side loaded to rail cars with direct access to the UP rail line. Additional facilities allow the port to take advantage of higher-margin cargo by providing dockside refrigerated warehouses and on-site bagging for grains (Port of Brownsville, nd).

A pair of bulk docks handles over $828 million in petroleum and over $100 million in other bulk materials. Corpus Christi is one of the largest bulk cargo ports in the United States and is poised to keep up with increasing ship sizes (Global Security, 2009). The port shipping channels are 45 feet deep and the largest liquid bulk dock can unload a 100,000 DWT tanker. The port's infrastructure also allows it to cater to higher-margin cargo like refrigerated bulk and bagged cargo by providing covered and refrigerated dock-side storage facilities (Port of Corpus Christi, nd). Tables F8, F9, and F10 show some annual statistics from 2003 to 2008.

Table F8: Port Corpus Christi Ship and Barge Activity

Source: Port of Corpus Christi, 2010

Year	2008	2007	2006	2005	2004
Dry	789	1,077	942	1,037	905
Tankers	962	1,057	1,019	1,043	1,056
Barges	4,281	4,610	4,672	5,298	5,276
Total	6,0320	6,744	6,633	7,378	7,237

Table F9: Tonnage Figures—2002 to 2009 (In Short-Tons)

Source: Port of Corpus Christi, 2010

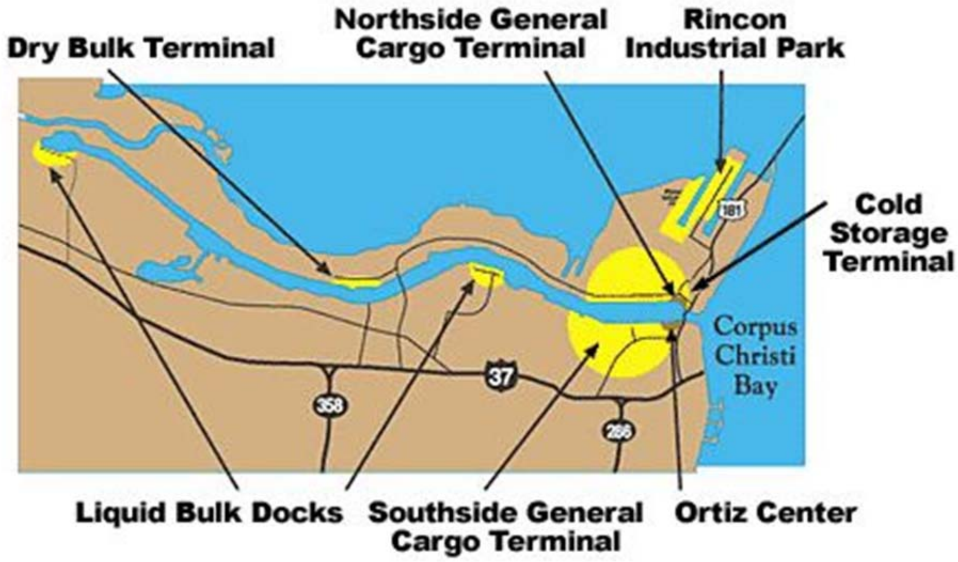
Year	**Break Bulk**	**Grain**	**Chemical**	**Dry Bulk**	**Liquid Bulk**	**Petroleum**	**Totals**
2008	552,590	5,423,867	1,630,019	7,891,343	301,007	70,060,614	85,859,440
2007	445,204	3,377,386	1,848,875	8,241,554	513,036	74,893,638	89,319,693
2006	256,697	2,031,610	1,569,993	7,700,130	248,355	75,176,048	86,982,833
2005	444,982	2,098,829	1,795,329	8,396,055	518,403	73,532,352	86,785,950
2004	503,016	1,836,090	2,142,736	7,289,403	407,906	74,214,650	86,393,801
2003	361,246	1,666,579	2,004,086	6,833,913	243,135	74,022,165	85,131,124

Table F10: Port of Corpus Christi Top 10 Commodities 2008

Source: Port of Corpus Christi, 2010

Rank	**Inbound**	**Outbound**
1	Crude Oil	Gasoline
2	Gas Oil	Fuel Oil
3	Bauxite Ore	Diesel
4	Fuel Oil	Wheat
5	Feed Stock	Feed Stock
6	Naphtha	Sorghum
7	Slop and Slurry	Gas Oil
8	Condensate	Alumina
9	Reformate	Cumene
10	Aggregate-Vulcan	Caustick Soda

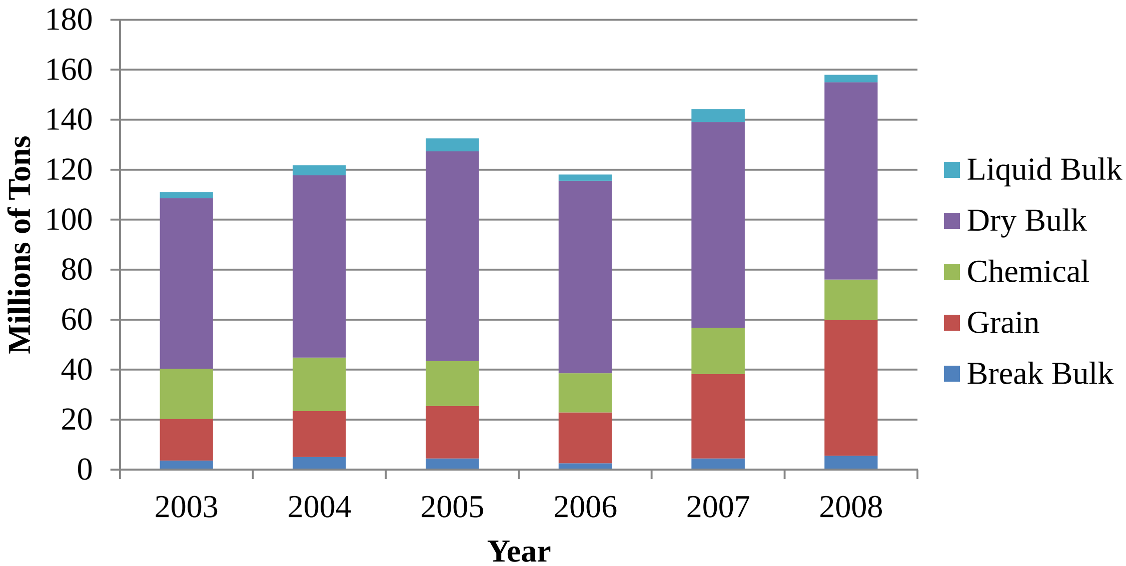
In 2008, the Port of Corpus Christi imported $24.72 billion in cargo (mostly crude oil, gas oil, feed, and condensate) and exported $4.97 billion (mostly refined products like gasoline, wheat, and feed stock) (International Trade Group, 2009). The port estimates it generates $1.3 billion annually in direct revenue as a result of port activities (Port of Corpus Christi, 2003). In 2008, 86.5% of the cargo moved through the Port of Corpus Christi was petroleum, chemical, or other liquid bulk. With such a heavy emphasis on liquid bulk cargo, the port has invested in extensive bulk, roll-on/roll-off (RO/RO) facilities, and advanced intermodal infrastructure as shown in Figure F21 (Brogman, 2008).



Source: (Port of Corpus Christi, nd)

Figure F21: A map of the specialty terminals at Port Corpus Christi

Although Texas consumes more gasoline than any other state, the Port of Corpus Christi has seen the tonnage of petroleum imports decrease over the last five years, while the amount of grain imports has increased three-fold since 2003 (Port of Corpus Christi, 2001). This shift may be due to the fact that grain generates 23% more revenue per ton than oil, as shown in Figure F22.



Source: Port of Corpus Christi, 2010

Figure F22: Tonnage of non-petroleum cargo moved through the Port of Corpus Christi

The port currently handles few containers per year due to the lack of container-handling machinery and infrastructure, but Corpus Christi is serious about expanding its ability to accept and move containers. Corpus Christi has plans to develop a 1,100 acre container terminal on the north side of the Corpus Christi Bay (Brogman, 2008). The initial plan for La Quinta Trade Gateway will have a capacity of 250,000 TEUs by year 5. That number would grow to 1.2 million TEUs after 20 years of investment. The plan includes a lengthy ship wharf (3,800 feet long) to handle some of the largest container ships and extensive container storage areas adjacent to a rail yard and trucking terminals. The project expects to handle a large number of cotton containers and a specially purposed cotton storage facility at La Quinta is planned (Brogman, 2008). Further detail on the development of La Quinta as it relates to the region's freight needs is explained further in the Policies and Strategies section.

In 1997, Corpus Christi was classified as a 'strategic port' by the United States Military. The port is located near a naval air station and the military base at Ingleside. The port's 45 ft. depth is important, because it can accommodate most medium-size military ships, but the U.S. military is looking to make other infrastructure improvements, particularly by providing dry-docking and major repair facilities (Global Security, 2009). An alliance with the U.S. military should help the port remain competitive and reduce the cost of dredging and upgrading their facilities. Additionally, the improvements the U.S. military is looking into implementing (particularly major repair facilities) are the features that Corpus Christi currently lacks and should acquire to be more nationally competitive (Global Security, 2009).

Port of Brownsville: In 2008, the Port of Brownsville moved a port-record 6.3 million metric tons of cargo, making it the second-largest port in the region behind Corpus Christi. Unlike Corpus Christi, Brownsville operates with a balanced trade deficit, importing $6.13 billion and exporting $7.33 billion in the fiscal year 2006 (International Trade Group, 2008). The port primarily handles chemicals, liquid petroleum gas (LPG), clay, petroleum, grain, bulk minerals, ore, steel, and fertilizers (International Trade Group, 2008). The port is regionally important because it is the only port that provides special ship services like repairing boats, repairing containers, and recovering waste oil (Port of Brownsville, nd).

The terminals at Brownsville are well-suited to handle intermodal cargo, particularly via rail. The port operates 10 port-adjacent warehouses with rail connections that pass along the land-side of the warehouse. Additionally, two docks have ship-side rail to facilitate the transfer to and from trucks or railcars. The port contains 33 miles of rail utilized by several carriers depending on the cargo's destination. UP and BNSF can handle U.S.-bound cargo, while Grupo Transportacion Ferroviaria Mexicana and TFM manage Mexico-bound traffic (International Trade Group, 2008).

The Port of Brownsville is actively investing in its land- and sea-side connectivity. The port has invested $12 million in roadway construction and repair to improve the Brownsville-Port Isabel Highway that connects port operations to State Highway 83. The port recently began a feasibility study to deepen and widen the ship channel to a depth of up to 50 feet with a width of 400 feet. Currently, the ship channel is 42 feet deep and 250 feet wide. Such an improvement would make the port more competitive as ship sizes increase, particularly allowing larger container-carrying ships to enter the port (Port of Brownsville, 2009). In 2008, the port began a short-sea shipping initiative to transport containers, juice concentrate, and heavy machinery between Port Manatee in Tampa, Florida and Brownsville. In just one year, the initiative moved 950 containers and 73 concentrate containers. Ensuring that Brownsville can handle large cargoes is critical to fostering the growth of intra-Gulf short sea routes (Port of Brownsville, 2009).

The port also has access to Foreign Trade Zone #62, the largest FTZ in Texas. Assembly, sorting, and inspection operations within the zone's 2,300 acres can operate domestically and take advantage of tax and tariff breaks offered to companies that work within the FTZ. The port's location along the U.S.–Mexico border allows for twin-factory operations, where a maquiladora factory can import duty-free materials and export a finished product to the other factory. The possible effect of maquiladoras on the regional freight network is elaborated on in the Policies and Strategies section.

Gulf Intracoastal Waterway (GIWW): The Gulf Intracoastal Waterway is an inland waterway that connects Carrabelle, Florida to Brownsville, Texas via a series of natural and man-made estuaries (Texas Department of Transportation, nd). Within our region, the most important stretch of the GIWW connects the lower and upper portions of the Laguna Madre, allowing the ports of Mansfield, Harlingen, Port Isabel, and Brownsville to have direct access to northern ports like Corpus Christi (Diaz & Kelly, 2001). The waterway is maintained at a 12 foot depth and 300 foot width by the Army Corps of Engineers who annually re-dredge the channel and are responsible for its maintenance (Crear, 2009). See Figure F23.

Figure F23: An aerial photograph of the GIWW connecting to the Laguna Madre near Port Mansfield. Dredged silt is dumped in piles along the waterway.

The GIWW provides a critical intermodal connection between Corpus Christi and the Rio Grande Valley. As explained earlier, Corpus Christi is a major exporter of energy along the Texas coast and as such, it is important that petroleum outbound from Corpus has a reliable water route to southern markets. It is estimated that 80% of the petroleum consumed in the Lower Rio Grande Valley moves through the GIWW and that the waterway contributed $2.9 billion to the Lower Laguna Madre in 1998, making the GIWW an important contributor to the region's economy [(Randall, 2000), (Texas Department of Transportation, nd)]. As one might expect, the distribution of freight movements along the waterway are surprisingly lopsided.

Nearly 80% of movements along the GIWW carry petroleum southbound out of Corpus Christi, while the remaining 20% carry northbound sugar, ore, and gravel (Diaz & Kelly, 2001). The number of movements along the GIWW is projected to increase along with the population growth of the Texas border regions. In the span of 1990–1999, over 2.26 million tons of cargo moved through the GIWW (Diaz & Kelly, 2001). As the cost of transporting cargo via truck increases, it is possible that the GIWW becomes a viable alternative to drayage, creating a successful short sea route between Brownsville and Corpus Christi.

The three biggest issues facing the GIWW are the demands of environmental interest groups, the cost of maintenance dredging, and the insufficient dimensions of the waterway. While moving cargo by water is more efficient than movements by land, environmental groups are continually concerned about how emissions into the GIWW are affecting the surrounding ecosystems. Conservation groups and fishing enthusiasts filed suit against the Corps in 1994 (Diaz & Kelly, 2001). They claimed that regularly dredging the channel was destroying sea grass, a critical element in the bay ecosystem. The Corps' report maintained that there were no reasonable alternatives to dredging and that the waterway should remain open (Crear, 2009). Carefully handling the demands of environmental groups is important to maintaining political and public support for the GIWW. In 2003, the Corps created an environmentally friendly "Beneficial Use Plan" to recreate marshland using sediment dredged from the GIWW. The project created 42 acres of emerging marshland and cost the Corps and TxDOT a combined $3.1 million (Texas Department of Transportation, nd). See Figure F24.

Figure F24: Protecting marshlands like this one are key to garnering support of the GIWW

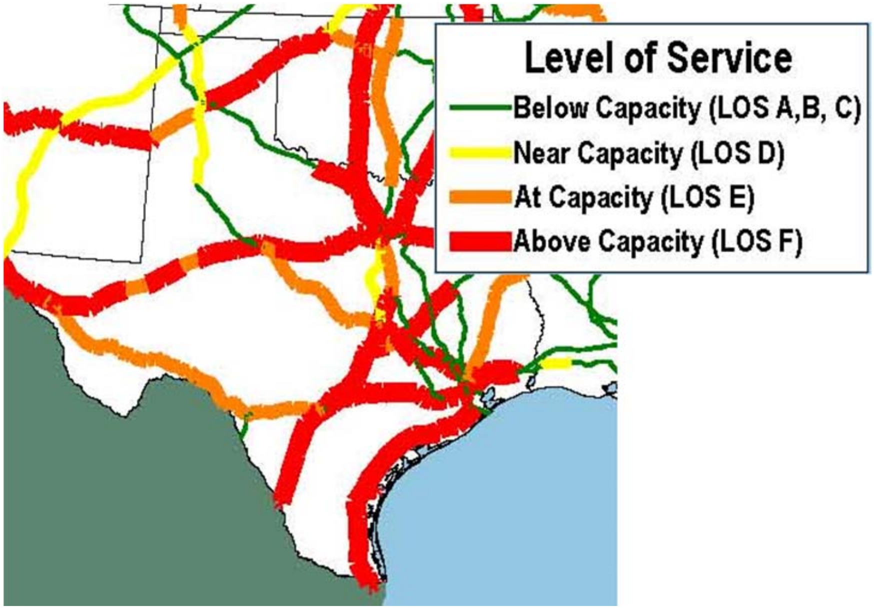
The current cost of dredging the GIWW between Corpus Christi and Brownsville is just over $4 million annually. Some critics believe that the cost of dredging is too high and that the GIWW stretch in the South Coastal region is unnecessary—that a combination of pipeline and open sea shipping would be a more reasonable method of moving freight (Diaz & Kelly, 2001). Considering that the waterway still has strong political and professional support, it is unlikely that the cost of dredging is of much concern—particularly to taxpayers in the Lower Rio Grande Valley who rely on the waterway for their energy.

Since the GIWW was last dimensioned in 1949, the size and quantity of barges using the GIWW has increased significantly. As a result, TxDOT (TxDOT) is concerned that the minimum GIWW dimensions (only 75 feet wide at the Colorado River) are slowing traffic and increasing the cost of moving freight along the waterway (Texas Department of Transportation, nd). Fortunately, the dimensions in the South Coastal region are not particularly restrictive and there are no choke points along the Laguna Madre stretch of the GIWW—it is 300 feet wide at its narrowest point.

Critical Freight Needs and Issues

The majority of the value of freight exchanged between the three NAFTA partners is by truck. Currently, the South Coastal region has no interstate highways that connect Laredo, Brownsville, and McAllen to major hubs like Houston or San Antonio. A recent push by the United States to increase trade between NAFTA partners will expand Interstate 69, which currently connects Michigan to Indianapolis, to the South Coastal region via Missouri and Houston. This will greatly increase the appeal of the region and encourage companies to do more business in the region. From Figure F25, it's clear that the region's steady growth in truck traffic over the last decade is largely due to increased traffic in Hidalgo. With the creation if IH 69, these trucks will have interstate highway access to Houston and the eastern United States.

Shippers have shifted their freight modal choice to truck over the past several years due to worsening delivery times and capacity overloads (Cambridge Systematics, 2007). The cause for the change in mode is that rail delivery times continue to worsen and rail facility capacities are overloaded. Bottlenecks at gateway communities severely limit the growth of rail tonnage. Other factors contributing to slow operating speeds and safety concerns include at-grade crossings, poor geometry, and high land use density of residential and commercial activity. The complication in remedying these factors lies in the fact that they must be solved on both sides of the border. Correcting these issues on one side of the border will worsen the problem as rail traffic will then increase to the less functional side. One of the most severe bottlenecks exists between Brownsville and Matamoros. As shown in Figure F25, the rail link in the South Coastal region will worsen significantly by 2035 if improvements are not made.



(Federal Highway Administration, 2009)

Figure F25: Forecasted Rail Level of Service in Year 2035

Policies and Strategies to Address Needs

The current freight infrastructure in the South Coastal region is expected to exceed its current capacity in the next 20 years. Increasing trade with Mexico, coupled with increased domestic trade via the region's major ports, and regional population growth, suggest that all modes of transportation will need to be increased to keep pace with the region's needs. According to the Texas Comptroller, the region's transportation infrastructure was originally designed for the east-west movement of cargo, not for the north-south trans-border movements that are common today (Texas Comptroller of Public Accounts, 2008b). In order to make the South Coastal region competitive, there are four initiatives that can help improve the overall network: the creation of IH 69/TTC 69, investment in new railroads and railroad maintenance, the promotion of short sea routes, and the creation of an intermodal facility at Corpus Christi.

Support for the Speedy Construction of Interstate 69: In 2006, the Congressional High Priority Corridors list included Interstate 69, a highway that would connect the great lakes to the U.S.–Mexico border and extend through the Texas–Mexico border to the Mexican Pacific coast (Federal Highway Administration, 2006). The Texas stretch of the IH 69 plan, also called TTC 69, is a trident-shaped network that passes through Houston and splits three ways to reach Laredo, McAllen, and Harlingen (Texas Department of Transportation, 2008). See Figure F26.

The most recent plan by TxDOT is to expand the existing state highways 77 and 281 (Texas Department of Transportation, 2008) to create a wide, fast, partly tolled road that will efficiently move traffic to and from the South Coastal region (Corridor Watch , 2009). Currently, these state highways are ill-equipped to handle the expected increase in cross-border freight. As explained in the section's introduction, the rail and highway network was originally built to accommodate east-west traffic (Texas Comptroller of Public Accounts, 2008b), and the lack of a north-south interstate places a strain on local TxDOT offices, which are exclusively responsible the maintenance of state highways.

Source: TxDOT, 2008

Figure F26: A map of the South Coastal segment of the proposed IH 69/TTC 69 corridor

It is recommended that IH 69/TTC 69 be constructed quickly to provide much-needed improvements to land-side access for cargo at the region's ports. Considering that the majority of freight movements in the South Coastal region are moved via highway, a major capacity improvement like IH 69/TTC 69 would prepare the region to accept more trucks in the future. Additionally, some economists feel that public works spending on megaprojects (like IH 69) is beneficial to the economy, contributing as much as one quarter of a percentage point to national GDP over the long term (Uchitelle, 2009). As the South Coastal region continues to grow, a megaproject could provide new citizens with jobs and bring money to the greater Lower Rio Grande.

<u>Increase Railroad Funding and Infrastructure</u>: The current U.S. rail system is considered the most efficient and cost-effective rail system in the world but rising volumes of trains on the rail network are causing the overall network to near capacity (Federal Highway Administration, 2006). A recent DOT forecast predicts that railroad demand will rise 88% by 2035. The American Association of Railroads (AAR) projects that $135 billion needs to be invested nationally in new Class I railroads in order to keep up with increasing demand in addition to hundreds of millions of dollars to improve the existing network.

For this region, a railroad is needed to parallel the Brownsville Railroad that connects Brownsville, McAllen, and Harlingen to Corpus Christi along the coast. Already, the railroad is operating at capacity and by 2035 the stretch should be operating well above capacity (Federal Highway Administration, 2006).

<u>Promote and Maintain Short Sea Routes</u>: As explained in earlier sections of this report, recent trends in the growth of freight transportation suggest that land-based modes of transportation will become increasingly congested within the next 20 years. For the transportation infrastructure to meet growing demand, water-based modes need to take a greater role, particularly for moving intra-continent freight (Global Insight, 2006). The ports at Corpus Christi and Brownsville, along with the other smaller ports along the Laguna Madre, have the opportunity to provide short sea shipping opportunities across the Gulf of Mexico.

The movement of petroleum, grain, concentrate and other bulk goods between Gulf Coast states will be hampered by the lower level of service caused by increased rail and truck demand. As a result, short sea routes will gain a competitive advantage that is already evident. The U.S. Department of Transportation conducted a 2006 study to show the potential performance that could be expected from short sea routes between major U.S. ports. One of the routes studied considered the potential cost, transit time, and operating margin that a short sea trip between Beaumont, TX and Camden, NJ would produce. The projections were made assuming a 1200 TEU vessel, a mature short sea market, and a market penetration of about 20% in each direction (Global Insight, 2006). Summary findings are included in Table F11.

Table F11: Comparison of Truck vs. Short Sea modes for a container ship moving 1200 TEU from Beaumont, TX to Camden, NJ

Source: Global Insight, 2006

	Truck	**Rail Intermodal**	**Short-Sea Shipping Status Quo**	**Short-Sea Shipping "Best in Class"**
Total miles (door to door)	1,470	1,699	2,091	2,091
Transit hours (door to door)	67.5	86.0	111.0	111.0
Carrier cost per highway mile	$1.64	$0.87	$0.99	$0.89
Estimated operating margin	10%	30%	10%	10%
Shipper cost per highway mile	$1.77	$1.06	$1.13	$1.03
Differential versus Truck	--	-40%	-36%	-42%

Overall, the findings were favorable. The report shows that a short sea trip is lengthier, but significantly cheaper than truck and similar in cost to rail. In the event of a hyper-congested land network, short sea routes may be able to gain greater market penetration than is assumed in this model, allowing the wide adoption of "best in class" standards that will produce more competitive prices.

The viability of short sea routes that connect to our region has already been demonstrated by the Port of Brownsville's partnership with Port Manatee in Florida (Port of Brownsville, 2009). In one year, the program has given Brownsville its first significant container movements and increased the port's liquid bulk activity. Our team recommends that ports take the initiative of seeking out short sea opportunities and working to improve land-side connections that will allow for reliable, just-in-time (JIT) movements that go over water.

<u>Create an Intermodal Facility at Corpus Christi</u>: This issue of congestion and facilities reaching capacity is already being addressed by expanding infrastructure in the South Coastal region. Although it is already one of the nation's largest sea ports, the Port of Corpus Christi plans to further extend its operations with the addition of an intermodal container facility on the La Quinta Channel (Corpus Christi Metropolitan Planning Organization, 2006); (American Association of Port Authorities, 2008). The development site located 17 miles from the Gulf of Mexico is ideal because of deep water conditions and room for future expansion including a 3,800 foot linear wharf and 1,056 acres. Environmental obstacles are non-existent and there are links to un-congested highways including US 181, IH 37, and SH 35 and three Class I railroads (American Association of Port Authorities, 2008). Permits have been obtained from United States Army Corps of Engineers to extend the channel to the facility site, dredge a turning basin, and construct a wharf. The extension of the channel is included in the recently passed Water Resources Development Act. There is an existing 550,000 square foot cotton warehouse and the

possibility of another 500,000 square foot warehouse on site. Not only will the facility have container port and intermodal train operations but it will be able to handle break bulk cargo, cross-dock, warehousing and distribution facilities, and chassis pools (American Association of Port Authorities, 2008). The development is expected to transfer an estimated 400,000 containers from ships to truck and rail throughout the rest of the decade (Corpus Christi Metropolitan Planning Organization, 2006) and will have the capacity to handle 1.5 million TEUs. Construction of the facility started in October 2009 and completion is slated for 2011 (Project Professionals Group, nd).

The project will be completed in four phases. In the first phase, the La Quinta Channel will be extended and a 31-acre terminal will be constructed along with the turning basin. Two cranes will facilitate a capacity of 250,000 TEUs and the processing of 151,515 container movements. The construction of a terminal in the first phase will allow the facility to quickly become part of the South Coastal region's intermodal network by beginning the movement of containers by trucks. Later, the facility will have 25% modal share (Martin Associates, 2004). By the 20th year of the terminal being in service, 703,800 container movements are projected for the terminal with a throughput of nearly 1.2 million TEU (Martin Associates, 2004). See Figure F27.

Source: American Association of Port Authorities, 2008

Figure F27: La Quinta Site Rendering

The justification for the project is that it is expected to have a significant impact on the region's freight movement (Corpus Christi Metropolitan Planning Organization, 2006). Not only does the nearby freight hub of Houston have traffic congestion and poor air quality, but even with the implementation of the new terminal in Corpus Christi it will remain at capacity. Corpus Christi is positioned in a place to accommodate traffic from Mexico on its way to Houston (American Association of Port Authorities, 2008). The project will also serve as an import center for Panama Canal traffic, which is expected to grow after the canal's expansion (American Association of Port Authorities, 2008).

G: South IH 35 Corridor

Economic Profile and Freight Movements

San Antonio Area

According to the San Antonio–Bexar County Metropolitan Planning Organization, San Antonio provides a strategic location for distribution, transshipment, and international trade processing activities, and has key logistical assets that support the delivery of products to both domestic and international customers (San Antonio MPO, 2010). It is well known for its manufacturing, trade and transportation services. According to 2007 reported data, the major commodity groups originating from San Antonio by weight include gravel, non-agglomerated bituminous coal, base metal and machinery, and grain products (Table G1). The first three commodity groups account for more than 85% of the commodities originating from San Antonio (CFS, 2007).

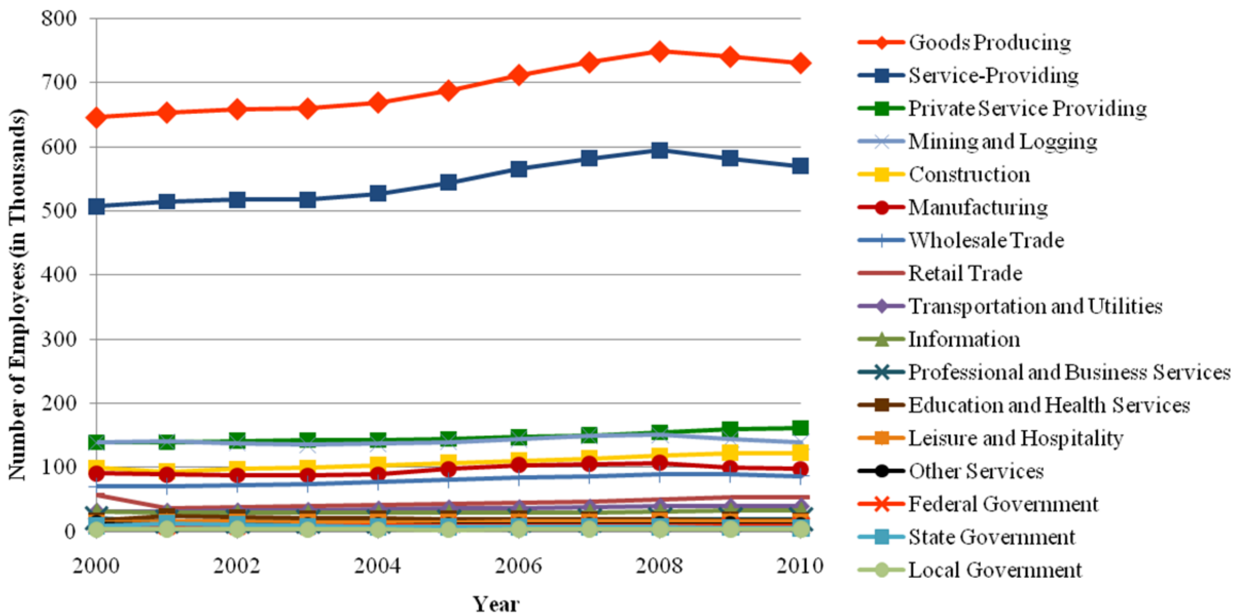
San Antonio's GDP for 2008 was $80,896,000 million dollars and ranks 36th in the U.S., a rank ahead of the Austin/Round Rock region (Bureau of Economic Analysis, 2009). Houston and Dallas recorded a GDP of $403,202,000 million and $379,863,000 million dollars respectively, and ranked 4th and 6th in the nation.

Table G1: 2007 Shipment Characteristics by Commodity Group Originating in the San Antonio, TX Combined Statistical Area

Source: Bureau of Transportation Statistics

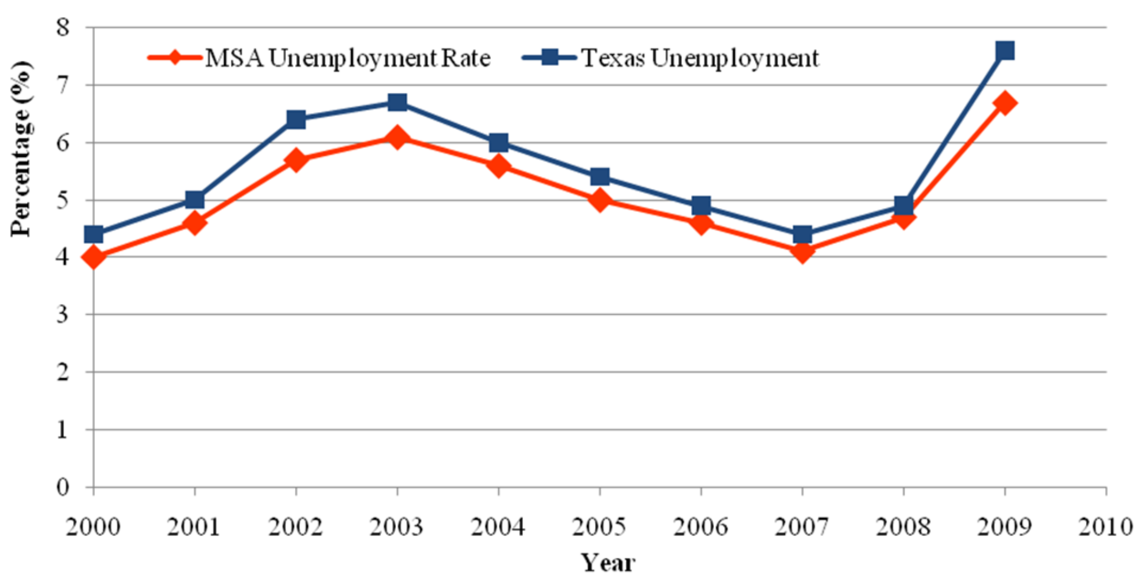
	Tons		Value	
Commodity	**(thousands)**	**% of Total**	**(millions $)**	**% of Total**
Monumental or building stone including gravel and crushed stones, except dolomite	54,791	46.5	357	0.4
Non-agglomerated bituminous coal	24,919	21.2	15,984	18.8
Base metal and machinery	22,605	19.2	7,078	8.3
Milled grain products and preparations, and bakery products	4,598	3.9	4,499	5.3
Furniture, mixed freight and misc manufactured products	3,738	3.2	9,250	10.9
Other prepared foodstuffs and fats and oils	2,788	2.4	2,173	2.6
Pharmaceutical and chemical products	2,130	1.8	S	S
Live animals and live fish	1,409	1.2	1,994	2.3
Logs, wood products, and textile and leather	1,275	1.1	3,109	3.7
Grains, alcohol, and tobacco products	1,237	1.1	1,231	1.4

Major industries in the area from 2002 to March of 2010 include the goods-producing industry, the service-providing industry, the mining/logging industry including quarries, and the construction industry (see Figure G1). The San Antonio/New Braunfels MSA is the only area of all of the MSAs analyzed in this study with the goods-producing industry being the largest employer. The service producing industry was always the highest employer in all the other areas. This reinforces the strong manufacturing industry in the San Antonio/New Braunfels area, which boasts of a Toyota manufacturing plant and a UP intermodal rail terminal. See Figure G2.



Source: Bureau of Labor Statistics, 2010

Figure G1: San Antonio/New Braunfels MSA Number of Employees by Industry



Source: Texas Workforce Commission, 2010

Figure G2: San Antonio/New Braunfels MSA Labor Force 2000–2009

Since 2007, unemployment in the area increased from 4.1% to 6.7% in 2009 (see Figure G2). Industries that seem to be affected include the goods-producing industry, the service-providing industry, the mining/logging industry and the manufacturing industries.

San Antonio’s dynamic and diverse economy is a healthy mix of business services, with a rapidly growing biomedical and biotechnology sector, and a diversified manufacturing sector, producing everything from aircraft and semiconductors to rolled aluminum sheet, and soon, Toyota Tundra trucks. It has a strong military presence made up of Fort Sam Houston, Lackland Air Force Base, Randolph Air Force Base, and Brooks City-Base, with Camp Bullis and Camp Stanley outside the city. Kelly Air Force Base operated out of San Antonio until 2001, when the airfield was transferred over to Lackland AFB and the remaining portions of the base became Port San Antonio, an industrial/business park. San Antonio is home to five Fortune 500 companies—Valero Energy Corporation, Tesoro Petroleum, USAA, Clear Channel Communications, and NuStar Energy (CNN, 2010)—and to the South Texas Medical Center, a conglomerate of various hospitals, clinics, and research units, and the only medical research and care provider in the South IH 35 corridor region. As of 2008, San Antonio's largest private employers included USAA, a worldwide insurance and diversified financial services association; and H-E-B Grocery Company, the largest private grocery company with stores in Texas and Mexico, and the 19th largest private company in the United States (Forbes.com, 2009). Table G2 lists some of the major regional employers in the area.

Other companies with a major presence in San Antonio include Frost National Bank, Toyota Manufacturing, Texas Southwest Research Institute, and Boeing San Antonio (InformationSanAntonio.com, 2010), Kinetic Concepts, Harte-Hanks, Eye Care Centers of America, Bill Miller Bar-B-Q Enterprises, Taco Cabana, Whataburger, Builders Square, and Rackspace, as well as the aforementioned Tesoro and Valero.

San Antonio also boasts of a strong tourism industry with over 20 million visitors in 2008 and an annual economic impact of over $11 billion (San Antonio Area Tourism Council, 2008).

Table G2: Major Regional Employers in San Antonio

Source: San Antonio Economic Development Foundation and The San Antonio Business Journal, 2010

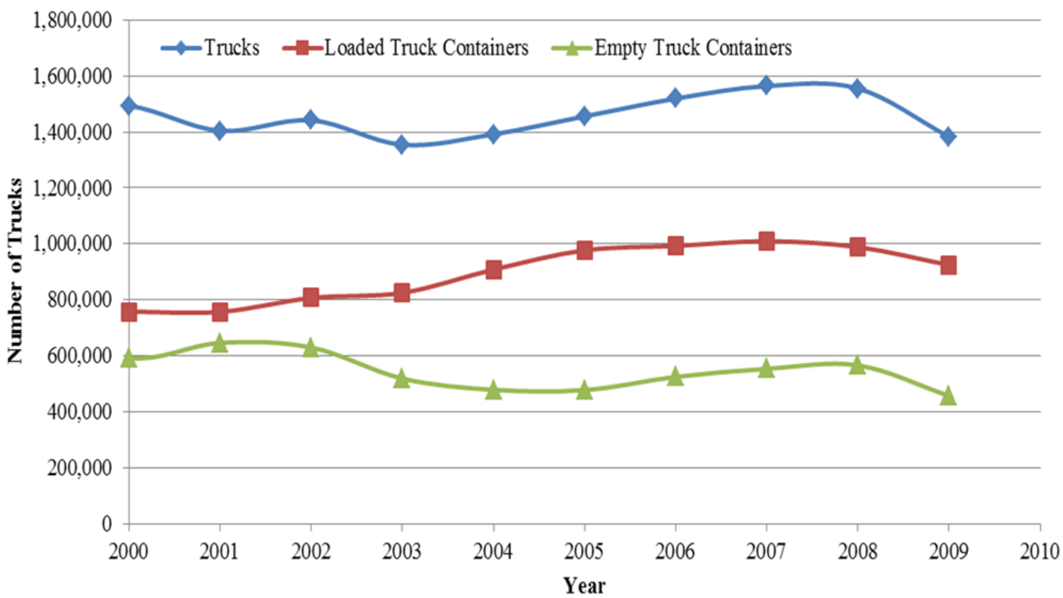
Company	Business	Employed in SA
Fort Sam Houston–U.S. Army	Military	30,793
Lackland Air Force Base	Military	28,100
USAA	Financial Services and Insurance	14,852
H-E-B Food Stores	Super Market Chain	14,588
Northside I.S.D.	School District	12,597
Randolph Air Force Base	Military	10,700
North East I.S.D.	School District	10,223
City of San Antonio	City Government	9,000
San Antonio I.S.D.	School District	7,581
Methodist Healthcare System	Health Care Services	7,013
University of Texas Health Science Center	Health Care Institute	5,985
Baptist Health System	Health Care Services	5,939
AT&T	Telecommunications	5,000
Bexar County	County	4,765
JP Morgan Chase	Contact Center and Banking Services	4,300
Wells Fargo	Contact Center and Banking Services	4,300
Bill Miller Bar-B-Q	Fast Food Chain	4,190
Cullen / Frost Bankers	Financial Services	3,982
Valero Energy	Oil Refinery and Gasoline Mktg.	3,777
Christus Santa Rosa	Health Care Services	3,721
CPS Energy	Energy	3,628
Brooks City-Base	Military Services	3,406
Southwest Research Institute	Physical Sciences Research	3,300
Harland Clarke	Check Printing	3,100
Citibank	U.S. Customer Service Center	3,000
SeaWorld of Texas	Amusement Park	3,000
Six Flags Fiesta Texas	Amusement Park	3,000
Judson I.S.D.	School District	2,997
Clear Channel Communications, Inc.	TV and Radio Stations, Outdoor Ads	2,800
South Texas Veterans Health Care System	Health Care Services	2,800
Alamo Colleges	College Institute	2,678
U.S. Postal Services	Central District Office	2,600

Laredo Area

According to the Laredo MPO, the Laredo regional economy relies heavily on the goods movement across the U.S. border into Mexico. The NAFTA, which increased trade between U.S. and Mexico, created a strong demand for trucking, warehousing, and support service industries in the region (Laredo MPO, 2010).

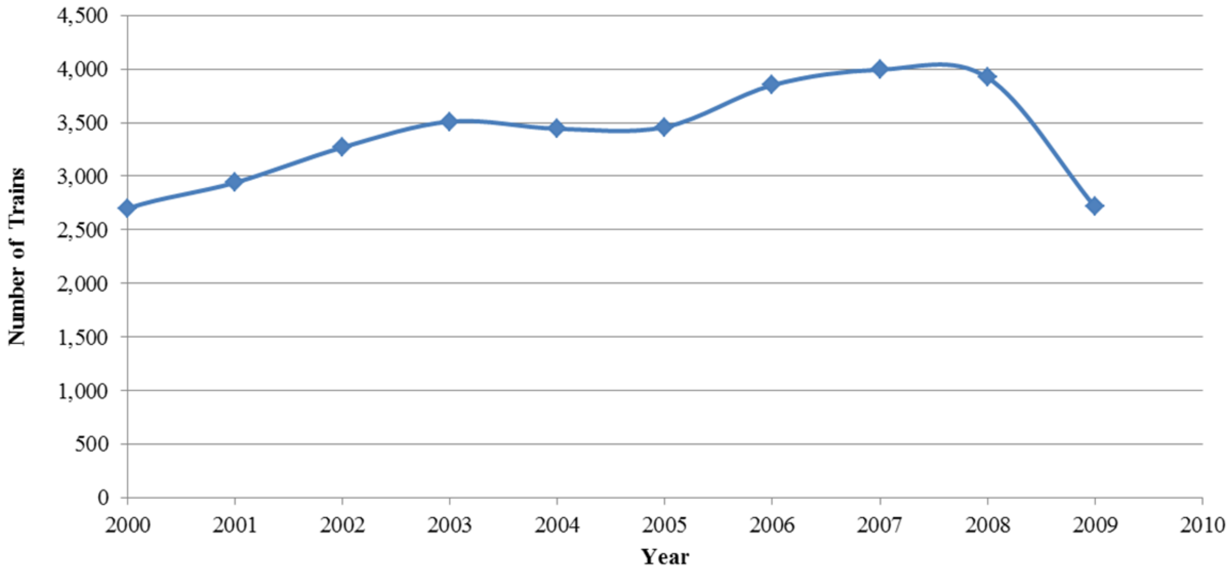
According to the Bureau of Transportation Statistics, 1,382,219 trucks and 2,716 trains crossed the Laredo Border from Mexico into the U.S. in 2009 alone (note: Data on export freight movement is not readily available). Figures G3 to G7 illustrate import data of Laredo from 2000 to 2009.

Figures G3 (truck), G4, and G5 (rail) show that since 2007, trade through Laredo has declined considerably for both truck and rail movements including number of loaded and empty containers, and value [Figures G6 (truck) and G7 (rail)]. In comparison with other ports of entry, Laredo continues to lose its market share for both truck and rail (Figures G8 and G11).



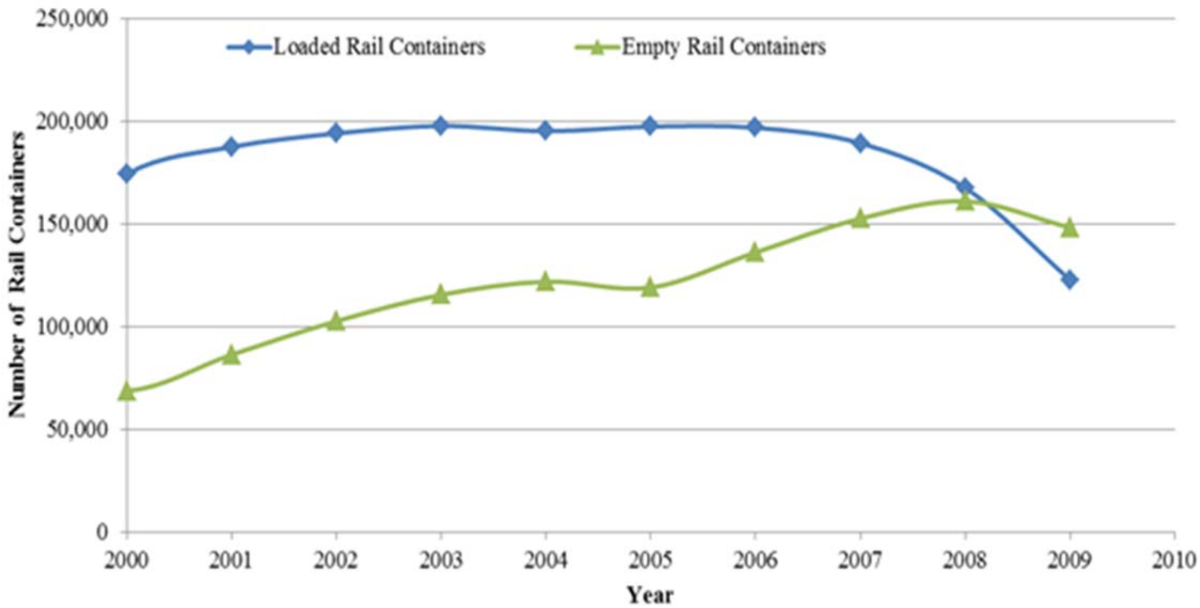
Source: Bureau of Transportation Statistics, 2010

Figure G3: Laredo Border Crossings by Trucks, Northbound (Imports)



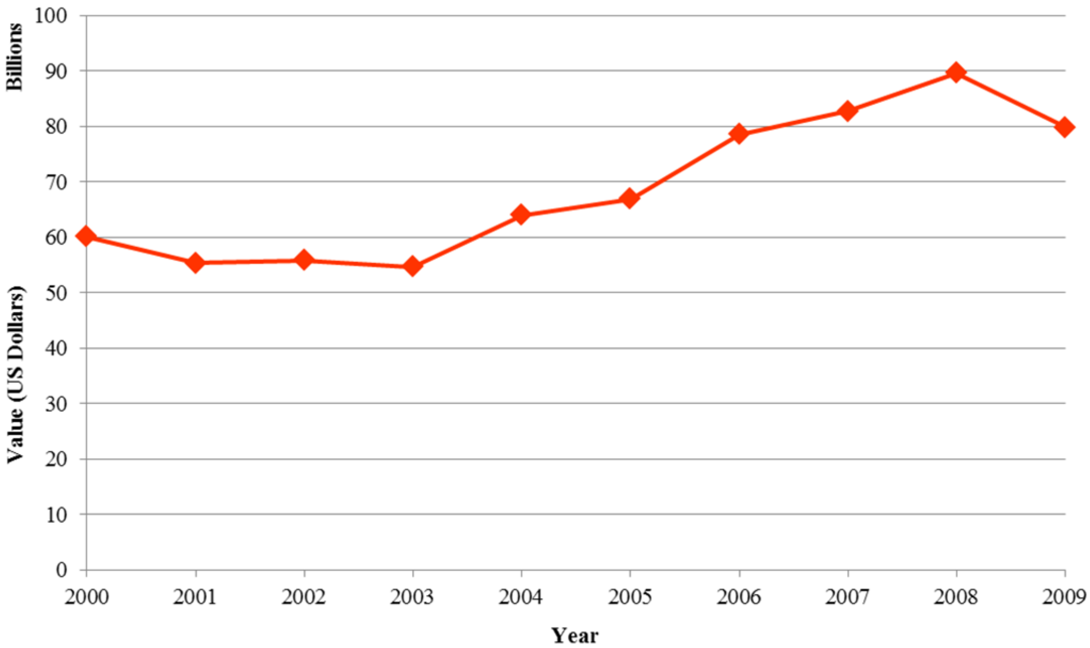
Source: Bureau of Transportation Statistics, 2010

Figure G4: Laredo Border Crossings by Rail, Northbound (Imports)



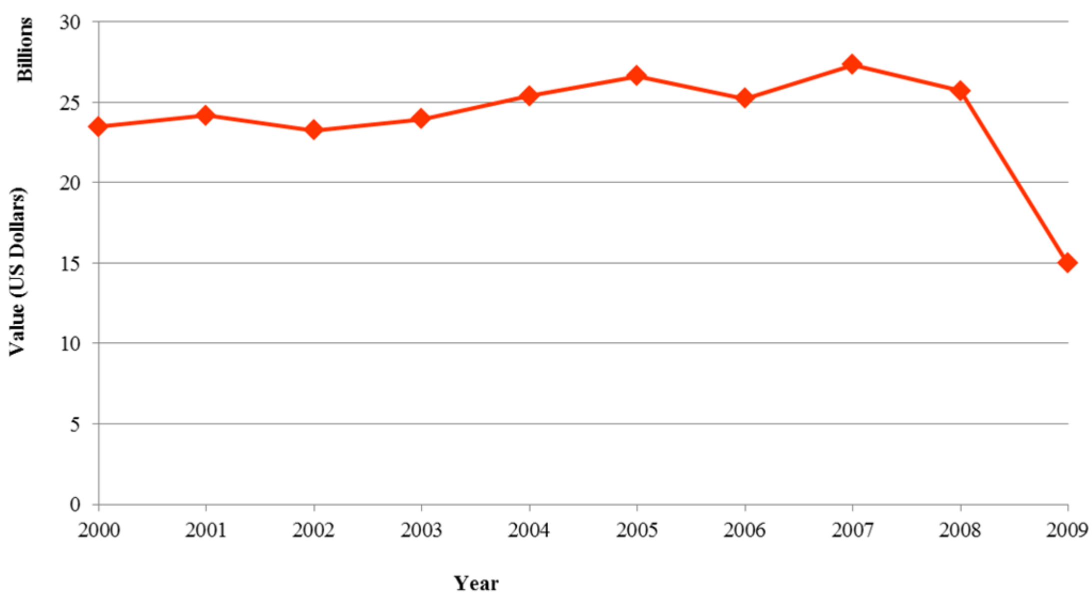
Source: Bureau of Transportation Statistics, 2010

Figure G5: Laredo Border Crossings by Number of Rail Containers, Northbound (Imports)



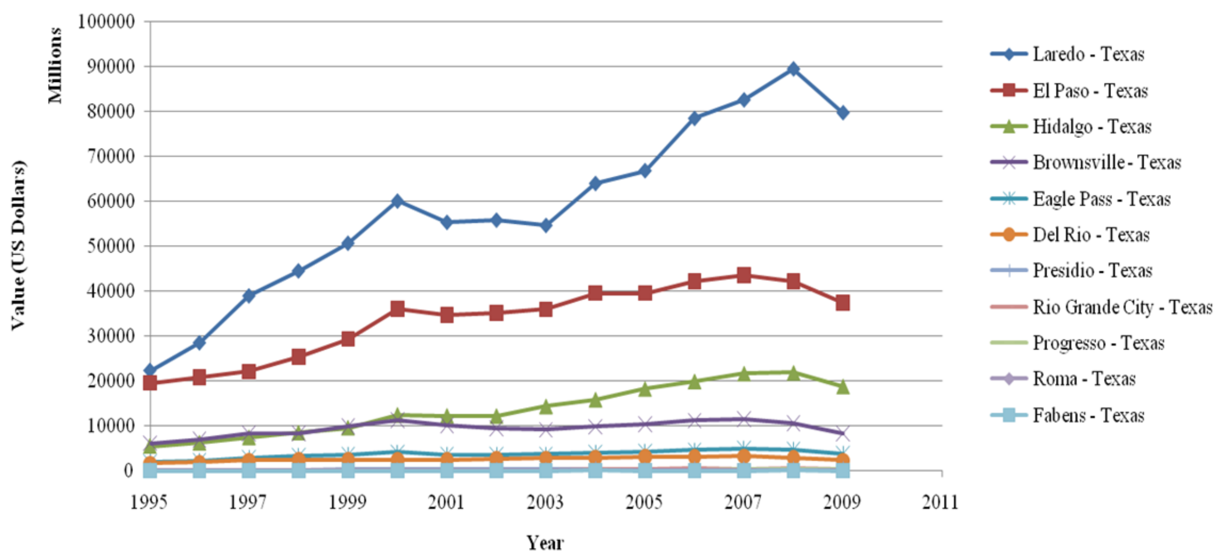
Source: Bureau of Transportation Statistics, 2010

Figure G6: U.S. Imports and Exports by Value by Truck through Laredo



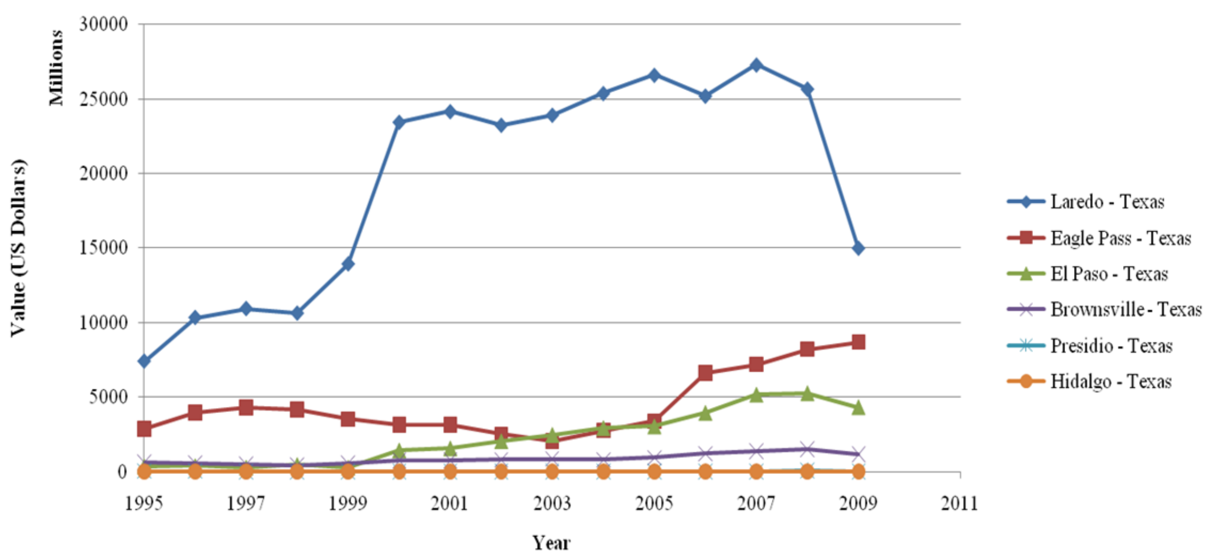
Source: Bureau of Transportation Statistics, 2010

Figure G7: U.S. Imports and Exports by Value by Rail through Laredo



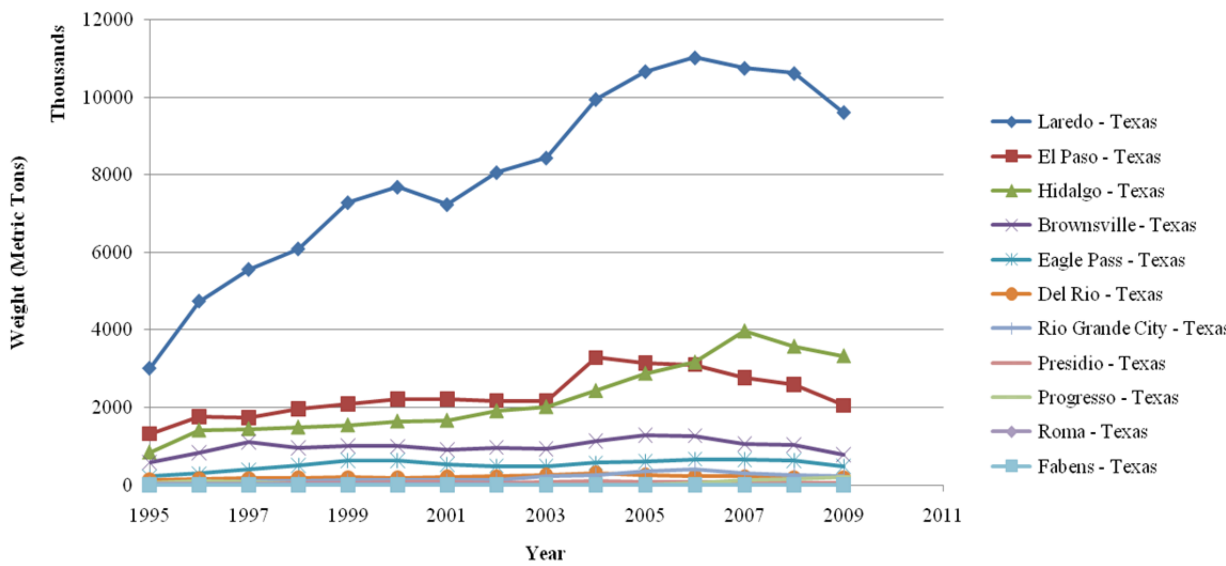
Source: Bureau of Transportation Statistics, 2010

Figure G8: U.S. Imports and Exports by Value by Truck by Texas Port



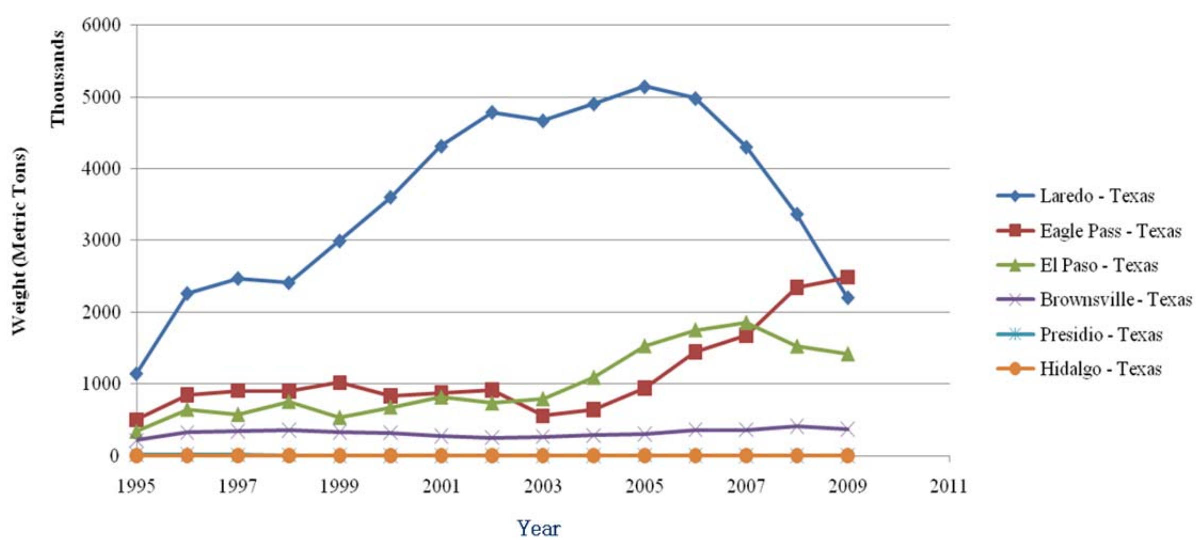
Source: Bureau of Transportation Statistics, 2010

Figure G9: U.S. Imports and Exports by Value by Rail by Texas Port



Source: Bureau of Transportation Statistics, 2010

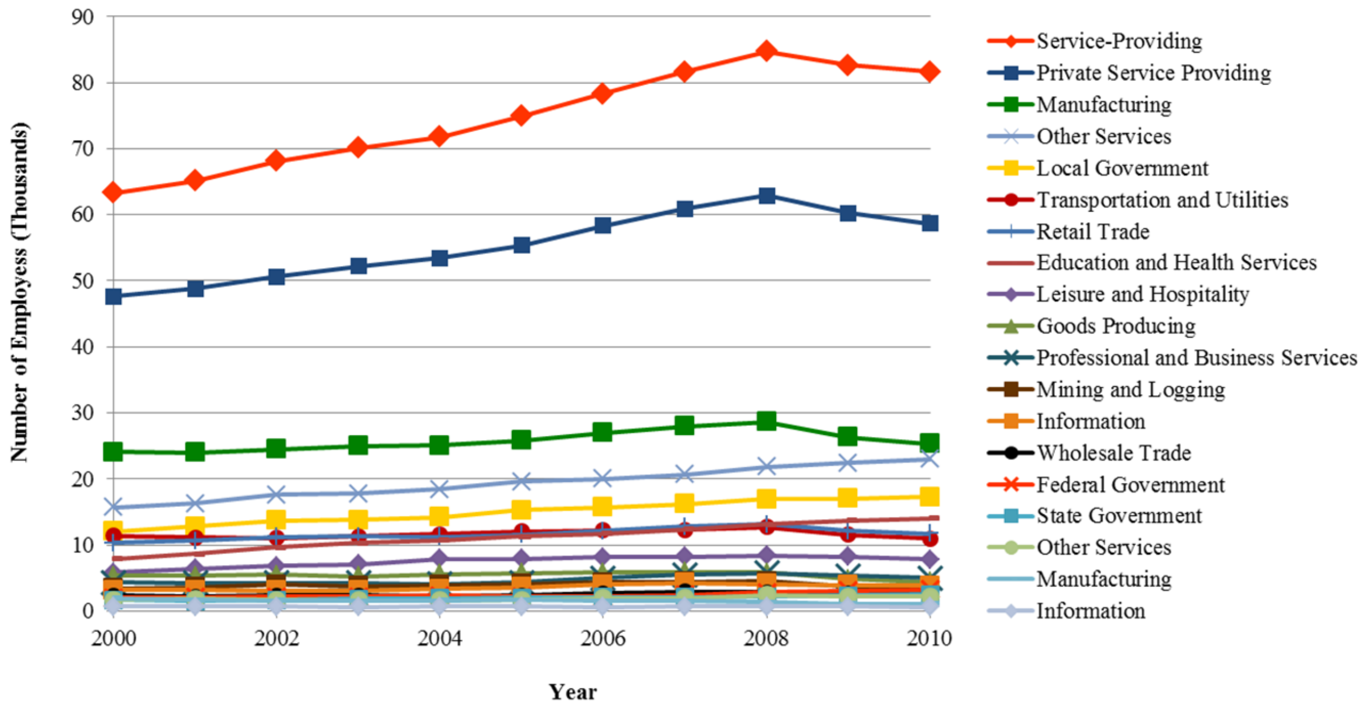
Figure G10: U.S. Imports by Weight by Rail by Texas Port



Source: Bureau of Transportation Statistics, 2010

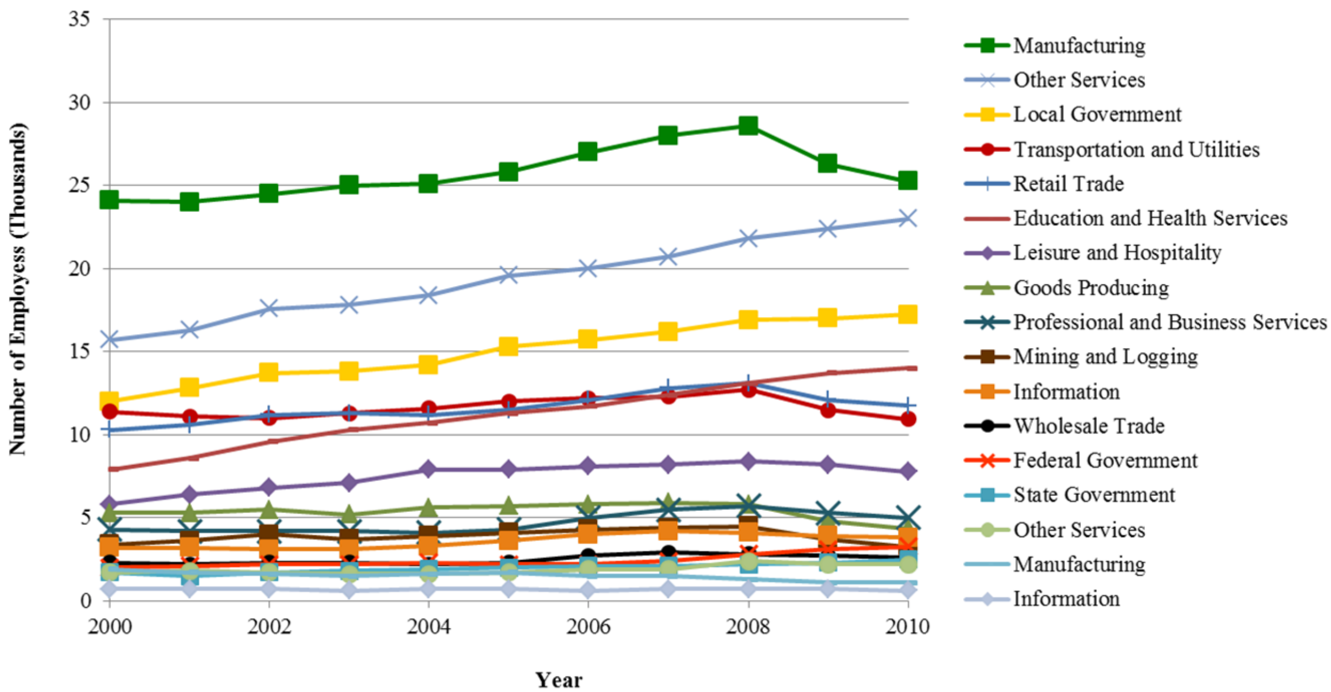
Figure G11: U.S. Imports by Weight by Rail by Texas Port

In terms of the industries, the service-providing industry remains the top employer in the region followed by the manufacturing, local government, transportation/utilities, and retail trade industries (see Figure G12). A detailed review of the industries in Figure G13 shows that the freight-related industries like manufacturing, retail trade, and goods-producing have been experiencing a decline in the number of employees since 2008. This trend has been worsened by the recent economic recession that saw an increase in the areas unemployment from 4.7% in 2007 to 8.7% in 2009 (see Figure G14).



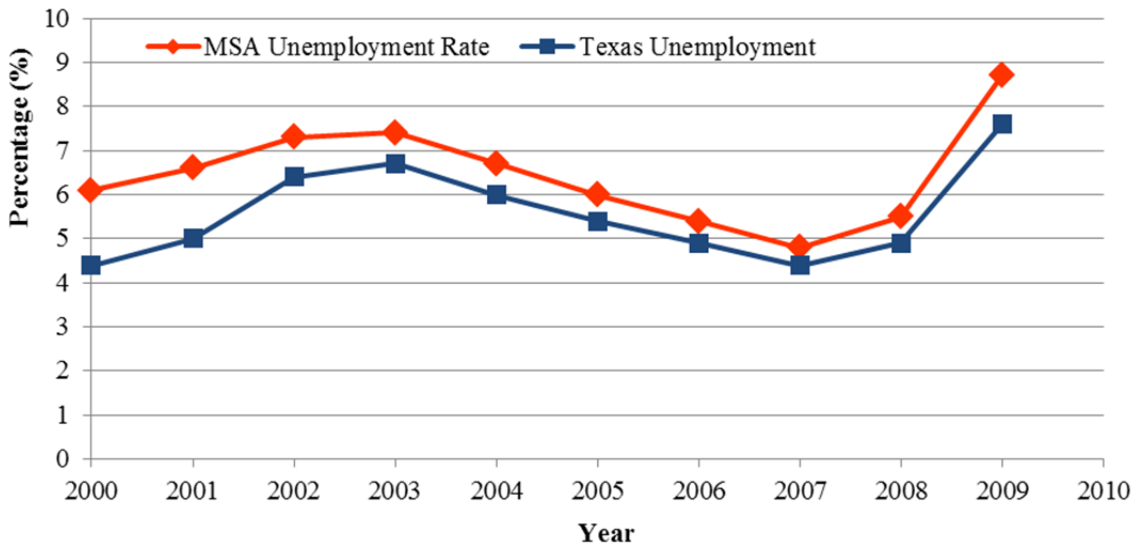
Source: Bureau of Labor Statistics, 2010

Figure G12: Laredo MSA Number of Employees by Industry



Source: Bureau of Labor Statistics, 2010

Figure G13: Laredo MSA Number of Employees by Industry less Service-providing



Source: Texas Workforce Commission, 2010

Figure G14: Laredo MSA Unemployment Rate

As of 2008, the major employers in the region were in the local government and education sector as illustrated in Table G3.

Table G3: 2008 Laredo Major Employers

Source: Laredo MPO, 2010

Number of Employees	Employer	Sector	Type
Over 2,000	City of Laredo	Public	Municipal
	Laredo Independent School District	Public	Education
	United Independent School District	Public	Education
1,500–1,999	H-E-B Grocery	Private	Grocery
	Laredo Community College	Public	Education
	Laredo Sector Border Patrol	Public	Immigration
	Webb County	Public	County
1,000–1,499	Convergys Call Center	Private	Call Center
	Laredo Medical Center	Private	Medical
	McDonald's Restaurant	Private	Fast Food
	Texas A&M International University	Public	Education
	Wal-Mart	Private	Retail
500–999	Compass Bank (formerly LNB)	Private	Financial
	Doctor's Hospital	Private	Medical
	International Bank of Commerce	Private	Financial
200–499	Falcon International Bank	Private	Financial
	Laredo Entertainment Center	Private	Arena
	Paul Young Auto Group	Private	Retail
	Stripes Convenience Stores	Private	Retail
	Target Greatland	Private	Retail

According to the 2007 Commodity Flow Survey, major commodities originating from Laredo by value include electronic/motorized vehicles/precision instruments, furniture/mixed freight/misc. manufactured products and grains/alcohol/tobacco products. By weight, the top commodities originating from Laredo include grains/alcohol/tobacco products and furniture/mixed freight /misc. manufactured products (see Table G3). The only mode of transport with recorded data available from the CFS database is trucks as shown in Table G4. For-hire trucks transported the majority of the high value commodities and private trucks carried most of the low value commodities. High value commodities include electronic/motorized vehicles/precision instruments (see Table G5 and G6). There is not sufficient data to determine the low value items transported by the private trucks.

Table G4: 2007 Commodity Flow Survey by Commodity for Laredo

Source: Bureau of Transportation Statistics

Commodity	Value		Tons	
	($million)	% Value	(thousands)	% Tons
Electronic, motorized vehicles, and precision instruments	918	39.79%	69	3.54%
Furniture, mixed freight and misc. manufactured products	529	22.93%	179	9.19%
Grains, alcohol, and tobacco products	437	18.94%	450	23.11%
Base metal and machinery	183	7.93%	-	-
Basic chemicals, chemical, and pharmaceutical products	172	7.46%	-	-
Logs, wood products, and textile and leather	41	1.78%	4	0.21%
Agriculture products and fish	17	0.74%	15	0.77%
Stones, nonmetallic minerals, and metallic ores	-	-	-	-
Coal and petroleum products	-	-	-	-
All Commodities	2307		1947	

Table G5: 2007 Commodity Flow Survey by Mode for Laredo

Source: Bureau of Transportation Statistics

Mode	Value	Tons	Ton-miles	Avg. Miles
	($million)	(thousands)	(million)	
Single modes	1756	1900	511	-
Truck	1756	1900	511	-
For-hire truck	1119	494	467	1131
Private truck	637	1406	44	23
Rail	-	-	-	-
Air (incl. truck and air)	-	-	-	-
Multiple modes	-	1	1	1366
Parcel, U.S.P.S. or courier	-	1	1	1366
Other and unknown modes	-	-	-	-
All modes	2307	1947	521	183

Table G6: 2007 Commodity Flow Survey by Truck Movements for Laredo

Source: Bureau of Transportation Statistics

Commodity	Value		Tons		Ton-miles
	($million)	% Value	(thousands)	% Tons	(million)
Electronic, motorized vehicles, and precision instruments	526	29.95%	59	3.11%	-
Furniture, mixed freight and misc. manufactured products	453	25.80%	161	8.47%	-
Grains, alcohol, and tobacco products	422	24.03%	442	23.26%	-
Basic chemicals, chemical, and pharmaceutical products	152	8.66%	-	-	6
Base metal and machinery	142	8.09%	-	-	51
Agriculture products and fish	17	0.97%	15	0.79%	-
Stones, nonmetallic minerals, and metallic ores	-	-	-	-	-
Coal and petroleum products	-	-	-	-	-
Logs, wood products, and textile and leather	-	-	3	0.16%	-
All Commodities	1756		1900		-

Inventory of Freight Facilities

San Antonio Area

Road Infrastructure

San Antonio is served by the following interstates: Interstate 10; Interstate 35; Interstate 37 that runs from San Antonio through its junction with US 281 south (Edinburg and McAllen) near Three Rivers and into Corpus Christi through its junction with US Highway 77 south (Kingsville, Harlingen and Brownsville) to its southern terminus at Corpus Christi Bay; and Interstate 410—a 53-mile inner beltway around the city.

Other major highways in the area include US 90, US 281, State Highway 151, State Loop 1604, US 87, US 181, State Highway 16, and State Loops 345, 368, 353, and 13, an inner loop on the south side that serves Lackland AFB and Port San Antonio.

Trucks are the dominant mode of transport in the region as illustrated in Table G7. For-hire trucks were mainly used in the transport of low value/high tonnage commodities and private trucks were used for all kinds of commodities.

Table G7: 2007 Commodity Flow Survey by Mode for Laredo

Source: Bureau of Transportation Statistics

Mode	**Value ($million)**	**Tons (thousands)**	**Ton-miles (million)**	**Avg. Miles**
Single modes	54850	114734	10428	151
Truck	54331	102370	7471	147
For-hire truck	19696	67082	5604	330
Private truck	34634	35288	1868	95
Rail	397	-	-	219
Air (incl. truck and air)	122	3	3	1261
Multiple modes	10424	599	349	1218
Parcel, U.S.P.S. or courier	10286	174	180	1218
Truck and rail	70	407	126	678
Truck and water	-	-	-	-
Rail and water	-	-	-	-
Other multiple modes	55	9	35	5118
Other and unknown modes	-	-	88	-
All modes	**85066**	**117764**	**10865**	**907**

Commodities moved by truck include coal/petroleum products, furniture/mixed freight/misc. manufactured products, base metal/machinery, grains/alcohol/tobacco products, and stones/nonmetallic minerals/metallic ores (see Table G8). By weight, 42.45% of the commodities transported were stones/nonmetallic minerals/metallic ores but these accounted for only 0.54% by value. Coal/petroleum products accounted for 28.91% of commodities transported by value and 23.65% by weight.

Table G8: 2007 Commodity Flow Survey by Truck Movements for Laredo

Source: Bureau of Transportation Statistics

Commodity	**Value**		**Tons**		**Ton-miles**
	($million)	**% Value**	**(thousands)**	**% Tons**	**(million)**
Coal and petroleum products	15705	28.91%	24208	23.65%	786
Furniture, mixed freight and misc. manufactured products	7480	13.77%	3537	3.46%	640
Base metal and machinery	6355	11.70%	22018	21.51%	2072
Grains, alcohol, and tobacco products	4466	8.22%	4553	4.45%	-
Logs, wood products, and textile and leather	2521	4.64%	1195	1.17%	208
Agriculture products and fish	1928	3.55%	1161	1.13%	342
Stones, nonmetallic minerals, and metallic ores	295	0.54%	43457	42.45%	-
Basic chemicals, chemical, and pharmaceutical products	-	-	2047	2.00%	466
Electronic, motorized vehicles, and precision instruments	-	-	-	-	-
Commodity Unknown	-	-	-	-	
All Commodities	**54331**		**102370**		7471

Over the next 20 years, truck and rail freight tonnage are expected to more than double within the San Antonio region (HNTB, 2008); see Table G9. Heavy trucks are expected to continue to provide both local and regional service to a number of intermodal facilities, local businesses, and warehouses located within the region (HNTB, 2008). Roadways expected to experience high congestion as a result of the forecasted growth include IH 35 north of IH 410, IH 37 north of IH 410, IH 410 east of US 281, and Loop 1604 northwest of San Antonio (HNTB, 2008). Forecasts done by the Statewide Analysis Model (SAM) based on 1998 Reebie Transearch Data showed that by 2025, truck movement by tonnage is expected to increase by 3 million for internal movements, 46 million tons for movements out of the region, and 54.6 million tons for movements of goods into the region (HNTB, 2008).

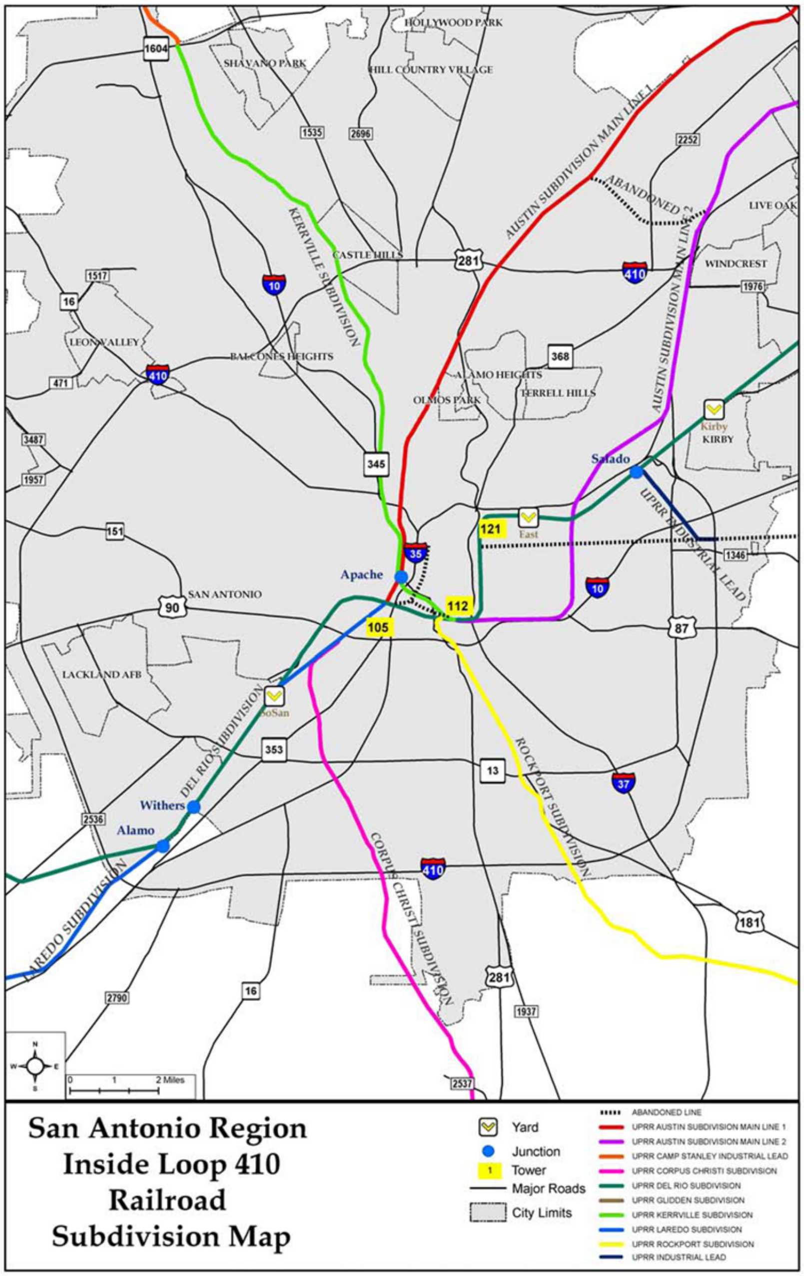
Table G9: Truck Freight Movements

Source: Statewide Analysis Model based on 1998 Reebie Transearch Data, Wharton Economic Forecasting Associates and Latin American Trade Transportation Study

Annual Truck Tons				
Origin	**Termination**	**1998**	**2025**	**Percent Change**
Internal to Internal				
San Antonio District		2,555,208	5,393,211	111%
Internal to External				
San Antonio District	Other Texas Counties	20,423,408	50,301,502	146%
San Antonio District	Western US	430,247	1,198,528	179%
San Antonio District	Northern US	2,581,484	7,191,168	179%
San Antonio District	Eastern US	2,151,237	5,992,640	179%
San Antonio District	Mexico	3,872,226	10,786,752	179%
External to Internal				
Other Texas Counties	San Antonio District	40,802,299	81,691,964	100%
Western US	San Antonio District	413,902	1,067,853	158%
Northern US	San Antonio District	2,483,411	6,407,118	158%
Eastern US	San Antonio District	2,069,509	5,339,265	158%
Mexico	San Antonio District	3,725,116	9,610,677	158%
Total		**81,508,046**	**184,980,677**	**127%**

Rail Infrastructure

According to the 2008 San Antonio Freight Study, there are five major rail lines owned and operated by the UP Railroad in the San Antonio area and three active rail yards in the region (Kirby Yard, East Yard, and SoSan Yard). East Yard is primarily used as an industrial service yard for local and regional customers. Kirby Yard is also equipped for unloading auto racks and provides some local service. In 2009, UP opened up a new $100 million San Antonio Intermodal Terminal. The terminal is expected to serve trade from U.S. West and East Coast ports, Mexican maquiladoras, and the U.S. Midwest. The facility has been equipped to process commodities such as clothing, electronics, and other household items. It can process approximately 180,000 containers per year with the added capacity and has growth potential for 250,000 containers per year (UP, 2009). It is located near Interstate 35 and Loop 410, and will assist in serving San Antonio customers who in the past had to truck containers delivered to Houston by trains that by-pass San Antonio. The new facility is expected to generate $2.48 billion in cumulative economic impact for the area over a 20-year period (UP, 2009). Figure G15 illustrates the existing rail network in San Antonio.



Source: HNTB, 2008

Figure G15: San Antonio Rail Network

According to the HNTB study, approximately 100 trains per day travel within the San Antonio region and areas extending north to Taylor and east to Flatonia with a significant volume of the rail freight moving into and/or out of San Antonio not originating or terminating in the area. It is estimated that approximately 70 to 75% of the trains moving into/out of San Antonio perform operations such as dropping off or picking up rail cars, maintenance services, fueling, and crew changes at SoSan Yard, located near the Port Authority of San Antonio (formerly Kelly USA) (HNTB, 2008).

According to available data from the 2007 Commodity Flow Survey, commodities hauled by rail originating from the San Antonio area included stones/nonmetallic minerals/metallic ores, coal/petroleum products, and base metal and machinery. Data for the other commodities are currently not available. See Table G10.

Table G10: 2007 Commodity Flow Survey by Rail Movements for Laredo

Source: Bureau of Transportation Statistics

Commodity	**Value**		**Tons**		**Ton-miles**
	($million)	**% Value**	**(thousands)**	**% Tons**	**(million)**
Agriculture products and fish	-	-	-	-	-
Grains, alcohol, and tobacco products	-	-	-	-	-
Stones, nonmetallic minerals, and metallic ores	60	15.11%	11178	-	-
Coal and petroleum products	-	-	667	-	161
Logs, wood products, and textile and leather	-	-	-	-	-
Base metal and machinery	55	13.85%	265	-	117
All Commodities	**397**		**-**	-	-

Air Infrastructure

San Antonio is served by the San Antonio International Airport (SAT), located in northern San Antonio, approximately 8 miles or 15 minutes from the downtown area. Loop 410 and US 281 are the two highways providing access to the main entry points. SAT has two terminal facilities, two all-weather air carrier runways, and one general aviation runway. As of end-of-year 2008, SAT had an average of 260 daily domestic and international departures and arrivals with a total number of 8,358,515 passengers (SAT, 2010). The San Antonio Airport System is operated by the City of San Antonio Department of Aviation. Airport operations and improvements at SAT and Stinson are paid for by user fees, bond funds and money from the Aviation Trust Fund, which is disbursed by the Federal Aviation Administration (SAT, 2010).

Kelly Air Force Base is located in Bexar County, Texas, approximately 7 miles southwest of downtown San Antonio. The base encompasses 4,660 acres and is bounded on the west by Lackland AFB and to the south by Military Drive and Leon Creek. The northern and eastern boundaries are Growdon Road and the UP Railroad Yards, respectively (GlobalSecurity, nd).

Port San Antonio is currently Kelly Air Force Base, a multi-purpose, 1,900-acre facility established to serve as an aerospace complex, international airport, and industrial hub with two railroads and close access to three interstate highways. Port San Antonio's Kelly Field (SKF) has a 11,500-foot (3,505 meter) runway that can handle all types of heavy lift aircraft. The runway opened to domestic air cargo planes in 2007 and includes a new air cargo terminal with ample ramp space that allows for quick refueling and efficient turnarounds (Port of San Antonio, 2010). The facility includes a 89,600 square-foot Class A Air Cargo Terminal that is ready for occupancy. The terminal has 14 acres (5.6 hectares) of available ramp space that can accommodate up to four wide body aircraft simultaneously. There is a 50,000 square-foot (4,600 square-meter) cargo staging area on the airside. The terminal also features a 131-foot (39-meter) truck staging area; 50-foot (15-meter) shipping bay; 24 landside dock high doors; 4 ramp doors; and security services (Port of San Antonio, 2010).

In addition, the entire Port San Antonio complex is covered by a general purpose U.S. foreign-trade zone designation (FTZ #80-10), offering Port customers significant economic advantages, including deferral, elimination, or reduction of duties. An on-site Federal Inspection Services (FIS) facility operated by U.S. Customs and Border Protection is adjacent to Kelly Field and can promptly inspect foreign shipments entering the U.S., including agricultural products (Port of San Antonio, 2010).

Laredo Area

There are three Congress-designated High Priority Corridors (HPC) that travel through the Laredo area: HPC 23, HPC 20, and HPC 38 as shown in Figure G16.

In addition, IH 35 and US 59 form part of the Texas HPC (Laredo MPO, 2010). Figure G17 also illustrates the area's major freight transportation infrastructure for highways, border ports of entries, and rail. The four bridges into Mexico are the Gateway to the Americas Bridge, the Juarez-Lincoln International Bridge, the World Trade Bridge, and Columbia Solidarity Bridge. The Colombia Solidarity Bridge and the World Trade Bridge allow commercial traffic and the Juarez-Lincoln International Bridge and Gateway to the Americas Bridge are for passenger use only. Another bridge, the Texas Mexican Railway International Bridge serves only rail traffic and is located next to the Gateway to the Americas Bridge.

The Gateway to the Americas Bridge was constructed in 1954, and is owned and operated by the City of Laredo and the Secretaría de Comunicaciones y Transportes (Mexico's federal Secretariat of Communication and Transportation). It is a four-lane bridge with two pedestrian walkways located in the San Agustin Historical District in downtown Laredo on the U.S. side and on the northern terminus of Mexican Federal Highway 85 in downtown Nuevo Laredo, Tamaulipas. It operates 24 hours a day, and recorded an average monthly pedestrian traffic of 328,319 from October 2009 to June 2010, and an average monthly non-commercial vehicle traffic of 101,139 (October 2009–June 2010) (City of Laredo, 2010).

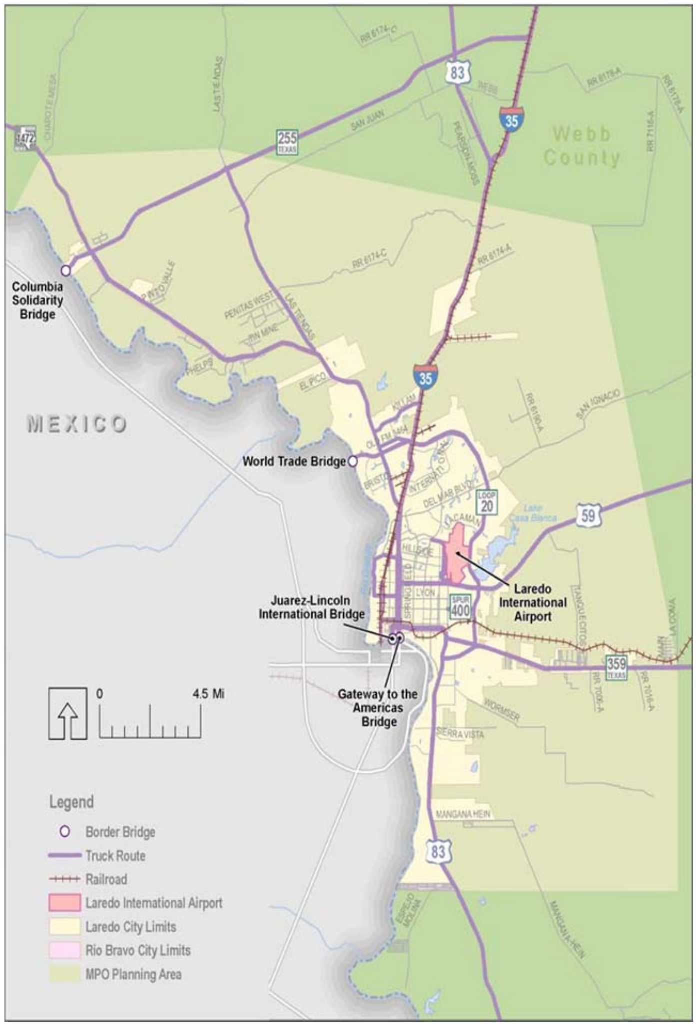
The Juarez-Lincoln International Bridge is an eight-lane bridge owned and operated by the City of Laredo and the Secretaria de Comunicaciones y Transportes. It was built in 1976 to alleviate traffic on the Gateway to the Americas International Bridge and to accommodate the fast growing cities of Laredo and Nuevo Laredo. The bridge is for buses and non-commercial traffic only and has a dedicated lane for Secure Electronic Network for Travelers Rapid Inspection (SENTRI) program users. Its average monthly non-commercial vehicle traffic from October 2009 to June 2010 was 294,145, and the average monthly commercial traffic for the same time period was 3,601 (City of Laredo, 2010).

Laredo MPO, 2010

Figure G16: High Priority Corridors through the Laredo Area

The Columbia Solidarity Bridge is owned and operated by the City of Laredo and the Secretaría de Comunicaciones y Transportes . It is an eight-lane bridge with two walkways for pedestrians that opened in 1992. It is located in the western State Highway 255 terminus or via Urban Road 1472 North in Laredo, Texas and the northern terminus of Nuevo León State Highway Spur 1 in Colombia, Nuevo León. Its average monthly traffic from October 2009 to June 2010 for non-commercial vehicles was 6,994, and 21,992 for commercial vehicles.

The last of the four bridges, the World Trade Bridge, was completed in 2000 to alleviate traffic congestion on IH 35 south through Laredo, Texas. It is an eight-lane bridge, owned and operated by the City of Laredo and the Secretaría de Comunicaciones y Transportes and was built for commercial traffic only. It is located in the northwestern Loop 20 termini in Laredo, Texas and in north Nuevo Laredo, Tamaulipas at the Mexican Federal Highway 85D termini. Average monthly traffic on the bridge from October 2009 to June 2010 for commercial vehicles was 103,896.



Source: Laredo MPO, 2010

Figure G13: Laredo's Freight Transportation Network

According to the Laredo MPO, there are designated truck routes that separate commercial traffic from non-commercial traffic. The primary designated truck routes are

- Interstate 35
- U.S. Highways: US 59 and US 83
- State Highways/Loops: SH 359 and Loop 20

- Farm-to-Market (FM) roads: FM 1472 and FM3368
- Major arterials: McPherson Road, Del Mar Boulevard, Clark Boulevard, Arkansas Avenue, and Santa Maria Avenue

As analyzed by the MPO, the level of service for the above listed truck routes are illustrated in Figure G18 and G19. As of 2008, certain segments of IH 35, US 83, and US 59 were considered to be over capacity. As stated by the MPO, if no highway capacity expansion projects are undertaken beyond what is currently committed in the state's Transportation Improvement Plan (TIP), there would be a spread of congestion to most of the area's road networks.

Figure G18: 2008 Laredo Level of Service

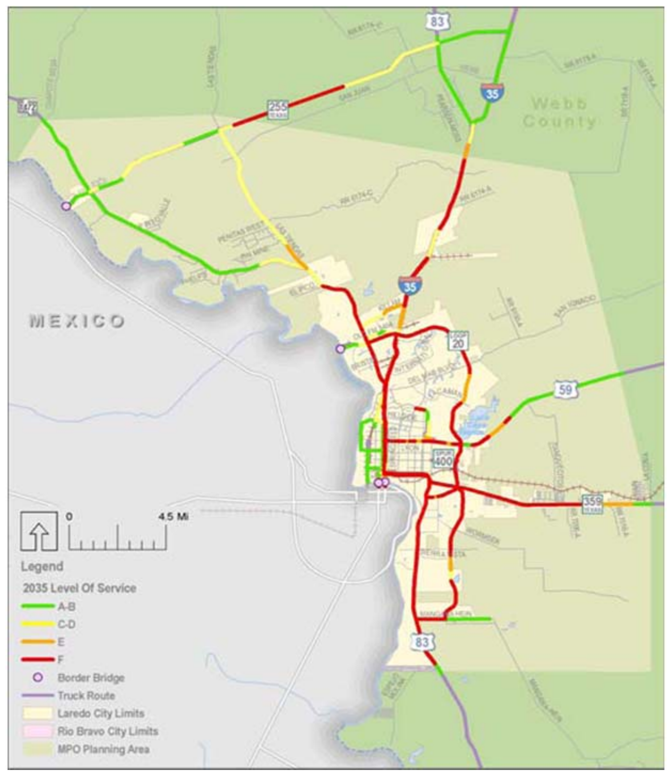


Figure G19: 2035 Laredo Level of Service

Rail Infrastructure

Laredo is served by two Class I railroad carriers—UP and KCS. UP has two rail yards, one located about 4 miles north of the IH 35 and Loop 20 interchange and another located north of the International Railroad Bridge yard, between Zaragosa and Moctezuma Streets (Laredo MPO, 2010). UP operates between 10 and 12 trains per day through Laredo. By the year 2020, this number is projected to increase to 20 trains per day (Laredo MPO, 2010).

KCS has a rail yard located 2 miles east of Loop 20 and has a capacity of 1,375 cars. It also operates 6–7 trains daily (Laredo MPO, 2010). KCS also owns and indirectly operates KCS de México (KCSM) in the central and northeastern states of México. KCSM maintains the Sanchez yard, which is located 11 miles south and west of Nuevo Laredo. This rail yard contains

22 tracks, including 2 for car repairs and an intermodal terminal capable of handling 40 trains and 1,500 trucks per day (Laredo MPO, 2010).

The Texas Mexican Railway International Bridge is currently owned by KCS, which purchased the Texas-Mexican Railway and KCSM. It is a single track bridge, and both UP and KCS share operation of it. It is located in the western termini of the Texas-Mexican Railway in Laredo, Texas and the northern termini of the KCS Railway in Nuevo Laredo, Tamaulipas, Mexico. As of 2007, UP operated approximately 10–12 trains daily and KCS operated 8–10 trains daily. This number is expected to increase to 20 trains daily for UP and 30 trains daily for KCS by year 2020 (KCS, 2007).

Air Infrastructure

According to the Laredo MPO, the Laredo International Airport has dedicated air freight facilities, and is located approximately 3 miles from the center of the city, and 6 miles from the international border. The airport has direct access to US 59 and Loop 20. The airport currently has 3 runways, 579,000 square feet of storage space, and 20 air cargo operators, including Federal Express, Emery Worldwide, BAX Global, American International, Northstar, Rhoades, and Ferreteria (Laredo MPO, 2010). Table G11 presents existing hanger and air cargo facilities in the airport.

Table G11: Storage Facilities in Laredo International Airport

Source: Laredo International Airport, 2010

Category	Storage Space (square feet)
10 Aircraft Hangars	207,000
15 Air Cargo Facilities	360,000
Federal Express Facility	30,000
Total Storage Space	597,000

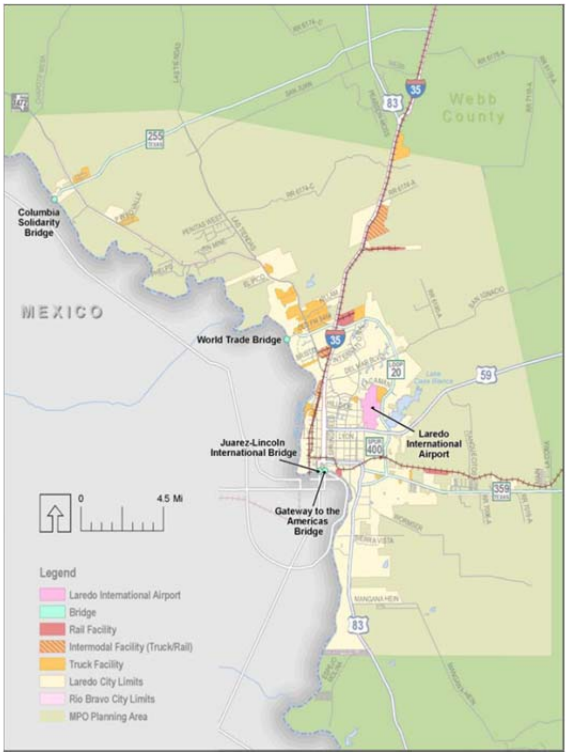
Industrial Facilities

The Laredo area boasts of a slew of industrial facilities that directly impact the area's transportation infrastructure. Through zoning and other regulations, freight facilities have been isolated away from residential areas; however, according to the Laredo MPO, the location of future facilities will directly impact freight movement the entire South IH 35 region (Laredo MPO, 2010). Figure G20 shows the location of regional industrial facilities.

Critical Freight Needs and Issues

San Antonio Area

As in many other metropolitan areas in the U.S., population and employment in San Antonio is expected to grow, thereby creating a greater burden on the transportation system. Congestion levels are expected to rise and statewide commodity movement is expected to increase. Funding, however, is the biggest challenge for the area. Proposed roadway system improvements in the MPO Metropolitan Transportation Plan (MTP) are limited by the amount of funding available, or revenue that can be reasonably expected over the 25-year life of the MTP (San Antonio MPO, 2010). To address some of these needs, the City of San Antonio Thoroughfare Plan is continually updated to meet the future anticipated needs of the area.



Source: Laredo MPO, 2010

Figure G20: Regional Industrial Facilities

Other needs identified in the San Antonio, freight rail study include the regional benefit of roadway-railroad grade separations/closures and the shift of commodities from truck transport to rail. The study suggests that the shift of truck cargo to rail cars could be expedited with additional rail routes that follow a preferred alignment, as determined through a public involvement process, which includes the major freight carriers (HNTB, 2008).

Laredo Area

Critical needs and issues identified by the Laredo MPO in the 2035 Metropolitan Transportation Plan include capacity constraints, border crossing wait times, air pollution, and security.

For capacity issues, the major concern is the ability of the current network to sustain future freight flows. Sections of the current infrastructure, such as IH 35, are already congested, and the situation is expected to worsen if nothing is done.

Border crossing time delays is also said to be negatively impacting the area's freight movement. According to the MPO, a NAFTA study by TxDOT revealed that the average wait-time for northbound commercial vehicles crossing at the World Trade Bridge is about 45 minutes instead of an acceptable non-delayed border crossing time of 10 minutes. Air pollution caused by the movement of freight through the region is expected to negatively impact the area should freight movement or congestion level increase in the future. Need for a new international bridge to accommodate increasing border traffic and more consideration of hazardous materials movement are other needs identified by the MPO.

According to the MPO, security measures implemented after 9/11 increased the cost of doing business over the U.S. and Mexico border. Increased wait times affected overall regional productivity. This situation is expected to worsen should freight volumes increase as forecasted. The MPO estimates that the total economic impact to the region resulting from lost productivity is between \$2.0 billion and \$2.5 billion annually (Laredo MPO, 2010). Furthermore, the Free and Secure Trade (FAST) program, among several programs, was implemented by the Department of Homeland Security's Customs and Border Protection (CBP) after 9/11 to increase security and efficiency of cross-border commercial vehicle movements. The FAST program, however, requires that the international importer, manufacturer, carrier, and driver be Customs-Trade Partnership Against Terrorism (C-TPAT) certified, which includes a detailed review and approval from CBP of the entire manufacturing and shipping supply chain. This makes the program expensive to implement from a private sector perspective and thus discourages the use of the FAST lane (Laredo MPO, 2010).

According to the Laredo MPO, the Presidential Permit Application for the KCS East Loop Bypass states that the Texas Mexican Railway International Bridge is expected to exceed its capacity of 40 trains per day by or before 2020, and the situation could worsen if more stringent screening and inspections were implemented (Laredo MPO, 2010).

Other issues identified for the other border crossings include safety concerns in relation to lane assignment and confusion over the Automatic Vehicle Identification (AVI) lane on the Gateway to the Americas; conflicts of turning movement and lane assignments and absence of pavement markings and signage on the Juarez-Lincoln Bridge; Port of Entry (POE) configuration, internal circulation, outdated facility layouts, and FM 255 and FM 1472 turning movement safety issues and traffic queues at the inspection facility of the Columbia International Bridge; and finally, mixing of commercial traffic types, capacity inadequacies, and lack of an adequate amount of inspection booths on the World Trade Bridge.

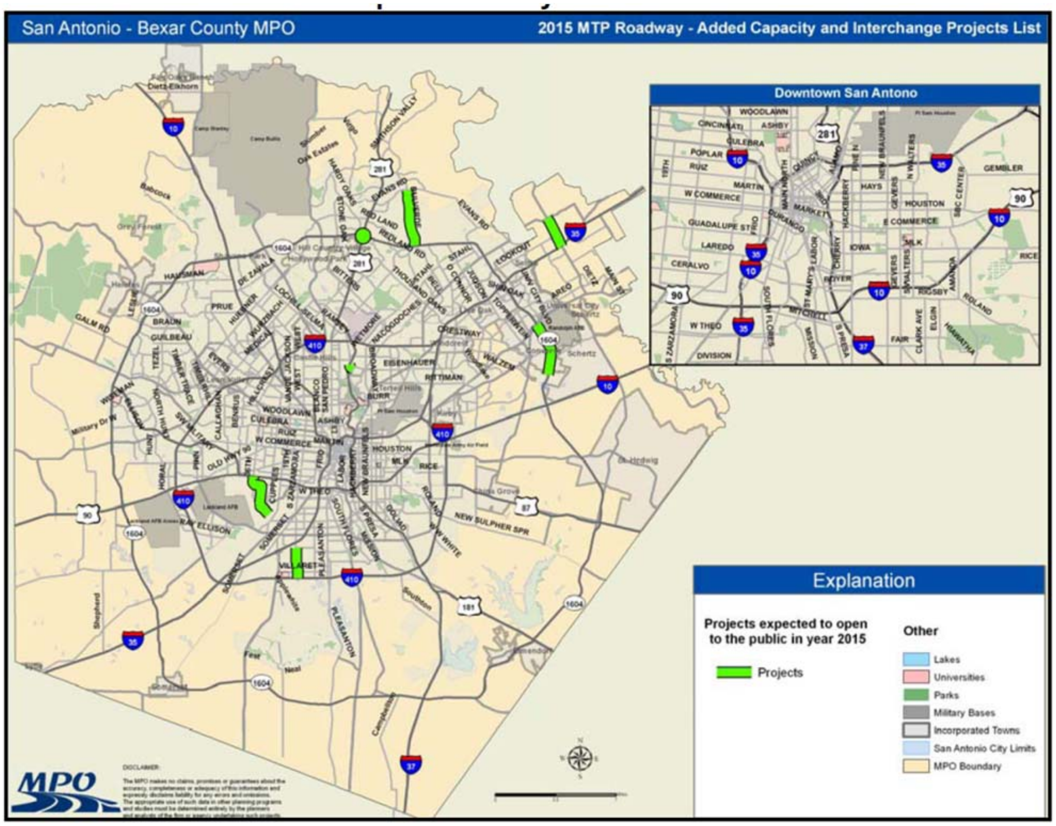
Policies and Strategies to Address Needs

San Antonio Area

Policies identified by the San Antonio MPO to address anticipated transportation needs in the San Antonio area include:

1. Developing a roadway system that is compatible with the needs of other modes such as bicycles, pedestrians, public transportation, and truck and rail freight
2. Considering safety in the project selection process
3. Requiring land developers to preserve the necessary rights-of-way in future travel corridors
4. Requiring private developer contributions in roadway construction in undeveloped areas through the development process
5. When approving new land development, ensuring that internal, connecting, and adjacent streets are able to handle the expected type and intensity of development that is proposed
6. Implementing access management strategies to improve safety and traffic flow
7. Ensuring sufficient funding exists for roadway maintenance
8. Using all available funding tools available to the area
9. Continuing to ensure coordination between the transportation partners

Figures G21 through G23 taken from the MTP report show the added capacity roadway projects that are expected to be open to the public by years 2015, 2025, and 2035, respectively.

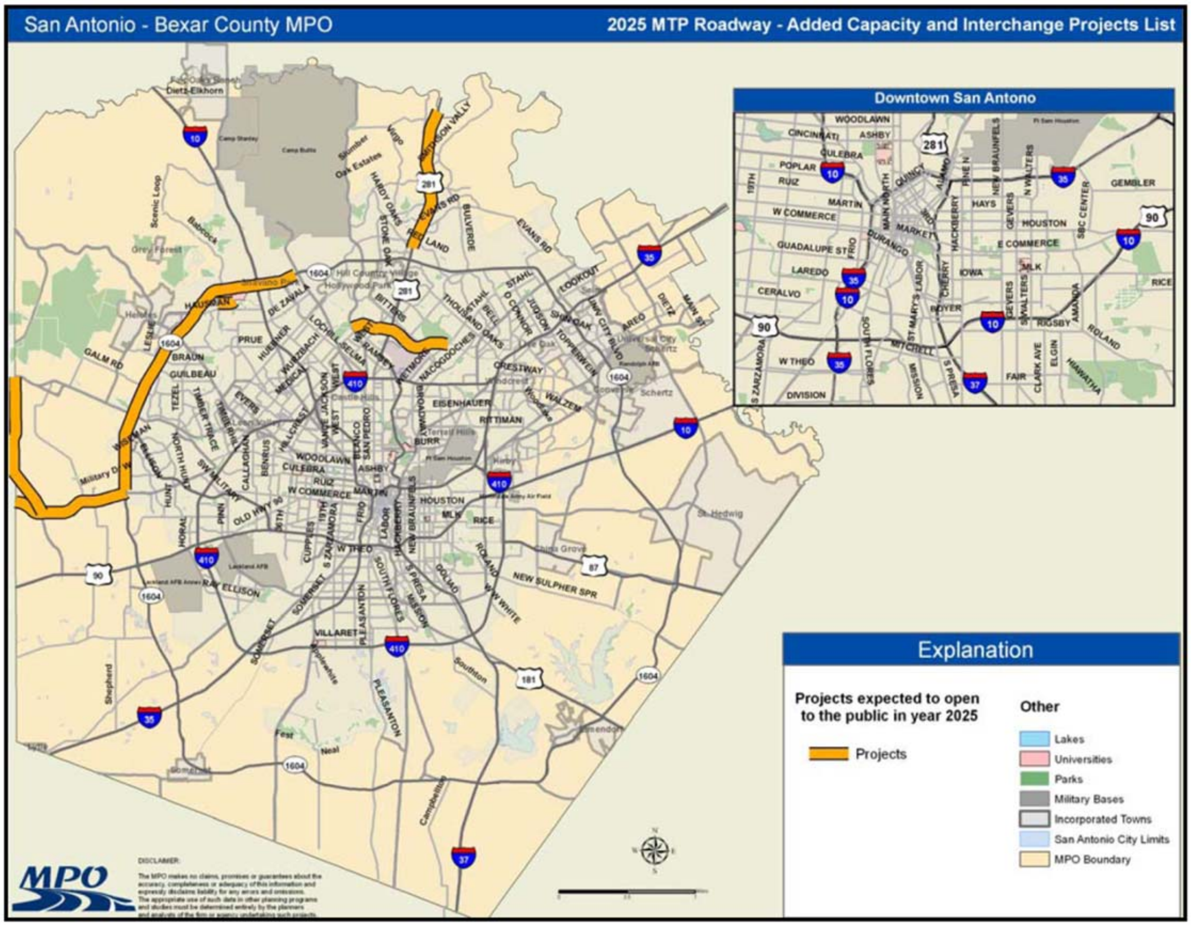


Source: San Antonio MPO, 2010

Figure G21: Added Capacity Roadway Projects that will be Operational by Year 2015

Added capacity roadway projects expected to be operational by year 2015 include:

- 36th Street from US 90 to Growdon
- Bulverde Road from Evans Road to Loop 1604
- FM 3009 from 0.2 miles north of FM 2252 to IH 35 North
- Jones Maltsberger from US 281 to east of the railroad tracks
- Loop 1604 from FM 78 to Graytown Road
- Southern direct connectors at the US 281 at Loop 1604 interchange
- Zarzamora from Hutchins to IH 410 South

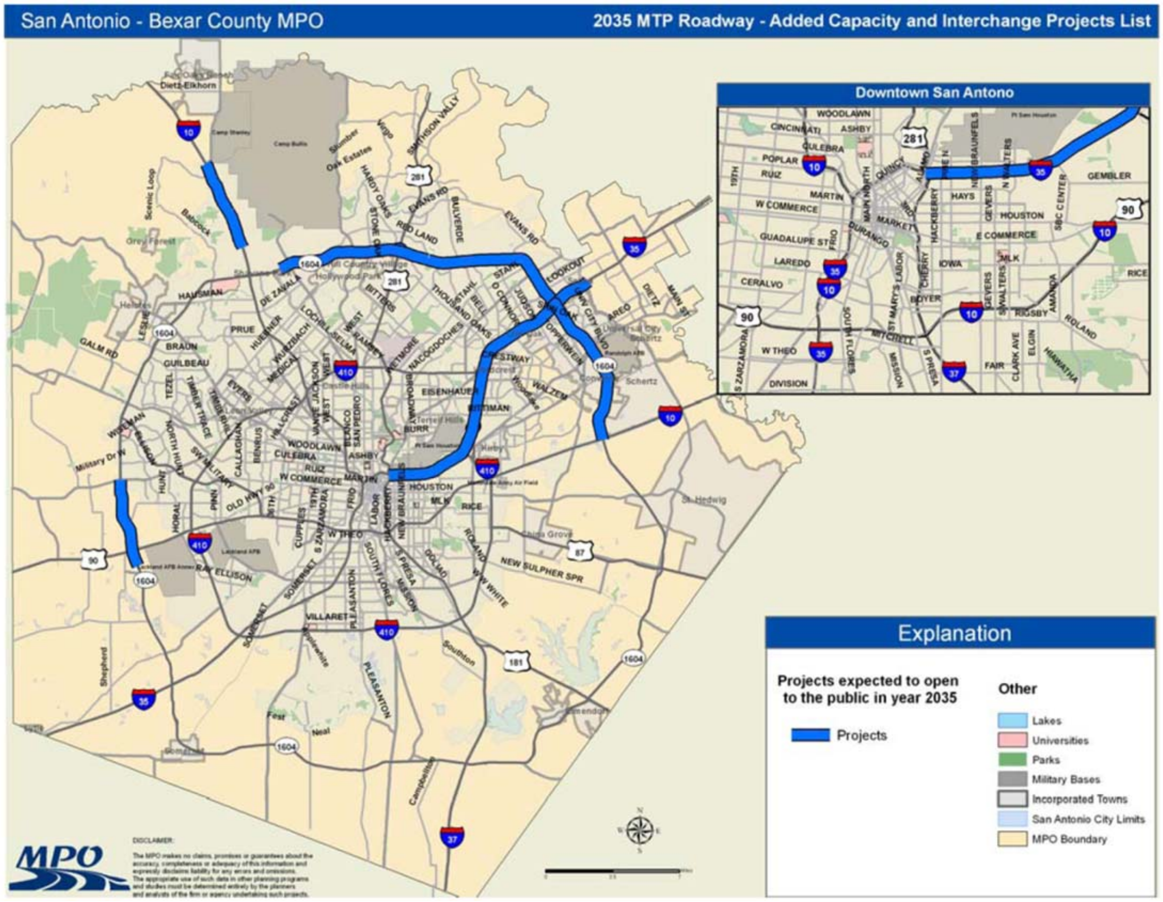


Source: San Antonio MPO, 2010

Figure G22: Added Capacity Roadway Projects that will be Operational by Year 2025

Added capacity roadway projects expected to be operational by year 2025 include:

- FM 1957 (Potranco Road) from Loop 1604 to the Medina County Line
- Loop 1604 from FM 1535 (NW Military Highway) to Military Drive West
- SH 211 from FM 1957 (Potranco Road) to FM 471 (Culebra Road)
- US 281 from 0.2 miles north of Loop 1604 to the Bexar/Comal County Line
- Wurzbach Parkway from West Avenue to Wetmore Road



Source: San Antonio MPO, 2010

Figure G23: Added Capacity Roadway Projects that will be Operational by Year 2035

Added capacity roadway projects expected to be operational by year 2035 include:

- IH 10 West from 1.5 miles north of Loop 1604 to FM 3351 (Ralph Fair Road)
- IH 35 North from US 281/IH 37 near downtown to the County Line
- Loop 1604 from Military Drive West to US 90
- Loop 1604 from FM 1535 (NW Military Highway) to IH 10 East
- Northern direct connectors at the US 281 at Loop 1604 interchange

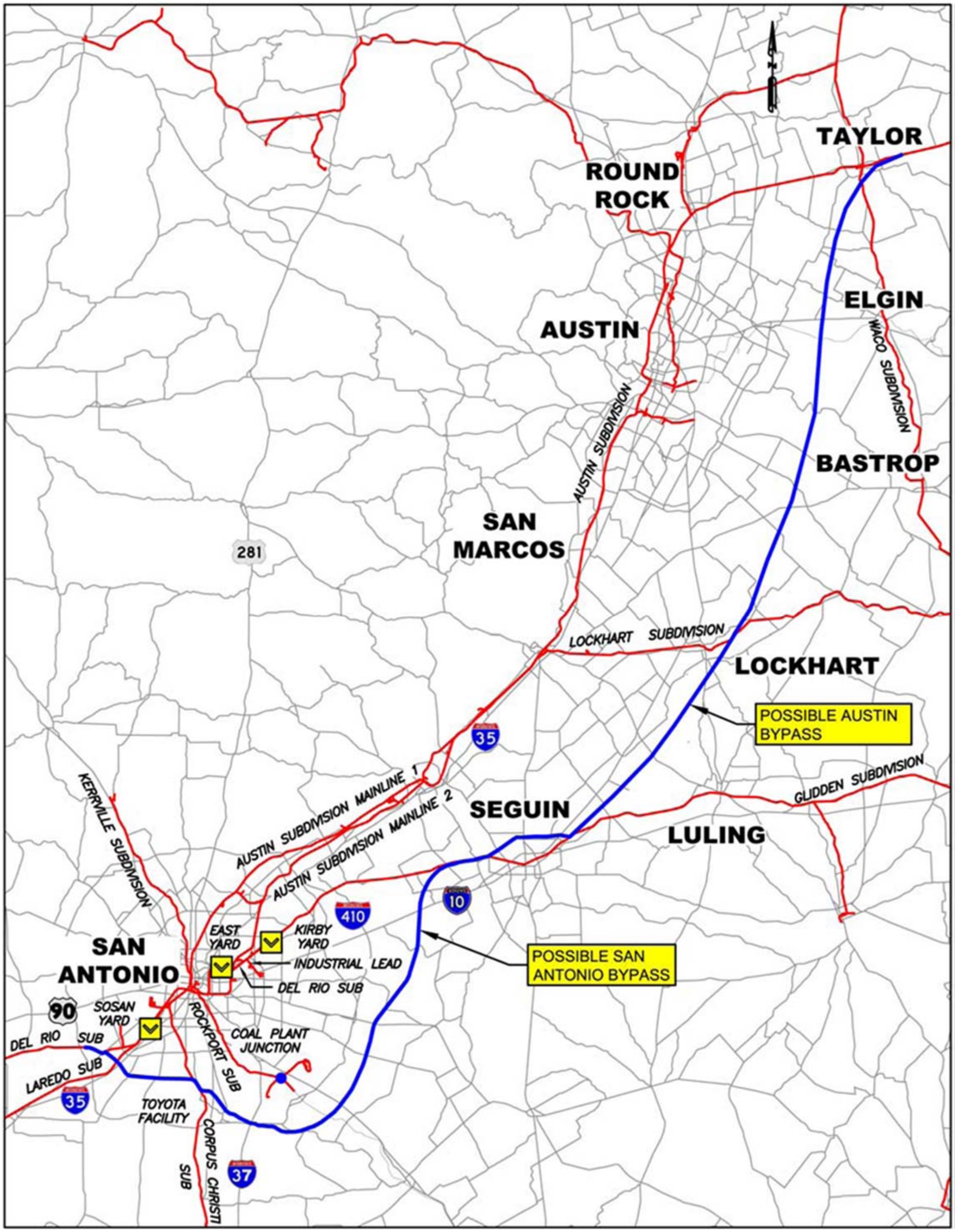
In addition to the above listed roadway projects, the City of San Antonio will begin work on a road-building project at the Port that will create a new access route from 36th Street into the complex. The project is expected to allow for the development of an additional 150 acres adjacent to Kelly Field, allowing the Port to work with investors and developers to build new aircraft-served facilities that will accommodate the growth of logistics and aerospace customers. It is expected to be completed in 2012 (Port of San Antonio, 2010).

The San Antonio Freight Study also identified transportation network improvements for the San Antonio area. Sixty-six grade separations were identified that would separate existing railroad lines from major streets in the San Antonio district. The improvements seek to reduce traffic safety hazards and delays in the district. The cost of the improvements was estimated at $924 million, (HNTB, 2008). Also identified in the study are 65 locations where existing grade crossings may be closed with an estimated cost of $3.3 million in the San Antonio District. These safety improvements are to minimize conflict points between trains and cars by closing crossings and encouraging motorists to use grade-separated roadways, or alternate streets, which have better safety systems in place.

The report also identified 28 rail capacity improvements estimated at $183 million, and 3 possible bypass routes estimated between $1.37 billion to $2.42 billion. Rail capacity enhancements studied include adding a mainline track; adding track adjacent to existing mainlines at strategic locations to allow trains to pass one another or to idle without causing delays; constructing connections from one rail line to another to improve rail traffic mobility; expanding rail yard capacity; relocating rail yards and/or facilities that accommodate trailers and containers by ship, rail, and truck referred to as "intermodal facilities." Eight scenarios were further investigated and these consist of:

- Planning Case A (PC A) – San Antonio rail bypass between Seguin and Macdona with new rail yards at Marion and Macdona
- Planning Case B1 (PC B1) – Austin rail bypass between Taylor and Seguin with a new intermodal yard at Macdona, trains routed on the Del Rio Subdivision between East Yard and Tower 112
- Planning Case B2 (PC B2) – Austin rail bypass between Taylor and Seguin with a new intermodal yard at Macdona, trains routed on the Austin Mainline 2 Subdivision between East Yard and Tower 112
- Planning Case C (PC C) – Combined San Antonio and Austin rail bypass between Taylor and Macdona with new rail yards at Marion and Macdona
- Planning Case 1 (PC 1) – Tested improvements in order to address operational efficiency with the installation of a second mainline route in and out of SoSan Yard
- Planning Case 2 (PC 2) – Tested improvements in order to address operational efficiency with the installation and completion of a second mainline route between East Yard and Kirby Yard
- Planning Case 3 (PC 3) – Tested improvements to address network fluidity and capacity
- Planning Case 4 (PC 4) – Tested improvements to improve meet/pass efficiency and reduce train delays

Planning Case C (see Figure G24) was determined to have the highest total public benefit-to-cost ratio as well as the highest total benefit-to-cost ratio. The estimated cost of Planning Case C was more than $2.42 billion, including the cost of grade separating select roadway-railroad crossings along the possible bypass route (HNTB, 2008). Further details on all the possible case studies can be found in the *San Antonio Region Freight Study* report.



Source: HNTB, 2008

Figure G24: Possible Austin–San Antonio Bypass

(Note: conceptual bypass route shown is for illustrative purposes only)

Laredo Area

Policies and strategies being pursued by the Laredo MPO include upgrading Loop 20 to a freeway facility to alleviate forecasted congestion; providing grade separations at major intersections; providing grade separations at intersections with railroads; increasing enforcement of truck routes; providing separate truck lanes on major roadways; and increasing number of main thoroughfares and arterials to distribute traffic over more roadways.

New International Bridges

According to the Laredo MPO, in anticipation of increasing rail traffic, the Webb County Rural Rail District, KCS, and UP are contemplating new international rail bridges as part of their long-range planning efforts as illustrated in Figures G25 and G26. However, according to the transportation plan, during the public outreach efforts for the development of this MTP, citizens and other stakeholders rejected the idea of encircling the city with railroad tracks. Therefore, it is likely that only one of these two projects will actually be constructed (Laredo MPO, 2010).

Source: Laredo MPO, 2010

Figure G25: Proposed Rural Rail District Rail Project

Source: Laredo MPO, 2010

Figure G26: Proposed KCS Rail Project

Mexican Multimodal Corridor

According to the Laredo MPO, in an ongoing study sponsored by the Mexican Secretariat of Communications and Transportation, the Lázaro Cárdenas–San Luis Potosí–Monterrey–San Antonio Corridor has been identified as a high priority trade corridor that will provide Mexico with a master plan to develop a multimodal transportation network. The corridor is expected to begin at Lázaro Cárdenas approximately 953 miles from the border, and end at San Antonio, Texas (see Figure G27). This route connects important industrial cities in the NAFTA corridor, including Querétaro, San Luis Potosí, Saltillo, and Monterrey (Laredo MPO, 2010).

Figure G27: Lázaro Cárdenas–San Luis Potosi–Monterrey–San Antonio Corridor

Laredo International Airport (LRD) Expansion

According to the Airport Master Plan Update, the existing air cargo apron and building space will be expanded in order to accommodate growing air cargo activities. The recommended air cargo expansion plan includes a total of 720,000 square feet of air cargo building space, 246,000 square feet of aircraft parking yard, 82,100 square feet of truck docking area, and 55,000 square feet of fuel farm or non-aviation commercial activities (Laredo MPO, 2010). The *LRD Master Plan* forecasts that growth in air freight between 2010 and 2025 will be between 7.2% and 11% annually. The projections are based on the assumption that the air cargo market will become more diverse, while the lower growth scenario assumes that the air cargo at LRD will remain predominately from the automobile industry (Laredo MPO, 2010).

In response to the international bridge issues, the following recommendations were also included in the Laredo MPO 2035 MTP:

- Gateway to the Americas:

- Issues: Safety concerns in relation to lane assignment; confusion over the Automatic Vehicle Identification (AVI) lane
- Recommendations: Synchronizing traffic signals, installing ITS devices, and improving or adding signs to indicate lane assignments

- Juarez-Lincoln Bridge:
  - Issues: Conflicts of turning movement and lane assignments; absence of pavement markings and signage
  - Recommendations: Synchronizing traffic signals, installing ITS devices, improving or adding signs to indicate lane assignments, installing dual left-turn lanes at problem intersections, and restriping of lanes
- Colombia Solidarity Bridge
  - Issues: POE configuration, internal circulation, and outdated facility layouts; FM 255 and FM 1472 turning movement safety issues and traffic queues at the inspection facility
  - Recommendations: Adding a traffic signal at FM 1472/FM 255 intersection, lane striping, improving/adding signage, adding a right-turn lane for traffic entering the facility, and increasing the acceleration lane for commercial trucks exiting the facility
- World Trade Bridge:
  - Issues: Mixing of commercial traffic types, capacity inadequacies, the lack of an adequate amount of inspection booth
  - Recommendations: Improving traffic signal phasing and timing at certain key intersections and improving/adding signs to the immediate area surrounding the border crossing

H: West Texas

Introduction

The West Texas economic region is located at the west end of the state, lined by the national border with Mexico and the state border with New Mexico (see Figure H1). It encompasses two TxDOT districts—El Paso and Odessa—with a land area of approximately 40,000 square miles. The region is the most sparsely populated region in the state. According to the U.S. Census Bureau, 4.5% of the Texas population (about 1.1 million people) lives in the region. Industrial activity is thus concentrated near the larger cities in the region, primarily Odessa, Midland, Fort Stockton, and El Paso. Steel pole and wind energy-related manufacturing are present near Odessa and Midland, serving largely the wind energy region in the northwest part of the state (i.e., the Central Texas region). Otherwise, oil and gas remain the dominant industry throughout much of this region. Thus, the western region is very susceptible to fluctuations in oil and gas prices. Many towns are struggling to sustain themselves when no pumps are in operation. The El Paso area, including some towns in nearby New Mexico, has more of a manufacturing base, partly because of the region's ability to attract lower cost laborers from Juarez, Mexico. In El Paso, assembly plants manufacture various electronic, plastic, and steel products. El Paso is also the main entry point into the state of Texas from either New Mexico or northern Mexico. Most of the other major population centers in the region lie along IH 20 between El Paso and Dallas. El Paso is the largest city in the region, with major interstate highways and railway connections to both the east and the west.

The West Texas region shares several hundred miles of border with Mexico along the Rio Grande, and has several land border bridges (i.e., highways and rail) in the region. As for marine freight movement, the region does not have any coastline, and no ports exist on the Rio Grande River.

Overall, population of the region, as seen in Figure H2, has changed slightly between 2000 and 2005. Most counties have seen declining populations, with the exception of those counties near the metropolitan areas.

The West Texas economic region has about 1.1 million people, residing in 15% of the land area of Texas. Approximately 92% of the region's population lives in metropolitan areas. Also, the population in this region has been increasing by 7.7% in the past decade, which is lower than the state average of 17.1%. The lower population growth of the region can be attributed to decreasing population in many of the West Texas counties.

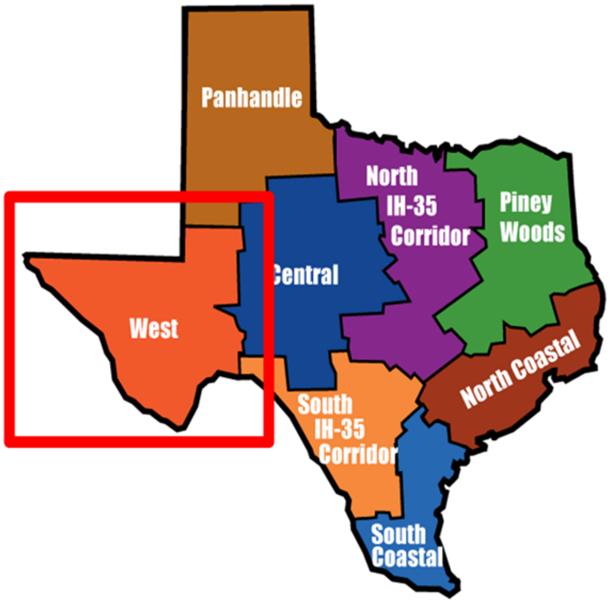


Figure H1: Location of economic regions

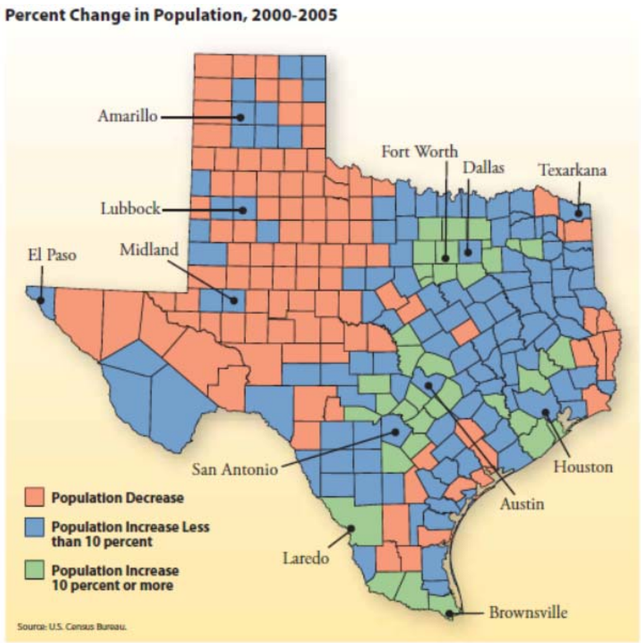


Figure H2: Location of population centers

Population distribution in the West Texas economic region is rather centralized around El Paso and Midland/Odessa (see Figure H3). More than half of the region's population (67.5% or 740,000) lives in El Paso; this forms an economic area with Ciudad Juarez, Mexico and Las Cruces, New Mexico across both national and state borders. Also, El Paso serves as a transshipping location, which has contributed to the city's growth. Odessa and Midland comprise the other major metropolitan area in the region, contributing another 24% of the regional population, or about 260,000. Odessa and Midland are neighboring major cities, located approximately one-third the distance from El Paso to Dallas.

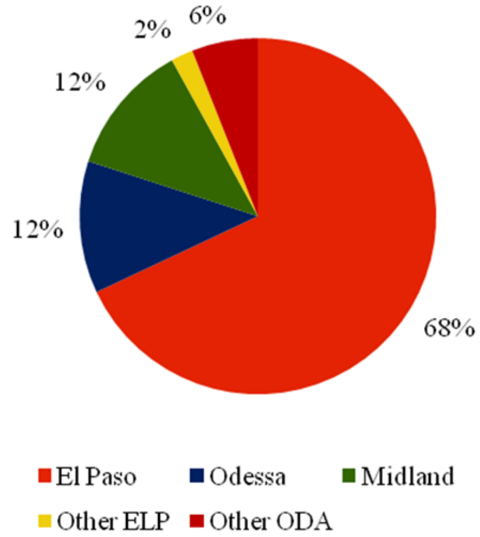


Figure H3: West Texas Population Distribution

Economic Profile and Freight Movements

El Paso

As indicated before, about 92% of the population of the West Texas region is in El Paso, Midland, and Odessa. El Paso, being the largest of the three cities, has a highly diverse economy that is mostly dominated by the manufacturing, oil, and gas industries. With 70 Fortune 500 companies located in the region, El Paso serves as an important manufacturing and border port city between the U.S. and Mexico. The area features a large number of small parts manufacturing and fabrication facilities, with many companies using low-cost maquiladora labor in nearby Juarez, Mexico. Assembly plants utilize low labor costs in the area to manufacture various electronic products, mold plastics, and steel, particularly for automobiles. The Franklin Mountains, which extend into El Paso from the north and nearly divides the city into two sections, is also an important resource for building stones mined by the large quarry industry in the city. These products, given El Paso's location along major interstate highways, contribute to freight traffic in the state of Texas, as well as across the desert southwest.

El Paso also maintains a major U.S. military presence at Fort Bliss, as well as White Sands National Missile Range in nearby New Mexico. The military complexes in the area are the largest major employers, and contribute significantly to consumption of goods in the region. Among other major job sources in El Paso are a number of customer service call centers for various American companies, the University of Texas at El Paso, and other community colleges. While not contributing significantly to niche freight demand, these employees undoubtedly also affect regional consumption of goods.

Table H1 from the 2007 Commodity Flow Survey shows the majority of the commodities originating from El Paso. These commodities include monumental or building stones, fuel oils, coal, petroleum products, base metals, and machinery. The high volume of monumental or building stones can be attributed to the active quarry industry in the area.

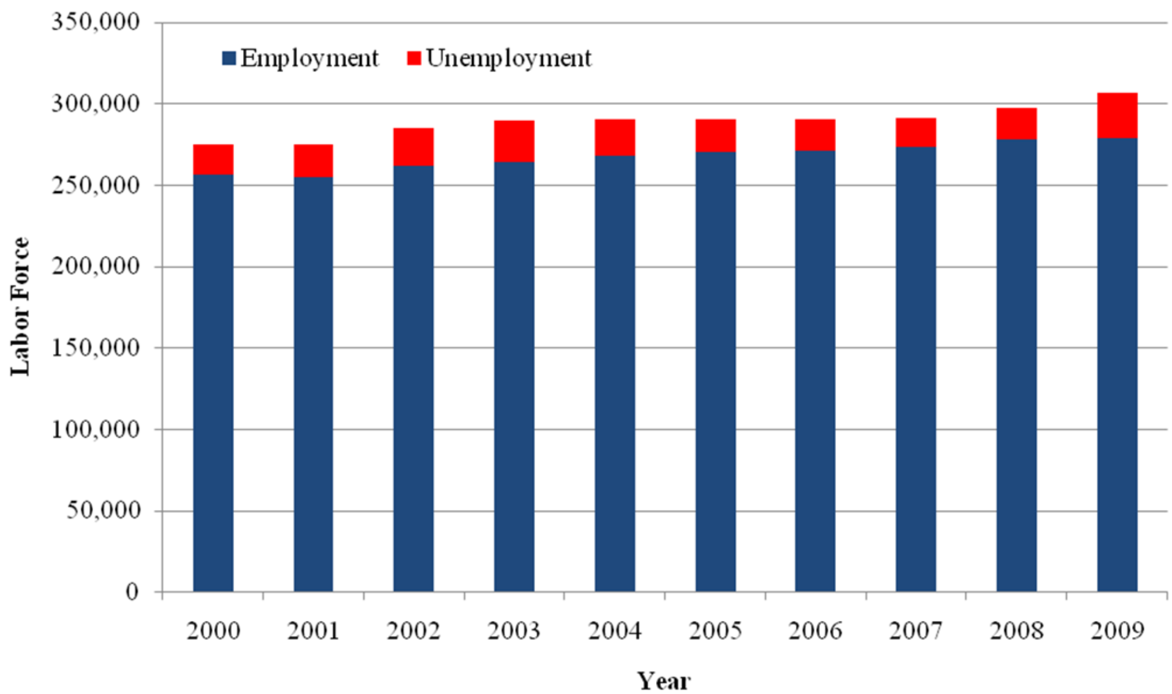
El Paso, with a highly diverse economy, also maintained a relatively low unemployment rate until the economic recession in 2008 and 2009. As shown Figure H4, the area's labor force remained almost constant at 290,000 from 2003 to 2007. Though the labor force increased from 2008 to 2009, so did unemployment. The change in unemployment is better illustrated in Figure H5 where it increased from 5.9% in 2007 to 9.0% in 2009. This trend is expected to remain the same in 2010 but stakeholders are optimistic that the area's economy will bounce back in the near future after the expansion of a Foxconn[11] manufacturing plant that will produce up to a million cell phones this year. There are also plans for an aerospace manufacturing plant in the area.

Fort Bliss is expected to expand over the next several years as a result of continued national base closure and realignment. Fort Bliss' population of troops and family members is expected to increase to from 24,660 in 2005 to 90,418 by the end of 2012, including more than 13,500 children forecasted to enter local schools. This will also result in an additional demand for 20,000 apartments and homes off-base in the city (Meyer, 2008). It is unknown whether other military operations in the West Texas region, such as Dyess AFB, will expand or contract.

[11]Foxconn is an electronics manufacturing giant that makes products for Apple, Nokia, HP, Motorola, Dell, and Sony, and manufactures more cell phones than any other firm in the world.

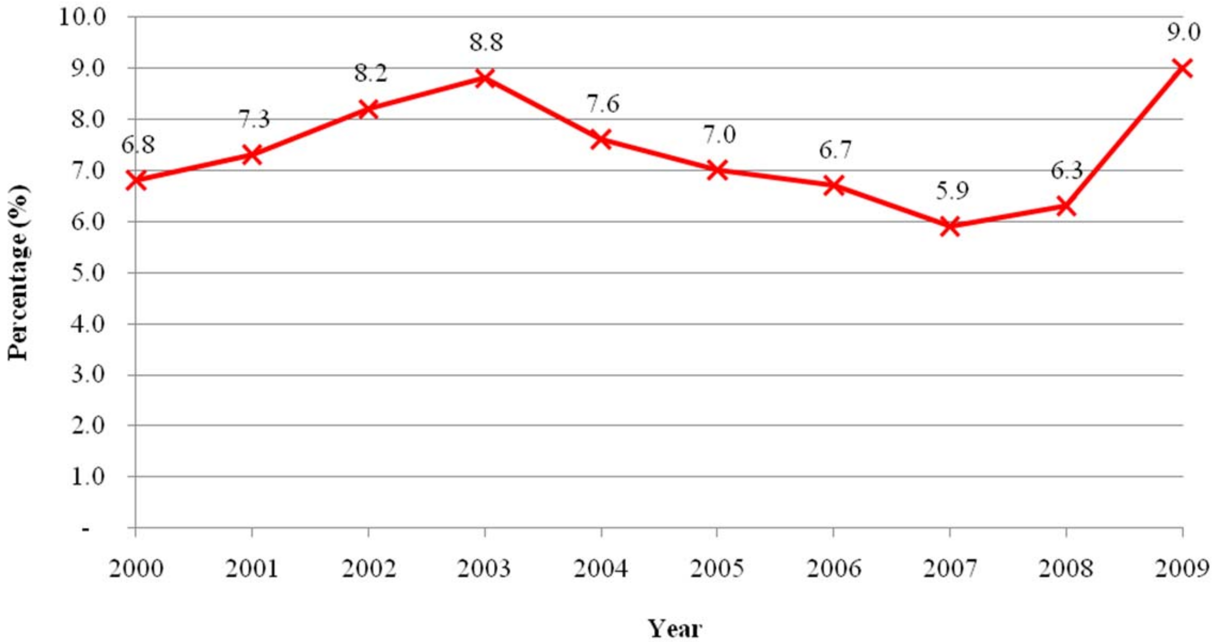
Table H1: 2007 Commodity Flow Survey Data for El Paso, TX

Commodity Group	Tons (in 1000s)	% Tons	Value ($mil)	% Value	Avg. miles
Monumental or building stone, except dolomite	4,176	32%	62	0%	13.00
Fuel oils, coal and petroleum products	2,192	17%	1,249	6%	149.00
Base metal and machinery	1,859	14%	5,759	27%	169.00
Milled grain products and preparations, and bakery products	954	7%	1,435	7%	n/a
Electronics, motorized vehicles, and precision instruments	603	5%	6,255	29%	939.00
Logs, wood products, and textile and leather	434	3%	2,150	10%	907.00
Pharmaceutical and chemical products	367	3%	1,200	6%	n/a
Furniture, mixed freight and misc manufactured products	365	3%	1,128	5%	290.00
Commodity Unknown	2,156	16%	2,162	10%	n/a
All Commodities	**13,106**		**21,400**		**449.00**



Source: Texas Workforce Commission, 2010

Figure H4: El Paso Labor Force 2000–2009

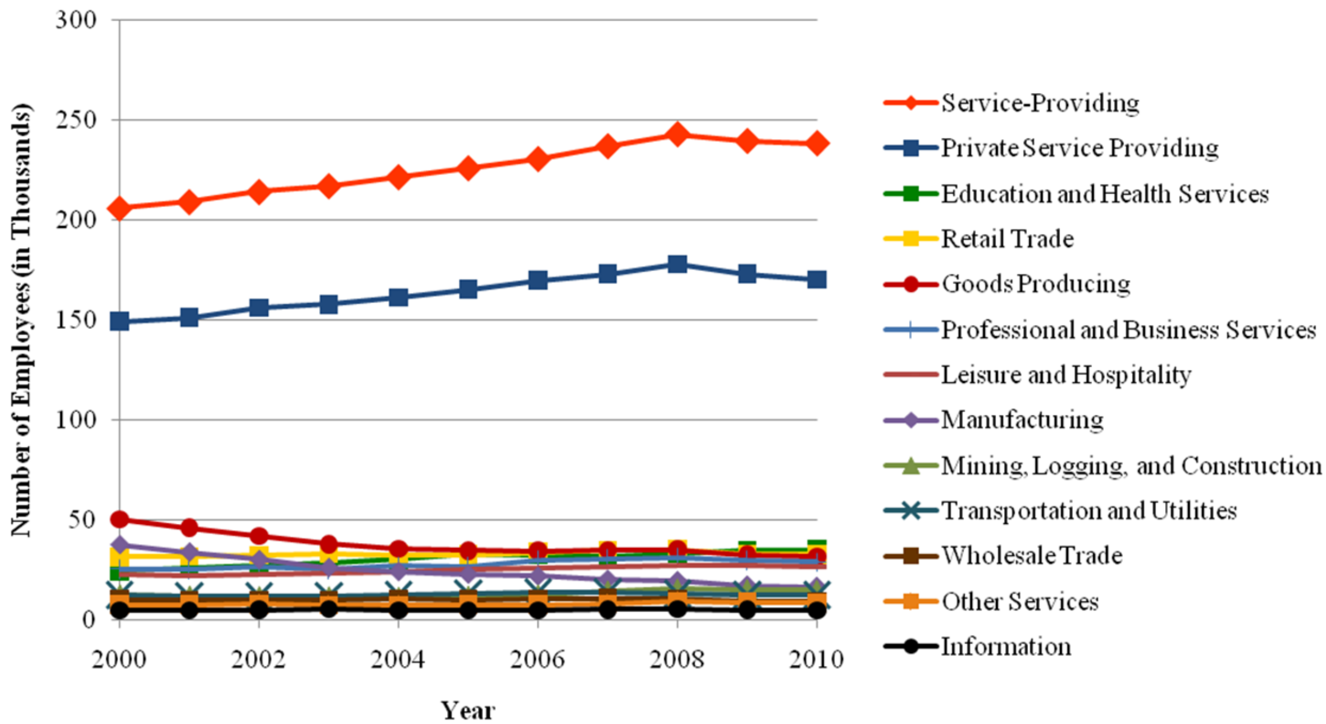


Source: Texas Workforce Commission, 2010

Figure H5: El Paso Unemployment Rate 2000–2009

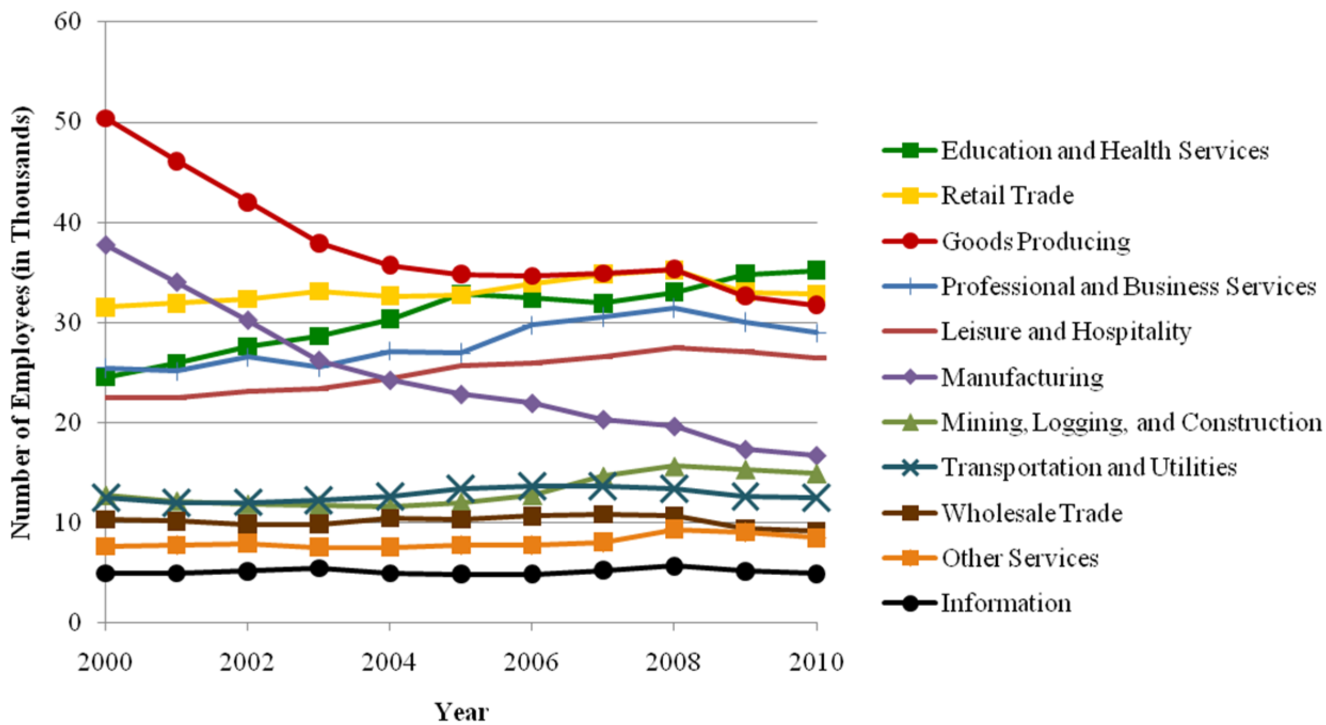
A review of the area's industries from 2000 to 2010 in Figure H6 shows that the greatest number of employees worked for the service-providing industry, which experienced a rapid growth from 2000 to 2008. Aside the service-providing industries, other major industries in the area as of 2010 are education and health services, retail trade, goods-producing, professional and business services, leisure and hospitality, manufacturing, and mining, logging and construction[12] (see Figure H7). From Figure H7 it can also be inferred that the industries with the most rapid decline in employment over the last decade are the goods-producing and manufacturing industries. Employment in the goods-producing industry declined by almost 40% from 2000 to 2010, and that of the manufacturing industries declined by more than 50% in the same time period.

[12] The oil and gas industries fall under this category.



Source: Bureau of Labor Statistics, 2010

Figure H6: El Paso Number of Employees by Industry, 2000 to 2010



Source: (Bureau of Labor Statistics, 2010)

Figure H7: El Paso Number of Employees by Industry less Service-providing, 2000 to 2010

As stated earlier, El Paso also serves as an important border port of trade between U.S. and Mexico. From January to March 2010, commodities valued at more than $2.6 and $5 billion dollars were exported and imported respectively via El Paso (Texas A&M International University, 2010). Further discussions on El Paso's border operations can be found in the section under the Freight Trends subtopic.

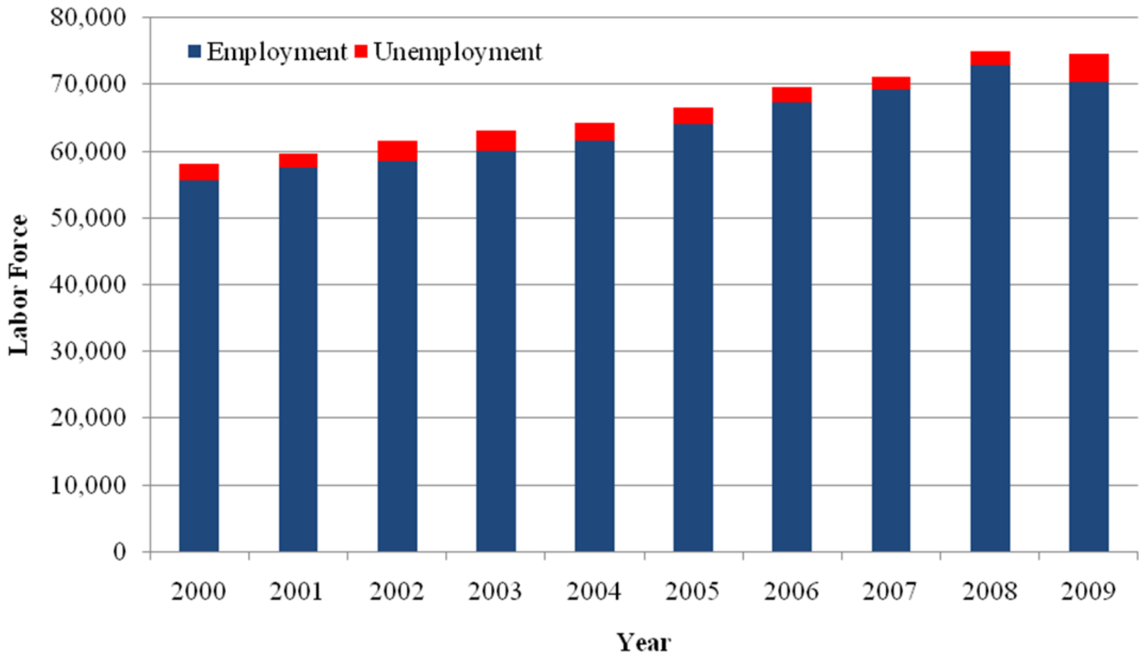
Midland/Odessa

Midland/Odessa's economy is primarily driven by the area's oil industry but steps are currently being undertaken towards economic diversification. The La Entrada al Pacifico trade corridor, if implemented, is projected to serve as a boost to the area's economy, because of its connectivity to Dallas and the proposed Ports-to-Plains corridor.

From 2000 to 2009 both Midland and Odessa experienced a steady growth in their labor force (Figure H8 and H10) but like El Paso, unemployment greatly increased in 2009. The change in unemployment in these two cities is better illustrated in Figure H9 and H11 where unemployment in Midland increased from 2.9% in 2008 to 5.6% in 2009, and that of Odessa increased from 3.5% in 2008 to 8.2% in 2009. As shown in Figures H12 and H14, service-providing industries are the major employers in both cities followed by goods-producing and mining, logging and construction, local government, and retail trade. Figures H13 and H15 show the similarities shared by the industries in the cities of Midland and Odessa, which are just less than 25 miles apart. Unlike El Paso, the goods-producing, mining, logging, construction, and manufacturing industries experienced growth from 2002 to 2008. However, from 2008 to 2010, employment in these industries declined sharply, thereby accounting for the increased unemployment in the region in 2009.

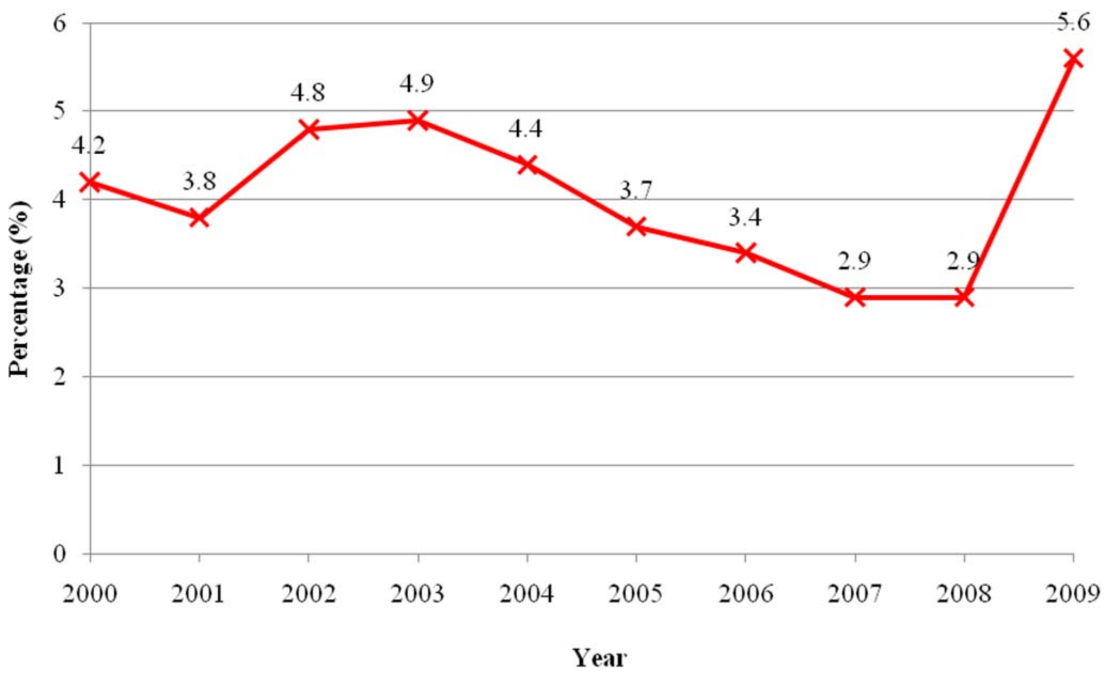
In 2003, Family Dollar Corporation opened its seventh distribution center in Odessa's industrial park. The facility features an advanced warehouse management system as well as other cutting edge technology. It supports Family Dollar stores in eight states: Idaho, Nevada, Utah, Wyoming, Colorado, New Mexico, Arizona, and Texas (Family Dollar, 2003). In 2004, Family Dollar was joined by Telvista Telecommunication, an international customer contact center. In spring 2006, Navasota Energy broke ground on a 550-MW gas-fired power plant, which will operate under the name Quail Run Energy. This $200 million plant will be built in two phases, the first being completed in 2007, and will employ 14 highly-skilled employees and there will be between 150 and 200 employed at the peak of each construction phase.. This new facility has been designed to use state-of-the-art emissions control technology and it meets or exceeds all state and federal regulations for a plant of this type (Odessa Chamber of Commerce, 2007a). Coca-Cola Enterprises also purchased a lot in the Parkway Industrial Park and constructed a new $3 million regional distribution center.

In the energy sector, proposed or ongoing projects include a new 80-MW solar farm in the area (Folsom, 2009a; Odessa American, 2009), and a 400-MW clean coal power plant, which is a Texas Clean Energy Project (TCEP) by Summit Power Group Incorporated. The project is estimated to bring in more than 1,200 construction jobs to the Permian Basin for 3 years after work starts there in late 2010. And once the $1.7 billion coal gasification power plant opens in 2014, 150 people would have permanent jobs at the site (Folsom, 2009b). With over 500 manufacturers in the area and a heavy concentration of machine shop services, and more export opportunities available and domestic demand lessening, companies are finding it very profitable to extend their markets overseas, using Odessa as their base of operations (Odessa Chamber of Commerce, 2007a).



Source: Texas Workforce Commission, 2010

Figure H8: Midland Labor Force 2000–2009

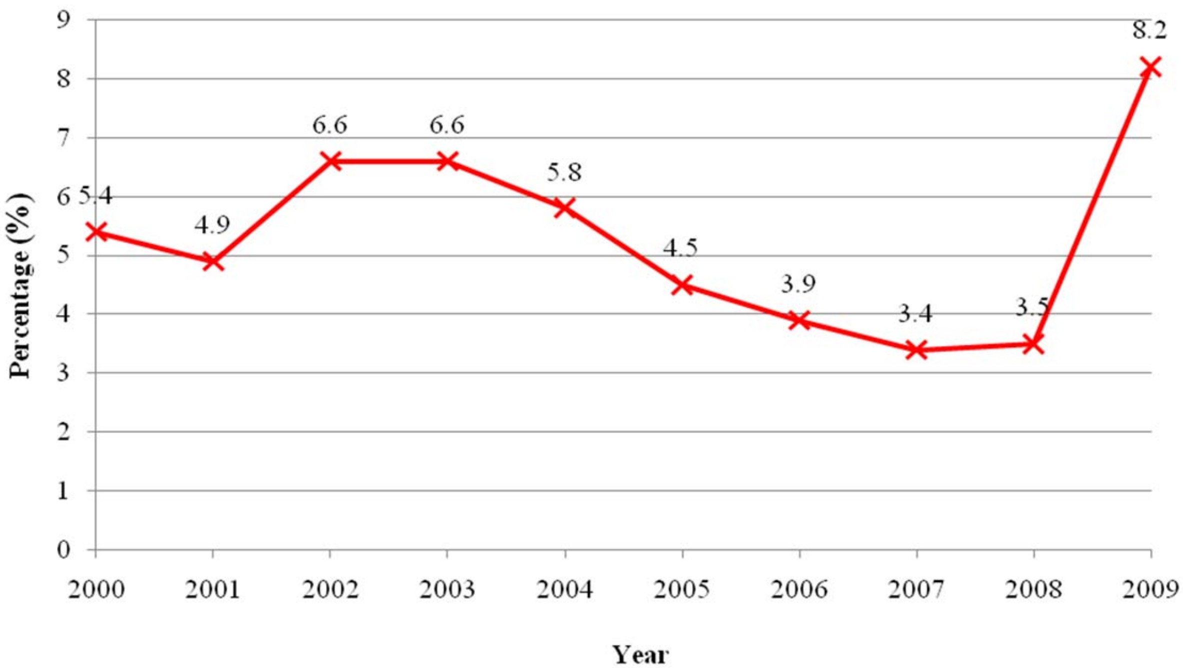


Source: Texas Workforce Commission, 2010

Figure H9: Midland Unemployment Rate 2000–2009

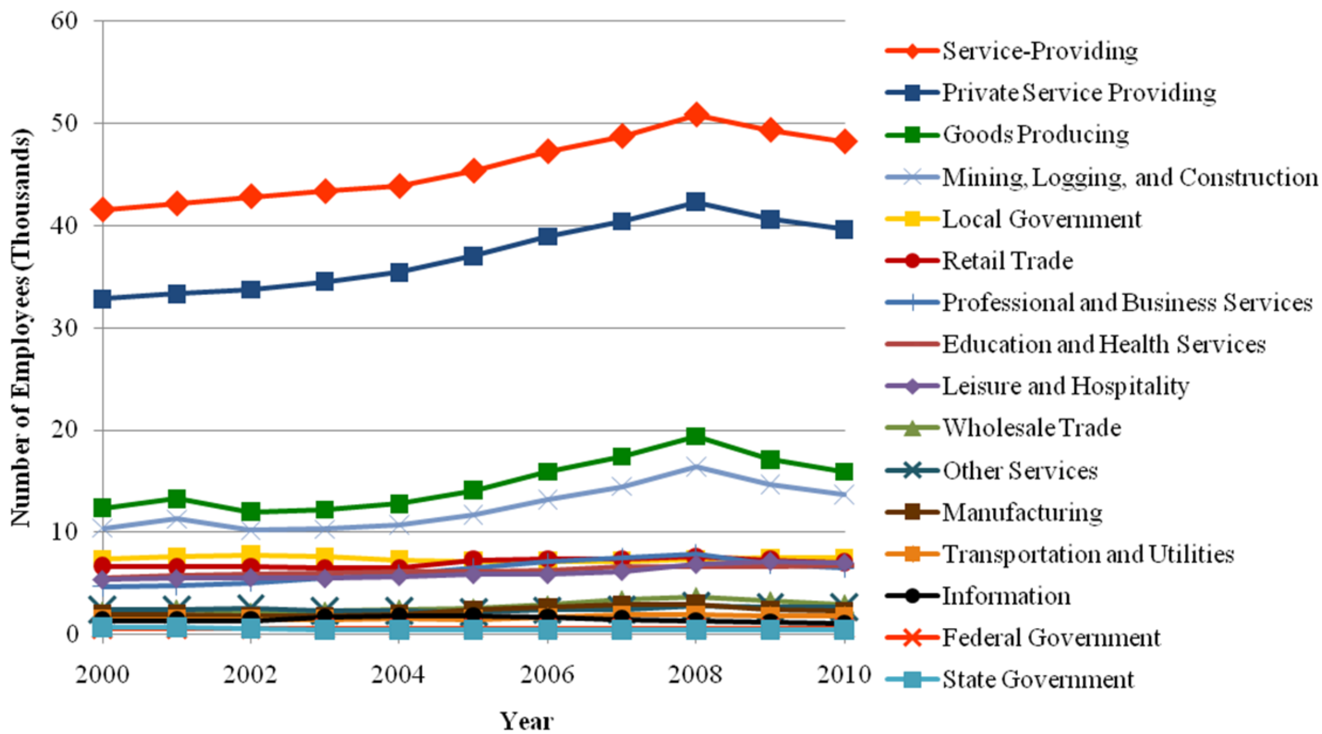
Source: Texas Workforce Commission, 2010

Figure H10: Odessa Labor Force 2000–2009



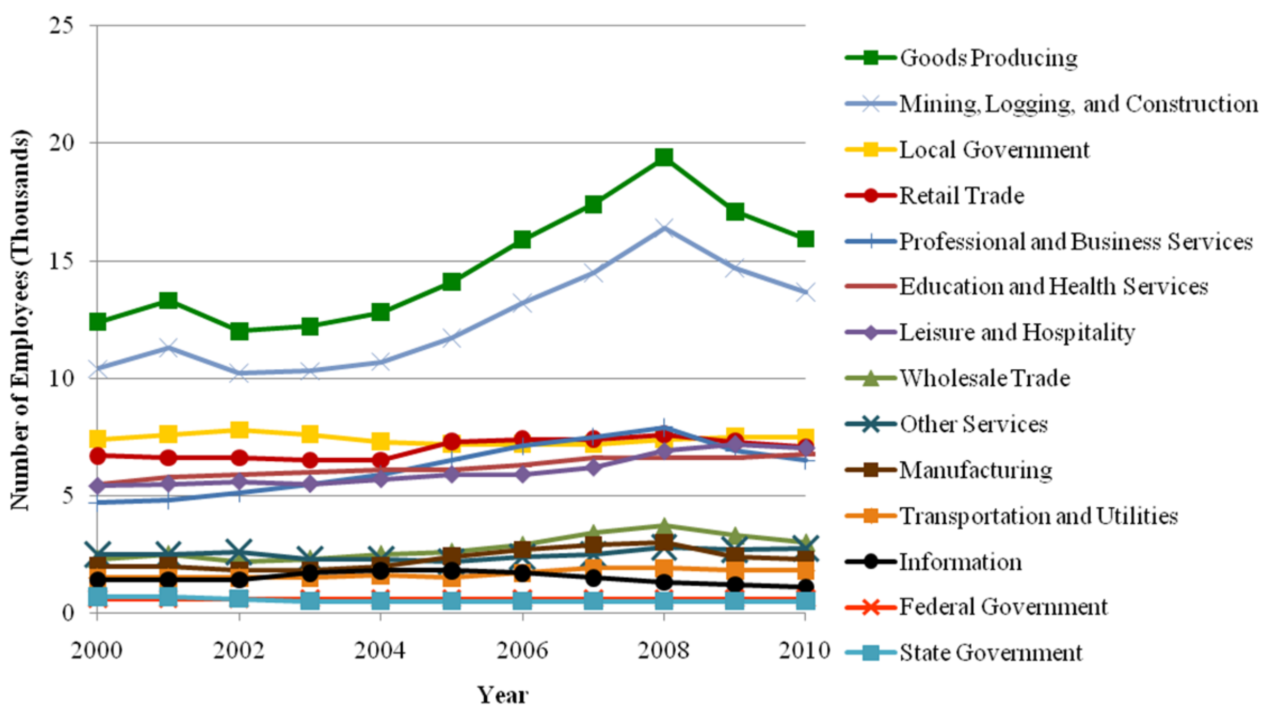
Source: Texas Workforce Commission, 2010

Figure H11: Odessa Unemployment Rate 2000–2009



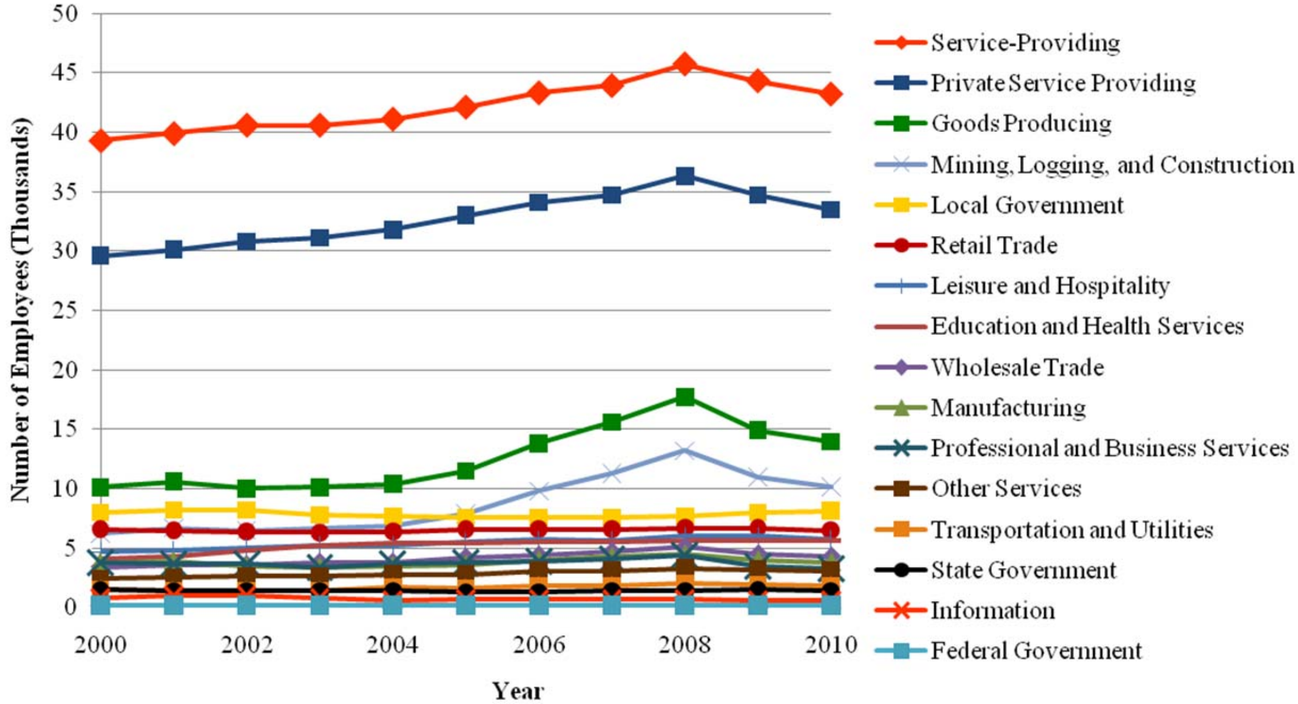
Source: (Bureau of Labor Statistics, 2010)

Figure H12: Midland Number of Employees by Industry, 2000 to 2010



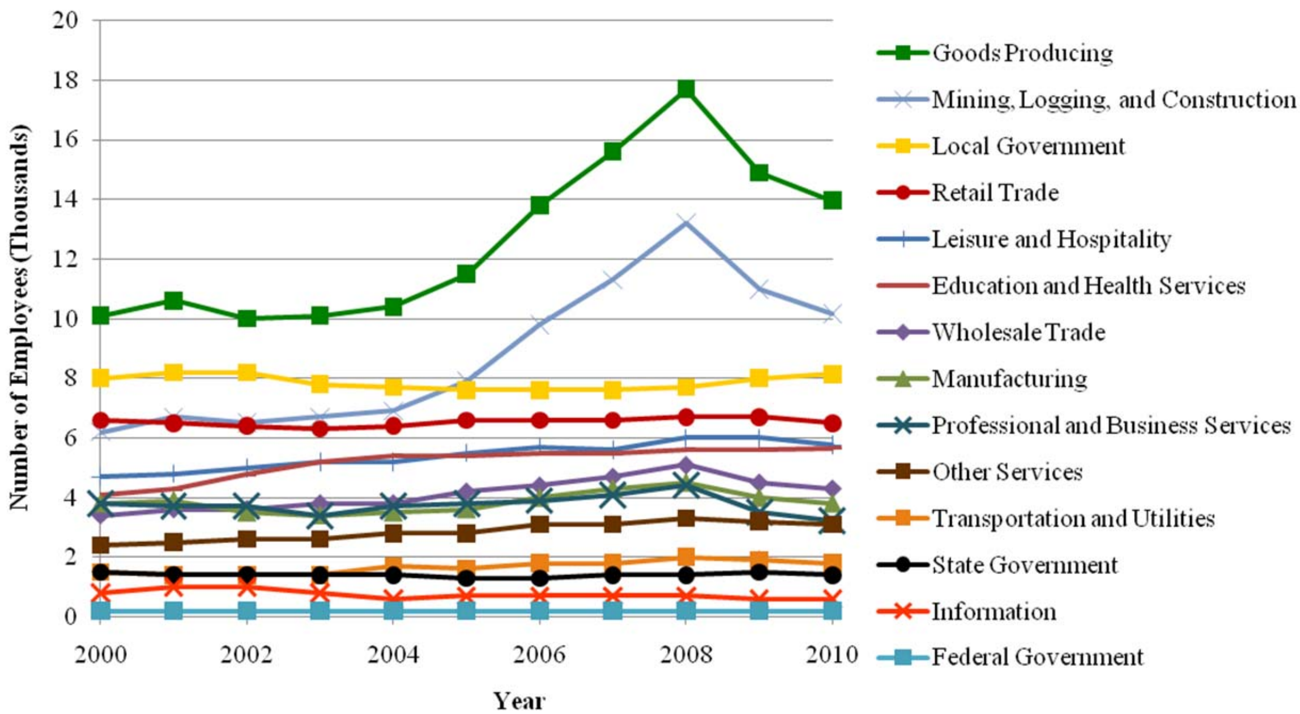
Source: (Bureau of Labor Statistics, 2010)

Figure H13: Midland Number of Employees by Industry less Service-Providing, 2000 to 2010



Source: (Bureau of Labor Statistics, 2010)

Figure H14: Odessa Number of Employees by Industry, 2000 to 2010



Source: (Bureau of Labor Statistics, 2010)

Figure H15: Odessa Number of Employees by Industry less Service-Providing, 2000 to 2010

Inventory of Freight Facilities

Major economic centers in West Texas are linked by an extensive system of roadways, railways, and air facilities. IH 10 and IH 20 link El Paso and the extreme western end of the state directly with other cities in the region, as well as the other major population centers in the eastern half of the state, e.g., Austin. Beyond Texas, IH 10 and IH 20 directly link the region with other major cities in the southeast United States, as well as the Los Angeles and Phoenix MSAs, two major population centers of the western United States. Although Figure H16 is outdated, the map displays the vital importance of these interstate highways to freight movement throughout the nation. Near these two interstates are rail lines owned by UP. One runs almost directly in parallel with IH 20, connecting Abilene and Midland/Odessa with Dallas and El Paso, while the other runs along US 90, some distance south of IH 10, but still connecting El Paso and San Antonio without encountering any cities of any real size en route. BNSF owns a minor section of track that crosses the region from Lampasas to Sweetwater (continuing to Lubbock), via Brownwood. BNSF also maintains trackage rights on small sections of UP's lines, including a section of about 100 miles along the US 90 parallel rail route.

Source: U.S. DOT, 1998

Figure H16: El Paso Truck Flows in the U.S.

Additionally, TxDOT owns a section of track known as the SORR route that runs parallel to US 67 from San Angelo to the Mexican border at Presidio, via Fort Stockton. This track is in poor repair, generally, and trains cannot travel at high speeds, but it does provide a vital connection to the center of the region.

There are no water connections in the region, as the only major river, the Rio Grande, is not navigable near El Paso. Major airports exist in the major cities of El Paso and Midland/Odessa. All have some form of passenger air service. The El Paso airport is located in direct proximity with Fort Bliss, allowing for quick transfer of cargo between the two facilities.

El Paso also has the benefit of several major border crossings, including the Bridge of the Americas. Four bridges account for a significant amount of border traffic in Texas, as well as in the United States. The rail connections maintained by UP near these border connections also engage in significant crossings by train. Other less prominent road routes, particularly north-south, crisscross the region linking the two interstate highways with routes to other trade corridors and major cities. US 67, US 83, US 84, US 87, US 277, US 377, and US 385 all generally serve this purpose, with most of these routes passing through San Angelo en route to another major city or thorough fare.

El Paso

As mentioned earlier, El Paso serves as an important manufacturing and border port city between the U.S. and Mexico. The area features a large number of small parts manufacturing and fabrication facilities, with many companies using low-cost maquiladora labor in nearby Juarez, Mexico. Commodities manufactured in El Paso are transported to other parts of the country by both single and multimodal transportation modes as shown in Table H2. The dominant mode of transport is by truck, accounting for 76% (by ton) and 71% (by value) of manufactured commodities transported from the region. By ton, private trucks carried majority of the commodities to areas within 17 miles of El Paso. However, these commodities seem to have a much lesser value ($3 billion) when compared to the value of commodities ($12 billion) transported by for-hire trucks. Also, the average distance traveled by for-hire trucks is much greater than that of private trucks. A review of Table H1 shows that building stones moved an average distance of 13 miles and electronics, motorized vehicles, precision instruments, logs, wood products, textile, and leather moved an average of more than 900 miles. It can therefore be inferred that majority of the private trucks moved building stones and other low value commodities, and the for-hire trucks moved high valued items like electronics, motorized vehicles, and precision instruments. Also, only 3% of commodities originating from El Paso were transported via rail, and 2% were transported by multiple modes like truck and rail (Bureau of Transportation Statistics, 2007).

Table H2: El Paso Shipment Characteristics by Mode

Source: Commodity Flow Survey, 2007

Mode	**Tons (thousands)**	**Percent Tons (%)**	**Value ($mil)**	**Percent Value (%)**	**Ton-miles (mil)**	**Avg. miles**
Single Modes	12,690	97%	18,119	85%	2,308	213
Truck	9,983	76%	15,250	71%	2,106	205
Private truck	6,070	46%	3,118	15%	155	17
For-hire truck	3,913	30%	12,132	57%	1,951	798
Rail	399	3%	659	3%	191	597
Air (incl. truck and air)	1	0%	89	0%	N/A	1,819
Multiple Modes	368	3%	3,094	14%	602	1,202
Truck and rail	320	2%	1,735	8%	545	1763
Parcel, U.S.P.S. or courier	48	0%	1,357	6%	55	1,198
All modes	**13,106**	-	**21,400**		**2,923**	**449**

Road Infrastructure

The region has an extensive road system providing access and connections to major centers in and outside of the region. There are nearly 5,000 total centerline miles of state-maintained highways in the region. The major roads that are utilized for freight traffic are primarily IH 10 (connecting El Paso with San Antonio and Houston to the east, as well as Phoenix and Los Angeles to the west), and IH 20, which branches from IH 10 about 100 miles east of El Paso, connecting El Paso to other major cities in the region (i.e., Odessa and Midland) and with the Dallas/Ft. Worth MSA. Currently, IH 10 and IH 20 are major truck traffic corridors, particularly in response to NAFTA. As of 2003, IH 10 and IH 20 carry nearly 20% of Texas NAFTA freight truck traffic (by VMT). This translates into more than 1,000 AADT along IH 10 east of El Paso, of which approximately 250 veer off to utilize IH 20. Generally, both roadways see diminished NAFTA truck traffic heading eastbound across the region and the state (Cambridge Systematics, 2007b).

The capacity of the road system in this region of Texas is generally greater than the traffic volumes, with little or no congestion along a vast majority of the major corridors. Most of the major truck routes in the region operate at or near free-flow speeds (i.e., greater than 55 mph). Minor congestion (volume to capacity ratios of 0.75–0.95) exists in and around the major cities in the region but does not spread much beyond city limits. The only significant delays and congestion in the region occur in the El Paso metropolitan area. Here, volume frequently exceeds capacity, particularly during peak times (Cambridge Systematics, 2007b).

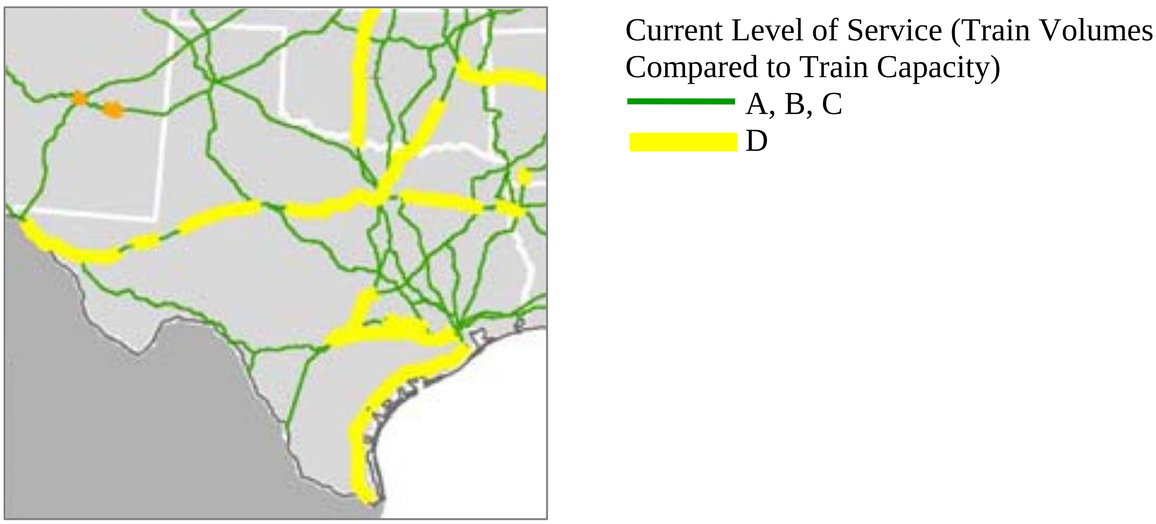
Border congestion, however, is a major contributor to congestion in the El Paso area, with a large number of freight-transporting trucks utilizing IH 10 from El Paso. Two of the top 100 congested roadway segments lie in or around El Paso. The first, IH 10, significantly affects freight traffic, with peak travel index of 1.21, meaning traveling along that corridor takes approximately 21% longer in peak periods, amounting to nearly $16 million in annual delay costs. Lee Trevino Drive, also in El Paso, contributes to delay on the regional road system, although this road has much lower capacity and demand than IH 10.

By most measurements, truck travel is expected to develop very rapidly over the coming decades. A NAFTA study determined that NAFTA traffic accounted for almost 15% of truck traffic through IH 10 in 2003, and it's expected to increase to 27% in 2030. NAFTA truck traffic utilizing IH 10 and IH 20 as key routes is also expected to increase more than 200% on both corridors by 2030, even if no improvements to these roadways take place (Cambridge Systematics, 2007b). The annual delay in El Paso along IH 10 is expected to increase rapidly in twenty years if no improvements are made. While congestion in the area is certainly not widespread, pockets of delay affect the freight transportation system. Many projects are currently underway or in the planning stages to reverse the trend of increasing congestion at these locations (see section on Policies and Strategies).

Rail Infrastructure

UP and BNSF both operate extensive rail systems that connect the region with the U.S. West Coast and Gulf ports and key inland population centers. UP and BNSF both have intermodal facilities in El Paso that move TOFC/COFCs. BNSF's routes are primarily north-south while UP's route is primarily east-west. Both companies exchange with Mexican operator, Ferromex (FXE), at El Paso. BNSF's intermodal facilities at El Paso have a track capacity of 600 cars; FXE has a track capacity of 500.

Rail capacity of moving through the region on the primary UP lines is higher than its current use, according to the 2007 National Rail Investment and Infrastructure Study (Cambridge Systematics, 2007a). The most heavily used line, operated by UP along IH 20 between Dallas and El Paso, currently has a volume-to-capacity ratio of 0.7 to 0.8 (noted in yellow in Figure H17). Approximately 50–100 trains utilize this corridor on a daily basis. The segment of rail along US 90, roughly parallel to IH 10, moves 25–50 trains per day, while the BNSF rail line operating in the midsection of the state (via Brownwood), moves less than 15 trains per day. The southerly UP line that passes through the region sees the higher share of NAFTA traffic, with top speeds along the "Sunset Route" that operates along US 90 and reaches 75 mph for freight operations. This line, however, is only single-tracked between El Paso and San Antonio. Speeds along the rail line linking El Paso and Fort Worth reach 60 mph. Ferromex lines that connect at El Paso permit speeds as high as 60 mph as well. TxDOT's SORR rail line maintains track conditions that permit speeds of 25 mph (HTNB, 2008).



Source: Cambridge Systematics, 2007a

Figure H17: Capacity of Texas railways

As with truck traffic, but even more pronounced, the region has few destinations for rail traffic, but rather serves as a thoroughfare for trains destined outside the region. The primary exception to this is El Paso. While rail freight passing through the El Paso border crossing only contributes approximately 25% by weight (BTS), rail freight is still a major concern in the region, as El Paso is noted as one of the major freight bottlenecks in the state of Texas. Bottleneck conditions are worsened by limitations on freight conditions to an eight-hour window from 10:00 p.m. to 6:00 a.m. through Ciudad Juarez. As seen in Figure H18, projected increases in rail freight traffic are expected to mirror those of truck traffic, with the northern UP line and the BNSF line projected to see an increase of at least 100% in train traffic between now and 2035. The southern UP route will see increases between 50 and 100% over the same time period (Cambridge Systematics, 2007a). Additionally, general concerns for safety in urban areas continue to decrease productivity, with at-grade crossings, poor geometric designs, and urban density contributing to delays (Cambridge Systematics, 2007b).

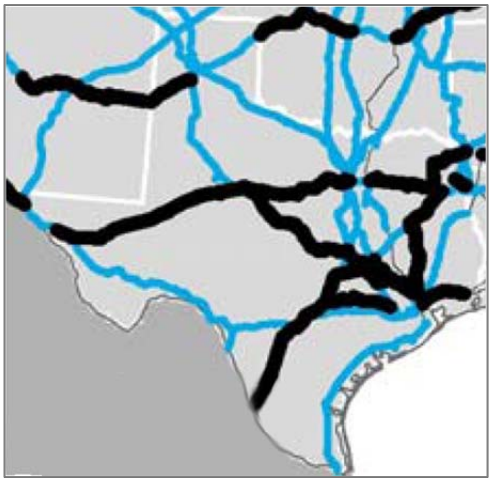


Figure H18: Rail growth in the Southwest

Source: Cambridge Systematics, 2007a

Air Infrastructure

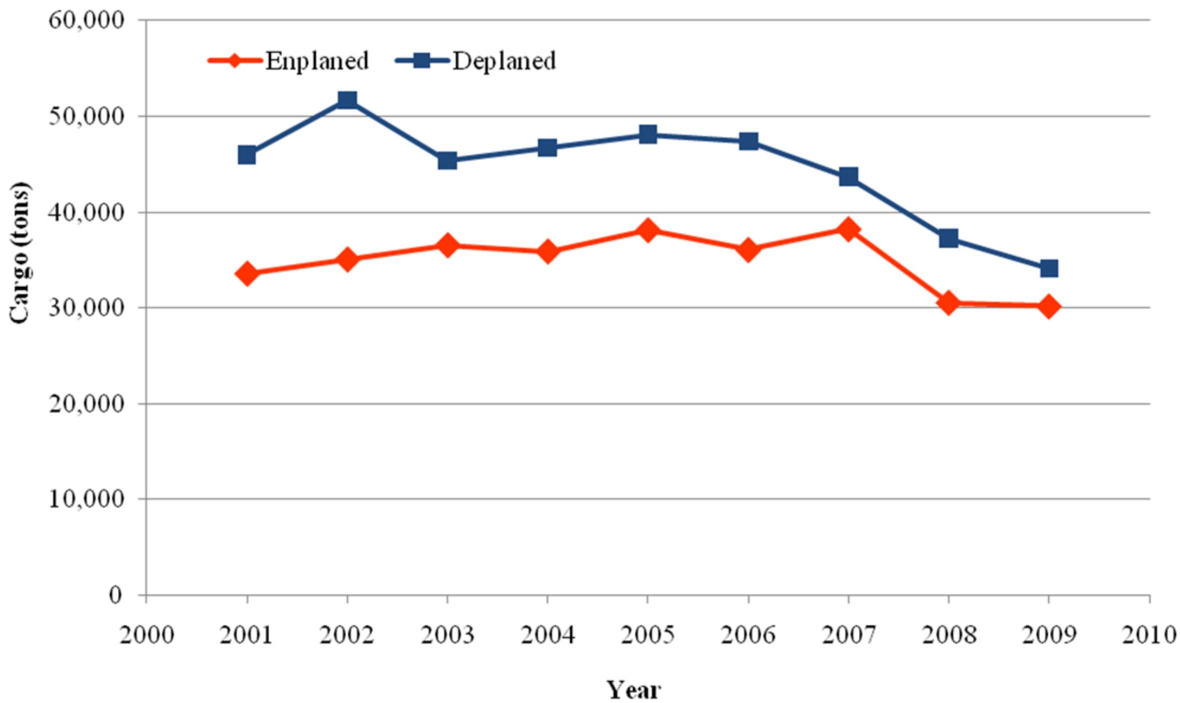
There are two major airports in the region, El Paso International Airport, and Midland International Airport. Operations of these main airports are presented in Table H3.

Table H3: Characteristics of major airports

Source: AirNav.com, 2009

	El Paso International	**Midland International**
Average Daily Operations	271	217
% Commercial	41%	11%
% Transient General	27%	31%
% Air Taxi	19%	17%
% Military	7%	36%
% Local General Aviation	7%	5%

El Paso International Airport is home to the border's largest and newest passenger terminal and is emerging as the border's most centralized intermodal hub. El Paso International far surpasses the cargo operations of all other airports in the region, processing 87 million pounds of cargo between October 2008 and September 2009 by 16 airline groups (21 companies). This amount declined by 17% from the previous year (El Paso International Airport, 2010). Figure H19 shows a 9-year trend of freight movement at El Paso International Airport in tons. It shows that freight arrival (deplaned) generally exceeds freight departure (enplaned). Freight arrival declined from 2005 to 2009, and freight departure also declined from 2008 after a slight increase from 2001 to 2007. The El Paso International Airport began upgrading its air cargo facility in 2006, and now features a significant base for cargo operations, with nearly 300,000 feet of covered warehousing space, 34 acres of aircraft parking space, and 6.4 miles of roadways. Currently, the El Paso air cargo facility operates below its capacity (El Paso International Airport, 2010).



Source: El Paso International Airport, 2010

Figure H19: Trend of cargo movement at El Paso airport

Border Crossings

The West Texas region has several hundred miles of land border with Mexico, with two international commercial border facilities at El Paso and Presidio. El Paso has four international border ports-of-entry with its sister city of Juarez, Chihuahua, Mexico. These include Bridge of the Americas, Ysleta International Bridge, Paso Del Norte Bridge, and Stanton Street Bridge (City of El Paso, nd).

The Ysleta-Zaragoza Bridge, whose length is 804 feet, was completed in August 1992 (Figure H20). The General Services Administration owns the border station and 61 acres of land area. The inauguration of the new commercial facilities was held in October 2008. The new facilities included the expansion of commercial lanes from six to eight, with the ability to add two additional lanes in the future; updated radiation monitors; and an x-ray machine at one of the lanes to allow empty trucks to be reviewed quickly without having to go to secondary inspection. Its hours of operation are 6:00 a.m. to midnight on weekdays, and 8:00 a.m. to 4:00 p.m. on weekends (City of El Paso, nd).

Source: TxDOT, nd

Figure H20: Ysleta-Zaragoza Bridge at El Paso

The other major cross-border bridge for international commercial trucks at El Paso is Bridge of the Americas, whose length is 506 feet. It has four separate structures: two two-lane bridges for truck traffic, and two four-lane bridges for other vehicular traffic (see Figure H21). A FAST lane became operational in 2004. The FAST Program is a bilateral initiative between the U.S. and Mexico designed to ensure security and safety while enhancing the economic prosperity of both countries. Its hours of operation are 6:00 a.m. to 6:00 p.m. on weekdays, and 6:00 a.m. to 2:00 p.m. on weekends (City of El Paso, nd).

In 2008, approximately $15.4 billion worth of commodities were exported through El Paso, and more than $19.8 billion worth of commodities imported. Exports declined by 50% in 2009 to $8.5 billion and imports remained about the same at $17.3 billion (Texas A&M International University, 2010). As of March 2010, export value was approximately $2.6 billion, and import value was approximately $5.1 billion (see Tables H4 and H5). Commodities exported include machinery and transport equipments, manufactured goods and articles, and mineral fuels. Commodities imported include machinery, transport equipments, and miscellaneous manufactured articles (Texas A&M International University, 2010).

Source: TxDOT, nd

Figure H21: Bridge of the Americas at El Paso

Table H4: U.S. Export to Mexico by Value—El Paso Port of Exit, Jan.–Mar. 2010

Source*:* Texas A&M International University, 2010

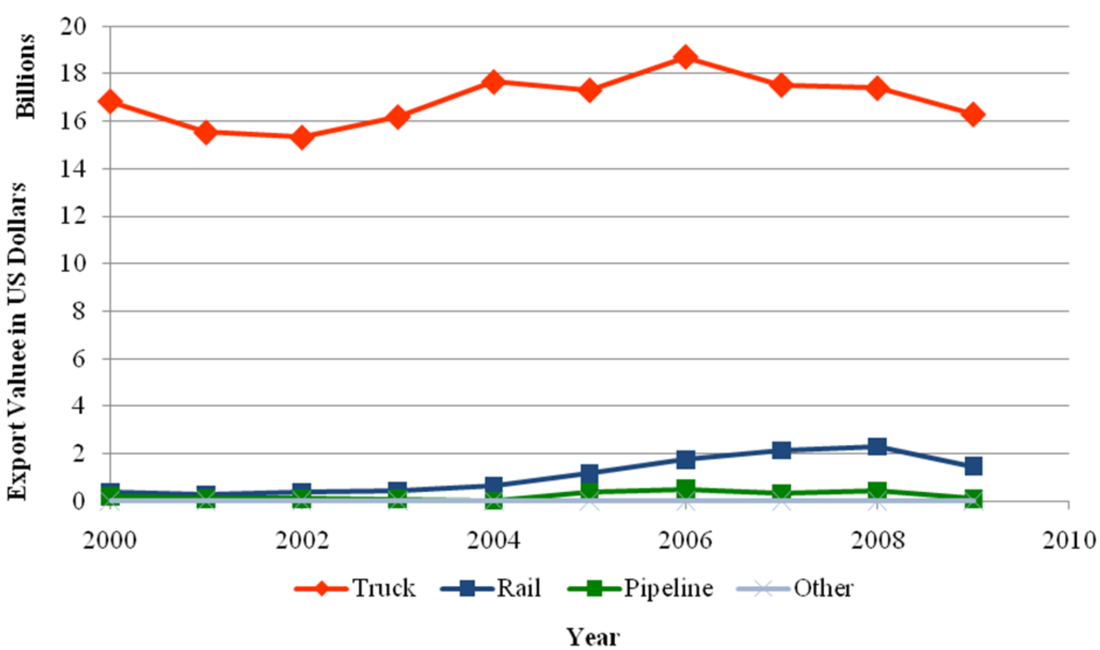
Rank	SITC Commodity Group	Trade Value (unadjusted U.S. dollar values)
1	Machinery and transport equipment	1,944,192,740
2	Miscellaneous manufactured articles	275,654,082
3	Manufactured goods classified chiefly by material	243,342,028
4	Mineral fuels, lubricants and related materials	79,555,282
5	Animal and vegetable oils, fats and waxes	77,411,438

Table H5: U.S. Imports from Mexico by Value—El Paso Port of Entry, Jan.–Mar. 2010

Source*:* Texas A&M International University, 2010

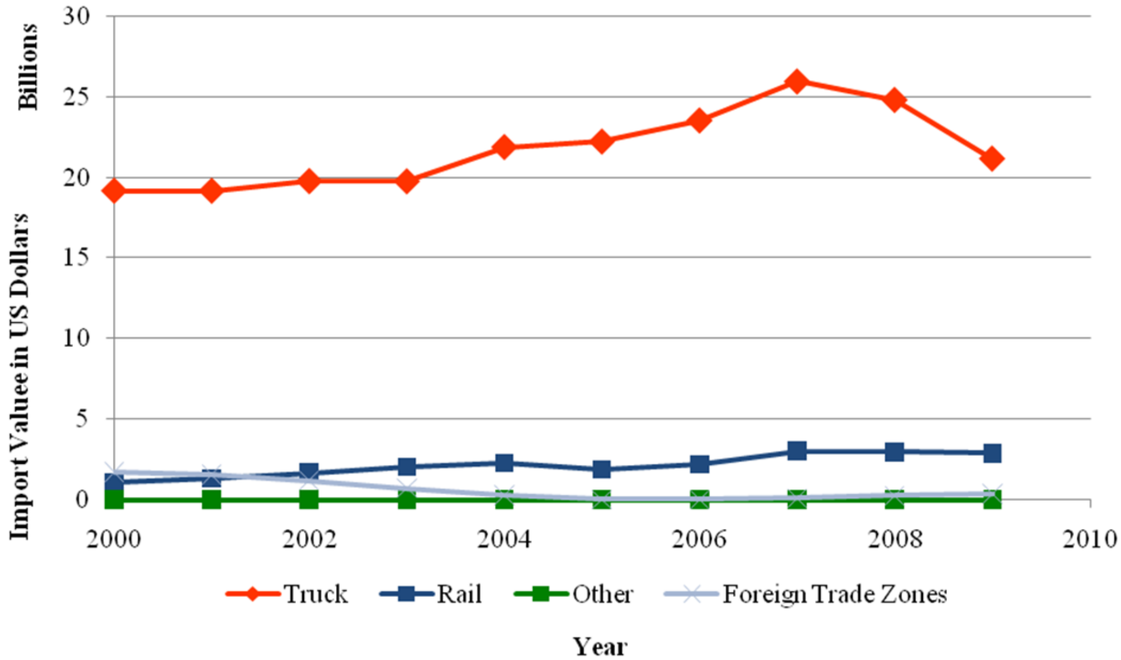
Rank	SITC Commodity Group	Trade Value (unadjusted U.S. Dollar values)
1	Machinery and transport equipment	4,087,462,858
2	Miscellaneous manufactured articles	689,825,883
3	Commodities and transactions not classified elsewhere in the SITC	225,444,391
4	Beverages and tobacco	71,297,823

Trucks carry the bulk of freight passing through El Paso, in terms of both value and weight of shipments for both exports and imports. Since 2000, trucks have carried over 90% of trade passing through El Paso by value (see Figures H22 andH23).



Source: U.S. Department of Transportation, 2010

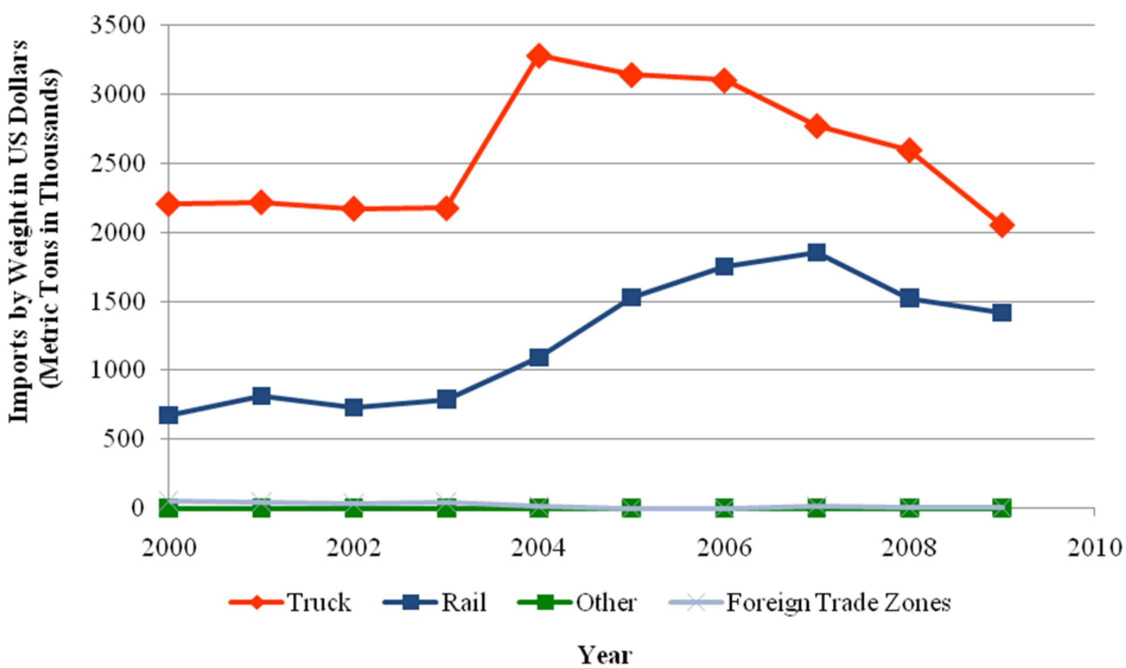
Figure H22: Annual Exports by Value between USA and Mexico, El Paso Port of Exit



Source: U.S. Department of Transportation, 2010

Figure H23: Annual Imports by Value between USA and Mexico, El Paso Port of Exit

By weight, the share of rail imports increased considerably from 2003 to 2007, before the economic recession of 2008 and 2009 (Figure H24). During the same time period, rail share increased, truck share decreased for imports, but the value of commodities transported via both modes continued to increase slightly.



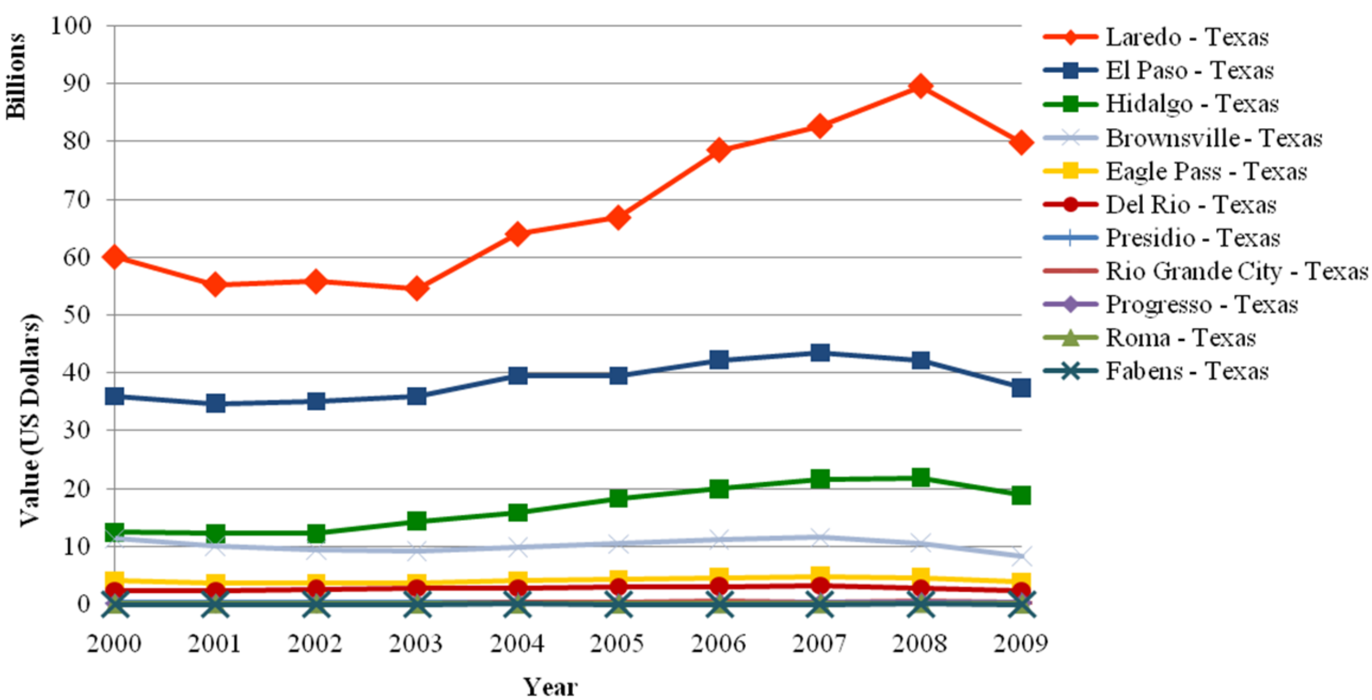
Source: U.S. Department of Transportation, 2010

Figure H24: Annual Imports by Weight between USA and Mexico, El Paso Port of Exit

Trucks

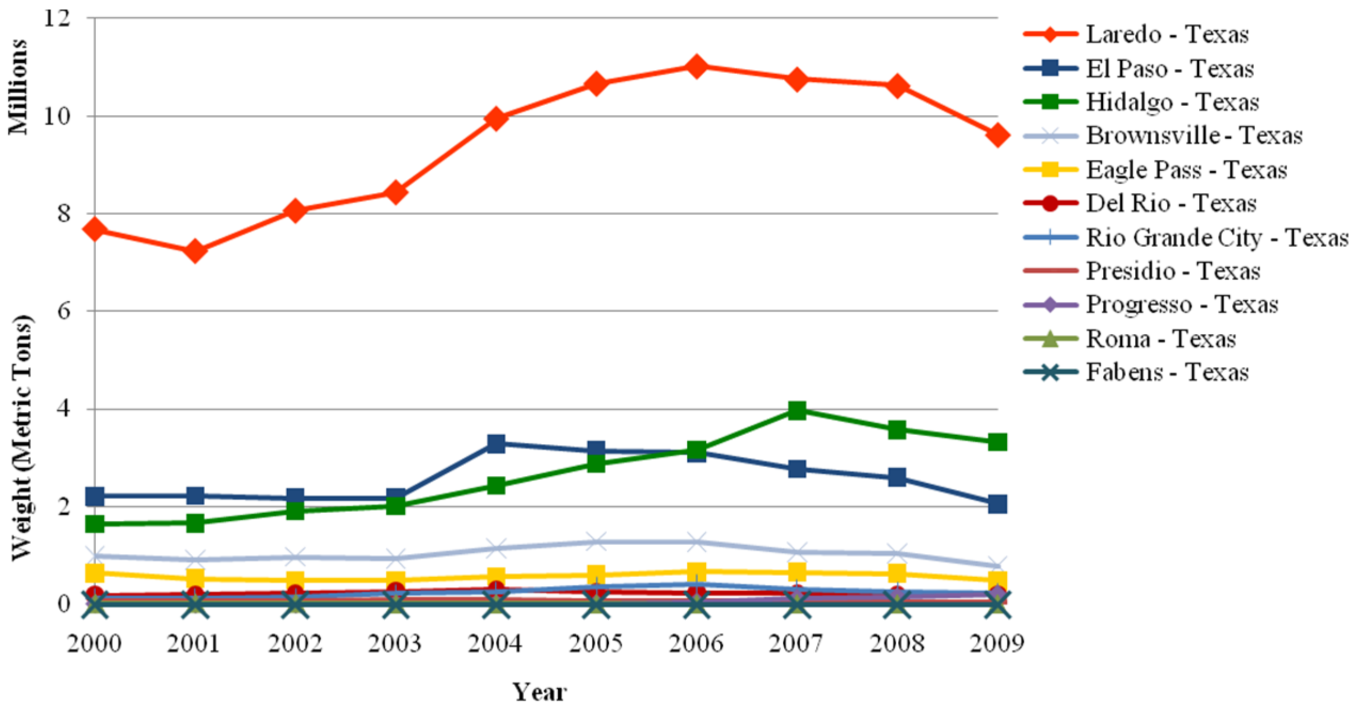
El Paso is the second most important border port in Texas for truck traffic as illustrated in Figure H25. Laredo remains the most important border port in the state, with other ports such as Hidalgo, Brownsville, and Eagle Pass having significant shares in terms of the value of commodities traded between U.S. and Mexico. Laredo's U.S. trade market share increased much faster than that of El Paso's this past decade, most notably from 2003 to 2008 where the value of commodities traded increased from $55 billion dollars to $90 billion dollars. The economic recession of 2008–2009 has resulted in a decrease in operations in all border ports with Laredo, El Paso, and Hidalgo experiencing the most declines in terms of value but the least declines in terms of percentages (Laredo, 11%; El Paso, 11%, and Hidalgo, 14%). In terms of percentage, Fabens experienced the most significant drop (94%), followed by Roma (64%) (U.S. Department of Transportation, 2010).

Despite the value of commodities transported via El Paso having a greater value, Hidalgo surpassed El Paso, by weight, from 2006 to 2009 (see Figure H26). This shift can be attributed to the lighter nature of electronic equipment and manufactured articles transported through El Paso. Figure H27 compares the number of loaded containers to the number of empty containers transported through El Paso. The difference between the loaded containers and empty containers increased from 2000 to 2005, and began to decrease from 2006 to 2008. It can be inferred that more loaded containers than empty containers were being transported via El Paso despite the total number of trucks not changing significantly, until 2008 and 2009 when everything declined.



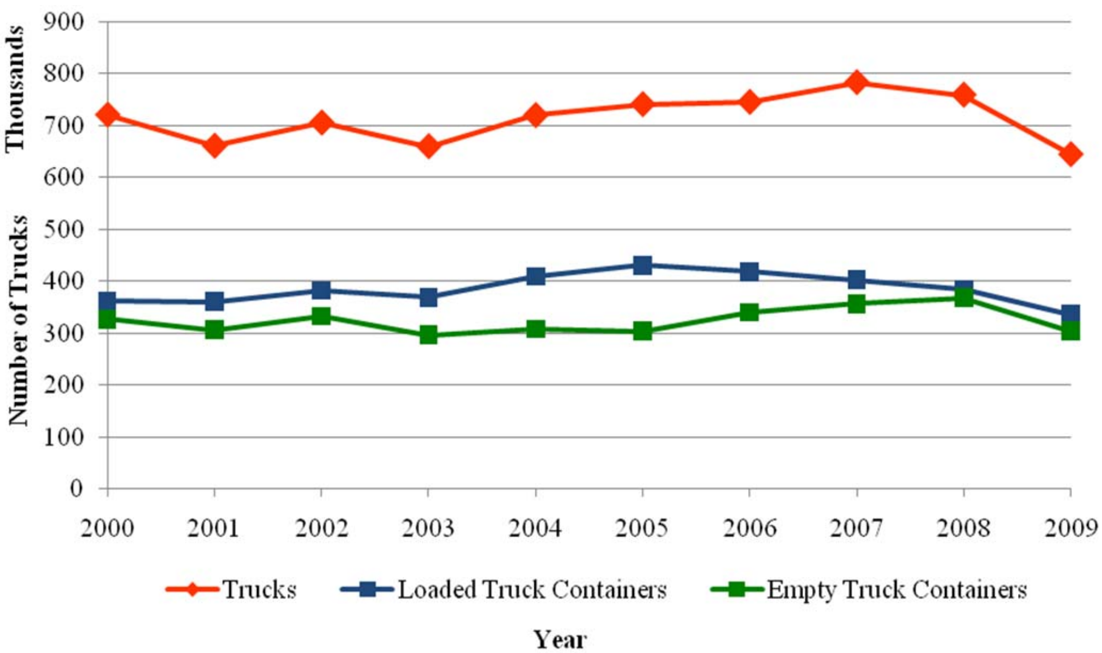
Source: U.S. Department of Transportation, 2010

Figure H25: U.S. Imports and Exports by Value by Texas Port, by Trucks



Source: U.S. Department of Transportation, 2010

Figure H26: U.S. Imports by Weight by Texas Port, by Trucks



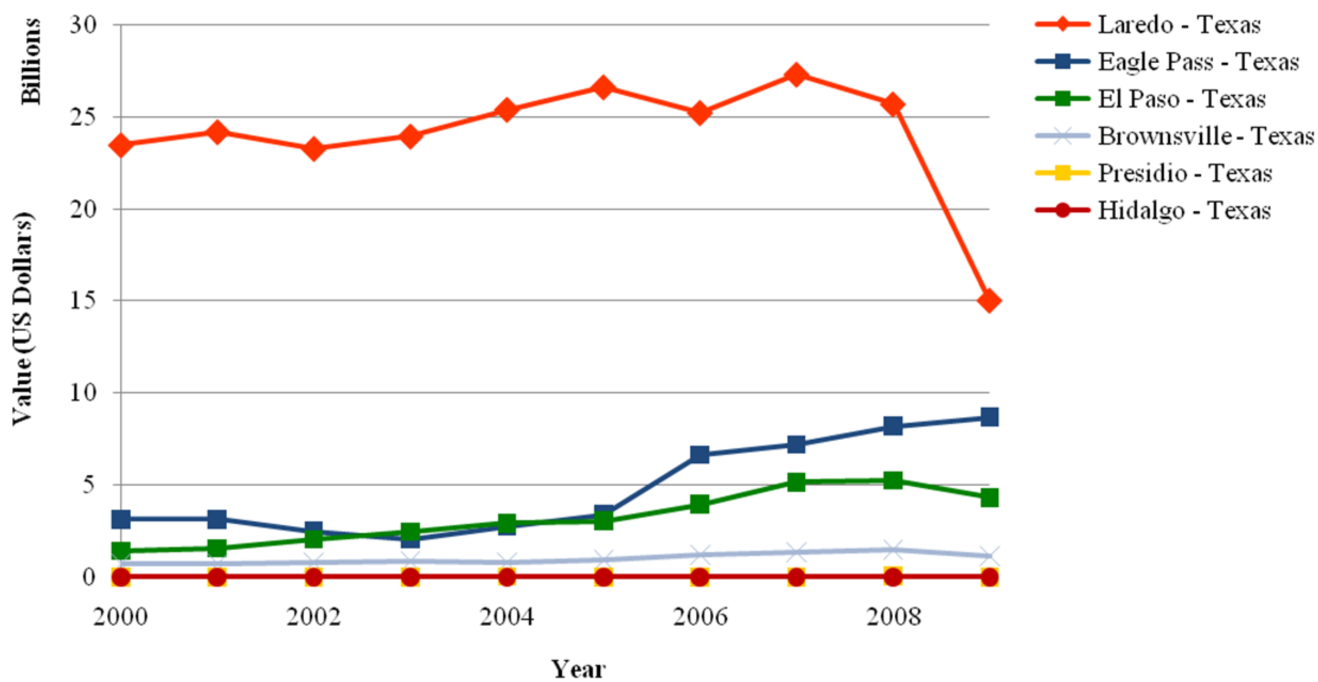
Source: U.S. Department of Transportation, 2010

Figure H27: U.S. Imports by Number of Trucks through El Paso

Rail

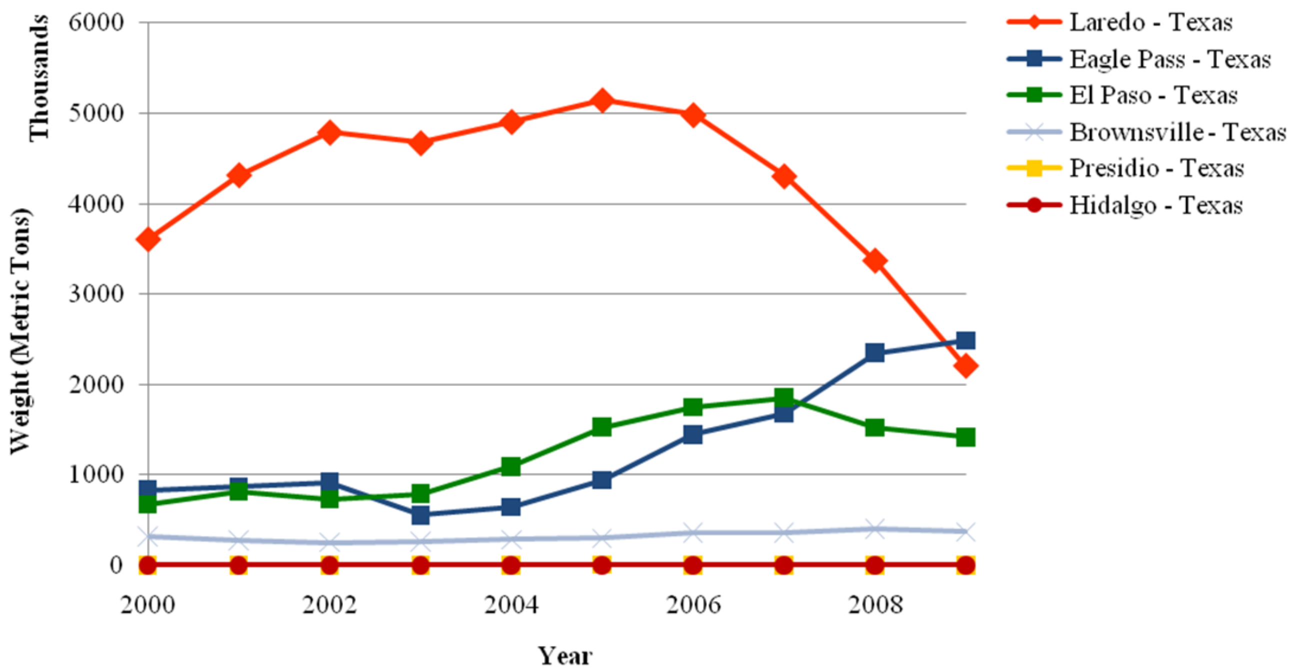
By rail, Laredo and Eagle Pass surpass El Paso in terms of value of imports and exports as illustrated in Figure H28. This can be attributed to the unfavorable border operating times in El Paso. El Paso's 8-hour border operating window from 10:00 p.m. to 6:00 a.m. is a disincentive for shippers using rail; shippers rather prefer moving items via Eagle Pass because it offers a 24-hour operating schedule. Also, recent operational improvements at Eagle Pass have encouraged auto shippers to use Eagle Pass rather than traditional routes like Laredo (see Figure H29).

As illustrated in Figure H30, the number of train movements into El Paso from Mexico decreased by more than 50% from 2008 to 2009 while that of Eagle Pass increased for reasons discussed earlier. In addition, the number of loaded and empty rail containers transported through El Paso follows a similar pattern as train movements (Figure H31 and H32), and Figure H33 shows that from 2003 to 2009 the number of loaded containers remained almost equivalent to the number of empty containers for imports. A reason for the number of loaded containers being almost equal to the number of empty containers for imports is currently unknown.



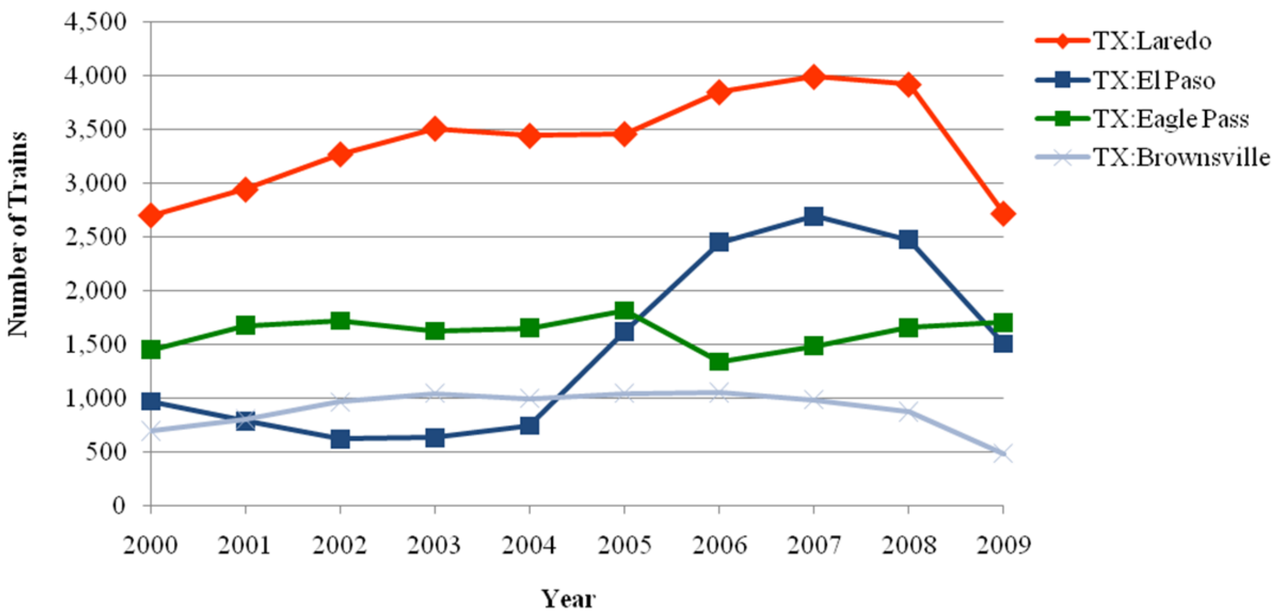
Source: U.S. Department of Transportation, 2010

Figure H28: U.S. Imports and Exports by Value by Texas Port, by Rail



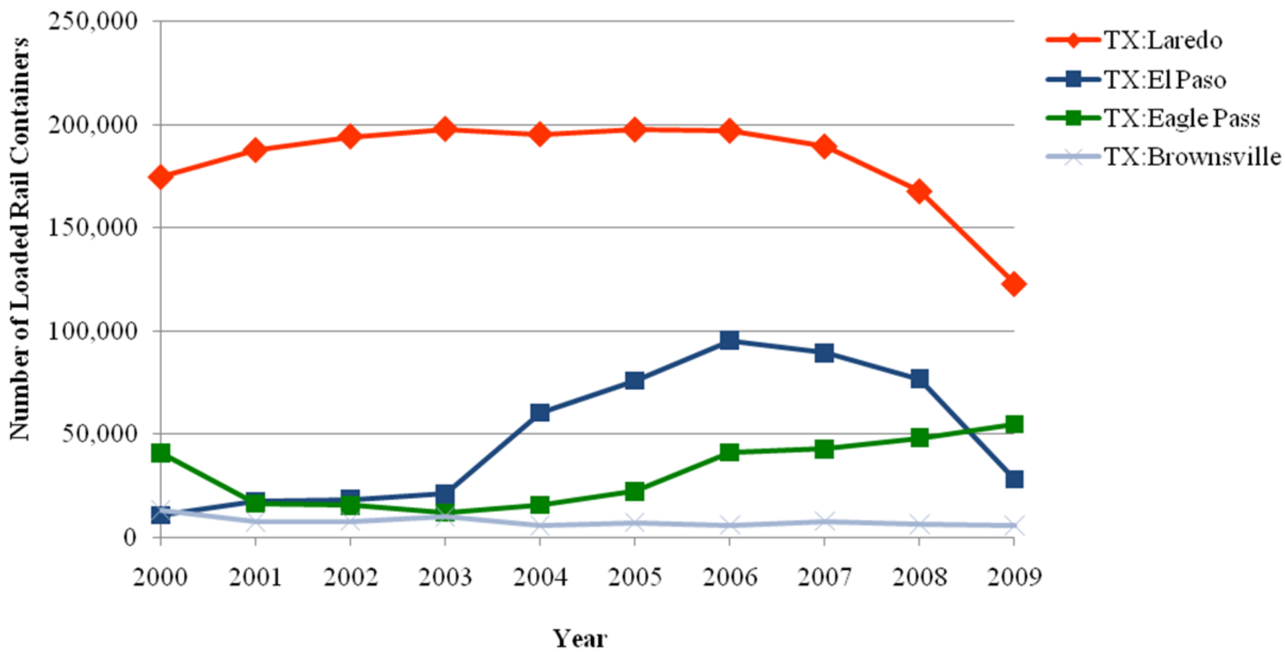
Source: U.S. Department of Transportation, 2010

Figure H29: U.S. Imports by Weight by Texas Port, by Rail



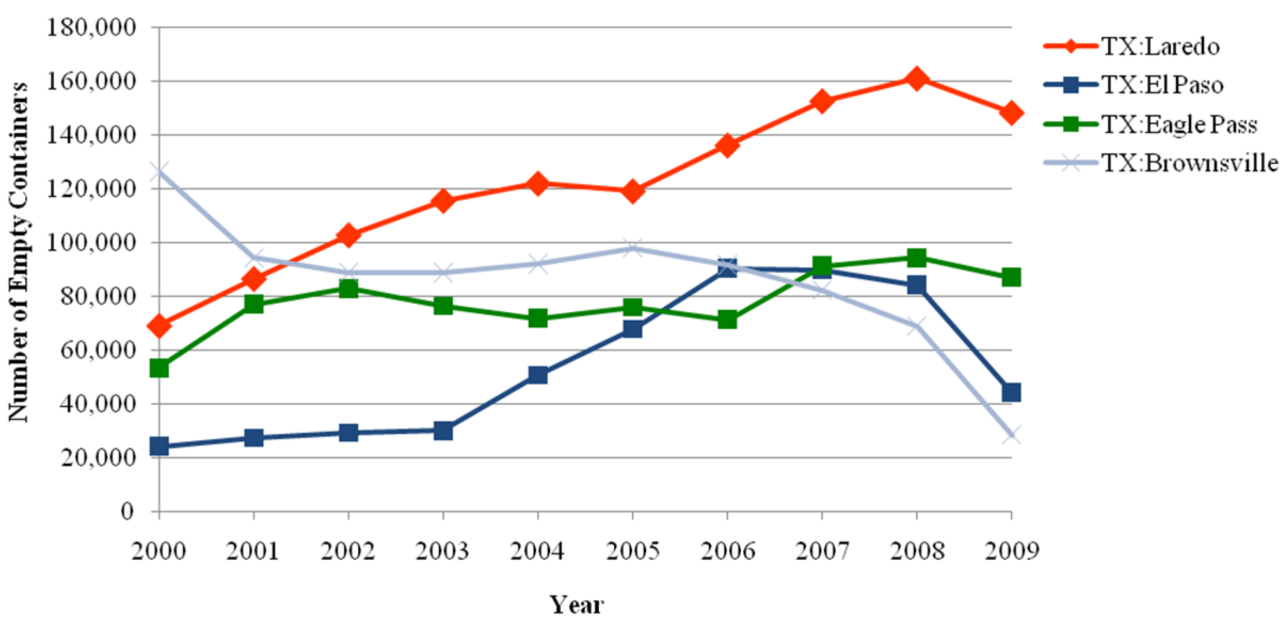
Source: U.S. Department of Transportation, 2010

Figure H30: U.S. Imports by Number of Trains by Texas Port



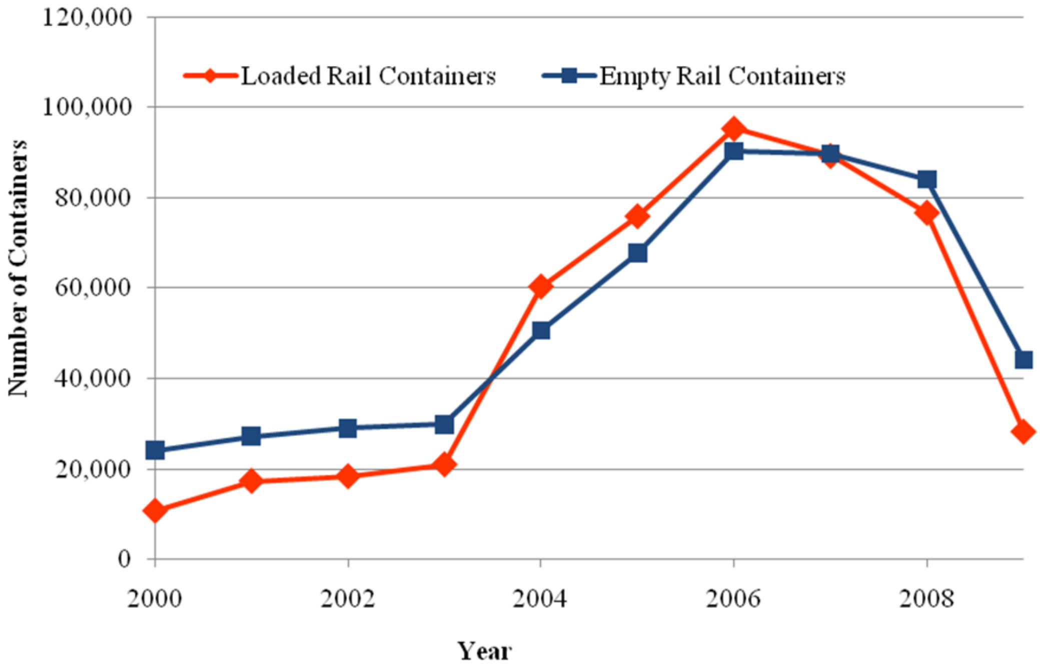
Source: U.S. Department of Transportation, 2010

Figure H31: U.S. Imports by Number of Loaded Containers by Texas Port



Source: U.S. Department of Transportation, 2010

Figure H32: U.S. Imports by Number of Empty Containers by Texas Port



Source: U.S. Department of Transportation, 2010

Figure H33: U.S. Imports by Number of Loaded and Empty Containers through El Paso

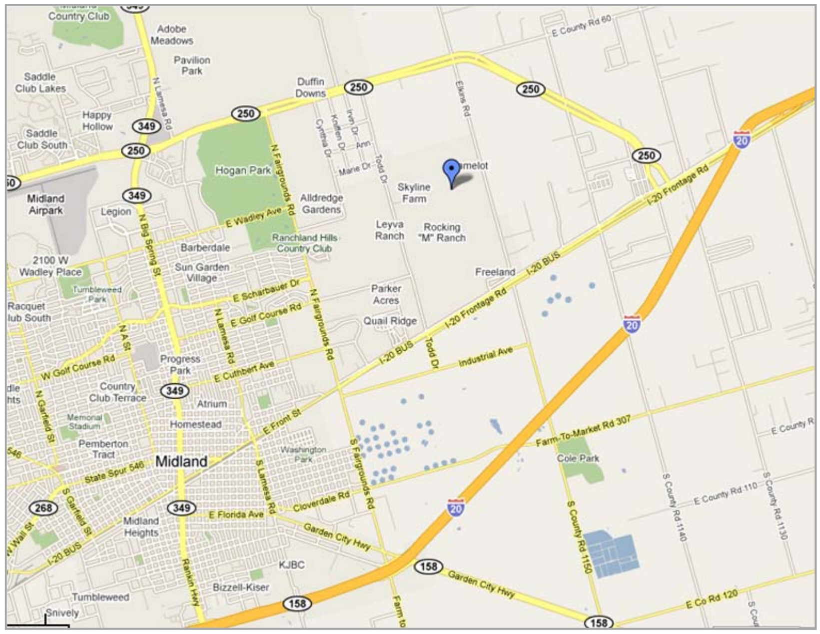
Midland/Odessa

Road Infrastructure

This study indentified five important freight routes passing through the City of Midland: IH 20, Loop 250, SH 158, SH 349, and the proposed La Entrada. The major roadways in the Odessa area include IH 20, US 80, US 385, Loop 338, SH 191, SH 302, and FM 1936 (West Odessa). SH 191 connects 42nd Street to Loop 250 in Midland.

IH 20 is the only interstate highway passing through Midland, and it currently serves as a major east-west regional transportation route to and from the city. As stated in the City of Midland Master Plan (2005), development along IH 20 is clustered around major intersections with Loop 250, Midkiff Road, and State Highway 158. Development in the area comprises primarily retail or office developments (City of Midland, 2005). According to the Master Plan, IH 20 was recently rezoned to protect against further encroachment of less desirable land uses. Residential developments that currently exist along the frontage are recommended to be redeveloped to non-residential uses (City of Midland, 2005). Recent policies established by TxDOT include strategies that will restrict the amount of “strip” nonresidential development, and increase the amount of concentrated nonresidential development at intersections. These strategies will also result in an increased reliance on localized access provided via a roadway constructed parallel to IH 20. The land area between IH 20 and the proposed roadways will be planned for high quality retail development (City of Midland, 2005). Further details on some these policies and strategies can be found in the Future Land Use Plan of the City of Midland Master Plan, 2005.

According to the Master Plan, Loop 250 is a highly utilized and visible corridor in Midland. The Loop has developed into a retail corridor in response to market conditions, resulting in the prevalent use of Planned District zoning, a cooperative zoning effort between the development community and the municipality (City of Midland, 2005). It was recommended in the Master Plan that vacant land within Loop 250 (between IH 20 and SH 349/Big Spring Street) should be developed with retail uses (see Figure H34).

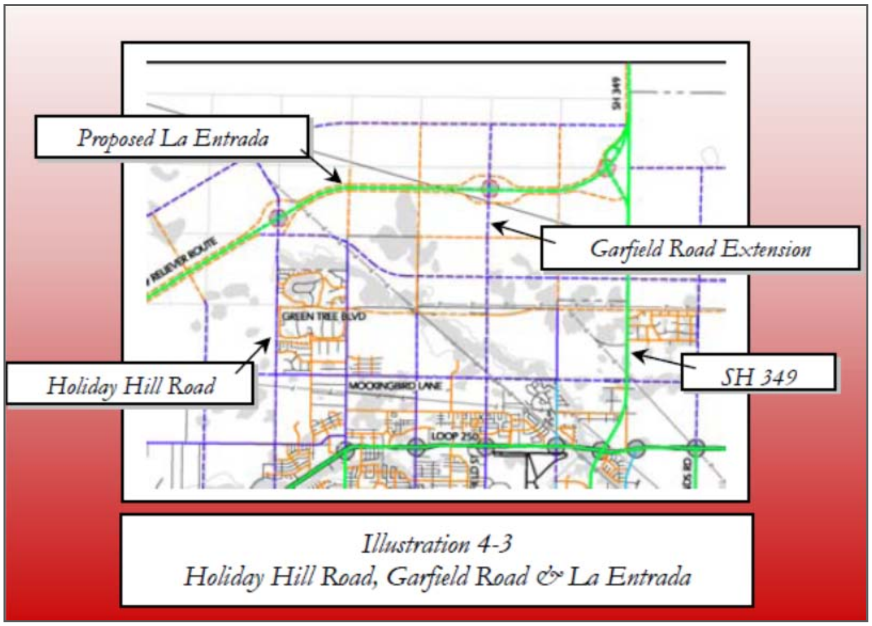


Source: Google Maps

Figure H34: Recommended tract of land within Loop 250 to be used for retail use.

State Highways 158 and 349 form a section of the Ports-to-Plains Corridor that traverses Midland, serving as the major north-south corridor for the city. NAFTA was the catalyst for the Ports-to-Plains corridor.

The proposed La Entrada corridor runs from the Pacific deep water port of Topolobampo, Mexico, through Midland/Odessa to Lamesa, Lubbock, and Amarillo; east to Dallas/Ft. Worth; and west to Lubbock. The corridor is expected to support increased trade between the U.S. and Mexico, and will serve as another international trade route. Midland is positioned as a convergence point for multiple modes of transport (road, air, and rail), and can function as a key hub for the corridor by handling trucks in transit between Dallas/Ft. Worth (east), the Texas Panhandle (north), and the Texas–Mexico border (south). An intersection between this proposed corridor and SH 349 is planned to enable access of the corridor to the Ports-to-Plains Corridor. As illustrated in Figure H35, the current plan provides minimal direct access to the city, and therefore Midland’s 2025 Master Plan recommends that the Briarwood Avenue extension (County Road 60), SH 158, and SH 329 be the primary access points utilized by regional traffic (i.e., large commercial trucks), and Holiday Hill Road and Garfield Street serve as important interchanges, but are not identified as truck routes (City of Midland, 2005).



Source: City of Midland, 2005

Figure H35: The proposed La Entrada Corridor, SH 349, Garfield Road Extension, and Holiday Hill Road

Rail Infrastructure

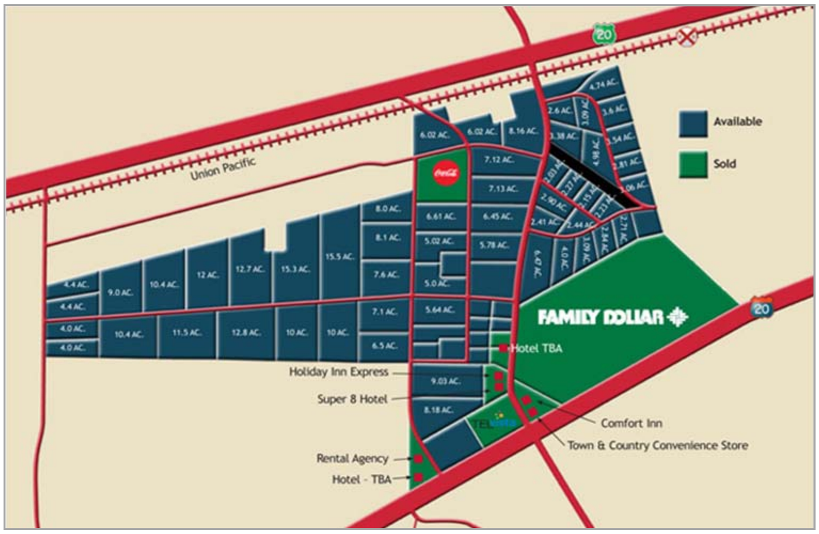
A UP line traverses Midland and runs parallel to IH 20 BUS, and passes next to the Midland International Airport. UP currently does not have a terminal in the area.

Air Infrastructure

Midland International Airport, owned and operated by the City of Midland, offers residents connections to major hubs in the U.S. The city is served by three passenger carriers: American Eagle, Continental, and Southwest Airlines (Midland Development Corporation, nd).

For cargo and package shipments, Midland International Airport is served by Southwest Airlines Cargo, Airborne Express, Burlington Air Express, DHL Worldwide Express, Emery Worldwide, Federal Express, UPS, and the U.S. Postal Service. Eleven motor freight operators also serve the cargo transportation sector.

Midland International Airport is a Port of Entry and Border Entry airport and houses a U.S. Customs office. Midland's Foreign Trade Zone is located at the airport (Midland Development Corporation, nd). Recent completion of the Entrada Business Park, a manufacturing/warehouse/distribution center, is part of the efforts currently being made to position Midland as an important transportation hub for the future. Odessa is served by Midland International Airport, which is located halfway between Odessa and Midland. Odessa's regional airport, Schlemeyer Field, is a general aviation facility having an average daily aircraft operations of 139 flights, with 53% transient general aviation and 47% local general aviation (AirNav.com, 2009). The Odessa Business Park (see Figure H36) is one of the facilities built to attract freight-related businesses to the City of Odessa. It is currently home to Family Dollar and Coca-Cola distribution centers.



Source: Odessa Texas, 2009

Figure H36: Odessa Business Park

Critical Freight Needs and Issues

The West Texas region remains relatively free-flowing for freight traffic, with bottlenecks only occurring on a few major highway links at the border crossings, primarily in the El Paso area. The highest traffic areas in the region, the major cities, are generally congestion-free, and rarely exhibit the traffic patterns of the congested metropolitan regions in the eastern half of the state. Still, with a large shift toward renewable energy, particularly between Midland/Odessa, there will be demand for new types of freight operations to handle the large equipment needed. While parts can certainly be transported by truck, it is expected that there will be some development in the rail industry to handle the equipment, as some of these parts tend to be oversized and overweight. An increase in distribution centers courted by cities like Midland/Odessa will certainly increase truck traffic to major metropolitan areas like Dallas/Ft. Worth and El Paso, especially with the expected influx of population related to Fort Bliss.

El Paso

The road infrastructure in El Paso is in a generally good condition. Nonetheless, with dwindling transportation funds in the states, concerns do exist about the maintenance of existing infrastructure. The capacity of the road system is generally greater than volume with little or no congestion along a vast majority of major routes (free-flow speeds greater than 55 mph). Minor congestion, however, does exist in the El Paso metropolitan area mostly during peak times, with the top two congested road segments in the city being IH 10 and Lee Trevino Drive. Failure to maintain the current infrastructure may result in the deterioration of the road network leading to reduced capacity and increased congestion.

A major problem in this border city is rail delays when trains get into downtown El Paso. The railroads, UP and BNSF, have rail yards in the downtown area. Access to these yards by both rail and trucks can be problematic because of the yards' location in a highly populated and geographically constrained area. Insufficient funding for rail relocation projects in El Paso has hindered plans to move these yards to the outskirts of the city. The BNSF line is also single tracked with limited siding lengths, making passing maneuvers difficult.

El Paso's border crossing infrastructure is also considered a major freight bottleneck in the state of Texas. Operational concerns and inadequate infrastructure result in border crossing delays. Additional inspections result in long lines on IH 10 and Loop 375, and bottleneck conditions are worsened by limitations on freight rail. Trains are allowed only an 8-hour window from 10:00 p.m. to 6:00 a.m. through Ciudad Juarez, Mexico. Funding limitations have resulted in nothing being done so far but the city and MPO are looking to other alternative sources of funding such as tolling. Border conditions in Juarez are worse than that of El Paso. Improvements need to be made on both sides of the border in order to have a more efficient border crossing system.

Furthermore, there is an anticipated need for additional border crossing infrastructure because of projected growth in Juarez. However, freight stakeholders in El Paso remarked that border delays are worse in Juarez than in El Paso because of Juarez's inadequate transportation infrastructure. Therefore, for any improvements to be beneficial to freight movement in the region, developments should be made in both Juarez and El Paso. The current violence in Juarez is also negatively impacting cross border movements, and if not dealt with, can hinder economic growth in El Paso.

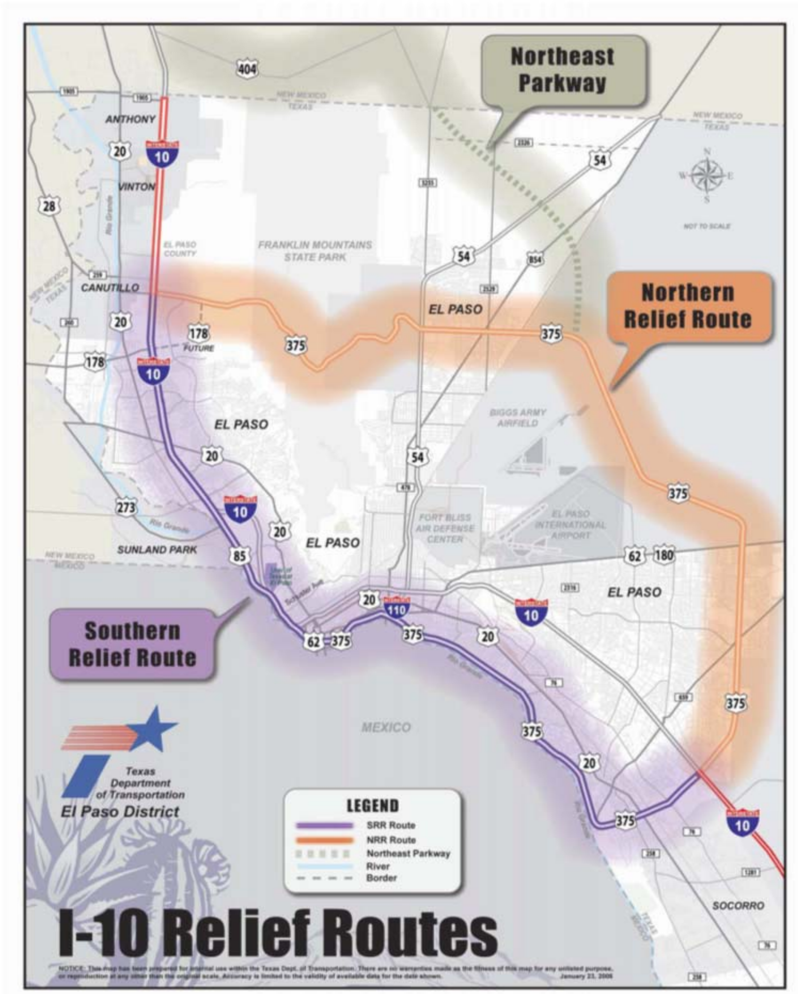
Midland/Odessa

Transportation needs in Midland/Odessa are not as critical as in El Paso. Identified needs include better transportation access to downtown Midland with provision of ingress/egress points into the city from the proposed La Entrada corridor roadway. These access points are expected to attract truck traffic, and thereby boost the area's economy.

Policies and Strategies to Address Needs

Road Infrastructure

El Paso suffers from a unique set of constraints, in that it is sandwiched between the Mexican border, Fort Bliss, and the Franklin Mountains. As a result, a small number of parallel corridors see a majority of the area freight (and non-freight) traffic, especially IH 10. This is worsened because the primary border crossings and rail intermodal facilities are located in the most physically constrained area, near downtown. To address congestion along IH 10 in El Paso, TxDOT has already planned four projects to construct flyover connections between IH 10 and several arterial roads, including Lee Trevino Drive. Two of these projects were estimated to bid in December 2009, after being funded with money from ARRA at the federal level. For the more distant future, the El Paso MPO has developed an ambitious plan to develop the road network to alleviate congestion through downtown El Paso and along IH 10. As shown in Figure H37, this involves a route parallel to IH 10 along the Rio Grande River, as well as a northern relief route and a northeast parkway that will provide connections to roads that bypass central El Paso. Also included in the plan is a provision for tolled lanes to raise additional revenues (El Paso MPO, 2010). In evaluating these plans relative to the proposed policy structure, the plans are geared more toward new facilities, rather than improvements of existing facilities. The consideration of pricing techniques, however, is quite promising, and should continue to be evaluated to make sure they make a large impact on the freight facilities. It is unclear if these plans truly minimize the impact of the freight system on communities, or simply move the impacts to other sections of the city. However, as a part of a regional solution, these plans are worth pursuing. Further engagement with the city of Ciudad Juarez, the state of Chihuahua, and the Mexican government may, however, be needed.



Source: El Paso MPO, 2010

Figure H37: Proposed relief routes in El Paso (El Paso MPO)

In January 2007, a feasibility study was authorized by the Texas Transportation Commission to evaluate potential strategic, economic, emergency, and environmental benefits of transportation improvements along US 190/IH 10 corridor (TxDOT, 2009). The corridor is proposed to be a multimodal facility accommodating both highway and rail. Consideration is being given to the corridor’s connectivity between the military installations of Fort Hood and Fort Bliss, and deployment Ports of Beaumont and Corpus Christi. It also has the potential to serve as a relief route for IH 10 through Houston and IH 20 through Dallas/Ft. Worth (TxDOT, 2009). The proposed route also has the potential of connecting relevant Texas cities like San Angelo, Killeen, Temple, and Bryan/College Station to an important trade corridor. See Figure H38.

The feasibility study is still in the initial stages and will seek to evaluate the following: existing and future mobility demands and needs (all modes) along the corridor; the impact of future expansion of Fort Bliss, Fort Hood, and Ports of Beaumont and Corpus Christi; the benefits of connecting military bases and ports to each other; the impacts along the corridor resulting from the proposed Gulf Coast Strategic Highway from Texas through Louisiana and the 14th Amendment Highway from Mississippi to Georgia; and the necessary safety and mobility improvements that need to be made on the corridor.

Source: TxDOT, 2009

Figure H38: Map of IH 10/US 190 Study Area, and Proposed Gulf Coast Strategic Highway System and 14th Amendment Highway Corridor

Rail Infrastructure

As previously mentioned, the growth of container traffic by rail across the border requires that new rail developments take place. Also related to the physical constraints of the El Paso region are a number of innovations to find new feasible rail routes, especially as Ferromex, BNSF, and UP all foresee long-term growth continuing at El Paso. NAFTA cargo has already begun to impact other border crossings, especially those with rail and intermodal connections outside of the West Texas region (Cambridge Systematics, 2007b). The Presidio crossing has become attractive for freight movement, and Ferromex and TxDOT have both completed research regarding the feasibility of improvements to the crossing and the associated rail lines. This crossing is also under study as the south connection for the United States in the La Entrada Al Pacifico Corridor. This corridor parallels (for some distance) the SORR rail segment currently owned by TxDOT. With upgrades, this rail segment could provide an attractive alternative. This, however, would require significant investment (some $70 million) by both the Mexican and U.S. federal governments, given the requirements of a point of entry (Frawley, et al., 2004).

The potential for relocating intermodal facilities and several freight lines from downtown El Paso, together with the redevelopment of the existing rail right-of-way, are also currently under study. However, only select elements of the proposal are supported by all three rail providers that interchange in El Paso. The proposed Santa Teresa intermodal facility (seen in the bottom left section of Figure H39) was on the verge of construction until November 2009 when UP delayed the project, citing funding concerns (Davenport, 2009).

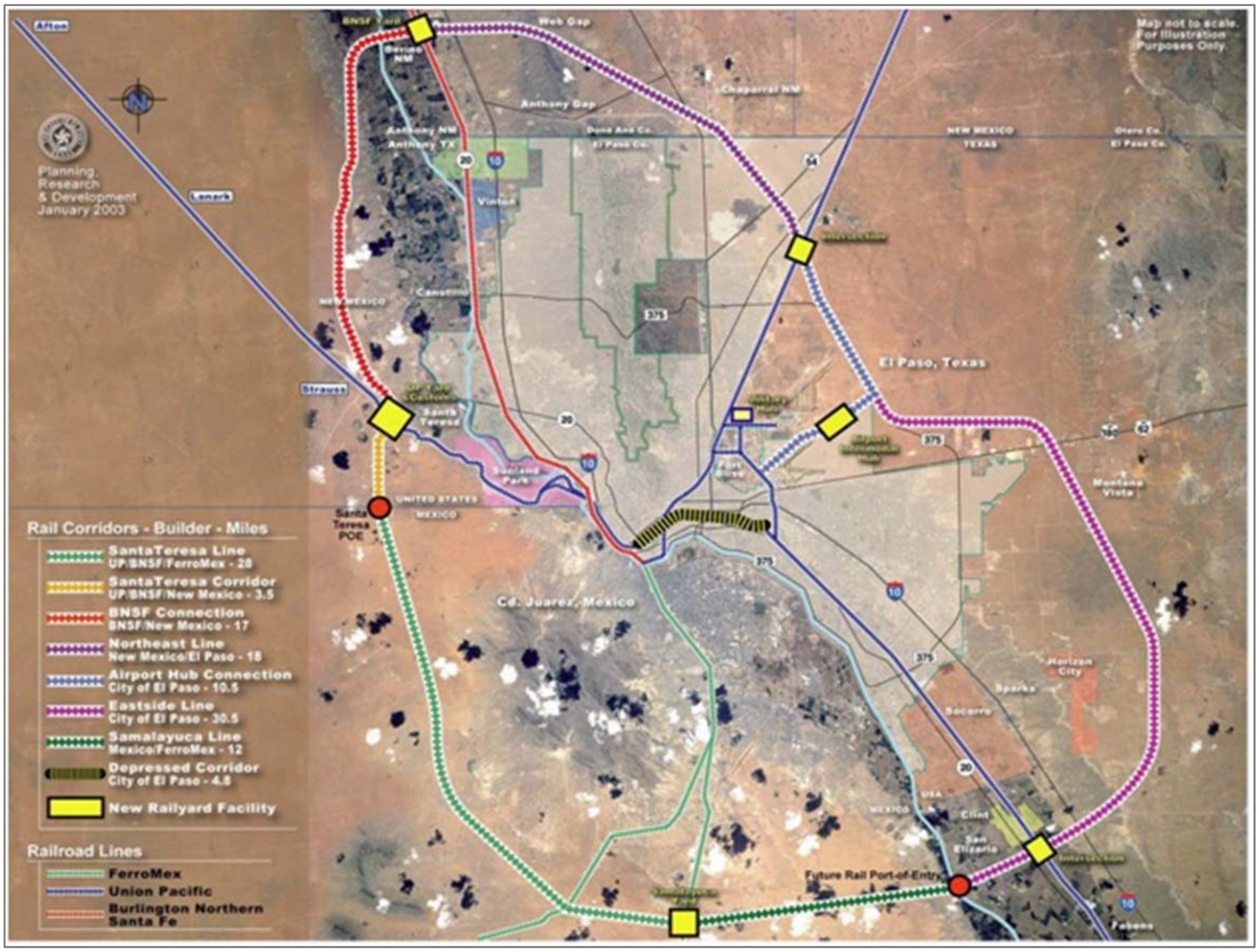


Figure H39: Potential alignment of rail corridors around El Paso (Moffat and Nichol)

While UP is not planning to abandon its El Paso facilities, it would shift majority of its business to the Santa Teresa site, which would include train-to-truck transfer facilities, fueling, and maintenance. Citing growing congestion, UP hopes the new facility will be able to handle a minimum of 100,000 containers annually (Union Pacific, 2006).

Within the noted policy framework for the region, the proposals related to the Presidio crossing and La Entrada Al Pacifico corridor focus on using and upgrading existing facilities, while incorporating fairly extensive regional planning. The Santa Teresa relocation, while constructing obviously new facilities, does focus on rail relocation, which is expected to have significant benefits for El Paso's citizens. It is undoubtedly a regional solution that involves a number of stakeholders, including the three rail companies, the City of El Paso, the State of Texas, the State of New Mexico, Ferromex, and many others.

In Chihuahuita, Mexico, there are plans to relocate a BNSF railroad crossing, known as "The Diamond," to the east side of the community because trains using the track frequently block traffic into the neighborhood. Stakeholders, including city leaders and TxDOT, believe the project will provide better access to the neighborhood, and reduce the risk of accidents between trains and vehicles (Porter, 2010). An $8 million TIGER II planning grant is currently being prepared so funding can be acquired for this project.

Border Crossing

Planned border crossing improvements in El Paso include increasing border crossing hours of operations, investing in intelligent transportation systems, utilizing toll facilities, and improving incident management. In order for El Paso to attract shippers and other freight stakeholders, the border crossing facility plans to extend its hours of operation for trucks to 24 hours, and provide a truck-only facility to separate passenger and truck traffic border operations. A previous attempt by the CBP to employ the 24-hour schedule was not successful as the time period for its implementation coincided with the decline of the U.S. economy. Furthermore, logistics companies were unwilling to change their operating schedules, which led to the border being heavily underutilized during non-peak periods. Also, the use of intelligent transportation system elements like radio-frequency identification (RFID) and blue tooth technology is being explored to help alleviate border inspection delays.

In addition to the proposed improvements for incoming border traffic (northbound), CBP is currently exploring the possibility of inspecting outgoing border traffic (southbound). Should this be implemented, it is expected that freight movements to Mexico will experience delays. There is therefore a need to improve upon the current border crossing infrastructure in El Paso, so it remains attractive for shippers and freight stakeholders.

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