EAST TEXAS FREIGHT STUDY

FINAL REPORT

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Presented By
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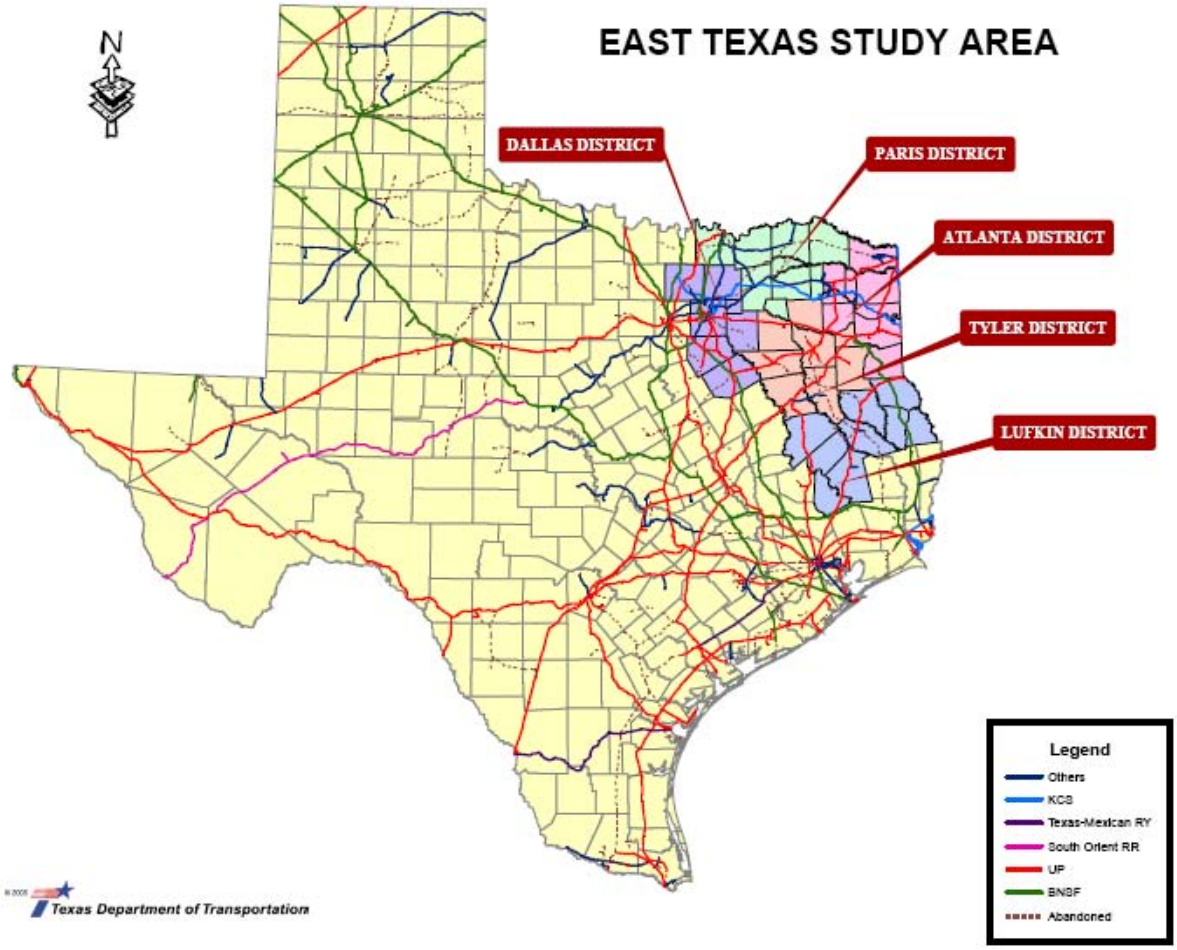
The *East Texas Freight Study* could not be undertaken without the cooperative participation of public, private, and governmental representatives from the East Texas region and the State of Texas.

Members of the Stakeholder and Technical Advisory committees who have participated and contributed to this study are listed as follows:

EXECUTIVE SUMMARY

This report is the beginning of an analysis of the East Texas region's freight network (roads, railroads, and intermodal facilities) and the process of developing ways to accommodate and capitalize on future freight movements. It identifies improvements that may provide relief to residents and the traveling public adversely affected by delays, interruptions, and noise attributed to the movement of freight within the region. It also identifies alternatives that may improve regional freight capacity by enhancing the efficiency and operations of the freight transportation network.



This report identifies up to $519 million of improvements for the 42-county East Texas region comprised of the TxDOT Atlanta, Lufkin, Paris, and Tyler Districts. The TxDOT Dallas District improvements will be included in a separate report. These improvements are categorized as:

- Grade Separations (bridges to separate the railroad from streets) - $61.1 million

- Grade Crossing Closures (closing and re-routing the street at the intersection with the railroad) - $600 thousand
- Roadway Capacity Improvements (adding roadway lanes to existing highways) - $426 million
- New Rail Bypass – between $8.4 and $30.9 million, depending on alternative

The East Texas Region Freight Study identifies existing and projected truck and freight rail transportation operations, bottlenecks, and constraints with the goal of establishing a slate of potential infrastructure improvements geared toward providing solutions that may resolve the problems associated with rising congestion levels and the expected growth of commodity movements.

Over the next twenty years, given growth rates for both vehicle and train traffic, the total public cost of delay at the roadway-rail crossings in the 42-county East Texas region is estimated to be more than $269 million. The cost of lost time is estimated at $3.7 million per year; the cost of collisions is estimated at $3.4 million per year; and the combined cost of emissions and wasted fuel is $345 thousand per year. The estimated 20-year public benefit of the grade separations and crossing closures identified in this report is nearly $23.4 million.

Train and vehicular traffic at roadway-rail crossings is prevalent throughout the state, and the East Texas region is no exception. The Federal Railroad Administration (FRA) has reported, for the East Texas region alone, nearly 340 incidents between trains and vehicles at public and private railroad crossings occurring between 2002 and 2006, including 150 injuries and 54 fatalities. The grade separations and crossing closures identified in this report play an instrumental role in improving public safety at roadway-rail crossings within the region.

An improved rail system can promote continued growth in the local economy as well as support the shifting of truck cargo to rail cars, potentially providing congestion relief on regional freeways. It can strengthen the region's global competitiveness in goods movement and help citizens reap the benefits associated with economic growth and vitality. This report recognizes that improvements made to the region's transportation infrastructure must describe both public and private benefits, so that the costs for the improvements are apportioned in a fair and balanced manner to all parties involved.

Existing Freight Movements and Operations

The East Texas regional rail network is comprised of tracks owned and operated by the BNSF Railway Company (BNSF), the Union Pacific Railroad (UP), the Kansas City Southern Railway Company (KCS), and multiple shortline railroads. The region's infrastructure includes more than 2,000 miles of mainline track and nearly 30 miles of railroad bridges.

The three major railroads (UP, BNSF, and KCS) ship a significant amount of tonnage through the East Texas region. The largest tonnage shipments occur

between this region and the Houston area. Accommodating these and other locations with freight rail service will be critical to the future of Texas in terms of economic growth and also providing options to shift truck cargo to rail cars.

The overall tonnage shipped by rail in the East Texas region is projected to more than double by 2025. The challenge to accommodate the forecasted growth in freight rail will be in planning for new or expanded rail facilities that can capitalize on the expected growth markets. The commodity with the largest projected tonnage increase is raw materials, which accounts for the coal movement through the region.

Like the rail freight movement, the overall truck tonnage shipped by truck in the East Texas region and each of the included Districts is projected to more than double by 2025. Large volumes of trucks move and will continue to move between the region and major growth markets such as the Texas urban centers of Dallas-Fort Worth, Houston, San Antonio, Austin, and El Paso as well as the U.S.-Mexico border. The I-35 corridor between Dallas and San Antonio, the I-30 corridor between Dallas and Texarkana, and the U.S. 59 corridor between Houston and Texarkana accommodate the largest truck movements for trips going to and from East Texas. Major truck movements are also currently seen, and are projected to increase, between East Texas and Arkansas, Louisiana, Oklahoma, New Mexico, and Mexico. These movements inside and outside of Texas illustrate the need for increased capacity on the freeway system to allow for increasing truck movements.

Identified Improvements

At an estimated cost of $61.1 million, nine identified grade separations would separate railroad lines from streets, thereby reducing safety hazards and delays. For the citizens that travel across these roadway-rail crossings, these projects could provide relief from blocked intersections and traffic congestion on the roadways. It also means improved safety by allowing emergency and law enforcement vehicles to respond without delay, while improving the quality of life for residents in the impacted neighborhoods. The estimated public benefit of the identified grade separations totals $21.6 million.

Also identified are 12 locations where grade crossings may be closed for an estimated cost of $600 thousand. These safety improvements minimize conflict points between trains and cars by closing crossings and encouraging motorists to use grade-separated roadways or alternate streets, which have been better safety systems in place. The estimated public benefit value for the crossing closures totals more than $1.7 million.

In addition to improvements that address rail-roadway crossings, the report also identifies five roadway capacity enhancements at an estimated $426 million. Roadway capacity enhancements foster the economic growth of the region by improving the efficiency of freight operations as well as minimizing disturbance to residents of the region. Providing additional roadway capacity relieves congestion

along the highway corridors and allows freight to pass through the region more quickly. Examples of roadway capacity enhancements are listed as follows:

- Adding lanes to existing roadways
- Upgrading the roadway facility (e.g. convert highway with traffic signals to freeway)
- Constructing bypasses around major at-grade intersections in larger cities

One rail capacity enhancement, a new rail bypass with two alternative alignments around the town of Livingston, has been identified and is estimated to cost $8.4 million for Alternative 1 and $30.9 million for Alternative 2. Replacing the existing rail facility within Livingston with a bypass outside of town increases safety since fewer motorists will be required to interact with trains at roadway-rail crossings. Other rail capacity enhancements, including additional mainline tracks and sidings, connections to adjacent rail lines, and expansion and relocation of rail yard facilities have also been analyzed for this study. However, there are not any other rail capacity enhancements that warrant consideration for implementation at this time.

Anticipated public benefits of identified improvements include reduced vehicular delay times due to passing trains at roadway-rail crossings, reduced vehicle fuel consumption, improved air quality, improved public safety, improved mobility for vehicular and freight traffic, reduced noise and vibration, and increased freight movement capacity.

Potential Passenger and Commuter Rail Opportunities

With the Dallas-Fort Worth metroplex and Shreveport within an hour of the East Texas region, the possibility of increasing passenger rail service and the addition of commuter rail service was reviewed. Discussions with individuals within local government agencies involved in potential passenger and commuter rail corridors included topics such as potential origins and destinations, feasibility, and contact with the railroads.

Four potential routes were chosen based on those discussions and locations of existing and abandoned freight lines. Two of the potential routes incorporated commuter rail into Dallas; these will be analyzed in the independent Dallas-Forth Worth Region Freight Study. The other most logical and feasible route within the East Texas region was an extension of the existing Amtrak service from Marshall to Shreveport. An RTC planning case with one additional train per day along the route showed a decrease in freight rail speeds and an increase in operating costs for freight rail operations totaling between $88.8 and $100.0 million over 20 years within the East Texas region.

Next Steps

This study was conducted to establish a needs assessment report for the stakeholders in the East Texas region as part of the Texas statewide analysis of freight mobility and outlines potential infrastructure improvements with their

associated order of magnitude costs. The study assists in understanding the movement of freight by rail and the inherent relationships that exist between rail and truck freight shipments.

The improvements outlined in this report are intended to provide the foundation for consideration of infrastructure and facility modifications that will benefit the quality of life in the local communities, reduce the public's exposure to freight movements, enhance economic growth and development, and improve passenger and freight mobility throughout the East Texas region.

This needs assessment ultimately will assist the Texas Transportation Commission, the State Legislature, and other stakeholders in understanding the magnitude and extent of the investment required to improve regional mobility, thus providing an overview of rail funding needs within the State.

Once funding is secured, regional agencies (such as the MPOs within East Texas), in cooperation with TxDOT and the freight railroads serving the region, and other public and private partners can work together to determine which improvements may become prioritized projects. The chosen improvements can then undergo the rigorous project development schedule that includes environmental and public involvement processes.

Meeting this region's transportation needs, for both people and goods, requires collaboration, cooperation, and an understanding that the region will continue to grow. The region requires a multi-modal solution that provides economic, efficient, and safe transportation infrastructure.

SECTION 1: PROJECT BACKGROUND

The state of Texas has great diversity, including varied climates, demographics, and agricultural and industrial products. Given these characteristics, and nearly 77,000 miles of state-maintained roads, the transportation system of Texas has had, and will continue to have, a direct impact on the economic health of the state.

Beginning in 1871 when the Texas & Pacific Railway gained permission to build a southern transcontinental railroad from Marshall, Texas to San Diego, California, the construction of the railroads across Texas was a driving force that defined how and where the state developed and grew. A study of the railroad alignments across Texas provides a hint about how technology and economy worked hand in hand to transform East Texas into productive land. The growth and development of industries continues to rely on the accessibility of freight transportation today as it has in the past.

In addition to the Dallas metropolitan area located at the western edge of the East Texas Region Freight Study, there is at least one major community in each of the five TxDOT Districts. Future population and industrial growth in East Texas will be located around these communities and will drive the justification and location for the majority of the future transportation improvements.

The possible Trans-Texas Corridor (TTC)-35 would be located around the eastern edge of the Dallas District and the TTC I-69 would extend from the northeast corner of Texas and cut through the remaining TxDOT Districts in this study area. Critical high density east-west and north-south rail corridors are located across the East Texas region making it a strategic location for the nation's rail traffic movement.

The growth and development of the transportation infrastructure throughout the TxDOT Atlanta, Dallas, Lufkin, Paris, and Tyler Districts will be constantly evolving to keep pace with not only their own population growths and transportation needs, but the needs of the nation.

PUBLIC MEETINGS AND FREIGHT SURVEYS

An important element of this Study is to address and incorporate the freight mobility issues, concerns and ideas of the communities, government agencies, and industries within the region. To accomplish this objective, public meetings were conducted in Tyler, Texarkana, Longview, Marshall, and Commerce, Texas. Representatives from the local Chambers of Commerce, Economic Development Boards, cities, counties, businesses, and railroads were invited and attended presentations and open discussions regarding the scope and objectives of the Study.

Additionally, freight surveys were sent to government agencies, private industries, and shortline railroads in the region as identified by the Texas Department of Transportation (TxDOT) District staff as well as the technical and steering

committees. Separate survey forms were developed that addressed specific issues associated with each distinct group. A total of 181 surveys were submitted, 92 of which were sent to government representatives, 80 to industry representatives, and nine to the shortline railroads. Of the 181 surveys sent, 51 responses were received, 18 of which came from government representatives, 28 from industry representatives, and five from the shortline railroads.

Information received from the government agencies helped improve the data used to develop the Texas Statewide Analysis Model (SAM). SAM uses projected growth rates to project traffic and freight patterns. The survey information also helped identify local traffic congestion and safety issues used in the development and analysis of potential improvements.

Survey responses, including telephone interviews, from the shortline railroads and industries helped identify the types of freight that are important to the local areas and what kinds of options are available for shipment of freight. The number of trains and rail cars that are shipped on the shortline railroads helped develop the data needed for the Rail Traffic Controller (RTC) computer model used for rail traffic projections.

Trucking companies were identified as contacts for the Freight Study; however, because none of the survey form questions were relevant to the trucking industry, telephone interviews were conducted to gain an insight and perspective of freight movement issues.

In addition to the standard contact information on each of the survey forms, questions that were asked are included in Appendix C.

Freight Survey and Meeting Results:

The meetings and surveys highlighted a consistent area of interest from the government agencies, which is the need to improve the public transportation system throughout the region. In addition to new and expanded bus service, there is a strong interest in developing and expanding passenger rail services to East Texas. The North Texas Council of Governments, East Texas Regional Transportation Steering Committee, Northeast Texas Regional Mobility Authority, East Texas Corridor Council, and members of Congress are interested in funding upgraded intercity passenger services by Amtrak from Little Rock and Shreveport through East Texas into the Dallas-Fort Worth area.

Survey responses indicated a perception that 20 percent of freight shipments were transported by rail with 80 percent of freight movements by truck throughout East Texas. The biggest concerns within the industrial responses were focused on the availability of trucks during peak shipping seasons and truck driver availability. These concerns were more evident for truck shipments into “dead areas”, or “dead head runs”. These types of truck shipments involve “one-way” freight deliveries to

an area that does not provide an opportunity to pick-up a new shipment for the return trip thus creating a lost opportunity for additional revenue.

Representatives from some communities stressed their concern that the UP closed their intermodal facilities in East Texas. The loss of these facilities has been blamed for businesses moving away, noting that one business has gone from 600 down to 85 container movements per month. Economic development agencies stressed their concern with the railroads removing track switches and industrial sidings that do not meet minimum railroad business activity. They believe that by loosing the accessibility of railroad freight delivery, the community may lose an opportunity to market and bring in new businesses that would need rail service. The perception is that Class I railroads are struggling to provide their own through-freight capacity and are no longer committed to local customers in the region. With the UP operating directional mainline train movements (southbound on the Lufkin Subdivision and northbound on the Palestine Subdivision), the respective local businesses are hindered by shipping requirements to and from Houston.

The development and renovation of the Red River Army Depot facility west of Texarkana provides an opportunity to develop a facility that will resolve several of the concerns noted from the freight surveys. With access to both shortline and Class I railroads and immediate access to I-30, it could serve as a transload facility that could service a variety of truck-to-rail, or rail-to-truck commodities. This facility is at an ideal location to serve as a “drop-and-hook” for truck shipments. Distribution hubs for FedEx, WalMart, and other large businesses are basically drop-and-hook facilities dedicated to those specific companies where local drivers can drop off a container and pick up a new container to return home. The facility then arranges to make deliveries of local container destinations and arrange for through delivery containers to be picked up on other trucks. The trucking industry has shown an interest in a more public type drop-and-hook facility that would be managed by a private agent and used by independent truckers and shippers.

All of the shortline railroads in the East Texas area are interested in working with businesses and communities to provide rail shipments and most of the shortline railroads have property that could accommodate a transload facility. The objective of the shortline railroad industry is to support local communities. However, the shortline railroad industry is facing challenges associated with the high “per-mile” maintenance costs and capital improvement costs. Rail shippers and the Class I railroads are constantly requesting the shortline railroads to accept the heavier 286,000-pound rail cars that their bridges are not capable of supporting.

SECTION 2: PURPOSE OF STUDY

The purpose of the East Texas Region Freight Study is to provide the region with evaluations and recommendations for near term, mid-range, and long term improvements and/or activities that may reduce freight mobility impacts.

The overall concept of the Study is envisioned to evaluate regional freight movements and operations, identify opportunities to increase freight efficiency, determine the physical and financial viability of potential improvements, and analyze potential alternatives or additional freight corridors.

The Study was conducted in two Phases. Phase I encompassed establishing an inventory of the existing freight rail system, conducting a District-wide freight operational study, and identifying freight constraints in each of the Districts. Phase II included identifying freight rail and rail/roadway interface safety issues, alternatives and associated feasibility for Rail System/Roadway improvements, and modeling potential rail system improvements to develop a realistic cost/benefit analysis.

Scope of Work

The following is an outline of the tasks completed for the East Texas Freight Study Phase I and Phase II Work Authorizations.

Task 1 – Inventory Existing Rail System

A. Obtain and review previous freight/passenger rail corridor studies conducted within the past 5 years that are applicable to the Study Area. Incorporate applicable and credible information as part of this study, with appropriate notation given to the source document.
B. Meet and coordinate with the freight rail carriers: UP; BNSF; KCS; DGNO; DART; Kiamichi; Blacklands; Timber Rock; Angelina & Neches River; Texas North East; Texas Northern; Texas Southern-Eastern; and the Moscow Camden & San Augustine, and any other freight rail carriers' representatives within the Study Area to determine rail line ownership, operating responsibility and line classification and nomenclature. From the information received from Item A and the data obtained with the meetings with the railroads, generate a freight rail inventory that will include information regarding Class of Track, method and type of dispatching, number and location of main lines, secondary lines, sidings, set-out tracks, yards and applicable facilities.
C. Establish a preliminary listing of potential Stakeholders.
D. Prepare and submit a draft summary report outlining the findings of Task 1.

Task 2 – Conduct Region Wide Freight Rail Operational Study

A. Current Freight Rail Operations: Meet and coordinate with freight rail carriers within the region regarding existing traffic volumes and operation impacts within the study area. Some of this information will be considered confidential by the railroads, and the Engineer's project manager shall ensure, to the satisfaction of the various freight rail carriers, it is maintained as such. It is anticipated that up

to three (3) meetings with each carrier may be required. The initial meeting will present the scope of the study and engage the railroads for continued input into the establishment of factual freight volumes and operational parameters. Subsequent meetings will analyze preliminary findings and allow for the incorporation of commentary offered by the carriers. Included in this section will be a summary of traffic flow and volume on the existing rail infrastructure including information:

- Within each of the Districts
- Carrier specific
- By location (Railroad operating Division/Subdivision)
- Origin and Destination including
    - Local
    - Through-freight
    - Originating outside the study area for local destinations
    - Originating inside the study area for other destinations
- By commodity
- Identify local industries served in the area
- Identify what portions of existing freight rail operations that may be re-routed to alternative alignments
- Examine the operations impact of re-routing, including crew time, train miles, fuel, transit time, and other operating parameters
- Identification of rail/truck interfaces and intermodal facilities
- Projected Freight Rail Operations: Utilizing the SAM the parameters outlined in Task 2-A shall be duplicated to incorporate freight rail volume projections to the year 2025 developing projected flows for RTC modeling beyond the Base Case, and then validated with each rail carrier within the Districts. It is anticipated only 1 meeting with each carrier will be required to validate projected traffic volumes.
- Prepare and submit a draft summary report outlining the findings of Task 2.

Task 3 – Identification of Freight Rail Constraints

A. Building upon data previously determined in Tasks 1 and 2 meet and coordinate with Freight Rail carriers within the Districts regarding operating impacts, parameters and constraints. Concurrently, obtain engineering data required to establish a baseline layout of the track geometry for the study area that will graphically represent the inventory assessed in Task 1.

B. Determine infrastructure constraints inhibiting freight rail efficiencies resulting from:
    - Congestion
    - Track, Bridge, and/or Signal deficiencies
    - Track alignment and profiles
    - Yard utilization
    - Highway/Rail grade crossing conflicts

C. Incorporating the train volume and flow data obtained in Task 2, Task 3A, and Task 3B, establish a base case operational model utilizing RTC software.

D. Conduct progress meetings with the freight rail carriers within the Districts to coordinate and validate the results of RTC modeling, allowing for the incorporation of comments offered by the carriers.
E. Expand the RTC model to evaluate impacts of the projected traffic growth against the base case model identifying the impacts of 10%, 20%, 30% and 50% increases in freight rail volume on the rail network under study.
F. Prepare and submit a draft summary report outlining the findings of Task 3.

Task 4 - Identification of Freight Rail and Rail/Roadway Interface Safety Issues.

A. Utilizing information available from the Federal Railroad Administration and that provided by TxDOT from the Texas Statewide Grade Crossing Inventory study, obtain and compile data for the past 5 years, showing trends, etc., for:
    - Vehicle/train accidents
    - Vehicle/pedestrian accidents
    - Train derailments that damaged private/public (non railroad owned) property
    - Train accidents/derailments involving hazardous materials

Task 5 – Develop Alternatives and Feasibilities for Rail System/Roadway Improvements

A. Building upon the results Tasks 1 - 3, identify potential improvements, realignments, or relocations to the existing railway infrastructure that may increase the efficiency of through-freight rail operations and improve road user mobility and safety within the Region. This analysis, at a minimum, will include:
    - Track improvements and/or additions
        - Existing interlockings and wyes
        - Siding extensions
        - ML Track additions
        - Capital Improvements as identified by the railroads
    - Roadway/Rail re-alignments
    - Railway yard improvements/relocations
        - Evaluate all rail yards
    - New, modified, and/or relocations of rail intermodal facilities
    - Existing railway line consolidation and/or connections
    - Joint use freight corridors
    - Rail line relocation alternatives
    - New and/or modified roadways to mitigate heavy truck freight flows
B. Analyze the results of Task 5A with respect to:
    - District corridor demographics and growth patterns within a ¼ mile of the rail/roadway centerline
    - Truck congestion and delay pre and post improvements
    - Evaluate truck commodity shift to rail based on improved system performance.
C. Building upon the results of Tasks 5A and 5B establish at least one alternative alignment for SAM and/or RTC Modeling in Task 6, and order of magnitude cost estimates associated with each alternative

D. Establish and maintain throughout the course of this work authorization a web site that outlines the results of this study.

Task 6 – Modeling of Existing System, Improvements, and Alternatives

A. Building on the RTC Base Case modeled for train operations within the Region, prepare and model train operations to establish an enhanced Base Case model which incorporates the suggested track improvements and/or additions within the Region as jointly recommended by the railroads, establishing a ranking of improvements with regard to freight rail mobility improvements. RTC modeling will provide a comparison of the alternatives selected versus the Base Case and the Enhanced Base Case for existing traffic volumes including forecasted growth scenarios through 2025.
B. Prepare order of magnitude capital cost estimates for the alternatives identified and modeled including a realistic cost/benefit analysis per alternative.
C. Prepare and submit a draft summary report outlining the findings of Task 6, including safety benefits and the identification of potential funding sources.

Task 7 – Trans Texas Corridor Connections

A. Analyze current and projected freight traffic volumes, including origin and destination flows, to determine possible freight flows to/from Trans Texas Corridor conceptual routes within the District.
B. Determine the feasibility of the potential alternative freight rail alignments, including potential intermodal yard locations, identified in Task 5 with respect to connectivity to the Trans Texas Corridor conceptual routes within the District.

Task 8 – Highway/Rail Grade Crossing Impact Analysis

A. Collect the following data for the grade separation/closure sites identified in Tasks 1 - 3 :
    - Research available data on railroad distribution by time of day;
    - Roadway geometry at crossing as well as closely spaced upstream and downstream intersections;
    - Average number of trains per day;
    - Average length of train;
    - Average speed of train; and,
    - Gather available traffic count data near potential grade separation/closure sites as well as closely spaced upstream and downstream intersections.
B. Set up traffic analysis model for each of the potential grade separation/closure sites using the data collected in Task 8A. For the purpose of this scope it is assumed that there would not be more than 15 potential sites to be analyzed. Scenario models will be developed with and without the grade separation/closure in order to perform a comparison analysis. Therefore traffic analysis models will be developed for up to 30 sites (15 sites with and without grade separation/closures).
C. Perform comparison analysis with and without grade separation/closure for each specified site using the traffic analysis model. Measures of effectiveness that will be used for evaluation will include:

- Vehicle delay;
- Queue length
- Emissions (Fuel consumption, carbon monoxide, nitrogen oxides, volatile organic compounds)

D. Determine the impact to access existing adjacent properties near the studied crossings for the scenarios with and without grade separation/closures. Recommend at least one alternative for each grade separation that would minimize any access changes or eliminations for adjacent properties.

Task 9 - Study of Potential Intercity Passenger and Commuter Rail Routes

A. Meet and coordinate with Amtrak, and other local agencies involved in intercity passenger and commuter rail initiatives regarding long term plans for intercity passenger and commuter rail transit within the Region.

B. Analyze current and projected vehicular traffic volumes within designated Regional corridors to determine the feasibility of incorporating potential commuter and intercity passenger rail routes utilizing existing freight rail lines.

C. Utilize RTC modeling to analyze the viability of expanding intercity passenger rail service and introducing commuter rail operations along existing and/or abandoned freight rail lines within the Corridor. This analysis will include:
   - Recommended rail line upgrades and improvements to incorporate commuter or intercity passenger rail operations along existing and/or abandoned freight rail corridors while maintaining freight rail operations along existing routes,
   - Recommended rail line upgrades and improvements to incorporate commuter or intercity passenger rail operations along existing and/or abandoned freight rail corridors in which rail operations may have been consolidated,
   - Recommended rail line upgrades and improvements to incorporate commuter or intercity passenger rail operations along existing and/or abandoned freight rail corridors in which through-freight rail operations may have been relocated, and
   - Recommended rail yard relocations onto new and/or existing rail corridors to facilitate rail network fluidity.

D. Prepare order of magnitude cost estimates for the alternatives, improvements, and upgrades identified.

E. Review the analysis of existing intercity passenger or commuter rail operations then discuss comparisons of these passenger rail networks to the similar conditions encountered within the East Texas Region regarding corridor growth and population density, potentially providing additional justification for the incorporation of passenger rail operations within the Region.

Task 10 – Economic Analysis of Identified Improvements

A. Collect and review existing studies by Chambers of Commerce, Counties Metropolitan Planning Organizations, Regional Mobility Authorities and other transportation entities, and other available information such as economic trends and employment projections.

B. Identify development opportunities having potential for major economic impact on the Region, and document how these developments can be realized by implementing infrastructure improvements described in previous tasks.
C. Prepare order of magnitude costs for infrastructure required to integrate development opportunities in Part B into the Trans Texas Corridor, and project the economic benefits of these developments based on results reported for similar developments already in operation.
D. Prepare a cost-benefit analysis of constructing grade separation structures or implementing grade crossing closures at locations identified in Task 8

SECTION 3: FREIGHT OPERATIONAL STUDY

Introduction

It is through an understanding of the movement of truck and rail freight that each District can begin to develop ways to accommodate and capitalize on future commodity movements. The process to begin to explore the future freight outlook requires that the best available tools are used to examine the current/base year (1998) and future year (2025) commodity flows within the region.

The following section describes the available tools and the freight modeling process and methods. Following the discussion of modeling methods, technical information is provided on truck freight flows, rail freight movements and a comparison of truck and rail movements for the entire East Texas Region.

Freight Model Methods

The primary tool used to determine future truck and rail freight activity is the Texas Statewide Analysis Model, referred to as “SAM”. The SAM is a statewide travel demand modeling package developed for and used by TxDOT to analyze the movement of people and freight throughout the state. The SAM is actually a large group of interrelated models that generate passenger trip estimates and freight tonnage flows for highway, aviation, and railroad networks, as well as waterway facilities along the Texas Gulf Coast. The maps and data produced by the SAM are useful in planning regional transportation system improvements and addressing future needs and priorities.

The SAM was developed using base year (1998) transportation planning data to validate the adequacy of the model in estimating passenger flows by travel mode. In urban areas transportation data from existing urban models was extracted. In the remaining rural areas, national and state travel survey and demographic data (population, employment, and other socioeconomic factors) were used to prepare travel estimates, which were then compared to traffic counts. SAM freight models were used to develop estimates of freight flow (tonnage) and heavy truck traffic.

Model Calibration

Transportation and travel survey data necessary for freight modeling is less comprehensive than for passenger modeling. Therefore, SAM freight models were developed using base year and future/forecast year (2025) data made available from three primary sources:

- Reebie Transearch Database – This 1998 survey data includes a sample of all Texas freight movements (within, to, from, and through the State), but does not include freight movements between Texas and Mexico.

- Wharton Economic Forecasting Associates (WEFA) – Similar to the Reebie data, the WEFA data included only intra-U.S. flows and did not include freight movements between Texas and Mexico.

- Latin America Trade Transportation Study (LATTS) – This study collected data from the DRI/Mercer World Sea Trade Service (WSTS), which integrates world trade databases and economic/trade models to produce historical data and forecasts of freight movements around the world.

Additionally, Surface Transportation Board (STB) Waybill Data from 2002, 2003, and 2004 was obtained and used as another level of calibration for freight rail movements throughout the state. The STB data, along with actual rail tonnage maps provided by the freight railroads, were compared as a process check to validate current rail freight volumes, thus establishing a defendable prediction of forecasted rail freight movements throughout the state.

The freight model produces freight flow tonnage estimates based on the following nine commodity types:

- Agriculture
- Raw materials
- Food
- Textiles
- Wood
- Chemicals/petroleum
- Building materials
- Machinery
- Secondary

Trip Generation

Trip generation is the process of converting people and jobs into trips. These trips become auto trips, truck trips and in this case tons of commodities. All trip generation model estimates for the freight model were developed at the county level since Reebie freight data was defined in terms of freight origins and destinations as counties. More specifically, the trip generation model applies equations relating

variables for employment types and special freight handling facilities to the tonnages produced or attracted to individual counties. Freight transportation demand growth is affected by increases in both employment and worker productivity. The trip generation equations estimate freight tonnages based on employment and productivity increases. The resulting estimates were then compared to 1998 Reebie control total data and the equations were iteratively adjusted to obtain reasonably accurate freight tonnage estimates by commodity and by movement type. In short, freight movement was calculated using scientific equations; these calculations were compared to freight data from individual counties from 1998, and adjustments were made to develop accurate totals to use in the study.

Finally, average daily trip tables were obtained by dividing the annual values by the number of days in a year. The freight model-estimated overall tonnage movements at county and District level are reasonable and accurate in replicating base and future freight movement. The freight flow estimates over the various highway network routes are also reasonably accurate.

Mode Choice and Assignment

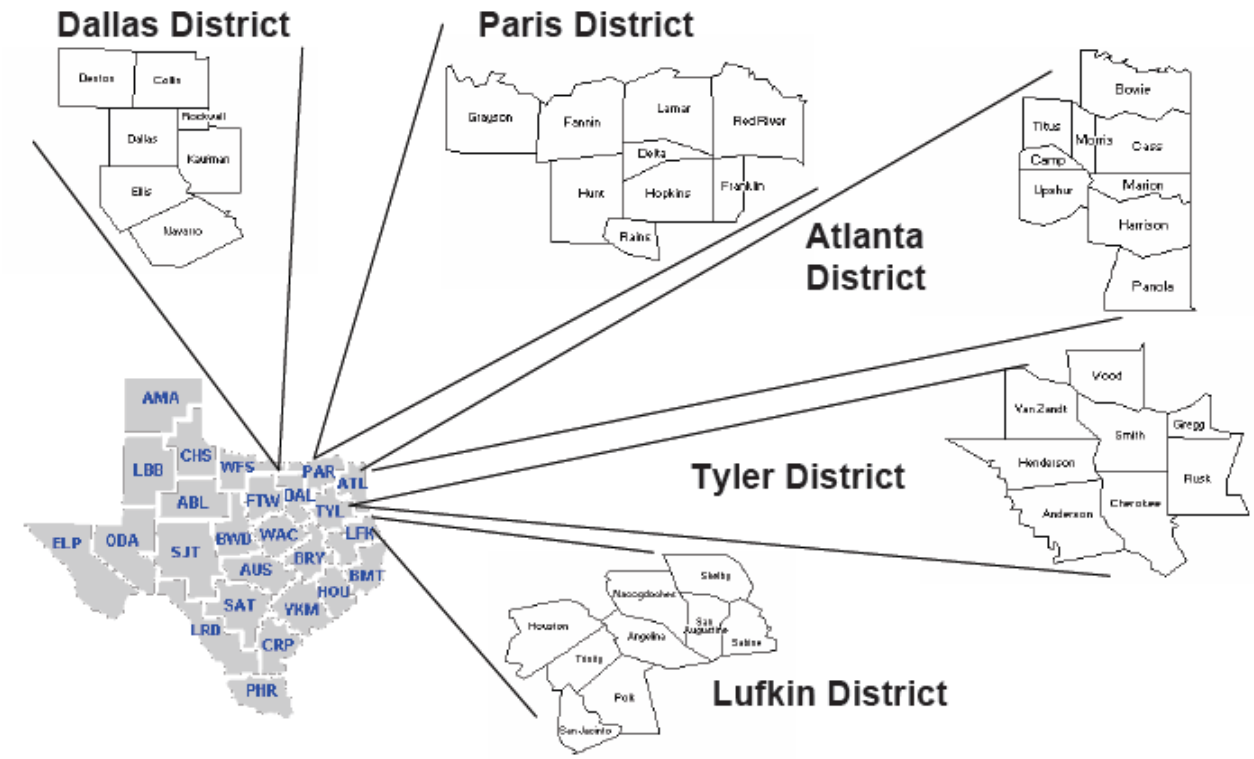
The statewide freight flow tonnage estimates (produced at the county level) are allocated to highway, rail, and waterway modes by a mode choice model. While rail and waterborne movements were assigned to their respective networks at the county level, the highway freight tonnage estimates were disaggregated to even smaller geographic areas (traffic analysis zones — TAZ) prior to being assigned to the road network. In addition, heavy truck flow estimates for the highway network were derived through factoring of the freight tonnage estimates (variables of vehicle load factor by commodity group and related trip length were applied to the freight tonnage values).

2025 Roadway Network

The SAM includes roadway improvements through the year 2025 as provided by Planning Department or Advanced Project Development sections of each District. These improvements represent anticipated roadway improvements based on future growth and mobility needs. The network includes projected improvements that are planned to occur between 1998 and 2025 for all five Districts. Tables and maps showing planned improvements for each District are included in Appendix D.

East Texas Region Overview

The following sections provide an overview of the East Texas region (Atlanta District, Dallas District, Lufkin District, Paris District, and Tyler District) freight flow movements in terms of truck and rail commodity flow. The counties comprising the East Texas Districts are shown on the following page.



Truck Freight Movements and Commodities

The movement of truck freight within, into, and out of the region is significant today and is expected to continue to be a significant method of transporting goods and materials for the state of Texas and the country.

Table 3-1 illustrates that while the movement of truck tons within the East Texas Region is projected to increase by approximately 17.6 million tons between 1998 and 2025, it is small when compared to the increased movements expected to come into (154 million) and out of (165 million) the region. Analysis concluded the following for 2025 truck movements for East Texas:

- Projected growth of 140 percent (an additional 17.6 million tons) in truck movements within the region (internal to internal movement type);
- Projected growth of 138 percent (an additional 165 million tons) in truck movements leaving the region (internal to external movement types); and,
- Projected growth of 124 percent (an additional 154 million tons) in truck movements entering the region (external to internal movement types)

Table 3-1 describes each movement type that would either originate or end in the East Texas region. Internal to internal movements occur within the region, while all other movements (internal to external; external to internal) occur either between the region and other Texas counties or between the region and the rest of the U.S. and Mexico. These figures demonstrate that the East Texas Region truck freight activity has an important economic role for the entire state of Texas and the nation as a whole.

Annual Truck Tons				
Origin	**Termination**	**1998**	**2025**	**Percent Change**
Internal to Internal				
East Texas Region	East Texas Region	12,680,860	30,373,394	140%
Internal to External				
East Texas Region	Other Texas Counties	93,468,456	219,872,482	135%
East Texas Region	Western U.S.	882,394	2,201,523	149%
East Texas Region	Northern U.S.	13,550,107	33,752,503	149%
East Texas Region	Eastern U.S.	4,428,250	10,866,735	145%
East Texas Region	Mexico	6,896,144	17,146,557	149%
External to Internal				
Other Texas Counties	East Texas Region	91,814,658	199,952,524	118%
Western U.S.	East Texas Region	1,154,691	2,765,910	140%
Northern U.S.	East Texas Region	17,942,223	42,973,879	140%
Eastern U.S.	East Texas Region	5,381,417	12,875,026	139%
Mexico	East Texas Region	8,610,345	20,713,860	141%
	Total	**256,809,548**	**593,494,395**	**131%**

Table 3-1: Truck Freight Movement

Truck Movements within the State

Figure 3-1 reveals that in 1998 large numbers of trucks moved between East Texas, Corpus Christi, Houston, San Antonio, the Dallas-Fort Worth metroplex, El Paso, Austin, and areas along the U.S.-Mexico border with the largest origin and destination being the Houston region. Trucks also moved to other parts of the state; however, their final destination remained in the major growth markets mentioned above. The I-35 corridor between Dallas and San Antonio, the I-20 corridor between Dallas and Texarkana, and the U.S. 59 corridor between Houston and Texarkana are the primary roadway segments used for major truck movements going to and from East Texas.

Figure 3-2 shows the continued growth of truck freight movement in the future between the East Texas region and the urban areas of Houston, San Antonio, Dallas-Fort Worth, El Paso, and Austin. These trends bring into focus the need to plan and accommodate for trucks along the major freeway corridors both inside and outside of the major urban centers. With the already depleted capacity on most the freeway facilities, new corridors may be needed to keep auto and truck traffic moving, thereby benefiting the state and local economies.

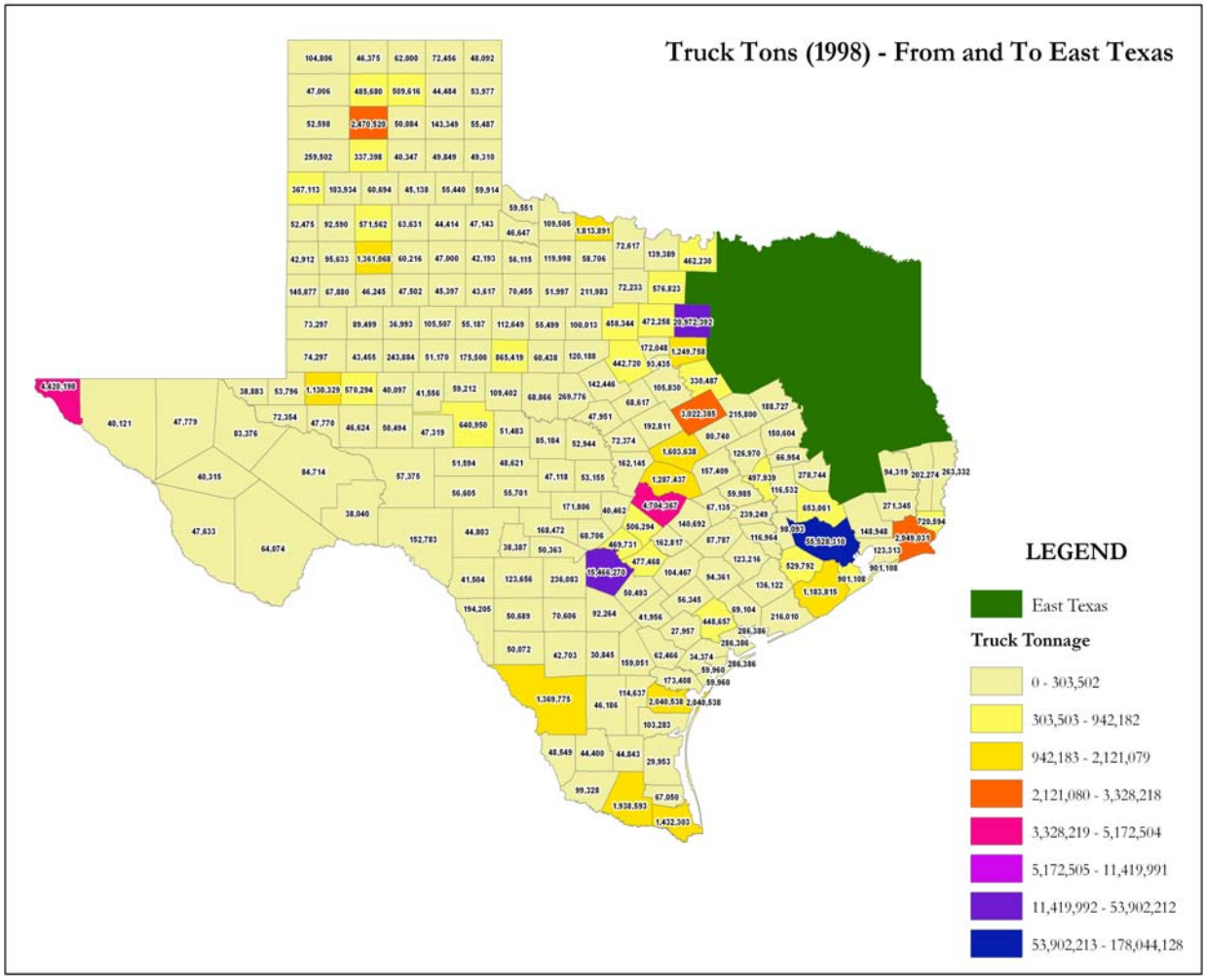


Figure 3-1: 1998 Truck Movements within Texas To and From East Texas

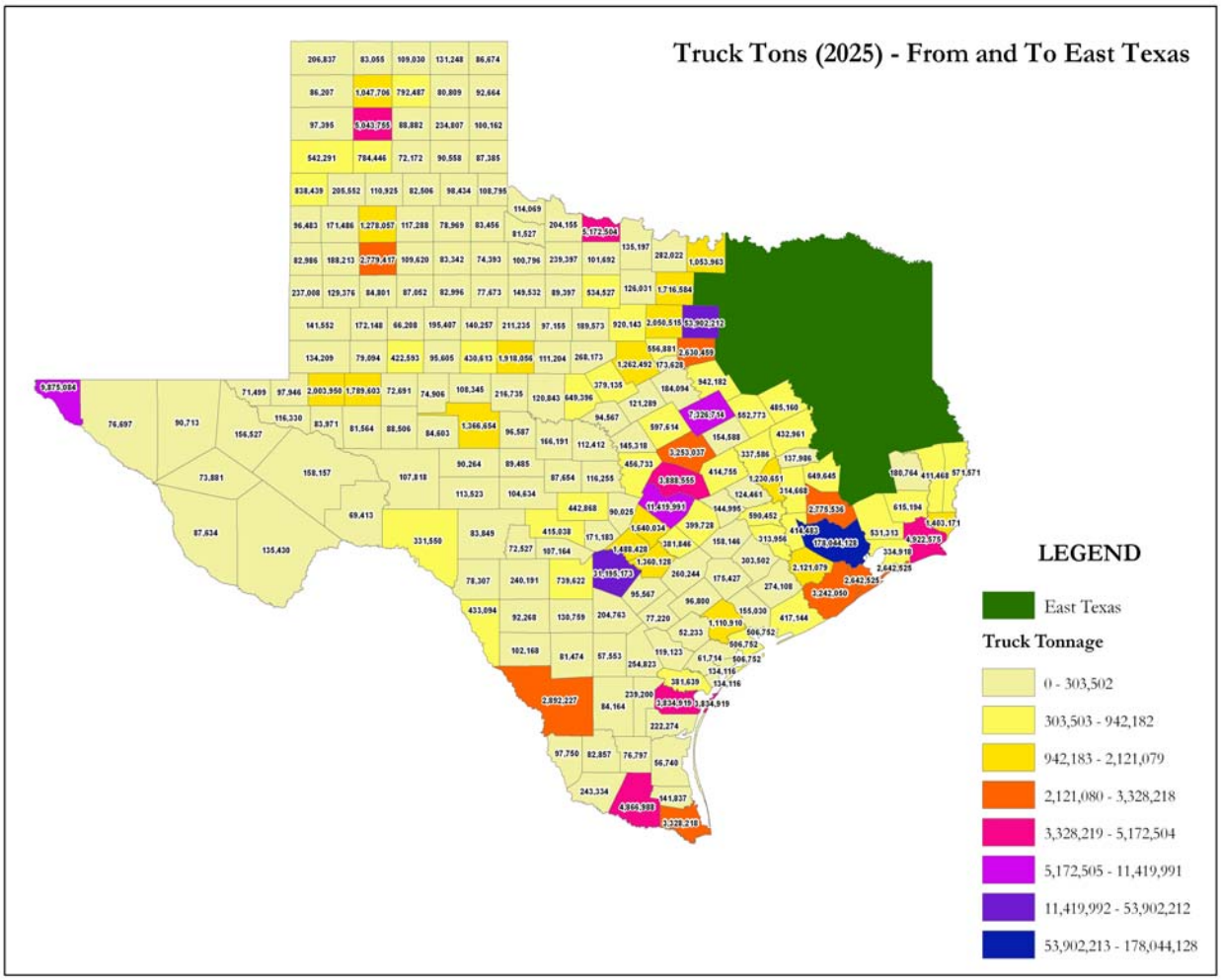


Figure 3-2: 2025 Truck Movements within Texas To and From East Texas

Truck Movements Outside of the State

Large increases in truck freight activity are expected between the East Texas region and other parts of the country in the future. These movements represent trucks that are relegated to long haul trips. Major movements in 1998 can be seen between East Texas and Oklahoma, Arkansas, Louisiana, New Mexico, and Mexico as well as destinations outside of Texas as shown in Figure 3-3. Large increases in truck activity are projected for truck movements into and out of the state from the East Texas region. Figure 3-4 clearly demonstrates increased movement between East Texas and Oklahoma, New Mexico, Louisiana, the northeastern states of the country, and Mexico.

These movements outside of the state of Texas further illustrate the need for additional truck allowance on the freeway system. Exclusive truck lanes and new freeway opportunities are potential solutions. Additionally, with the lack of available freeway capacity, these long haul movements may be better served by shifting truck cargo to rail cars.

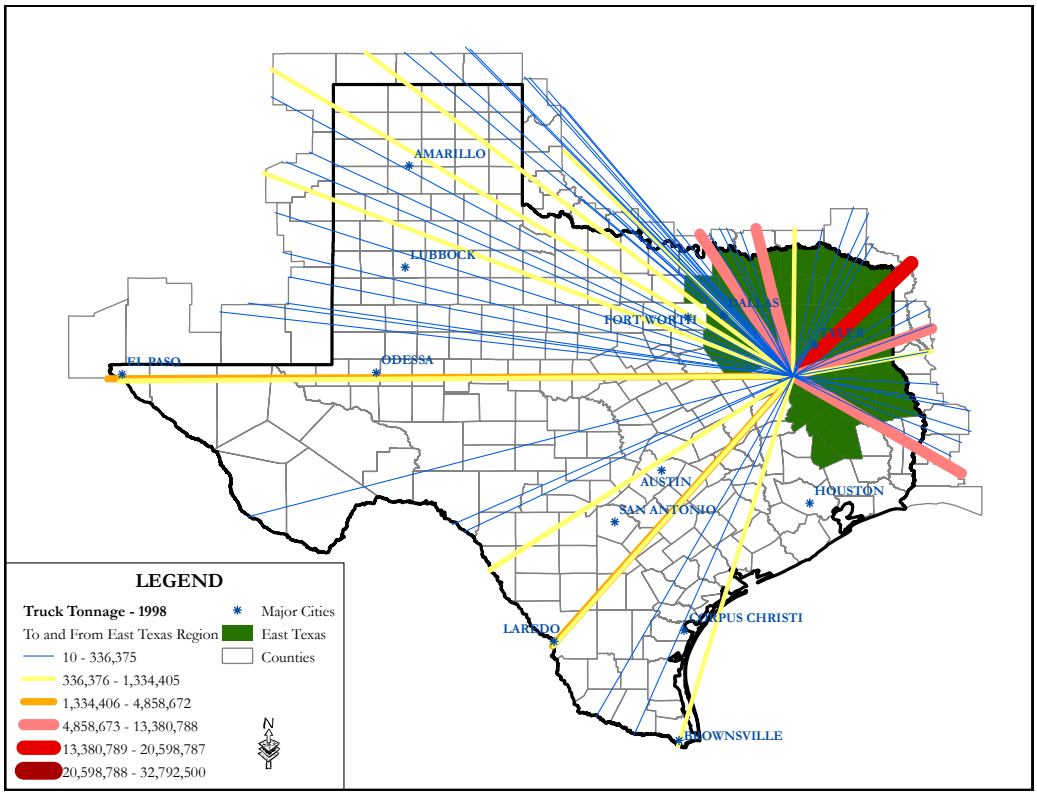


Figure 3-3: 1998 Truck Movements Between Outside of Texas and East Texas

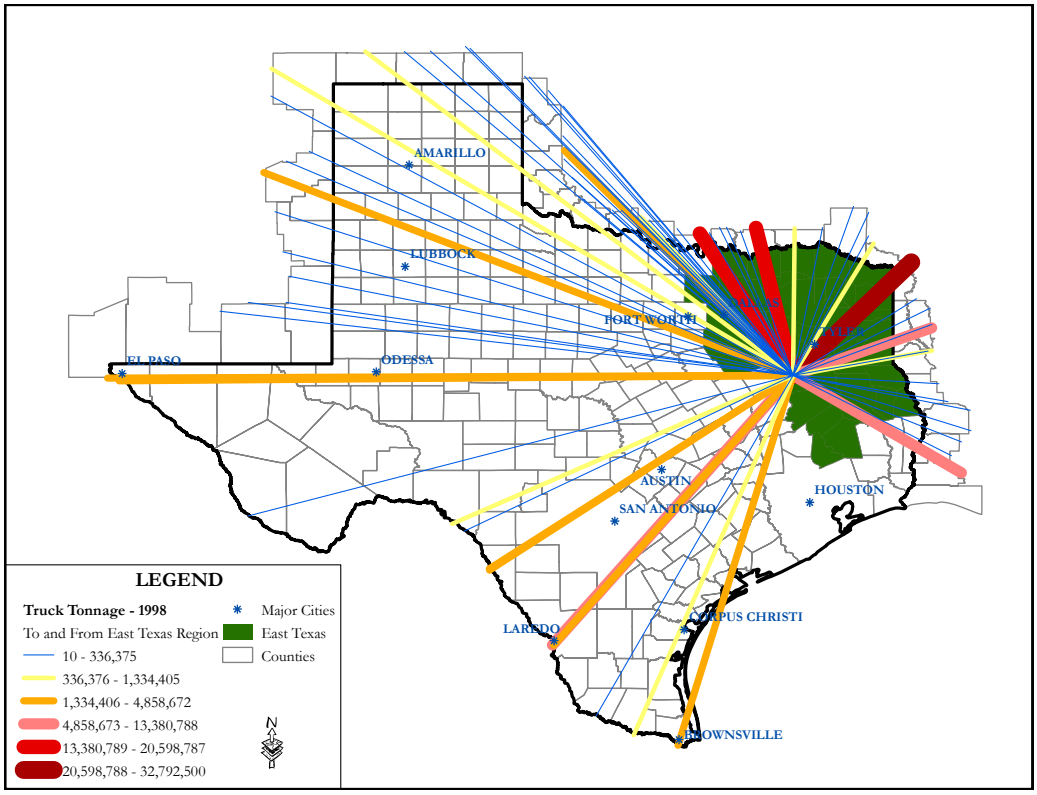


Figure 3-4: 2025 Movements Between Outside of Texas and East Texas

Truck Commodity Trends

The overall truck tonnage is projected to more than double within the East Texas Region by 2025. Commodity trends provide insight into truck movements internal and external to Texas. Table 3-2 indicates that building materials will be the largest growing commodity in terms of the weight of increased tonnage and will account for approximately 28 percent of the total truck tonnage movement in East Texas. Food products are projected to increase by approximately 71.5 million tons between 1998 and 2025. Wood products are projected to increase approximately 51.6 million tons between 1998 and 2025, and secondary products are projected to increase approximately 45.4 million tons between 1998 and 2025. Chemical/petroleum products are projected to exhibit the smallest percent increase; however, the overall tonnage is projected to be the fifth largest increase. Machinery products are projected to be the sixth largest increase, with approximately 16.9 million tons. Textiles and agriculture are projected to produce much lower tonnages, but they are expected to exhibit high percentage increases.

All of the commodity groups show large increases and represent a positive economic outlook for the entire East Texas region. However, additional infrastructure and modal shifts (i.e. truck freight to rail cars) may be needed with this substantial growth.

Commodity	**Truck Tons**		
	1998	**2025**	**% Increase**
Building Materials	54,881,034	167,640,542	205%
Wood	39,524,713	91,161,726	131%
Agriculture	1,841,943	4,576,050	148%
Textiles	3,157,090	9,941,129	215%
Chemical/Petroleum	52,001,128	74,647,971	44%
Food	50,489,230	121,939,730	142%
Machinery	9,329,828	26,226,902	181%
Raw Materials	10,442,177	16,747,147	60%
Secondary	35,142,369	80,613,199	129%
TOTAL	256,809,512	593,494,395	131%

Table 3-2: Truck Commodity Growth

The greatest commodity volumes moving by truck are generally low value, bulk materials — consistent with traffic moving through bulk ports. The leading products moving by truck (in terms of tonnage in the Districts) are food, building materials, wood, chemical/petroleum, and secondary materials. Secondary materials consist of re-handled freight from warehouse or distribution centers, and the truck drayage

portions of truck/rail or truck/air intermodal trips. The secondary products are often bulk materials that have been packed or containerized that could be shipped to a store or distribution center and are an exception to the low-value tendency among the top commodities (by weight).

Since growth projections were based on 1998 information, additional data was collected through surveys, interviews, and observations. As determined from recent interviews with economic development groups and industry professionals, the building materials commodity is expected to show significant growth in areas dealing with steel, iron, and lumber products. Additional industries such as cotton, grain, and cement plants as well as food and wood products are expected to grow at a significant pace. Growth in industry leads to jobs and increased population, which in turn will continue to spur on the increasing amount of building materials shipped by truck.

Figures 3-5, 3-6 and 3-7 further illustrate the commodity tonnage within the East Texas region for both 1998 and 2025.

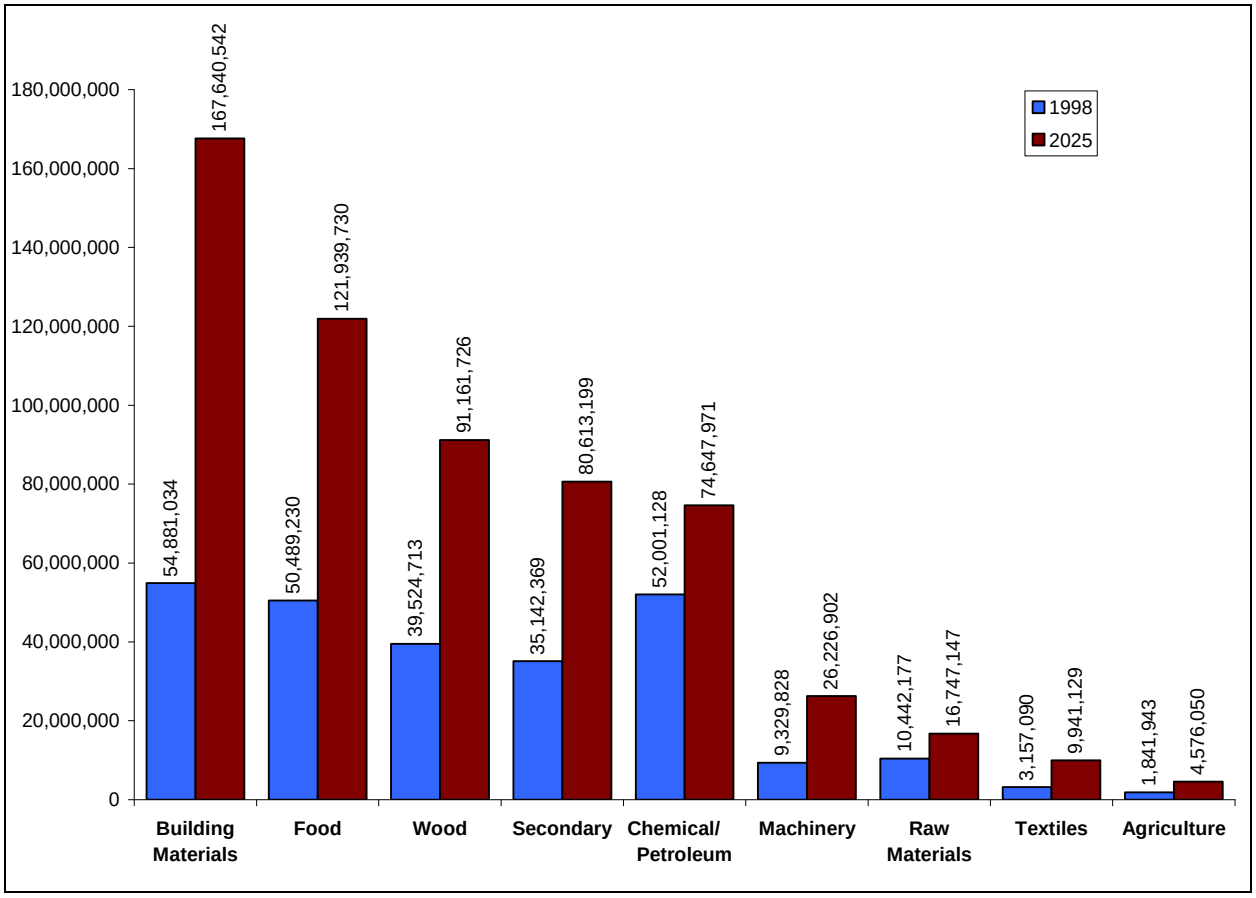


Figure 3-5: Total Truck Tons by Commodity

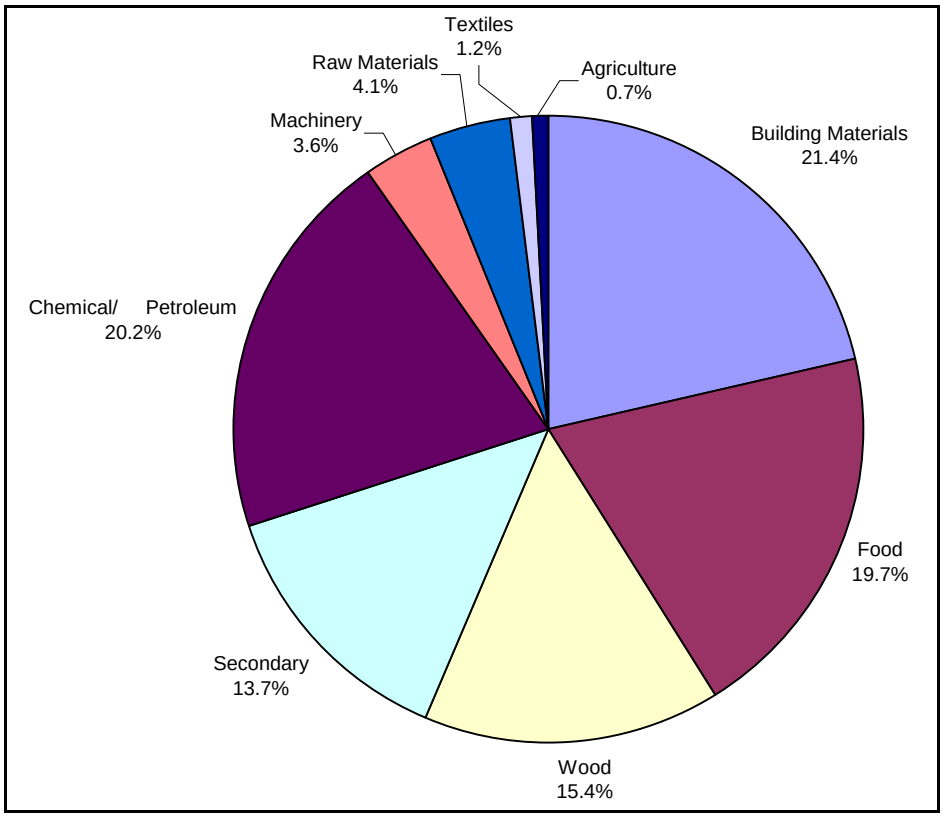


Figure 3-6: Percentage of Truck Tons by Commodity (1998)

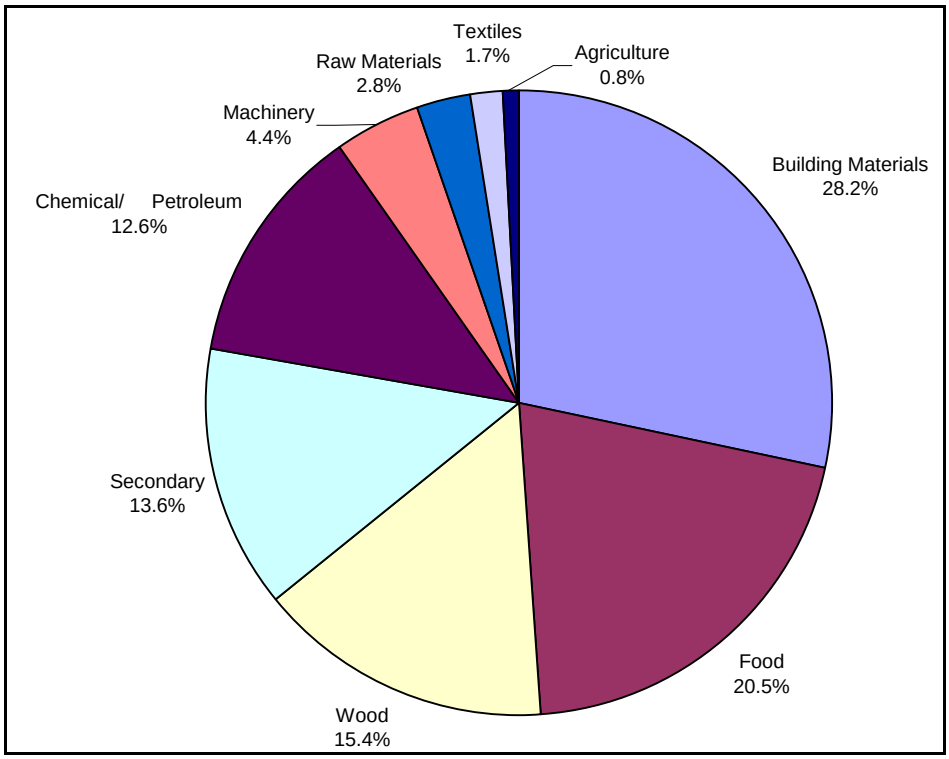


Figure 3-7: Percentage of Truck Tons by Commodity (2025)

Rail Freight Movements and Commodities

Rail freight movements and commodities within and through the East Texas region as well as those commodities destined for other locations outside of Texas were included in the analysis of rail movement.

Much like the truck movements described in the previous section**,** rail freight movements are also growing. Table 3-3 illustrates that the East Texas region will continue to import a great deal of commodities by the year 2025. While a modest increase in rail freight movement will occur internally to the region, approximately 44 million additional tons are projected to be transported from/to Mexico and other parts of the country between 2004 and 2025. An additional 9.5 million tons are projected to be transported from/to other Texas counties between 2004 and 2025.

Annual Rail Tons				
Origin	**Termination**	**2004**	**2025**	**Percent Change**
Internal to Internal				
East Texas Region	East Texas Region	152,482	272,499	79%
Internal to External				
East Texas Region	Other Texas Counties	2,273,643	5,284,561	132%
East Texas Region	Western U.S.	1,800,821	3,994,632	122%
East Texas Region	Northern U.S.	3,876,515	8,702,337	124%
East Texas Region	Eastern U.S.	1,222,319	2,693,413	120%
East Texas Region	Mexico	1,552,194	3,431,950	121%
External to Internal				
Other Texas Counties	East Texas Region	9,483,091	15,935,451	68%
Western U.S.	East Texas Region	6,174,898	13,360,872	116%
Northern U.S.	East Texas Region	15,030,421	32,491,141	116%
Eastern U.S.	East Texas Region	3,518,185	7,555,895	115%
Mexico	East Texas Region	4,191,696	9,038,984	116%
Total		**49,276,264**	**102,761,736**	**109%**

Table 3-3: Rail Freight Movements

Rail Freight Movements within the State

Intermodal centers, rail yards, and ports of entry are the primary locations in which rail freight can be either sent or received. Figure 3-8 illustrates the origin and destinations for freight rail movements occurring in 2004, while Figure 3-9 shows projected rail movements in 2025. Harris, Brown, Tarrant, Bexar, Denton, Comal, Webb, and Williamson Counties are handling the largest movements to and from the East Texas region. The largest tonnage shipments occur between Harris County (Houston area) and the East Texas region.

The major rail lines (UP, BNSF and KCS) ship a significant amount of tonnage to and from the East Texas region. UP serves most of the Districts in the East Texas

region except for the Paris District, while BNSF primarily serves the Dallas and Lufkin Districts, but also provides some service to the Atlanta and Paris Districts. Providing freight rail service to and from the region will be critical to the future of Texas in terms of economic growth and also providing options to shift truck cargo to rail cars.

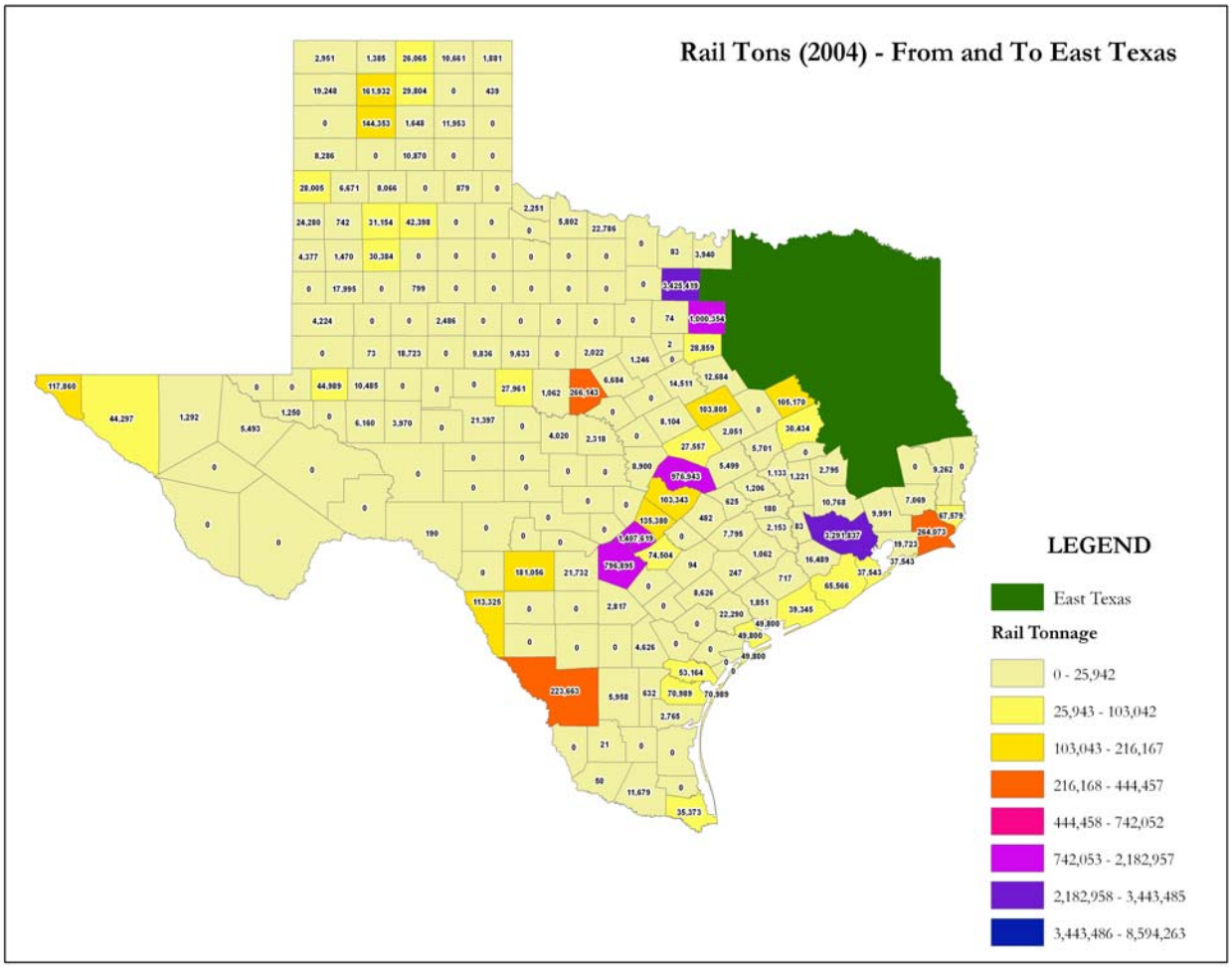


Figure 3-8: 2004 Rail Freight Movements

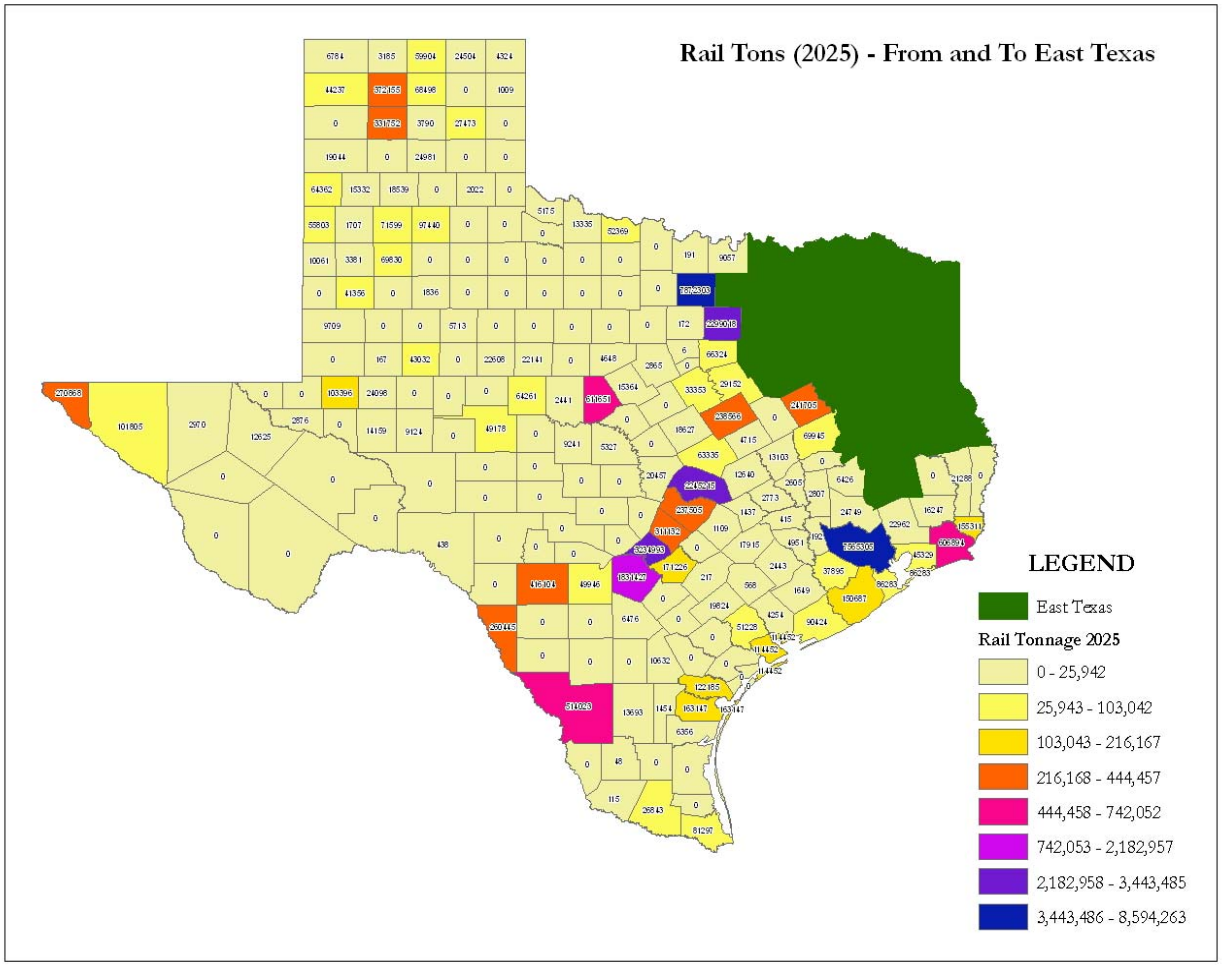


Figure 3-9: 2025 Rail Freight Movements

Rail Freight Movements Outside of the State

The cost effectiveness of utilizing rail to transport cargo over long distances has led to continued growth of tonnage movements between the East Texas region and locations outside of the state. Figures 3-10 and 3-11 illustrate that major rail freight movements will continue between East Texas and New Mexico, Oklahoma, Arkansas, and more moderately from Louisiana and Mexico, with movement from Mexico projected to grow significantly. These new growth opportunities will need to be accommodated and strategic planning will need to occur to capitalize on these emerging markets.

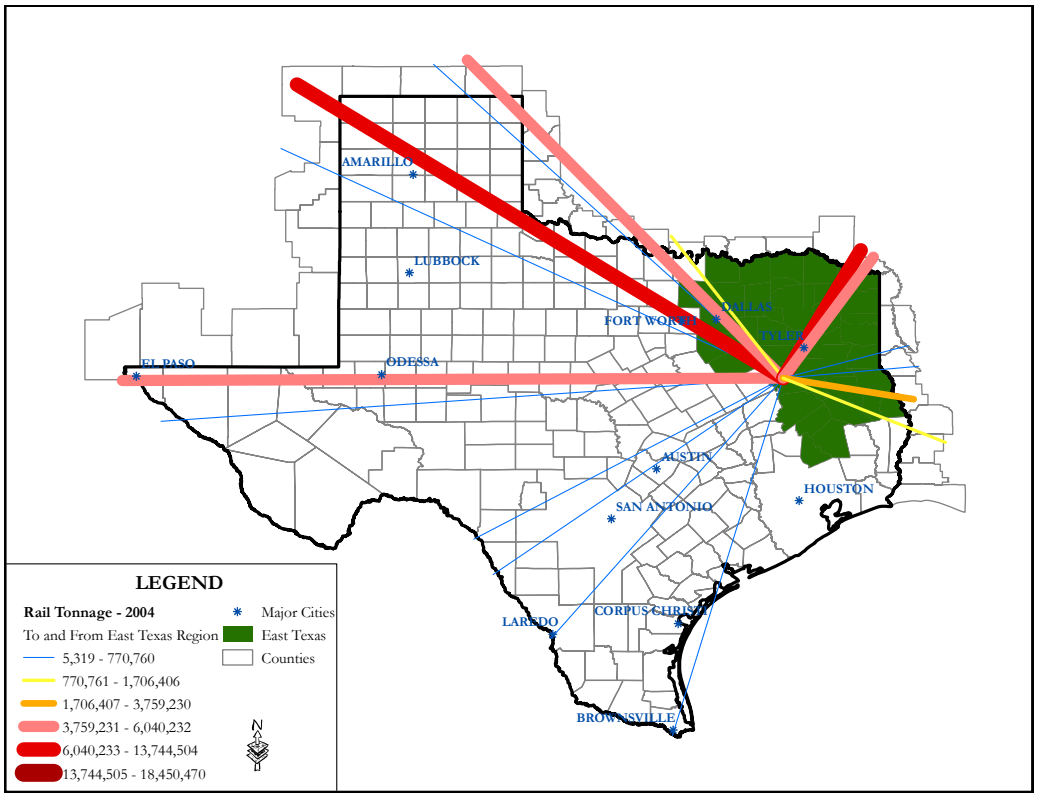


Figure 3-10: 2004 Freight Rail Between Outside of Texas and East Texas

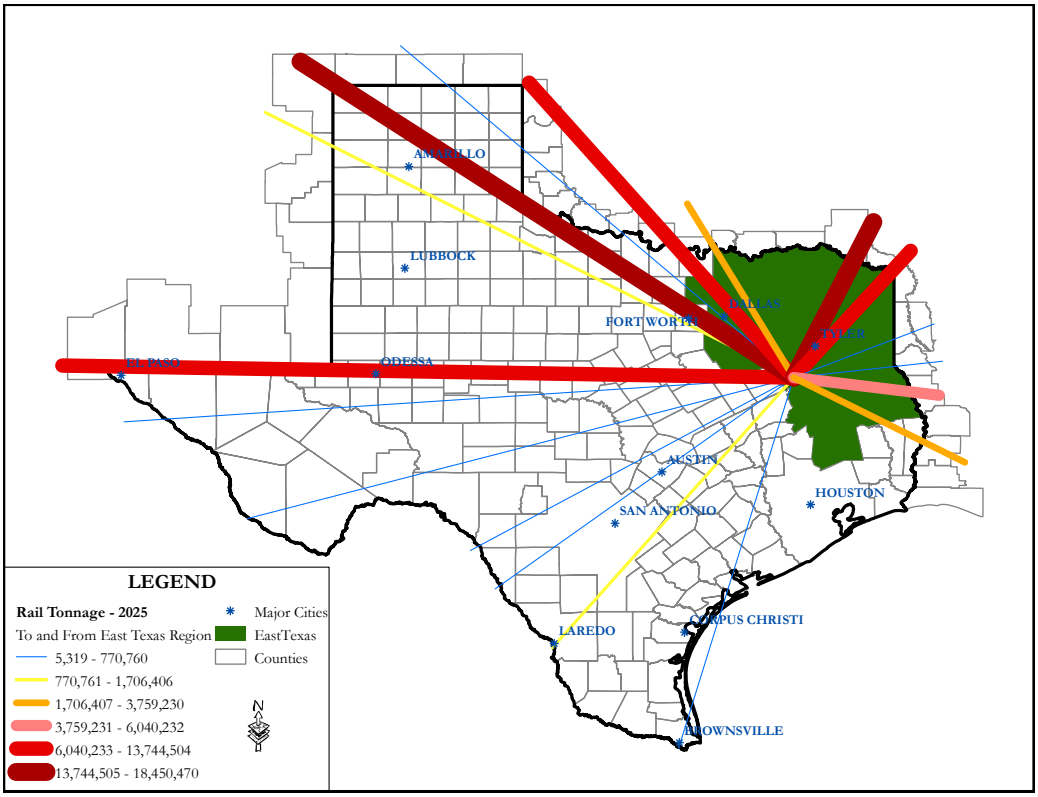


Figure 3-11: 2025 Freight Rail Between Outside of Texas and East Texas

Freight Rail Commodity Trends

Table 3-4 shows a comparison between 2004 and 2025 rail commodities. As mentioned earlier, the overall tonnage is projected to more than double between 2004 and 2025. The commodity with the largest tonnage increase is raw materials, which accounts for the coal movement through the region. The movement of building materials is projected to increase approximately 107 percent. The expected growth in the steel and iron industry could explain the projected increase in building materials. Wood and secondary products were also projected to result in high growth rates. Raw materials and secondary products account for approximately 65 percent of the total rail tonnage movements. Secondary rail commodities include hazardous materials and products that are transferred at intermodal facilities which include containerized or packaged products.

Commodity	Rail Tons		
	2004	2025	Percent Increase
Raw Materials	22,441,581	47,707,993	113%
Secondary	9,507,399	19,261,977	103%
Building Materials	3,917,401	8,101,188	107%
Agriculture	3,364,311	6,931,606	106%
Wood	2,849,019	5,891,773	107%
Chemical/ Petroleum	2,623,562	5,428,930	107%
Food	2,436,225	5,019,439	106%
Machinery	1,157,414	2,393,533	107%
Textiles	979,350	2,025,297	107%
Total	49,276,264	102,761,736	109%

Table 3-4: Rail Freight Commodity Growth

Figures 3-12 and 3-13 display the commodities being moved by rail within the East Texas region. There are no significant changes in the relative percentages of commodity shipped by rail between 2004 (Figure 3-13) and 2025.

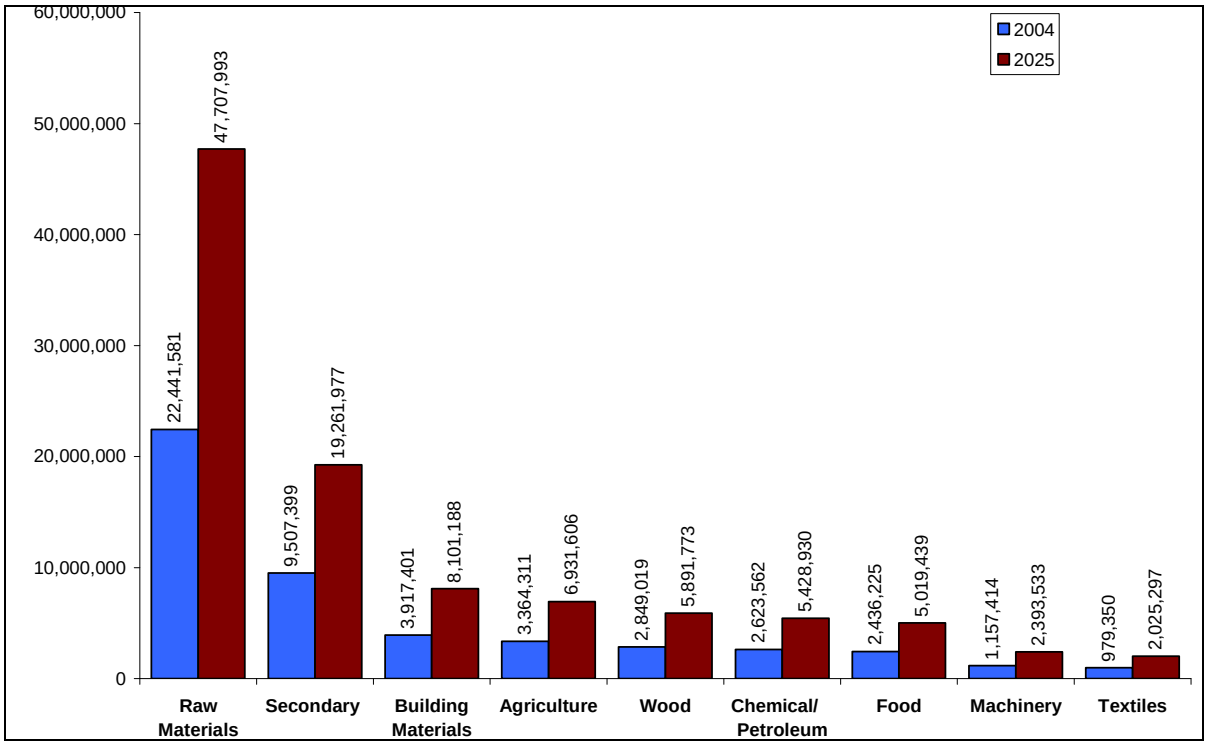


Figure 3-12: Total Freight Rail Tons by Commodity

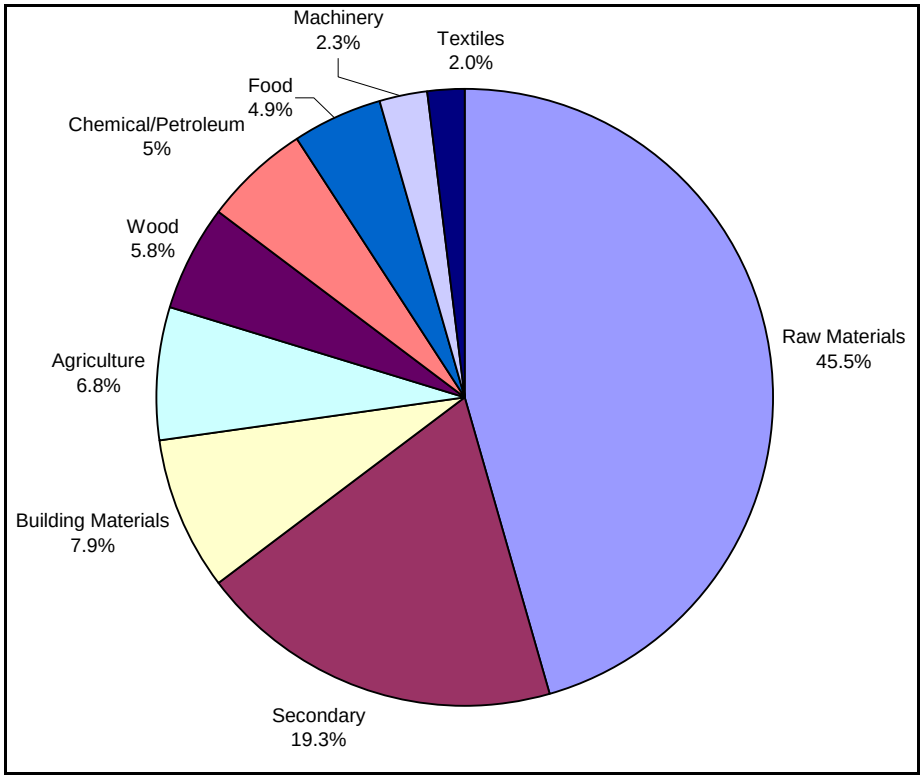


Figure 3-13: Percentage of Freight Rail Tons by Commodity (2004)

The challenge to accommodate the forecasted growth in freight rail will be in planning for new or expanded rail facilities that can capitalize on the growth markets. These new facilities must be planned in a way that allows for the ability to shift the truck cargo burden to rail cars. The percent growth is one way to analyze data; however, examining the percentage that each commodity has on the market is equally important.

Analyzing the trends in commodity movements aids in further understanding the trip generation and distribution of rail freight movements. In general, railways are best suited to hauling large, heavy, low-value loads that are not overly time-sensitive over distances greater than 300 to 400 miles. While growth is expected to occur for all commodity groups analyzed, raw materials is likely to remain the predominant commodity transported by rail for the East Texas region.

Rail Freight Findings Summary

- Freight tonnages moved by rail are projected to more than double by 2025.
- Raw materials are a majority of the freight rail tonnage.
- Rail shipments originating from other states and from Mexico are projected to constitute approximately 61 percent of total rail shipments within the East Texas region.

Rail and Truck Freight Comparison

Table 3-5 and Figure 3-14 provide the total truck and rail tons transported in East Texas for the base year and projected to 2025. The increase between 1998 and 2025 for truck tons represents a 131 percent increase, as opposed to a rail tonnage increase of 109 percent from 2004 to 2025. This increase of both rail and truck tons is substantial and will need to be addressed through additional infrastructure and modal shifts.

The total tonnage transported as well as the projected percentage of increase between the base year and 2025 for truck freight is higher than that for rail freight. The massive investment in highway construction has made it more convenient and quicker for trucks to carry long haul cargo. With similar investments made to rail infrastructure this trend can be adjusted.

Year	Truck	Rail
1998 (Truck), 2004 (Rail)	256,809,548	49,276,264
2025	593,494,395	102,761,736
Percent Increase	131%	109%

Table 3-5: Rail and Truck Tons Comparison

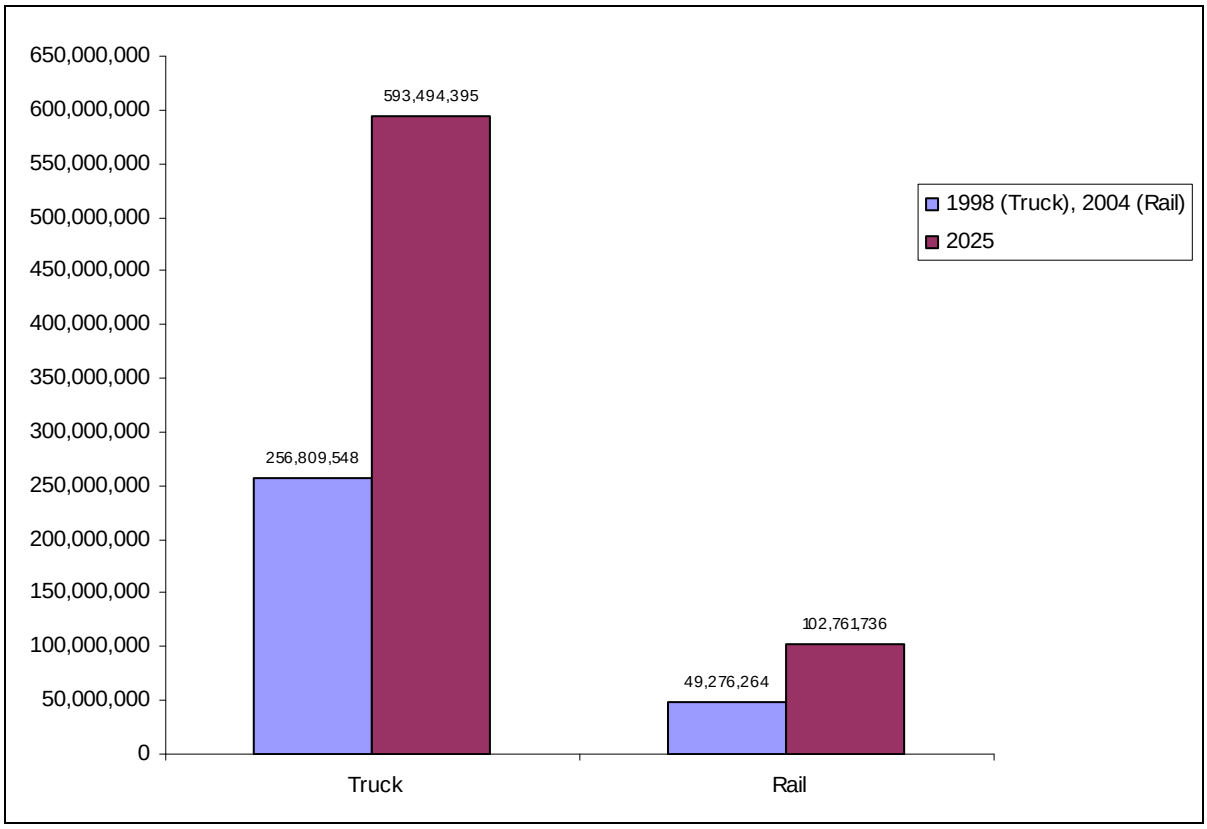


Figure 3-14: Total Rail / Truck Tons

The total combined tonnage shipped by both truck and rail are projected to increase by 127 percent by 2025. The majority of freight movement entering and leaving the East Texas region either originates or is destined for other Texas counties. Table 3-6 illustrates that approximately 63 percent of the projected combined truck and rail tonnage begins or ends in other Texas counties outside of the East Texas region. Of the trips originating or ending outside the state, approximately 53 percent are projected to go to/from the northern U.S.

The projected internal tons shipped by truck within the East Texas region for 2025 is more than 30 million tons (Table 3-1) while the projected internal rail shipments are shown as more than 270 thousand tons (Table 3-3). The internal combined freight movement is projected to increase approximately 139 percent with the trucks projected to haul nearly 110 times more cargo than rail cars. The trucks leaving the Region are projected to haul approximately 1,130 percent more cargo than rail cars while the trucks entering the Region are projected to haul approximately 286 percent more cargo. The projected truck freight growth for movements entering and leaving the Region might be due to the food products, building materials and large timber industry within northeast Texas and because it is generally more economically feasible to ship by truck for destinations within a 500 mile radius.

Combined Truck and Rail Tons				
Origin	**Termination**	**1998/2004**	**2025**	**Percent Change**
Internal to Internal				
East Texas Region	East Texas Region	12,833,342	30,645,893	139%
Internal to External				
East Texas Region	Other Texas Counties	95,742,099	225,157,043	135%
East Texas Region	Western U.S.	2,683,216	6,196,155	131%
East Texas Region	Northern U.S.	17,426,622	42,454,840	144%
East Texas Region	Eastern U.S.	5,650,569	13,560,148	140%
East Texas Region	Mexico	8,448,338	20,578,507	144%
External to Internal				
Other Texas Counties	East Texas Region	101,297,749	215,887,975	113%
Western U.S.	East Texas Region	7,329,590	16,126,783	120%
Northern U.S.	East Texas Region	32,972,644	75,465,021	129%
Eastern U.S.	East Texas Region	8,899,603	20,430,922	130%
Mexico	East Texas Region	12,802,041	29,752,845	132%
Total		**306,085,812**	**696,256,131**	**127%**

Table 3-6: Combined Rail and Truck Tons

TxDOT - Atlanta District

This section describes the freight flow movement in terms of truck and rail commodity flow for TxDOT's Atlanta District. Network improvements updated in the SAM to reflect projects cited in the District's list of planned projects are shown in Figure 3-15 and are listed individually in Table D-1 in Appendix D.

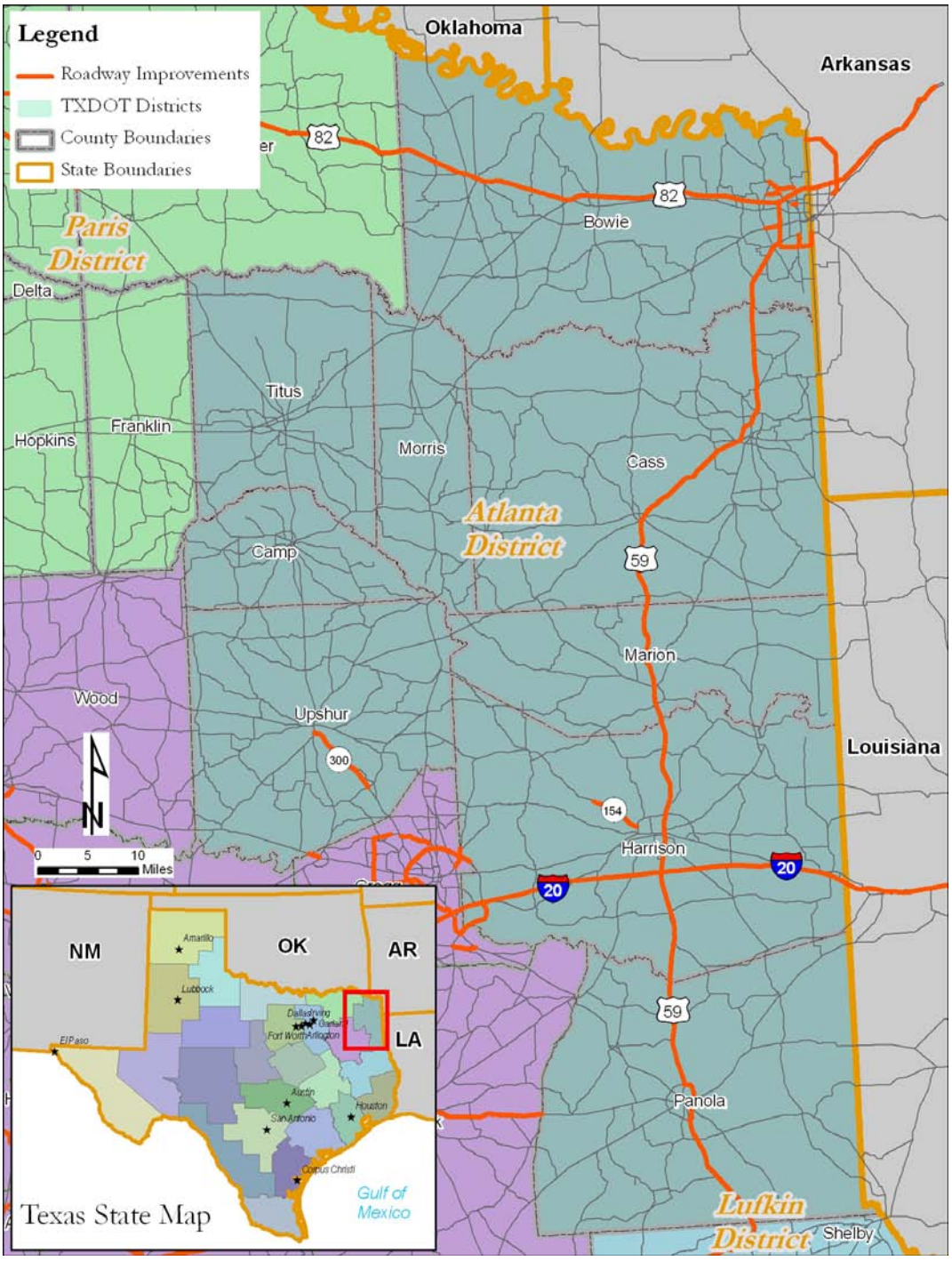


Figure 3-15: Future Network Improvements for the Atlanta District

Truck Freight Movements and Commodities

Table 3-7 illustrates that while the movement of truck tons within the Atlanta District is projected to increase by nearly 365,000 tons between 1998 and 2025, it is small when compared to the increased movements coming into (6.1 million) and out of (10.1 million) the Atlanta District.

Annual Truck Tons				
Origin	**Termination**	**1998**	**2025**	**Percent Change**
Internal to Internal				
Atlanta District	Atlanta District	282,423	648,064	129%
Internal to External				
Atlanta District	Other Texas Counties	5,610,953	15,116,728	169%
Atlanta District	Western U.S.	23,445	40,958	75%
Atlanta District	Northern U.S.	541,560	946,104	75%
Atlanta District	Eastern U.S.	201,252	351,587	75%
Atlanta District	Mexico	23,250	40,617	75%
External to Internal				
Other Texas Counties	Atlanta District	5,052,622	10,537,208	109%
Western U.S.	Atlanta District	19,818	39,512	99%
Northern U.S.	Atlanta District	457,783	912,693	99%
Eastern U.S.	Atlanta District	170,119	339,170	99%
Mexico	Atlanta District	19,653	39,183	99%
	Total	**12,402,878**	**29,011,824**	**134%**

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

Table 3-7: Annual Truck Tons

Truck Movements within the State

Figures 3-16 and 3-17 show the existing and projected truck tonnage movement between the Atlanta District and other Texas counties. Figure 3-16 illustrates that in 1998 large numbers of trucks moved between the Atlanta District and the Dallas-Fort Worth metroplex, Houston, San Antonio, El Paso, and Austin, as well as areas along the U.S.-Mexico border. The largest origins and destinations were located in the Dallas-Fort Worth metroplex and the Houston region. A major portion of the Atlanta District truck movements use the I-35 corridor between Dallas and San Antonio. Figure 3-17 projects continued growth of truck traffic between the Atlanta District and the major urban areas currently served.

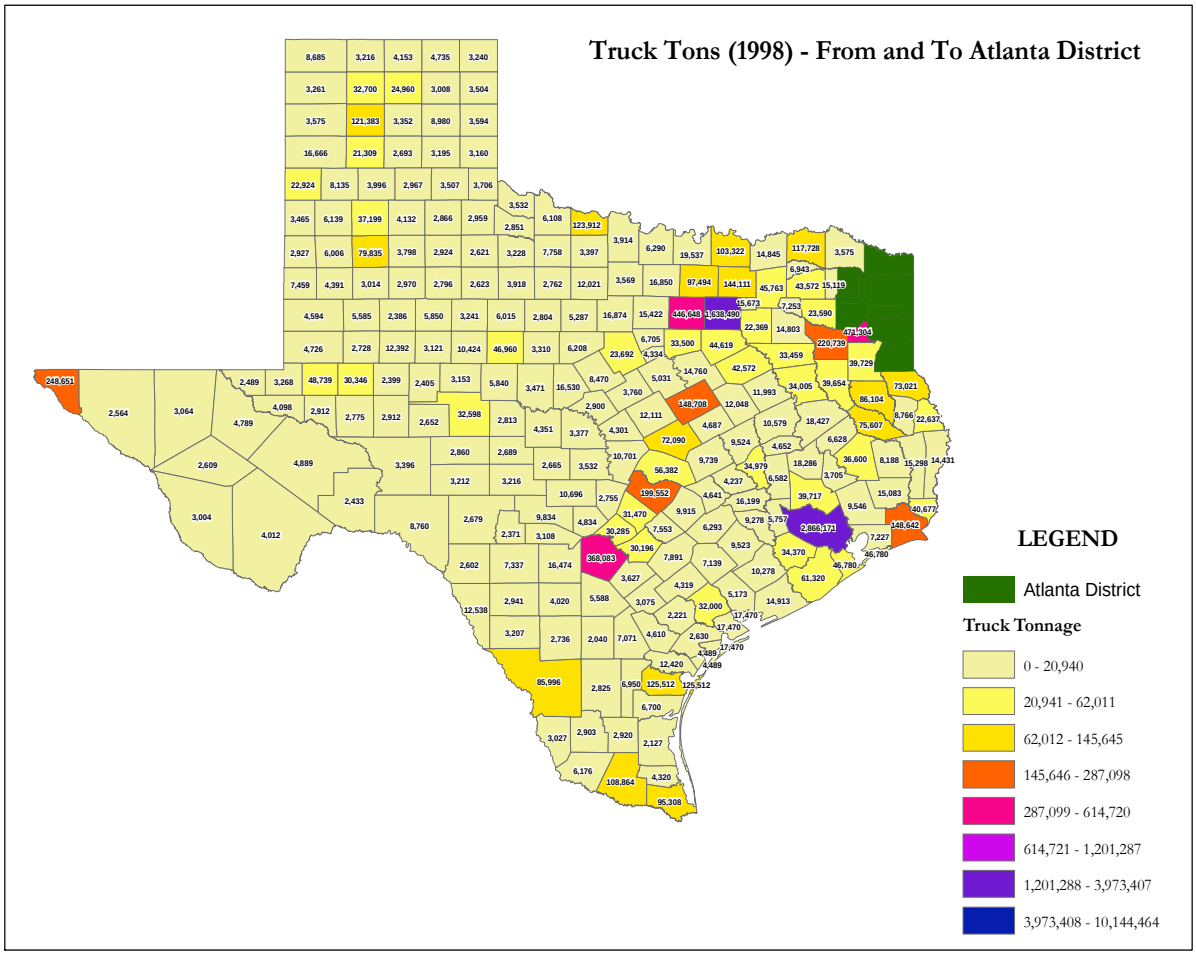


Figure 3-16: 1998 Truck Movements within Texas To and From Atlanta District

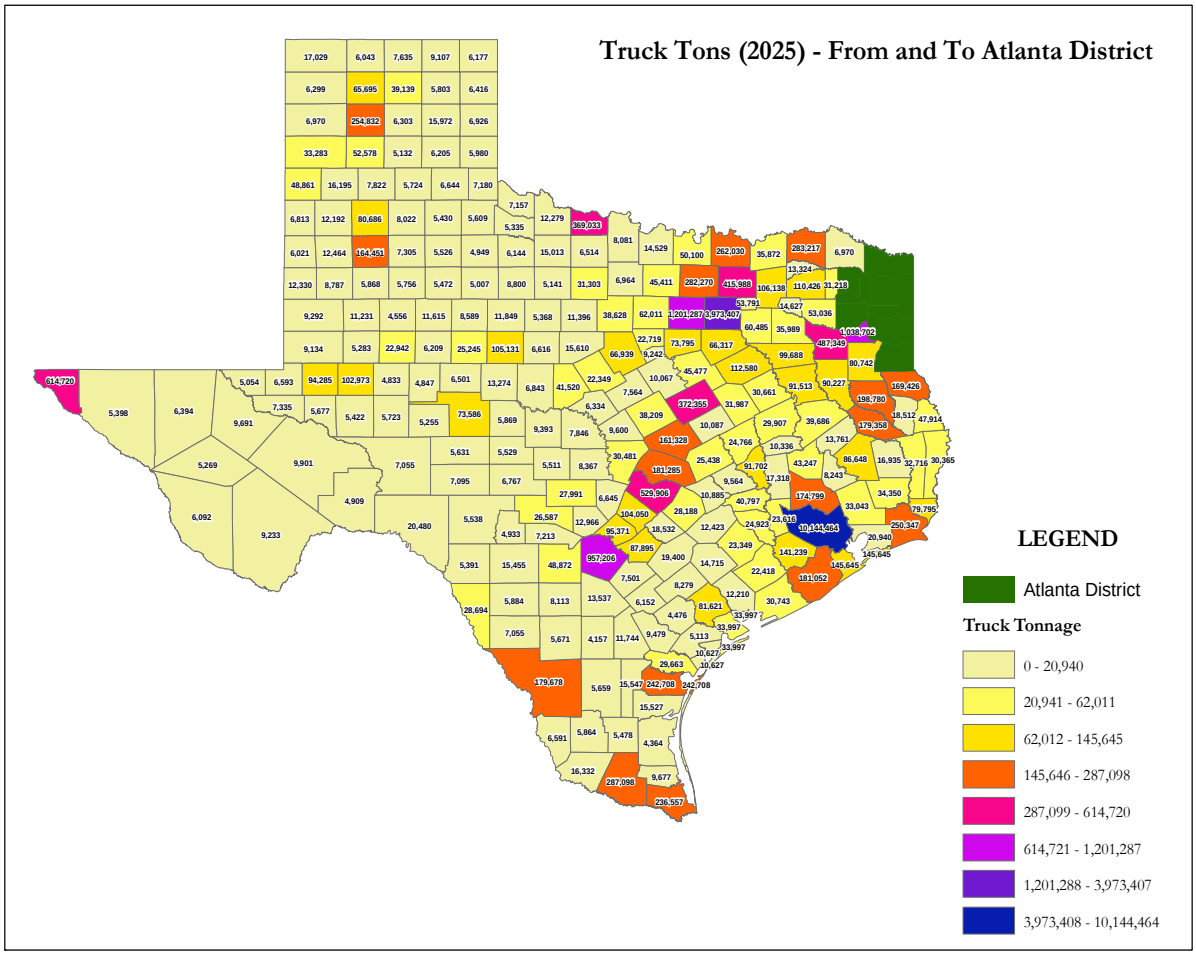


Figure 3-17: 2025 Truck Movements within Texas To and From Atlanta District

Truck Movements Outside of the State

Movements between the District and other parts of the country represent trucks that are relegated to long haul trips. Major movements in 1998 occurred between the Atlanta District and Arkansas, Louisiana, Oklahoma, and New Mexico as shown in Figure 3-18. Figure 3-19 demonstrates the projected increases to and from market areas outside of Texas in 2025.

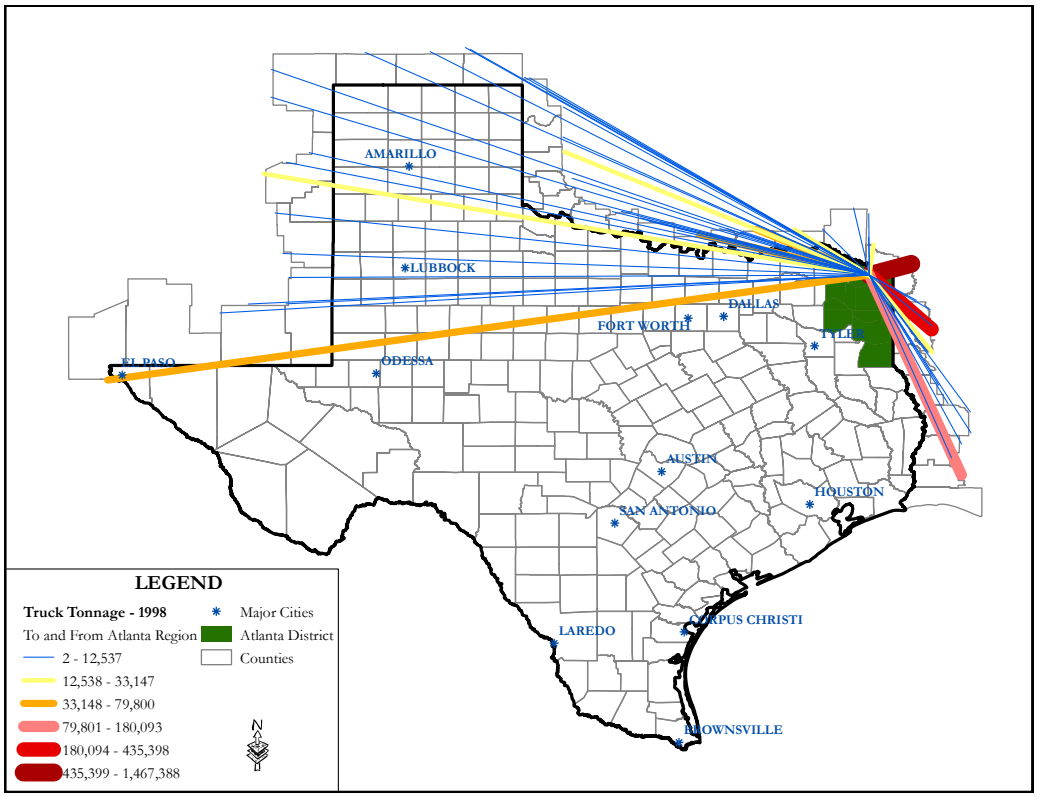


Figure 3-18: 1998 Truck Movements Between Atlanta District and Outside of Texas

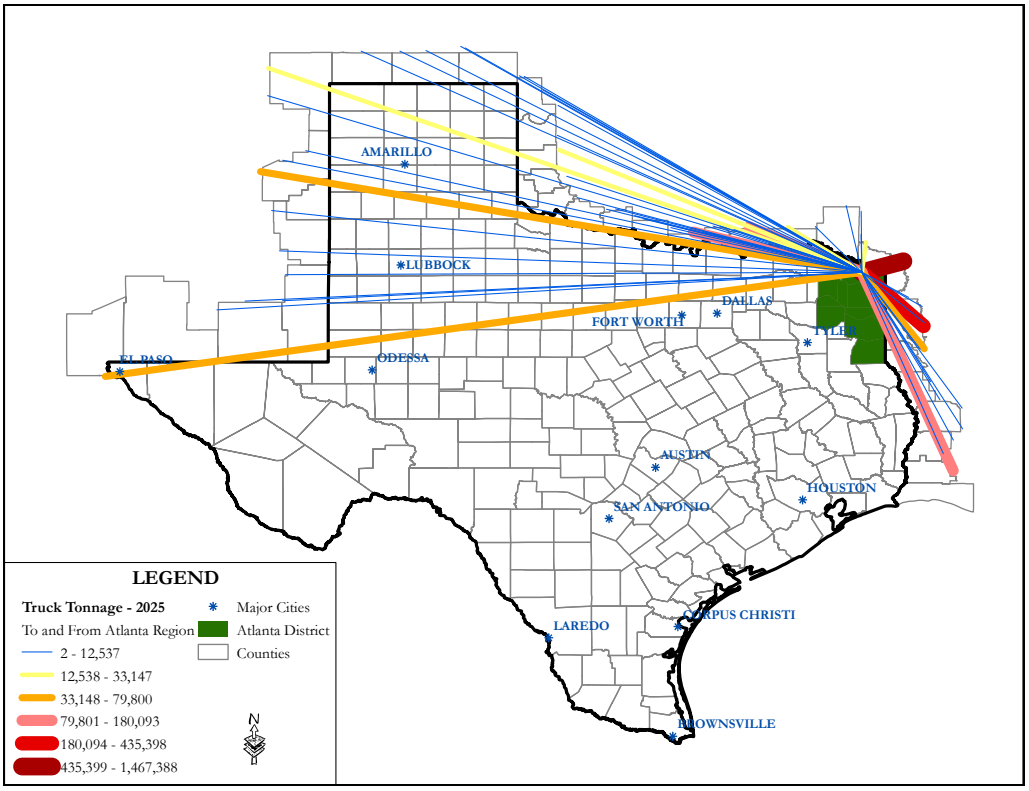


Figure 3-19: 2025 Movements Between Atlanta District and Outside of Texas

Truck Commodity Trends

Table 3-8 shows that building materials will be the fastest growing commodity in terms of the weight of increased tonnage, as well as producing the largest total tonnage. Building materials truck tonnage is projected to more than triple by 2025. Additionally, it is noteworthy to mention the lack of raw materials projected to be moved by truck within and through the Atlanta District. The reason for this anomaly could be explained by two reasons. First, the data used to determine truck tonnage movement for each commodity was a sampling of truck movement throughout the state; therefore, the sampling did not identify any raw materials being moved in this area. Secondly, the predominant raw material for the region is coal. Coal is a bulk commodity better suited for rail movement. The majority of the facilities in the region that require the movement of coal provide direct access to rail facilities, minimizing the movement of coal by truck.

Commodity	**Truck Tons**		
	1998	**2025**	**% Increase**
Building Materials	4,217,727	13,318,760	216%
Wood	2,103,288	4,568,711	117%
Agriculture	9,058	14,040	55%
Textiles	108,409	230,301	112%
Chemical/Petroleum	1,787,647	2,198,287	23%
Food	2,467,325	5,199,583	111%
Machinery	117,465	248,255	111%
Raw Materials	-	-	0%
Secondary	1,591,958	3,233,886	103%
TOTAL	12,402,877	29,011,824	134%

Table 3-8: Truck Commodity Growth

Since projected growth was based on 1998 information, surveys, interviews, and additional data were used to supplement the compiled data used in commodity projections. As determined from recent interviews with economic development groups and industry professionals, the building materials commodity is expected to show the most significant growth in the future. The District is also home to major wood products and food products industries that are expanding processing and shipping requirements for trucks. These facilities are primarily located in or near the cities of Texarkana, Mount Pleasant, Longview, and Marshall. These examples are just a sampling of the industry growth that is currently occurring in the Atlanta District. Figures 3-20, 3-21 and 3-22 further illustrate the commodity tonnage within the Atlanta District for both 1998 and 2025.

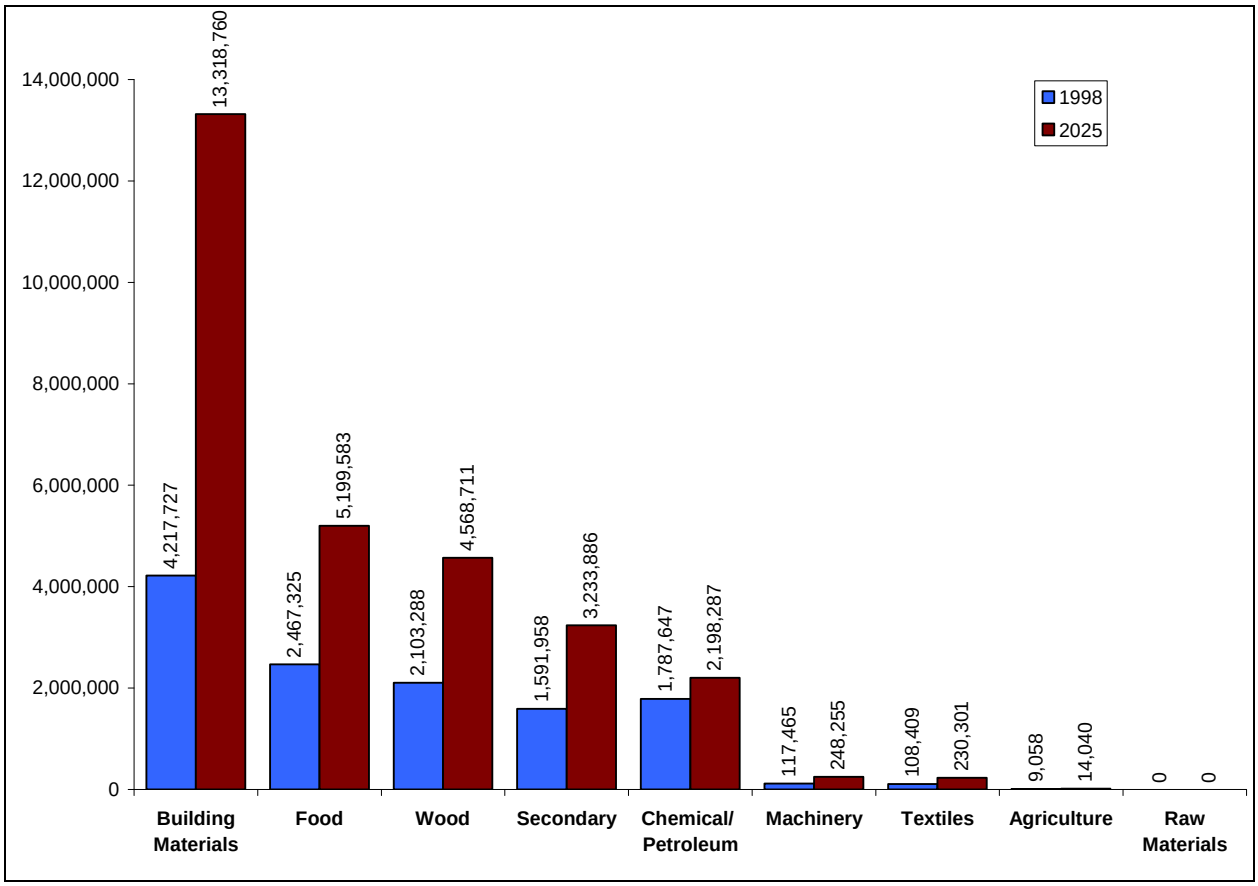


Figure 3-20: Total Truck Tons by Commodity

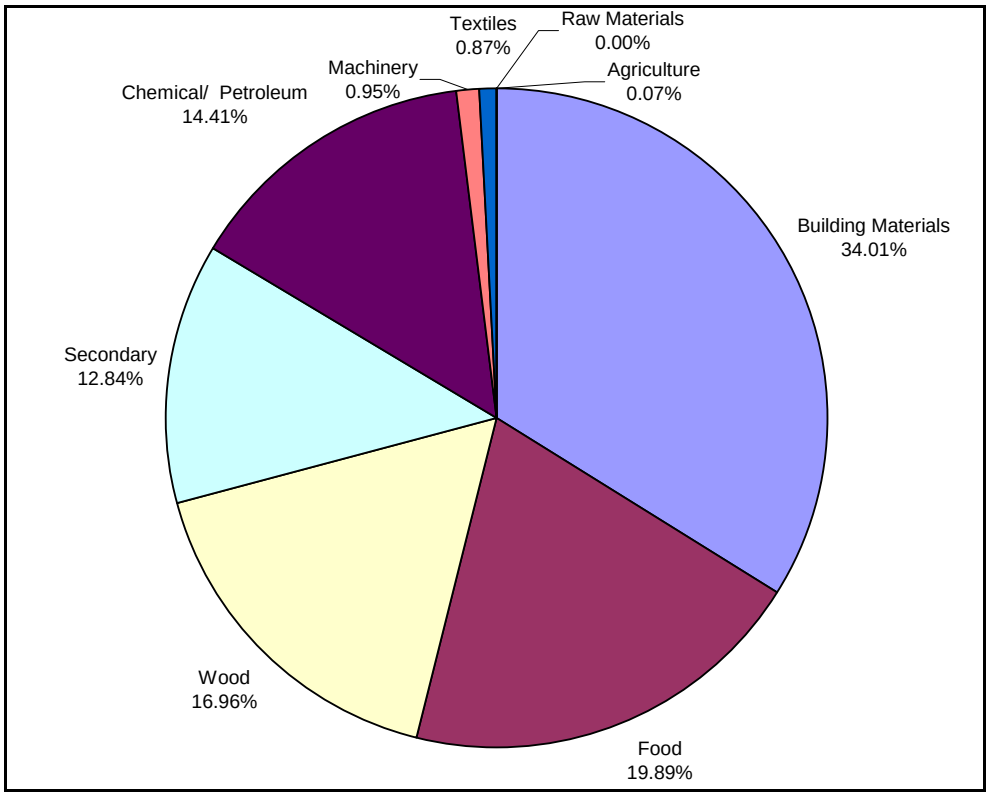


Figure 3-21: Percentage of Truck Tons by Commodity (1998)

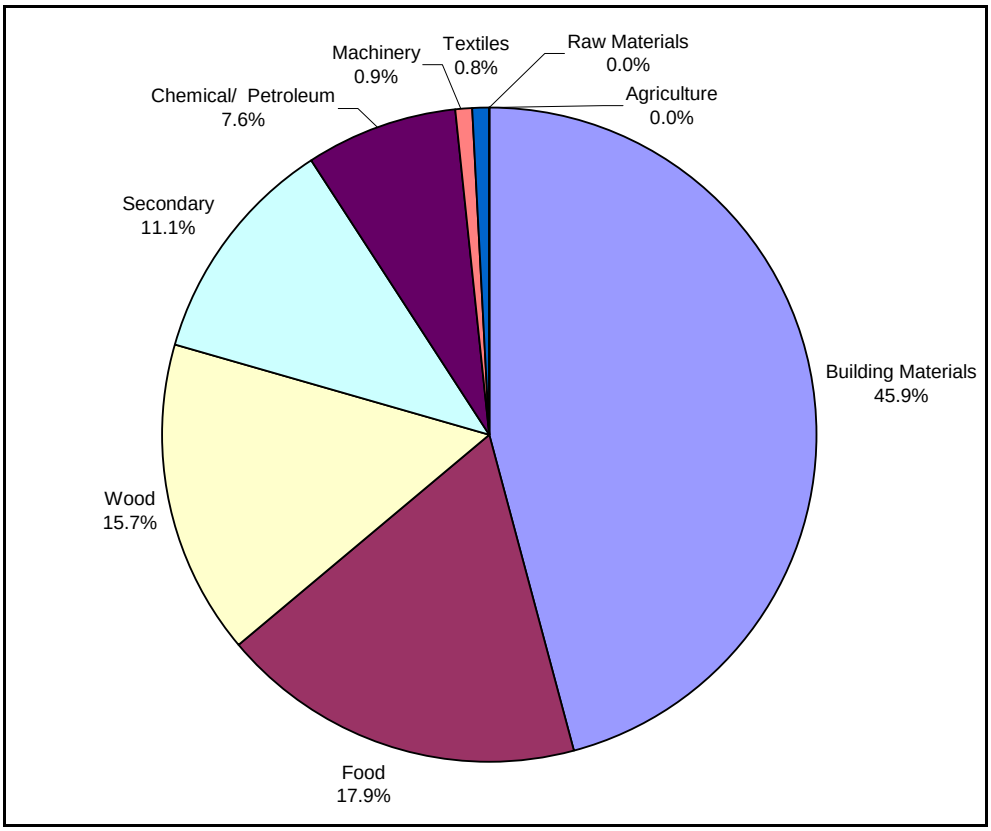


Figure 3-22: Percentage of Truck Tons by Commodity (2025)

Traffic Volume Analysis

Traffic data including total traffic volumes, truck volumes, percentage of trucks, and V/C are listed for individual roadway segments in the Atlanta District as shown in Table E-1 and E-2 (in Appendix E) for 1998 and 2025, respectively. Figure E-1 graphically shows the locations at which such traffic data is provided.

The primary areas of roadway congestion in the Atlanta District were in the urban area near the city of Texarkana, although other locations of minor capacity deficiencies were identified in Mount Pleasant and Daingerfield. The following figures show the existing and projected congestion in the District and the urban areas of Texarkana. Figures 3-23 and 3-25 show areas of congestion district-wide, while Figures 3-24 and 3-26 highlight the expected areas of congestion in the city of Texarkana for 1998 and 2025. It should be noted that the large area north of I-30 in Figure 3-26 is projected to experience congestion due to the proposed Red River Depot transload site at that location.

The major freeways and arterials through Texarkana are the predominant areas of projected congestion. The I-30, U.S. 59, and U.S. 71 corridors were projected to experience higher congestion levels for the base and future year volumes. Specifically, the business U.S. 59 and U.S. 71 arterial routes were projected to experience serious congestion by 2025.

As Tables E-1 and E-2 (in Appendix E) show, heavy truck traffic occurs in several areas within the District. Approximately 30 percent or more of the traffic traveling east-west along the I-20 and I-30 corridors is trucks. The truck traffic traveling north or south along U.S. 59 (between 24 and 39 percent trucks) from Carthage to Texarkana will typically travel through the town centers or business districts often creating congestion at local intersections. The interaction of heavy truck traffic with local traffic can often cause bottleneck and related safety issues. Additional areas within the District exhibit high percentages of truck traffic and as industries such as manufacturing and warehouse distribution centers continue to locate to the area, truck traffic will increase.

It was also determined that local roadways often become congested at locations with at-grade crossings within the cities of Texarkana, Marshall, and Mount Pleasant.

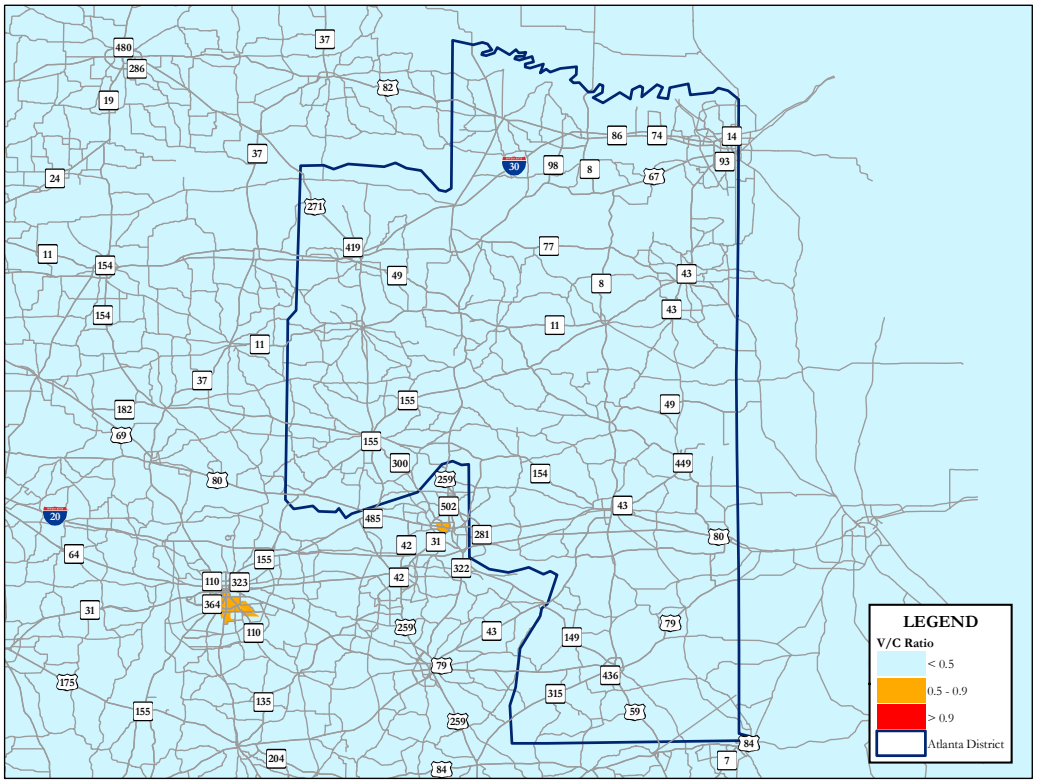


Figure 3-23: 1998 Congestion for Atlanta District (based on SAM modeling)

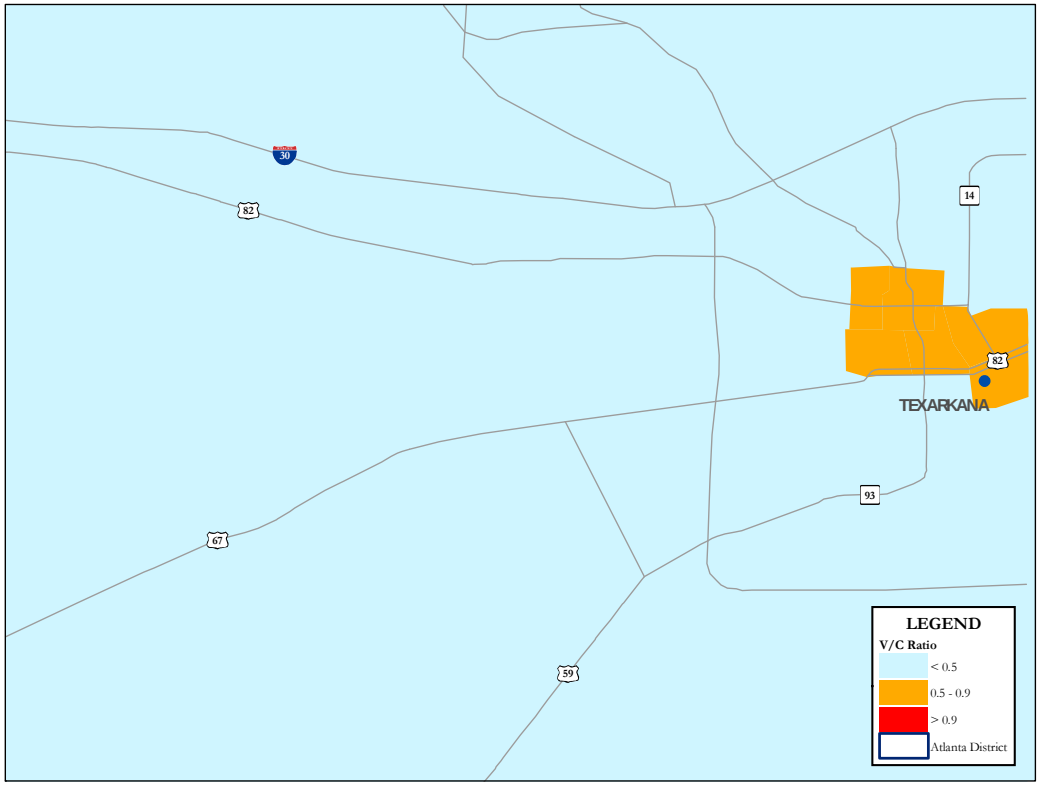


Figure 3-24: 1998 Congestion for City of Texarkana (based on SAM modeling)

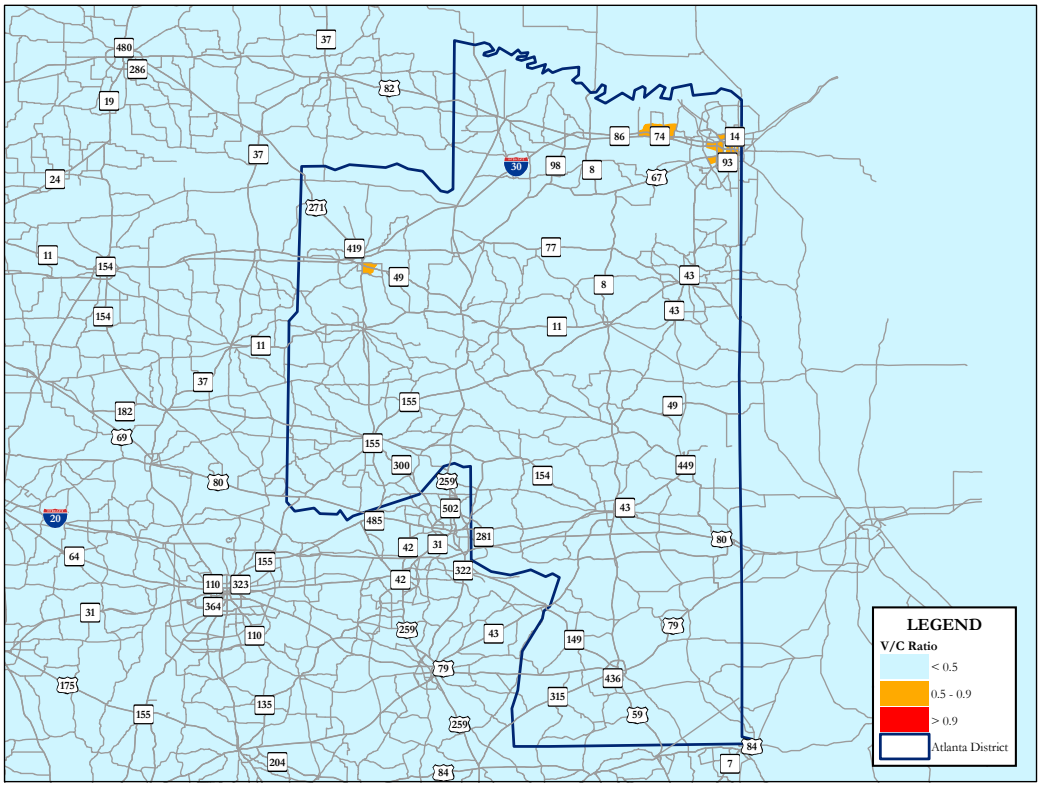


Figure 3-25: 2025 Congestion for Atlanta District (based on SAM modeling)

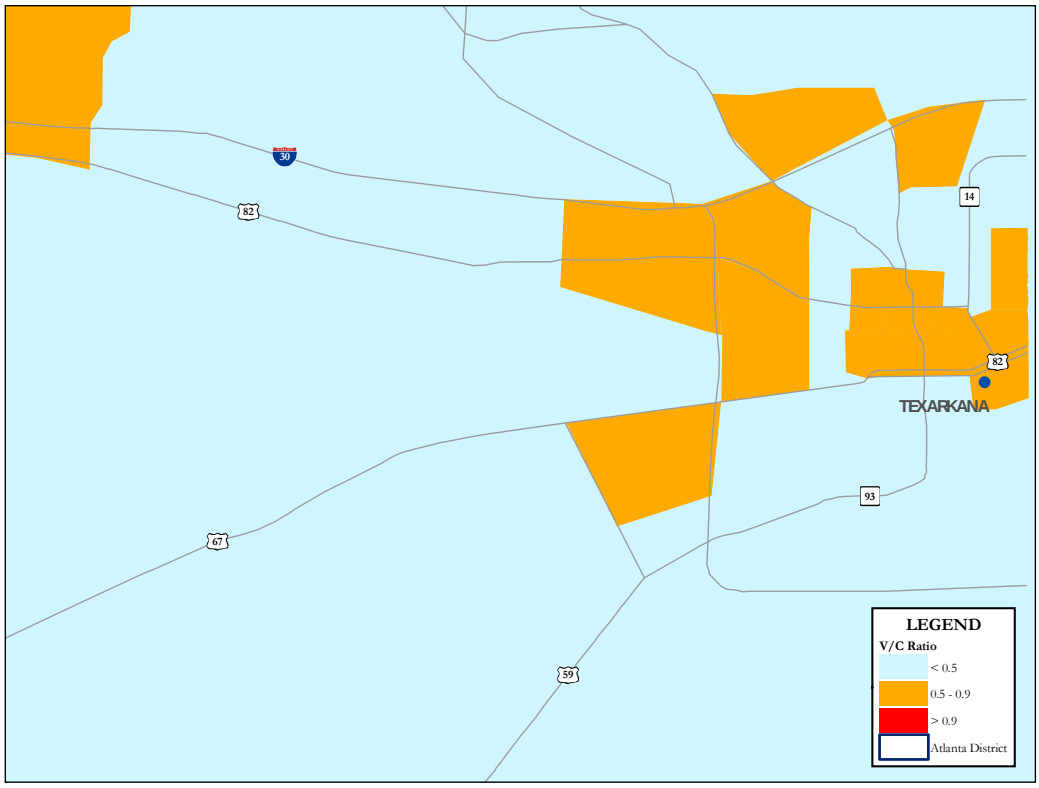


Figure 3-26: 2025 Congestion for City of Texarkana (based on SAM modeling)

Rail Freight Movements and Commodities

Rail freight movements and commodities within and through the Atlanta District as well as those commodities destined for other locations outside of the state were included in the analysis of rail movement.

Existing Rail Network

Figure 3-27 depicts the existing railroad network for the Atlanta District based on the Texas State Railroad Map prepared by TxDOT. The three Class I railroads that serve the Atlanta District move the most significant amounts of freight over long distances and own track spanning several states.

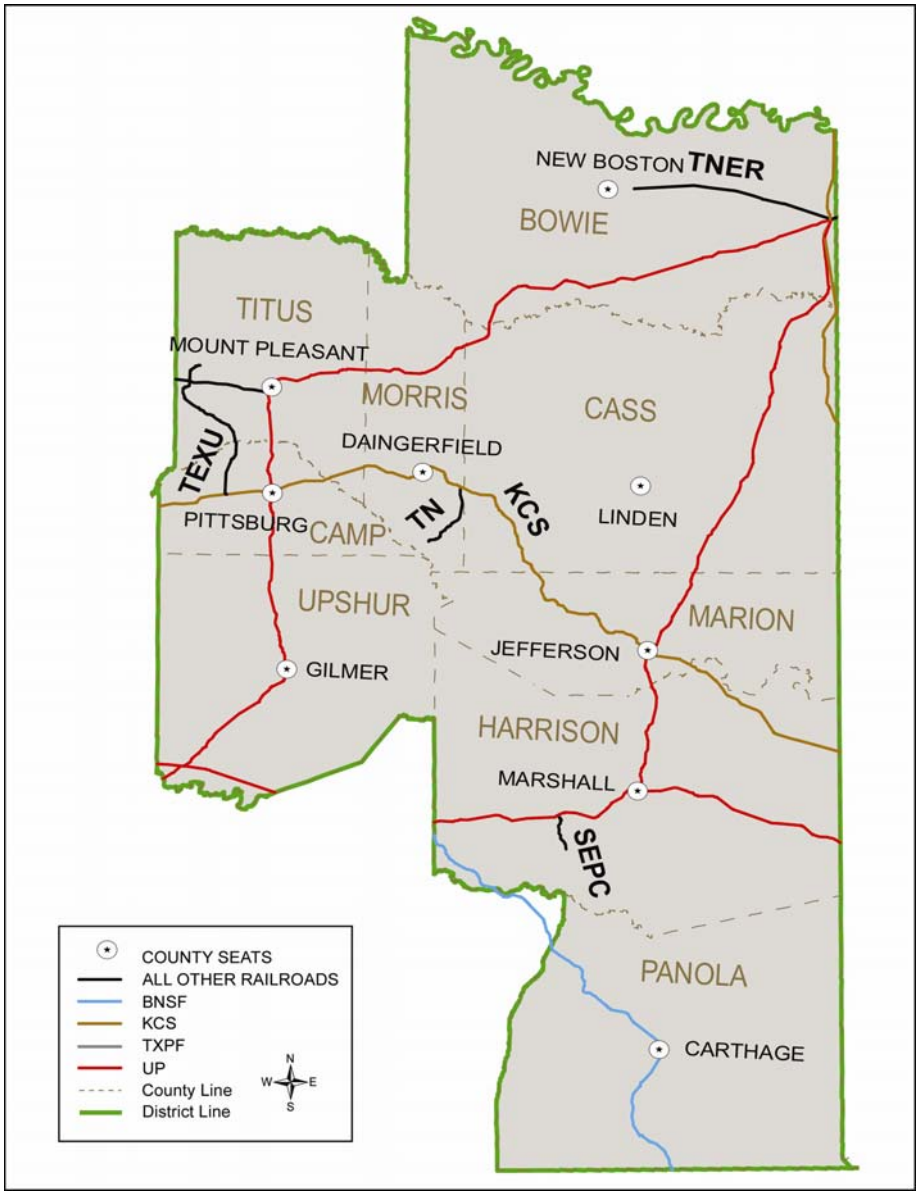


Figure 3-27: Rail Network within Atlanta District

The Atlanta District is also served by three shortline railroads (TNER, BLR, and TN) and a TXU railroad. TXU owns their own railroad serving their power plants and operates their own trains as well as being served by the KCS. These shortline railroads often engage in specialized services to a specific company or industry and are typically concentrated in small geographic areas.

Rail Freight Movements for the Atlanta District, the State, and the Country

Table 3-8 illustrates that the Atlanta District will continue to import a great deal of commodities by the year 2025. While a slight increase in rail freight movement is projected to occur internally to the District, approximately 10.5 million additional tons are projected to be transported from the Atlanta District to and from places outside Texas between 2004 and 2025. An additional 929,000 tons will be transported to/from other Texas counties between 2004 and 2025.

Annual Rail Tons				
Origin	**Termination**	**2004**	**2025**	**Percent Change**
Internal to Internal				
Atlanta District	Atlanta District	42,250	72,500	72%
Internal to External				
Atlanta District	Other Texas Counties	309,642	713,632	130%
Atlanta District	Western U.S.	200,491	469,884	134%
Atlanta District	Northern U.S.	543,701	1,274,253	134%
Atlanta District	Eastern U.S.	32,512	76,197	134%
Atlanta District	Mexico	23,325	54,665	134%
External to Internal				
Other Texas Counties	Atlanta District	538,873	1,063,522	97%
Western U.S.	Atlanta District	1,974,111	4,332,358	119%
Northern U.S.	Atlanta District	5,353,484	11,748,684	119%
Eastern U.S.	Atlanta District	320,126	702,544	119%
Mexico	Atlanta District	229,662	504,014	119%
Total		**9,568,176**	**21,012,254**	**120%**

*Source: Statewide Analysis Model based on 2004 Surface Transportation Board Waybill Data

Table 3-8: Rail Freight Movements

Rail Freight Movements within the State

Figure 3-28 illustrates the origin and destinations for freight rail movements occurring in 2004 while Figure 3-29 depicts 2025 movements. Harris, Galveston, Dallas, Tarrant, Travis, Bexar and Jefferson Counties appear to be handling the largest movements to and from the Atlanta District both in 2004 and 2025. The amount of rail tonnage shown in 2004 and projected in 2025 for the counties bordering the Mexico Ports of Entry at Laredo, El Paso, and Brownsville are projected to significantly increase, as Texas and U.S. trade with Mexico continues to expand.

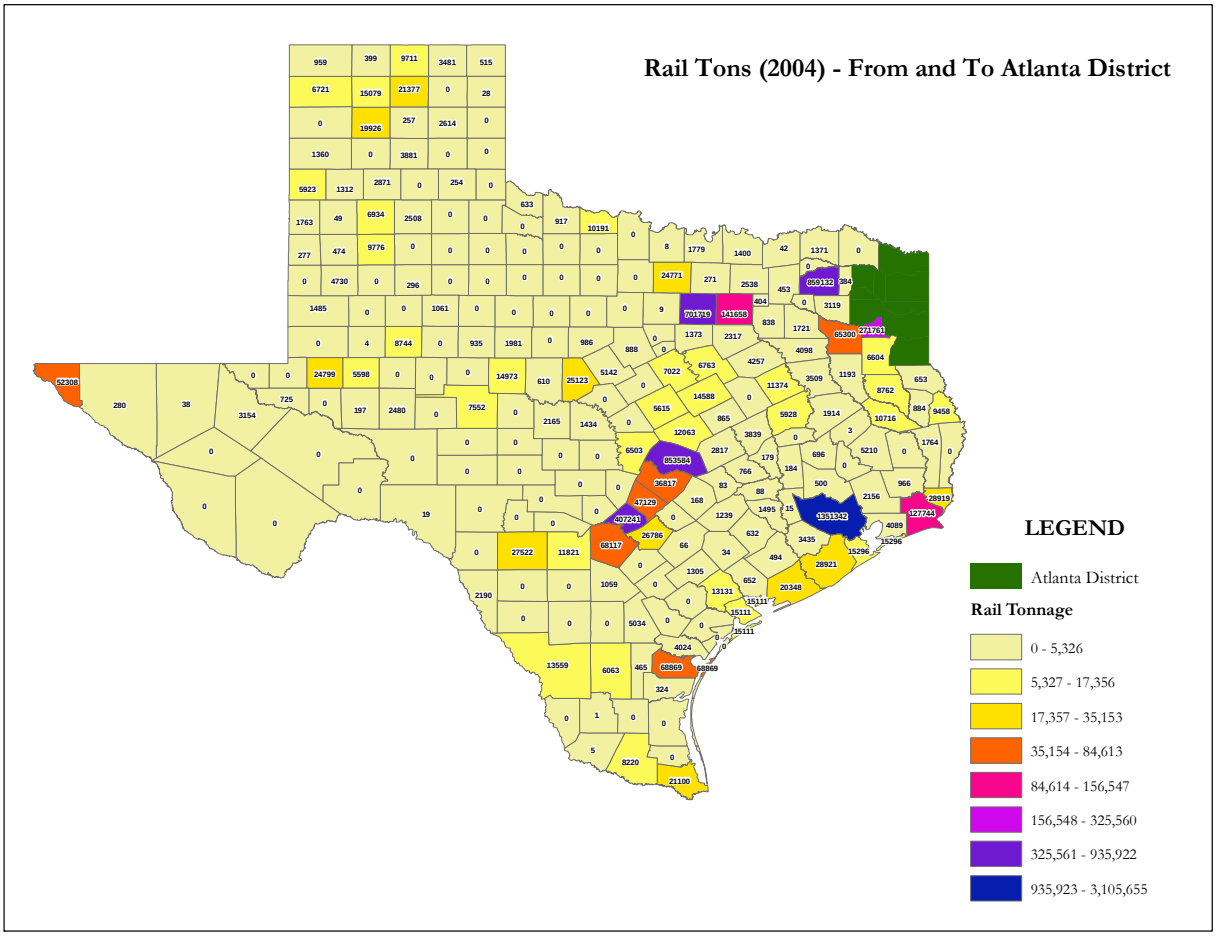


Figure 3-28: 2004 Rail Freight Movements

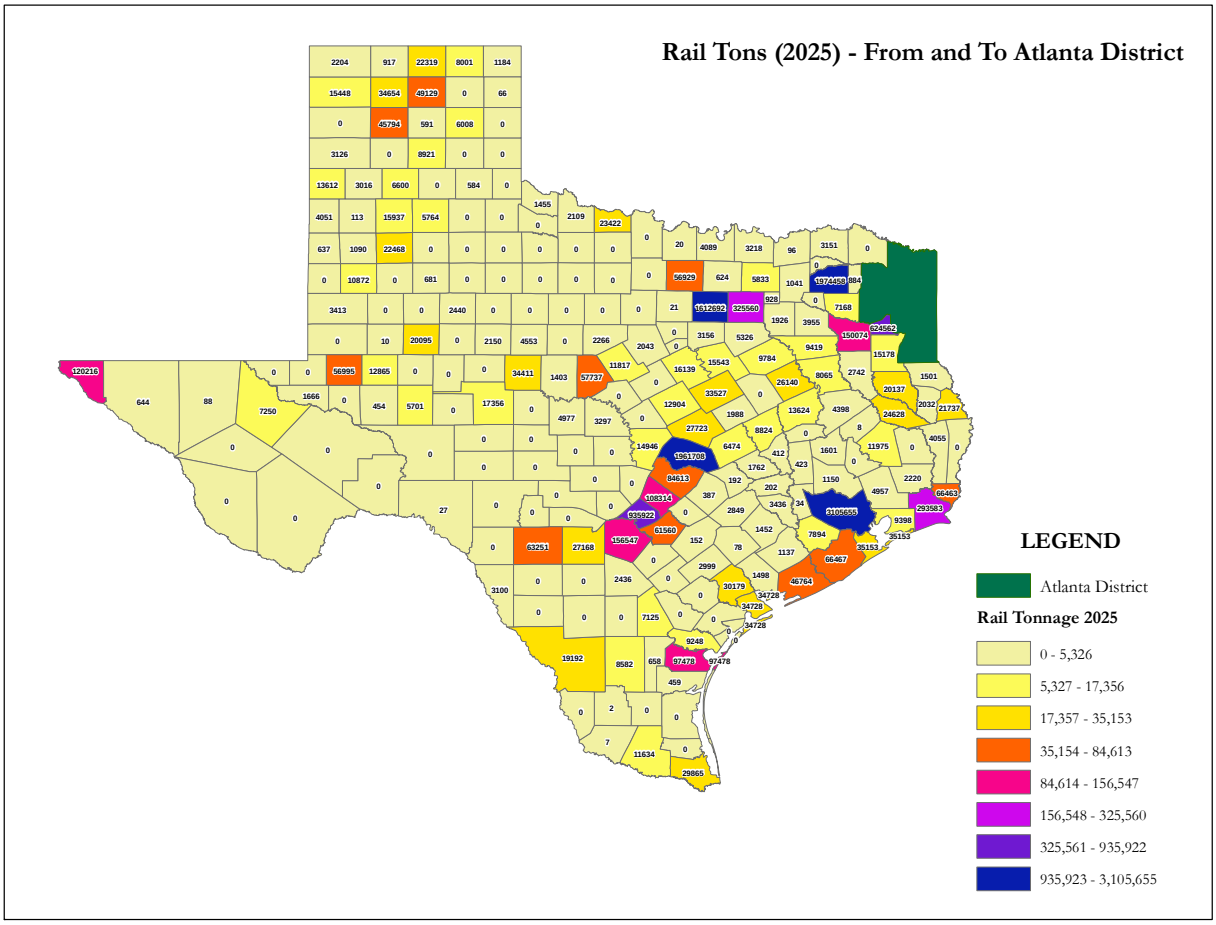


Figure 3-29: 2025 Rail Freight Movements

Rail Freight Movements Outside of the State

The cost effectiveness of utilizing rail to transport cargo over long distances has led to continued growth of tonnage movement between the Atlanta District and locations outside of the State. Figures 3-30 and 3-31 illustrate that major rail freight movements in 2004, particularly coal, are occurring from New Mexico, Colorado, and Wyoming. By 2025 the volume of rail freight is projected to expand as new coal-fired energy plants are constructed in the District. Rail freight movement to the upper plains area and Midwest via Arkansas and Oklahoma is projected to increase the most by 2025, although shipments west via El Paso, and east via Louisiana are also projected to grow.

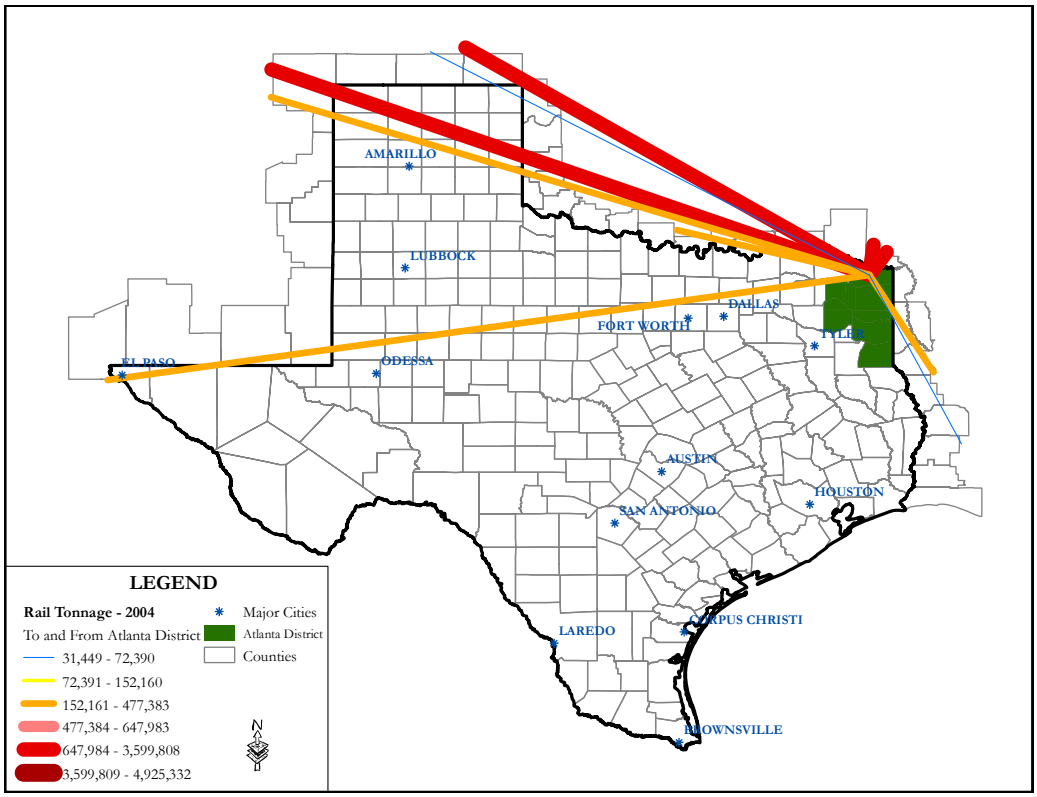


Figure 3-30: 2004 Freight Rail Between Atlanta District and Outside of Texas

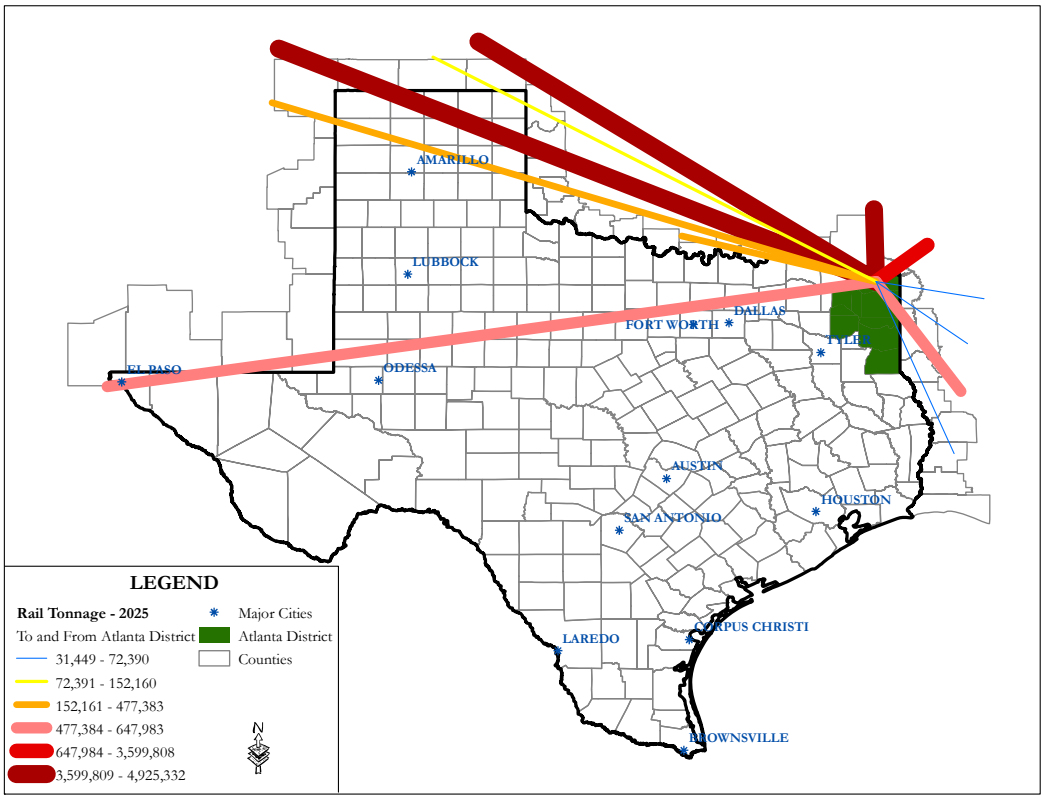


Figure 3-31: 2025 Freight Rail Between Atlanta District and Outside of Texas

Freight Rail Commodity Trends

Table 3-9 shows a comparison between 2004 and 2025 rail commodities. The raw materials tonnage increase of about 9.5 million tons is significantly greater than all other commodity tonnage increases; although, the commodity with the largest percent of increase in tonnage is secondary products.

Commodity	Rail Tons		
	2004	2025	Percent Increase
Raw Materials	7,913,872	17,352,095	119%
Building Materials	369,633	820,327	122%
Agriculture	368,968	810,020	120%
Wood	268,824	596,601	122%
Food	267,184	586,566	120%
Secondary	117,638	266,454	127%
Machinery	109,210	242,369	122%
Textiles	92,408	205,082	122%
Chemical/ Petroleum	60,439	132,740	120%
Total	9,568,176	21,012,254	120%

Table 3-9: Rail Freight Commodity Growth

Figures 3-32 and 3-33 display commodities being moved by rail within the Atlanta District. The percentages of freight rail by commodity do not significantly change from 2004 (Figure 3-33) to 2025.

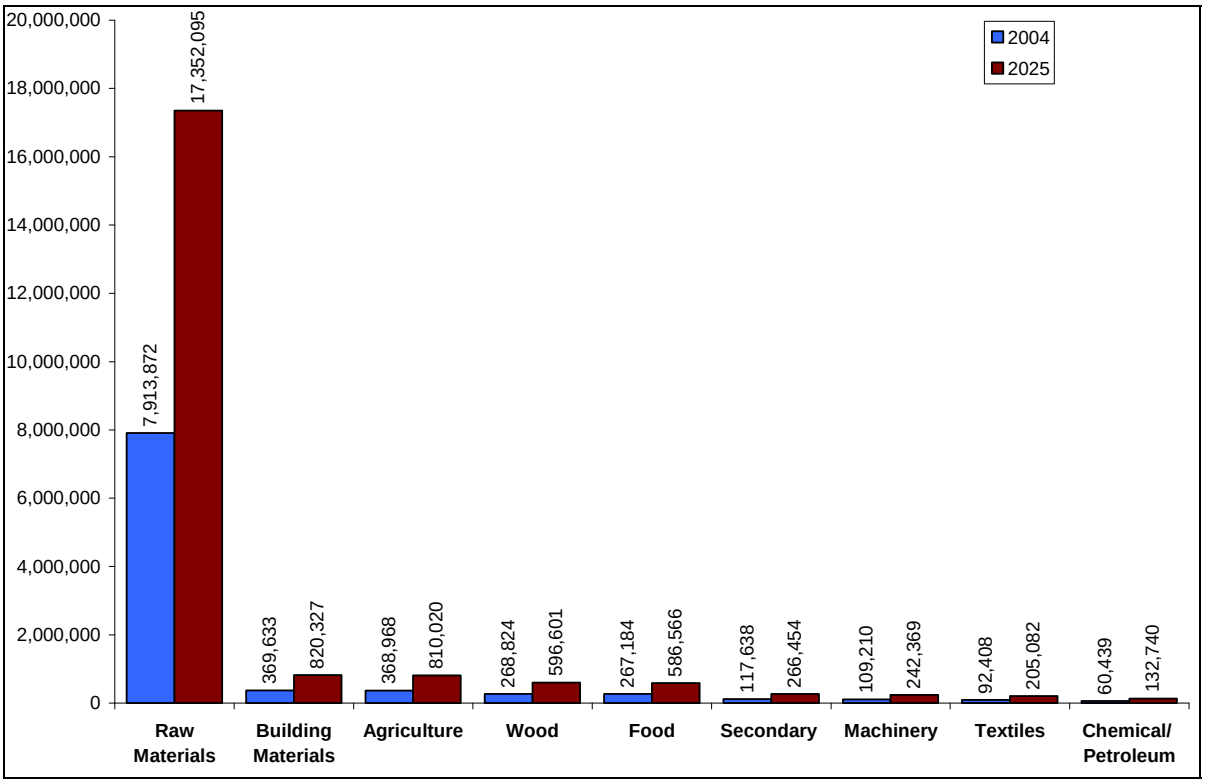


Figure 3-32: Total Freight Rail Tons by Commodity

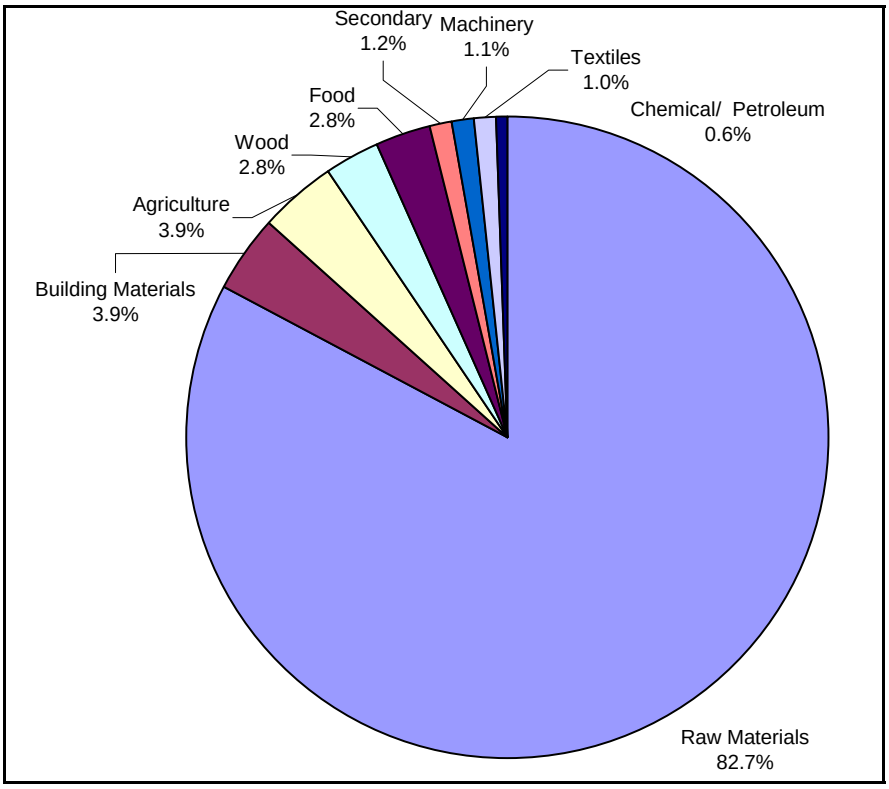


Figure 3-33: Percentage of Freight Rail by Commodity (2004)

The Atlanta District could benefit significantly with the development of an intermodal rail-truck transload facility in or near Texarkana and Marshall. The Red River Army Depot site near Texarkana, now called Red River Commerce Park, may be a viable candidate for an intermodal rail-truck facility and as a truck trailer pickup/drop facility, since it has excellent rail connections to the UP and is close to I-30. These new facilities must be planned in a way that allows for the ability to shift the truck cargo burden to rail cars.

Rail Freight Findings Summary

- Freight tonnage moved by rail is projected to more than double by 2025.
- Raw materials constitute a majority of the freight rail tonnage for this District.
- Rail shipments originating from outside Texas are projected to constitute approximately 80 percent of total rail shipments within the Atlanta District by 2025.

Rail and Truck Freight Comparison

Table 3-10 and Figure 3-34 provide the total truck and rail tonnages in the District for the base year and 2025. Truck tons are expected to increase 134 percent, as opposed to a rail tonnage increase of 120 percent.

Year	Truck	Rail
1998 (Truck), 2004 (Rail)	12,402,878	9,568,176
2025	29,011,824	21,012,254
Percent Increase	134%	120%

Table 3-10: Rail and Truck Tons Comparison

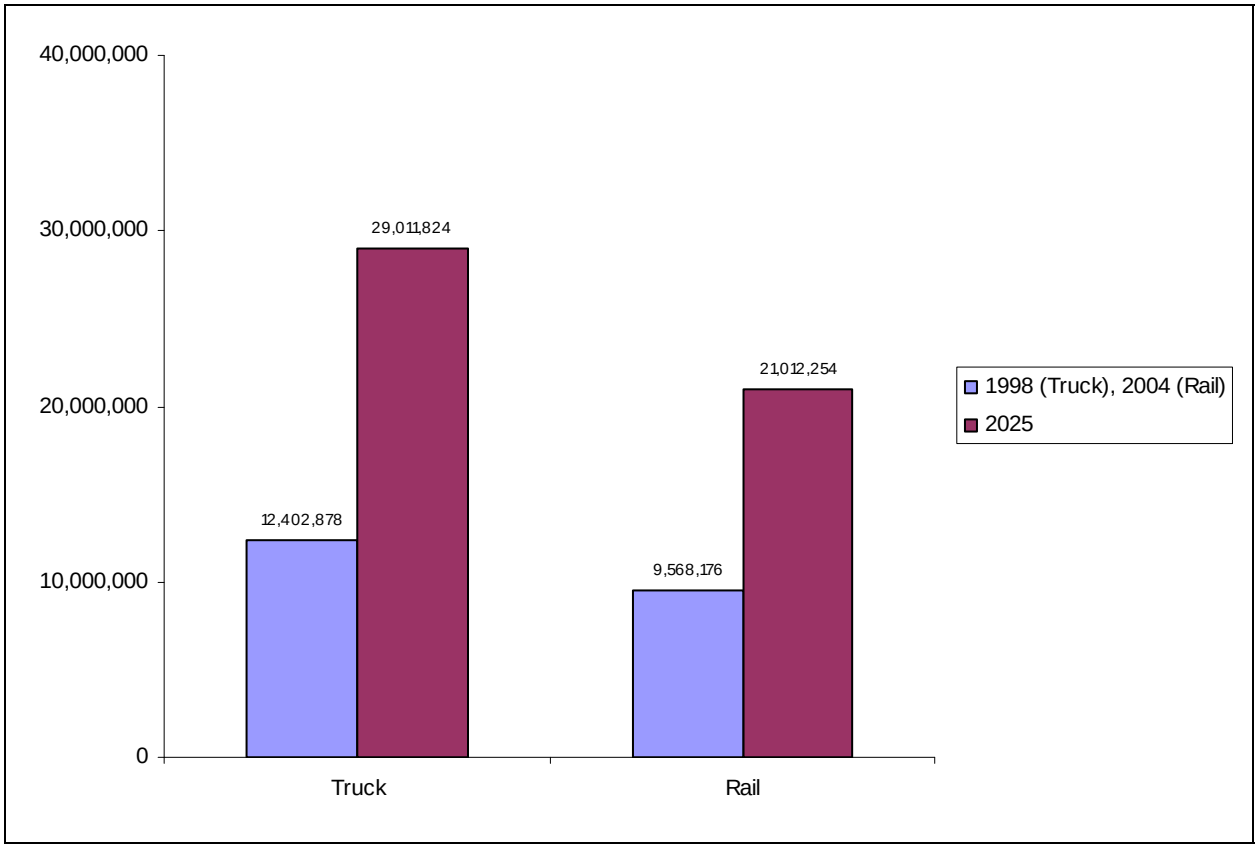


Figure 3-34: Total Rail / Truck Tons

While the total combined tons shipped by both truck and rail are projected to increase by 128 percent by 2025, there could be a bigger increase of freight shipped out of the Atlanta District (154 percent increase) than freight shipped into the District (114 percent increase) and shipments internal to the District (122 percent increase).

Table 3-11 illustrates that the largest projected increase of freight tons is represented by shipments from the Atlanta District to other Texas Counties (167 percent). It becomes clear that most of the freight shipping requirements within the

Atlanta District are supported by trucks. This is basically due to the large timber industry within northeast Texas. The projected internal tons shipped by truck within the Atlanta District for 2025 is nearly 650 thousand tons (Table 3-7) while the projected internal rail shipments will be more than 72 thousand tons (Table 3-8). This shows that trucks will be shipping 794 percent more tonnage within the Atlanta District than trains.

For the projected freight shipments out of the Atlanta District by 2025, trucks will be hauling 537 percent more tons than rail; however, for shipments into the Atlanta District, rail shipments will be 55 percent more than trucks. The largest amount of tonnage moving into and out of the Atlanta District is either to or from other locations within Texas. This is because it is generally more economically feasible to ship by truck for destinations within a 500 mile radius. The largest projected freight tonnage that will be shipped by rail into the Atlanta District will be from the northern portion of the country (Table 3-8).

Combined Truck and Rail Tons				
Origin	**Termination**	**1998/2004**	**2025**	**Percent Change**
Internal to Internal				
Atlanta District	Atlanta District	324,673	720,564	122%
Internal to External				
Atlanta District	Other Texas Counties	5,920,594	15,830,360	167%
Atlanta District	Western U.S.	223,936	510,843	128%
Atlanta District	Northern U.S.	1,085,261	2,220,357	105%
Atlanta District	Eastern U.S.	233,764	427,784	83%
Atlanta District	Mexico	46,574	95,282	105%
External to Internal				
Other Texas Counties	Atlanta District	5,591,495	11,600,730	107%
Western U.S.	Atlanta District	1,993,929	4,371,870	119%
Northern U.S.	Atlanta District	5,811,267	12,661,377	118%
Eastern U.S.	Atlanta District	490,245	1,041,714	112%
Mexico	Atlanta District	249,315	543,197	118%
Total		**21,971,054**	**50,024,078**	**128%**

Table 3-11: Combined Rail and Truck Tons

TxDOT - Dallas District

This section describes the freight flow movement in terms of truck and rail commodity flow for TxDOT's Dallas District. The information provided for the Dallas District is based on preliminary data. A more in-depth analysis will be performed as part of a separate study for the Dallas-Fort Worth metroplex; therefore, the data presented in this section is subject to change.

Truck Freight Movements and Commodities

Table 3-12 illustrates that the movement of truck tons within the Dallas District is projected to increase by nearly 16 million tons from 1998 to 2025, while movements coming into the District are projected to increase by 121.5 million and movements coming out of the District are projected to increase by 106.2 million.

Annual Truck Tons				
Origin	**Termination**	**1998**	**2025**	**Percent Change**
Internal to Internal				
Dallas District	Dallas District	11,096,952	26,959,156	143%
Internal to External				
Dallas District	Other Texas Counties	59,841,316	135,421,973	126%
Dallas District	Western U.S.	683,845	1,764,692	158%
Dallas District	Northern U.S.	10,716,243	27,653,726	158%
Dallas District	Eastern U.S.	3,015,315	7,781,151	158%
Dallas District	Mexico	5,024,691	12,966,431	158%
External to Internal				
Other Texas Counties	Dallas District	66,484,572	146,737,037	121%
Western U.S.	Dallas District	1,023,735	2,475,469	142%
Northern U.S.	Dallas District	16,042,509	38,792,020	142%
Eastern U.S.	Dallas District	4,514,010	10,915,222	142%
Mexico	Dallas District	7,522,100	18,189,016	142%
	Total	**185,965,288**	**429,655,894**	**131%**

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

Table 3-12: Truck Freight Movements

Truck Movements within the State

Figures 3-35 and 3-36 show the existing and projected truck tonnage movements between the Dallas District and other Texas counties. Figure 3-35 illustrates large numbers of trucks moved between the Dallas District and Houston, San Antonio, El Paso, and Austin, as well as areas along the U.S.-Mexico border in 1998. Major truck movements to and from the Dallas District use the I-35 corridor between Dallas and San Antonio and the I-45 corridor between the Dallas and Houston. Figure 3-36 shows continued growth between the Dallas District and the other major urban areas in Texas projected in 2025.

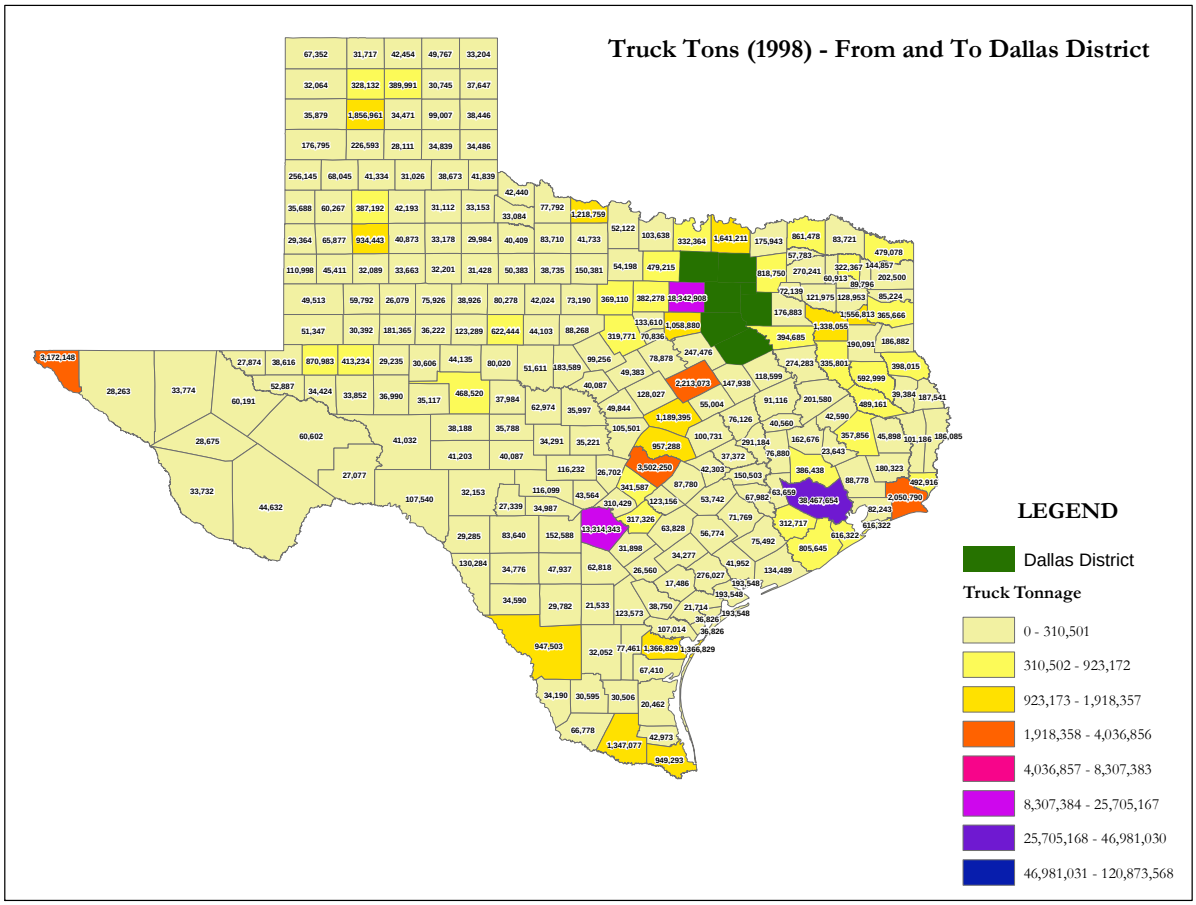


Figure 3-35: 1998 Truck Movements within Texas To and From Dallas District

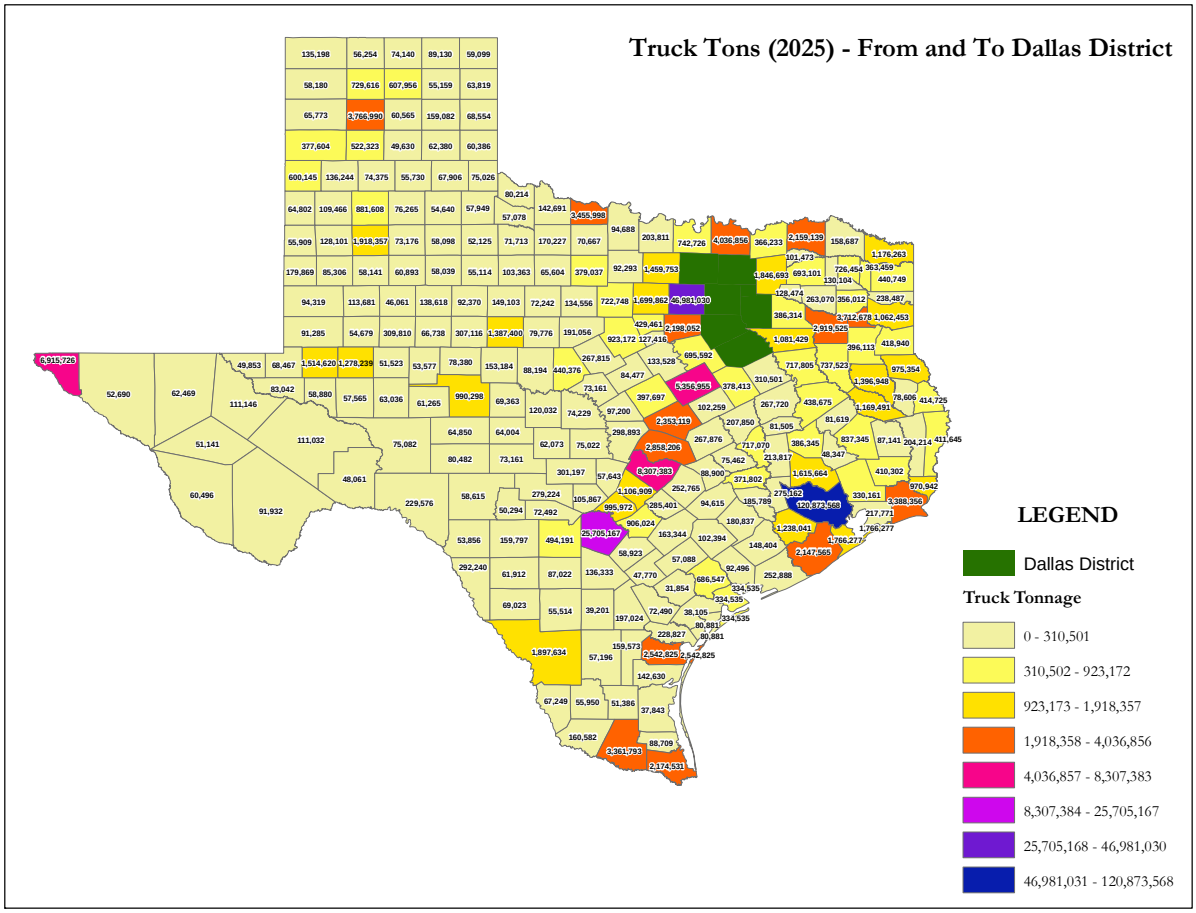


Figure 3-36: 2025 Truck Movements within Texas To and From Dallas District

Truck Movements Outside of the State

As shown in Figure 3-37, major movements in 1998 enter the state from Oklahoma, Arkansas, New Mexico, Louisiana, and Mexico. From the sampling of data utilized in the analysis, it is expected that truck movements into and out of the state from the Dallas District will likely result in large increases. Figure 3-38 demonstrates the expected increased truck volumes between the Dallas District and outside the state.

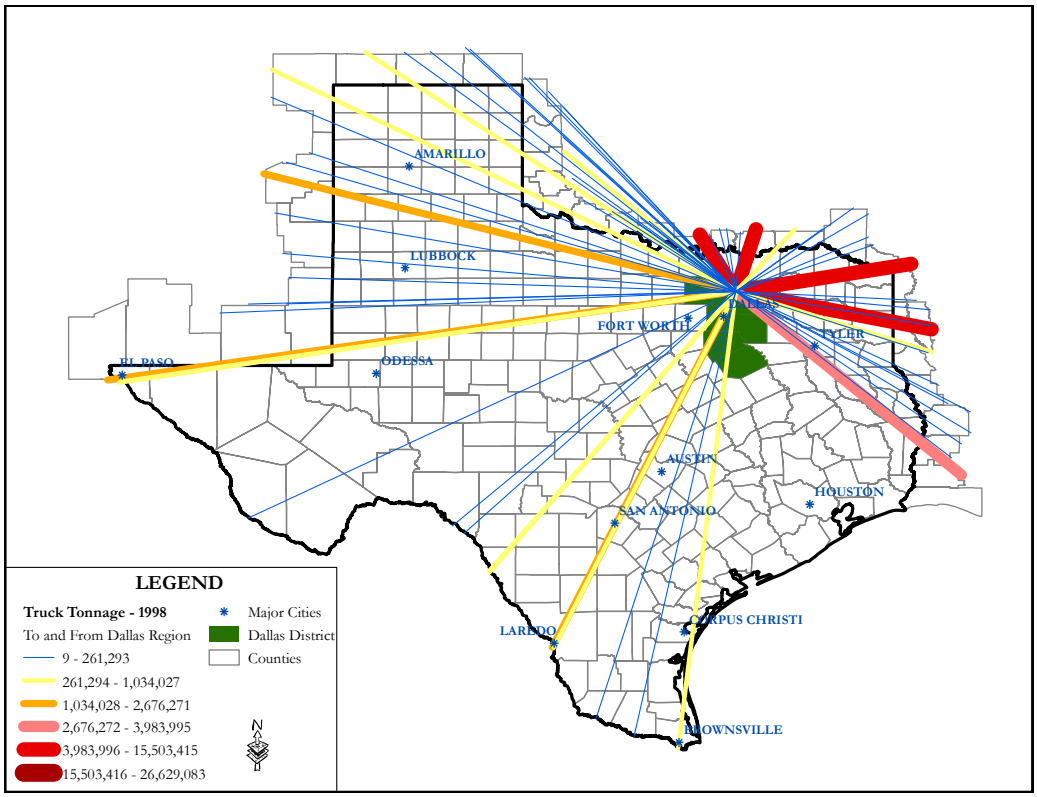


Figure 3-37: 1998 Truck Movements Between Dallas District and Outside of Texas

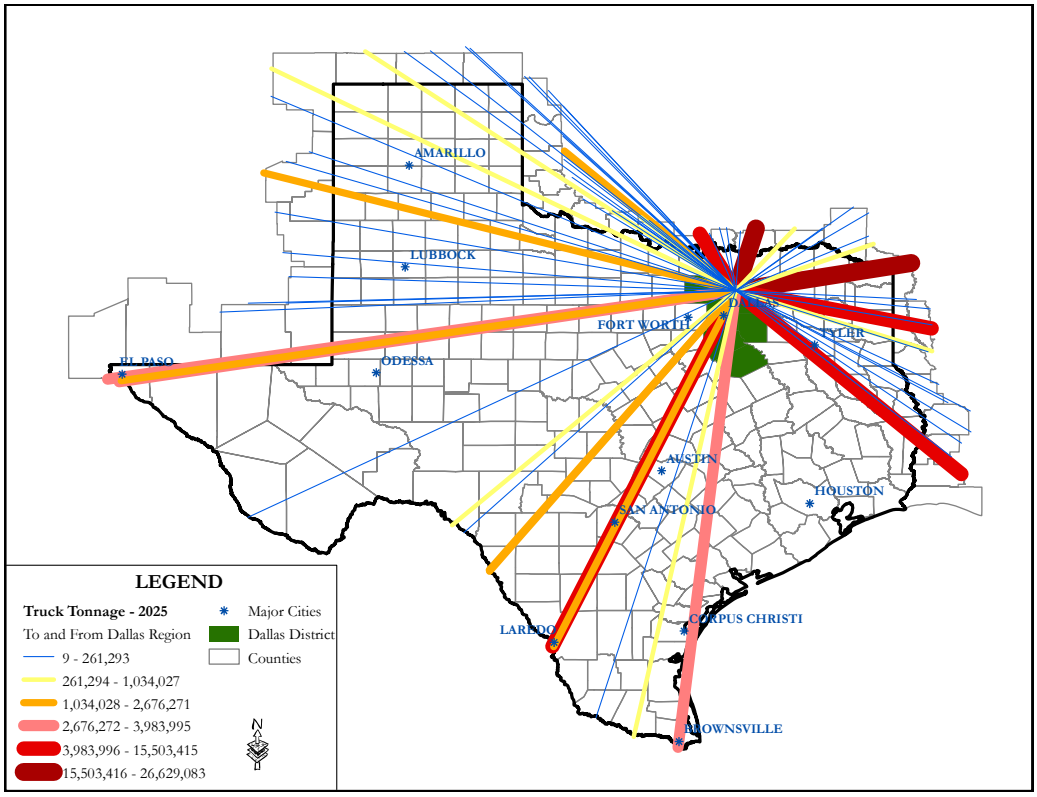


Figure 3-38: 2025 Movements Between Dallas District and Outside of Texas

Rail Freight Movements and Commodities

Table 3-13 illustrates that the Dallas District will continue to import a great deal of commodities by the year 2025. Approximately 27.4 million additional tons are projected to be transported to/from Mexico and other parts of the U.S. between 2004 and 2025. This tremendous increase in interstate and international rail freight movement is indicative of the fact that the DFW area is becoming one of the nation's largest inland ports of trade. While modest increases are projected to occur via rail freight internal to the District, an additional 2.7 million tons are projected to be transported to/from other Texas counties between 2004 and 2025.

Annual Rail Tons				
Origin	**Termination**	**2004**	**2025**	**Percent Change**
Internal to Internal				
Dallas District	Dallas District	22,990	50,259	119%
Internal to External				
Dallas District	Other Texas Counties	1,103,029	2,811,374	155%
Dallas District	Western U.S.	1,398,004	3,081,978	120%
Dallas District	Northern U.S.	2,775,716	6,119,222	120%
Dallas District	Eastern U.S.	1,033,396	2,278,179	120%
Dallas District	Mexico	1,468,025	3,236,344	120%
External to Internal				
Other Texas Counties	Dallas District	4,783,051	5,725,860	20%
Western U.S.	Dallas District	3,567,208	7,684,618	115%
Northern U.S.	Dallas District	7,082,639	15,257,695	115%
Eastern U.S.	Dallas District	2,636,858	5,680,423	115%
Mexico	Dallas District	3,745,877	8,069,514	115%
Total		**29,616,794**	**59,995,465**	**103%**

*Source: Statewide Analysis Model based on 2004 Surface Transportation Board Waybill Data

Table 3-13: Rail Freight Movements

Rail Freight Movements within the State

Figure 3-39 and Figure 3-40 illustrate the origin and destinations for freight rail movements occurring in 2004 and 2025, respectively. Houston, San Antonio, Austin, and El Paso appear to be handling the largest movements, although the Laredo region is projected to experience significant rail growth and other locations in South Texas are showing a moderate level of rail movement including the Gulf coast ports at Beaumont and Corpus Christi.

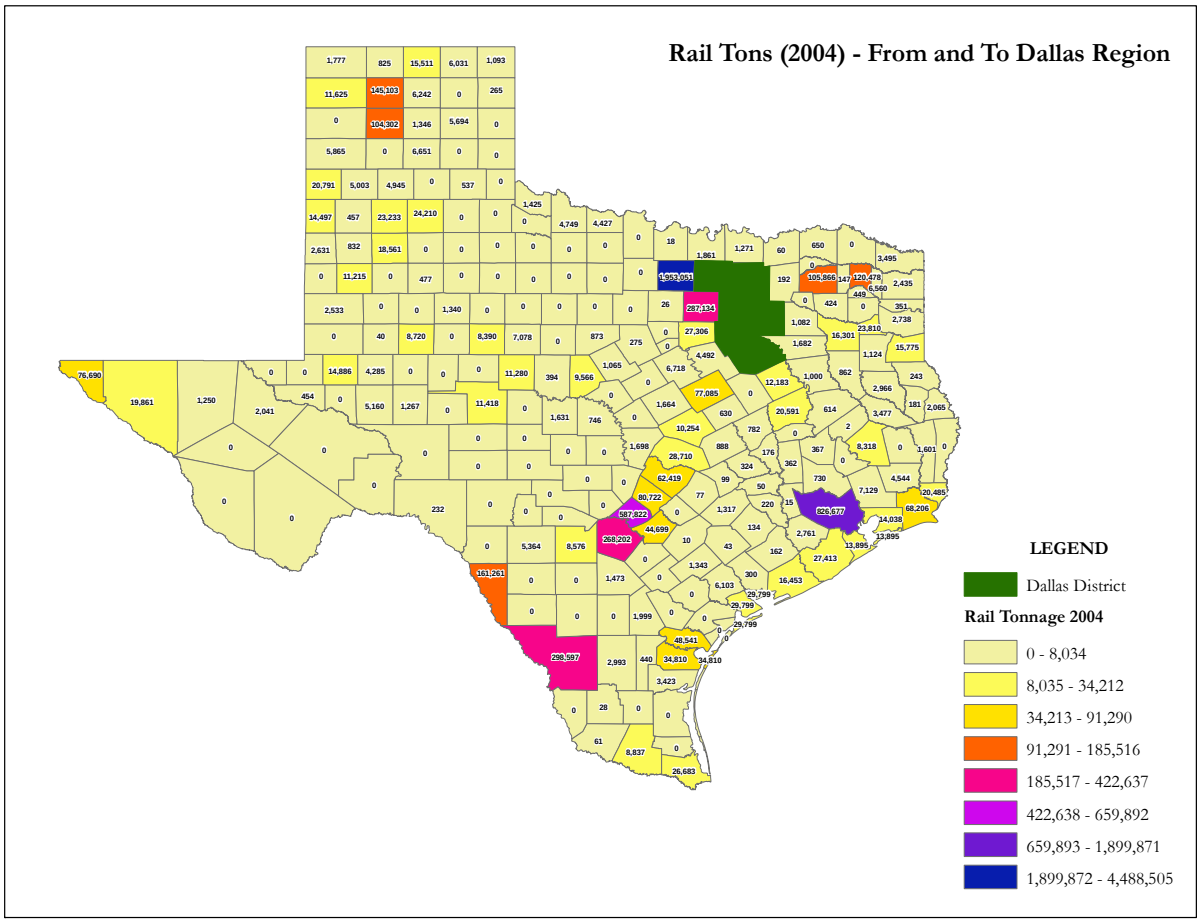


Figure 3-39: 2004 Rail Freight Movements

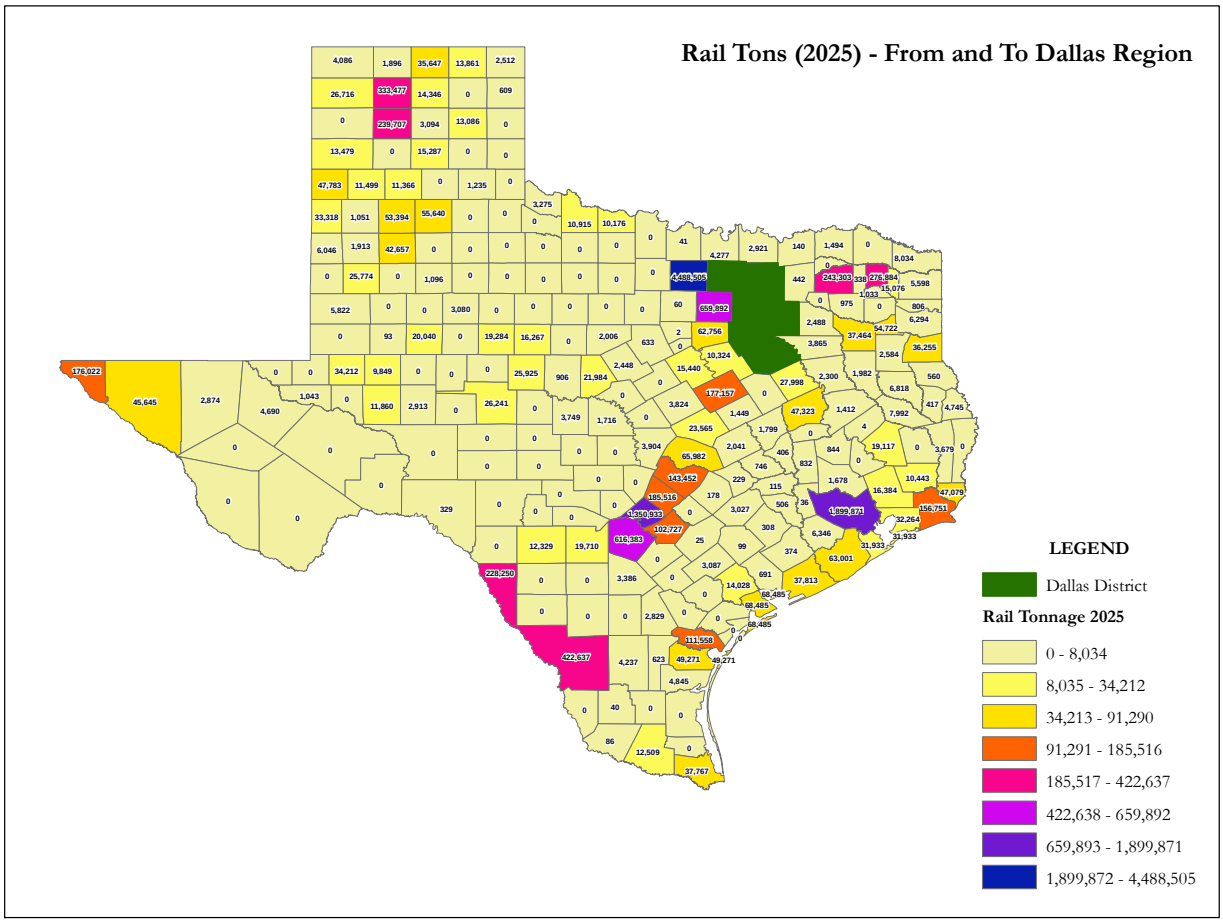


Figure 3-40: 2025 Rail Freight Movements – Dallas District

Rail Freight Movements Outside of the State

Figures 3-41 and 3-42 illustrate that major rail freight movements are occurring between the Dallas District and New Mexico, Oklahoma, Arkansas, and more moderately Louisiana and Mexico.

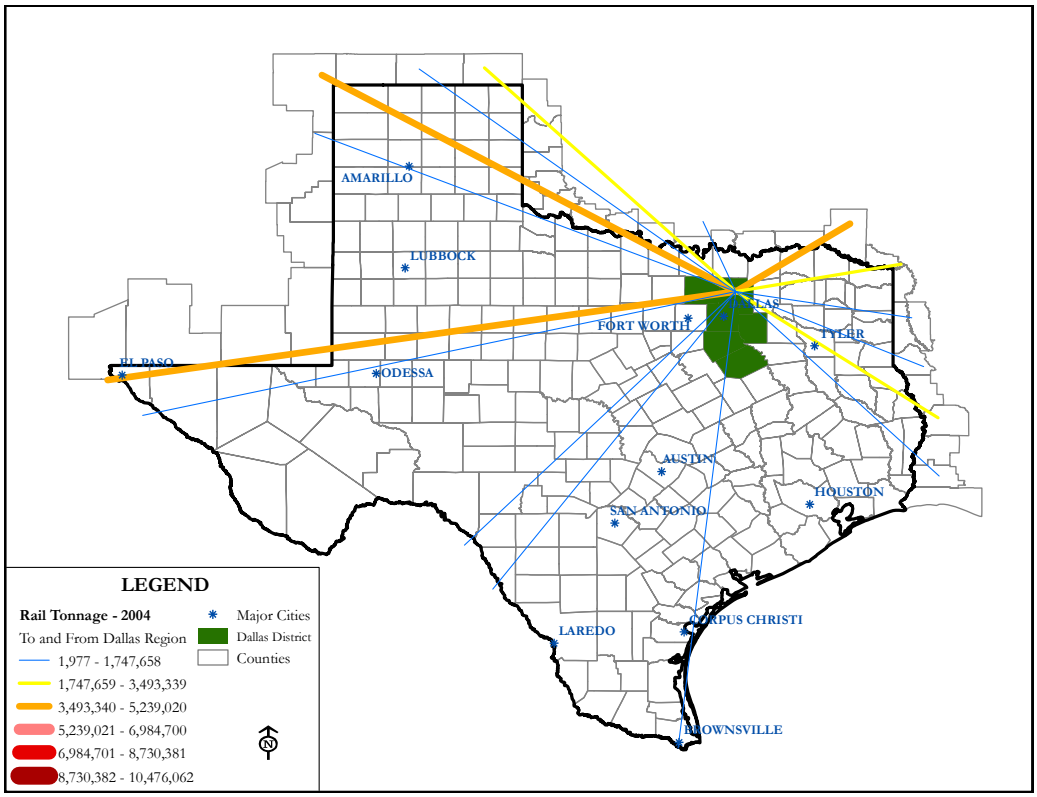


Figure 3-41: 2004 Freight Rail Between Dallas District and Outside of Texas

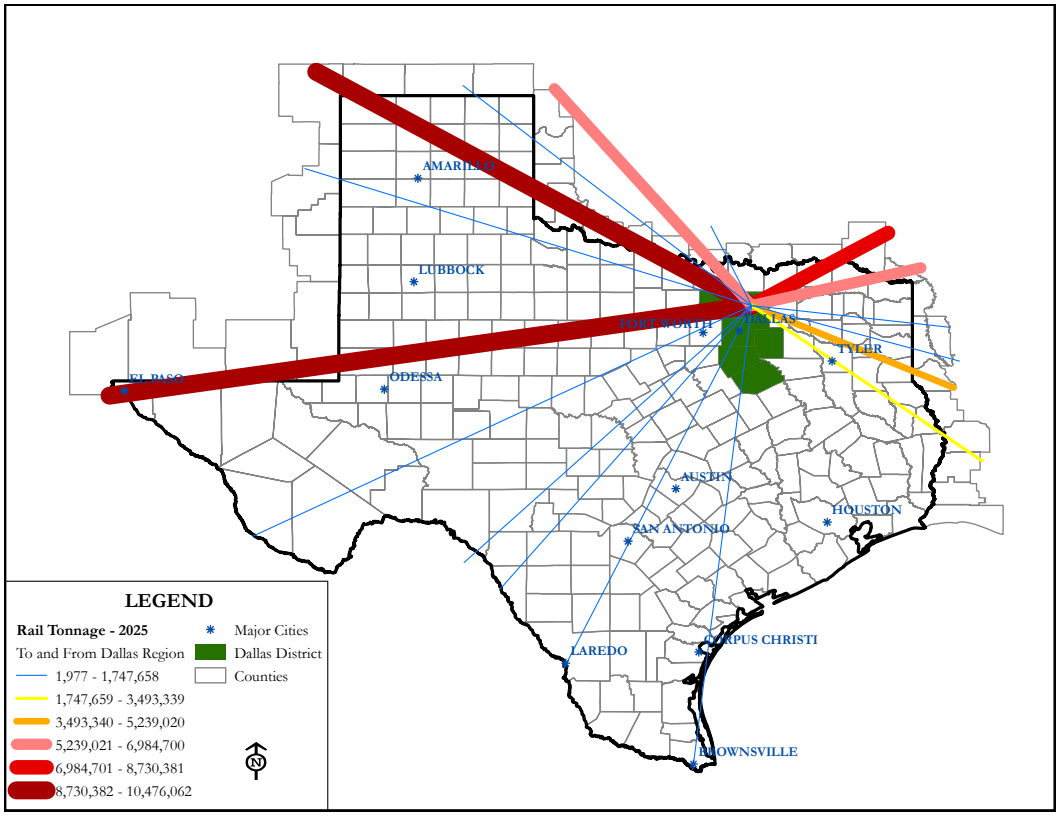


Figure 3-42: 2025 Freight Rail Between Dallas District and Outside of Texas

Rail Freight Findings Summary

- Freight tonnages moved by rail are projected to more than double by 2025.
- Raw materials and secondary freight constitute a majority of the freight rail tonnage.
- Rail shipments originating from other states and from Mexico are projected to constitute approximately 60 percent of total rail shipments within the Dallas District by 2025.

Rail and Truck Freight Comparison

Table 3-14 and Figure 3-43 provide the total truck and rail tons in the District for the base year and projected to 2025. The increase between 1998 and 2025 for truck tons represents a 131 percent increase as opposed to a rail tonnage increase of 103 percent from 2004 to 2025.

Year	Truck	Rail
1998 (Truck), 2004 (Rail)	185,965,288	29,616,794
2025	429,655,894	59,995,465
Percent Increase	131%	103%

Table 3-14: Rail and Truck Tons Comparison

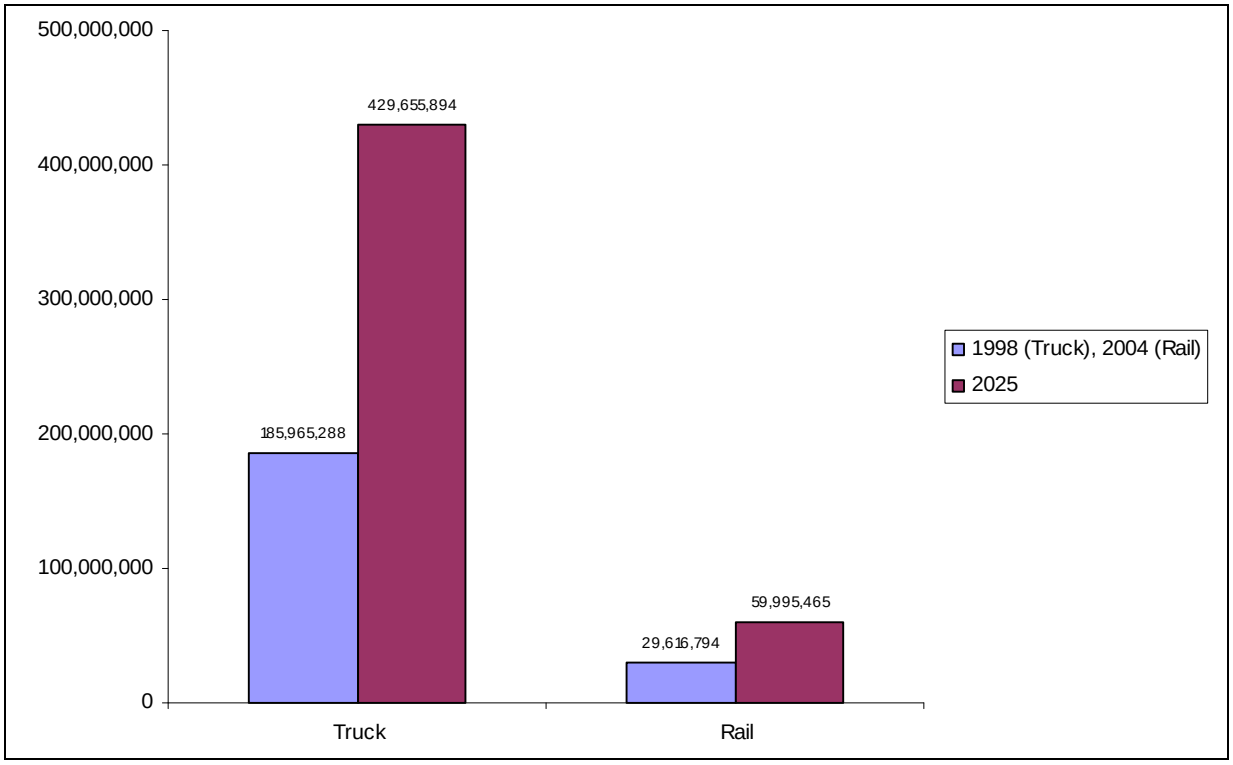


Figure 3-43: Total Rail / Truck Tons

The total combined tons shipped by both truck and rail are projected to increase by 127 percent by 2025. While the overall combined truck and rail freight tonnage

increases projected to enter the District (142.1 million tons) by 2025 results in a larger increase than freight movements out of the Dallas District (116.1 million tons) or internal to the District (15.9 million tons); the largest projected percentage increase for combined truck and rail movement are expected to be the result of internal movements (143 percent increase). The majority of the freight within the District is moved by trucks. Given the amount of various industries within the Dallas District, the projected amount of internal truck movements are much higher than for the other East Texas Districts.

The rail movements within the District are projected to be low compared to the 2025 truck movements. The projected internal rail movements resulted in lower values because the Fort Worth District was not included in the study. Due to the close interaction between the two Districts, the Dallas-Fort Worth area will be analyzed as part of a separate study.

Table 3-15 illustrates that the majority of the projected increase for the combined freight movements leaving or entering the Dallas District are going to (77.3 million tons) or from (81.2 million tons) other Texas counties. For the projected freight shipments out of the Dallas District by 2025, trucks are projected to haul 959 percent more tons than rail while, for shipments into the Dallas District, trucks are projected to carry approximately 412 percent more cargo than rail.

Combined Truck and Rail Tons				
Origin	**Termination**	**1998/2004**	**2025**	**Percent Change**
Internal to Internal				
Dallas District	Dallas District	11,119,942	27,009,415	143%
Internal to External				
Dallas District	Other Texas Counties	60,944,345	138,233,347	127%
Dallas District	Western U.S.	2,081,849	4,846,670	133%
Dallas District	Northern U.S.	13,491,959	33,772,948	150%
Dallas District	Eastern U.S.	4,048,711	10,059,330	148%
Dallas District	Mexico	6,492,716	16,202,775	150%
External to Internal				
Other Texas Counties	Dallas District	71,267,623	152,462,897	114%
Western U.S.	Dallas District	4,590,943	10,160,087	121%
Northern U.S.	Dallas District	23,125,148	54,049,716	134%
Eastern U.S.	Dallas District	7,150,868	16,595,645	132%
Mexico	Dallas District	11,267,977	26,258,530	133%
Total		**215,582,082**	**489,651,359**	**127%**

Table 3-15: Combined Rail and Truck Tons

TxDOT - Lufkin District

This section describes the freight flow movement in terms of truck and rail commodity flow for TxDOT's Lufkin District. Network improvements updated in the SAM to reflect projects cited in the District's list of planned projects are shown in Figure 3-44 and are listed individually in Table D-3 in Appendix D.

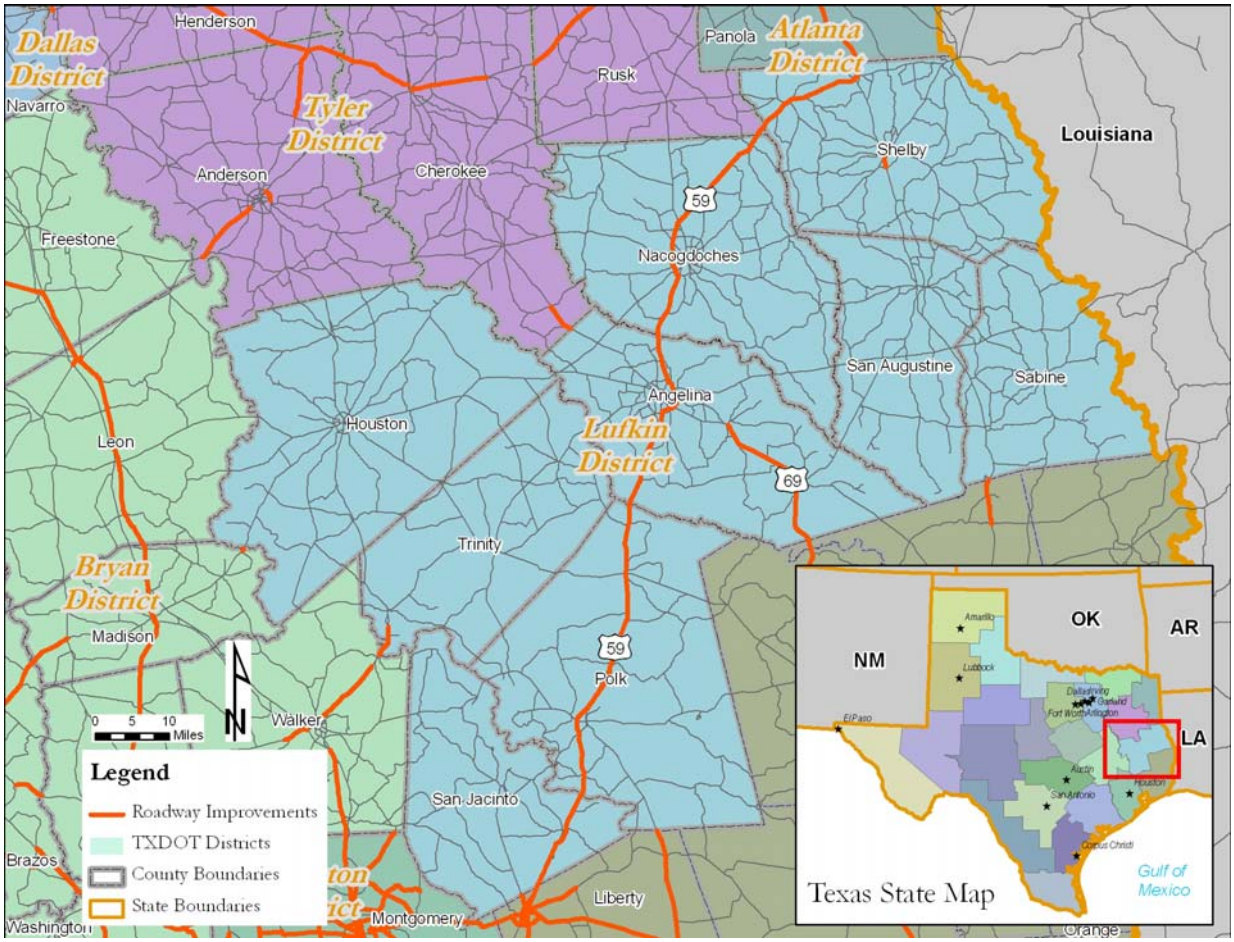


Figure 3-44: Future Network Improvements

Truck Freight Movements and Commodities

Table 3-16 illustrates that while the movement of truck tons within the Lufkin District are projected to increase by nearly 284,000 tons from 1998 to 2025, it is small when compared to the increased movements coming into (5.8 million) and out of (15.6 million) the Lufkin District.

Annual Truck Tons				
Origin	**Termination**	**1998**	**2025**	**Percent Change**
Internal to Internal				
Lufkin District	Lufkin District	259,481	543,101	109%
Internal to External				
Lufkin District	Other Texas Counties	10,222,360	24,207,128	137%
Lufkin District	Western U.S.	39,508	93,332	136%
Lufkin District	Northern U.S.	366,391	865,537	136%
Lufkin District	Eastern U.S.	381,287	900,726	136%
Lufkin District	Mexico	389,909	921,095	136%
External to Internal				
Other Texas Counties	Lufkin District	4,846,714	9,822,601	103%
Western U.S.	Lufkin District	21,567	50,186	133%
Northern U.S.	Lufkin District	200,003	465,413	133%
Eastern U.S.	Lufkin District	208,135	484,335	133%
Mexico	Lufkin District	212,841	495,287	133%
	Total	**17,148,196**	**38,848,742**	**127%**

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

Table 3-16: Truck Freight Movement

Truck Movements within the State

Figure 3-45 reveals that in 1998 large numbers of trucks moved between the Lufkin District and Houston, San Antonio, the Dallas-Fort Worth metroplex, El Paso, and Austin with the largest origins and destinations located in the Dallas-Fort Worth metroplex and the Houston region. Major truck movement for trips going to and from the Lufkin District are along the U.S. 69/U.S. 175 corridor between Dallas and Lufkin and U.S. 59 between Houston and Lufkin. Figure 3-46 shows continued growth of truck traffic between the Lufkin District and the major urban areas of Houston, San Antonio and the Dallas-Fort Worth metroplex.

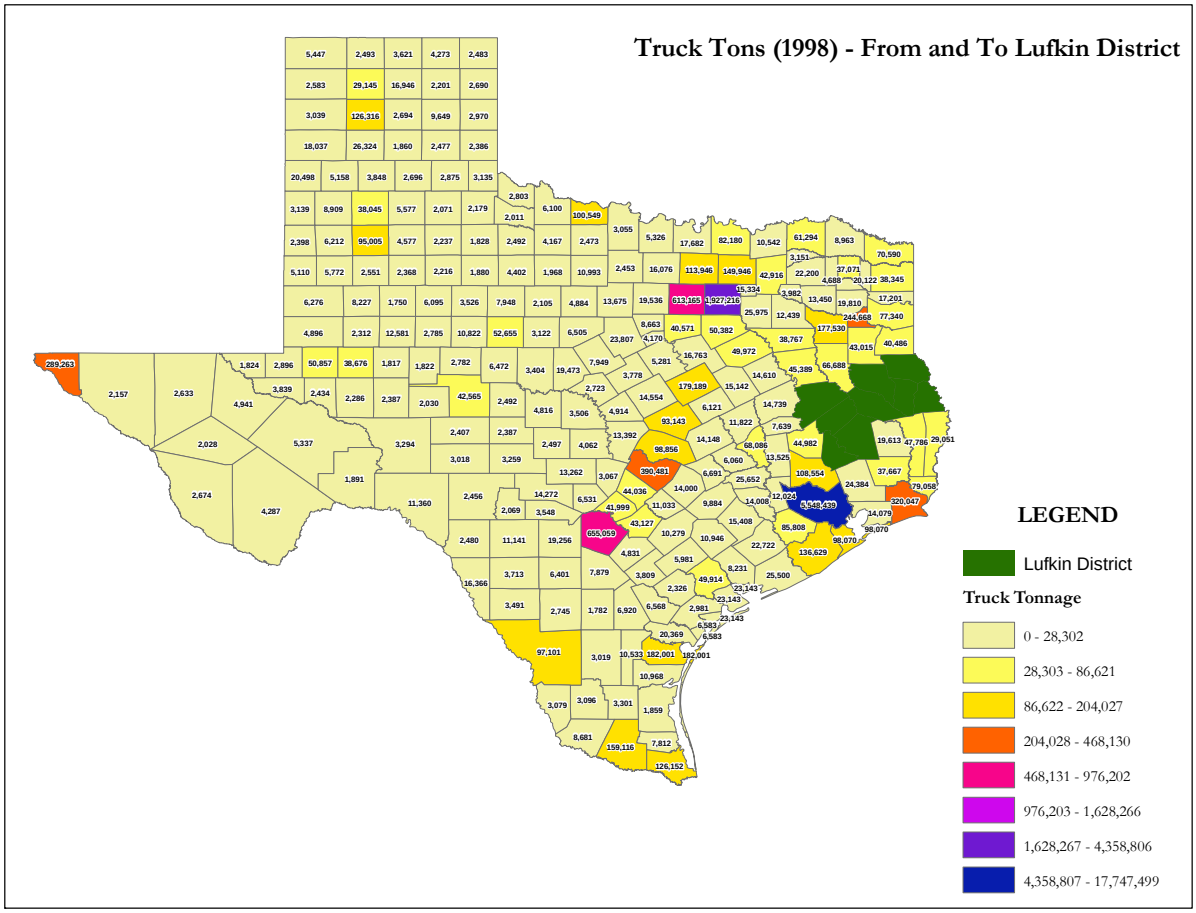


Figure 3-45: 1998 Truck Movements within Texas To and From Lufkin District

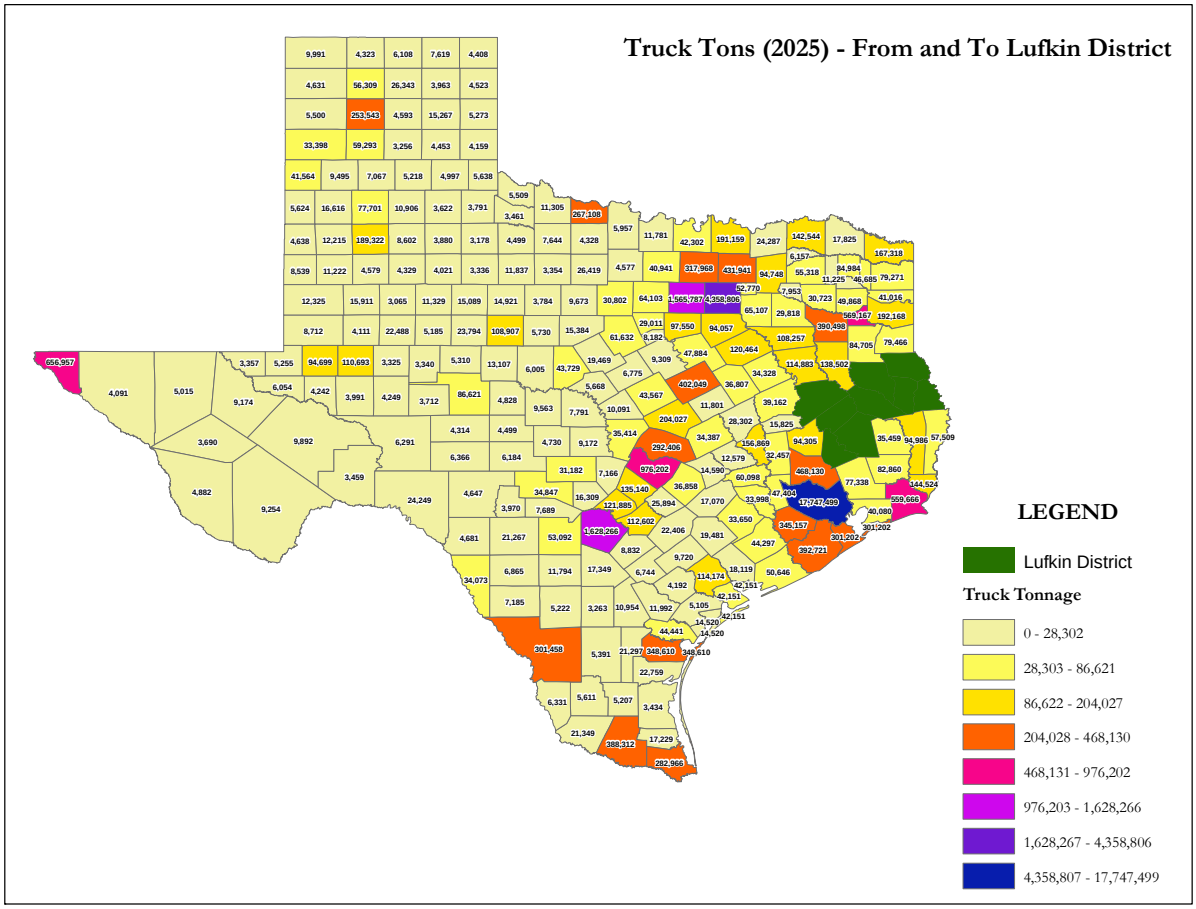


Figure 3-46: 2025 Truck Movements within Texas To and From Lufkin District

Truck Movements Outside of the State

Major movements in 1998 can be seen between the Lufkin District and Oklahoma, Arkansas, New Mexico, Louisiana, and Mexico as shown in Figure 3-47. Figure 3-48, demonstrates significantly increased movement between the Lufkin District and Oklahoma, New Mexico, Louisiana, and Mexico projected in 2025.

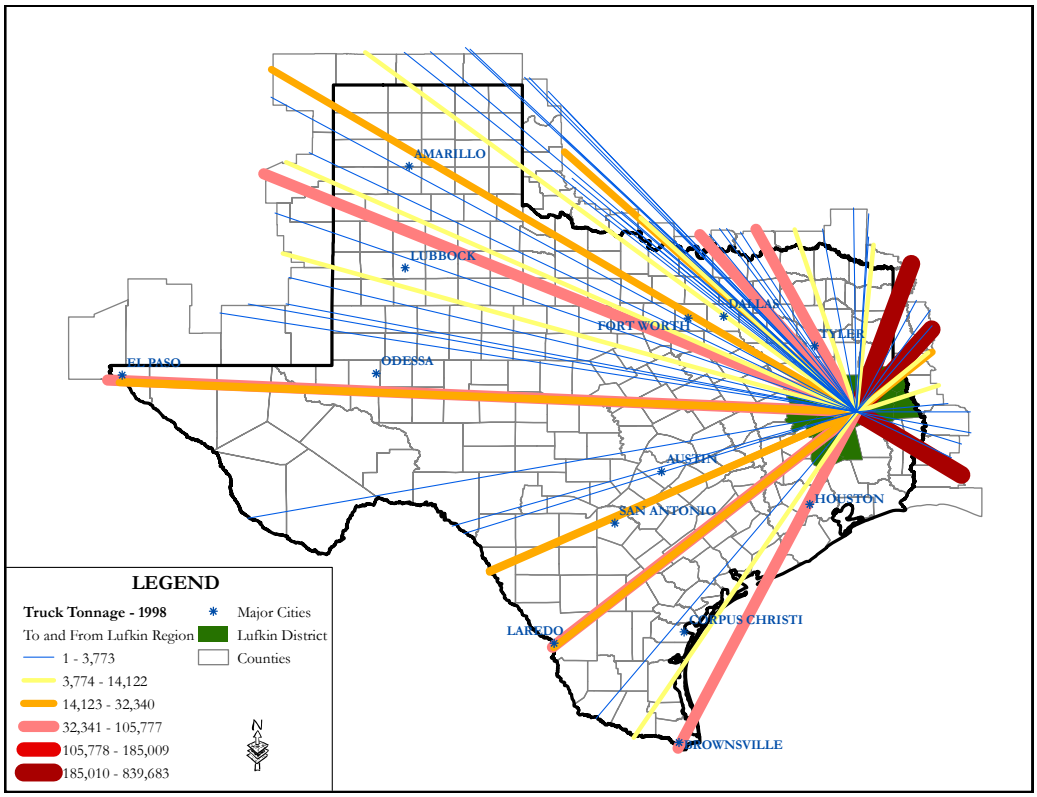


Figure 3-47: 1998 Truck Movements Between Lufkin District and Outside of Texas

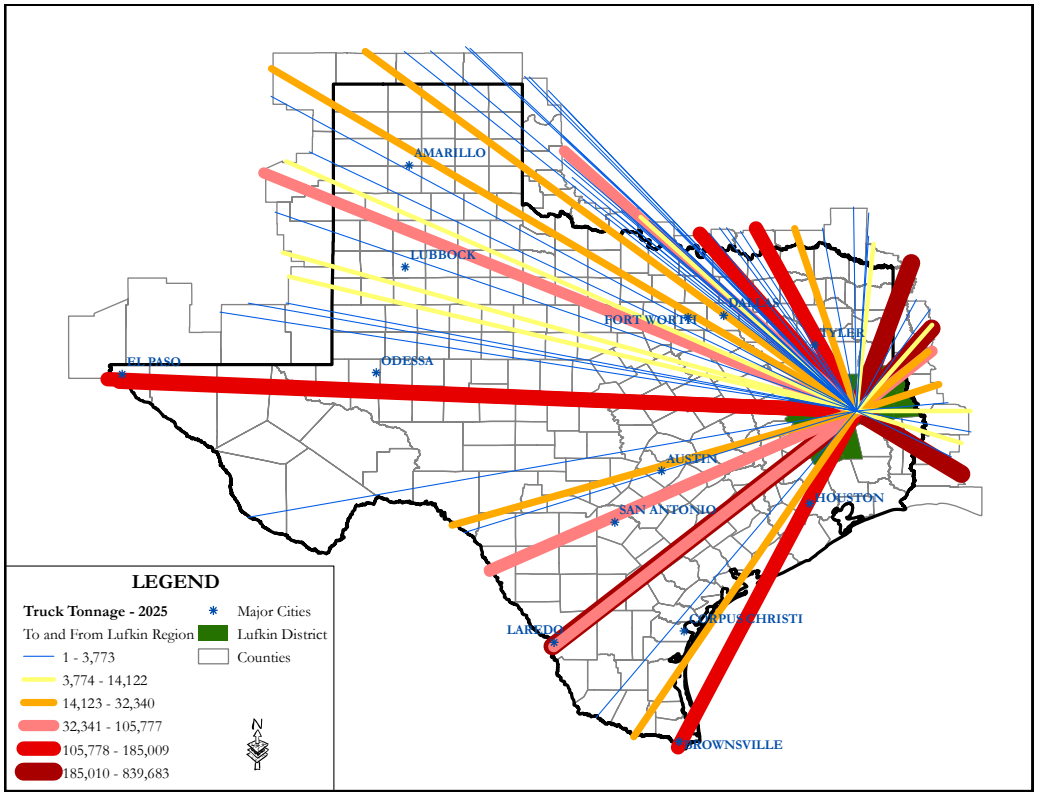


Figure 3-48: 2025 Movements Between Lufkin District and Outside of Texas

Truck Commodity Trends

Table 3-17 indicates that wood products will be the largest commodity by tonnage. The leading products moving by truck (in terms of tonnage percentage in the Districts) are wood, food, building materials, chemical/petroleum, and secondary products. While agriculture, textiles, machinery and raw materials are projected to produce lower tonnages, they are expected to exhibit significant increases.

As determined from recent interviews with economic development groups and industry professionals, significant tonnages of wood products are moved by a majority of the trucking agencies in the Lufkin District. Based on surveys performed in the summer of 2006, new companies like Steel Fabrication Company, Asphalt Company, and Corrosion Protection Applications had been started near Livingston, Polk County. Figures 3-49 and 3-50 display the commodities being moved by truck within the Lufkin District for both 1998 and 2025. The relative percentages of commodity tonnages do not change significantly between 1998 (Figure 3-50) and 2025.

Commodity	**Truck Tons**		
	1998	**2025**	**% Increase**
Building Materials	2,852,499	8,519,992	199%
Wood	6,458,699	14,464,446	124%
Agriculture	35,665	120,813	239%
Textiles	114,307	346,871	203%
Chemical/Petroleum	1,686,210	2,100,614	25%
Food	4,447,702	9,937,300	123%
Machinery	139,352	445,866	220%
Raw Materials	9,609	36,278	277%
Secondary	1,404,151	2,876,562	105%
TOTAL	17,148,196	38,848,742	127%

Table 3-17: Truck Commodity Growth

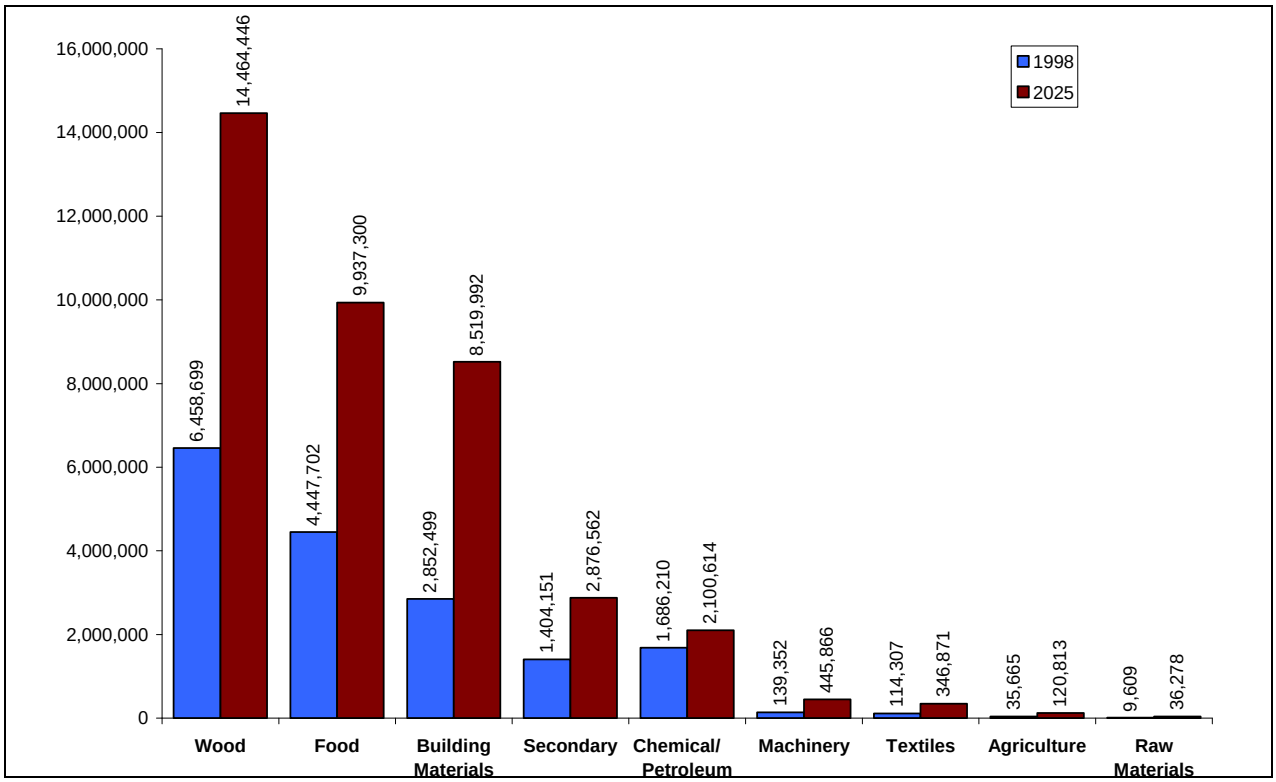


Figure 3-49: Total Truck Tons by Commodity

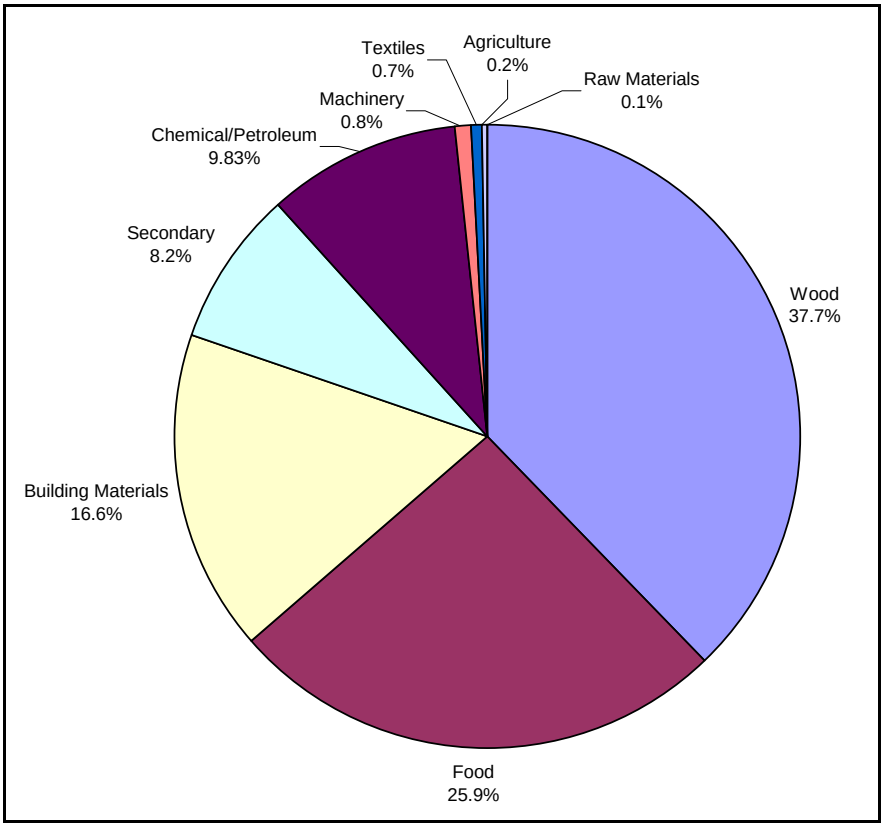


Figure 3-50: Percentage of Truck Tons by Commodity (1998)

Traffic Volume Analysis

Traffic data including total traffic volumes, truck volumes, percentage of trucks, and V/C are listed for individual roadway segments in the Lufkin District as shown in Tables E-5 and E-6 (in Appendix E) for 1998 and 2025, respectively. Figure E-3 graphically shows the locations at which such traffic data is provided.

The primary areas of congestion in the Lufkin District were in the urban areas near the cities of Lufkin and Nacogdoches. Figures 3-51 and 3-53 show the areas of congestion district-wide while Figures 3-52 and 3-54 highlight the areas of congestion in the cities of Lufkin and Nacogdoches for years 1998 and 2025.

While the V/C ratio analysis showed that the freeways and arterials would continue to experience increased periods of congestion between base and future years, the overall congestion level throughout the District was projected to remain relatively low. The major highways and arterials through Lufkin and Nacogdoches exhibited the only areas of projected congestion. The northern and southern portions of U.S. 59 in Lufkin, the eastern portion of SH 21 and the northern portion of SH 495 in Nacogdoches were projected to result in higher congestions levels for base and future year volumes. Future congestion is also projected along.

As Tables E-5 and E-6 show, heavy truck traffic is expected in several areas within the District. Approximately 33 percent of the traffic traveling on U.S. 59 northeast of Leggett is trucks, while U.S. 287 located northwest of the town of Groveton accommodates approximately 27 percent trucks. The truck traffic through Bronson, which is located east of Lufkin, currently, accommodates 31 percent along U.S. 96.

Different industries continue to locate in the Lufkin District that may increase truck movements in the area. Specifically, three new industries have developed in Livingston in Polk County: a steel fabrication plant, an asphalt company, and a corrosion protection applications company.

It was also determined that several bottlenecks occur due to at-grade railroad crossings. For instance, local roadways often become congested at locations with at-grade crossings within the cities of Lufkin, and Nacogdoches.

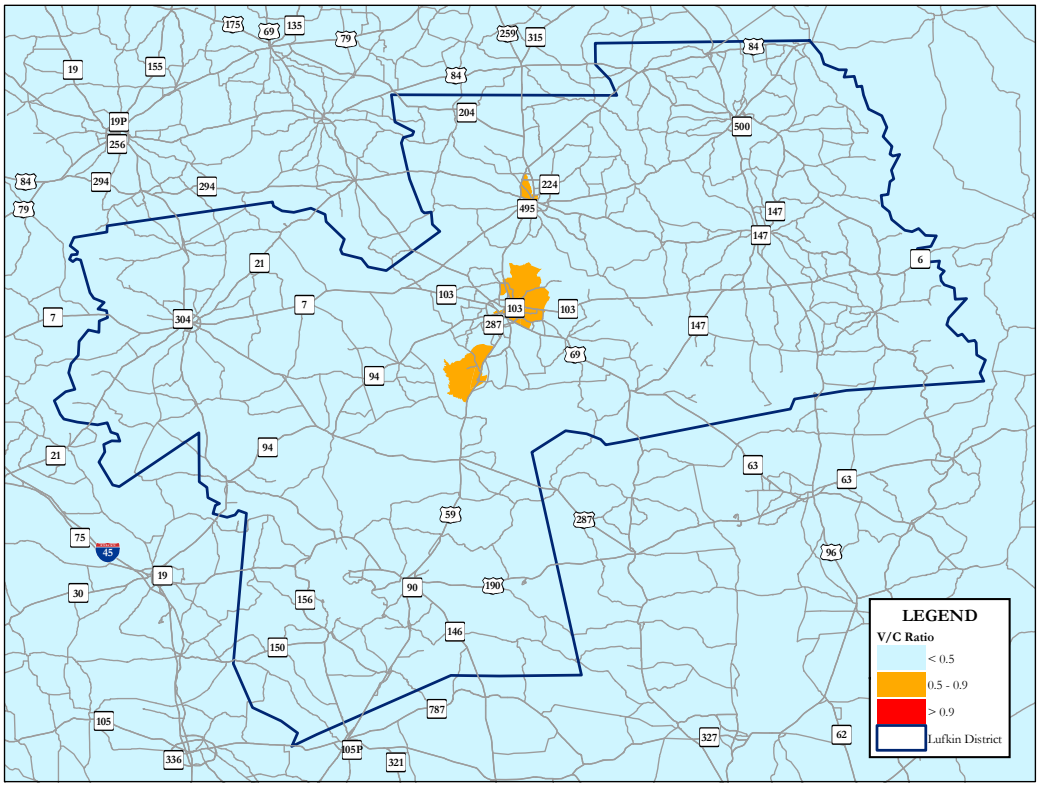


Figure 3-51: 1998 Congestion for Lufkin District (based on SAM modeling)

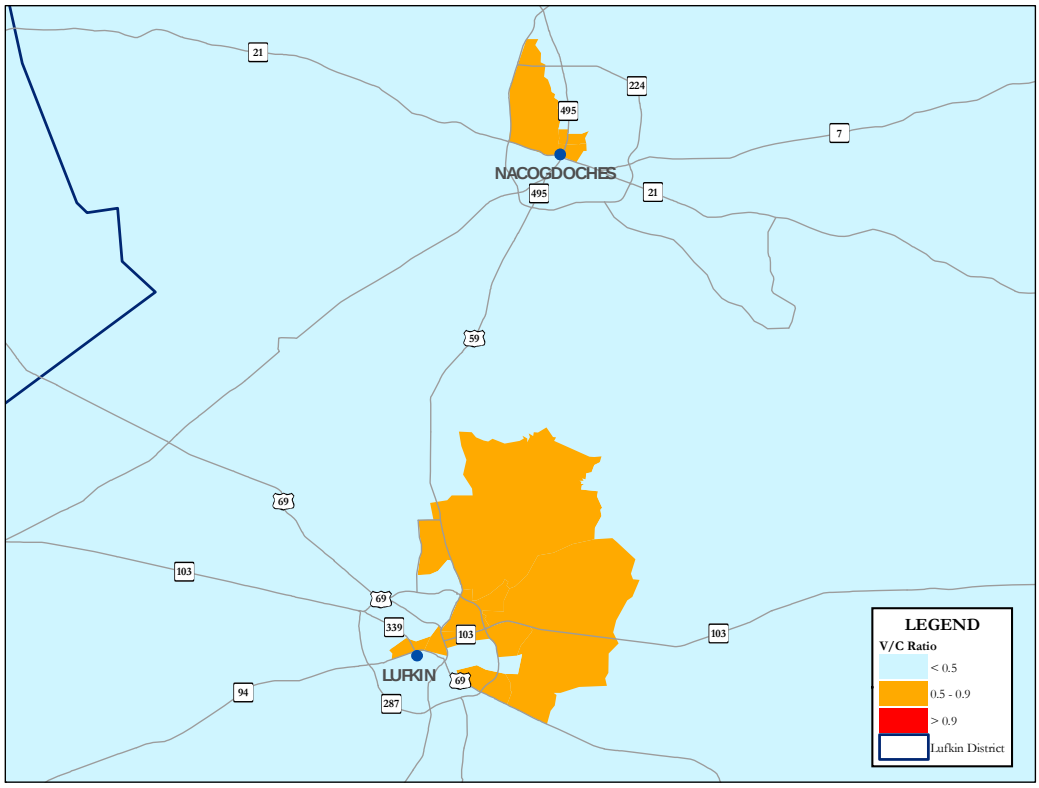


Figure 3-52: 1998 Congestion for Cities of Lufkin and Nacogdoches (based on SAM modeling)

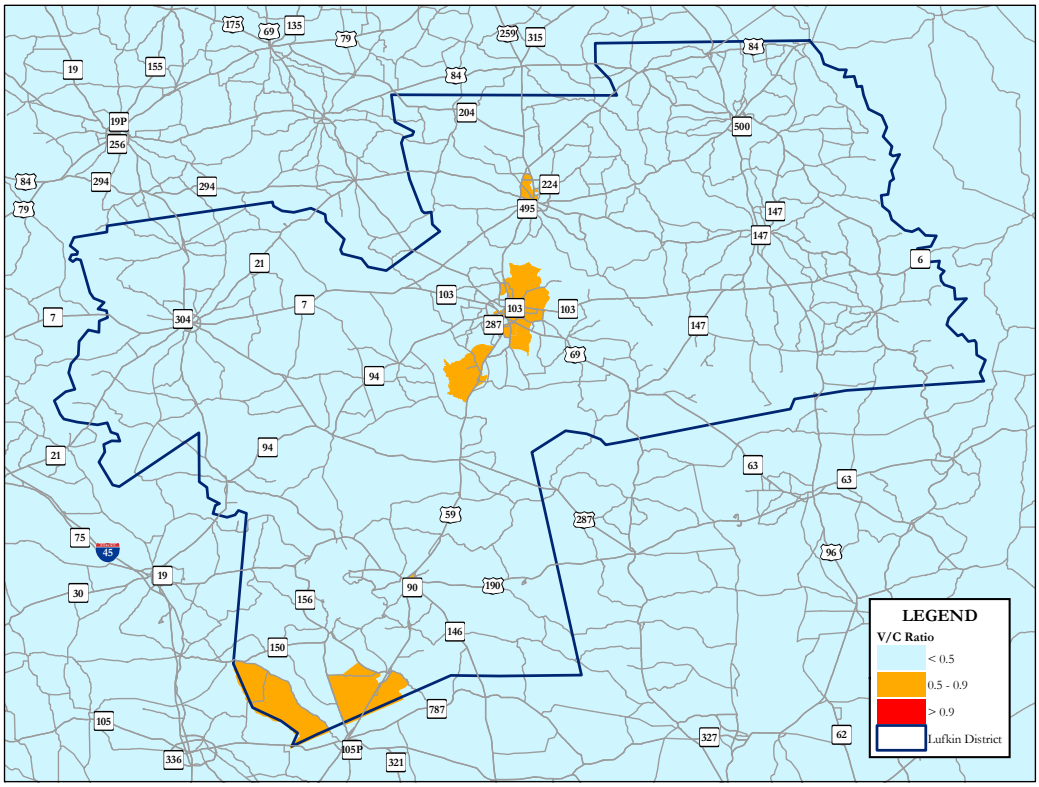


Figure 3-53: 2025 Congestion for Lufkin District (based on SAM modeling)

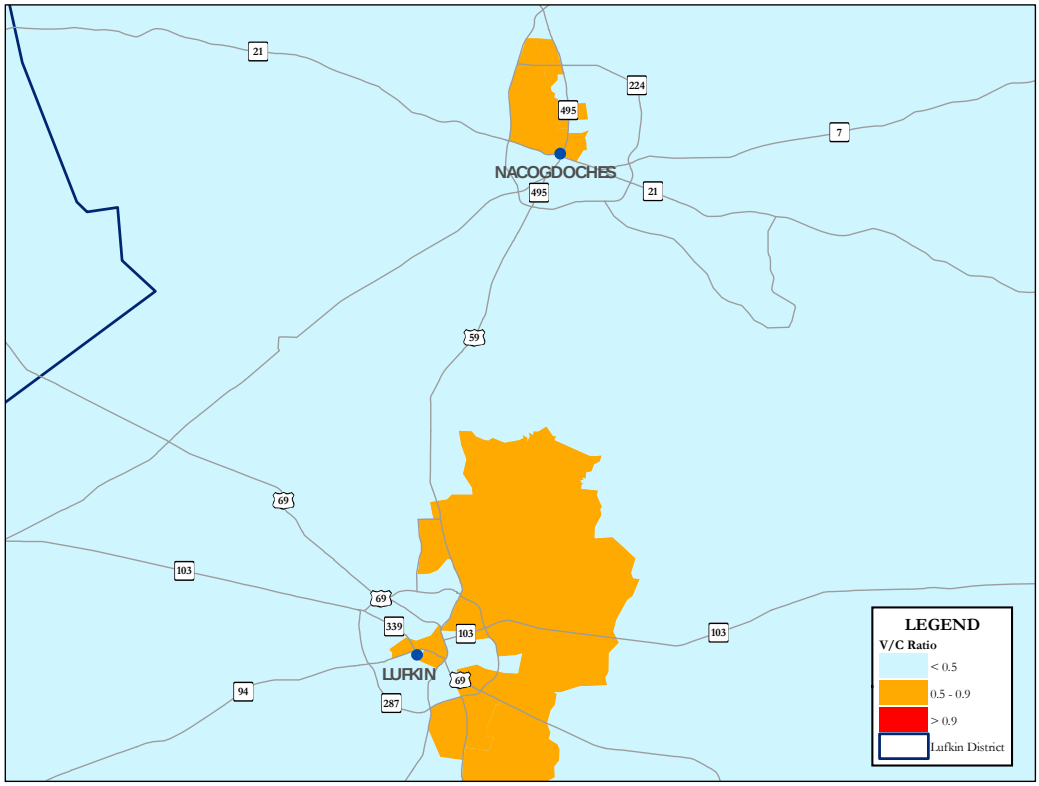
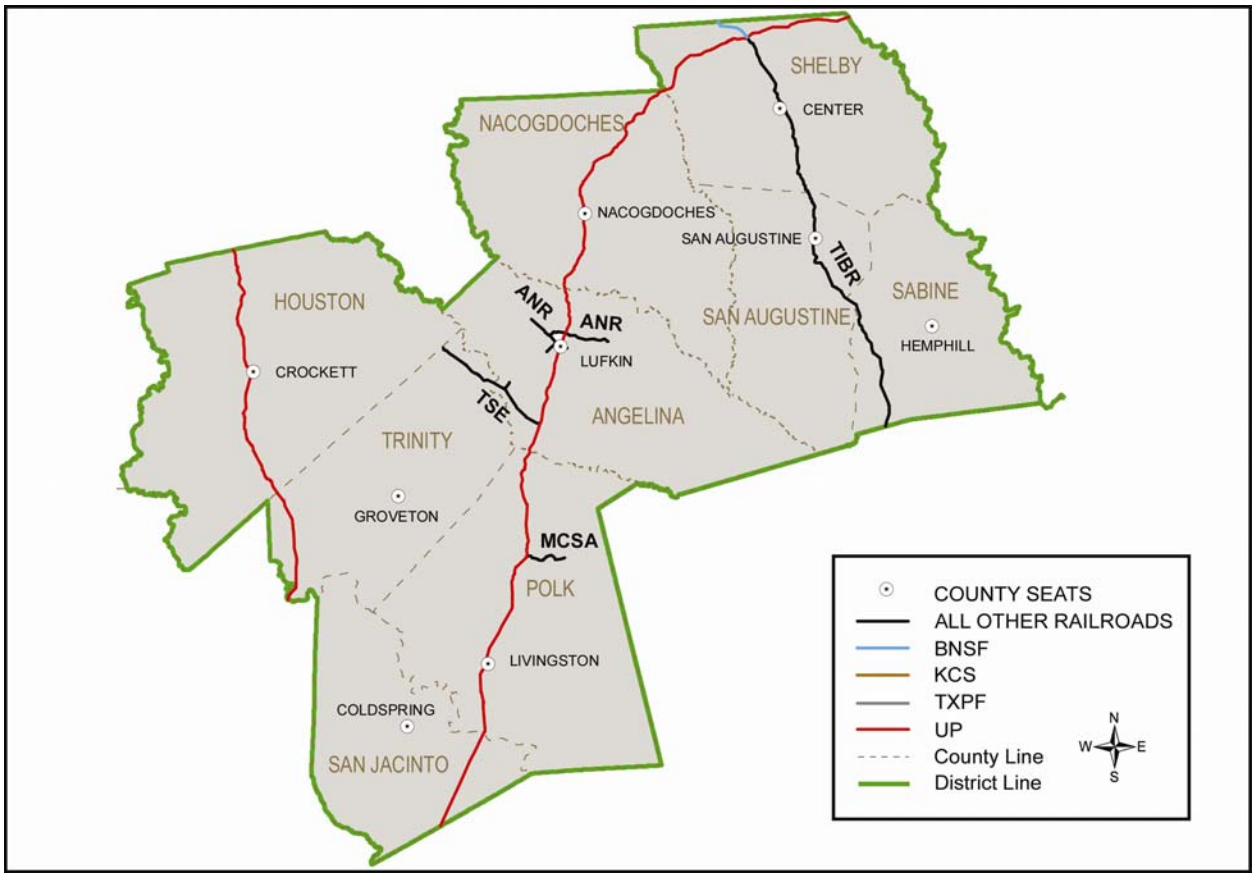


Figure 3-54: 2025 Congestion for Cities of Lufkin and Nacogdoches (based on SAM modeling)

Rail Freight Movements and Commodities

Existing Rail Network

The Lufkin District is served by two Class I railroads: the UP, and BNSF. Figure 3-55 depicts the existing railroad network for the Paris District. There are two independently owned and operated railroad companies that are identified as switching companies: the Angelina & Neches River Railroad (AN&R) located in Lufkin and the Texas South-Eastern Railroad (TSE) located at Diboll, Texas.



*Source: TxDOT Texas State Railroad Map

Figure 3-55: Rail Network within Lufkin District

Rail Freight Movements for the Lufkin District, the State, and the Country

Table 3-18 illustrates that the Lufkin District will continue to import a great deal of commodities through the year 2025. While a modest increase in internal rail freight movements will occur in the District, approximately 2.5 million additional tons will be transported to/from Mexico and other parts of the country between 2004 and 2025. An additional 2.2 million tons are expected to be transported to/from other Texas counties between 2004 and 2025.

Annual Rail Tons				
Origin	**Termination**	**2004**	**2025**	**Percent Change**
Internal to Internal				
Lufkin District	Lufkin District	30,516	50,200	65%
Internal to External				
Lufkin District	Other Texas Counties	163,219	325,360	99%
Lufkin District	Western U.S.	6,686	17,220	158%
Lufkin District	Northern U.S.	221,947	571,669	158%
Lufkin District	Eastern U.S.	11,752	30,269	158%
Lufkin District	Mexico	13,106	33,758	158%
External to Internal				
Other Texas Counties	Lufkin District	1,801,555	3,832,673	113%
Western U.S.	Lufkin District	49,781	104,305	110%
Northern U.S.	Lufkin District	1,652,625	3,462,727	110%
Eastern U.S.	Lufkin District	87,505	183,349	110%
Mexico	Lufkin District	97,590	204,480	110%
Total		**4,136,282**	**8,816,009**	**113%**

*Source: Statewide Analysis Model based on 2004 Surface Transportation Board Waybill Data

Table 3-18: Rail Freight Movements

Rail Freight Movements within the State

Figures 3-56 and 3-57 illustrate the origin and destinations for freight rail movements occurring in 2004 and 2025, respectively. Bexar, Wise, Harris, and Brown Counties appear to be handling the largest movements to and from the Lufkin District. The reason for the significant difference in the amount of rail tonnage into and out of these areas is due to the lack of available rail lines. The major rail line coming to and from the Lufkin District is provided by UP and travels from the south in Harris County to the north corner of the Lufkin District in Shelby County leading to Harris County being one of the counties that experiences significant rail tonnage traveling to and from the Lufkin District.

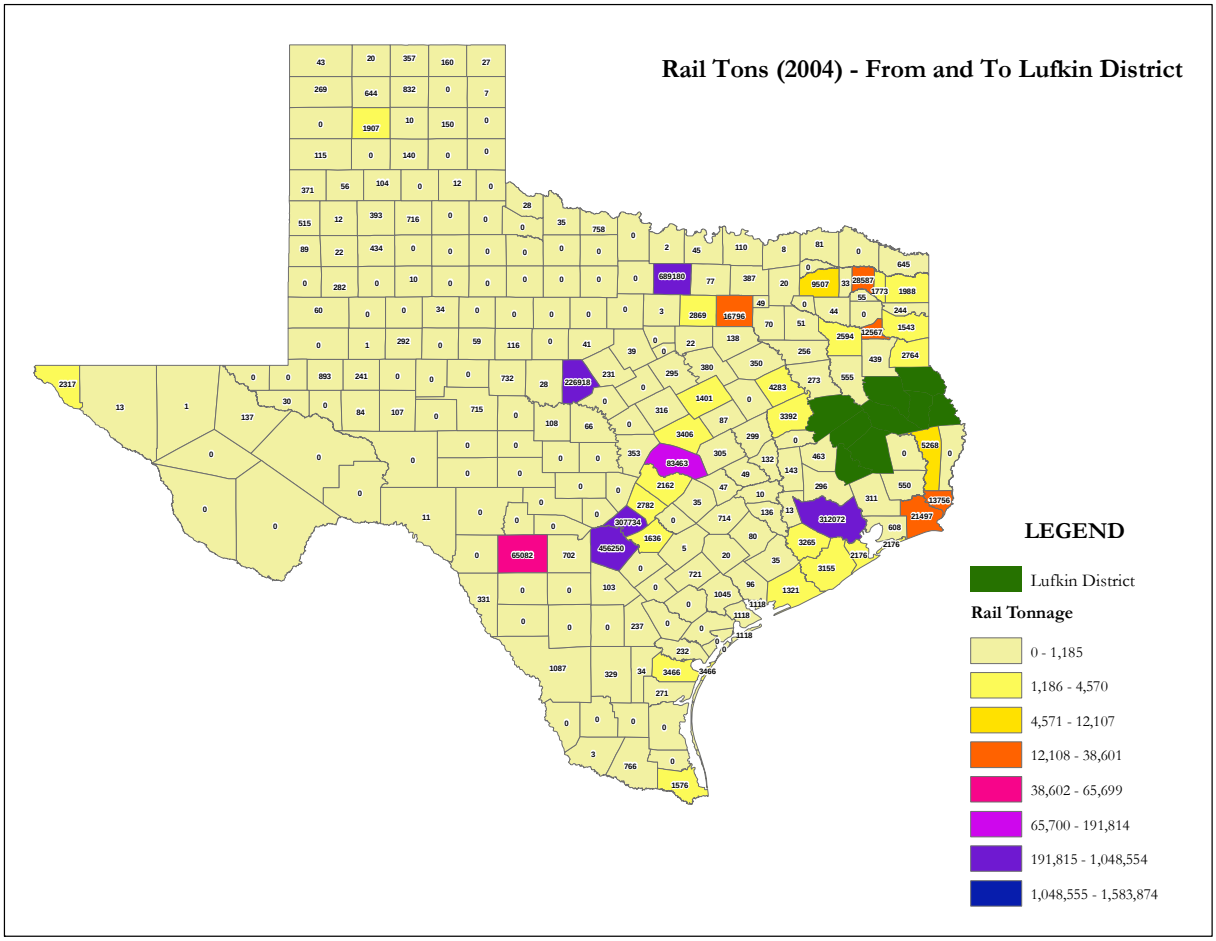


Figure 3-56: 2004 Rail Freight Movements

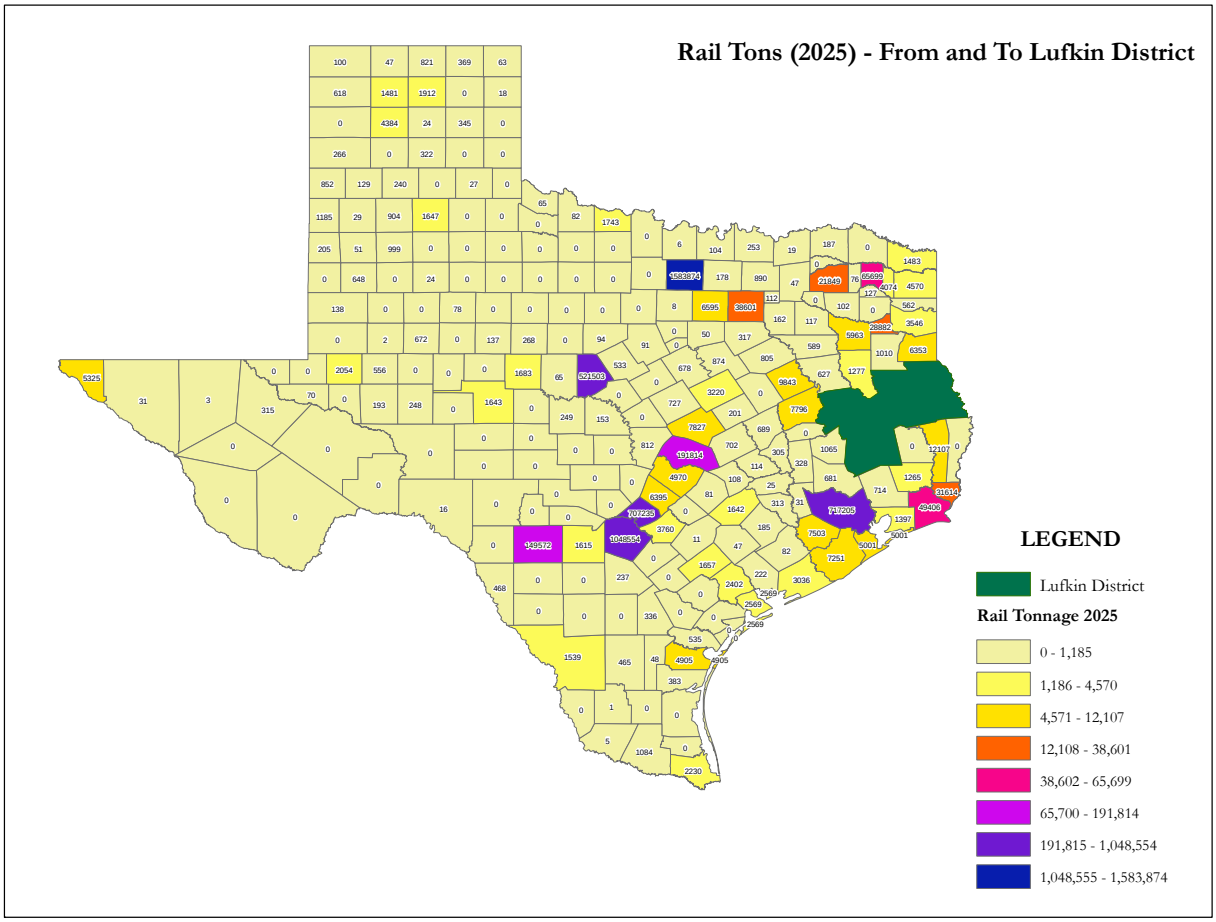


Figure 3-57: 2025 Rail Freight Movements

Rail Freight Movements Outside of the State

Figures 3-58 and 3-59 illustrate that major rail freight movements are occurring and are projected to grow between the Lufkin District and New Mexico, Oklahoma, Arkansas, and more moderately from Louisiana and Mexico.

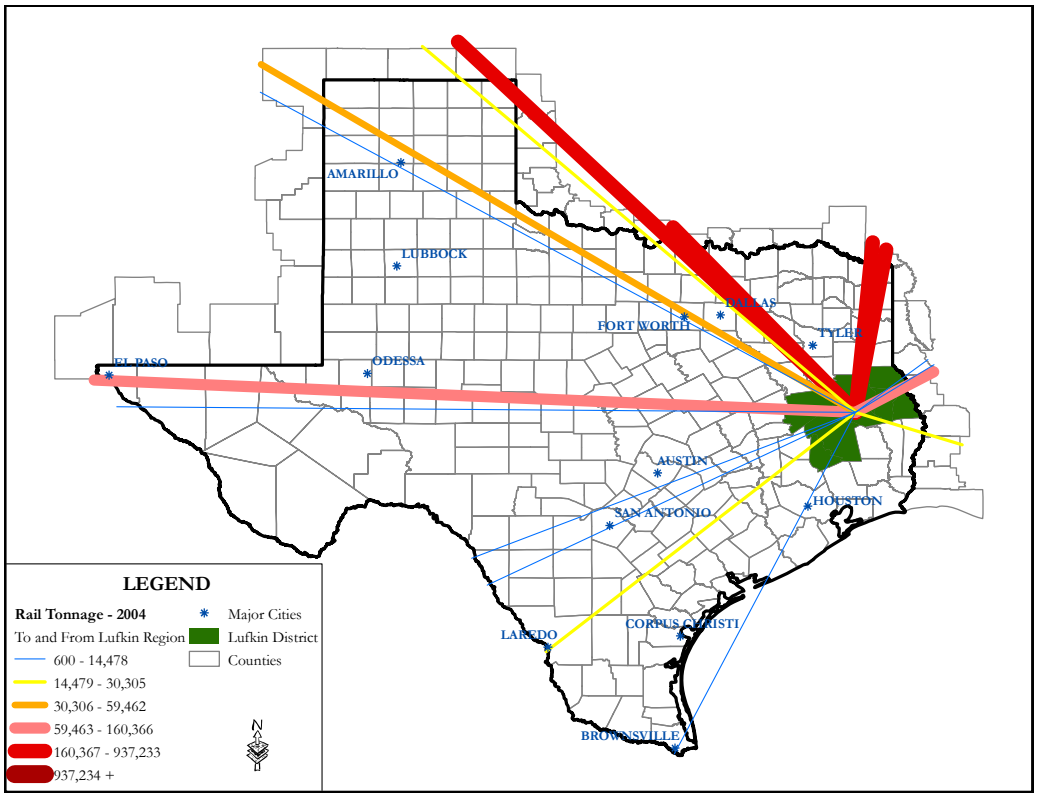


Figure 3-58: 2004 Freight Rail Between Lufkin District and Outside of Texas

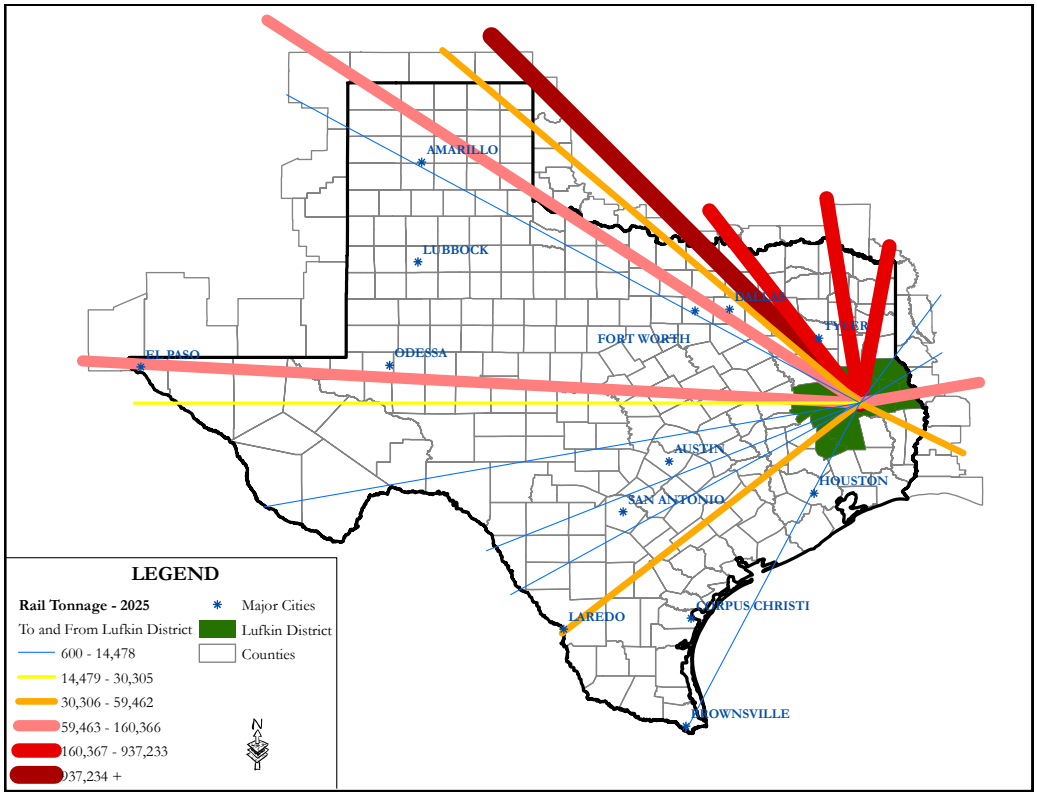


Figure 3-59: 2025 Freight Rail Between Lufkin District and Outside of Texas

Freight Rail Commodity Trends

As shown in Table 3-19, the commodity movement with the largest tonnage increase in the Lufkin District is raw materials, followed by agricultural products. Given the large growth in the population, the increase in manufacturing, and the expected continued strengthening of the Texas economy, all of the commodities are projected to increase at about the same high growth percentage.

Commodity	Rail Tons		
	2004	2025	Percent Increase
Raw Materials	1,763,286	3,934,906	123%
Agriculture	1,144,260	2,347,183	105%
Food	828,602	1,699,684	105%
Chemical/ Petroleum	103,772	213,035	105%
Building Materials	98,737	203,359	106%
Secondary	71,960	159,022	121%
Wood	71,808	147,897	106%
Machinery	29,172	60,083	106%
Textiles	24,684	50,840	106%
Total	4,136,282	8,816,009	113%

Table 3-19: Rail Freight Commodity Growth

Figures 3-60 and 3-61 display the commodities being moved by rail within the Lufkin District for both 2004 and 2025. The relative percentages of commodity tonnages do not change significantly from 2004 (Figure 3-61) to 2025.

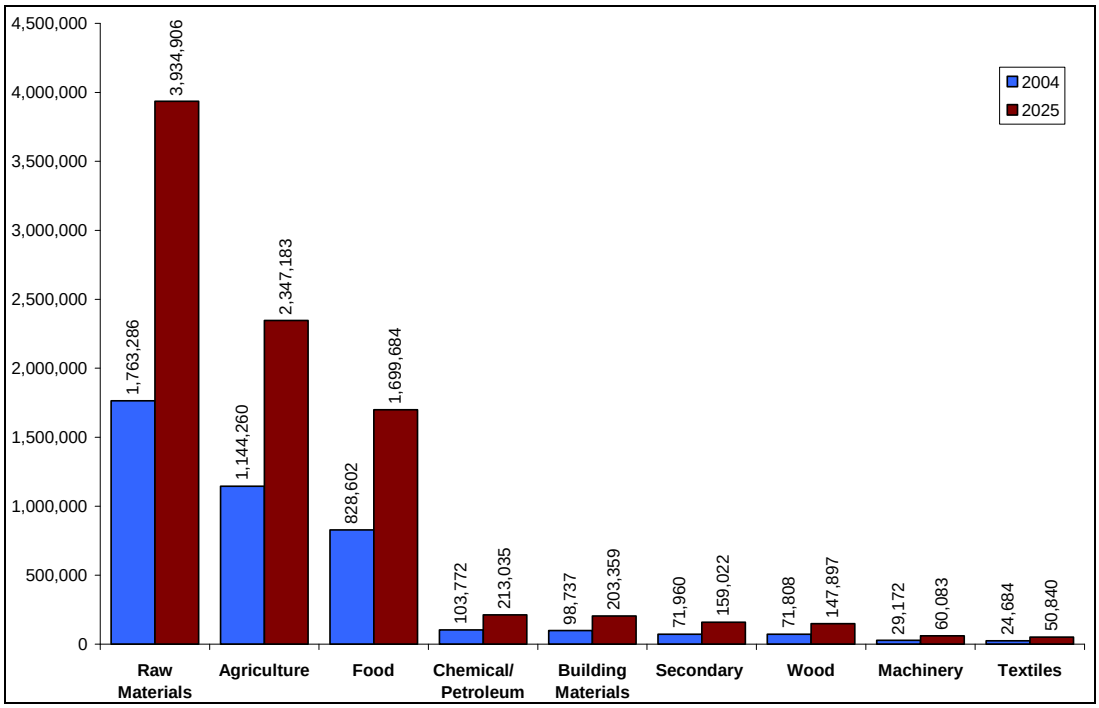


Figure 3-60: Total Freight Rail Tons by Commodity

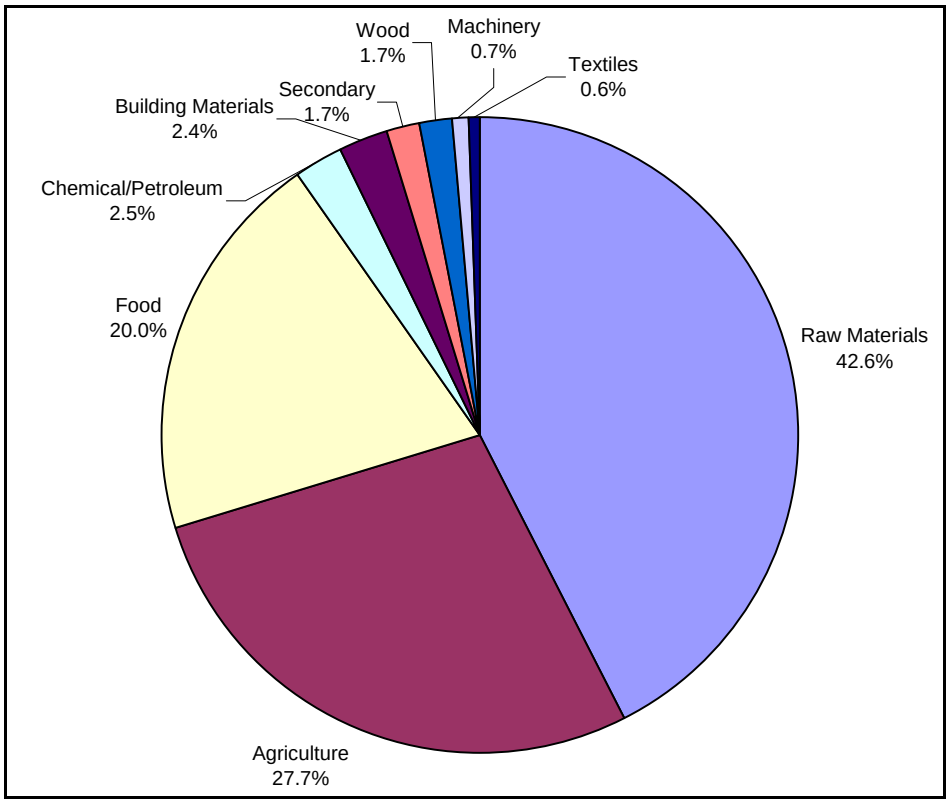


Figure 3-61: Percentage of Freight Rail Tonnage by Commodity (2004)

Rail Freight Findings Summary

- Freight tonnage moved by rail is projected to more than double by 2025.
- Agriculture and raw materials constitute a majority of the freight rail tonnage.
- Rail shipments to and from other states and Mexico are projected to constitute approximately 51 percent of total rail shipments within the Lufkin District.

Rail and Truck Freight Comparison

Table 3-20 and Figure 3-62 provide the total truck and rail tons in the District. The increase between 1998 and 2025 for truck tons represents a 127 percent increase as opposed to a rail tonnage increase of 113 percent between 2004 and 2025.

Year	Truck	Rail
1998 (Truck), 2004 (Rail)	17,148,196	4,136,282
2025	38,848,742	8,816,009
Percent Increase	127%	113%

Table 3-20: Rail and Truck Tons Comparison

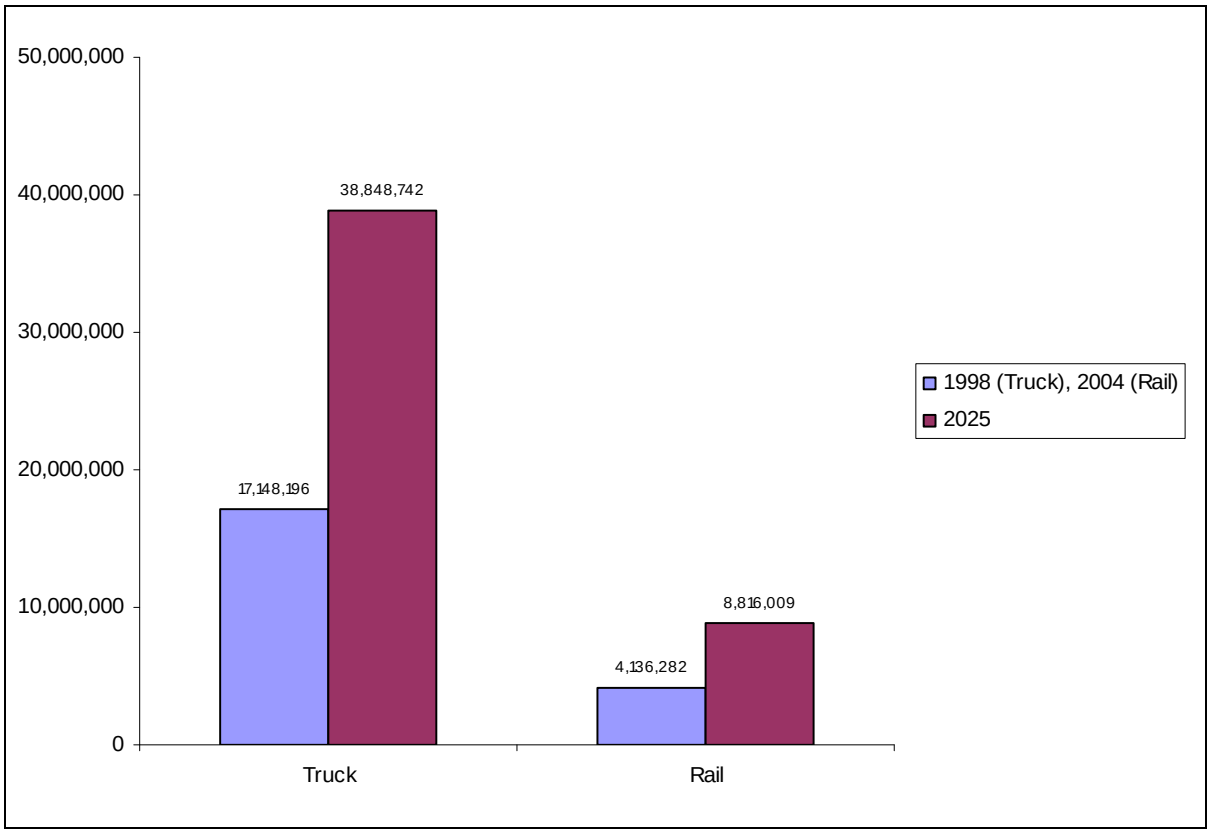


Figure 3-62: Total Rail / Truck Tons

As shown in Table 3-21, the total combined tons shipped by truck and rail are projected to increase by 124 percent by 2025. The majority (approximately 80 percent) of freight movement entering and leaving the Lufkin District either originates or is destined for other Texas counties. Of the trips originating or ending in Mexico or other parts of the country, approximately 59 percent are projected to go to/from the northern U.S.

The projected internal tonnage shipped by truck within the Lufkin District for 2025 is more than 540 thousand tons, while the projected internal rail shipments are projected to be more than 50 thousand tons. The internal combined freight movement is projected to increase approximately 105 percent with trucks projected to carry nearly 1000 percent more than trains by 2025. The trucks leaving the District are projected to haul approximately 27 times more than rail cars while the trucks entering the District are projected to haul approximately 45 percent more cargo. The projected truck freight growth for movements entering and leaving the District may be due to the wood, food and building materials being shipped within northeast Texas and because it is generally more economically feasible to ship by truck for destinations within a 500 mile radius.

Combined Truck and Rail Tons				
Origin	**Termination**	**1998/2004**	**2025**	**Percent Change**
Internal to Internal				
Lufkin District	Lufkin District	289,997	593,301	105%
Internal to External				
Lufkin District	Other Texas Counties	10,385,579	24,532,488	136%
Lufkin District	Western U.S.	46,194	110,552	139%
Lufkin District	Northern U.S.	588,338	1,437,206	144%
Lufkin District	Eastern U.S.	393,039	930,996	137%
Lufkin District	Mexico	403,016	954,853	137%
External to Internal				
Other Texas Counties	Lufkin District	6,648,269	13,655,274	105%
Western U.S.	Lufkin District	71,347	154,491	117%
Northern U.S.	Lufkin District	1,852,628	3,928,140	112%
Eastern U.S.	Lufkin District	295,640	667,684	126%
Mexico	Lufkin District	310,432	699,767	125%
Total		**21,284,478**	**47,664,751**	**124%**

Table 3-21: Rail and Truck Tons Comparison

TxDOT - Paris District

This section describes the freight flow movement in terms of truck and rail commodity flow for TxDOT's Paris District. Network improvements updated in the SAM to reflect projects cited in the District's list of planned projects are shown in Figure 3-63 and are listed individually in Table D-4 in Appendix D.

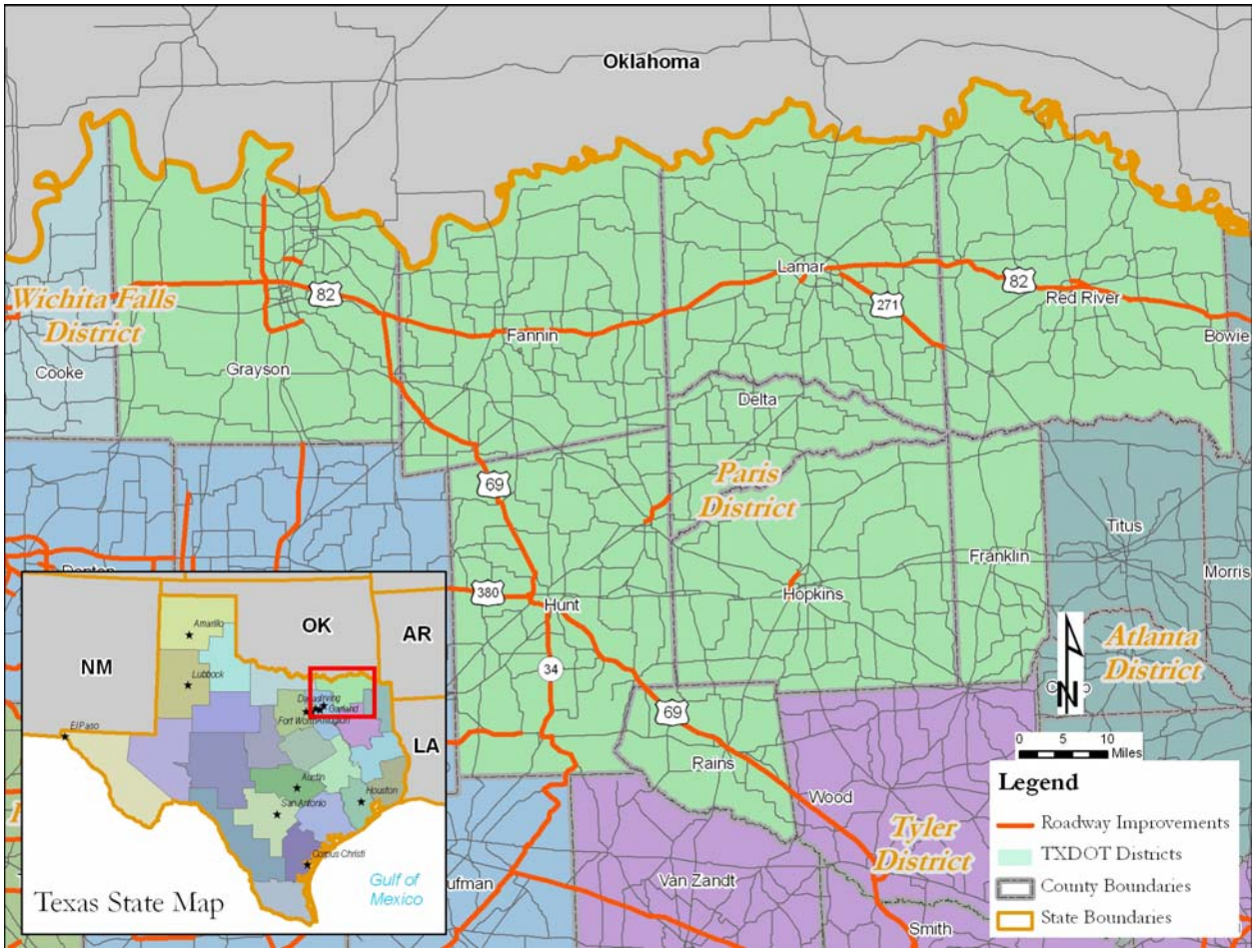


Figure 3-63: Future Network Improvements

Truck Freight Movements and Commodities

Table 3-22 illustrates that while the movement of truck tons within the Paris District is projected to increase by nearly 322,000 tons from 1998 to 2025, it is small when compared to the increased movements coming into (8.3 million) and out of (13.6 million) the Paris District.

Annual Truck Tons				
Origin	**Termination**	**1998**	**2025**	**Percent Change**
Internal to Internal				
Paris District	Paris District	254,746	576,615	126%
Internal to External				
Paris District	Other Texas Counties	7,256,590	18,912,856	161%
Paris District	Western U.S.	69,757	158,735	128%
Paris District	Northern U.S.	881,876	2,006,744	128%
Paris District	Eastern U.S.	213,675	486,225	128%
Paris District	Mexico	363,474	827,099	128%
External to Internal				
Other Texas Counties	Paris District	6,578,943	13,530,594	106%
Western U.S.	Paris District	55,501	118,034	113%
Northern U.S.	Paris District	701,648	1,492,199	113%
Eastern U.S.	Paris District	170,006	361,554	113%
Mexico	Paris District	289,191	615,025	113%
	Total	**16,835,407**	**39,085,679**	**132%**

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

Table 3-22: Truck Freight Movement

Truck Movements within the State

Figure 3-64 revealed that in 1998, large numbers of trucks moved between the Paris District and Houston, San Antonio, the Dallas-Fort Worth metroplex, El Paso and Austin, as well as, areas along the U.S.-Mexico border with the largest origins and destinations being the Dallas-Fort Worth metroplex and the Houston region. The I-35, I-30, I-45, and U.S. 82 corridors link the Paris District with the major markets in Texas and other states. Figure 3-65 shows the projected growth of truck traffic between the Paris District and the major urban areas listed above.

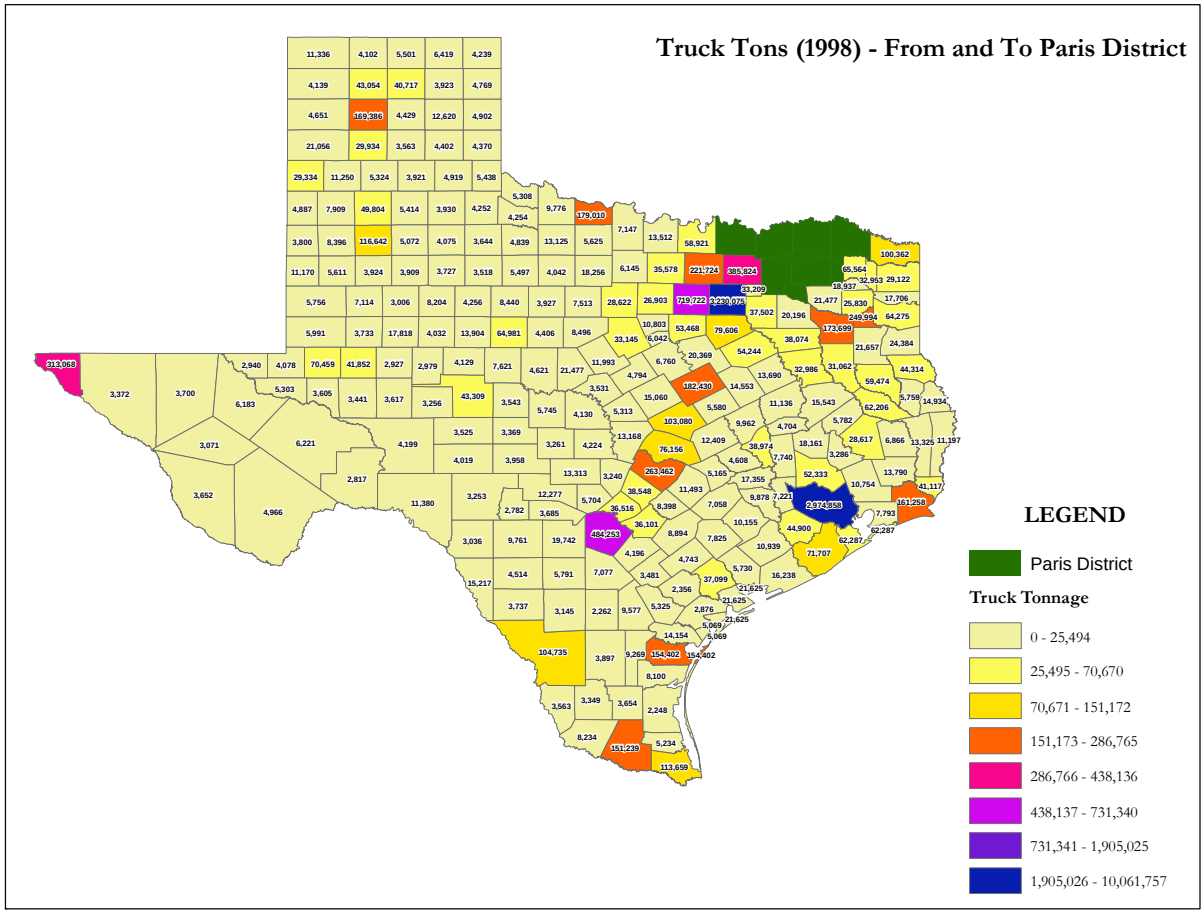


Figure 3-64: 1998 Truck Movements within Texas To and From Paris District

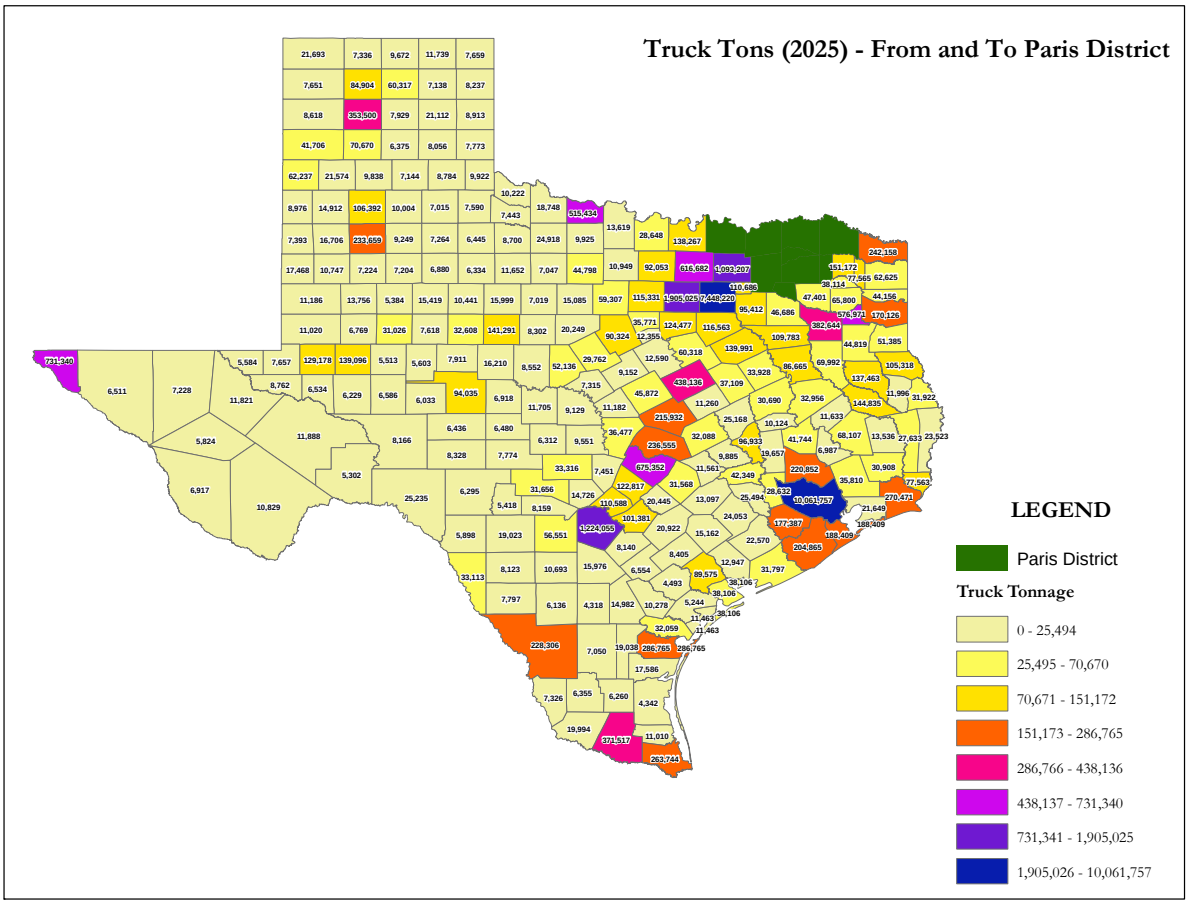


Figure 3-65: 2025 Truck Movements within Texas To and From Paris District

Truck Movements Outside of the State

Major movements in 1998 can be seen from Arkansas, Oklahoma, Louisiana, and Mexico as shown in Figure 3-66. Figure 3-67 demonstrates large projected increases in movement from Arkansas, Oklahoma, New Mexico, Louisiana, and Mexico to the Paris District in 2025.

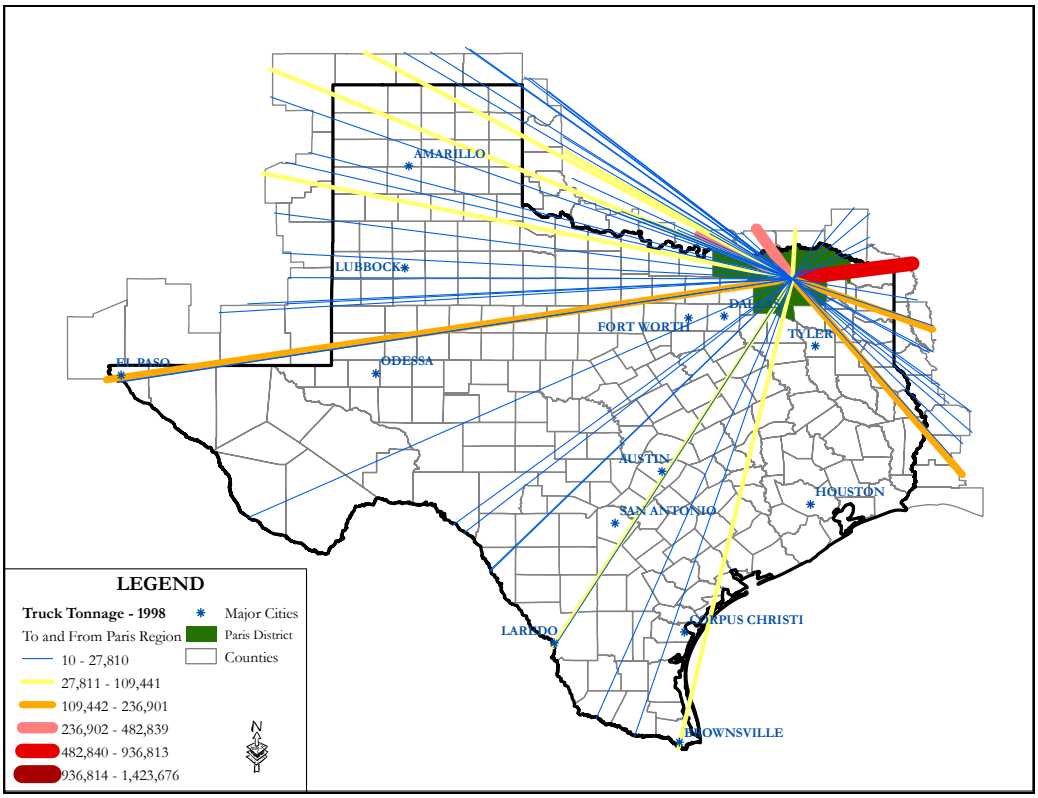


Figure 3-66: 1998 Truck Movements Between Paris District and Outside of Texas

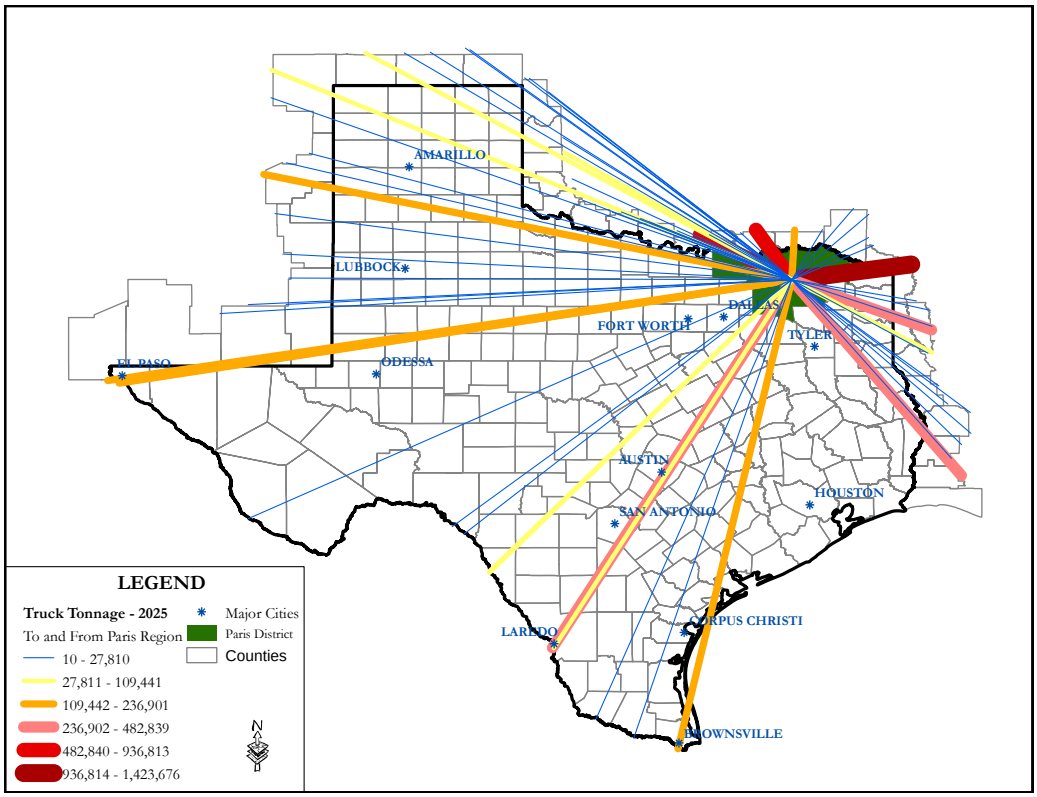


Figure 3-67: 2025 Movements Between Paris District and Outside of Texas

Truck Commodity Trends

Table 3-23 indicates that building materials will be the fastest growing commodity in terms of the weight of increased tonnage, as well as producing the largest total tonnage. While textiles, machinery, and raw materials are projected to produce much lower tonnages, they are expected to exhibit high growth percentages. The leading products moving by truck (in terms of tonnage percentage for both 1998 and 2025) are food, building materials, chemical/petroleum products, wood, and secondary products.

Commodity	**Truck Tons**		
	1998	**2025**	**% Increase**
Building Materials	4,375,343	13,436,732	207%
Wood	2,262,303	5,059,413	124%
Agriculture	290,750	512,793	76%
Textiles	171,883	455,254	165%
Chemical/Petroleum	2,269,542	2,933,722	29%
Food	5,037,518	11,497,422	128%
Machinery	196,631	578,191	194%
Raw Materials	9,106	34,379	277%
Secondary	2,222,331	4,577,773	106%
TOTAL	16,835,407	39,085,679	132%

Table 3-23: Truck Commodity Growth

Figures 3-68, 3-69 and 3-70 display the commodities being moved by truck within the Paris District for both 1998 and 2025.

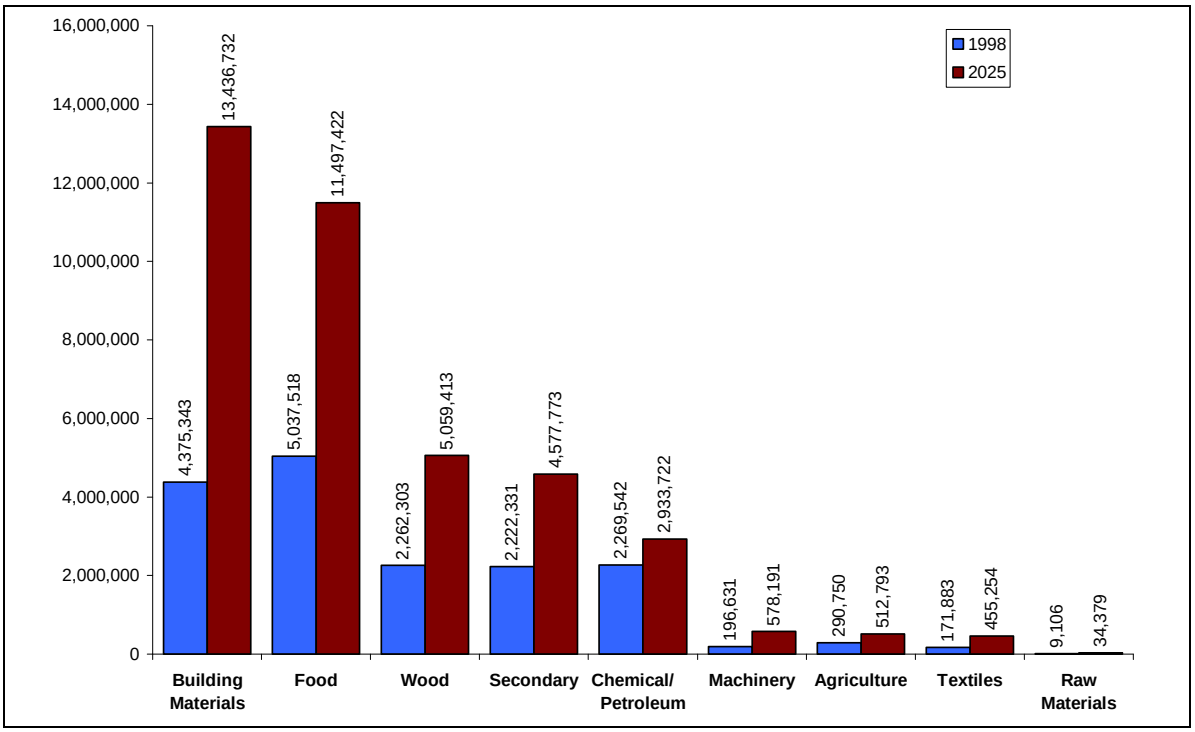


Figure 3-68: Total Truck Tons by Commodity

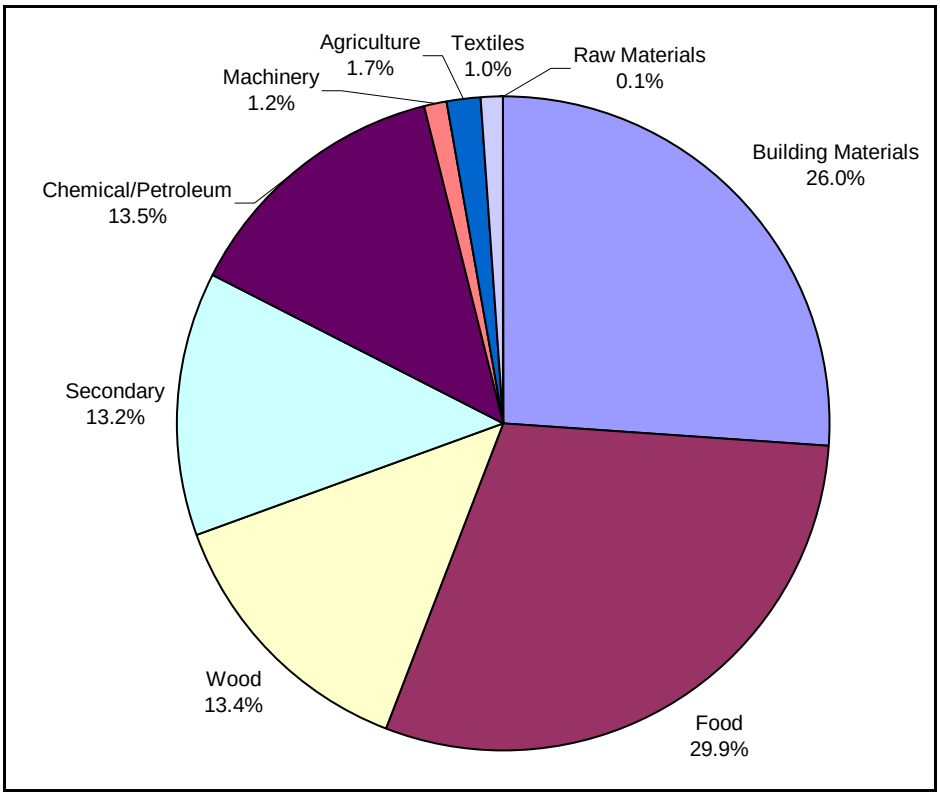


Figure 3-69: Total Truck Tons by Commodity (1998)

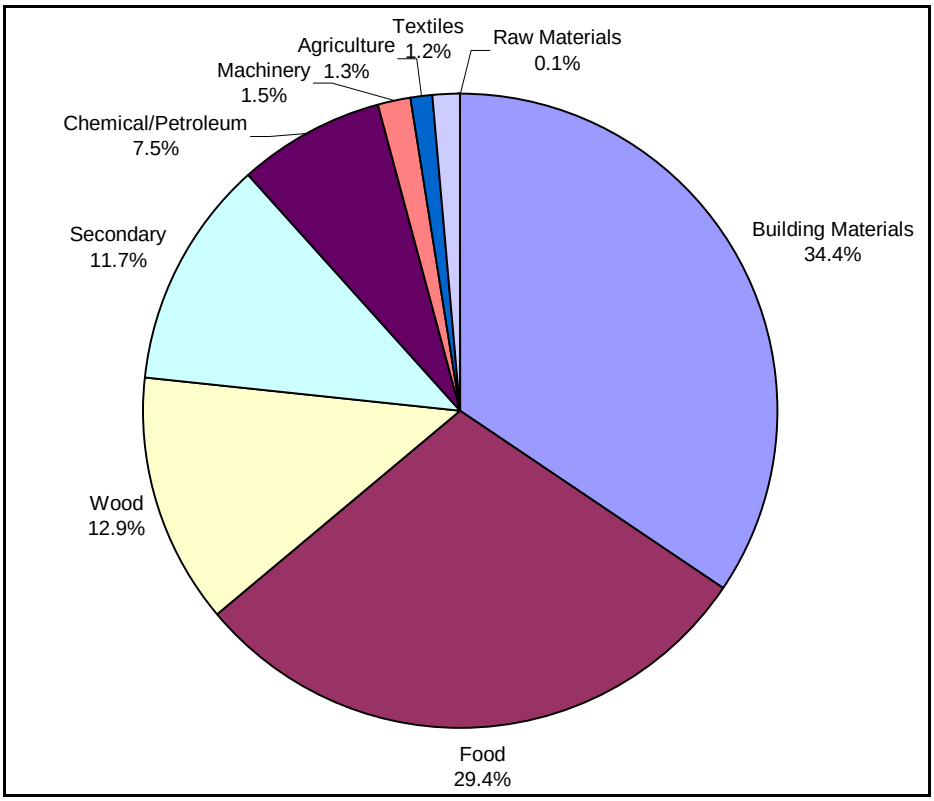


Figure 3-70: Percentage of Truck Tons by Commodity (2025)

Traffic Volume Analysis

Traffic data including total traffic volumes, truck volumes, percentage of trucks, and V/C are listed for individual roadway segments in the Paris District as shown in Tables E-7 and E-8 (in Appendix E) for 1998 and 2025, respectively. Figure E-4 graphically shows the locations at which such traffic data is provided. While the V/C ratio analysis showed that several highway segments would continue to result in increased periods of congestion between base and future years, the overall congestion level throughout the District was projected to remain relatively low. The primary areas of congestion are projected within or near the cities of Paris, Greenville, Sherman, and Whitesboro. The northern portion of SH 271 in Paris is projected to result in higher congestion levels for base and future year volumes. Future congestion is projected along U.S. 69 northwest of Greenville and U.S. 377 north of Whitesboro.

Figures 3-71 and 3-73 indicate the areas of congestion district-wide, while Figures 3-72 and 3-74 highlight the areas of congestion within/near the cities of Paris, Greenville, Sherman, and Whitesboro for the years 1998 and 2025. These figures show projected congestion in the southwestern portion of the District between the SH 289 and U.S. 377 corridors. This congestion is a reflection of the continued growth north of the DFW metroplex through Collin/Denton counties and into Grayson County. Due to expected growth and lack of projected roadway improvements in this area, congestion is likely to increase.

As Tables E-7 and E-8 show, heavy truck traffic occurs in several areas within the District. Approximately 18 percent of the east-west traffic traveling along I-30 west of Greenville is trucks, while east of Greenville the truck usage is 35 percent of the total traffic volume. Much of the truck traffic leaving I-30 travels on U.S. 69 north and south or travels on U.S. 380 east and west. The truck traffic traveling north or south will typically follow U.S. 69 which goes through Greenville. The two-lane capacity on U.S. 69 is inadequate for both passenger vehicles, as well as trucks. The interaction of heavy truck traffic with local traffic can exacerbate such capacity deficient traffic conditions on this section of U.S. 69, and often causes bottleneck and related safety issues.

Additional areas within the District also can expect to experience the effects of both congestion and higher percentages of truck traffic in the future. A good example is the section of SH 271 that lies north of the downtown district in Paris. This facility only has two lanes, is a major artery into Oklahoma, and serves a growing complex of industrial and commercial business parks, as well as the regional hospital and medical complex. Similar conditions characterize SH 19 on the south side of Paris and the section of U.S. 377 north of the Whitesboro business district near U.S. 82. Both of these north-south highway facilities might need widening to accommodate future traffic volumes. It was also determined that several bottlenecks occur due to at-grade railroad crossings. For instance, local roadways often become congested for locations with at-grade crossings within the cities of Paris, Greenville and Sherman.

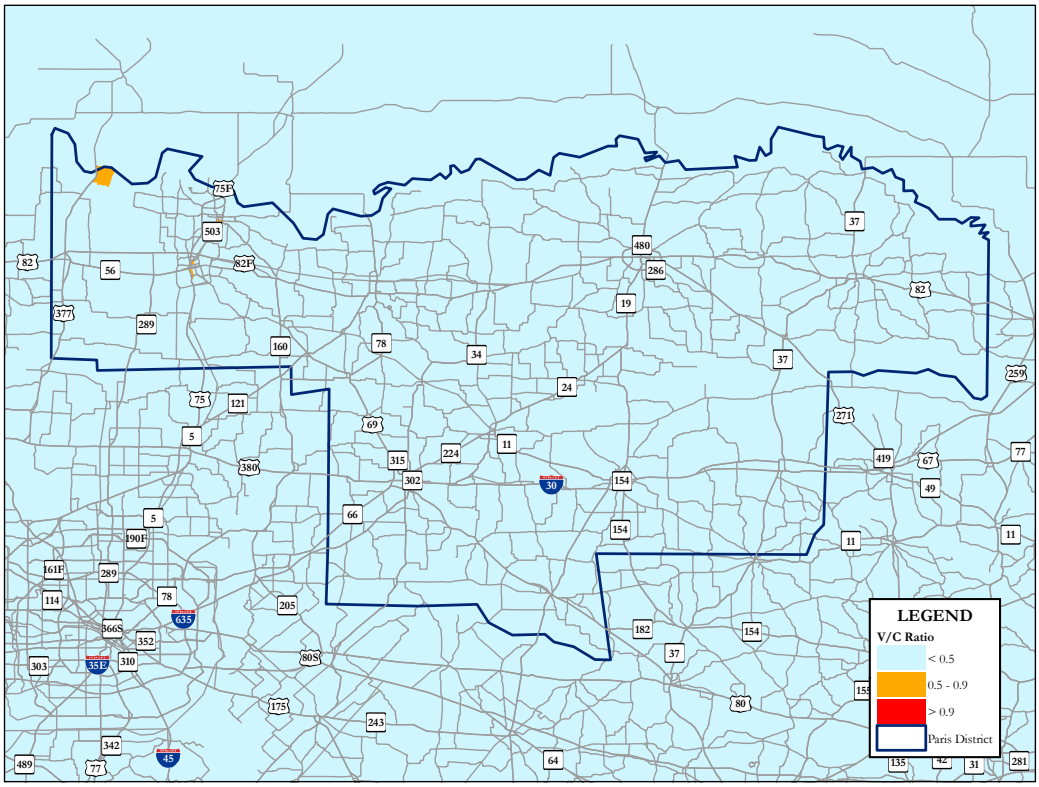


Figure 3-71: 1998 Congestion for Paris District (based on SAM modeling)

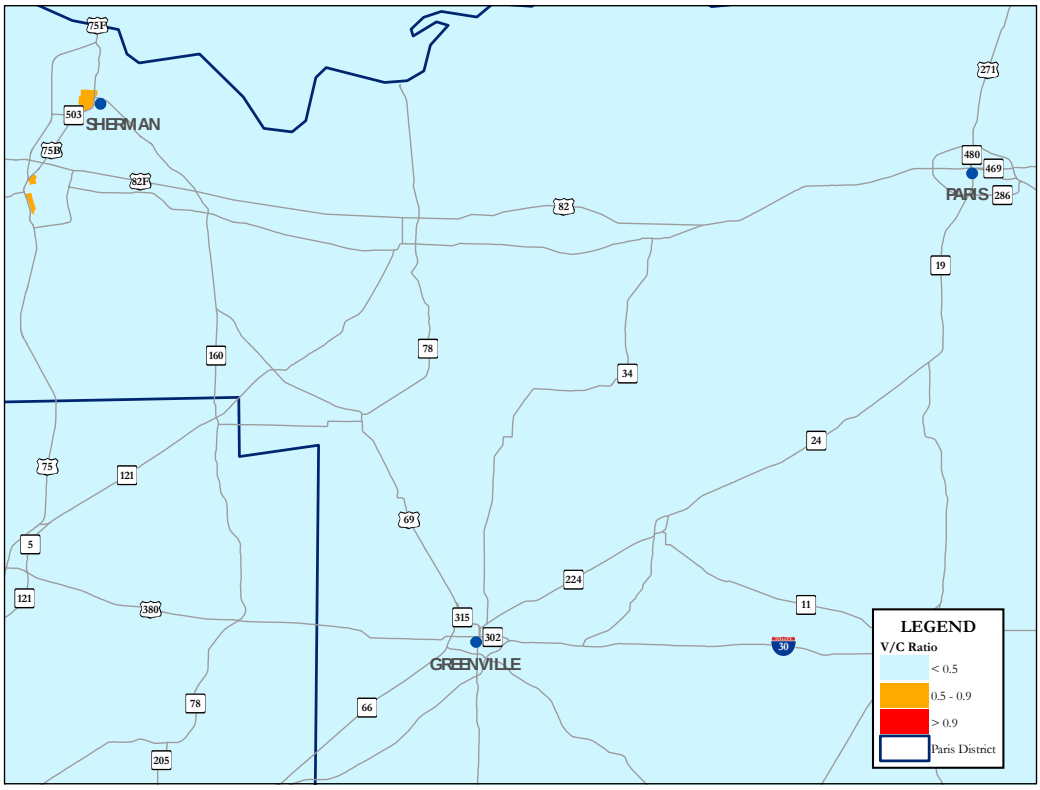


Figure 3-72: 1998 Congestion for Cities of Paris, Greenville and Sherman (based on

SAM modeling)

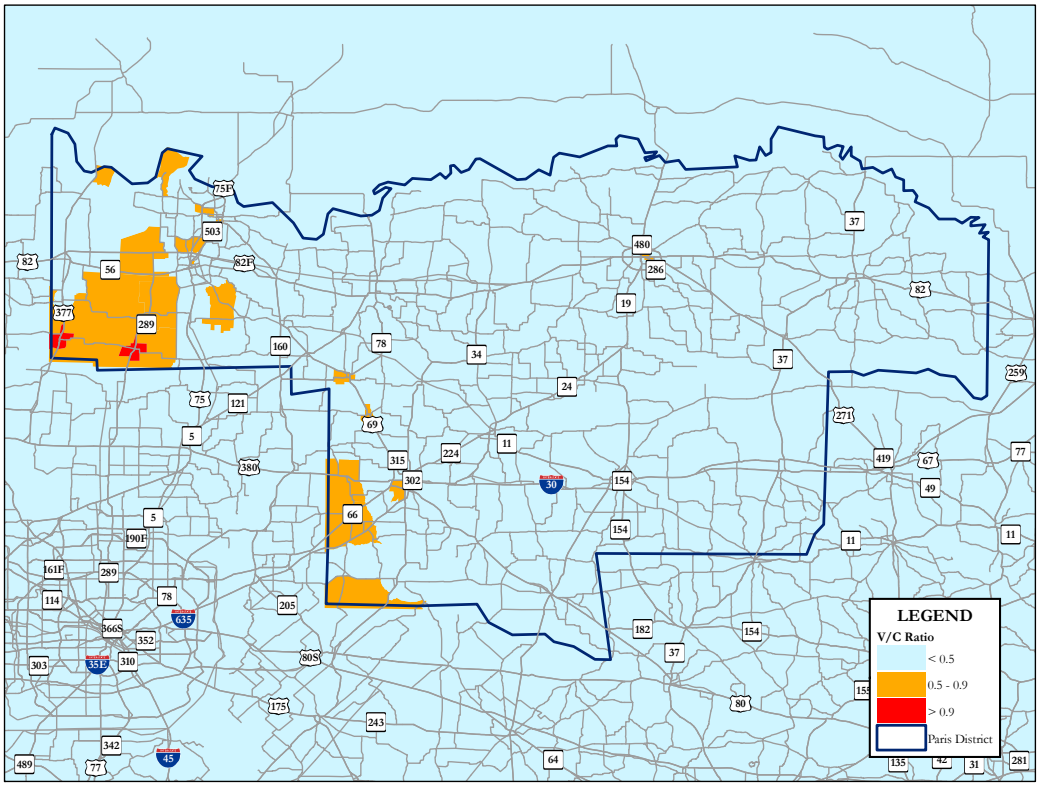


Figure 3-73: 2025 Congestion for Paris District (based on SAM modeling)

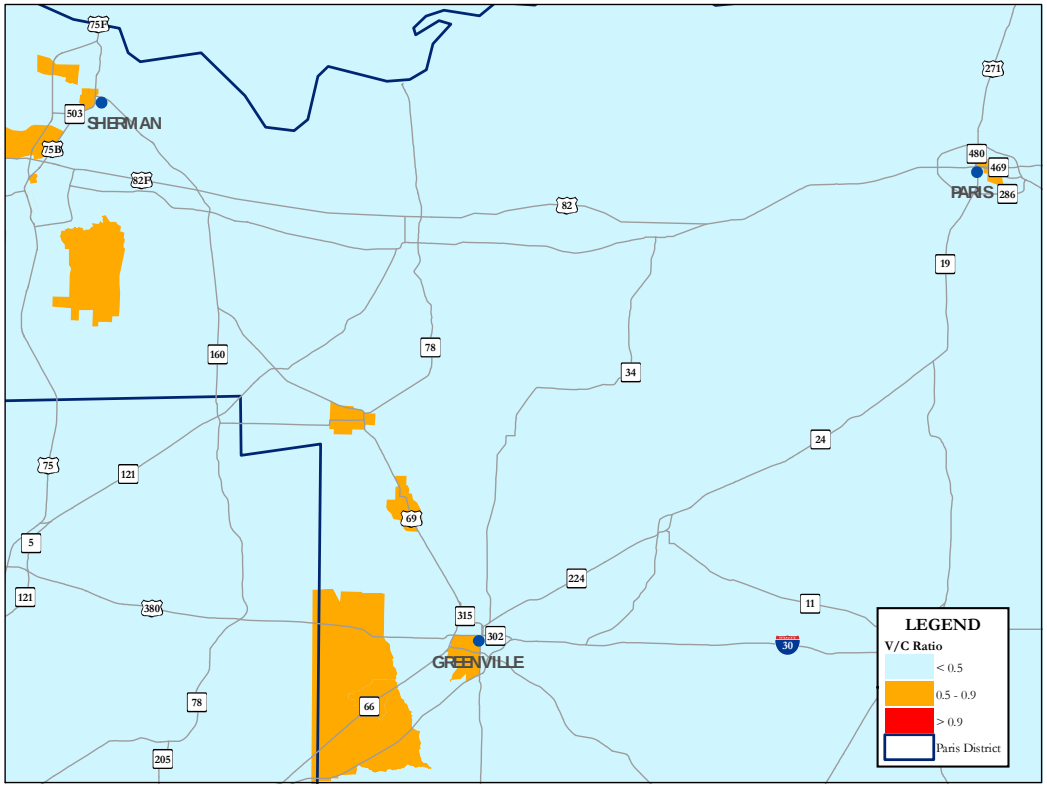
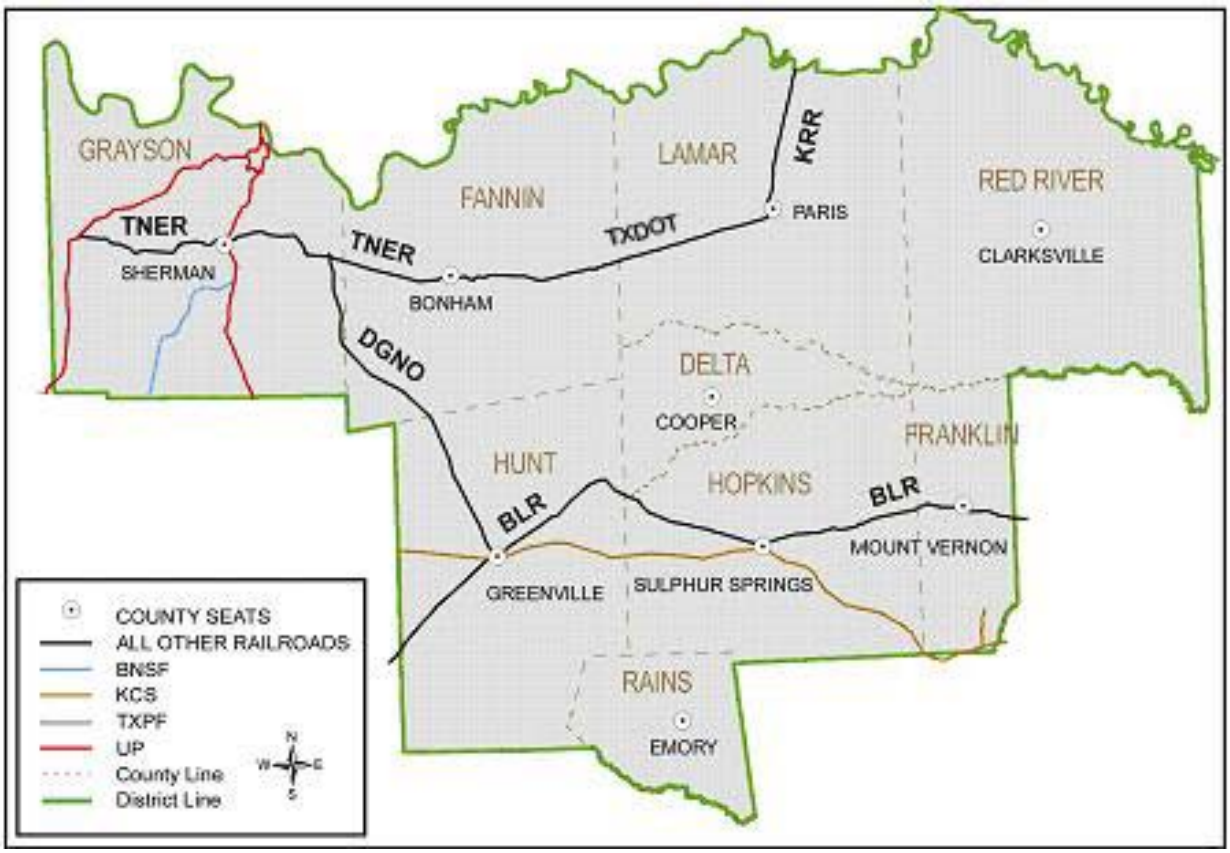


Figure 3-74: 2025 Congestion for Cities of Paris, Greenville and Sherman Rail Freight Movements and Commodities (based on SAM modeling)

Rail Freight Movements and Commodities

Existing Rail Network

The Paris District is served by three Class I railroads: the UP, BNSF, and KCS. Figure 3-75 depicts the existing railroad network for the Paris District.



*Source: TxDOT Texas State Railroad Map

Figure 3-75: Existing Rail Network – Paris District

Paris District is also served by four Class III railroads: the TNER, DGNO, BLR, and the Kiamichi railroads. The TNER, DGNO, and Kiamichi railroads are operated by RailAmerica, Inc., while the Blacklands Railroad operates on track owned by the Northeast Texas Rural Rail Transportation District. The Class III railroads, usually referred to as “short lines”, often engage in specialized services to a specific company or industry and are typically concentrated in small geographic areas. TxDOT also owns track between Bonham and Paris, but the track is in a state of disrepair.

Rail Freight Movements for the Paris District, the State, and the Country

Table 3-24 illustrates that while a modest increase in rail freight movement will occur internally to the District, approximately 1.3 million additional tons will be transported to/from Mexico and other parts of the country between 2004 and 2025. An additional 1.9 million tons will be transported to/from other Texas counties between 2004 and 2025.

Annual Rail Tons				
Origin	**Termination**	**2004**	**2025**	**Percent Change**
Internal to Internal				
Paris District	Paris District	22,120	40,210	82%
Internal to External				
Paris District	Other Texas Counties	232,725	451,000	94%
Paris District	Western U.S.	77,737	160,339	106%
Paris District	Northern U.S.	89,342	184,275	106%
Paris District	Eastern U.S.	89,008	183,587	106%
Paris District	Mexico	1,052	2,169	106%
External to Internal				
Other Texas Counties	Paris District	1,257,342	2,876,875	129%
Western U.S.	Paris District	294,422	601,038	104%
Northern U.S.	Paris District	338,374	690,762	104%
Eastern U.S.	Paris District	337,110	688,182	104%
Mexico	Paris District	3,983	8,131	104%
Total		**2,743,214**	**5,886,569**	**115%**

*Source: Statewide Analysis Model based on 2004 Surface Transportation Board Waybill Data

Table 3-24: Rail Freight Movements

Rail Freight Movements within the State

Figure 3-76 illustrates the tonnage of freight rail moving between the Paris District and other Texas counties occurring in 2004. Harris, Galveston, Titus, Morris, Jefferson, Freestone, and Dallas Counties appear to be handling the largest movements to and from the Paris District. The rail tonnage entering and leaving the Paris District in 2004 and projected for 2025, as shown in Figure 3-77, is significantly influenced by the fact that the District lies within a heavily used corridor connecting Laredo with the upper midwest states. Additionally, the Paris District lies along the main east-west corridors across the southern tier of the United States.

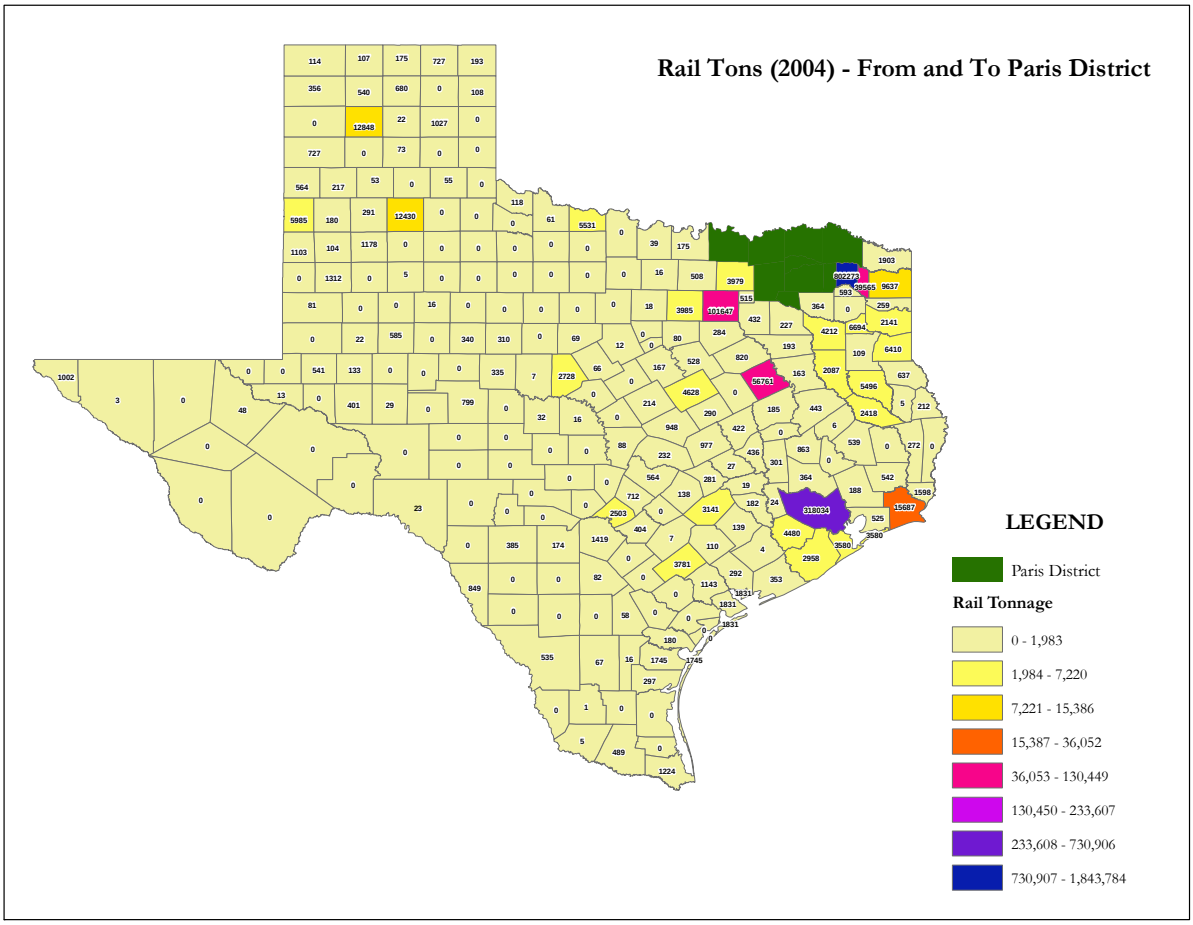


Figure 3-76: 2004 Rail Freight Movements

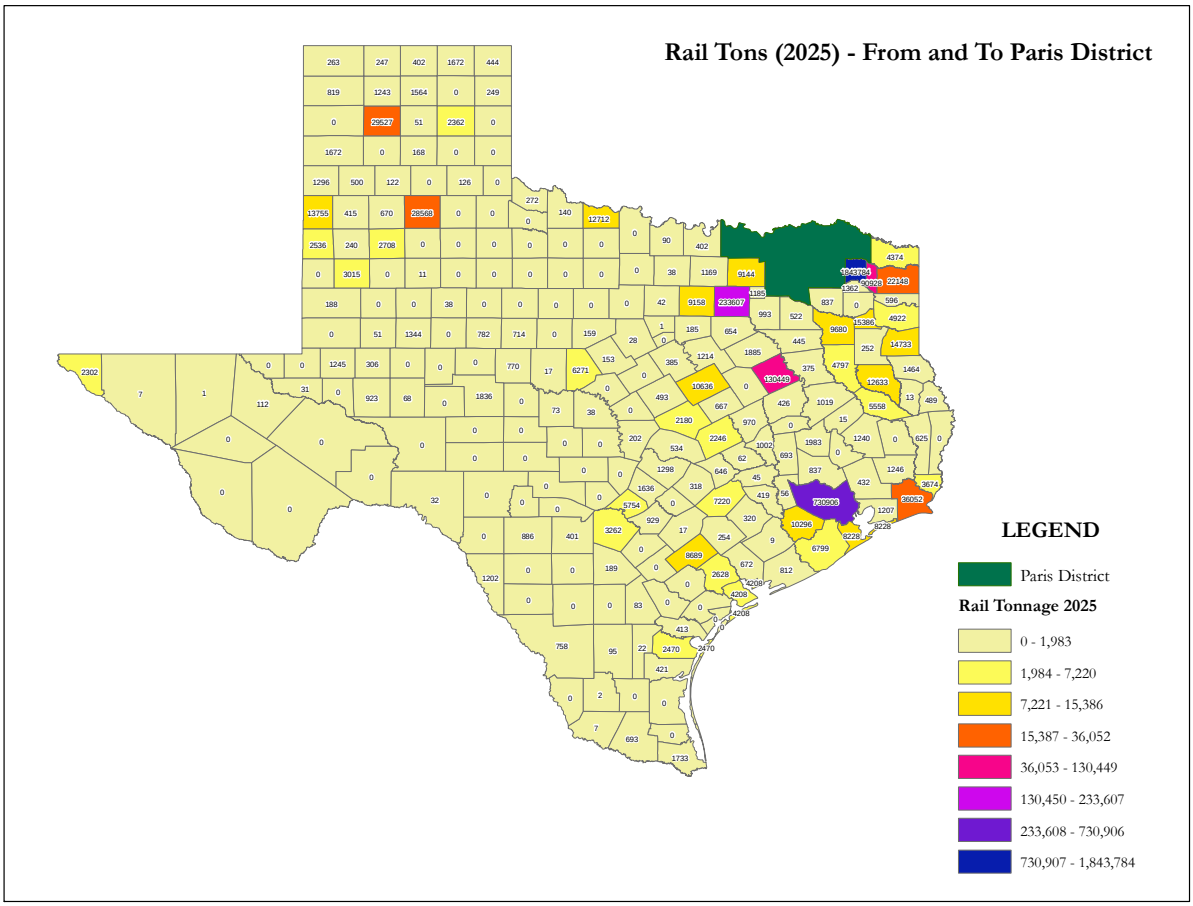


Figure 3-77: 2025 Rail Freight Movements

Rail Freight Movements Outside of the State

Figures 3-78 and 3-79 illustrate the data sampling from the STB waybill data that major rail freight movements are occurring from New Mexico, Oklahoma, Arkansas, and more moderately from Louisiana, and Mexico. The major freight movements to the west/northwest (via the Texas Panhandle) are indicative of the enormous shipments of coal, non-metallic minerals (stone, aggregates, etc.), and wood products to/from East Texas.

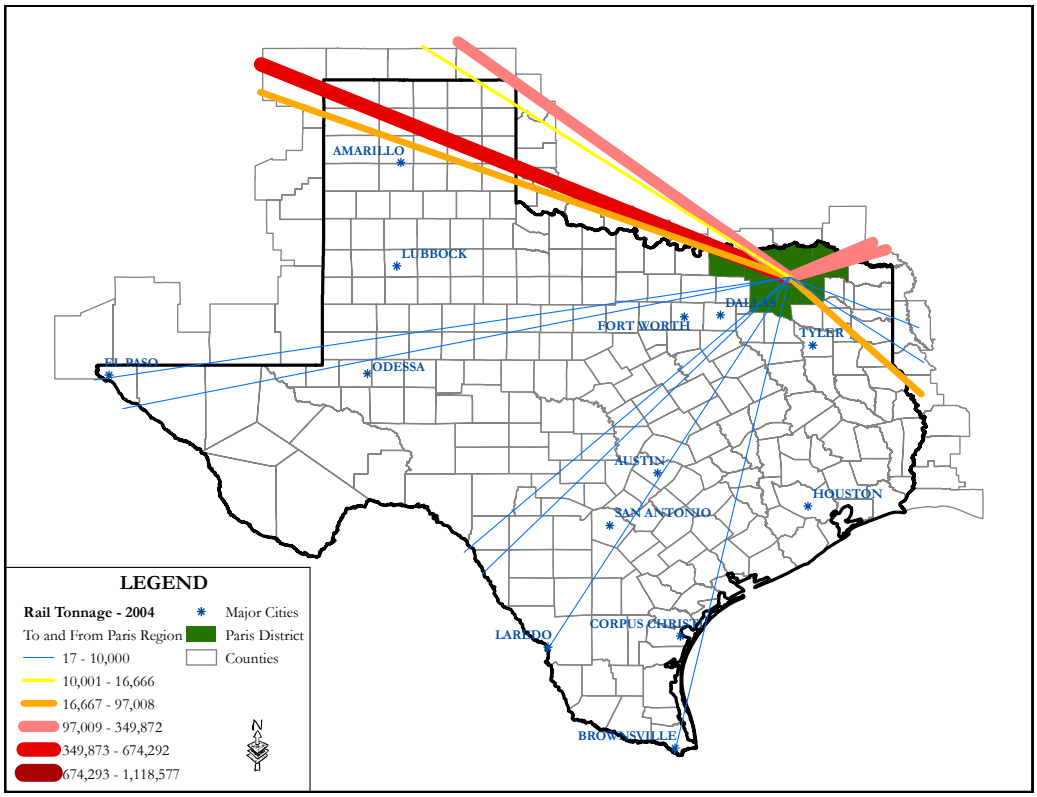


Figure 3-78: 2004 Freight Rail Between Paris District and Outside of Texas

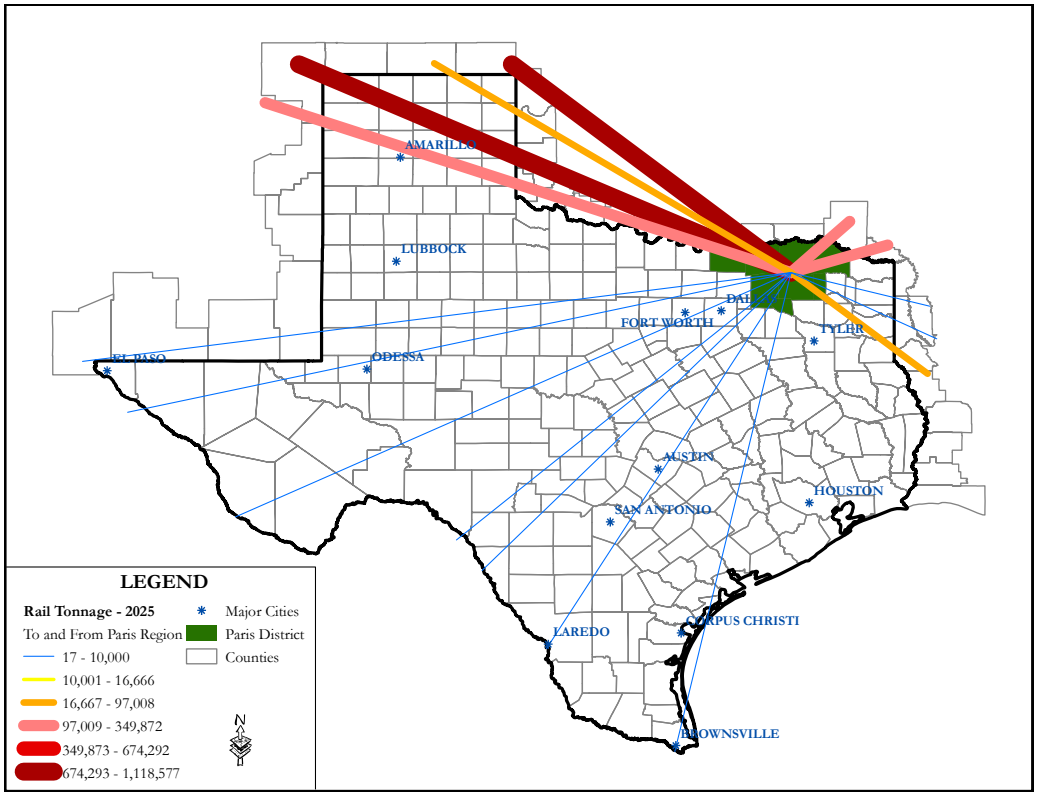


Figure 3-79: 2025 Freight Rail Between Paris District and Outside of Texas

Freight Rail Commodity Trends

Table 3-25 shows a comparison between 2004 and 2025 rail commodities. The commodity with the largest tonnage increase is raw materials, which accounts for the coal movement through the Paris District, as well as non-metallic minerals (stone, aggregates, etc. – used in building roadways). Given the growth in the population, the increase in manufacturing, and the expected continued strengthening of the Texas economy all of the commodities are projected to increase at about the same high growth percentage.

Commodity	Rail Tons		
	2004	**2025**	**Percent Increase**
Raw Materials	2,096,229	4,490,805	114%
Agriculture	211,587	454,591	114%
Chemical/ Petroleum	156,313	342,430	119%
Food	153,218	329,187	114%
Building Materials	49,020	105,063	114%
Wood	35,651	76,410	114%
Machinery	14,483	31,041	114%
Secondary	14,459	30,775	112%
Textiles	12,255	26,266	114%
Total	2,743,214	5,886,569	114%

Table 3-25: Rail Freight Commodity Growth

Figures 3-80 and 3-81 display the commodities being moved by rail within the Paris District for both 2004 and 2025. The relative commodity tonnage percentages do not significantly change from 2004 (Figure 3-81) projected to 2025.

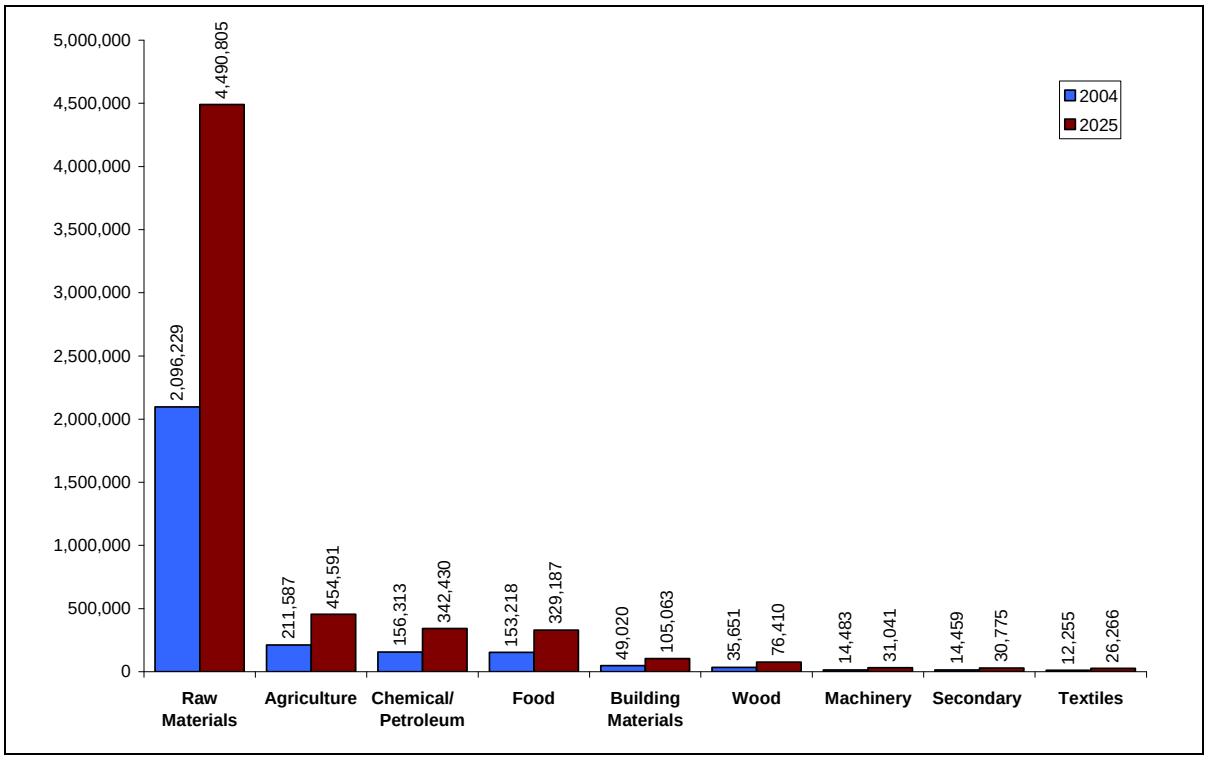


Figure 3-80: Total Freight Rail Tons by Commodity

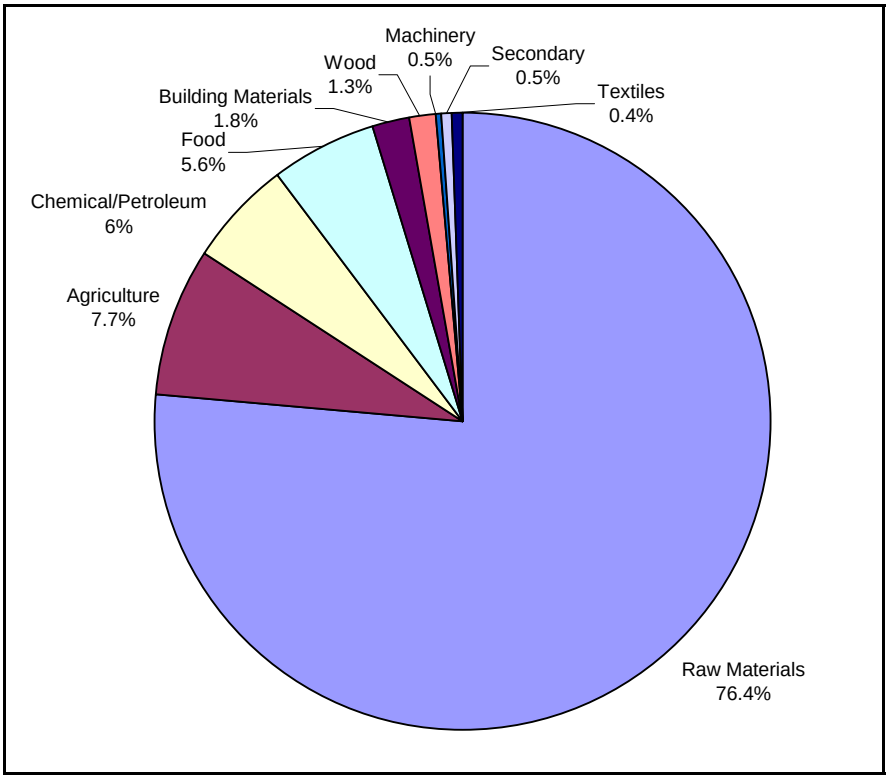


Figure 3-81: Percentage of Freight Rail Tonnage by Commodity (2004)

Rail Freight Findings Summary

- Freight tonnage moved by rail is projected to more than double by 2025.
- Raw materials constitute a majority of the freight rail tonnage.
- Rail shipments originating from other states and Mexico are projected to constitute approximately 34 percent of total rail shipments within the Paris District by 2025.
- Rail shipments originating from other Texas counties are projected to constitute approximately 56 percent of total rail shipments within the Paris District by 2025.

Rail and Truck Freight Comparison

Table 3-26 and Figure 3-82 provides the total truck and rail tons in the District for the base year and projected to 2025. The increase between 1998 and 2025 for truck tons represents a 132 percent increase as opposed to rail tonnage increase between 2004 and 2025 of 115 percent.

Year	Truck	Rail
1998 (Truck), 2004 (Rail)	16,835,407	2,743,214
2025	39,085,679	5,886,569
Percent Increase	132%	115%

Table 3-26: Rail and Truck Tons Comparison

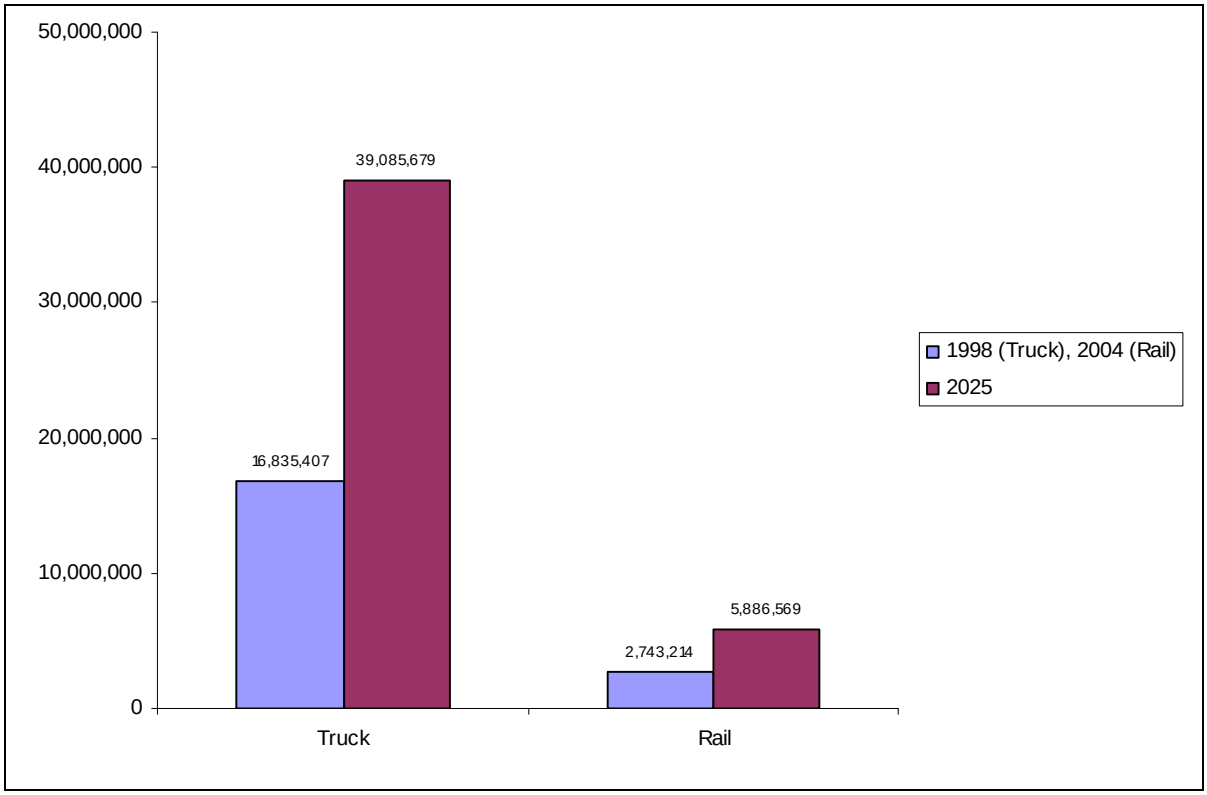


Figure 3-82: Total Rail / Truck Tons

The total combined tons shipped by both truck and rail are projected to increase by 130 percent by 2025. The majority of freight movement entering and leaving the Paris District either originates or is destined for other Texas counties. Table 3-27 illustrates approximately 80 percent of the projected combined truck and rail tonnage begins or ends in other Texas locations outside of the Paris District. Of the trips originating or ending in Mexico or other parts of the country, approximately 51 percent was projected to go to/from the northern U.S. The projected internal tonnage shipped by truck within the Paris District for 2025 is more than 576 thousand tons, while the projected internal rail shipments is shown as more than 40 thousand tons.

Therefore, the internal combined freight movement is projected to increase approximately 123 percent with the trucks projected to haul nearly 1400 percent more cargo than rail cars. The trucks leaving the District are projected to haul approximately 2700 percent more cargo than rail cars while the trucks entering the District are projected to haul 216 percent more cargo. The projected truck freight growth for movements entering and leaving the District might be due to the wood, food and building materials industries within northeast Texas and because it is generally more economically feasible to ship by truck for destinations within a 500 mile radius.

Combined Truck and Rail Tons				
Origin	**Termination**	**1998/2004**	**2025**	**Percent Change**
Internal to Internal				
Paris District	Paris District	276,866	616,825	123%
Internal to External				
Paris District	Other Texas Counties	7,489,315	19,363,856	159%
Paris District	Western U.S.	147,494	319,074	116%
Paris District	Northern U.S.	971,218	2,191,019	126%
Paris District	Eastern U.S.	302,683	669,812	121%
Paris District	Mexico	364,526	829,268	127%
External to Internal				
Other Texas Counties	Paris District	7,836,284	16,407,469	109%
Western U.S.	Paris District	349,923	719,072	105%
Northern U.S.	Paris District	1,040,022	2,182,961	110%
Eastern U.S.	Paris District	507,117	1,049,736	107%
Mexico	Paris District	293,174	623,156	113%
Total		**19,578,621**	**44,972,248**	**130%**

Table 3-27: Combined Rail and Truck Tons

TxDOT - Tyler District

This section describes the freight flow movement in terms of truck and rail commodity flow for TxDOT's Tyler District. Network improvements updated in the SAM to reflect projects cited in the District's list of planned projects are shown in Figure 3-83 and are listed individually in Table D-5 in Appendix D.

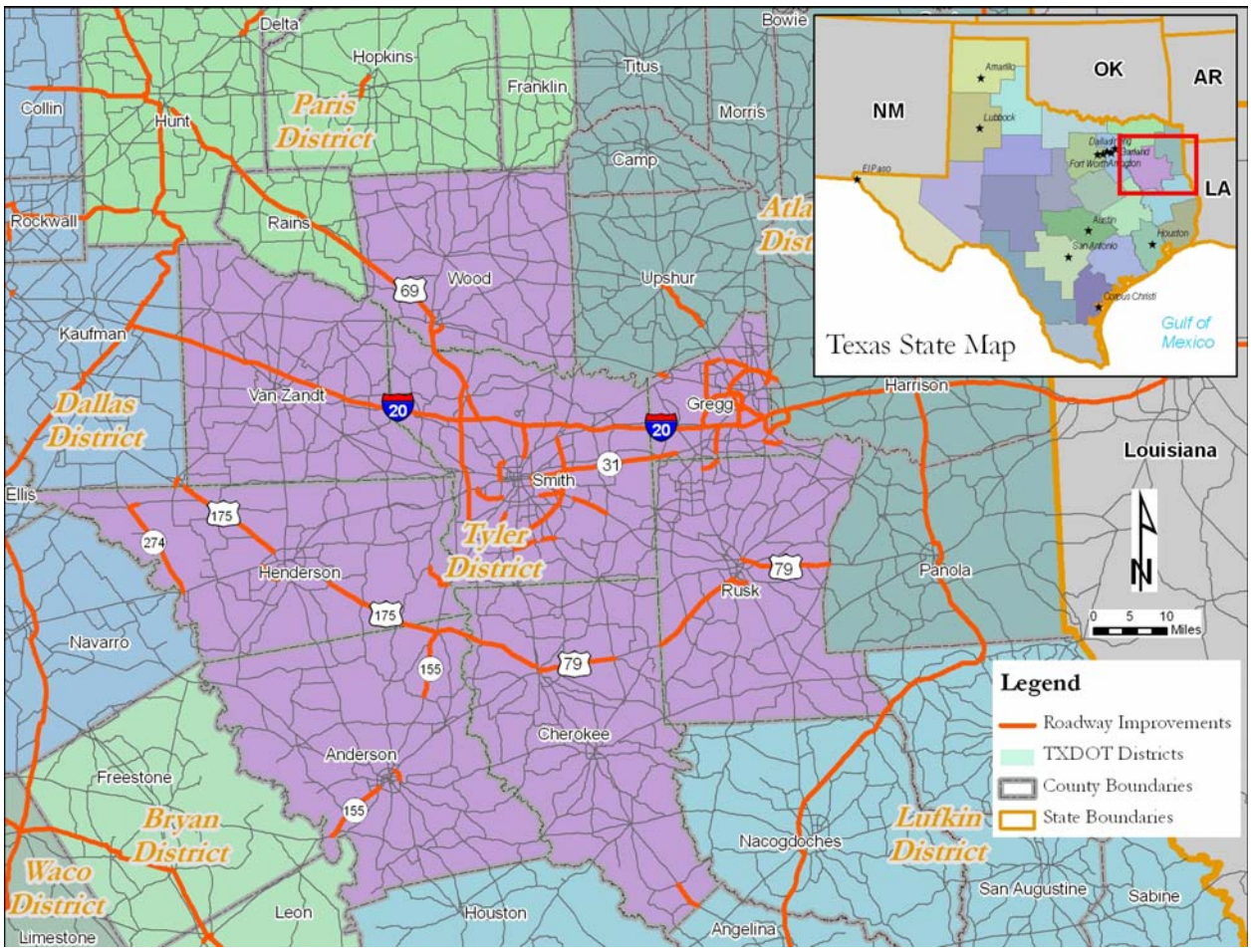


Figure 3-83: Future Network Improvements

Truck Freight Movements and Commodities

Table 3-28 illustrates that while the movement of truck tons within the Tyler District is projected to increase by nearly 859,000 tons from 2004 to 2025, it is small when compared to the increased movements coming into (12.5 million) and out of (19 million) the Tyler District.

Annual Truck Tons				
Origin	**Termination**	**1998**	**2025**	**Percent Change**
Internal to Internal				
Tyler District	Tyler District	787,259	1,646,459	109%
Internal to External				
Tyler District	Other Texas Counties	10,537,238	26,213,797	149%
Tyler District	Western U.S.	65,839	143,806	118%
Tyler District	Northern U.S.	1,044,037	2,280,392	118%
Tyler District	Eastern U.S.	616,721	1,347,046	118%
Tyler District	Mexico	1,094,820	2,391,314	118%
External to Internal				
Other Texas Counties	Tyler District	8,851,808	19,325,084	118%
Western U.S.	Tyler District	34,071	82,709	143%
Northern U.S.	Tyler District	540,280	1,311,554	143%
Eastern U.S.	Tyler District	319,148	774,746	143%
Mexico	Tyler District	566,560	1,375,350	143%
	Total	**24,457,779**	**56,892,256**	**133%**

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

Table 3-28: Truck Freight Movements

Truck Movements within the State

Figure 3-84 reveals that in 1998 large numbers of trucks moved between the Tyler District and Houston, the Dallas-Fort Worth metroplex, San Antonio, and Austin, as well as areas along the U.S.-Mexico border with the largest origins and destinations being the Houston region and the Dallas-Fort Worth metroplex. Trucks are also moving to other parts of the state, such as Beaumont and Waco; however, their final destinations remain in the major growth markets mentioned above. Major truck movements for trips going to and from the Tyler District are along the I-35 corridor between Dallas and San Antonio and I-20. Figure 3-85 shows the projected continued growth between the Tyler District and the other major urban areas listed above.

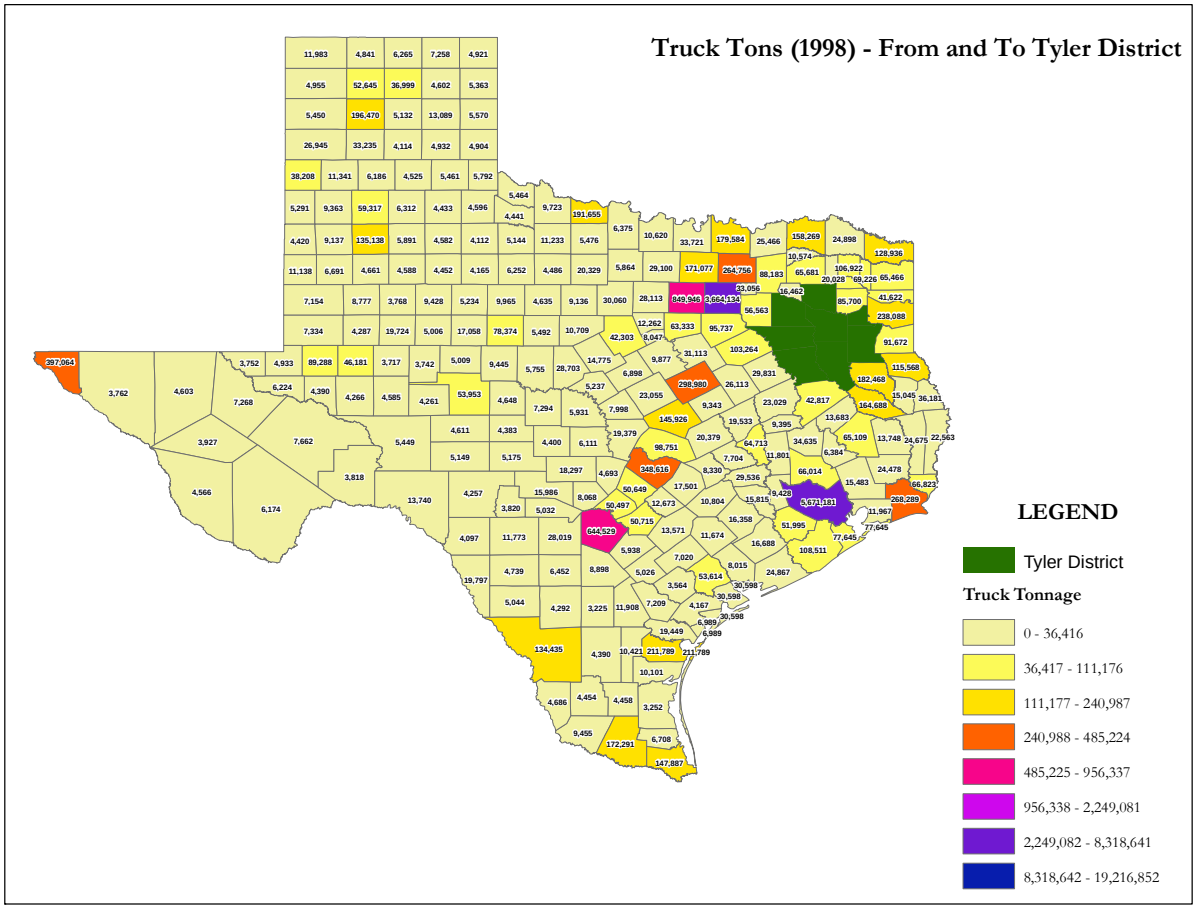


Figure 3-84: 1998 Truck Movements within Texas To and From Tyler District

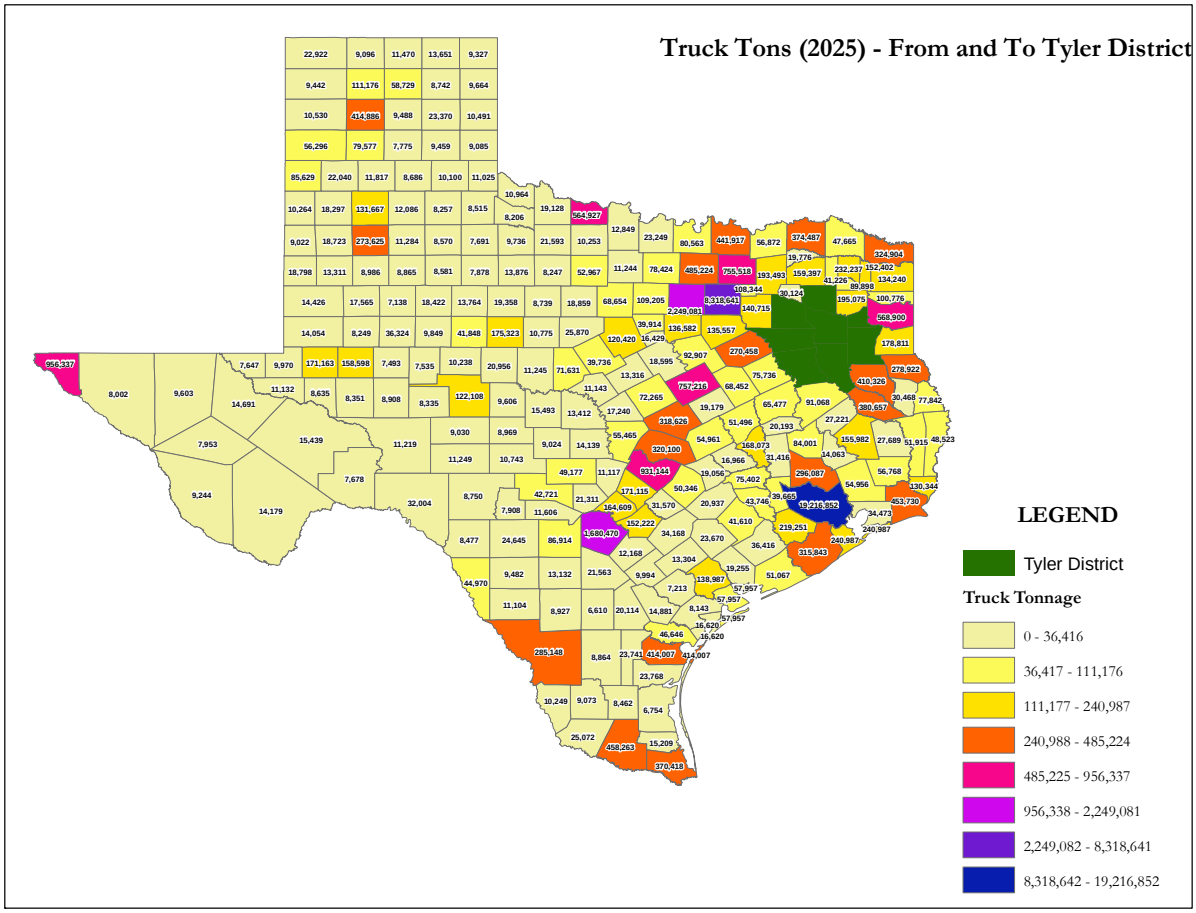


Figure 3-85: 2025 Truck Movements within Texas To and From Tyler District

Truck Movements Outside of the State

Major movements in 1998 can be seen between the Tyler District and Arkansas, Louisiana, Oklahoma, New Mexico, and Mexico as shown in Figure 3-86. Figure 3-87 demonstrates projected increased movement between the District and Arkansas, Louisiana, and Mexico in 2025.

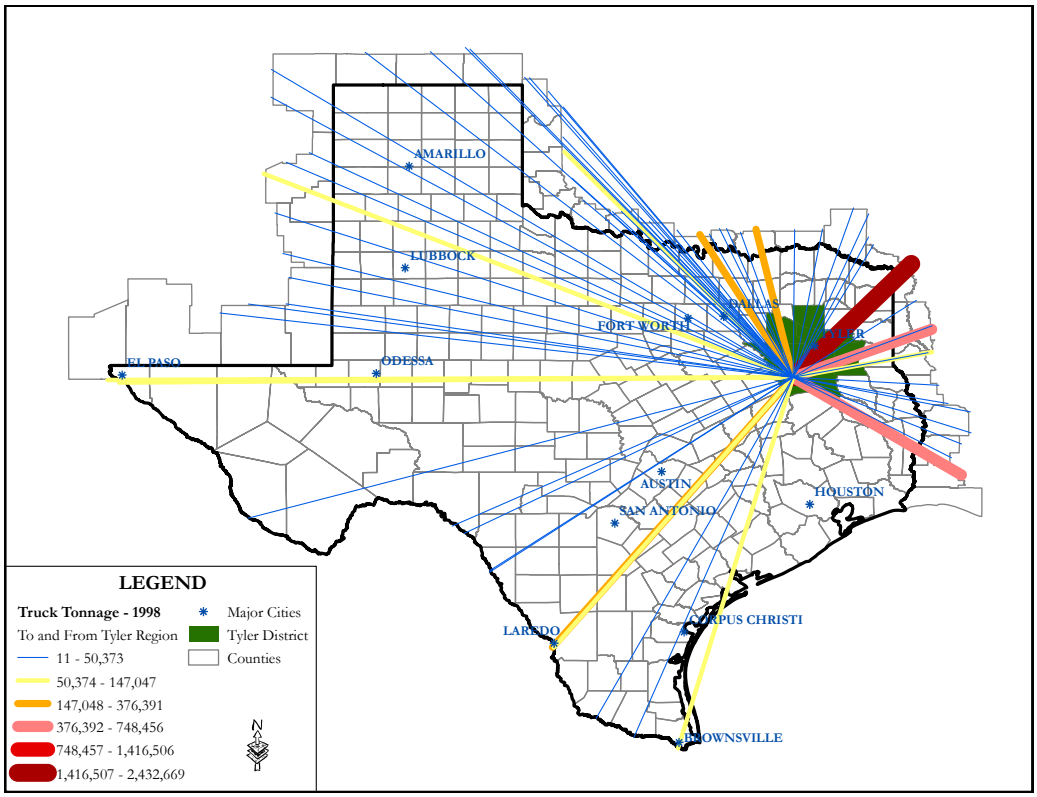


Figure 3-86: 1998 Truck Movements Between Tyler District and Outside of Texas

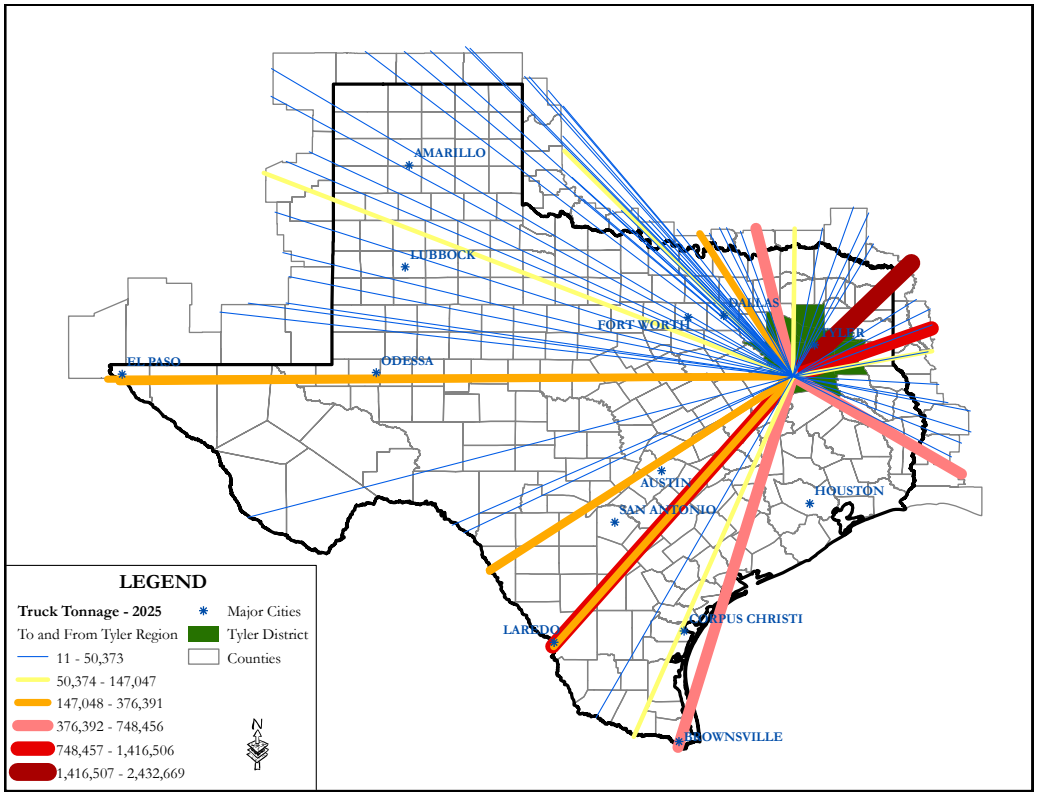


Figure 3-87: 2025 Movements Between Tyler District and Outside of Texas

Truck Commodity Trends

Table 3-29 indicates that building materials will be the fastest growing commodity in terms of the weight of increased tonnage, as well as, producing the largest total tonnage. While agriculture, machinery and raw materials are projected to produce lower tonnages, they are expected to exhibit some of the highest percentage increases. The leading products moving by truck are building materials, chemical/petroleum products, wood, and food products.

Commodity	Truck Tons		
	1998	2025	% Increase
Building Materials	6,649,334	21,525,011	224%
Wood	3,643,193	8,405,891	131%
Agriculture	104,405	344,025	230%
Textiles	428,267	1,230,751	187%
Chemical/Petroleum	6,286,118	8,479,105	35%
Food	3,958,265	9,323,810	136%
Machinery	370,793	1,257,898	239%
Raw Materials	26,715	100,858	284%
Secondary	2,990,687	6,224,906	108%
TOTAL	24,457,777	56,892,256	133%

Table 3-29: Truck Commodity Growth

Figures 3-88, 3-89 and 3-90 display the commodities being moved by truck within the Tyler District for both 1998 and 2025.

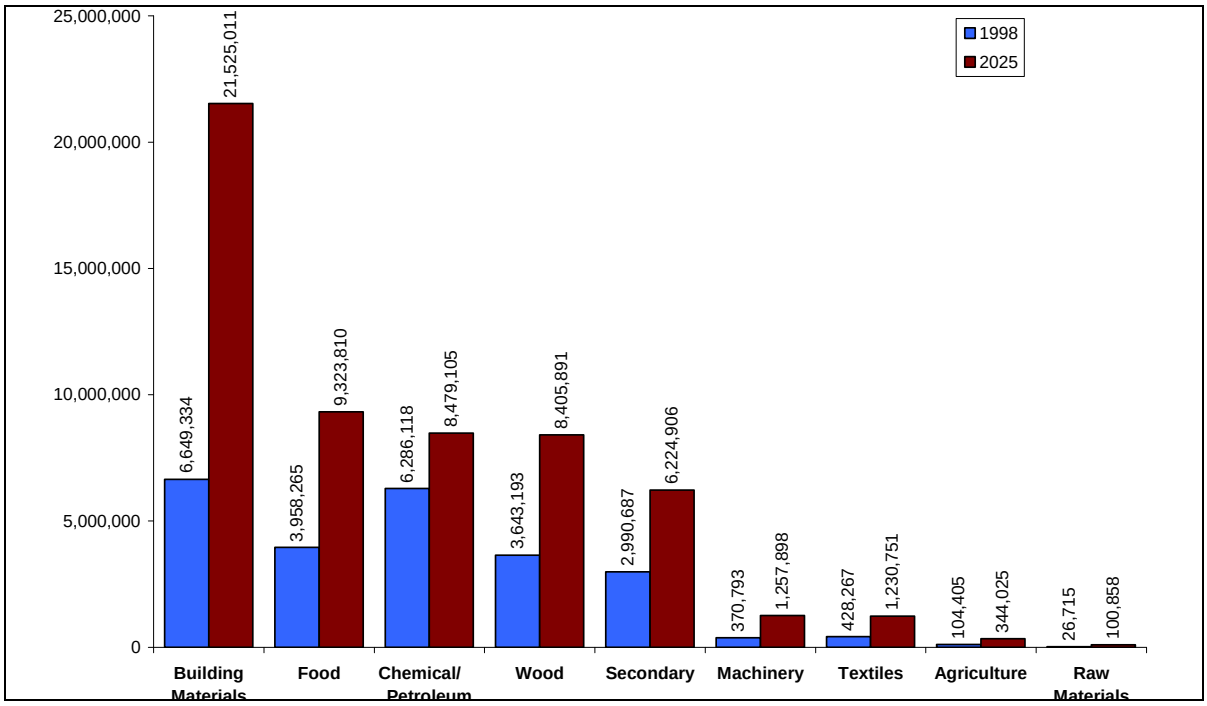


Figure 3-88: Total Truck Tons by Commodity

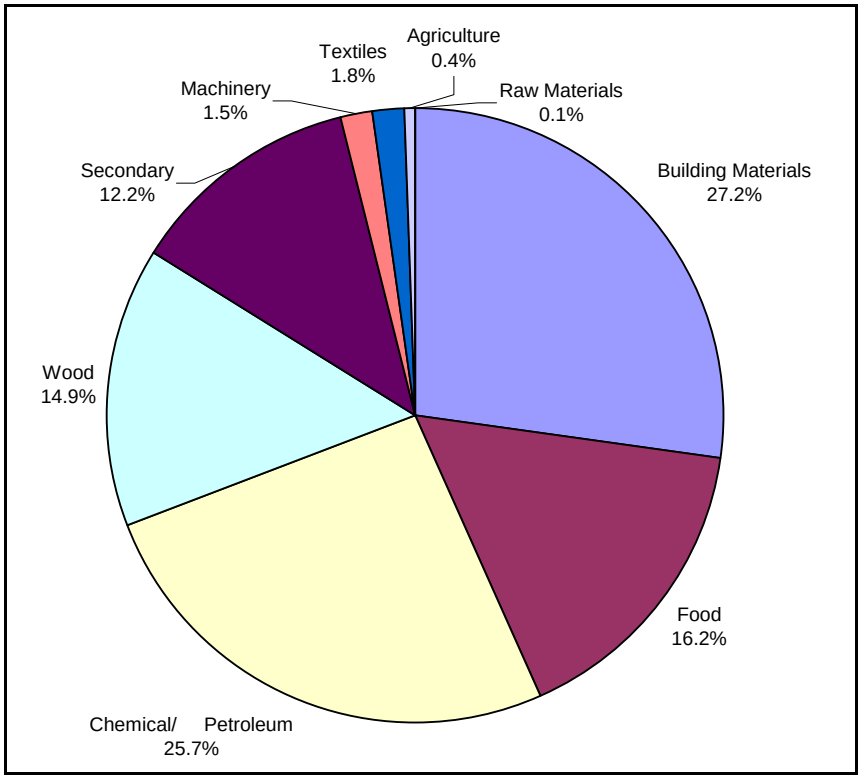


Figure 3-89: Percentage of Truck Tons by Commodity (1998)

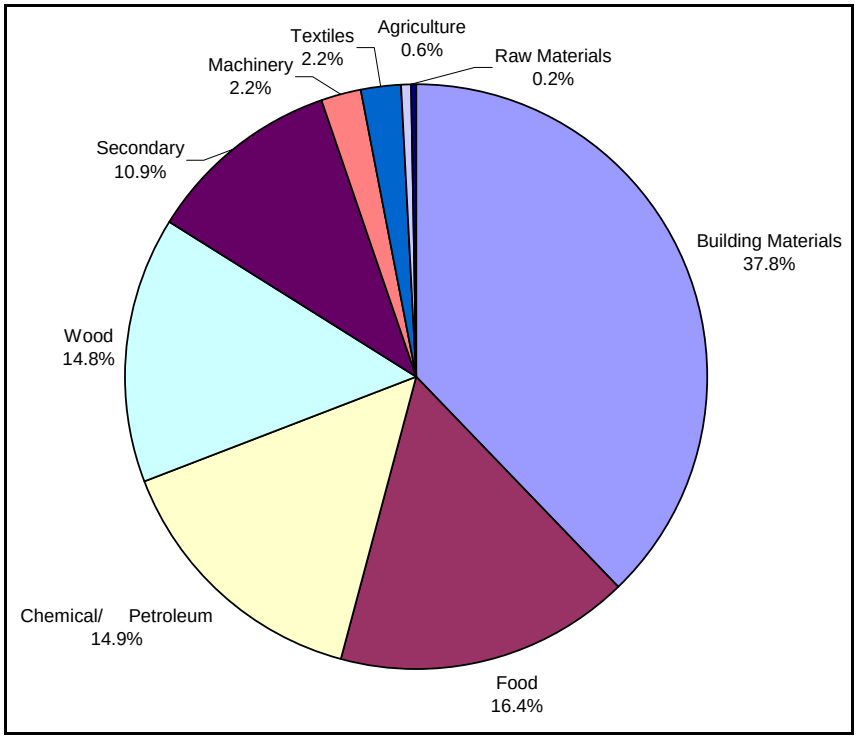


Figure 3-90: Percentage of Truck Tons by Commodity (2025)

Traffic Volume Analysis

Traffic data including total traffic volumes, truck volumes, percentage of trucks, and V/C are listed for individual roadway segments in the Atlanta District as shown in Table E-9 and E-10 (in Appendix E) for 1998 and 2025, respectively. Figure E-5 graphically shows the locations at which such traffic data is provided.

While the V/C ratio analysis showed that the freeways and arterials would continue to result in increased periods of congestion between base and future years, the overall congestion level throughout the District was projected to remain relatively low. The primary areas of congestion were in the urban area near the cities of Tyler and Longview, as well as more moderately in the cities of Athens, Mineola, and Canton. Figures 3-91 and 3-93 show the areas of congestion district-wide while Figures 3-92 and 3-94 highlight the areas of congestion in the city of Tyler for years 1998 and 2025. The majority of the congestion is projected in the urban areas of Athens, Tyler and Longview. Additional congestion is shown in the western portion of the District in Henderson County. However, this area is in the low end of the volume to capacity range (volume to capacity of 0.5 to 0.9 shown in Figures 6-92 and 6-94) and is not expected to experience congestion similar to the urban areas of Athens, Tyler and Longview.

As Tables E-9 and E-10 reveal, approximately 31 percent of the traffic traveling along I-20 North is trucks. Thirty percent of the traffic traveling north or south along U.S. 259 north of Mt. Enterprise is trucks. The interaction of heavy truck traffic with local traffic can often cause bottleneck and safety issues.

Additional areas within the District also result in high percentages of truck traffic. The truck traffic through Henderson on U.S. 79 is 26 percent. A high percentage of truck traffic (over 20 percent) also occurs along U.S. 84 near Rusk and along U.S. 175 near Athens. These are just some examples of higher truck percentages that are occurring in the Tyler District.

It was also determined that several bottlenecks occur due to at-grade railroad crossings. For instance, local roadways often become congested at locations with at-grade crossings within the cities of Tyler, Longview, Kilgore, and Mineola.

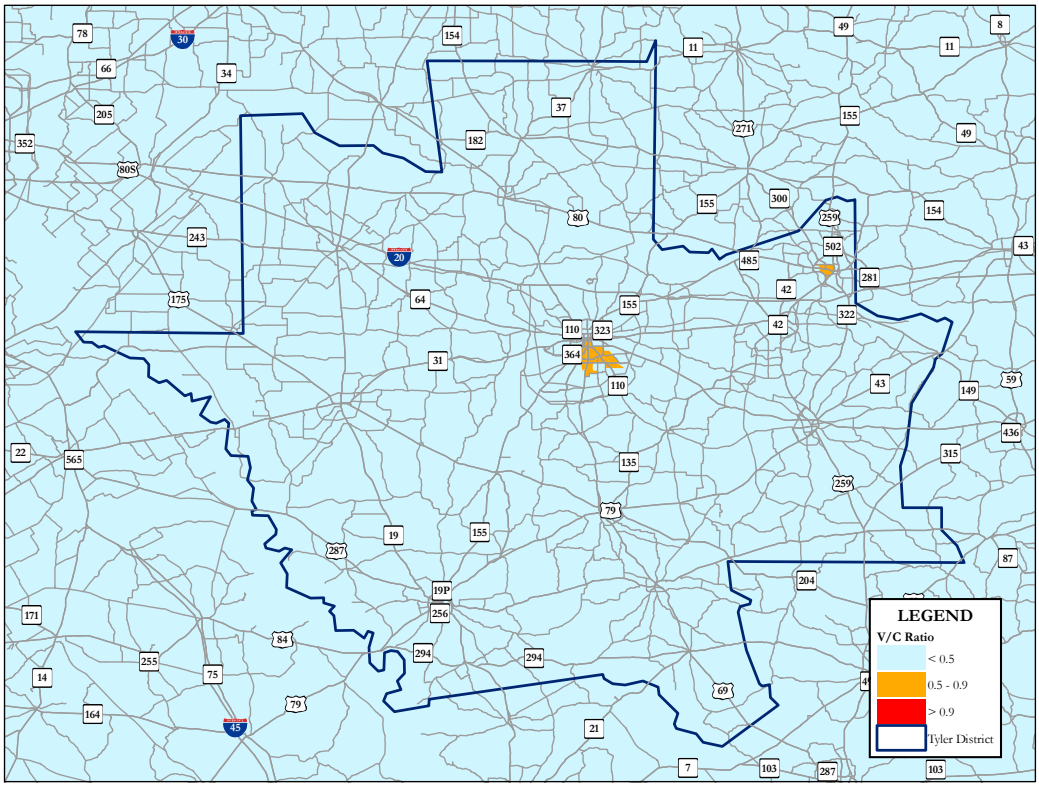


Figure 3-91: 1998 Congestion for Tyler District (based on SAM modeling)

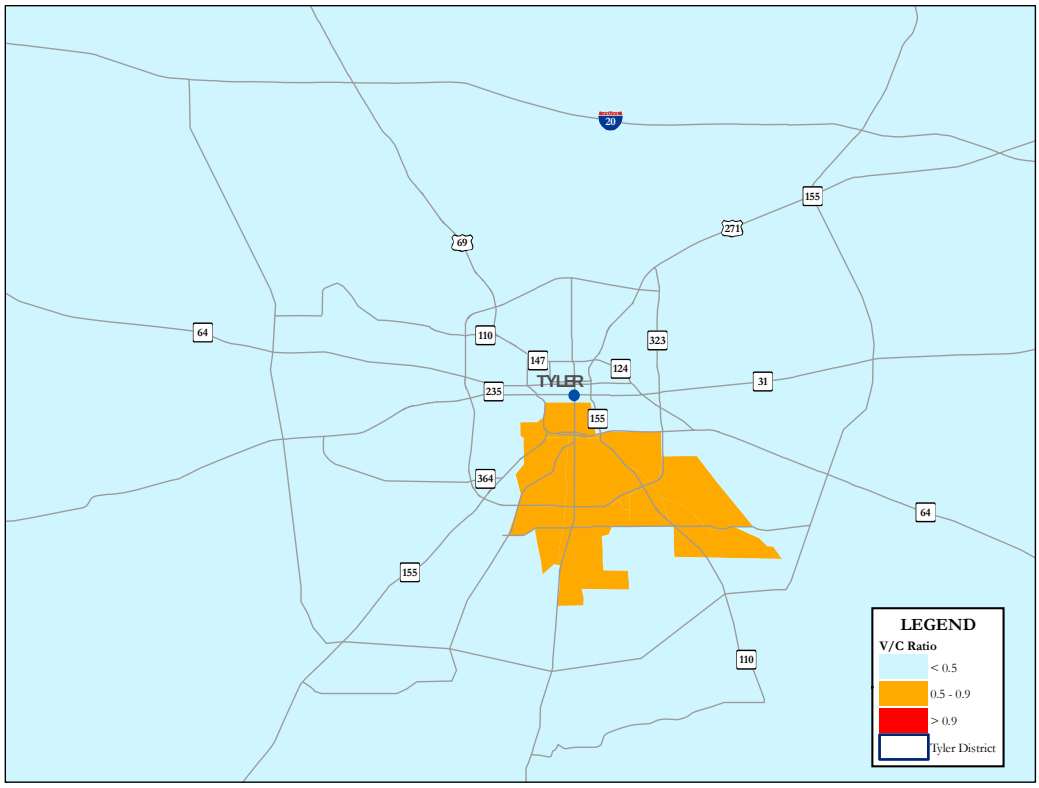


Figure 3-92: 1998 Congestion for City of Tyler (based on SAM modeling)

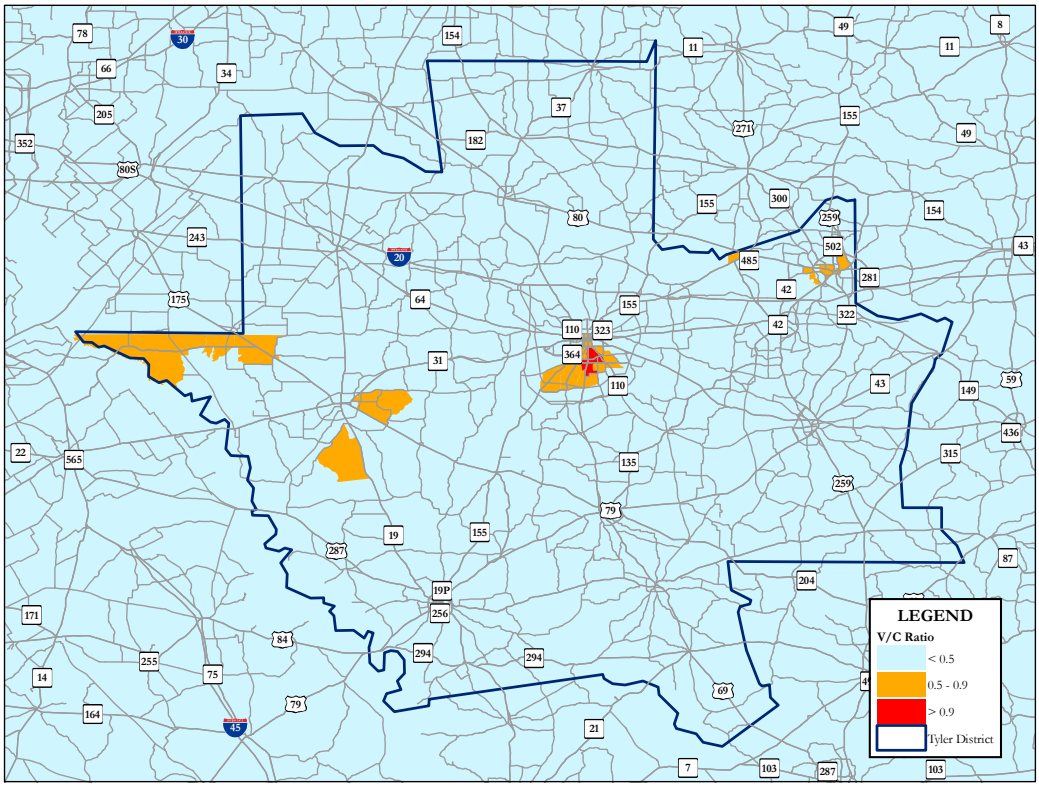


Figure 3-93: 2025 Congestion for Tyler District (based on SAM modeling)

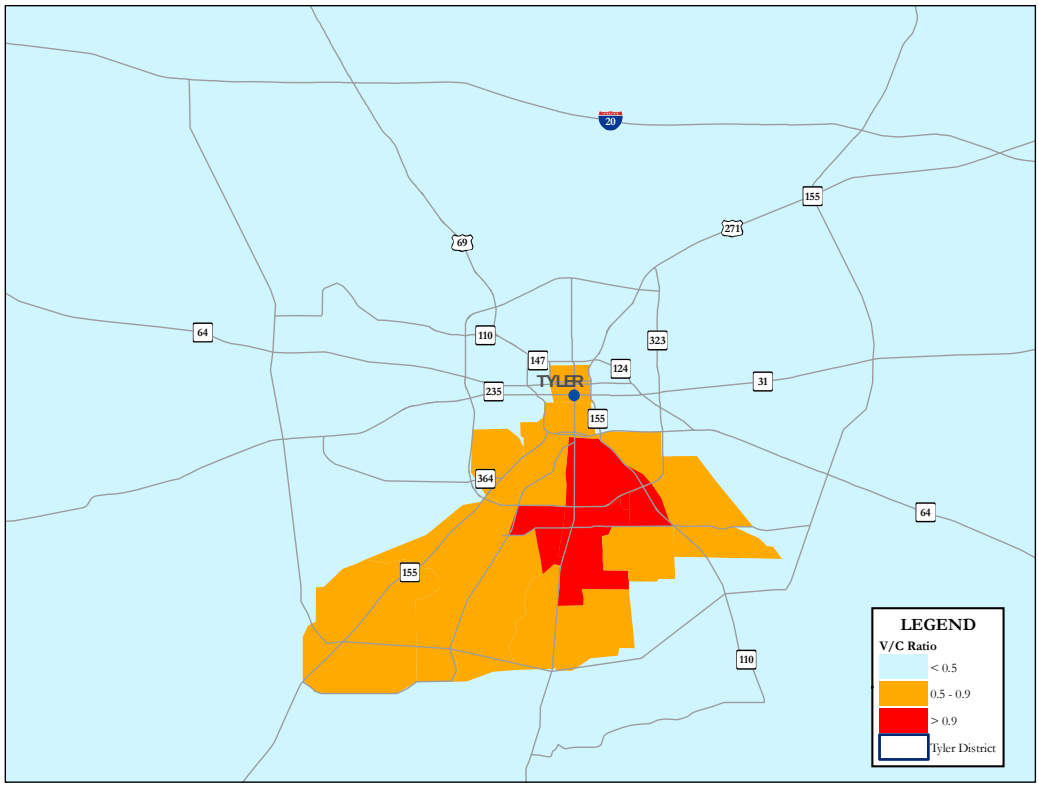
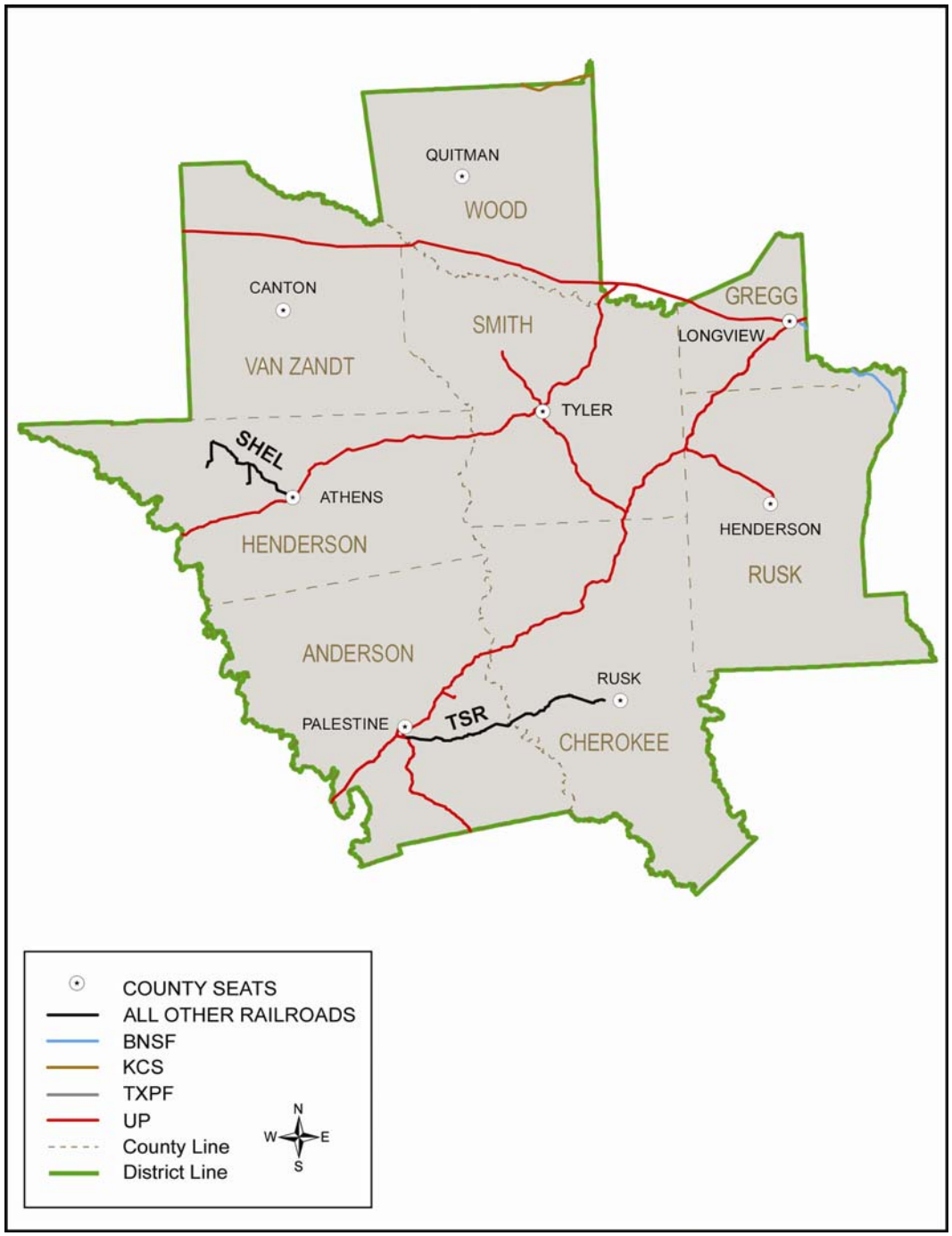


Figure 3-94: 2025 Congestion for City of Tyler (based on SAM modeling)

Rail Freight Movements and Commodities

Existing Rail Network

The Tyler District is served by three of the Class I railroads: the UP, BNSF, and KCS (with 5 miles of track across the corner of Wood County). Figure 3-95 depicts the existing railroad network for the Tyler District.



*Source: TxDOT Texas State Railroad Map

Figure 3-95: Existing Rail Network - Tyler District

The Tyler District is also served by two unique Class III railroads. The Texas State Railroad (TSR), which is owned by the State of Texas (between Palestine and Rusk) with the operation of an old steam locomotive and passenger excursion train that is provided to the public and TXU.

Rail Freight Movements for the Tyler District, the State, and the Country

Table 3-30 illustrates that while a modest increase in rail freight movement will occur internally, approximately 1.9 million additional tons will be transported to/from Mexico and other parts of the country between 2004 and 2025. An additional 1.9 million tons is expected be transported to/from other Texas counties between 2004 and 2025.

Annual Rail Tons				
Origin	**Termination**	**2004**	**2025**	**Percent Change**
Internal to Internal				
Tyler District	Tyler District	34,606	59,330	71%
Internal to External				
Tyler District	Other Texas Counties	465,028	983,195	111%
Tyler District	Western U.S.	117,904	265,211	125%
Tyler District	Northern U.S.	245,809	552,918	125%
Tyler District	Eastern U.S.	55,651	125,180	125%
Tyler District	Mexico	46,686	105,014	125%
External to Internal				
Other Texas Counties	Tyler District	1,102,270	2,436,522	121%
Western U.S.	Tyler District	289,376	638,553	121%
Northern U.S.	Tyler District	603,300	1,331,273	121%
Eastern U.S.	Tyler District	136,586	301,398	121%
Mexico	Tyler District	114,583	252,845	121%
Total		**3,211,798**	**7,051,438**	**120%**

*Source: Statewide Analysis Model based on 2004 Surface Transportation Board Waybill Data

Table 3-30: Rail Freight Movements

Rail Freight Movements within the State

Figures 3-96 and 3-97 illustrate the origin and destinations for freight rail movements occurring in 2004 and 2025, respectively. Houston, the Dallas-Fort Worth metroplex, Beaumont, San Antonio, and the border cities of Eagle Pass and Laredo appear to be handling the largest freight rail movements to and from the Tyler District. The amount of rail tonnage projected for 2025, as shown in Figure 3-97, indicates that freight rail movements between the District and the large urban markets listed above will continue to expand. Additionally, new freight markets are projected for the Gulf coast ports of Freeport, Corpus Christi, and Brownsville.

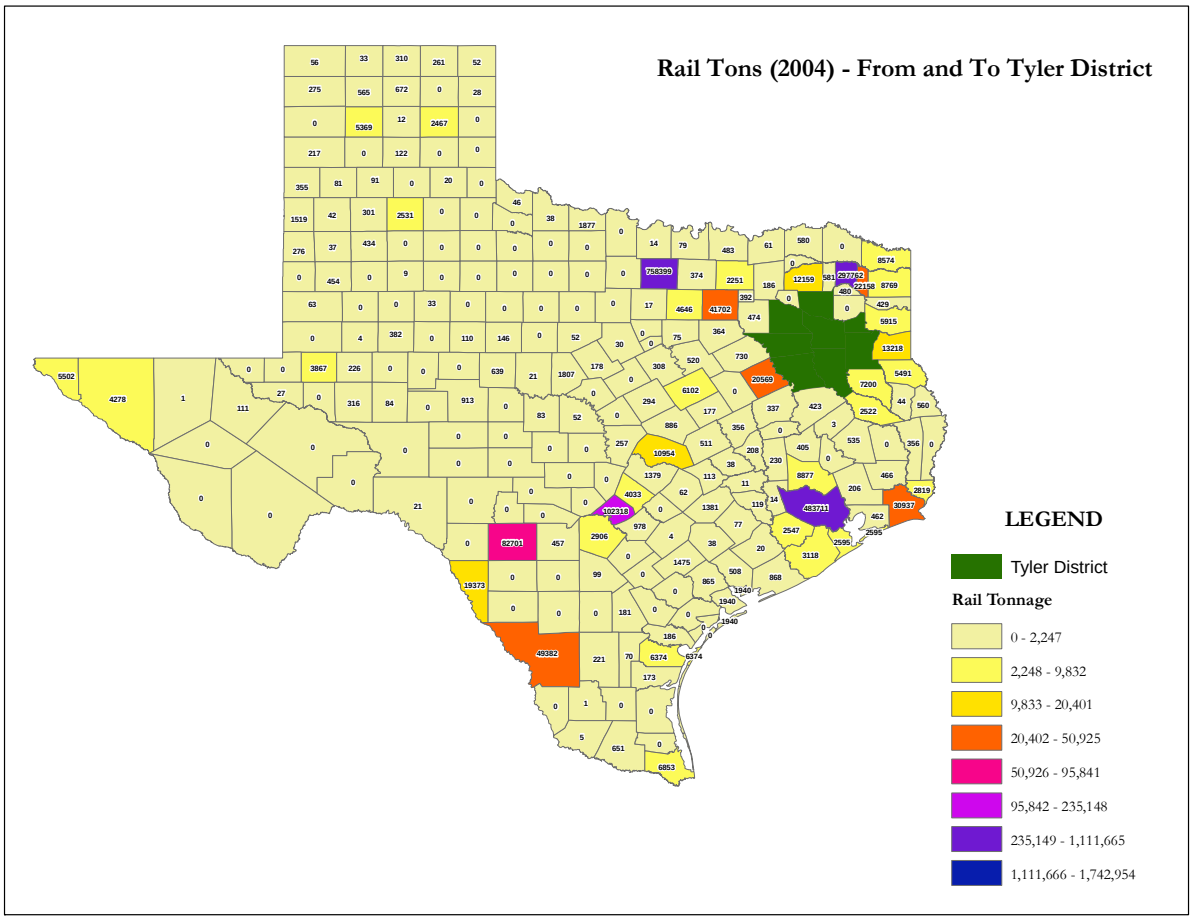


Figure 3-96: 2004 Rail Freight Movements

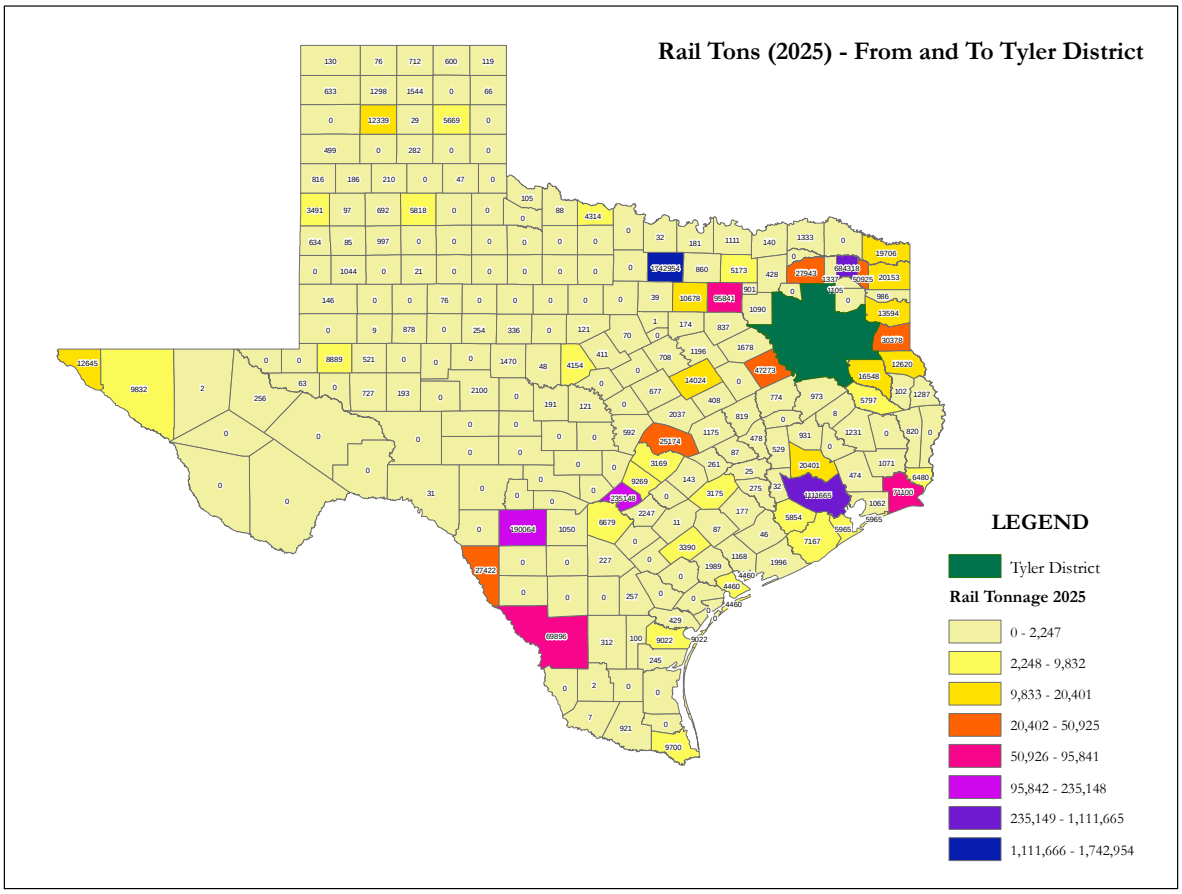


Figure 3-97: 2025 Rail Freight Movements

Rail Freight Movements Outside of the State

Figures 3-98 and 3-99 illustrate that major rail freight movements in 2004, particularly coal, are occurring from New Mexico, Colorado, and Wyoming. Freight rail movement to Arkansas and the upper Midwest, as well as Louisiana is also substantial in 2004. By 2025 the predicted construction of coal-fired energy plants in East Texas is projected to increase coal freight rail movements. Expanding freight movement to the upper plains area and Midwest via Arkansas and Oklahoma will also increase in the future.

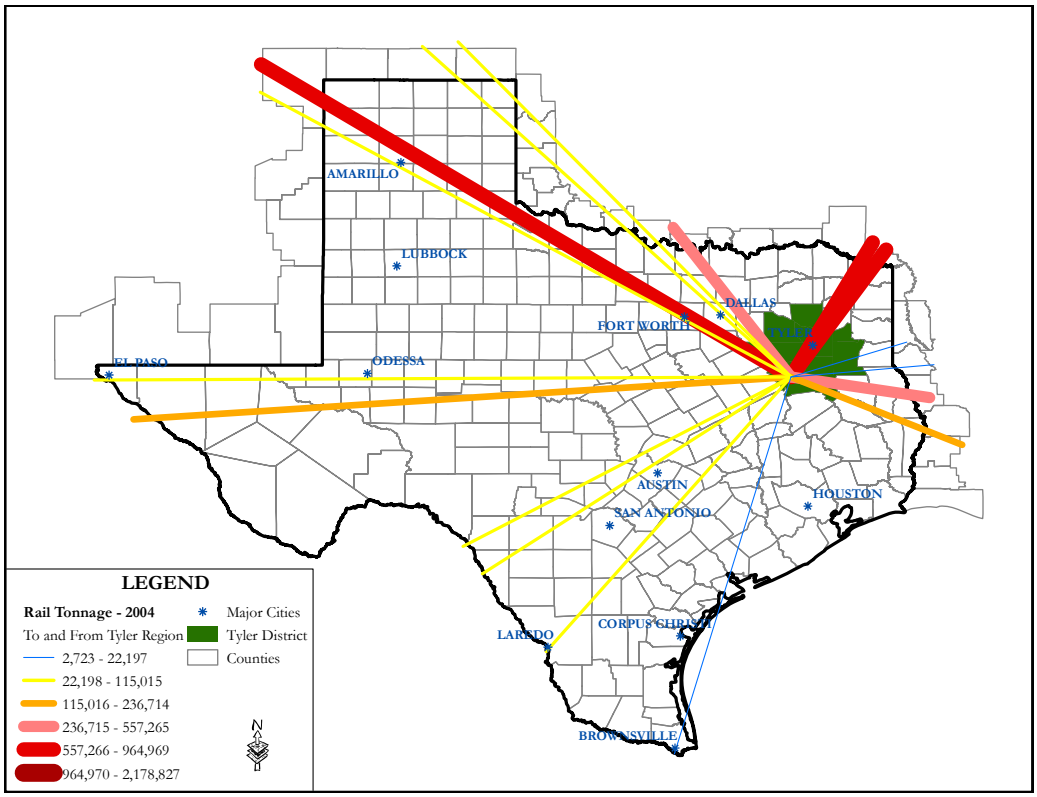


Figure 3-98: 2004 Freight Rail Between Tyler District and Outside of Texas

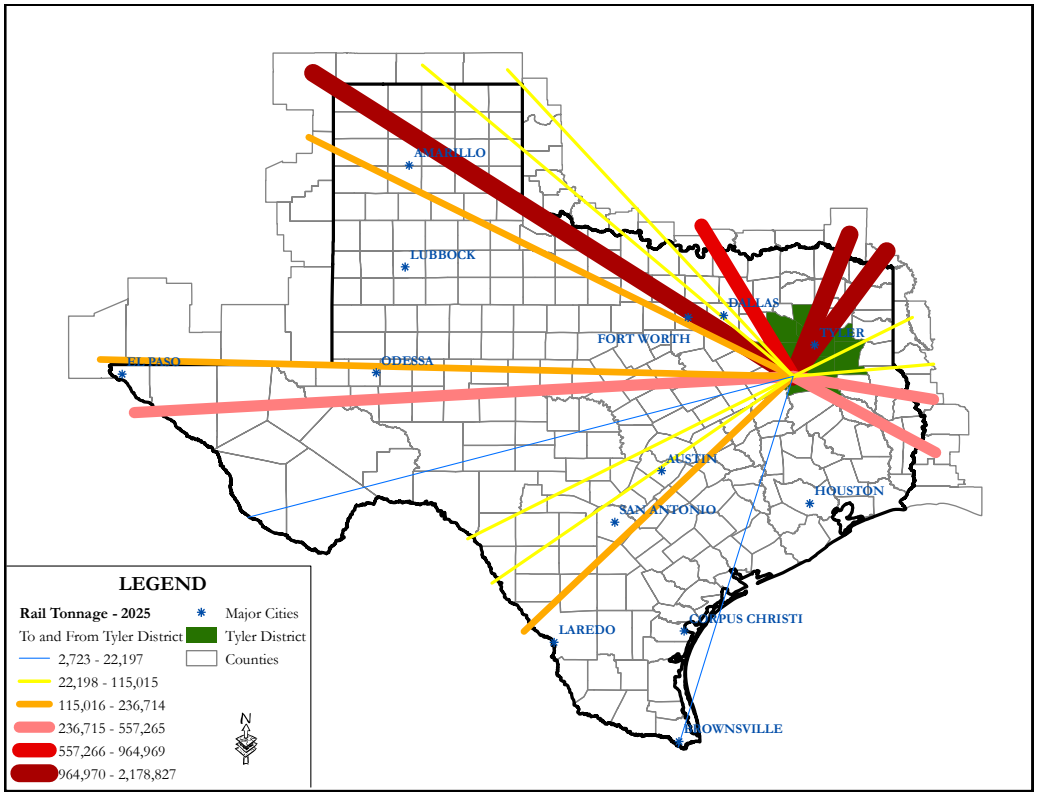


Figure 3-99: 2025 Freight Rail Between Tyler District and Outside of Texas

Freight Rail Commodity Trends

Table 3-31 shows a comparison between 2004 and projected 2025 commodities transported by rail. The commodity with the largest tonnage increase is raw materials, which accounts for the coal movement through the Tyler District. The chemical/petroleum and secondary freight industry are each projected to increase over 112 percent. Figures 3-100 and 3-101 show percentages of commodities moved by rail within the Tyler District. The relative percentages of commodities shipped by rail do not change significantly from 2004 (Figure 3-101) to 2025.

Commodity	Rail Tons		
	2004	2025	Percent Increase
Raw Materials	1,352,350	3,081,500	128%
Secondary	789,976	1,696,003	115%
Chemical/ Petroleum	684,698	1,453,629	112%
Agriculture	137,543	294,336	114%
Food	99,600	213,140	114%
Building Materials	64,957	137,645	112%
Wood	47,241	100,106	112%
Machinery	19,192	40,668	112%
Textiles	16,239	34,411	112%
Total	3,211,798	7,051,438	120%

Table 3-31: Rail Freight Commodity Growth

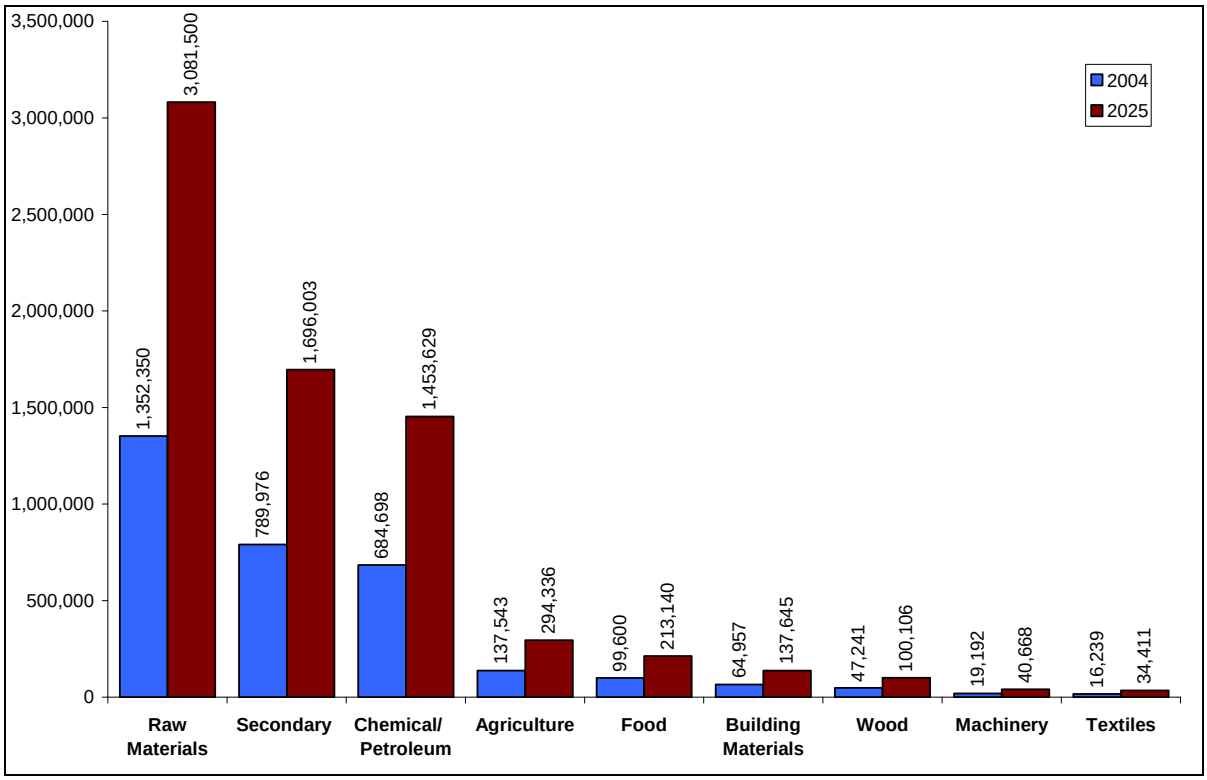


Figure 3-100: Total Freight Rail Tons by Commodity

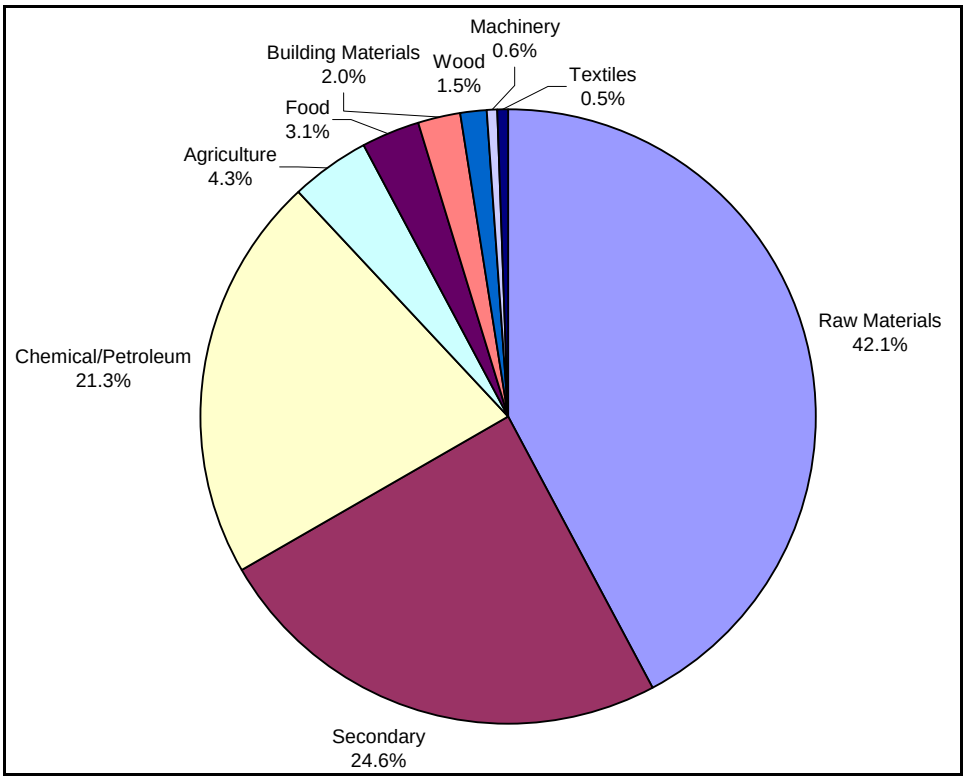


Figure 3-101: Percentage of Freight Rail Tons by Commodity (2004)

Rail Freight Findings Summary

- Freight tonnage moved by rail is projected to more than double by 2025.
- Raw materials and secondary freight constitute a majority of the freight rail tonnage.
- Rail shipments originating from other states and from Mexico are projected to constitute approximately 35 percent of total rail shipments within the Tyler District.

Rail and Truck Freight Comparison

Table 3-32 and Figure 3-102 provides the total truck and rail tons in the District. The increase between 1998 and 2025 for truck tons represents a 133 percent increase as opposed to a rail tonnage increase of 120 percent between 2004 and 2025.

Year	Truck	Rail
1998 (Truck), 2004 (Rail)	24,457,779	3,211,798
2025	56,892,256	7,051,438
Percent Increase	133%	120%

Table 3-32: Rail and Truck Tons Comparison

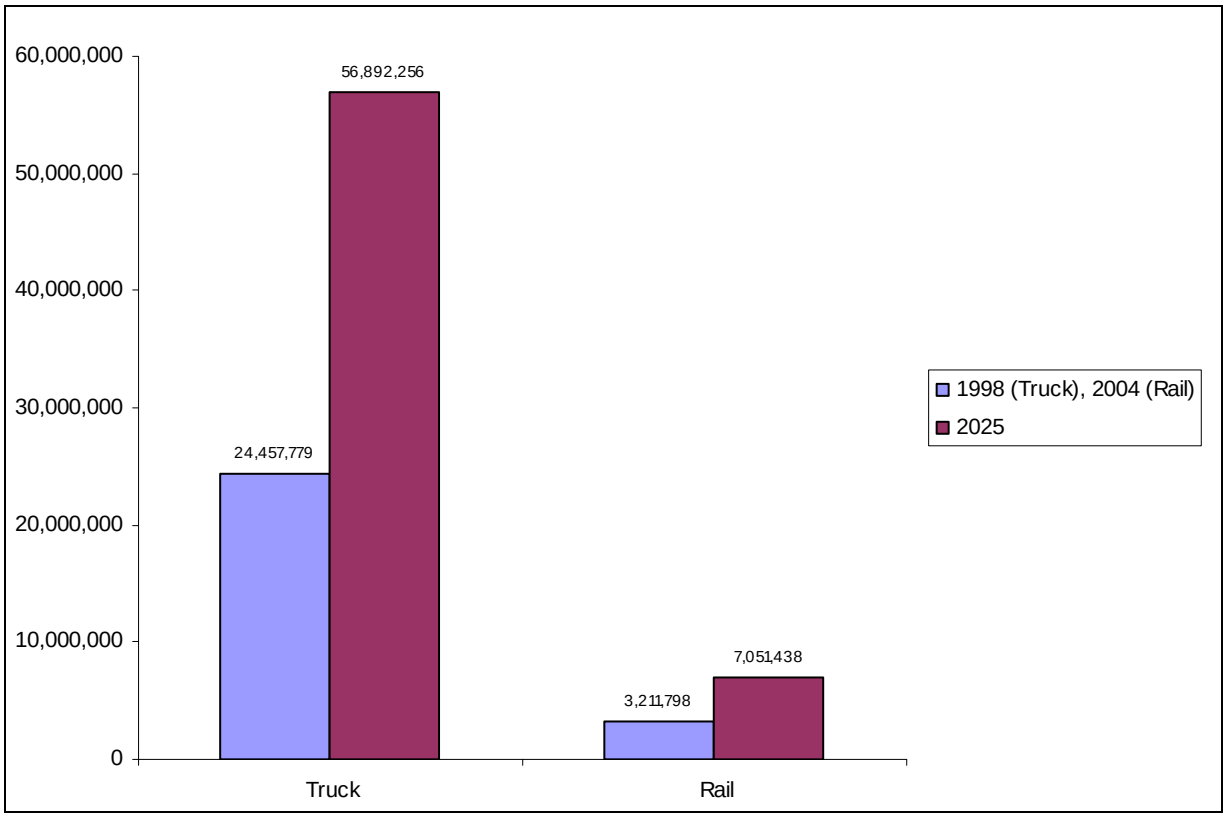


Figure 3-102: Total Rail / Truck Tons

The total combined tons shipped by both truck and rail are projected to increase by 131 percent by 2025. The majority of freight movements entering and leaving the Tyler District either originates or is destined for other Texas counties. Table 3-33 illustrates approximately 77 percent of the projected combined truck and rail tonnage begins or ends in other Texas locations outside of the Tyler District. Of the trips originating or ending in Mexico or other parts of the country, approximately 41 percent is projected to go to/from the Northern U.S. The projected internal tonnage shipped by truck within the Tyler District for 2025 is nearly 1,646,500 tons, while the projected internal rail shipments are shown as nearly 60,000 tons.

Therefore, the internal combined freight movement is projected to increase approximately 108 percent with the trucks projected to haul nearly 1628 percent more cargo than trains. The trucks leaving the District are projected to haul approximately 2700 percent more cargo than rail cars while the trucks entering the District are projected to haul approximately 363 percent more cargo. The projected truck freight growth for movements leaving the District might be due to the large timber industry within northeast Texas and because it is generally more economically feasible to ship by truck for destinations within a 500 mile radius.

Combined Truck and Rail Tons				
Origin	**Termination**	**1998/2004**	**2025**	**Percent Change**
Internal to Internal				
Tyler District	Tyler District	821,865	1,705,789	108%
Internal to External				
Tyler District	Other Texas Counties	11,002,266	27,196,992	147%
Tyler District	Western U.S.	183,743	409,016	123%
Tyler District	Northern U.S.	1,289,845	2,833,310	120%
Tyler District	Eastern U.S.	672,372	1,472,226	119%
Tyler District	Mexico	1,141,506	2,496,328	119%
External to Internal				
Other Texas Counties	Tyler District	9,954,078	21,761,606	119%
Western U.S.	Tyler District	323,448	721,262	123%
Northern U.S.	Tyler District	1,143,580	2,642,827	131%
Eastern U.S.	Tyler District	455,733	1,076,143	136%
Mexico	Tyler District	681,143	1,628,195	139%
Total		**27,669,577**	**63,943,695**	**131%**

Table 3-33: Combined Rail and Truck Tons

Summary and Conclusions

Given the projected growth in commodities moved by both rail and trucks, the economic outlook for East Texas is positive. The analysis projected that commodities moved by both trucks between 1998 and 2025, and rail between 2004 and 2025 would more than double. The majority of tonnage moved by truck is composed of:

- Building materials
- Wood
- Food
- Secondary products

Building materials compose nearly 28 percent of the commodities moved by truck, while food constitutes approximately 20 percent. The majority of tonnage moved by rail into, out of and through East Texas is composed of the following commodities:

- Raw materials
- Secondary products
- Building materials
- Agriculture

Raw materials are projected to account for nearly 46 percent of the total tonnage movements by rail, while secondary products are expected to be approximately 19 percent of the total rail tonnage. Building materials constitute approximately 8 percent of tonnage movements by rail. As the amount of these commodities continues to grow at a rapid pace, the infrastructure will need to be evaluated.

The traffic analysis identified existing and current congestion levels for each District and all of them occurred in the major urban areas. Therefore, the need to plan for additional highway improvements that can accommodate the future truck demand is quite apparent**.** With fairly consistent commodity percentages between 1998 and 2025, it can be concluded that an increase in the volumes of trucks will be experienced, unless a benefit can be found from shifting truck cargo to rail cars. With the expected congestion and the need to continue efficient movement of goods throughout the State, improvements to the Districts transportation system are needed. A number of alternatives could be included in a list of recommended capacity improvements that include, but are not limited to, the following concepts:

- Roadway capacity upgrades;
- Dedicated truck lanes; and,
- Shifting more cargo from trucks to freight rail.

Heavy trucks will continue to serve a much needed purpose for both local and regional service. A number of intermodal facilities located within the Dallas District use trucks to ship goods to local businesses and warehouses (drayage) as well as regional locations. New industries may encourage freight movement growth into, out of and through East Texas. As such, it is important to attempt to make local roadway capacity improvements so that these trucks can move efficiently. In recent years timely and efficient movement of goods has become vital to private industry and can be evidenced by the increase in logistical analysis. One way to encourage timely and efficient truck flows is through dedicated truck lanes. The interaction of trucks and passenger cars can often decrease the capacity of a roadway. By separating truck traffic from passenger cars, the roadways could operate more efficiently and result in safer driving conditions. Specifically, the TTC plan of a multi-faceted transportation network of corridors that provide separate truck lanes would benefit both truck traffic and passenger car traffic movements.

The final strategy that could be implemented to improve truck flow on East Texas Districts' roadways is to reduce the number of trucks needed on the roadway by relying more on trains to move cargo. By using the railroad system to ship more regional cargo, the number of trucks that need to be on local roadways will be reduced. The challenge for the future of goods movement is dependent on two major factors: the movement of a significant percentage of truck freight to rail cars; and planning building and enhancing the rail infrastructure to compete with trucks. As new freight movement infrastructure is added, the time and cost of the delivery of goods will be affected accordingly. This time and cost will be evaluated by commodity group and applied to a percentage shift goal.

As evidenced by existing and projected freight flows, the economic outlook seems positive for the East Texas region. However, it is also important to plan for future roadway and rail infrastructure that would accommodate the explosive commodity growth.

SECTION 4: EXISTING RAIL NETWORK

The Atlanta, Dallas, Lufkin, Paris, and Tyler TxDOT Districts have 2,047 miles of mainline railroad tracks within the study area. The Districts include three Class I Railroads and ten shortline railroad companies within East Texas.

The TXU railroad lines have been included in this survey because they serve two major coal powered electric generating plants within the study area with a total of approximately 40 miles of railroad track. The Timber Rock Railroad is a shortline railroad that operates across the BNSF Longview Subdivision. Although the Timber Rock Railroad is included as one of the nine shortline railroads, the track inventory is shown as the BNSF Longview Subdivision.

Both the Dallas Area Rapid Transit (DART) and Dallas Garland & Northeastern Railroad (DGNO) operate within the Dallas Metropolitan area, which is within the area. Over the last few years, the ownership of portions of railroad lines within the Dallas Metropolitan area have transferred from the DGNO to DART with freight operating rights remaining with the DGNO. These ownership transfers have been completed as DART has expanded its commuter rail operations. The DART and DGNO tracks within the Dallas Metropolitan area are not included in this Study with the exception of two of the DGNO rail lines that extend beyond the metropolitan area. One of these lines extends north from Plano, Texas to Sherman, Texas connecting the BNSF Madill Subdivision and the second DGNO line extends east from Garland, Texas turning toward Greenville and connecting to the Texas Northeastern Railroad at Trenton, Texas. The remaining DART and DGNO lines are included in an independent DFW Region Freight Study.

The Fort Worth and Western Railroad (FWWR) and the Trinity Railway Express (TRE) also operate within the limits of the study area, but their primary operations are beyond the western limits of the area with only short segments extending into Dallas County. Both of these railroads was evaluated in the Dallas-Fort Worth Region Freight Study being conducted jointly by NCTCOG and TxDOT and are not included in this study.

Detailed track, bridge, and crossing inventories, including the number of public crossings by county and district and the type of crossing protection at each crossing, for these railroads can be found in the appendices of this report. A summary of the railroad inventory is shown in Table 4-1.

	TxDOT Districts					E. Texas
	Dallas	**Paris**	**Atlanta**	**Tyler**	**Lufkin**	**Study Area**
UP Mainline Track	250	42	237	316	203	1048
BNSF Mainline Track	183	37	40	10	67	337
KCS Mainline Track	71	66	113	6	0	256
Shortline Track	54	214	68	42	29	407
Total Mainline Track Miles	558	359	458	374	299	2048
Number of Sidings	80	11	59	25	52	227
Siding Lengths (miles)	80	14	60	35	51	240
Industrial Sidings	235	40	95	232	79	681
Number of Bridges	365	54	201	277	195	1092
Length of Bridges (Miles)	9.47	1.06	6.27	7.85	5.06	29.71
Public Grade Crossings	1143	503	334	421	265	2666

Table 4-1: East Texas Railroad Inventory Summary

The East Texas Region Freight Study area includes three Class I railroads: BNSF, UP, and KCS. As of 2005, a Class I railroad, as defined by the Association of American Railroads (AAR), has an operating revenue exceeding $319-million. Class II and Class III designations are rarely used anymore as the AAR currently splits non-Class I railroads into the following three categories:

- Regional Railroads - operate at least 350-miles, or make at least $40-million per year up to the Class I criteria;
- Local Railroads - non-regional railroads that engage in line-haul service;
- Switching and Terminal Railroads - mainly switch cars between other railroads, or provide service from other lines to a common terminal.

The Surface Transportation Board (STB) continues to use Class II and Class III designations since labor regulations are different for the two classes. The term "Shortline Railroad(s)" has been used throughout the Study to describe non-Class I railroads. The railroads located in the study area are classified as follows according to the AAR designations:

- Class I Railroads
  - BNSF Longview Subdivision
  - BNSF DFW Subdivision
  - BNSF Ward Industrial Spur
  - BNSF Madill Subdivision
  - BNSF Forth Worth Subdivision
  - UP Little Rock Subdivision
  - UP Reisor Subdivision
  - UP Pine Bluff Subdivision
  - UP Dallas Subdivision
  - UP Corsicana Subdivision
  - UP Palestine Subdivision
  - UP Lufkin Subdivision
  - UP Choctaw Subdivision

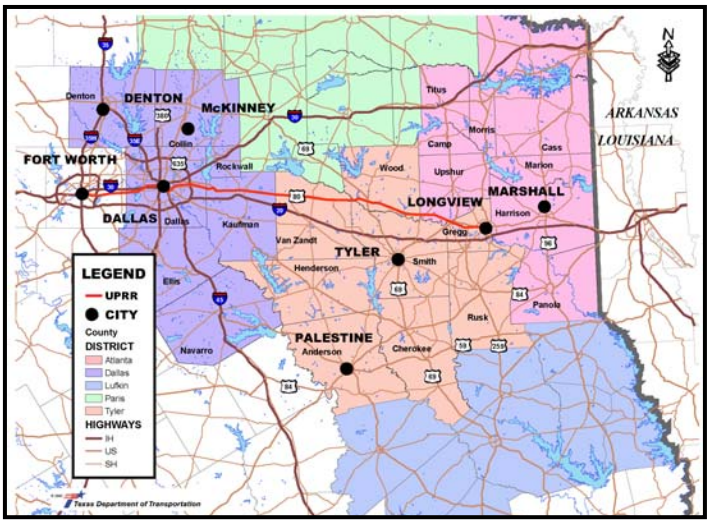
- o UP Ennis Subdivision
- o UP Midlothian Subdivision
- o UP Athens Industrial Lead
- o UP Tyler Industrial Lead
- o UP Henderson Industrial Lead
- o KCS Shreveport Subdivision
- o KCS Greenville Subdivision
- o KCS Alliance Subdivision

- ➢ Shortline Railroads
  - o Local Railroads
    - ▪ Kiamichi Railroad
    - ▪ Blacklands Railroad
    - ▪ Texas State Railroad
    - ▪ Texas Northeastern Railroad
    - ▪ Texas Northern Railroad
    - ▪ TXU Railroads
    - ▪ Texas Northern Railroad
    - ▪ Dallas, Garland and Northeastern Railroad
  - o Switching and Terminal Railroads
    - ▪ Angelina & Neches River Railroad
    - ▪ Texas South-Eastern Railroad

Each of the above noted railroads operate either in or through the TxDOT Atlanta, Dallas, Lufkin, Paris, or Tyler Districts. Each of these railroads and subdivisions are described in the section.

Class I Railroads

UP Dallas Subdivision:



The UP Dallas Subdivision operates from Longview, Texas west to the Dallas - Fort Worth metroplex. The end of the UP Little Rock Subdivision marks the beginning of the Dallas Subdivision and also designates the beginning of the UP Palestine Subdivision. This key intersection is located at the west end of the UP Yard in downtown Longview, Texas. After leaving the Longview Yard Limits, the Dallas Subdivision goes through Greggton, Texas. This portion of the UP is within the North Little Rock Service Unit; however, the North Little Rock Service Unit ends where the UP Fort Worth Service

Unit begins. The Dallas Subdivision milepost's increase as the alignment follows U.S. 81 highway west to Dallas, Texas.

The Dallas Subdivision operates across 141.47 miles into Dallas crossing seven counties within the study area. The maximum allowed freight speed across this subdivision is 60 miles-per-hour and 75 miles-per-hour for Amtrak passenger trains. Train operations are controlled using centralized traffic control (CTC) on 123.28 miles of single track mainline before the junction of the UP Ennis Subdivision, where the track becomes a double-track operation for the next 18.19 miles (incorporating milepost equations) within the study area.

The following tables summarize key information for the Dallas Subdivision. Table 4-2 lists the track mileage by District and by county within the study area and Table 4-3 lists key locations across the subdivision with associated milepost locations.

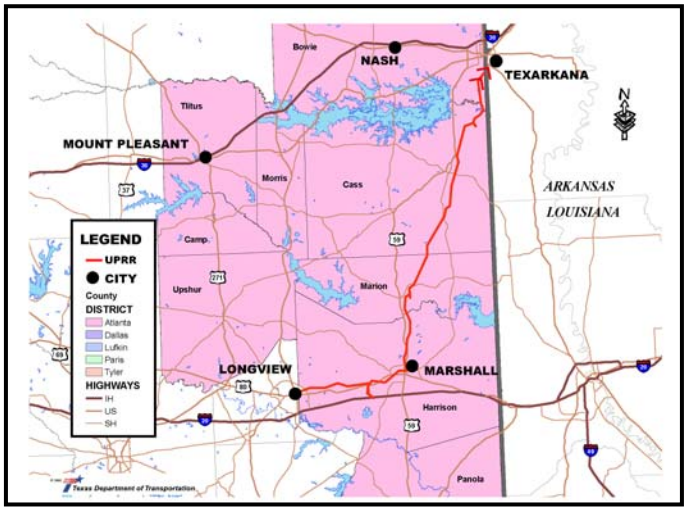
County:	**Miles of Mainline Track:**	**Miles of Double Mainline Track:**	**Total Miles:**
TxDOT Atlanta District			
Upshur	11.72	0	11.72
Subtotal:	11.72	11.72	11.72
TxDOT Tyler District			
Gregg	14.2	8.30	22.50
Wood	24.41	0	24.41
Smith	2.56	0	2.56
Van Zandt	28.28	0	28.28
Subtotal:	69.45	8.30	77.75
TxDOT Dallas District			
Kaufman	26.58	0	26.58
Dallas	33.72	18.19	51.91
Subtotal:	60.30	18.19	78.49
Total:	**141.47**	**26.49**	**167.96**

Table 4-2: UP Dallas Subdivision Inventory Summary

Milepost:	Location Description:
89.60	Begin Dallas Sub. / End Little Rock Sub.
89.77	Greggton
90.21	End North Little Rock Subdivision / Start Fort Worth Service Unit
93.02	End Double Track
95.70	End Longview Yard Limits
103.80	Gregg County – Upshur County
103.87	Gladewater
112.93	UP Pine Bluff Subdivision Ends at Crossing
112.93	UP Corsicana Subdivision Starts at Crossing
112.96	Big Sandy
115.52	Upshur County – Wood County
118.55	Hawkins
135.94	Mineola
139.93	Wood County – Smith County
142.49	Smith County – VanZandt County
142.69	Silver Lake
149.56	Grand Saline
158.05	Edgewood
166.68	West Point
170.77	VanZandt County – Kaufman County
175.14	Elmo
181.42	Terrell
186.20	Lawrence
194.00	Forney
197.35	Kaufman County – Dallas County
203.53	Mesquite
203.53	Intermodal / Auto Facility
210.26	KCS Junction: Milepost Equation 210.26 = B210.26
B210.26	KCS Junction: Milepost Equation B210.26 = 210.26
B212.88	Ennis Jct. = Connection to UP Ennis Subdivision
B215.08	BNSF DFW Subdivision Connection (MP 768.90)
B217.00	Milepost Equation B217.00 = 214.32
214.32	Milepost Equation 214.32 = B217.00
217.00	Dallas
225.00	Grand Prairie
228.39	Dallas County – Tarrant County

Table 4-3: UP Dallas Subdivision Key Locations

UP Little Rock Subdivision



The Little Rock Subdivision is part of the UP North Little Rock Service Unit and is located between Little Rock, Arkansas and Longview, Texas. For the limits of this study the Little Rock Subdivision inventory is defined between Texarkana, Texas and Longview, Texas for a length of 89.32 miles.

As the subdivision crosses from Miller County, Arkansas into Bowie County, Texas, the milepost changes to 0.00 and increases until the Little Rock Subdivision changes to the Dallas Subdivision in Longview, Texas. After entering Texas, the Little Rock Subdivision turns south toward Marshall, Texas before turning east toward Longview, Texas.

The subdivision primarily operates on a single track with a maximum freight speed of 70 miles-per-hour and a maximum Amtrak passenger train speed of 75 miles-per-hour. Train operations are dispatched across the Little Rock Subdivision using CTC procedures. The Little Rock Subdivision operates on two mainline tracks as it enters into Texas with the second mainline track ending at milepost 1.79.

The following tables summarize key information for the Little Rock Subdivision. Table 4-4 lists the track mileage by District and by county within the study area and Table 4-5 lists key locations across the subdivision with associated milepost locations.

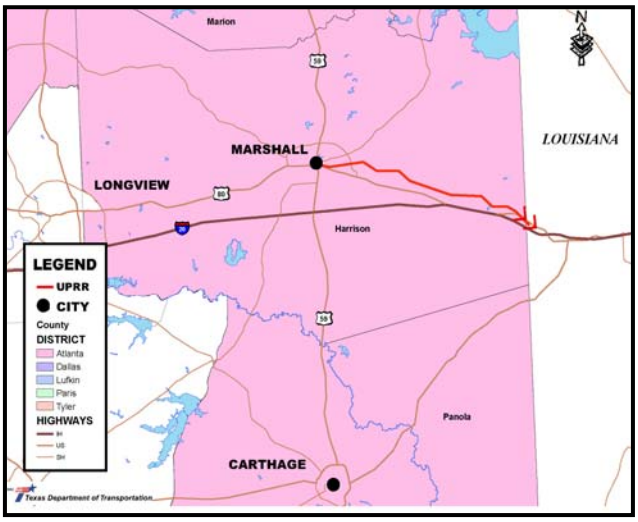
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Atlanta District			
Bowie	8.70	1.79	10.49
Cass	33.10	0	33.10
Marion	13.40	0	13.40
Harrison	32.43	6.49	38.92
Subtotal:	87.63	8.28	95.91
TxDOT Tyler District			
Gregg	1.64	1.64	3.28
Subtotal:	1.64	1.64	3.28
Total:	**89.27**	**9.92**	**99.19**

Table 4-4: UP Little Rock Subdivision Inventory Summary

Milepost:	Location Description:
0.00	Miller County AK – Bowie County TX
0.43	UP Pine Bluff Subdivision Crossing (MP 419.05)
1.79	Double Track to Single Track
2.43	KCS Shreveport Subdivision Crossing (MP 489.40)
8.70	Sulphur
8.70	Bowie County – Cass County
19.68	Queen City
24.00	Atlanta
30.43	Bivins
36.92	Kildar
41.80	Cass County – Marion County
49.35	Jefferson
51.26	KCS Greenville Subdivision Crossing (MP 50.20)
55.20	Marion County – Harrison County
57.79	Woodlawn
66.67	Marshall Junction
66.67	UP Reisor Subdivision Connection (MP 351.43)
73.33	Milepost Equation 73.33 = 73.61
73.61	Milepost Equation 73.61 = 73.33
74.53	Keokuck
80.28	Hallsville
81.47	Lansing Junction = Beginning Double Track
87.96	Harrison County – Gregg County
88.95	BNSF Longhorn Subdivision Crossing (MP 207.14)
89.60	End Little Rock Subdivision = Start Dallas Subdivision

Table 4-5: UP Little Rock Subdivision Key Locations

UP Reisor Subdivision



The UP Reisor Subdivision is a single track mainline part of the UP North Little Rock Service Unit between Shreveport, Louisiana and Marshall, Texas. This subdivision follows U.S. 80 highway to the northwest as its milepost markers increase towards Marshall. The Reisor Subdivision inventory was considered between the Texas/Louisiana border and Marshall, Texas as defined by the limits of the East Texas Freight Study. The maximum freight speed across the subdivision is 50 miles per hour with train operations controlled using

Automatic Block Signals (ABS).

The following tables summarize key information for the Reisor Subdivision. Table 4-6 lists the track mileage by District and by county within the study area and Table 4-7 lists key locations across the subdivision with associated milepost locations.

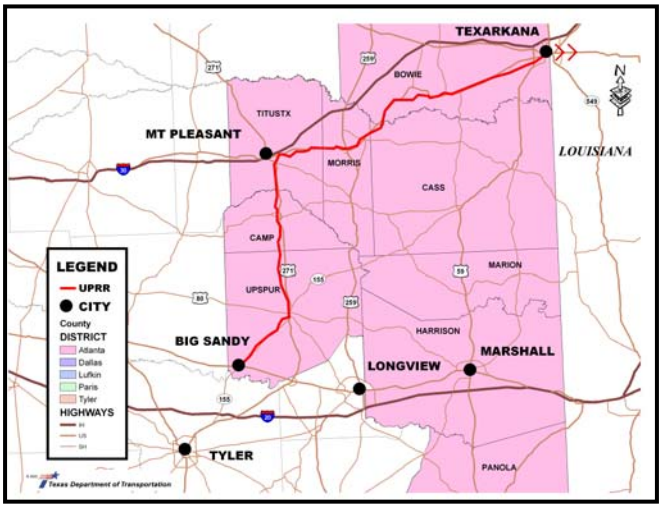
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Atlanta District			
Harrison	20.48	0	20.48
Subtotal:	20.48	0	20.48
Total:	**20.48**	**0**	**20.48**

Table 4-6: UP Reisor Subdivision Inventory Summary

Milepost:	Location Description:
330.95	Caddo Parish, LA – Harrison County, TX
332.50	Waskom
343.10	Scottsville
347.30	Loop SR 380 crossing
349.50	Texas/Louisiana border
350.3	U.S. 59 crossing
351.00	Marshall
351.40	Marshall Junction
351.43	End Reisor Subdivision at UP Little Rock Subdivision Track #2, (MP 66.67)

Table 4-7: UP Reisor Subdivision Key Locations

UP Pine Bluff Subdivision



The Pine Bluff Subdivision is operated from the UP North Little Rock Service Unit and located between Pine Bluffs, Arkansas and Big Sandy, Texas. The Pine Bluff Subdivision inventory was considered between the Arkansas/Texas border and Big Sandy, Texas as defined by the study limits.

The Pine Bluff Subdivision operates through six counties within the TxDOT Atlanta District. The alignment goes southwest out of Texarkana, Texas toward Mount Pleasant, Texas

before turning south following U.S. 271 toward Gilmer, Texas then southwest to Big Sandy, Texas. Train operations are controlled using CTC with the maximum freight speed of 65 miles per hour.

The UP's Texarkana Freight Yard is located on the south side of the Texarkana, Texas downtown vicinity with the yard limits extending across the Texas/Arkansas state border. An industrial track supports the Lone Star Army Ammunition Plant and Red River Army Depot located north of Redwater, Texas and west of Texarkana, Texas.

Before the track turns south and follows U.S. 271, the UP Commerce Industrial Lead Track connects to the subdivision and provides service to the TXU Monticello Power Plant and the Backlands Railroad.

At Big Sandy, Texas three UP subdivisions merge and/or cross. The Dallas Subdivision goes through Big Sandy Junction from the east to the west, the Pine Bluff Subdivision crosses Big Sandy Junction from the north and crosses the Dallas Subdivision before merging into the Corsicana Subdivision.

The following tables summarize key information for the Pine Bluff Subdivision. Table 4-8 lists the track mileage by District and by county within the study area and Table 4-9 lists key locations across the subdivision with associated milepost locations.

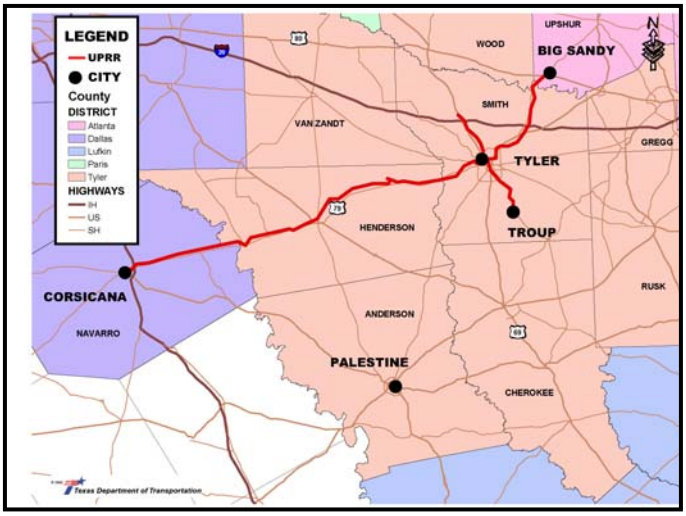
County:	**Miles of Mainline Track:**	**Miles of Double Mainline Track:**	**Total Miles:**
TxDOT Atlanta District			
Bowie	37.54	0	37.54
Cass	3.80	0	3.80
Morris	9.93	0	9.93
Titus	15.85	0	15.85
Camp	12.17	0	12.17
Upshur	27.41	0	27.41
Subtotal:	106.70	0	106.70
Total:	**106.70**	**0**	**106.70**

Table 4-8: UP Pine Bluff Subdivision Inventory Summary

Milepost:	Location Description:
418.60	Miller County, AK – Bowie County, TX
419.05	UP Little Rock Subdivision Crossing (MP 0.43)
419.62	KCS Shreveport Subdivision Crossing, Business U.S. 59 crossing (MP 489.40)
431.00	Redwater
421.93	U.S. 59 crossing
431.02	Industrial Track Connection to Army Ammo Plant
435.94	Maud
435.94	SH 8 crossing
451.60	Darden
455.88	Sulphur River Bridge (2,947')
456.14	Bowie County – Cass County
459.94	Cass County – Morris County
460.70	Naples
460.97	U.S. 77 crossing
464.12	Omaha
465.13	U.S. 259 crossing
469.27	Morris County – Titus County
478.30	Mount Pleasant
479.99	U.S. 271 crossing
480.15	U.S. 271/Loop 410 crossing
485.73	Titus County – Camp County
491.20	KCS Greenville Subdivision Connection (MP 98.30)
491.68	Pittsburg
497.89	Camp County – Upshur County
510.50	Gilmer
520.72	SR 155 crossing
524.89	U.S. 80 crossing
524.98	Big Sandy Junction
525.14	UP Dallas Subdivision Crossing (MP 112.93)
525.30	Start UP Corsicana Sub., End UP Pine Bluff Sub.

Table 4-9: UP Pine Bluff Subdivision Key Locations

UP Corsicana Subdivision



The Corsicana Subdivision runs between Big Sandy, Texas and Corsicana, Texas on a single track mainline with a maximum freight speed of 60 miles-per-hour. Milepost markers increase from Big Sandy as the track runs along SR 155 to Tyler, Texas then west along SR 31 toward Corsicana. This subdivision is operated out of the UP Fort Worth Service Unit with trains dispatched by CTC signalization.

At Big Sandy, three UP Subdivisions merge and/or cross: the Dallas Subdivision goes through Big Sandy Junction from the east to the west, the Pine Bluff Subdivision crosses Big Sandy Junction from the north and crosses the Dallas Subdivision before merging into the Corsicana Subdivision. Near downtown Tyler, the subdivision crosses the UP Tyler Industrial Lead Track, which runs from Troup, Texas on the UP Palestine Subdivision, north through Tyler and continues north to Swan, Texas. The UP Athens Industrial Lead crosses the Corsicana Subdivision at Athens Junction and operates from Athens, Texas northwest to Eustace, Texas. The Corsicana Subdivision ends as it connects to the UP Ennis Subdivision.

The following tables summarize key information for the Corsicana Subdivision. Table 4-10 lists the track mileage by District and by county within the study area and Table 4-11 lists key locations across the subdivision with associated milepost locations.

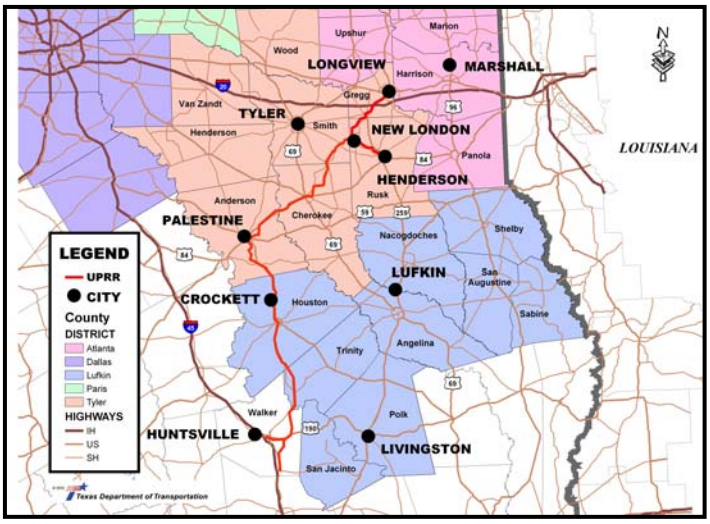
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Atlanta District			
Upshur	2.29	0.00	2.29
Subtotal:	2.29	0.00	2.29
TxDOT Tyler District			
Smith	29.48	0.00	29.48
Henderson	42.41	0.00	42.41
Subtotal:	71.89	0.00	71.89
TxDOT Dallas District			
Navarro	21.82	0.00	21.82
Subtotal:	21.82	0.00	21.82
Total:	**96.00**	**0.00**	**96.00**

Table 4-10: UP Corsicana Subdivision Inventory Summary

Milepost:	Location Description:
525.30	Start UP Corsicana Subdivision – End UP Pine Bluff Subdivision
525.30	Big Sandy
527.54	Sabine River Bridge (963.6')
527.59	Upshur County – Smith County
533.10	Winona
536.19	I-21 crossing
537.50	U.S. 121 crossing
543.20	Loop SR 323 crossing
543.89	Loop SR 323 crossing
545.20	Tyler
546.65	U.S. 271 crossing
546.71	UP Tyler Industrial Lead Crossing (MP 19.11)
547.72	U.S. 31/U.S. 69 crossing
547.81	SH 110 crossing
549.47	Loop SR 323 crossing
552.19	SR 164 crossing
552.96	SR 364 crossing
557.07	Smith County – Henderson County
557.23	Chandler
559.15	SR 31 crossing
567.00	Brownsboro
574.78	Murchison
583.28	UP Athens Industrial Lead Connection (MP 242.53)
583.30	Athens Junction
584.16	U.S. 175/SR 31 crossing
593.70	Malakoff
599.48	Trinity River Bridge (906')
599.48	Henderson County – Navarro County
599.90	Trinidad
607.00	SH 309 crossing
607.51	Kerens
613.10	Powell
619.98	I-45 crossing
621.02	BNSF DFW Subdivision Crossing (MP 239.68)
621.30	End UP Corsicana Subdivision = Connection to UP Ennis Subdivision

Table 4-11: UP Corsicana Subdivision Key Locations

UP Palestine Subdivision



The Palestine Subdivision operates on a single track mainline between Longview, Texas and Houston, Texas with the milepost markers increasing toward Houston. Trains are dispatched across this subdivision using CTC with a maximum freight train speed of 60 miles-per-hour. Traffic on the Palestine Subdivision and the UP Lufkin Subdivision operate in a unidirectional flow with trains scheduled to run southbound on the Palestine Subdivision and northbound on the Lufkin Subdivision. The Palestine Subdivision runs through seven counties and two of TxDOT's Districts within the limits of the East Texas Freight Study.

The Palestine Subdivision starts in UP Longview Yard located in downtown Longview, Texas. Three of the UP subdivisions and one of the BNSF subdivisions either start or end within the Longview Yard limits. The UP Little Rock Subdivision ends, the UP Dallas Subdivision starts, the UP Palestine Subdivision starts, and the BNSF Longview Subdivision ends at this location. The Palestine Subdivision connects to the Dallas Subdivision second mainline track. The Palestine Subdivision goes southwest out of Longview to Palestine, Texas then turns south towards Houston, Texas. The first 3.5 miles of this subdivision are controlled from the UP North Little Rock Service Unit with the remaining subdivision controlled from the UP Houston Service Unit.

The Henderson Industrial Lead runs southeast from the Palestine Subdivision where it ends and serves Henderson, Texas. The UP Tyler Branch begins off of the Palestine Subdivision and runs northwest toward Tyler, Texas ending at Swan, Texas. The UP Palestine Yard is located in downtown Palestine, Texas. The UP Hearne Subdivision begins at the Palestine Subdivision and runs southwest toward Hearne, Texas. At South Junction, located at the south end of the Palestine Yard, the Texas State Railroad ties into the Palestine Subdivision and goes east to Rusk, Texas. The limit of the East Texas Freight Study ends at the Walker County border.

The following tables summarize key information for the Palestine Subdivision. Table 4-12 lists the track mileage by District and by county within the study area and Table 4-13 lists key locations across the subdivision with associated milepost locations.

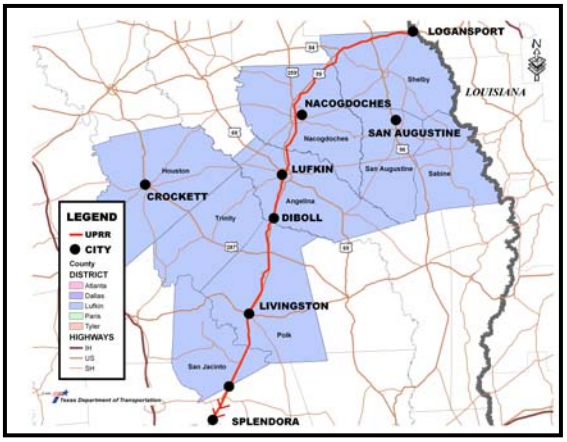
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Tyler District			
Gregg	13.59	0.00	13.59
Rusk	9.62	0.00	9.62
Smith	12.94	0.00	12.94
Cherokee	29.16	0.00	29.16
Anderson	36.34	0.00	36.34
Subtotal:	101.65	0.00	101.65
TxDOT Lufkin District			
Houston	36.38	0.00	36.38
Trinity	15.83	0.00	15.83
Subtotal:	52.21	0.00	52.21
Total:	**153.86**	**0.00**	**153.86**

Table 4-12: UP Palestine Subdivision Inventory Summary

Milepost:	Location Description:
0.00	Begin UP Palestine Subdivision in Longview Yard = UP Dallas Subdivision MP 89.63, Tk. #2
3.68	Sabine River Bridge (839')
7.06	I-20 Crossing
10.23	U.S. 259 Crossing
10.25	Kilgore
11.34	U.S. 42 Crossing
12.51	SH 135 Crossing
13.59	Gregg County – Rusk County
22.27	Overton
22.76	UP Henderson Industrial Lead Connection
23.21	Rusk County – Smith County
27.38	SH 64 Crossing
35.02	Troup
35.77	UP Tyler Branch Connection
36.15	Smith County – Cherokee County
47.65	Tecula
53.24	Jacksonville
57.02	Hume
65.31	Cherokee County – Anderson County
65.41	Neches River Bridge (667')
68.67	Neches
71.43	U.S. 79 Crossing
79.86	U.S. 256 Crossing
81.10	U.S. 287 Crossing
81.40	Palestine
82.69	UP Hearne Subdivision Connection (MP 1.10)
84.32	South Junction = Texas State Railroad Connection
85.04	Loop SR 256 Crossing
94.66	Elkhart
94.79	SR 294 Crossing
101.65	Anderson County – Houston County
107.37	Grapeland
118.57	Loop Sr-304 Crossing
119.77	SR 21 Crossing
120.03	Crockett
134.01	Lovelady
135.67	SH 19 Crossing
138.03	Houston County – Trinity County
146.54	Trinity
147.29	SH 94 Crossing
153.41	Trinity River Bridge (2,817')
153.86	Trinity County – Walker County

Table 4-13: UP Palestine Subdivision Key Locations

UP Lufkin Subdivision



The Lufkin Subdivision operates on a single track mainline between Houston, Texas and Shreveport, Louisiana with the milepost markers increasing toward Shreveport. Trains are dispatched across this subdivision using ABS with a maximum freight train speed of 49 miles per hour and a maximum speed for Amtrak Passenger Trains of 49 miles per hour. Traffic on the Lufkin Subdivision and the UP Palestine Subdivision operate in a unidirectional flow with trains scheduled to run southbound on the Palestine Subdivision and northbound on the Lufkin Subdivision. The Lufkin Subdivision runs through five counties through TxDOT's Lufkin District that are within the limits of the Study.

The Lufkin Subdivision follows U.S. 59 Highway north going through Lufkin, Nacogdoches, and Tenaha to U.S. 84 where the alignment turns east toward Logansport, Louisiana then north to Shreveport, Louisiana. The Lufkin Subdivision is controlled from the UP Houston Service Unit. After leaving Houston, Texas, the Lufkin Subdivision goes north through Cleveland, Texas and crosses the BNSF Conroe Subdivision just before crossing from Liberty County into San Jacinto County and the limit of this study. After the Lufkin Subdivision crosses the Sabine River Bridge, the subdivision enters Louisiana and leaves the limits of this study.

The following tables summarize key information for the Lufkin Subdivision. Table 4-14 lists the track mileage by District and by county within the study area and Table 4-15 lists key locations across the subdivision with associated milepost locations.

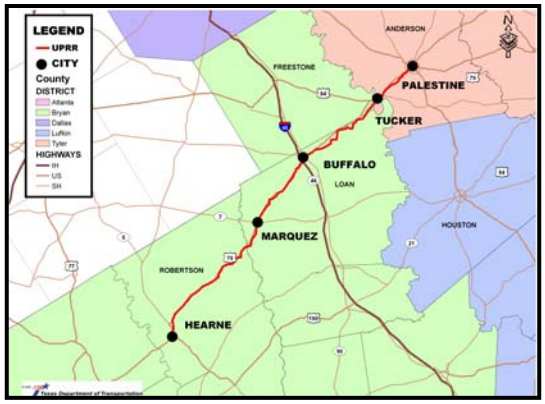
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Lufkin District			
San Jacinto	13.38	0.00	13.38
Polk	41.84	0.00	41.84
Angelina	24.09	0.00	24.09
Nacogdoches	34.15	0.00	34.15
Shelby	37.73	0.00	37.73
Subtotal:	151.19	0.00	151.19
Total:	**151.19**	**0.00**	**151.19**

Table 4-14: UP Lufkin Subdivision Inventory Summary

Milepost:	Location Description:
47.59	Liberty County – San Jacinto County
53.38	U.S. 59 Crossing
54.30	Shepard
55.27	SH 150 Crossing
60.00	Urbana
60.97	Trinity River Bridge (648')
60.97	San Jacinto County – Polk County
63.60	Goodrich
67.20	Lamont
69.40	U.S. 59 Crossing
71.20	U.S. 190 Crossing
71.50	Livingston
72.85	U.S. 59 Crossing
79.70	Legett
83.50	Waldo
84.00	Bering
87.50	Moscow
92.89	U.S. 287 Crossing
93.88	Corrigan
102.81	Polk County – Angelina County
106.72	Texas South Eastern Railroad Connection
107.10	Dibol
118.38	Angelina & Neches River Railroad Connection
120.38	Angelina & Neches River Railroad Connection
120.68	SH 287/U.S. 69 Crossing
121.02	U.S. 59 Crossing
126.90	Angelina County – Nacogdoches County
138.20	Nacogdoches, SR 21 Crossing
147.40	Appleby
158.40	Garrison
161.05	Attoyac River Bridge (1,209')
161.05	Nacogdoches County – Shelby County
165.00	Timpson
167.38	U.S. 59 Crossing
176.08	Tenaha
176.40	BNSF Longview Subdivision Connection (MP 151.43)
177.02	U.S. 59 Crossing
180.30	Paxton
188.20	Joaquin
189.20	U.S. 84 Crossing
190.78	Sabine River Bridge (978')
190.97	Shelby County, TX – De Soto Parish, LA

Table 4-15: UP Lufkin Subdivision Key Locations

UP Hearne Subdivision



The Hearne Subdivision operates between Palestine, Texas and Hearne, Texas connecting the Palestine Subdivision with the Ennis Subdivision. Because Palestine, Texas is located near the southeast edge of East Texas, only the first 13.66 miles of the Hearne Subdivision are within the limits of the study area. The Hearne Subdivision is part of the UP Houston Service Unit with trains dispatched using ABS controls. The milepost markers increase from Palestine toward Hearne with a maximum freight speed of 40 miles per hour across a single track mainline. The Hearne Subdivision connects to the Palestine Subdivision at the west end of the Palestine Yard within Palestine, Texas. The Subdivision crosses from Anderson County into Freestone County at the end of the study limits.

The following tables summarize key information for the Hearne Subdivision. Table 4-16 lists the track mileage by District and by county within the study area and Table 4-17 lists key locations across the subdivision with associated milepost locations.

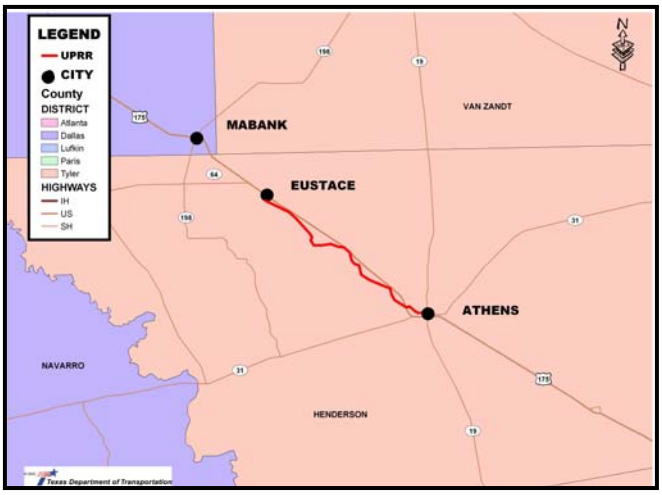
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Tyler District			
Anderson	12.56	0.00	12.56
Subtotal:	12.56	0.00	12.56
Total:	**12.56**	**0.00**	**12.56**

Table 4-16: UP Hearne Subdivision Inventory Summary

Milepost:	Location Description:
1.10	Begin Hearne Subdivision = UP Palestine Subdivision (MP 82.69 in Palestine Yard Limits)
1.80	Loop SH 294 Crossing
8.50	Tucker
11.20	SH 29 Crossing
12.50	Trinity River Bridge (1,810')
13.50	Trinity River Bridge (1,031')
13.66	Anderson County – Freestone County

Table 4-17: UP Hearne Subdivision Key Locations

UP Athens Industrial Lead



The Athens Industrial Lead operates from Athens, Texas following along the south side of U.S. 175 going northeast to Eustace, Texas with the milepost markers increasing toward Eustace. This industrial track is part of the UP Fort Worth Service Unit with trains dispatched using Track Warrant Control (TWC) procedures across a single track mainline with a 30 mile per hour freight speed. The Athens Industrial Lead is located within Henderson County and the TxDOT Tyler District.

The Athens Industrial Lead begins its connection to the Corsicana Subdivision located in downtown Athens, Texas. The Athens Industrial Lead goes through Pickens, Texas, Stockard, Texas and ends in Eustace, Texas.

The following tables summarize key information for the Athens Industrial Lead. Table 4-18 lists the track mileage by District and by county within the study area and Table 4-19 lists key locations across the subdivision with associated milepost locations.

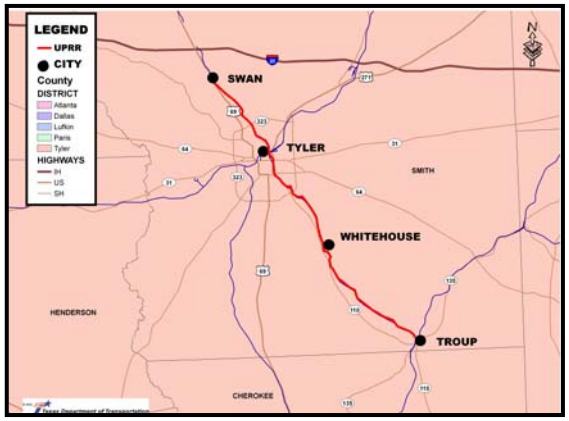
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Tyler District			
Henderson	13.92	0.00	13.92
Subtotal:	13.92	0.00	13.92
Total:	**13.92**	**0.00**	**13.92**

Table 4-18: UP Athens Industrial Lead Inventory Summary

Milepost:	Location Description:
242.60	Begin Athens Industrial Lead at connection to Corsicana Subdivision
242.87	U.S. 19 Crossing
244.36	U.S. 175 Crossing
248.60	Pickens
251.20	Stockard
255.1	Eustace
256.22	End Athens Industrial Lead

Table 4-19: UP Athens Industrial Lead Key Locations

UP Tyler Industrial Lead



The Tyler Industrial Lead operates from Troup, Texas following along the north side of SR 100 northwest toward Tyler, Texas then along the north side of U.S. 69 to Swan, Texas. Milepost markers increase toward Swan, Texas. This industrial track is part of the UP Fort Worth Service Unit with trains dispatched using TWC procedures across a single track mainline with a 30 mile per hour freight speed.

The Tyler Industrial Lead is located within Smith County and the TxDOT Tyler District and provides a connection between the UP Palestine Subdivision and the UP Corsicana Subdivision. The Tyler Industrial Lead begins in Troup, Texas at a connection with the UP Palestine Subdivision. Since this portion of the Palestine Subdivision is located within the UP Houston Service Unit, the first 0.25 miles of the Tyler Industrial Lead are located within the Houston Service Unit before changing over to the Fort Worth Service Unit.

The following tables summarize key information for the Tyler Industrial Lead. Table 4-20 lists the track mileage by District and by county within the study area and Table 4-21 lists key locations across the subdivision with associated milepost locations.

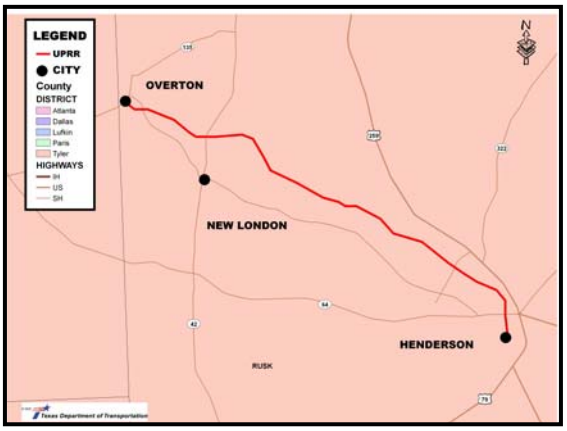
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Tyler District			
Smith	26.96	0.00	26.96
Subtotal:	26.96	0.00	26.96
Total:	**26.96**	**0.00**	**26.96**

Table 4-20: UP Tyler Industrial Lead Inventory Summary

Milepost:	Location Description:
0.04	Begin Tyler Industrial Lead = UP Palestine Subdivision MP 45.26
0.04	Troup
8.60	Whitehorse
15.00	SR 324 Crossing
17.70	SR 64 Crossing
18.60	SR 31 Crossing
19.00	Tyler
19.11	UP Corsicana Subdivision Crossing (MP 546.71)
19.70	SR 147 Crossing
20.43	SR 14 Crossing
25.50	Swan
27.70	End Tyler Industrial Lead

Table 4-21: UP Tyler Industrial Lead Key Locations

UP Henderson Subdivision



The Henderson Subdivision operates between Overton, Texas to the southeast towards Henderson, Texas along the north side of SR 323. Milepost markers increase toward Henderson. This subdivision is part of the UP Houston Service Unit with trains dispatched using TWC procedures across a single track mainline with a 10 mile per hour freight speed.

The Henderson Subdivision is located within Rusk County and the TxDOT Tyler District starting at the south end of Overton, Texas on the Palestine Subdivision.

The following tables summarize key information for the Henderson Subdivision. Table 4-22 lists the track mileage by District and by county within the study area and Table 4-23 lists key locations across the subdivision with associated milepost location.

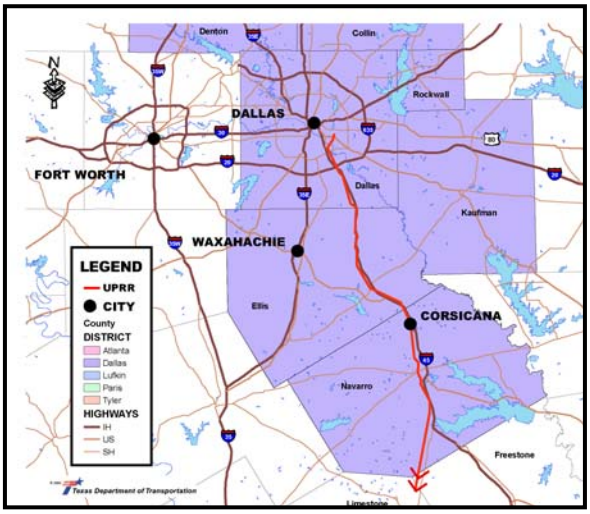
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Tyler District			
Rusk	16.28	0.00	16.28
Total:	16.28	**0.00**	16.28

Table 4-22: UP Henderson Subdivision Inventory Summary

Milepost:	Location Description:
0.00	Overton, Begin Henderson Industrial Lead = UP Palestine Subdivision MP 22.76
0.59	SH 135 Crossing
1.00	SR 323 Crossing
3.30	SH 42 Crossing
12.71	Loop SR 571 Crossing
15.01	SH 64 Crossing
16.00	Henderson
16.28	End Henderson Industrial Track

Table 4-23: UP Henderson Subdivision Key Locations

UP Ennis Subdivision



The Ennis Subdivision operates from Hearne, Texas to Dallas, Texas with the Milepost markers increasing toward Dallas. This subdivision is part of the UP Fort Worth Service Unit across a single track mainline with trains dispatched using ABS procedures with a maximum freight speed of 60 miles per hour. The Ennis Subdivision inventory was defined between Dallas, Texas and the border between Navarro County and Freestone County at the limits of the East Texas Freight Study area. This subdivision crosses through three counties within the TxDOT Dallas District. As the Ennis Subdivision enters the Dallas-Fort Worth area, the tracks cross the Trinity River Bridge (2,921-feet long) and connects to Trinity Junction where the Ennis Subdivision ends as it connects to the UP Dallas Subdivision.

The following tables summarize key information for the Ennis Subdivision. Table 4-24 lists the track mileage by District and by county within the study area and Table 4-25 lists key locations across the subdivision with associated milepost locations.

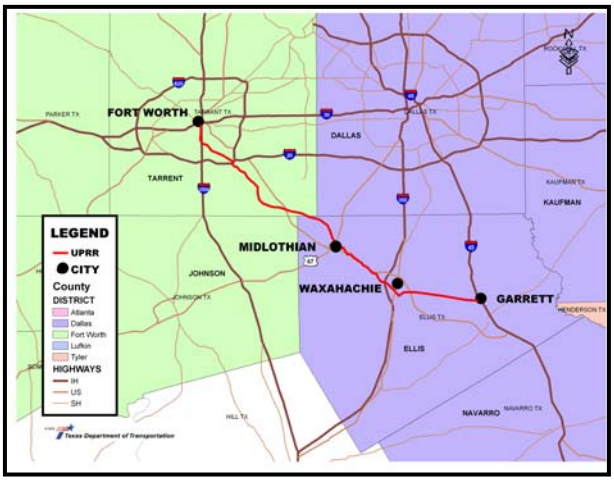
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Dallas District			
Navarro	32.01	0.00	32.01
Ellis	24.09	0.00	24.09
Dallas	14.54	0.00	14.54
Total:	**70.64**	**0.00**	**70.64**

Table 4-24: UP Ennis Subdivision Inventory Summary

Milepost:	Location Description:
190.56	Freestone County – Navarro County
198.30	Richland
203.90	Angus
210.20	Corsicana
210.27	SH 31 Crossing
211.09	BNSF DFW Subdivision Crossing (MP 240.56)
215.39	Chambers Creek Bridge (1,138')
221.10	Rice
222.60	Navarro County – Ellis County
225.40	Alama
226.82	U.S. 287 Crossing
230.20	SH 34 Crossing
230.86	U.S. 287 Crossing
231.70	Ennis
233.50	UP Midlothian Subdivision Connection (MP 0.00)
238.50	Palmer
242.30	Trumbull
246.60	Ferris
246.69	Ellis County – Dallas County
251.30	Hutchins
254.87	I-45 Crossing
255.65	I-20 Crossing
258.75	U.S. 12 Crossing
258.80	UP Miller Yard
260.18	Trinity River Bridge (2,921')
260.7	Trinity Junction, End Ennis Subdivision = UP Dallas Subdivision (MP 212.90)

Table 4-25: UP Ennis Subdivision Key Locations

UP Midlothian Subdivision



The Midlothian Subdivision operates from Garrett, Texas northwest to Fort Worth, Texas with the milepost markers increasing toward Fort Worth. This subdivision is controlled from the UP Fort Worth Service Unit across a single track mainline with trains dispatched using TWC procedures with a maximum freight speed of 49 miles per hour. The Midlothian Subdivision inventory was defined between Garrett, Texas and the border between Ellis County and Tarrant County at the limits of the Study.

The following tables summarize key information for the Midlothian Subdivision. Table 4-26 lists the track mileage by District and by county within the study area and Table 4-27 lists key locations across the subdivision with associated milepost locations.

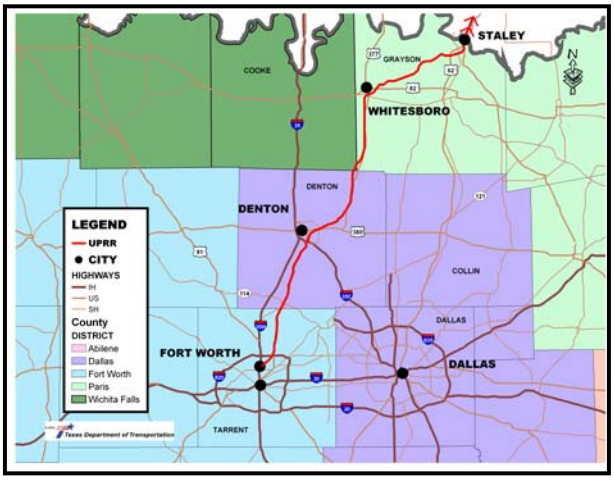
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Dallas District			
Ellis	29.04	0.00	29.04
Subtotal:	29.04	0.00	29.04
Total:	29.04	**0.00**	29.04

Table 4-26: UP Midlothian Subdivision Inventory Summary

Milepost:	Location Description:
0.00	Garnett Junction, Begin Midlothian Subdivision = UP Ennis Subdivision (MP 233.55)
5.20	Boyce
9.40	U.S. 287 Crossing
11.50	Waxahachie
12.80	BNSF DFW Subdivision Crossing (MP 796.64)
13.32	Bus U.S. 287 Crossing
13.7	I-35E Crossing
21.1	U.S. 287 Crossing
23.10	Midlothian
23.10	BNSF Ward Industrial Track Crossing (MP 27.28)
23.55	Loop U.S. 67 Crossing
29.35	Milepost Equation: MP 29.35 = MP 29.37
29.37	Milepost Equation: MP 29.37 = MP 29.35
29.46	Ellis County – Tarrant County

Table 4-27: UP Midlothian Subdivision Key Locations

UP Choctaw Subdivision



The Choctaw Subdivision operates from McAlester, Oklahoma to Fort Worth, Texas with the milepost markers increasing toward Forth Worth. This subdivision is controlled from the UP Fort Worth Service Unit across a single track mainline with trains dispatched using CTC procedures with a maximum freight speed of 60 miles per hour. The Choctaw Subdivision inventory was limited between the Texas/Oklahoma border and the Denton County to Tarrant County border at the limits of the study area. Between these limits, the subdivision departs the study area for 1.46 miles as the tracks go into and out of Cooke County. The Choctaw Subdivision inventory includes Grayson County located within the TxDOT Paris District, and Denton County located within the TxDOT Dallas District.

The Choctaw Subdivision enters Texas by crossing the Red River and crossing from Oklahoma into Texas. Both the UP Choctaw Subdivision and the BNSF Madill Subdivision utilize this same bridge as they cross from Oklahoma into Texas. Immediately on the south end of the bridge, the BNSF Madill Subdivision departs the UP Choctaw Subdivision. From the Red River Bridge, located north of Denison, Texas, the Choctaw Subdivision goes southwest toward Whitesboro, Texas then turns south to Aubrey, Texas then southwest to Fort Worth. The Choctaw Subdivision crosses from Denton County into Tarrant County, the limits of the study area.

The following tables summarize key information for the Choctaw Subdivision. Table 4-28 lists the track mileage by District and by county within the study area and Table 4-29 lists key locations across the subdivision with associated milepost locations.

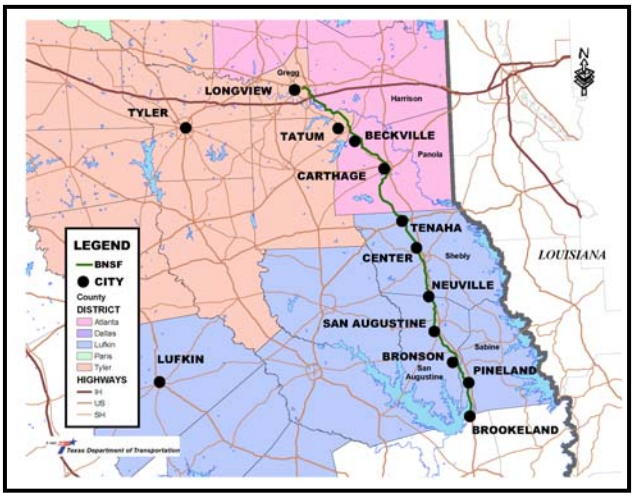
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Paris District			
Grayson	41.50	0.00	41.50
Subtotal:	41.50	0.00	41.50
TxDOT Dallas District			
Denton	36.75	0.00	36.75
Subtotal:	36.75	0.00	36.75
Total:	**78.25**	**0.00**	**78.25**

Table 4-28: UP Choctaw Subdivision Inventory Summary

Milepost:	Location Description:
656.15	Oklahoma – Grayson County, TX
656.15	Red River Bridge (1,025')
656.17	BNSF Madill Subdivision Connection (MP 631.30)
657.80	U.S. 69/75 Crossing
659.86	SH 92 Crossing
660.40	U.S. 84 Crossing
661.90	U.S. 75 Crossing
666.47	Pottsboro
679.21	Sadler
680.50	U.S. 82 Crossing
682.10	Whitesboro
682.60	U.S. 377 Crossing
686.70	Bus U.S. 377 Crossing
689.50	Collinsville
697.65	Grayson County – Cooke County
699.11	Cooke County – Denton County
699.30	Pilot Point
708.60	Aubrey
713.30	Big Elm Creek Bridge (1,253')
713.56	Mingo
716.30	Loop U.S. 288 Crossing
716.70	U.S. 380 Crossing
719.10	Denton
719.70	U.S. 77 Crossing
720.50	I-35 Crossing
720.80	U.S. 377 Crossing
722.40	KCS Alliance Subdivision Crossing (MP 101.54)
725.09	Argyle
735.00	SH 114 Crossing
735.20	Roanoke
735.86	Denton County – Tarrant County

Table 4-29: UP Choctaw Subdivision Key Locations

BNSF Longview Subdivision



The Longview Subdivision operates from Silsbee, Texas to Longview, Texas with the milepost markers increasing toward Longview. The subdivision alignment runs north along the east side of U.S. 96 on a single track mainline with trains dispatched using TWC procedures and the maximum freight speed of 49 miles per hour. The Longview Subdivision inventory was defined between the border of Jasper County and Sabine County, and Longview, Texas as defined by the limits of the Study. The Longview Subdivision runs through seven counties and three TxDOT Districts within the study area. These counties include Sabine County, San Augustine County, and Shelby County in the Lufkin District; Panola County and Harrison County in the Atlanta District; and Rusk County and Gregg County in the Tyler District.

The following tables summarize key information for the Longview Subdivision. Table 4-30 lists the track mileage by District and by county within the study area and Table 4-31 lists key locations across the subdivision with associated milepost locations.

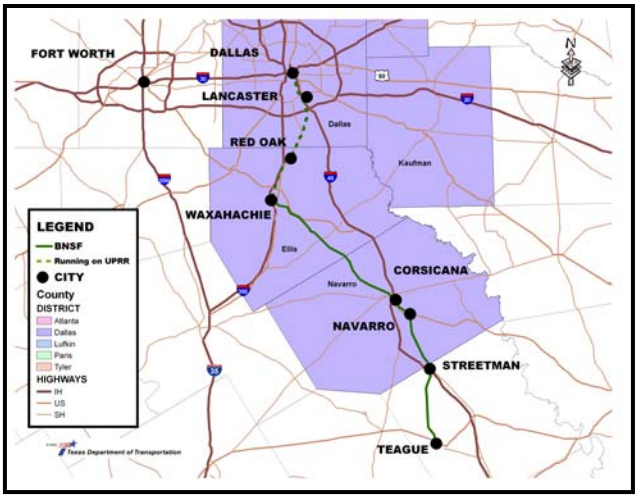
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Lufkin District			
Sabine	19.68	0.00	19.68
San Augustine	17.78	0.00	17.78
Shelby	29.28	0.00	29.28
Subtotal:	66.74	0.00	66.74
TxDOT Atlanta District			
Panola	31.38	0.00	31.38
Harrison	8.78	0.00	8.78
Subtotal:	40.16	0.00	40.16
TxDOT Tyler District			
Rusk	7.24	0.00	7.24
Gregg	3.14	0.00	3.14
Subtotal:	10.38	0.00	10.38
Total:	**117.28**	**0.00**	**117.28**

Table 4-30: BNSF Longview Subdivision Inventory Summary

Milepost:	Location Description:
89.86	Jasper County – Sabine County
97.50	Pineland
104.70	Bronson
104.76	U.S. 184 Crossing
109.54	Sabine County – San Augustine County
109.89	U.S. 103 Crossing
120.06	SR 147 Crossing
120.40	San Augustine
120.64	SR 21 Crossing
127.32	San Augustine County – Shelby Couty
131.40	Nueville
138.67	SR 500 Crossing
139.80	Center
139.81	SH 87 Crossing
140.48	SH 7 Crossing
146.60	U.S. 96 Crossing
151.52	U.S. 59 Crossing
151.53	UP Lufkin Subdivision Crossing (MP 176.08)
151.60	Tenaha
156.60	Shelby County – Panola County
161.70	Gary
165.22	Daniels
168.89	SH 149 Crossing
170.94	Bus U.S. 59 Crossing
171.70	Carthage
171.72	Bus U.S. 79 Crossing
172.76	Bus U.S. 59 Crossing
173.69	U.S. 79 Crossing
181.40	Beckville
184.90	Martin Lake Junction
184.90	TXU Private Industrial Track to service Martin Lake Power Plant
186.50	Martin Creek Bridge (1,513')
187.80	Tatum
187.98	Panola County – Rusk County
188.04	SH 43 Crossing
195.22	Rusk County – Gregg County
196.83	Gregg County – Harrison County
202.70	Estes
203.48	I-20 Crossing
205.61	Harrison County – Gregg County
207.17	End BNSF Longview Subdivision at UP Little Rock Subdivision (MP 88.95)

Table 4-31: BNSF Longview Subdivision Key Locations

BNSF DFW Subdivision



The DFW Subdivision operates from Teague, Texas to the Saginaw Freight Yard in Dallas, Texas. This subdivision dispatches trains using ABS procedures and a maximum freight speed of 40 miles per hour. The DFW Subdivision inventory was defined between the border of Freestone County and Navarro County at Streetman, Texas and the end of the subdivision in Dallas, Texas as defined by the limits of the Study. This subdivision operates through three counties all within the TxDOT Dallas Subdivision.

The DFW Subdivision enters the East Texas Freight Study area when it crosses from Freestone County into Navarro County near Streetman, Texas. As the DFW Subdivision enters Dallas, Texas, the tracks connect to the UP Dallas Subdivision where the BNSF DFW Subdivision ends.

The following tables summarize key information for the DFW Subdivision. Table 4-32 lists the track mileage by District and by county within the study area and Table 4-33 lists key locations across the subdivision with associated milepost locations.

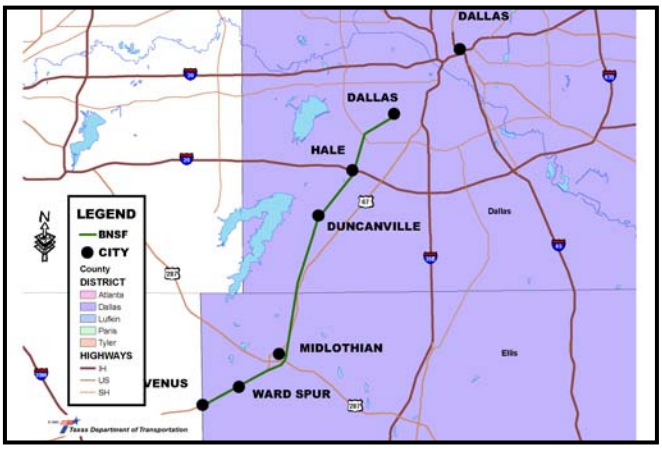
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Dallas District			
Navarro	30.28	0.00	30.28
Ellis	30.61	0.00	30.61
Dallas	16.54	0.00	16.54
Subtotal:	77.53	0.00	77.53
Total:	**77.53**	**0.00**	**77.53**

Table 4-32: BNSF DFW Subdivision Inventory Summary

Milepost:	Location Description:
222.51	Freestone County – Navarro County
234.31	U.S. 287 Crossing
238.30	I-45 Crossing
239.68	UP Corsicana Subdivision Crossing (MP 621.00)
239.70	Corsicana
239.74	SH 31 Crossing
240.41	U.S. 45 Crossing
240.56	UP Ennis Subdivision Crossing (MP211.09)
252.89	Navarro County – Ellis County
258.70	Bardwell, SH 34 Crossing
270.30	Waxahachie
271.01	U.S. 77 Crossing
271.04	Milepost Equation: MP 271.04 = MP 797.90
797.90	Milepost Equation: MP 797.90 = MP 271.04
797.06	Bus U.S. 287 Crossing
796.64	UP Midlothian Subdivision Crossing (MP 12.80)
795.01	U.S. 287 Crossing
788.00	Red Oak
785.44	Ellis County – Dallas County
777.10	I-21 Crossing
773.87	Loop SR 12 Crossing
768.90	End BNSF DFW Subdivision = UP Dallas Subdivision (MP B215.08)

Table 4-33: BNSF DFW Subdivision Key Locations

BNSF Ward Industrial Spur



The Ward Industrial Spur operates from Dallas, Texas south to Venus, Texas across a single track mainline with a maximum freight speed of 20 miles per hour and trains dispatched using TWC procedures. The Ward Industrial Spur inventory was defined between the border of Johnson County and Ellis County, near Venus, Texas, and the end of the track at the transition from BNSF to DART ownership located at DART's Rail Station adjacent to Westmorland Avenue. The Ward Industrial Spur travels through two counties within the TxDOT Dallas Subdivision with milepost markers increasing to the south toward Venus, Texas. The BNSF Ward Industrial Spur ends in Dallas with the track ownership changing to DART.

The following tables summarize key information for the Ward Industrial Spur. Table 4-34 lists the track mileage by District and by county within the study area and Table 4-35 lists key locations across the subdivision with associated milepost locations.

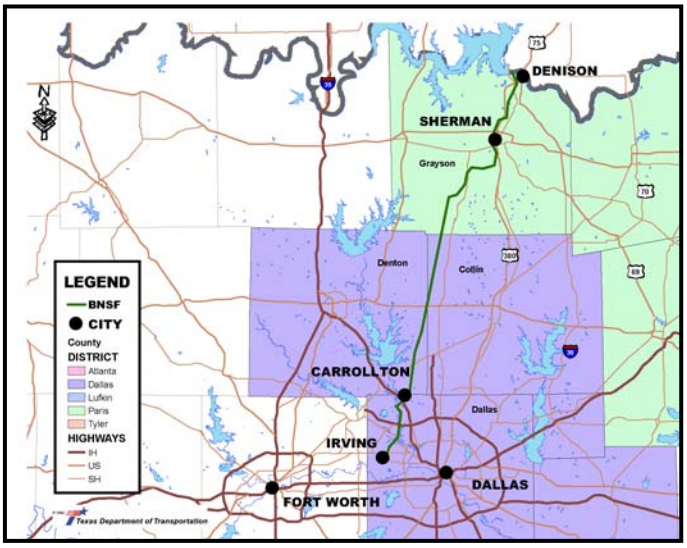
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Dallas District			
Ellis	10.84	0.00	10.84
Dallas	14.01	0.00	14.01
Subtotal:	24.85	0.00	24.85
Total:	**24.85**	**0.00**	**24.85**

Table 4-34: BNSF Ward Industrial Lead Inventory Summary

Milepost:	Location Description:
20.69	Johnson County – Ellis County
26.00	Midlothian
26.82	U.S. 287 Crossing
27.28	UP Midlothian Subdivision Crossing (MP 23.10)
33.61	U.S. 67 Crossing
34.00	Cedar Hill
40.00	Duncanville
40.70	I-20 Crossing
45.70	End BNSF Ward Industrial Spur – begin DART

Table 4-35: BNSF Ward Industrial Lead Key Locations

BNSF Madill Subdivision



The Madill Subdivision operates from Madill, Oklahoma south to Irving, Texas with milepost markers increasing toward Irving. The BNSF Madill Subdivision merges onto the UP Choctaw Subdivision on the north end of the Red River Bridge to cross from Oklahoma into Texas. On the south end of the Red River Bridge, the Madill Subdivision departs the UP Choctaw Subdivision marking the northern limit of this Subdivision's inventory within the study area.

The Madill Subdivision operates across a single track mainline with trains dispatched using CTC between Red River and Sherman, Texas where the trains are controlled

using TWC procedures. The maximum freight train speed in the CTC area is 55 miles per hour and 49 miles per hour through the TWC area. This subdivision goes through Denton County and Collin County within the TxDOT District and Grayson County in the TxDOT Paris District.

The following tables summarize key information for the Madill Subdivision. Table 4-36 lists the track mileage by District and by county within the study area and Table 4-37 lists key locations across the subdivision with associated milepost locations.

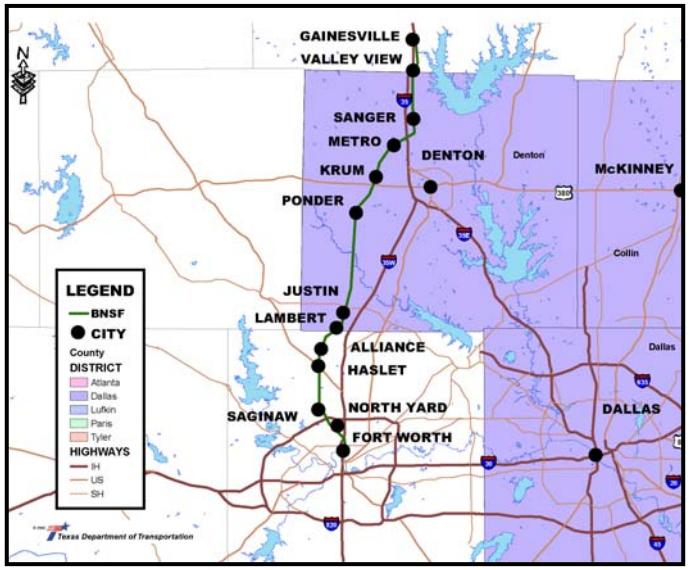
County:	**Miles of Mainline Track:**	**Miles of Double Mainline Track:**	**Total Miles:**
TxDOT Paris District			
Grayson	36..87	0.00	36.87
Subtotal:	36.87	0.00	36.87
TxDOT Dallas District			
Collin	19.51	0.00	19.51
Denton	9.97	0.00	9.97
Dallas	13.52	0.00	13.52
Subtotal:	43.00	0.00	43.00
Total:	**79.87**	**0.00**	**79.87**

Table 4-36: BNSF Madill Subdivision Inventory Summary

Milepost:	Location Description:
631.30	Depart UP Choctaw Subdivision (MP 656.17) at Red River Bridge
631.30	Red River Bridge: OK – Grayson County, TX
636.50	Denison
637.00	U.S. 69/Bus U.S. 75 Crossing
639.37	Bus U.S. 75 Crossing
643.95	U.S. 82 Crossing
645.50	Sherman
645.91	U.S. 56 Crossing
650.80	U.S. 75 Crossing
657.70	Dorchester
660.40	SR 289 Crossing
664.80	Gunter
667.90	Grayson County – Collin County
670.29	U.S. 289 Crossing
673.60	Celina
679.90	Prosper
681.30	U.S. 380 Crossing
685.60	Frisco
687.47	Collin County – Denton County
694.40	KCS Alliance Subdivision Connection (MP 80.90)
697.44	Denton County – Dallas County, Gerge Bush Freeway and SR 190 Crossing
700.08	BNSF ownership to Railtran
704.00	I-35E Crossing
709.20	Irving
707.74	SR 114 Crossing
709.25	SR 183 Crossing
710.96	End Madill Subdivision – Connection to Railtran DFW Subdivision

Table 4-37: BNSF Madill Subdivision Key Locations

BNSF Fort Worth Subdivision



The Fort Worth Subdivision operates from Temple, Texas north to Gainesville, Texas with the milepost increasing toward Gainesville. The limit of the East Texas Freight Study for this Subdivision is located through Denton County in the TxDOT Dallas District. Trains are dispatched using CTC Procedures across a single track mainline with the maximum speed for both freight trains and passenger trains at 55 miles per hour. The track alignment follows along FM-156 from Alliance, Texas to I-35 north of Denton, Texas then north along the north side of I-35.

The following tables summarize key information for the Fort Worth Subdivision. Table 4-38 lists the track mileage by District and by county within the study area and Table 4-39 lists key locations across the subdivision with associated milepost locations.

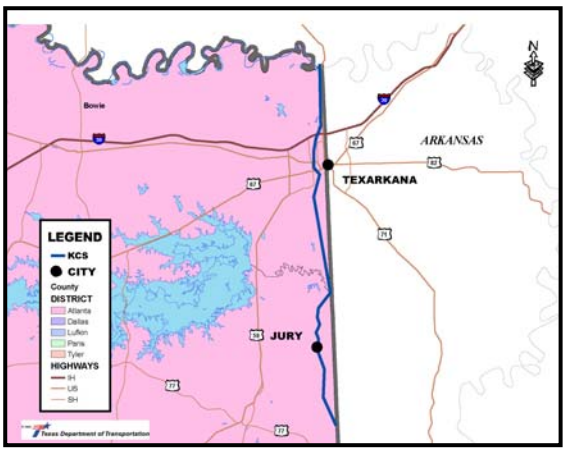
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Dallas District			
Denton	32.90	0.00	32.90
Subtotal:	32.90	0.00	32.90
Total:	**32.90**	**0.00**	**32.90**

Table 4-38: BNSF Fort Worth Subdivision Inventory Summary

Milepost:	Location Description:
363.48	Tarrant County – Denton County: #1 Track
365.81	SR 114 Crossing
366.50	SR 114 Crossing
368.52	#2 Track Connection
363.48	Tarrant County – Denton County: #2 Track
368.54	#1 Track Connection
368.54	Start Single Track
370.60	Justin
377.30	Ponder
381.55	U.S. 380 Crossing
383.50	Krum
385.69	Wye Track Connection to KCS Alliance Sub
386.81	Wye Track Connection to KCS Alliance Sub
388.58	I-35 Crossing
392.20	Sanger
396.40	Denton County – Cooke County

Table 4-39: BNSF Fort Worth Subdivision Key Locations

KCS Shreveport Subdivision



The KCS Shreveport Subdivision operates from Heavener, Oklahoma south to Texas Junction, located near Blanchard, Louisiana with the milepost markers increasing toward Blanchard. This subdivision enters into Texas and runs through Bowie County and Cass County within the TxDOT Atlanta District and the study area. Trains operate across a single track mainline with a maximum speed of 55 miles per hour for both freight and intermodal trains. The subdivision crosses the Red River from Arkansas into Bowie County, Texas and follows along the west side of U.S. 59/71 toward Texarkana, Texas. The subdivision goes through Bloomburg, Texas then leaves Cass County, Texas into Louisiana.

The following tables summarize key information for the Shreveport Subdivision. Table 4-40 lists the track mileage by District and by county within the study area and Table 4-41 lists key locations across the subdivision with associated milepost locations.

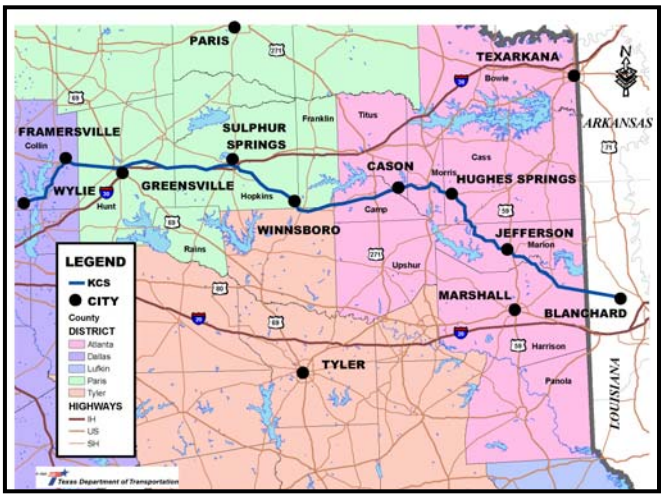
County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Dallas District			
Bowie	19.63	0.00	19.63
Cass	11.86	0.00	11.86
Subtotal:	31.49	0.00	31.49
Total:	**31.49**	**0.00**	**31.49**

Table 4-40: KCS Shreveport Subdivision Inventory Summary

Milepost:	Location Description:
478.00	Red River/Arkansas – Bowie County, TX
483.85	I-30 Crossing
486.12	U.S. 82 Crossing
486.87	U.S. 67 Crossing
486.90	Texarkana
487.40	Texas Northeastern Railroad Crossing
489.40	UP Little Rock Subdivision Crossing (MP 419.62)
497.63	Bowie County – Cass County
507.20	Bloomburg
509.49	Cass County, TX – Louisiana

Table 4-41: KCS Shreveport Subdivision Key Locations

KCS Greenville Subdivision



The Greenville Subdivision operates from Blanchard, Louisiana west to Wylie, Texas with the milepost markers increasing toward Wylie. This subdivision is a single track mainline track with the maximum speed for freight trains at 55 miles per hour and 59 miles per hour for intermodal trains. The Greenville goes through 11 counties in four TxDOT Districts within the study area.

The Greenville Subdivision crosses from Louisiana into Harrison County, Texas. After crossing the Lavon Lake Bridge, the Subdivision enters the KCS Wylie Yard at Milepost 199.50 with the Greenville Subdivision ending where it connects to the KCS Dallas Subdivision.

The following tables summarize key information for the Greenville Subdivision. Table 4-42 lists the track mileage by District and by county within the study area and

Table 4-43 lists key locations across the subdivision with associated milepost locations.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Atlanta District			
Harrison	18.47	0.00	18.47
Marion	19.11	0.00	19.11
Cass	11.84	0.00	11.84
Morris	11.39	0.00	11.39
Titus	3.79	0.00	3.79
Camp	16.69	0.00	16.69
Subtotal:	81.29	0.00	81.29
TxDOT Taylor District			
Wood	42.53	0.00	42.53
Subtotal:	42.53	0.00	42.53
TxDOT Paris District			
Franklin	70.20	0.00	70.20
Hopkins	36.65	0.00	36.65
Hunt	25.56	0.00	25.56
Subtotal:	131.41	0.00	131.41
TxDOT Dallas District			
Collin	18.57	0.00	18.57
Subtotal:	18.57	0.00	18.57
Total:	**274.80**	**0.00**	**274.80**

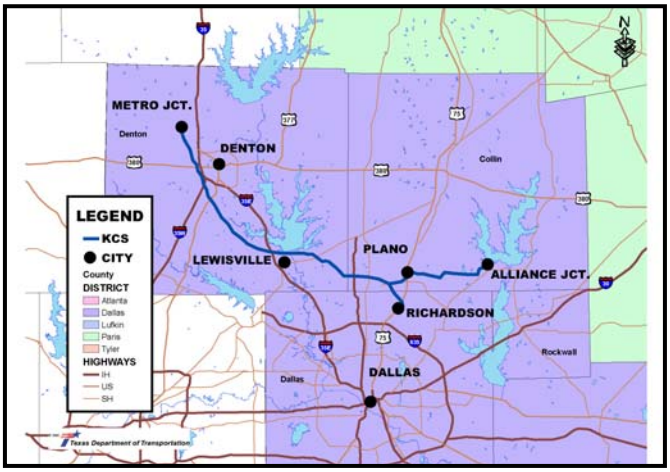
Table 4-42: KCS Greenville Subdivision Inventory Summary

Milepost:	Location Description:
9.73	Louisiana – Harrison County, TX
16.47	Milepost Equation: MP 16.47 = MP 34.73
34.73	Milepost Equation: MP 34.73 = MP 16.47
36.80	Karnack
41.70	Baldwin
45.46	Harrison County – Marion County at Little Cypress River
49.30	Jefferson
50.20	UP Little Rock Subdivision Crossing (MP 51.26)
52.10	Buford
58.30	Saber
61.10	Lassater
62.90	Orr's
65.57	Marion County – Cass County
67.20	Avinger
77.30	Hughes Springs
77.38	Texas Northern (TN) Railroad Connection
77.41	Cass County – Morris County
82.50	Dangerfield
88.80	Morris County – Titus County
88.80	Cason
90.24	Private Industrial Track to Southwest Electric Power
92.59	Titus County – Camp County
98.30	Pittsburg
98.30	UP Pine Bluff Subdivision Crossing (MP 491.20)
102.45	TXU Industrial Track to Service TXU Monticello Power Plant Facility
108.40	Newsome
109.28	Camp County – Wood County
110.26	Wood County – Franklin County
114.12	Franklin County – Wood County
117.70	Winnsboro
118.79	Wood County – Franklin County
119.02	Franklin County – Hopkins County
126.20	Pickton
130.70	Como
140.12	Blacklands Railroad Connection
140.30	Sulphur Springs
154.80	Cumby
155.67	Hopkins County – Hunt County
161.20	Campbell
171.60	Greenville
171.60	Hunt Freight Yard
171.60	Blacklands Railroad Connection

178.50	Floyd
181.23	Hunt County – Collin County
185.30	Farmersville
192.00	Copeville
199.50	KCS Wylie Yard
199.80	End KCS Greenville Sub, Start KCS Dallas Sub

Table 4-43: KCS Greenville Subdivision Key Locations

KCS Alliance Subdivision



The Alliance Subdivision operates from Wylie, Texas west across northern Dallas, Texas, through Plano, Hebron, Lewisville, Copper Canyon, and Denton, Texas where it connects to the BNSF Fort Worth Subdivision. Trains operate across a single track mainline with a maximum speed of 35 miles per hour for freight trains and 35 miles per hour for intermodal trains.

The KCS Alliance Junction is located in Wiley Yard where the Greenville Subdivision ends and the Alliance Subdivision begins within Collin County. The DART line connects to the Alliance Subdivision at this location going southwest toward Carrollton, Texas. The KCS Alliance Subdivision ties into the BNSF Fort Worth Subdivision.

The following tables summarize key information regarding the Greenville Subdivision. Table 4-44 lists the track mileage by District and by county within the study area and Table 4-45 lists key locations across the subdivision with associated milepost locations.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Dallas District			
Collin	20.70	0.00	20.70
Denton	31.80	0.00	31.80
Subtotal:	52.50	0.00	52.50
Total:	**52.50**	**0.00**	**52.50**

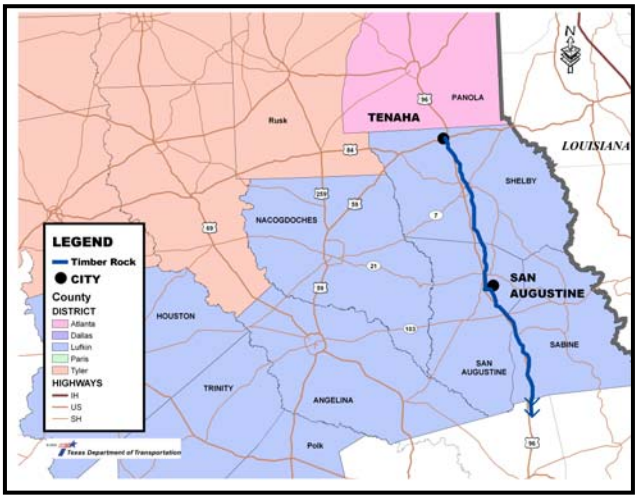
Table 4-44: KCS Alliance Subdivision Inventory Summary

Milepost:	Location Description:
578.30	Start Alliance Sub, End Greenville Sub (MP 199.80)
578.30	Wiley
580.40	KCS Dallas Sub Connection
589.75	DART Track Crossing
592.80	Renner Connection
593.10	KCS White Rock Sub Connection
593.10	DART Track Crossing
593.10	Renner Connection
593.10	Milepost Equation: MP 593.10 = MP 73.50
73.50	Milepost Equation: MP 73.50 = MP 593.10
79.40	Collin County – Denton County
80.90	BNSF Madill Crossing (MP 694.40)
89.39	DART Crossing
90.90	Lewisville
101.54	UP Choctaw Subdivision Crossing (MP722.40)
111.20	End Alliance Subdivision at BNSF Fort Worth Subdivision (MP 386.81)

Table 4-45: KCS Alliance Subdivision Key Locations

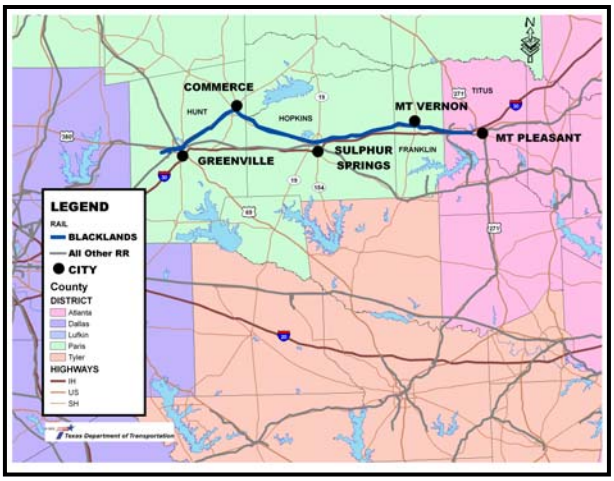
Shortline Railroads

Timber Rock Railroad



The Timber Rock Railroad (TIBR), a subsidiary of Watco, provides the locomotives and crews to service for the customers across this railroad. The TIBR railroad operates from Kirbyville, Texas to Oakdale, Louisiana, and from Beaumont, Texas north to Tenaha, Texas. The limits of the East Texas Freight Study extend from Tenaha, Texas south to the Sabine/Jasper County border along the BNSF Longview Subdivision. The TIBR has the ability to interchange its rail freight with the UP, KCS, and the BNSF. Although the BNSF remains the owner of this railroad of this section of the railroad, the TIBR owns and operates the trains and is responsible for the track maintenance of the railroad. The inventory information for the TIBR is included with the BNSF Longview Subdivision data.

Blacklands Railroad (BLR)

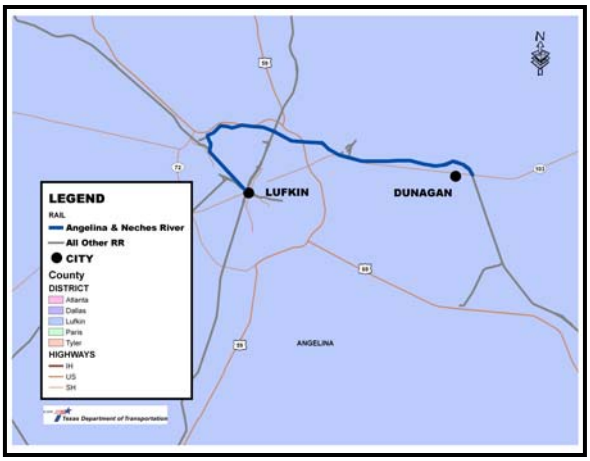


The Blacklands Railroad (BLR) operates from Greenville, Texas through Sulphur Springs and Mount Vernon terminating near the Franklin/Titus County border. The BLR has operating rights over the UP track from the Franklin/Titus County border into, and including, the Mount Pleasant Yard. The BLR provides the locomotives and crews that operate and serve the customers along the railroad, but the railroad tracks located in Hunt, Hopkins, Franklin, and Titus Counties are owned by NETX. In June, 2005, the BLR leased seven miles of additional track from the UP extending their service to a point just short of the UP's main line track in Mount Pleasant. The BLR can interchange with the UP at Mount Pleasant and the KCS at Sulphur Springs.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Paris District			
Franklin	10.61	0.00	10.61
Hopkins	33.28	0.00	33.28
Hunt	20.53	0.00	20.53
Delta	0.77	0.00	0.77
Subtotal:	65.19	0.00	65.19
TxDOT Atlanta District			
Titus	9.61	0.00	9.61
Subtotal:	9.61	0.00	9.61
Total:	**74.80**	**0.00**	**74.80**

Table 4-46: Blacklands Railroad Inventory Summary

Angelina & Neches River Railroad (A&NR)

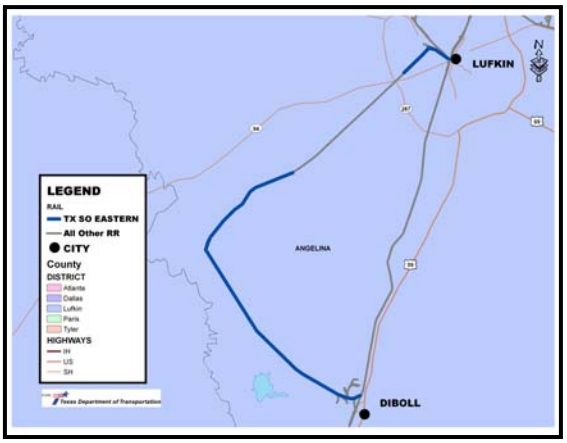


The Angelina and Neches River Railroad (A&NR), maintains 12 miles of main line track, 22 non-industry tracks and 22 industry tracks in Lufkin and the surrounding area toward Dunagan, Texas. The bulk of the train operations involve switching movements. Freight movements consist of 86 percent of the cars received, 13 percent of the cars shipped, and 1 percent being local movements. The ANR interchanges with the UP with one daily train per day from Monday through Friday at Lufkin and have operating rights across 3.5 miles of the UP mainline track. Fourteen customers across the ANR ship or receive aggregates and waste/scrap metal in gondola cars, pulp paper and allied products in boxcars, and hazmat material in tank cars. The A&NR crews and staff operate three locomotives to transport approximately 4,000 railcars with 142,300 net tons of product annually. A&NR has a 263,000-pound (263K) gross load capacity on all traffic; however, portions of the line will accept 286,000-pound loads with special permits. Most of the customer's industry tracks are not 286K compliant.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Lufkin District			
Angelina	11.00	0.00	11.00
Subtotal:	11.00	0.00	11.00
Total:	**11.00**	**0.00**	**11.00**

Table 4-47: A&NR Inventory Summary

Texas South-Eastern Railroad (TSE)



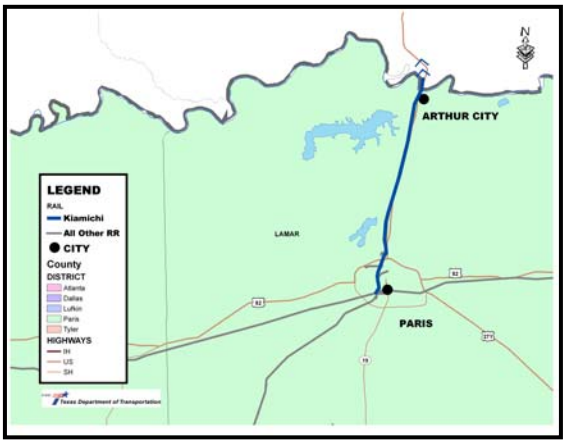
The Texas Southeastern Railroad (TSE) operates primarily as a switching company in and around Diboll, Texas, south of Lufkin. After railroad abandonment of tracks between Blix and Vair the TSE no longer had access to Lufkin leaving operations limited in and around Diboll. The TSE interchanges with the UP at Diboll and operates across approximately 12-miles of track with 12 non-industry sidings and 8 industry sidings. With six customers,

the TSE shipments include an even split of cars received and shipped. Products shipped are lumber products and particleboard.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Lufkin District			
Angelina	12.00	0.00	12.00
Subtotal:	12.00	0.00	12.00
Total:	**12.00**	**0.00**	**12.00**

Table 4-48: TSE Inventory Summary

Kiamichi Railroad



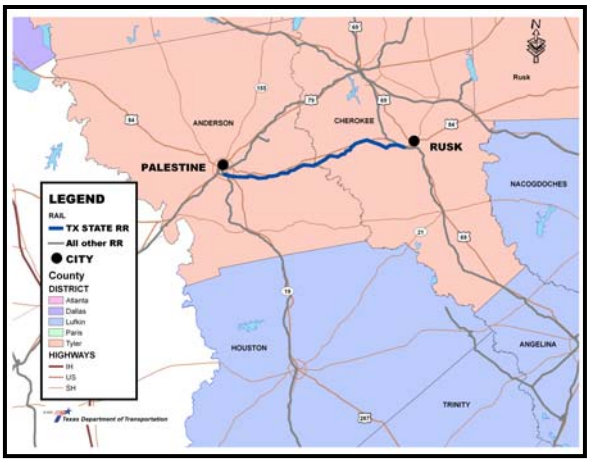
The Kiamichi Railroad (KRR) is a shortline railroad and part of the RailAmerica Corporation. The KRR operates across two rail lines that intersect in Hugo, OK with their Paris Subdivision running 40-miles from Antlers, OK to Paris, Texas. For the purpose of the East Texas Freight Study, the 16-mile portion of the Paris Subdivision was considered between the Oklahoma border and Paris, Texas.

The KRR serves eight customers on the Paris Subdivision (two being Fortune 500 companies) with one train running 6 days per week moving from 2,500 to 3,000 carloads per year and 360,000 gross tons of cargo. The KRR has the ability to interchange with the UP, BNSF, KCS, and the De Queen & Eastern Shortline Railroad. The top 4 commodities include tomato paste, wood pulp, flour, and feed grains. Most items are moved in boxcars and hoppers, but open top gondolas and tank cars are used for some movements. About 98 percent of the cargo is received by their customers with only 2 percent shipped. This implies that the customers receive raw goods from the railroad and ship the finished products by truck. For instance, Campbell soup transports their finished product by truck to Dallas where they trans-load to inter-modal.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Paris District			
Lamar	16.00	0.00	16.00
Total:	**16.00**	**0.00**	**16.00**

Table 4-49: Kiamichi Inventory Summary

Texas State Railroad (TSR)

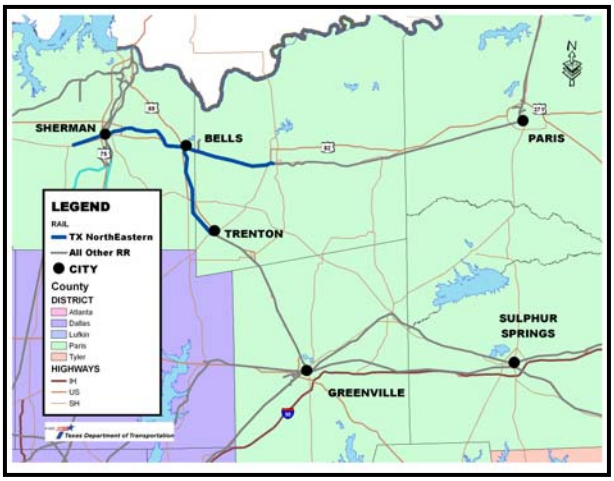


With a rich history of timber and ore shipments dating back to the turn of the late 1800's, the Texas State Railroad operated the railroad as a common carrier, providing both freight and passenger service until 1972 when the railroad was turned over the Texas Parks and Wildlife Department. Since 1976, the Texas State Railroad is a steam powered tourist excursion train operated by the Texas Parks & Wildlife Department between Rusk and Palestine, Texas.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Tyler District			
Anderson	9.00	0.00	9.00
Cherokee	16.00	0.00	16.00
Total:	**25.00**	**0.00**	**25.00**

Table 4-50: TSR Inventory Summary

Texas Northeastern (TNER)

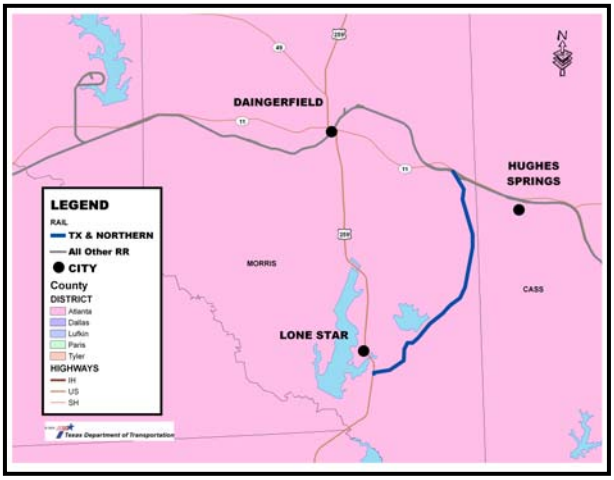


TNER is a shortline railroad and part of the RailAmerica Corporation. TNER operates three rail line segments within the East Texas Freight Study area. The eastern section runs from Texarkana, Texas west to New Boston, Texas and serves the Lone Star Army Ammunition Plant that is being converted to a freight transportation facility. The western section runs from Paris, Texas to Sherman, Texas and the final segment runs from Bells, Texas to Trenton, Texas. TNER operates with trackage rights over the BNSF Madill Subdivision from Sherman, Texas to Denison, Texas. Interchanges are made with the UP at Denison, Kiamichi Railroad at Paris, the BNSF at Sherman, and with the KCS and the UP at Texarkana. The UP switches cars to the KCS for TNER at Texarkana. With the RailAmerica cooperation owning the DGNO and TNER there is a seamless transition with the DGNO at Trenton that provides service to the Dallas, Texas area. Traffic includes aggregates, agriculture, and industrial products.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Atlanta District			
Bowie	26.60	0.00	26.60
Subtotal:	26.60	0.00	26.60
TxDOT Paris District			
Fannin	35.40	0.00	35.40
Grayson	27.40	0.00	27.40
Lamar	17.60	0.00	17.60
Subtotal:	80.40	0.00	80.40
Total:	**107.00**	**0.00**	**107.00**

Table 4-51: TNER Inventory Summary

Texas and Northern (TN)

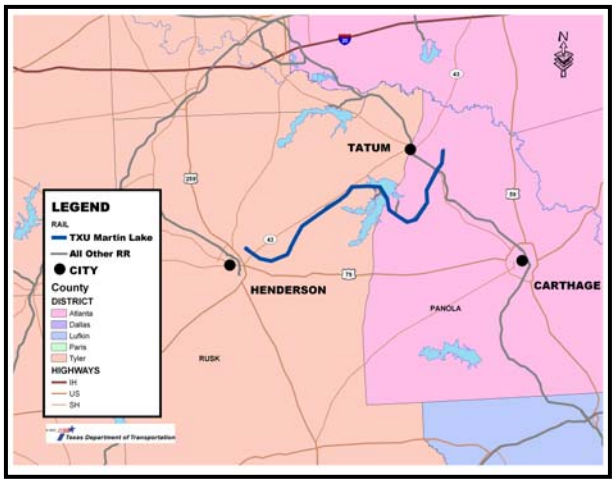


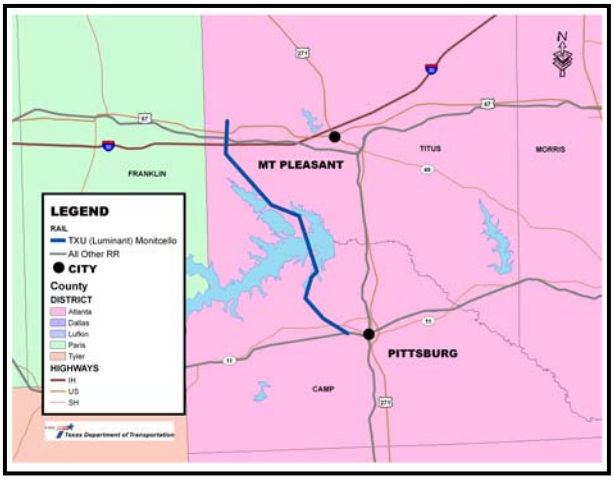
The Texas and Northern Railway (TN) is an eight-mile railroad connecting Lone Star, Texas to the KCS between Daingerfield, Texas and Hughes Springs, Texas. The railroad has remained in operation to serve the Lone Star Steel Company.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Atlanta District			
Morris	8.00	0.00	8.00
Total:	**8.00**	**0.00**	**8.00**

Table 4-52: Texas and Northern Railway Inventory Summary

TXU Mines (Monticello/Martin Lake)





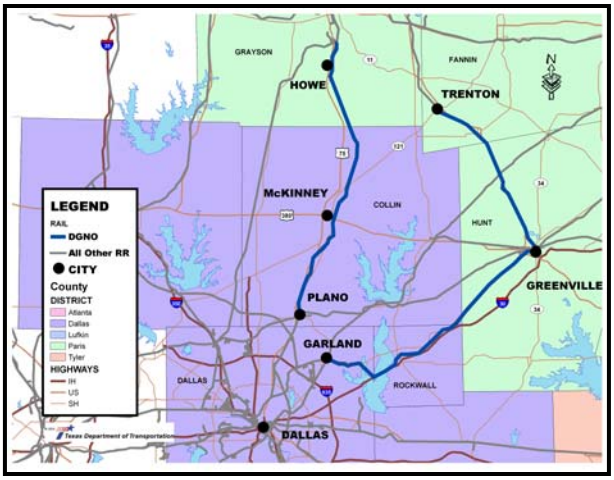
TXU is a private electric utility company that operates a rail line into each of their two power plants within the East Texas Freight Study area. One line is located at their Martin Lake facility south of Longview, Texas and the other line is at their Monticello facility near Pittsburg, Texas. Both rail lines are located on the TXU property with only one public grade crossing at the Monticello line and all other roads crossing either over or under the tracks. Both facilities mine their own coal that is used in the power plants, but a higher grade coal is shipped to each plant from the Power River Basin area in Wyoming to blend with the local coal.

The Monticello track connects to the Kansas City Southern Greenville Subdivision just west of Pittsburg and turns north toward Winfield crossing the lake and I-30 west of Mount Pleasant. The Martin Lake line runs from just east of Henderson, Texas following SR 43 east along the south side before crossing Martin Lake and connecting to the BNSF Longview Subdivision (Timber Rock Railroad) between Beckville and Tatum.

County:	Miles of Mainline Track:	Miles of Double Mainline Track:	Total Miles:
TxDOT Atlanta District			
Camp	6.00	0.00	6.00
Panola	8.25	0.00	8.25
Titus	9.40	0.00	9.40
Subtotal:	23.65	0.00	23.65
TxDOT Tyler District			
Tyler	16.60	0.00	16.60
Subtotal:	16.60	0.00	16.60
Total:	**40.25**	**0.00**	**40.25**

Table 4-53: TXU Inventory Summary

Dallas, Garland & Northeastern Railroad (DGNO)



The DGNO operates over a combination of owned and leased rail lines over 200 miles, including industrial leads. A line extends from Trenton, TX through Greenville to Garland, TX, then from Garland to Dallas via trackage rights over KCS and UP. DGNO also operates a group of lines from Sherman through McKinney to Plano, and from Carrollton through Plano to Murphy and from Dallas through Carrollton to Lake Dallas. DGNO leases and operates an 11-mile UP rail line between Center Pt., TX and Mockingbird Yard. Traffic includes aggregates, agricultural and food products, lumber, paper, scrap paper, scrap metals and auto parts. Most of the DGNO tracks are within the Dallas metropolitan area and was included in the TxDOT DFW Freight Study. Because some of the DGNO tracks extend out of the Dallas Metropolitan area and connect to and impact other railroads within the East Texas Mobility Study area, they are included in the railroad inventory.

SECTION 5: ESTABLISHMENT OF A FREIGHT RAIL BASE CASE OPERATIONS MODEL

Rail Operations Study

The railroad industry has gone through many changes over the past 35 years that have impacted their internal organization, methods of operation, and their relationships with the trucking industry, customers, and even other railroads. The Staggers Rail and Motor Acts of 1980, which deregulated the railroads, can be considered as having one of the most significant impacts to the rail freight industry. Once the railroad industry was deregulated and could begin setting its own freight rates and controlling their own expenditures, competition and the “American Way” took over.

Each railroad began to focus on how they could gain a larger market share of shippers. The overall answer seemed to be longer and faster trains. Priorities were given to the mainline, high density rail traffic lines with personnel, and services reduced on secondary lines. Then the mergers began and the number of Class I railroads dropped from 41 in 1978, to today’s seven Class I railroads throughout the continental United States.

The railroads merged to either increase profits or to avoid bankruptcy. With the larger railroads selling their less profitable secondary lines, we saw the growth of America’s Shortline Railroad Industry. Today, our Class I railroads continue to focus on increasing the “velocity” their trains by increasing their infrastructure capacity to operate more trains and at faster speeds. To accomplish this objective, freight rail transfers are made at major intermodal or transload hubs strategically located across the country, thus providing optimum train speeds across longer distances. Unit trains, which consist of over 100 cars of the same product typically having the same destination, are made up within these hubs. The products which make up unit trains can be containers from an intermodal facility or other items such as coal cars or vehicles. Because these unit trains do not have to stop along the route to perform switching operations, they can essentially go non-stop from origin to destination, making them a time sensitive movement.

Because so many unit trains that are loaded with containers are seen passing by on every major railroad, the term “intermodal” has become the accepted term used when discussing truck-to-train transportation systems. Although the nation’s intermodal system plays a major role in the railroad and trucking industries, the transload industry is often misunderstood and should not be overlooked when evaluating methods of freight movements. Intermodal facilities focus on 20-foot and 40-foot containers that can be loaded directly on or off of ships, trucks, and trains. Transload facilities offer locations for a variety of shipments to be transferred from and to trucks and trains. The cargo shipped via transload facilities could be anything shipped in trucks including gas, oil, sand, gravel, cotton, peanuts, and even the containers from intermodal locations.

This very generic overview of the rail industry can explain why many local communities, industries, and even shortline railroads, can become frustrated when making arrangements to ship their products long distances by rail. The process of providing a “local” train to make multiple stops across a high density rail line to pick-up or drop-off small numbers of freight cars is no longer economically feasible. For this reason, shippers are required to truck their products up to 500 miles to a major rail yard or facility to be transferred to a rail car then switched onto a long distance train. This process is then reversed when a shipment is received at a major rail yard or terminal. This type of frustration was apparent during several of the stakeholder meetings conducted in East Texas for this Study. One example of this type of perspective happened when the Winnsboro Economic Development Corporation (WEDC) tried to arrange for an abandoned rail spur to be reconstructed to provide rail service to a 60-acre potential industrial site. The WEDC believes that without the rail spur in place, they will not be able to bring the industry into the area. The railroad was not interested in funding the $1-million cost without an existing customer and the WEDC does not have the available funds to construct the facility, placing the burden of cost to any potential industry.

Rail Operations Modeling

As part of this Study, train operational simulations of railroad lines traversing East Texas were performed. The simulations were performed using Rail Traffic Controller (RTC), a software package that is used by all the major railroads for capacity analysis and evaluation of service alternatives. The primary purpose of the simulations was to determine the capacity of each rail line to accommodate existing and future traffic levels, and to identify areas where improvements might be made to increase rail capacity or to provide operating flexibility.

RTC requires user input of the characteristics of the rail network that determine train operations, such as length of track segments, elevations, allowable operating speeds, track classifications, and other data. It then requires the user to define the trains operating over the network in terms of length, tonnage, horsepower, starting and ending locations, priority, and stops en route. The software then dispatches these trains using algorithms that mimic the logic decisions made by railroad dispatchers who control actual train operations on a daily basis. The program produces statistical measures of the results that permit comparison of performance between routes, or between optional operating patterns or cases.

The East Texas rail network was coded using railroad track charts and operating timetable data, supplemented by other rail maps where necessary. The railroads did not provide actual train operating data on which to base the simulation. Therefore, representative train data were entered into the simulation based on descriptions of rail operations in recent publications, and descriptions provided by field observers in Texas. While the resulting train schedules that were input into the simulation do not precisely reflect actual train data, they do represent current train volumes and movement patterns and are considered generally valid for the purposes of this set of

simulations. Trains were coded to provide variation in their operating times similar to the actual variations experienced by the railroads, with starting times each day determined on a random basis within typical parameters. This process yields a better measure of the ability of a rail line to accommodate variations in rail traffic patterns over time.

A base case simulation was performed, along with two additional cases using different random number generators that result in trains being dispatched at varying times in each simulation. The statistical results of the additional cases were comparable to the base case, affirming that the base case is a reasonable representation of current daily train operations. Subsequent simulations will be compared or measured against the results of the original base case.

	Base Case	Variation A	Variation B
Trains Operated	1,243	1,246	1,241
Train Miles	219,295	220,008	218,759
Average Speed	28.422	27.108	27.474
Total Operating Hours	7,715.7	8,116.1	7,962.5
Total Delay Hours	1,721.9	2,093.9	1,993.3
Delay Minutes/100 TM	47.11	57.10	54.67

Table 5-1: Comparison of Simulations with Differing Random Number Generators

The simulation was performed for a 14-day period. The mainline rail network was coded into several distinct routes that serve different areas and have different track and train characteristics. These generally follow railroad operating subdivisions:

- BNSF Conroe Subdivision: Trackage between Silsbee and Navasota was included in the network, but no trains were run over this segment because it is generally outside the TxDOT Districts defined for this simulation. (Trains off the BNSF Longview Subdivision use Conroe Subdivision trackage for a short distance near Sillsbee, but the Conroe mileage was not included in the statistical measures produced by RTC).
- BNSF Longview Subdivision: The subdivision extends from Longview through Tenaha to a connection with the Conroe Subdivision at Silsbee.
- KCS Greenville Subdivision: The subdivision extends from Greenville to Texas Junction, where it connects with the Shreveport Subdivision.
- KCS Shreveport Subdivision: The simulation included Shreveport Subdivision trackage from Texarkana to Texas Junction. For statistical purposes, both the Greenville and Texarkana Subs were combined and are reported as the KCS Greenville Subdivision.
- UP Corsicana Subdivision: The simulation included the Corsicana Subdivision trackage from Big Sandy through Tyler to Corsicana.
- UP Dallas Subdivision: Dallas Subdivision trackage from Marshall to Edgewood via Longview and Big Sandy was included in the simulation.
- UP Hearne Subdivision: Trackage included in the simulation extends from Palestine to Hearne.

- UP Little Rock Subdivision: The simulation encompassed the trackage from Little Rock to Marshall.
- UP Lufkin Subdivision: Trackage from Keithville to Cleveland, via Nacodnoches, was included in the simulation.
- UP Palestine Subdivision: The simulation included the route from Longview to Palestine continuing to Conroe.
- UP Pine Bluff Subdivision: The simulation included the trackage from Texarkana through Pittsburgh to Big Sandy.
- UP Reisor Subdivision: The portion of the Reisor Subdivision between Marshall and Scottsville was included in the simulations.

Short line railroad trackage connecting to these lines was also included in the simulation, but since the short lines generally operate only one train per day over relatively low-speed trackage and do not conflict with main line operations, their performance characteristics are not essential to an understanding of route capacities or constraints. As a result, they are not included in the statistical results summarized in this report.

Figure 5-1 shows a "screen shot" of the rail network included in the East Texas simulations. The network is not portrayed with geographic accuracy, but does show the relative locations of the routes and the interconnections between them.

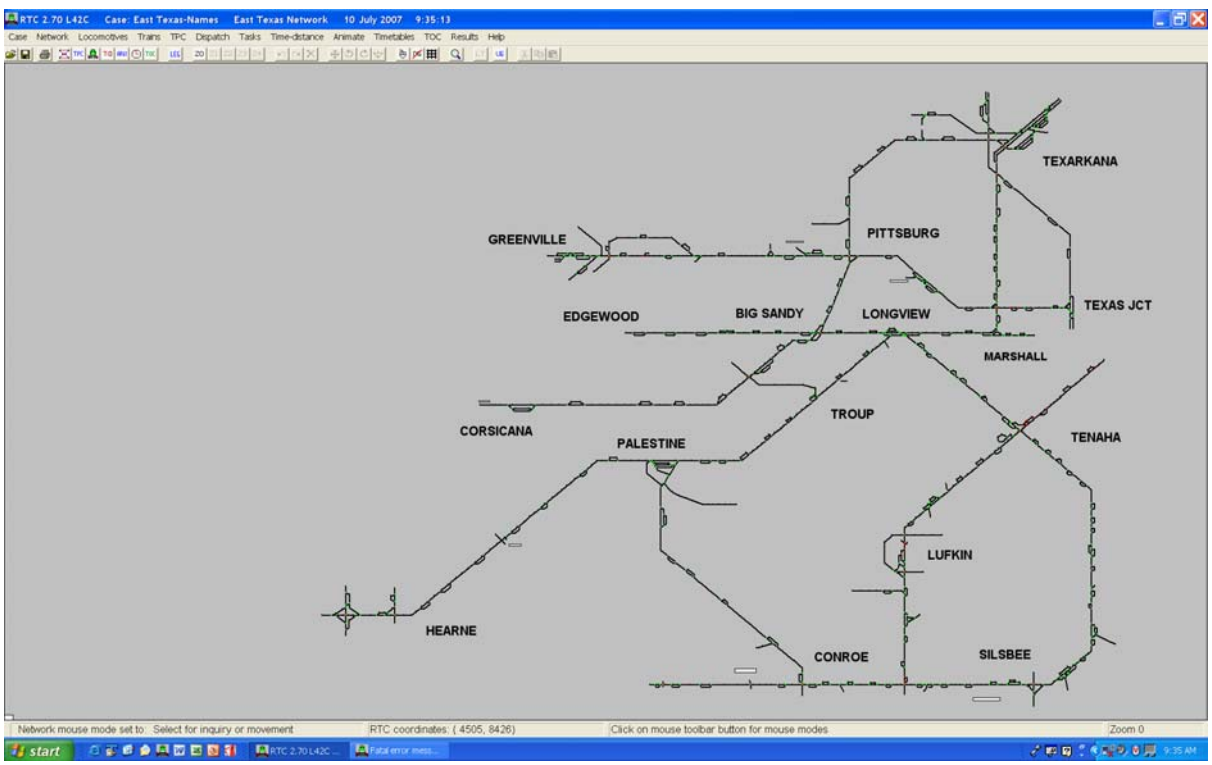


Figure 5-1: East Texas RTC Screen Shot

Table 5-2 provides the Base Case summary data for the entire network, and for each of the separate lines identified for analysis. Train volumes and operating

results vary widely between the lines because of the different operating characteristics of each line.

	Total Network	BNSF Longview	KCS Greenville	UP Corsicana	UP Dallas	UP Hearne	UP Little Rock	UP Lufkin	UP Palestine	UP Pine Bluff	UP Reisor
Trains Operated	1,243	67	468	116	712	139	774	90	273	224	92
Train Miles	219,295	14,585	26,173	11,154	36,870	13,765	33,549	19,472	38,090	23,268	585
Run Time (hours per day)	275.6	27.0	25.6	11.1	50.5	17.4	36.0	25.6	45.2	19.1	1.4
Delay Time (hours per day)	61.5	7.1	1.1	0.1	9.6	3.2	3.6	2.9	6.4	0.7	0.1
Delay Percent	22.3%	26.4%	4.3%	0.5%	19.1%	18.5%	10.0%	11.2%	14.3%	3.9%	5.6%
Delay/100 TM (min)	47.11	82.2	7.13	0.86	43.84	39.1	18.08	24.77	28.42	5.38	22.15
Average Speed	28.422	19.278	36.475	35.843	26.075	28.32	33.244	27.199	30.121	43.542	15.166

Table 5-2: RTC Base Case Summary Data

Table 5-3 shows the number of trains per day in each direction at selected locations on the network.

Subdivision	Average Trains per Day	Total Trains (14 Days)
KCS Shreveport		
North of Texas Jct	8.0	112
KCS Greenville		
West of Texas Jct	8.0	112
West of Jefferson	8	112
West of Pittsburg	8.0	112
UP Pine Bluff		
West of Texarkana	16	224
West of Pittsburg	16.0	224
UP Corsicana		
West of Big Sandy	8.3	116
UP Little Rock		
South of Texarkana	33.7	472
UP Reisor		
East of Marshall	5.9	82
UP Dallas		
West of Marshall	35.6	498
West of Longview	20.9	293
West of Big Sandy	27.2	381
UP Palestine		
West of Longview	19.5	273
South of Palestine	8.9	124
UP Hearne		
West of Palestine	10.6	149
UP Lufkin		
North of Tenaha	6.4	90
South of Tenaha	6.4	90
BNSF Longview		
North of Tenaha	4.8	67
South of Tenaha	4.8	67

Table 5-3: RTC Base Case Train Counts

SECTION 6: FREIGHT RAIL AND RAIL/ROADWAY INTERFACE SAFETY ISSUES

Safety Policies, Practices, and Legislation

The State of Texas has traditionally taken the lead regarding safety issues centering on the freight rail/roadway interface. The first toll-free call-in program for the public to notify of highway-rail crossing incidents was established by Texas in 1983 with the calls directed to the State's Emergency Management Center (EMC). Enacted by the Texas State Legislature in 1983, the Railroad Crossing Safety Information Act became part of the Texas Transportation Code in 1995, and established a State-wide toll-free telephone network intended to report malfunctions of the safety devices at highway-rail grade crossings. Telephone numbers were mounted onto the sides of the railroads grade crossing equipment cabinets near the at-grade crossing that contained the name of the roadway, the railroad subdivision name, and the approximate milepost of the crossing. Upon receipt of a call, the EMC operator would relay the information provided by the caller to the respective railroad. Even though only at-grade crossings with active warning devices contain the contact information, the Texas system handles over 1,200 calls monthly with information provided at public and private at-grade crossings.[1]

In 2001, after many system upgrades, the Texas call center operations were transferred to the Texas Department of Public Safety. This program, based on the success experienced in Texas, has been adopted by most Class I freight railroad companies and other states throughout the U.S.

The Federal Railroad Administration (FRA) administers a safety program that oversees the movement of hazardous materials across the rail network in the U.S. The current FRA hazardous materials safety regulatory program includes the following items:[2]

- Hazardous Materials Incident Reduction Program
- Tank Car Facility Conformity Assessment Program
- Tank Car Owner Maintenance Program Evaluations
- Spent Nuclear Fuel and High-Level Nuclear Waste Program
- Railroad Industrial Hygiene Program
- Rulemaking, Approvals, and Exemptions
- Partnerships in Domestic and International Standards-Related Organizations (e.g., American Association of Railroads - AAR)
- Education, Safety Assurance, Compliance, and Accident Investigation

As part of the safety program, the FRA periodically conducts a National Hazardous Material Audit (the results of which are public) in order to determine the level of

[1] Federal Railroad Administration – *Pilot Program for Emergency Notification Systems at Highway-Rail Grade Crossings,* May, 2006
[2] http://www.fra.dot.gov/us/content/337

compliance of Class I railroads with the federal requirements pertaining to the movement of hazardous materials.

The federal rules and regulations for the transport of hazardous materials are contained in Title 49 of the Code of Federal Regulations (49 CFR). The 49 CFR provides regulations as to what materials are considered to pose risk to humans, what materials may be transported, and by what means the materials should be transported and labeled. The CFR lists and classifies those materials which are designated as hazardous materials for purposes of transportation and prescribes the requirements for shipping papers, package marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of those hazardous materials.

The Emergency Response Guidebook (ERG), published by the U.S. Department of Transportation, specifies proper procedure by first responders at the scene of a transportation incident involving hazardous materials. The ERG aids in quickly identifying the classification of material involved in the incident as well as protecting the public in response of the incident.

The partnerships developed between the State of Texas, TxDOT, and the 42 counties comprising the East Texas region, along with the three Class I freight railroads are working for the collective good of the freight industry and the traveling public to continue striving for no incidents, no derailments, no accidents, and ultimately no fatalities.

Safety Statistics for Rail Transportation

Various data pertaining to train accidents/incidents including collisions, derailments, and other events causing reportable damage, injuries, or fatalities are reported to the FRA by the operating railroads across the country. Incidents, including those resulting in damage to rail cars transporting hazardous material or causing the release of the hazardous material, must be reported to the FRA if there is reportable damage resulting from the incident above a specified threshold ($6,700 in 2005) or if there are any injuries or evacuations ordered in response to the incident.[3]

Additionally, incidents must be immediately reported to the National Response Center for both rail and truck transport that result in any fatalities, personal injuries, public evacuations, closure of a major transportation artery, and fire, breakage, or spillage of radioactive or infectious materials.[4]

During the timeframe from January 2002 through December 2006, the 42-county region experienced 338 highway-rail at-grade crossing accidents, in which there were 54 fatalities and 150 injuries.

[3] Code of Federal Regulations, Title 49, Part 225: Railroad Accidents/Incidents: Reports, Classification, and Investigations

[4] Code of Federal Regulations, Title 49, Part 171.15: Railroad Accidents/Incidents: Immediate Notice of Certain Hazardous Materials Incidents.

In comparison, during this same period of time, the entire State of Texas experienced 1,565 highway-rail incidents in which there were 166 fatalities and 636 reported injuries.[5] Statistically, the East Texas region accounts for approximately 21.6 percent of all the highway-rail accidents, 32.5 percent of all the fatalities, and 23.6 percent of all the injuries that occurred at highway-rail crossings within the State. As would be expected, over 80 percent of the reported grade crossing incidents and fatalities occurred at public at-grade crossings.

Table 6-1 depicts the number of public at-grade crossings, sorted by type of warning device, for the United States, Texas, and the East Texas region.

Number of Public At-Grade Crossings by Warning Device					
United States		**Texas**		**East Texas Region (1)**	
2003		2003		2005	
Crossbucks (passive)	68,834	Crossbucks (passive)	5,244	Crossbucks (passive)	686
Lights only (active)	25,656	Lights only (active)	1,362	Lights only (active)	53
Gates (active)	36,410	Gates (active)	3,728	Gates (active)	928
Stop Signs	9,905	Stop Signs	270	Stop Signs	93
Special Warning	3,209	Special Warning	93	Special Warning	2
Hwy. Traffic Signal	1,269	Hwy. Traffic Signal	74	Hwy. Traffic Signal	35
Other (passive & active)	618	Other (passive & active)	7	Other (passive & active)	46
Unknown	4,843	Unknown	458	Unknown	0
Source: Federal Railroad Administration				*Source: TxDOT*	
(1) Mainline tracks only					

Table 6-1: Number of Public At-Grade Crossings

Figure 6-1 illustrates the number of highway-rail incidents, including injuries and fatalities, in the state of Texas, by county, from 2002 to 2006. Highway-rail incidents include accidents associated with traffic at highway-rail interfaces, and do not include accidents due to trespassing on railroad property.

[5] Federal Railroad Administration, 2002 – 2006 highway-rail at-grade crossing safety statistics.

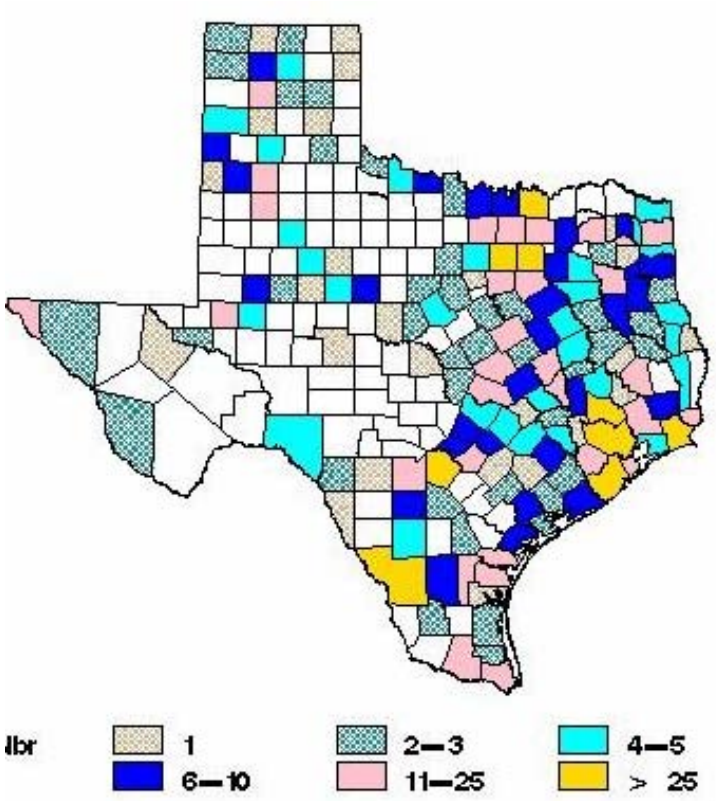


Figure 6-1: Highway-rail incidents in Texas, 2002-2006

In reviewing the investigation logs reported to the FRA for highway-rail incidents within the East Texas region, the average train speeds were approximately 30 mph while the average vehicle speeds were approximately 15 mph. The average vehicle damage per incident is approximately $10,000.

Tables 6-2 and 6-3 depict, by county within the East Texas region, the number of highway-rail incidents annually from 2002 to 2006. The 'Cnt' value displays the number of accidents, while the 'Kld' and 'Inj' values display the number of people killed and injured in those accidents, respectively.

County	Totals			At Public Crossing						At Private Crossing					
				Motor Vehicle			Other			Motor Vehicle			Other		
	Cnt	Kld	Inj	Cnt	Kld	Inj	Cnt	Kld	Inj	Cnt	Kld	Inj	Cnt	Kld	Inj
ANDERSON	3	1	1	3	1	1	-	-	-	-	-	-	-	-	-
ANGELINA	3	-	3	2	-	3	-	-	-	1	-	-	-	-	-
BOWIE	5	1	-	4	1	-	-	-	-	1	-	-	-	-	-
CAMP	11	2	9	8	-	6	-	-	-	3	2	3	-	-	-
CASS	14	2	6	14	2	6	-	-	-	-	-	-	-	-	-
CHEROKEE	7	4	7	7	4	7	-	-	-	-	-	-	-	-	-
COLLIN	17	-	3	17	-	3	-	-	-	-	-	-	-	-	-
DALLAS	70	9	22	65	8	20	1	-	-	3	-	1	1	1	1
DENTON	24	6	14	22	6	12	1	-	2	1	-	-	-	-	-
ELLIS	20	4	9	20	4	9	-	-	-	-	-	-	-	-	-
FRANKLIN	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
GRAYSON	28	4	14	27	4	14	-	-	-	1	-	-	-	-	-
GREGG	10	-	6	8	-	5	-	-	-	2	-	1	-	-	-
HARRISON	8	-	3	7	-	3	-	-	-	1	-	-	-	-	-
HENDERSON	5	1	2	4	1	2	-	-	-	1	-	-	-	-	-
HOPKINS	23	4	8	19	3	7	-	-	-	4	1	1	-	-	-
HOUSTON	2	-	-	1	-	-	-	-	-	1	-	-	-	-	-
HUNT	9	2	2	8	2	2	-	-	-	1	-	-	-	-	-
KAUFMAN	9	1	3	7	1	3	-	-	-	2	-	-	-	-	-
MARION	4	1	4	4	1	4	-	-	-	-	-	-	-	-	-
MORRIS	5	-	1	5	-	1	-	-	-	-	-	-	-	-	-
NACOGDOCHES	3	-	2	3	-	2	-	-	-	-	-	-	-	-	-
NAVARRO	9	1	1	9	1	1	-	-	-	-	-	-	-	-	-
PANOLA	3	1	1	3	1	1	-	-	-	-	-	-	-	-	-
POLK	13	2	9	11	2	8	-	-	-	2	-	1	-	-	-
RUSK	6	4	4	6	4	4	-	-	-	-	-	-	-	-	-
SABINE	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
SAN AUGUSTINE	4	-	-	4	-	-	-	-	-	-	-	-	-	-	-
SAN JACINTO	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
SHELBY	5	3	4	5	3	4	-	-	-	-	-	-	-	-	-
SMITH	13	1	9	11	-	8	1	1	-	1	-	1	-	-	-
TITUS	7	-	3	7	-	3	-	-	-	-	-	-	-	-	-
TRINITY	1	2	-	1	2	-	-	-	-	-	-	-	-	-	-
UPSHUR	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
VAN ZANDT	4	-	3	4	-	3	-	-	-	-	-	-	-	-	-
WOOD	3	-	3	2	-	3	-	-	-	1	-	-	-	-	-
Totals	**338**	**54**	**150**	**307**	**49**	**139**	**3**	**1**	**2**	**27**	**3**	**8**	**1**	**1**	**1**

Table 6-2: Highway-Rail Accidents in the East Texas Region, 2002-2006
(Source: FRA)

County	2002 Totals			2003 Totals			2004 Totals			2005 Totals			2006 Totals		
	Cnt	Kld	Inj	Cnt	Kld	Inj	Cnt	Kld	Inj	Cnt	Kld	Inj	Cnt	Kld	Inj
ANDERSON	-	-	-	-	-	-	1	1	-	1	-	1	1	-	-
ANGELINA	1	-	-	-	-	-	1	-	-	-	-	-	1	-	3
BOWIE	2	-	-	1	1	-	-	-	-	1	-	-	1	-	-
CAMP	2	2	7	2	-	-	3	-	1	1	-	-	3	-	1
CASS	1	-	-	4	2	2	1	-	2	4	-	2	4	-	-
CHEROKEE	1	2	2	1	2	2	1	-	1	2	-	2	2	-	-
COLLIN	2	-	-	5	-	1	4	-	-	4	-	-	2	-	2
DALLAS	13	-	2	16	2	5	16	1	6	13	4	7	12	2	2
DENTON	5	2	6	3	-	-	6	1	1	5	1	5	5	2	2
ELLIS	1	-	-	3	-	1	3	1	1	5	-	3	8	3	4
FRANKLIN	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
GRAYSON	2	-	1	6	-	4	4	2	1	9	-	2	7	2	6
GREGG	3	-	1	1	-	1	-	-	-	3	-	1	3	-	3
HARRISON	-	-	-	2	-	2	1	-	-	2	-	1	3	-	-
HENDERSON	2	1	1	-	-	-	1	-	-	2	-	1	-	-	-
HOPKINS	2	-	1	6	1	1	5	1	1	5	-	1	5	2	4
HOUSTON	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
HUNT	1	-	-	2	-	1	1	1	-	3	1	-	2	-	1
KAUFMAN	2	-	-	2	-	-	3	1	-	1	-	-	1	-	3
MARION	-	-	-	-	-	-	2	-	3	1	-	1	1	1	-
MORRIS	1	-	-	-	-	-	2	-	-	1	-	1	1	-	-
NACOGDOCHES	-	-	-	-	-	-	2	-	2	1	-	-	-	-	-
NAVARRO	4	1	1	1	-	-	1	-	-	1	-	-	2	-	-
PANOLA	1	1	-	1	-	1	-	-	-	1	-	-	-	-	-
POLK	5	-	2	1	-	-	3	-	2	2	-	3	2	2	2
RUSK	1	-	-	1	-	-	-	-	-	1	-	-	3	4	4
SABINE	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAN AUGUSTINE	1	-	-	-	-	-	2	-	-	-	-	-	1	-	-
SAN JACINTO	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
SHELBY	1	3	1	4	-	3	-	-	-	-	-	-	-	-	-
SMITH	3	-	4	-	-	-	5	-	1	4	1	4	1	-	-
TITUS	1	-	-	-	-	-	1	-	1	3	-	2	2	-	-
TRINITY	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-
UPSHUR	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
VAN ZANDT	-	-	-	1	-	1	1	-	1	-	-	-	2	-	1
WOOD	2	-	-	-	-	-	-	-	-	1	-	3	-	-	-
Totals	**61**	**12**	**29**	**63**	**8**	**25**	**71**	**9**	**24**	**78**	**7**	**40**	**79**	**20**	**38**

Table 6-3: Highway-Rail Accidents in the East Texas Region, 2002-2006
(Source: FRA)

Additionally, there were more than 180 derailments within the East Texas region from 2002 through 2006[6]. Data provided by the railroads to the FRA shows the accumulative cost of equipment and infrastructure damage was nearly $18 million dollars. Table 6-4 provides a yearly summary of the derailment damage statistics for

[6] Federal Railroad Administration safety statistics

the region, while Table 6-5 provides a breakdown of those incidents by type of track on which the accident occurred.

Year	Instances	Total Equipment & Track Damage	Average per Occurrence	Ave Train Speed (mph)	Total Locomotives Derailed	Total Cars Derailed	Total Killed	Total Injured
2006	48	$4,902,994	$102,146	10	15	218	0	3
2005	45	$3,238,930	$71,976	15	2	160	0	2
2004	29	$2,694,337	$92,908	13	11	148	0	0
2003	27	$2,390,312	$88,530	12	5	123	0	0
2002	33	$4,676,931	$141,725	14	4	182	0	2
Total	**182**	**$17,903,504**	**$497,285**	**13**	**37**	**831**	**0**	**7**

Table 6-4 – Derailment Incidents in the East Texas Region (source: FRA)
(FRA data does not distinguish between railroad and non-railroad damages)

Year	Type of Track				
	Main	**Industry**	**Siding**	**Yard**	**Total**
2006	18	14	2	14	48
2005	27	3	4	11	45
2004	10	4	3	12	29
2003	11	5	0	11	27
2002	14	4	1	14	33
Total	80	30	10	62	182

Table 6-5 – Derailment Incidents by Type of Track (source: FRA)

Pedestrian incidents at grade crossings within the East Texas region between 2002 and 2006 are listed in Table 6-6 for counties in which incidents occurred. Pedestrian incidents consist of deaths and injuries caused by pedestrians walking or running on railroad property at grade crossings, and do not include accidents associated with traffic at highway-rail interfaces or worker related incidents.

County	Year				
	2002	**2003**	**2004**	**2005**	**2006**
Morris		1			
Smith				1	

Table 6-6: Pedestrian Incidents by County, 2002-2006
(Source: FRA)

According to the FRA data, the East Texas region experienced two pedestrian incidents and 204 highway-rail incidents (from Table 6-2) in a five year period that resulted in deaths or injuries.

The statistics in the previous tables, however, show a moderate increase in most categories between 2002 through 2006. A combination of population increases, the number of people traveling on the roadway network, and an increase in the number of freight trains traveling through densely populated areas, increases the exposure rate of the highway/rail interface.

Rail incidents involving hazardous materials between 2002 and 2006 are listed in Table 6-7. The 'acc' value displays the number of accidents involving hazardous materials and the 'rel' value shows those accidents where those materials were released from the rail cars.

County	Derailments Involving Hazardous Materials									
	2002		2003		2004		2005		2006	
	Acc	Rel	Acc	Rel	Acc	Rel	Acc	Rel	Acc	Rel
ANGELINA	-	-	1	-	-	-	-	-	1	-
CAMP	1	-	-	-	-	-	-	-	-	-
COLLIN	1	-	-	-	1	-	1	-	-	-
DALLAS	-	-	-	-	2	1	1	-	1	-
DENTON	2	-	2	-	3	-	3	-	2	-
ELLIS	2	-	-	-	1	-	1	-	1	-
GRAYSON	2	-	1	-	-	-	1	-	1	-
GREGG	2	1	-	-	-	-	2	-	4	1
HARRISON	-	-	-	-	-	-	1	-	-	-
HOUSTON	1	-	-	-	-	-	-	-	-	-
HUNT	-	-	-	-	1	-	-	-	-	-
MARION	-	-	-	-	-	-	1	-	-	-
NAVARRO	-	-	-	-	-	-	-	-	1	-
POLK	1	-	-	-	-	-	-	-	-	-
RUSK	-	-	1	-	-	-	-	-	-	-
SAN JACINTO	-	-	-	-	-	-	1	1	-	-
SHELBY	-	-	-	-	-	-	-	-	1	-
UPSHUR	-	-	-	-	-	-	1	-	-	-
WOOD	1	-	-	-	-	-	-	-	-	-
Totals	**13**	**1**	**5**	**0**	**8**	**1**	**13**	**1**	**12**	**1**

Table 6-7: Accidents and Release Involving Hazardous Materials by County, 2002-2006 (Source: FRA)

The table shows an average of 10 annual accidents over the five-year span, accumulating to 51 accidents, four of which released hazardous materials. Denton County had the highest number of accidents, accounting for nearly one-quarter of the incidents in the East Texas region.

Hazardous materials are shipped throughout the U.S. via highways, rail, pipeline, water, and air. The trucking industry continues to remain the dominant mode of freight transport. Approximately 70 percent of the nation's freight tonnage is carried by trucks, far more than by any other mode. In 1998, trucks were reported to account for nearly 43 percent of all hazardous material tonnage shipped in the U.S., while rail accounted for approximately 4 percent of hazardous material tonnage shipments. Pipelines, water, and air transport accounted for the remaining 52 percent of hazardous material tonnage.[7]

[7] Hazardous Material Shipments, The Office of Hazardous Materials Safety, Research and Special Programs Administration, U.S. Department of Transportation, Washington, DC, October 1998.

The annual reported number of incidents and property damage resulting from incidents involving hazardous materials is consistently larger for trucks as opposed to rail. The number of reported personal injuries and fatalities resulting from incidents involving hazardous materials is also typically larger for trucks than rail. This may be partly because of the presence of personal vehicles on the same roadways as heavy trucks. Additionally, the number of incidents per tonnage shipped is far lower for rail than highway shipments of freight. Table 6-7 summarizes the 2002 through 2006 highway and rail incidents involving hazardous material transported by truck and rail for the U.S. and Texas.

	2002 Totals	2003 Totals	2004 Totals	2005 Totals	2006 Totals
Trucks					
Number of Truck Incidents in the U.S. involving hazmat	13,506	13,601	12,977	13,456	17,149
Injuries	118	105	156	175	192
Fatalities	8	15	10	24	6
Property Damage	$33,972,178	$39,114,403	$29,235,870	$40,039,279	$58,966,210
Number of Truck Incidents in Texas involving hazmat	1,035	1,097	1,124	1,267	1,382
Injuries	6	9	11	8	31
Fatalities	1	0	0	2	0
Property Damage	$3,510,363	$3,904,839	$3,458,029	$4,306,795	$5,888,350
Rail					
Number of Rail Incidents in the U.S. involving hazmat	870	802	753	745	704
Injuries	14	13	121	692	24
Fatalities	1	0	3	10	0
Property Damage	$9,745,140	$4,126,165	$11,635,633	$15,454,556	$10,739,810
Number of Rail Incidents in Texas involving hazmat	126	93	87	83	100
Injuries	1	2	92	7	2
Fatalities	0	0	3	0	0
Property Damage	$1,256,315	$1,262,120	$5,942,712	$424,500	$646,837

Table 6-7: 2002-2006 Truck and Rail Hazardous Material Incident Data

Source: U.S. Department of Transportation Office of Hazardous Materials Safety: Hazardous Materials Incident Data

SECTION 7: ALTERNATIVES ANALYSIS

This report is the beginning of an analysis of the East Texas region's freight network (roads, railroads, and intermodal facilities) and the process to develop ways to accommodate and capitalize on future freight movements. It identifies improvements that may provide relief to residents and the traveling public adversely affected by delays, interruptions, and noise attributed to the movement of freight within the region.

This report recognizes that improvements made to the region's transportation infrastructure must describe both public and private benefits so that costs of the improvements are apportioned in a fair and balanced manner to all parties involved.

It is intended that the East Texas region, through a cooperative effort of local governments, will study this report and add, subtract, modify, or use this information to develop a regional freight plan. The plan can then be incorporated into the region's long-range transportation plan developed by each local area's designated metropolitan planning organization (MPO).

The East Texas Region Freight Study identifies existing truck and freight rail transportation operations, bottlenecks, and constraints with the goal of establishing a slate of potential improvements. The identified improvements are geared toward providing solutions that may resolve the problems associated with rising congestion levels and the expected growth of commodity movements in the East Texas region.

The improvements selected to be analyzed were compiled from information and or recommendations from freight surveys sent out during Phase 1 of this study, meetings and independent discussions with the UP and the BNSF, and the results from the regional freight rail operations modeling (RTC) and the Statewide Analysis Model (SAM).

Improvements identified for the East Texas region, comprised of the TxDOT Atlanta, Lufkin, Paris, and Tyler Districts, are categorized as:

- Grade Separations (bridges to separate the railroad from streets)
- Grade Crossing Closures (closing and rerouting the street at the intersection with the railroad)
- Improvements to Existing Roadway Infrastructure (improving capacity and connectivity on existing roadways)
- Rail Bypass Routes (new rail lines to bypass congested areas)

The improvements determined from the aforementioned sources have been analyzed to determine the effects on efficiency, mobility, and safety for both rail operations as well as vehicular traffic in the East Texas region. This analysis included the identification of existing conditions and estimates of the implementation

cost, implementation timeframe, and public and private benefits for the identified improvements.

The identification of existing conditions at locations of potential improvements incorporated a review of property land uses and estimated values based on county appraisal information, environmental constraints, traffic flow volumes for both vehicular and rail traffic, and traffic accident statistics.

The estimated costs for each improvement are order of magnitude costs that were determined based on preliminary planning. The costs included in this study represent an estimate of probable costs prepared in good faith and with reasonable care. The study team has no control over the costs of construction labor, materials, or equipment, nor over competitive bidding or negotiating methods and does not make any commitment or assume any duty to assure that bids or negotiated prices will not vary from these estimates. The costs are subject to inflation, and in some cases are calculated using county appraisal district values for right-of-way acquisition, which may vary from the actual cost of property acquisition.

The estimated implementation timeframe for each improvement was determined based on the additional analysis, engineering design, environmental mitigation, and funding required prior to the implementation of an improvement.

All identified grade crossing closures and separations were determined to be near-term or mid-range improvements, depending on the level of complexity and available funding for each location. The grade crossing improvements may be prioritized by their associated benefit/cost ratios. Roadway capacity improvements (i.e. roadway widening) and identified potential truck and rail bypasses were determined to be long-range improvements.

Anticipated public benefits of the potential improvements include reduced vehicular delay times due to passing trains at existing at-grade crossings, reduced vehicle fuel consumption, improved air quality, improved public safety, improved mobility for vehicular and freight traffic, reduced noise and vibration, and increased freight movement capacity.

The estimated public benefits of the potential improvements were determined using a grade crossing “impedance” or delay model, which takes into account the volume and frequency of vehicular and train traffic at roadway-rail crossings to estimate the amount of time motorists are delayed by rail traffic.

The model measures the anticipated public costs associated with traffic delays and calculates the extra emissions and fuel usage experienced while delayed by a train at each of the approximately 1,850 rail crossings within the region. The cost of collisions is added to time delay costs, emissions, and fuel usage to provide an annualized estimate of total public costs at each grade crossing in the study. Forecasting for growth in both rail and vehicular traffic provides an annualized

estimate of public costs through the year 2017 for 10-year benefit calculations and through the year 2027 for 20-year benefit calculations.

The net present value (NPV) shown as the public benefit is the cumulative projected cost-burden over a 10-year or 20-year period. The NPV is a standard method for financial evaluation of long-term projects and is the value of the improvements projected 10 or 20 years into the future in terms of today's dollars. This can be assessed as the savings associated with a grade separation, crossing closure, or other identified improvements that change traffic volumes (roadway and/or rail) at roadway-rail crossings. An explanation of the public benefit calculations can be found in Appendix H.

The public benefits were calculated for individual roadway grade separations and crossing closures. The identified rail improvements should undergo further analysis to determine the extent of the improvement's impact on the region's freight rail network and to quantify the benefits that may be attained. The impact of potential commuter rail operations on existing rail infrastructure has not been included in the current public benefits calculations.

Benefits that may be realized by the railroad companies (private benefits) were calculated for the identified potential rail bypasses. The grade separations and crossing closures primarily provide benefit to the public in the form of reduced delays and improved safety, but also may provide a limited benefit to the railroads at certain locations. Every grade crossing in the region has not been evaluated; rather the analysis of grade crossings and rail line capacity enhancements was limited to those locations contained in this report or deemed necessary for analysis from traffic data analysis.

Grade Separations

Grade separations consist of bridges that separate the vehicular traffic from the train traffic at roadway-rail interfaces. In general, roadway overpasses and underpasses allow the train to travel under or over, respectively, the roadway traffic. This separation of traffic increases safety by eliminating the conflict point between trains and cars.

Locations for grade separations were determined based on the following sources:

- Freight surveys conducted during Phase 1 of this study
- Areas where EMS response may be slowed by high train movements
- Areas of high vehicular traffic volumes (AADT) with high train movements

The locations of EMS conflicts were identified from surveys sent out to mid-size and larger cities during Phase 1 of the Study. Additional at-grade roadway areas within these cities were determined by locating hospitals and fire department buildings and determining logical EMS response paths through each city where a grade separation between roadway and rail would be most efficient. Also, AADT volumes and

percentages of trucks were used to verify a reasonable amount of vehicular and truck traffic to justify the grade separation.
Locations with reported AADT volumes of at least 5,000 vehicles per day and at least 10 trains per day were analyzed for potential grade separation.

A list of roadways identified as potential grade separations is provided in Table 7-1 along with the estimated costs, 10- and 20-year public benefits, and AADT volumes associated with each roadway. Table 7-1 lists the potential grade separations in descending order of the estimated 20-year public benefit.

Grade Separations									
Street Name	TxDOT District	County	Railroad Subdivision	AADT	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
U.S. 69	Tyler	Wood	UP Dallas	12500	$ 9,770,000	$ 1,976,000	0.20	$ 5,523,000	0.57
4th St	Tyler	Van Zandt	UP Dallas	8600	$ 6,500,000	$ 1,072,000	0.16	$ 2,955,000	0.45
FM 249	Atlanta	Cass	UP Little Rock	8900	$ 6,500,000	$ 947,000	0.15	$ 2,617,000	0.40
SH 49	Atlanta	Marion	UP Little Rock	8500	$ 7,170,000	$ 912,000	0.13	$ 2,508,000	0.35
FM 450	Atlanta	Harrison	UP Little Rock	7200	$ 6,860,000	$ 892,000	0.13	$ 2,486,000	0.36
FM 74	Atlanta	Cass	UP Little Rock	5200	$ 5,860,000	$ 703,000	0.12	$ 1,865,000	0.32
Gilmer St/ Oak Ave	Paris	Hopkins	KCS Greenville	11400/ 5980	$ 9,330,000	$ 546,000	0.06	$ 1,517,000	0.16
SH 11	Atlanta	Camp	UP Pine Bluff	8000	$ 4,600,000	$ 430,000	0.09	$ 1,138,000	0.25
N Palace Ave	Tyler	Smith	UP Corsicana	12630	$ 4,520,000	$ 395,000	0.09	$ 1,035,000	0.23

Table 7-1: Potential Grade Separations (2008 estimates)

The difference in values between the estimated 10-year and 20-year public benefits is due to the forecasted growth of both vehicular and train traffic volumes in the future. The public cost burden associated with the at-grade roadway-railroad crossings, which is equivalent to the estimated public benefit of grade-separating the crossings, is projected to significantly increase after 10 years due to the compounding growth of traffic.

Grade Crossing Closures

Crossing closures consist of the closure of a roadway at the point where the roadway crosses the railroad, requiring an alternate route for vehicular traffic. These safety improvements 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.

Potential crossing closures for the purposes of this study only include those that would re-route traffic over a grade-separated roadway. Other criteria used in determining potential crossing closures include a maximum rerouting distance of 1 ½ miles and evaluation of traffic volumes at the roadway-rail interface. The cost estimated to implement a crossing closure was estimated to be $50,000, which only includes the placement of traffic barriers, minor street signage, and removal of the existing crossing material.

A list of crossings identified for potential closure is provided in Table 7-2 along with associated costs, benefits, and AADT volumes. Table 7-2 lists the crossing closures in descending order of the benefit-to-cost ratio. The potential reroutes of the crossing closures are discussed in further detail in Section 8.

Street Name	TxDOT District	County	Railroad Subdivision	AADT	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
Jackson St	Paris	Hopkins	KCS Greenville	900	$ 50,000	$ 255,000	5.10	$ 549,000	10.98
S Longview St	Tyler	Gregg	UP Palestine	1,200	$ 50,000	$ 108,000	2.16	$ 289,000	5.78
Craven St	Lufkin	Nacogdoches	UP Lufkin	200	$ 50,000	$ 97,000	1.94	$ 206,000	4.12
Stone St	Tyler	Wood	UP Dallas	500	$ 50,000	$ 62,000	1.24	$ 160,000	3.20
1st St	Atlanta	Cass	UP Little Rock	600	$ 50,000	$ 45,000	0.90	$ 118,000	2.36
Cox St	Lufkin	Nacogdoches	UP Lufkin	1,350	$ 50,000	$ 42,000	0.84	$ 111,000	2.22
Logansport St	Lufkin	Shelby	BNSF Longview	800	$ 50,000	$ 40,000	0.80	$ 106,000	2.12
Railroad St	Lufkin	Shelby	BNSF Longview	200	$ 50,000	$ 18,000	0.36	$ 41,000	0.82
Clarksville St	Atlanta	Marion	KCS Greenville	200	$ 50,000	$ 11,000	0.22	$ 24,000	0.48
W Texas Street	Paris	Grayson	BNSF Madill	500	$ 50,000	$ 17,000	0.34	$ 49,000	0.98
S Broadway St	Paris	Grayson	TNER	100	$ 50,000	$ 8,000	0.16	$ 19,000	0.38
S Main St	Paris	Fannin	DGNO Dallas	500	$ 50,000	$ 23,000	0.46	$ 53,000	1.06

Table 7-2: Potential Crossing Closures (2008 estimates)

Improvements to Existing Roadway and Rail Infrastructure

Roadway and rail capacity enhancements foster the economic growth of the region by improving the efficiency of operations as well as minimizing disturbance to residents of the region. Providing additional roadway and rail capacity relieves congestion along the highway and rail corridors and allows freight to pass through the region more quickly. Examples of roadway and rail capacity enhancements are listed as follows:

- Adding lanes to existing roadways
- Upgrading the roadway facility (e.g. convert highway with traffic signals to freeway)
- Constructing bypasses (truck and/or rail) around major at-grade intersections in larger cities

The locations of roadway capacity enhancements were determined based on the following criteria:

- Volume-to-capacity (V/C) ratio of 0.75 or greater for year 2025
- Truck volumes of 15% of the overall traffic volume
- Connectivity to and from other truck routes

The improvements identified for the above-listed locations of constraints are projected to lower the V/C ratio in 2025 to less than 0.75 where practicable.

A list of potential roadway and rail capacity enhancements is provided in Table 7-3 along with the estimated costs of the improvements and average annual daily traffic.

Facility Name/Limits	TxDOT District	County	AADT (2025)	Estimated Cost
Livingston Rail Bypass (Alternative 1)	Lufkin	Polk	N/A	$ 8,420,000
Livingston Rail Bypass (Alternative 2)	Lufkin	Polk	N/A	$ 30,920,000
SH 21 (SH 103 to Louisiana State Line)	Lufkin	Sabine	17,300	$ 49,350,000
U.S. 96 (Sabine County Line to US 59)	Lufkin	Sabine/San Augustine/Shelby	23,900	$ 181,910,000
U.S. 271 (Paris to Oklahoma State Line)	Paris	Lamar	30,900	$ 43,680,000
U.S. 259 (Mount Enterprise to Kilgore)	Tyler	Rusk/Gregg	41,900	$ 105,440,000
U.S. 271 (Loop 323 to Interstate 20)	Tyler	Smith	95,200	$ 43,850,000

Table 7-3: Potential Roadway and Rail Capacity Enhancements (2008 estimates)

A summary of the existing public costs and potential benefits associated with the implementation of either Alternative 1 or 2 of the Livingston Rail Bypass is shown in Table 7-4. The cost of grade crossing impedance on the Livingston Line is expected to decrease from $3.59 million to $3.30 million over 20 years following the implementation of Alternative 1, and to $2.27 million following the implementation of Alternative 2.

The cost of grade crossing impedance on the Lufkin Subdivision is expected to decrease from $25.40 million to 25.29 million over 20 years following the implementation of Alternative 1, and to $26.75 million following the implementation of Alternative 2. The total benefit of implementing Alternative 1 is expected to be $0.40 million, whereas the benefit of implementing Alternative 2 is expected to be $2.23 million.

Public Sector 20-Year Values	Base Case	Alternative 1	Alternative 2
Livingston Line ($ million)	3.59	3.30	2.27
Lufkin Subdivision ($ million)	25.40	25.29	24.48
Total Value ($ million)	28.98	28.58	26.75
Total Benefit ($ million)		0.40	2.23

Table 7-4: Public Costs and Benefits of At-Grade Rail Crossings

The economic impact of relocated rail infrastructure to the private sector was measured using the operating costs listed in Table 7-5. The train mileage cost of $51.23/mile is a representative industry cost that reflects rail operating expense per train mile. The run and delay time cost of $589.24/hour assumes that all train movements involve line operations (whereas yard operating expenses are $285.82 per hour). Since the terms of fuel contracts by the railroads are not available for this analysis, the cost of fuel is based on an average price of $3.33/gallon for low sulfur diesel delivered out of Houston.[1]

[1] Argus Diesel Fuel Prices, Argus Rail Business, Vol. 14, 16, April 2008.

Interest rates	
Nominal COC	9.08%
Inflation	2.40%
Operating Costs	
Real Cost of Capital (decimal)	6.68%
Train Miles ($/mi)	51.23
Run Time ($/hour)	589.24
Delay Time ($/hour)	589.24
Fuel ($/gallon)	3.33

Table 7-5: Railroad Operating Costs

Table 7-6 lists the railroad operating costs for existing (base case) conditions and expected rail bypass conditions (Alternatives 1 and 2) predicted by RTC simulation. Operating parameters and costs for the Livingston Line and the Lufkin Subdivision are listed separately, followed by the impact on the total East Texas rail network. In each case, train miles, run time, delay time, and total fuel consumption were converted to annual costs according to the list of costs provided in Table 7-5. Comparing the results associated with rail bypass Alternative 1 and Alternative 2 to the base case indicates that the private sector would incur a cost over 20 years equal to $2.6 million and $1.3 million, respectively.

Private Sector Cost	Base Case	Alternative 1	Alternative 2
Livingston Line			
Train Miles (mi/year)	21,842	22,375	23,774
Run Time (hours/year)	573	781	546
Delay Time (hours/year)	0	0	0
Value:			
Train Miles ($ million/year)	1.12	1.15	1.22
Run Time ($ million/year)	0.34	0.46	0.32
Delay Time ($ million/year)	0.00	0.00	0.00
Lufkin Subdivision			
Train Miles (mi/year)	390,610	391,142	392,542
Run Time (hours/year)	10,528	10,710	10,483
Delay Time (hours/year)	346	307	329
Value:			
Train Miles ($ million/year)	20.01	20.04	20.11
Run Time ($ million/year)	6.20	6.31	6.18
Delay Time ($ million/year)	0.20	0.18	0.19
Total Bypass			
Train Miles ($ million/year)	21.13	21.18	21.33
Run Time ($ million/year)	6.54	6.77	6.50
Delay Time ($ million/year)	0.20	0.18	0.19
Fuel (gal/14 days)	1,647,555	1,647,325	1,647,191
Fuel ($ million/year)	131.67	131.65	131.64
Annual Value ($ million/year)	159.55	159.79	159.66
Annual Benefit ($ million/year)		-0.24	-0.12
Total 20-Yr Benefit ($ million)		-2.63	-1.26

Table 7-6: Private Sector Benefits of a Rail Bypass

Economics of Infrastructure Improvements

Investments in infrastructure that contribute to substantial economic growth in East Texas can be thought of as transformative projects rather than traditional improvements to existing infrastructure. While the roadways and rail lines in place have historically contributed to industrial growth within the region, new transportation projects must capitalize on transformations in the freight operations and logistics planning of private industry if significant economic expansion is to occur.

The creation of a new transportation hub has proven to be a fundamental contributor to economic growth within a region, as demonstrated by the development of the Alliance Global Logistics Hub north of Fort Worth. By combining air, truck, and rail freight at an integrated facility, this multimodal center has produced over 27,700 direct jobs and close to 67,000 indirect jobs in support of ongoing operations.[2]

Union Pacific's intermodal terminal in Dallas has been built with the intent to coordinate rail service with distribution centers being developed in proximity to I-45.[3] Winter Haven, Florida, could also become a truck-rail warehousing hub with the creation of CSX's Integrated Logistics Center if the state follows through on its plan to acquire the railroad company's A Line in Central Florida for commuter rail operations.[4] In these cases, the projected need for distribution services is driven by growing consumer markets within the region.

Prospects for Regional Transportation Hubs

The capacity for additional transportation hubs throughout Texas, and specifically in East Texas, will be dictated by the needs of consumers and the strategies developed by distributors to meet those needs. The transport of consumer products in the modern era has been oriented toward just-in-time delivery so that corporate assets tied up as warehouse inventory could be minimized. However, this strategy has been based on the expectation of low transportation costs, including the consumption of low-cost diesel and unrestricted access to public roadways.

The fact that both low-cost diesel and roadway capacity has been in abundance throughout most of the last several decades has made the transport of freight by truck more economical and responsive to shippers needs than by rail over distances less than about 450 miles. Now, however, the availability and cost of fuel is becoming a new constraint to the transportation planning process that, inevitably, should modify the needs of shippers in their quest to control costs.

In terms of the needs of consumers, areas of East Texas have begun to be purchased by Timber Investment Management Organizations (TIMOs) and Real

[2] Alliance*Texas economic impact report. Available at: http://www.alliancetexas.com/Research/AllianceTexasFacts/EconomicImpact/tabid/202/Default.aspx
[3] Allen, M., UP Facility a Magnet, Dallas Business Journal, March 10, 2006. Available at: http://www.bixjournals.com/dallas/stories/2006/03/13/story3.html?t=printable
[4] Starner, R., The Crossroads of Growth, Florida Spotlight, May 2006. Available at: http://www.siteselection.com/features/2006/may/fl/

Estate Investment Trusts (REITs). TIMOs and REITs owned no timberland in East Texas prior to 2000, but had acquired a 13 percent share by 2004. These land trusts often divide up land and sell tracts to individual investors, which creates the potential for this portion of the state to be transformed into industrial and residential land with an increased need for the distribution of consumer products.

Rising Value of Rail Transportation

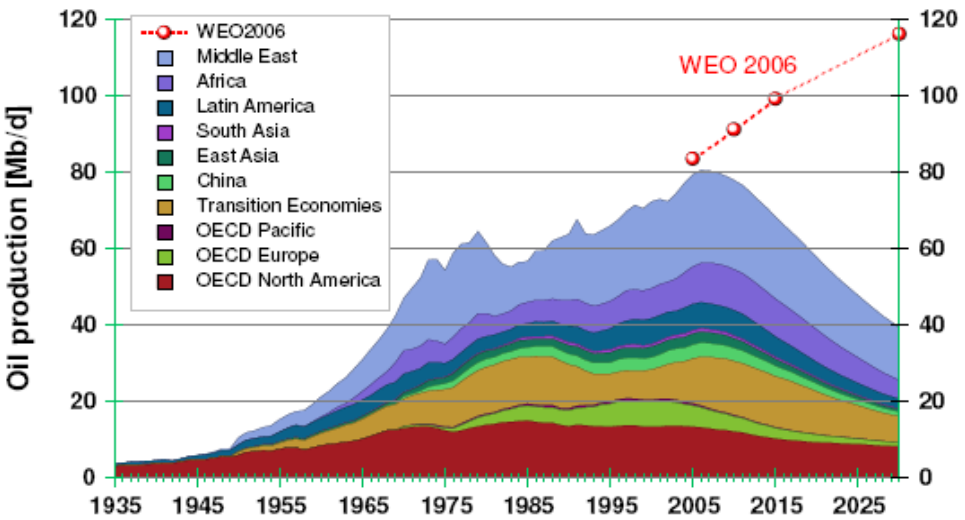
Much of the recent debate on rationalizing transportation infrastructure has focused on the environmental impact of shipping freight by truck versus rail. Delivering freight by truck over moderate distances is generally quicker and often more direct, but consumes at least three times as much fuel (Btu's) per ton-mile than rail.[5] While rail does offer a freight transportation mode capable of reducing highway congestion and pollutant emissions, its greatest contribution may ultimately be in the area of energy conservation.

Figure 1 shows historic world oil production and the future production forecast of the Energy Watch Group, which closely matches the production forecast prepared by the International Energy Agency.[6] This forecast indicates that world oil supplies are currently being produced at peak rates, which is in contrast to the World Energy Outlook (WEO) forecast showing a growth in production through 2030 (trend line in Figure 1). The WEO projections shown in Figure 1 are not constrained by historic data on oil discoveries that reflect a peak in worldwide discoveries during the early 1960s. In fact, declining oil discoveries have contributed to a condition where approximately 3.5 barrels of oil are now being consumed for every barrel being discovered worldwide, drawing down the sizable reserves accumulated decades ago.[7]

[5] Railroads: Building a Cleaner Environment, Association of American Railroads, AAR Policy and Economics Department, March 2008.

[6] Energy Watch Group, Crude Oil – The Supply Outlook, EWG Series No. 3, October 2007. Available at: http://www.energywatchgroup.org/fileadmin/global/pdf/EWG_Oilreport_10-2007.pdf

[7] Masters, C.D., Attanasi, E.D. and Root, D., World Petroleum Assessment and Analysis, Proceedings, 14th World Petroleum Congress, John Wiley & Sons, Stavanger, Norway, 1994.



Source: Energy Watch Group, Crude Oil – The Supply Outlook

Figure 1: Historic and Forecasted World Oil Supplies

A consequence of curtailed world oil production in the long term most likely will be a continued increase in the cost of transportation fuels. At that point, shippers may modify their expectations for the timing and frequency of freight deliveries, reducing the minimum distance over which rail transportation is practical and profitable. If these events materialize, distribution centers and support industries may become more localized.

Economic Impact of Infrastructure

Infrastructure is generally a facilitator of economic growth rather than the driver of economic growth. While the construction of transportation facilities can certainly influence which land areas appreciate in value, new growth comes from the need for more manufactured goods and supportive services, and from the freeing of investment capital by minimizing current costs. In this respect, the type of infrastructure capable of contributing the most to the East Texas economy will be greatly influenced by the business models of the private sector. Consequently, factors such as lowering transportation costs, the demand for consumer goods, and evolving logistics strategies are all relevant to the type of infrastructure that will be needed.

SECTION 8: IDENTIFIED IMPROVEMENTS

The potential improvements identified in this report have been organized by TxDOT District and are described in the following section. Potential projects for grade separation are based on roadway traffic volumes, train counts, and the associated delays that occur at the at-grade roadway-rail crossings. Each potential project needs to go through the environmental and public involvement process to determine feasibility. Improvements identified for the Dallas District are not included in this report and are part of the independent Dallas-Fort Worth Region Freight Study. The potential improvements are listed in Tables 8-1 through 8-4 with estimated costs and public benefits. Moreover, a detailed discussion of each identified improvement follows the list of potential improvements.

Atlanta District

The TxDOT Atlanta District is located in the northeast corner of the state and contains the counties of Bowie, Camp, Cass, Harrison, Marion, Morris, Panola, Titus, and Upshur. Major roadways that traverse the District include Interstates 20 and 30, U.S. 59, U.S. 259, and U.S. 271. Many of the major roadways in the District carry large volumes of truck traffic, generally over 15 percent of the total traffic volumes.

The Atlanta District is served by the UP, BNSF, and KCS, as well as three shortline railroads and the TXU railroad. The shortline railroads consist of the Texas Northeastern Railroad (TNER), the Blacklands Railroad (BLR), the Texas Northern (TN), and TXU rail lines.

A list of planned future network improvements has been provided by TxDOT for use in identifying areas of planned reconstruction or widening of major roadways. Some of these areas in the Atlanta District are I-30 in Texarkana, I-20 through the entire District, and a majority of U.S. 59. The planned improvements by TxDOT are not included as proposed improvements in this study unless additional widening of the roadway was deemed necessary. The list of planned future improvements by TxDOT in the Atlanta District is shown in Table D-1 in Appendix D.

Potential improvements within the Atlanta District consist of five potential grade separations and two potential crossing closures as listed in Table 8-1 with their associated costs and estimated public benefits.

Atlanta District						
Grade Separations	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
FM 74	Cass	$ 5,860,000	$ 703,000	0.12	$ 1,865,000	0.32
FM 249	Cass	$ 6,500,000	$ 947,000	0.15	$ 2,617,000	0.40
FM 450	Harrison	$ 6,860,000	$ 892,000	0.13	$ 2,486,000	0.36
SH 49	Marion	$ 7,170,000	$ 912,000	0.13	$ 2,508,000	0.35
SH 11	Camp	$ 4,600,000	$ 430,000	0.09	$ 1,138,000	0.25
Crossing Closures	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
1st St	Cass	$ 50,000	$ 45,000	0.90	$ 118,000	2.36
Clarksville St	Marion	$ 50,000	$ 11,000	0.22	$ 24,000	0.48

Table 8-1: Atlanta District Potential Improvements (2008 estimates)

Grade Separations

Grade Separation of SH 11 on the UP Pine Bluff Subdivision

SH 11, also known as Quitman Street, is currently a two-lane roadway that crosses the UP Pine Bluff Subdivision in Camp County within the city of Pittsburg. This roadway, with approximately 8,000 vehicles crossing the railroad tracks daily, has been identified as a potential candidate for grade separation. The potential two-lane roadway overpass would separate vehicular traffic from the Pine Bluff Subdivision.

A preliminary layout of the overpass is included in the figures in Appendix G. The land use in the vicinity of SH 11 consists of commercial properties east of the tracks, including a portion of the central business district, and primarily residential properties (with some commercial land use) west of the tracks.

Access to adjacent properties would not be available along the SH 11 overpass for a length of more than ¼ mile. However, some of these adjacent properties would still have access via the existing Pittsburg local street network. Those properties without access were included in the estimated cost of right-of-way acquisition. Cypress Street, Market Street, and Mill Street would be converted to cul-de-sacs where connection to SH 11 is not viable.

The grade separation of SH 11 is estimated to cost $4.6 million, with an estimated public benefit of $1.1 million, which is 25 percent of the estimated cost of the grade separation.

Grade Separation of FM 74 on the UP Little Rock Subdivision

FM 74, also known as Houston Street, is currently a two-lane roadway that crosses the UP Little Rock Subdivision in Cass County within Queen City. This roadway, with approximately 5,200 vehicles crossing the railroad tracks daily, has been

identified as a potential candidate for grade separation. The potential two-lane roadway overpass would separate vehicular traffic from the Little Rock Subdivision.

A preliminary layout of the overpass is included in the figures in Appendix G. The overpass at the railroad track on FM 74 also requires vertical alignment adjustments along Loop 236. The land use in the vicinity of FM 74 consists of a mix of residential and commercial properties.

Access to adjacent properties would not be available along FM 74 for less than ¼ mile and along the Loop 236 profile adjustment for a length of over ¼ mile. However, some of these adjacent properties would still have access via the existing Queen City local street network east of the tracks. Those properties without access were included in the estimated cost of right-of-way acquisition. First Street would continue under FM 74 and provide access to the businesses north of FM 74 and east of the tracks. Second Street and the alley between Second and Third Streets would be converted to cul-de-sacs where connection to FM 74 is not viable.

The grade separation of FM 74 is estimated to cost $5.9 million, with an estimated public benefit of $1.9 million, which is 32 percent of the estimated cost of the grade separation.

Grade Separation of FM 249 on the UP Little Rock Subdivision

FM 249, also known as Main Street, is currently a four-lane roadway that crosses the UP Little Rock Subdivision in Cass County within the city of Atlanta. This roadway, with approximately 8,900 vehicles crossing the railroad tracks daily, has been identified as a potential candidate for grade separation. The potential four-lane roadway overpass would separate vehicular traffic from the Little Rock Subdivision.

A preliminary layout of the overpass is included in the figures in Appendix G. The land use in the vicinity of FM 249 consists of commercial properties, including a portion of the central business district of Atlanta.

Access to adjacent properties would not be available along the FM 249 overpass for a length of over ¼ mile. However, some of these adjacent properties would still have access via the existing Atlanta local street network. Those properties without access were included in the estimated cost of right-of-way acquisition. West Street, East Street, and William Street would continue as through streets, although they would not have direct access to FM 249. Additionally, Starkey Street east of the overpass would be converted to a cul-de-sac where connection to FM 249 is not viable.

The grade separation of FM 249 is estimated to cost $6.5 million, with an estimated public benefit of $2.6 million, which is 40 percent of the estimated cost of the grade separation.

Grade Separation of FM 450 on the UP Little Rock Subdivision

FM 450, also known as Central Street, is currently a two-lane roadway that crosses the UP Little Rock Subdivision in Harrison County within the city of Hallsville. This roadway, with approximately 7,200 vehicles crossing the railroad tracks daily, has been identified as a potential candidate for grade separation. The potential two-lane roadway overpass would separate vehicular traffic from the Little Rock Subdivision.

A preliminary layout of the overpass is included in the figures in Appendix G. The land use in the vicinity of FM 450 consists of commercial properties, including a portion of the central business district of Hallsville.

Access to adjacent properties would not be available along the FM 450 overpass for a length of over ¼ mile. However, some of these adjacent properties would still have access via the existing local street network. Those properties without access were included in the estimated cost of right-of-way acquisition. U.S. 80 (Main Street) would continue as a through street, although access to FM 450 would be provided by a ramp connection. Also, portions of Chestnut Street, Pine Street, and Willow Street would be converted to cul-de-sacs where connection to FM 450 is not viable.

The grade separation of FM 450 is estimated to cost $6.9 million, with an estimated public benefit of $2.5 million, which is 36 percent of the estimated cost of the grade separation.

Grade Separation of SH 49 on the UP Little Rock Subdivision

SH 49, also known as Broadway Street, is currently a four-lane roadway that crosses the UP Little Rock Subdivision in Marion County within the city of Jefferson. This roadway, with approximately 8,500 vehicles crossing the railroad tracks daily, has been identified as a potential candidate for grade separation. The potential four-lane roadway overpass would separate vehicular traffic from the Little Rock Subdivision.

A preliminary layout of the overpass is included in the figures in Appendix G. The land use in the vicinity of SH 49 consists of a mix of commercial and residential properties.

Access to adjacent properties would not be available along the SH 49 overpass for a length of over ¼ mile. However, some of these adjacent properties would still have access via the local street network; those properties without access were included in the estimated cost of right-of-way acquisition. U.S. 59 would continue as a through street, although access to SH 49 would require a connection ramp. Owens Street and Dixon Street would be converted to cul-de-sacs where connection to SH 49 is not viable.

The grade separation of SH 49 is estimated to cost $7.2 million, with an estimated public benefit of $2.5 million, which is 35 percent of the estimated cost of the grade separation.

Crossing Closures

Crossing Closure of 1st Street on the UP Little Rock Subdivision

1st Street is currently a two-lane roadway that crosses the UP Little Rock Subdivision east of Loop 236 and south of FM 74 in Queen City. Accommodating approximately 600 daily vehicles, 1st Street provides access to and from residential areas on the east side of the Little Rock Subdivision. The location of the potential crossing closure as well as an alternative traffic routing and associated distance are included in the figures in Appendix G.

Closing the crossing would increase the travel distance to access these residences from 1st Street by less than one mile. The vehicular traffic along 1st Street could be rerouted to cross the railroad over the proposed FM 74 overpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of 1st Street is $118,000, which is over two times greater than the estimated cost to implement the crossing closure.

Crossing Closure of Clarksville Street on the KCS Greenville Subdivision

Clarksville Street is currently a two-lane roadway that crosses the KCS Greenville Subdivision east and south of SH 49 and north of FM 134 in Jefferson. Accommodating approximately 200 daily vehicles, Clarksville Street provides access to and from residential and commercial areas on either side of the Greenville Subdivision. The location of the potential crossing closure as well as an alternative traffic routing and associated distance are included in the figures in Appendix G.

Closing the crossing would increase the travel distance to access residences and businesses from Clarksville Street by ¾ mile. The vehicular traffic along Clarksville Street could be rerouted to cross the railroad over the existing SH 49 underpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Clarksville Street is $24,000, which is 48 percent of the estimated cost to implement the crossing closure.

Lufkin District

The TxDOT Lufkin District is located in the eastern part of the state at the border with Louisiana and the Tyler and Beaumont Districts. The Lufkin District contains the counties of Angelina, Houston, Nacogdoches, Polk, Sabine, San Augustine, San Jacinto, Shelby, and Trinity. San Jacinto County is not included in this study since it is part of the independent Houston Region Freight Study conducted by TxDOT. Major roadways that traverse the District include U.S. 59, U.S. 96, SH 7, and SH 21. Many of the major roadways in the District carry large volumes of truck traffic, generally over 15 percent of the total traffic volumes.

The Lufkin District is served by the UP and BNSF as well as two switching companies, which consist of the Angelina & Neches River Railroad (A&NR) in Lufkin

and the Texas Southeastern Railroad (TSE) at Diboll. The major rail line coming to and from the Lufkin District is provided by UP and travels from south Harris County to the north corner of the Lufkin District in Shelby County.

A list of planned future network improvements has been provided by TxDOT for use in identifying areas of planned reconstruction or widening of major roadways. The majority of these planned improvements in the Lufkin District are widening projects along U.S. 59. The planned improvements by TxDOT are not included as proposed improvements in this study unless additional widening of the roadway was deemed necessary. The complete list of planned future improvements by TxDOT in the Lufkin District can be viewed in Table D-3 in Appendix D.

Potential improvements within the Lufkin District consist of four potential crossing closures, three roadway capacity enhancements, and one rail bypass as listed in Table 8-2 with their associated costs and estimated public benefits.

Lufkin District						
Crossing Closures	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
Cox St	Nacogdoches	$ 50,000	$ 42,000	0.84	$ 111,000	2.22
Craven St	Nacogdoches	$ 50,000	$ 97,000	1.94	$ 206,000	4.12
Logansport St	Shelby	$ 50,000	$ 40,000	0.80	$ 106,000	2.12
Railroad St	Shelby	$ 50,000	$ 18,000	0.36	$ 41,000	0.82
Roadway/Rail Capacity Enhancements	County	Estimated Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Private Benefit	Ratio: Benefit/ Cost
Livingston Rail Bypass (Alternative 1)	Polk	$ 8,420,000	$ 400,000	0.05	$ (2,630,000)	(0.31)
Livingston Rail Bypass (Alternative 2)	Polk	$ 30,920,000	$ 2,230,000	0.07	$ (1,260,000)	(0.04)
SH 21 (SH 103 to Louisiana State Line)	Sabine	$ 49,350,000	N/A	N/A	N/A	N/A
U.S. 96 (Sabine County Line to US 59)	Sabine/San Augustine/Shelby	$ 181,910,000	N/A	N/A	N/A	N/A

Table 8-2: Lufkin District Potential Improvements (2008 estimates)

Crossing Closures

Crossing Closures of Cox Street and Craven Street on the UP Lufkin Subdivision

Cox Street and Craven Street are currently two-lane roadways that cross the UP Lufkin Subdivision east of Business U.S. 59 and south of SH 21 in Nacogdoches. Accommodating approximately 1,350 and 200 daily vehicles, respectively, Cox Street and Craven Street provide access to and from residential and commercial areas on either side of the Lufkin Subdivision. The location of the potential crossing closures as well as alternative traffic routing and associated distances are included in the figures in Appendix G.

Closing the crossings would increase the travel distance to access residences and businesses from Cox Street and Craven Street by less than one mile each. The vehicular traffic along Cox Street and Craven Street could be rerouted to cross the railroad over the existing SH 7 overpass.

The crossing closures are estimated to cost $50,000 each. The estimated public benefit calculated for the closure of Cox Street is $111,000, which is over two times the estimated cost to implement the crossing closure. The estimated public benefit calculated for the closure of Craven Street is $206,000, which is over four times the estimated cost to implement the crossing closure.

Crossing Closure of Logansport Street on the BNSF Longview Subdivision

Logansport Street is currently a two-lane roadway that crosses the BNSF Longview Subdivision between FM 699 and SH 7 in the city of Center. Accommodating approximately 800 daily vehicles, Logansport Street provides access to and from residential and industrial areas on either side of the Longview Subdivision. The location of the potential crossing closure as well as alternative traffic routing and associated distance are included in the figures in Appendix G.

Closing the crossing would increase the travel distance to access residences and businesses from Logansport Street by less than one mile. The vehicular traffic along Logansport Street could be rerouted to cross the railroad over the existing SH 7 underpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Logansport Street is $106,000, which is over two times the estimated cost to implement the crossing closure.

Crossing Closure of Railroad Street on the BNSF Longview Subdivision

Railroad Street is currently a two-lane roadway that crosses the BNSF Longview Subdivision north of U.S. 59 and west of FM 947 in the city of Tenaha. Accommodating approximately 200 daily vehicles, Railroad Street provides access to and from commercial areas on the east side of the Longview Subdivision. The location of the potential crossing closure as well as alternative traffic routing and associated distance are included in the figures in Appendix G.

Closing the crossing would increase the travel distance to access adjacent properties from Railroad Street by approximately ¾ mile. The vehicular traffic along Railroad Street could be rerouted to cross the railroad over the existing U.S. 59 underpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Railroad Street is $41,000, which is 82 percent of the estimated cost to implement the crossing closure.

Roadway/Rail Capacity Enhancements

Livingston Rail Bypass

The single-track UP Lufkin Subdivision crosses U.S. 190 in Polk County within the city of Livingston and bisects the business district at approximately railroad milepost 71.5. Major roadway congestion occurs at intersections of U.S. 190, Business U.S. 59 and the UP Lufkin Subdivision. U.S. 190 is currently a four-lane highway with approximately 15,500 vehicles crossing the railroad track and Business U.S. 59 daily. Track speed through the intersection is 35 MPH and 49 MPH on the north and south ends of the intersection, respectively. Two preliminary bypass track alternatives, as shown in the figures in Appendix G, have been identified to alleviate the congestion.

Alternative 1 includes 19,500 feet, 1,300 feet longer than the existing alignment of 18,200 feet, of new Bypass Track along the median of U.S. 59 west of the existing route. The intersection of the Bypass Track and U.S. 190 would require an overpass railroad bridge for grade separation of the vehicular and train traffic. Full warning devices for two at-grade crossings at the intersection of the Bypass Track and north/south frontage roads would also be required. Two existing highway bridges on southbound U.S. 59 would possibly be retrofitted to accommodate for the Bypass Track alignment. No additional right-of-way would be required since the alternative alignment would run along the median of U.S. 59. This alternative alignment would be limited to a speed of 25 mph due to existing freeway geometry. Alternative 1 of the Livingston rail bypass is estimated to cost $8.4 million, with an estimated 20-year public benefit of $400,000 and a 20-year private cost of $2,630,000.

Alternative 2 includes 28,800 feet, 4,700 feet longer than the existing alignment of 24,100 feet, of new track further west of the Alternative 1 alignment. Two railroad bridges would be required to cross the creek, north and south of U.S. 59, for a total length of approximately 400 feet. The intersection of the Bypass Track and U.S. 190 would require an overpass highway bridge to grade separate vehicular and trains traffic. The existing U.S. 190 bridge crossing the creek would need to be replaced to accommodate the new U.S. 190 grade separation. A preliminary layout of the overpass is included in the figures in Appendix G along with environmental constraints and adjacent property land uses. Access to adjacent properties could be maintained via access roads alongside U.S. 190 along with at-grade u-turns located beneath the overpass on each side of the Bypass Track. Alternative 2 of the Livingston rail bypass is estimated to cost $30.9 million, with an estimated 20-year public benefit of $2,230,000 and a 20-year private cost of $1,260,000.

Widening of SH 21 from SH 103 west of Milam to the Louisiana State Line (from two to four lanes)

SH 21 is a two-lane roadway between SH 103 west of Milam and the Louisiana state line that passes through Milam and connects to SH 87. In 2003, a volume of approximately 8,500 vehicles per day traveled along this section of SH 21. That

volume is expected to increase to approximately 17,000 vehicles by 2025. Around 18 percent of the daily traffic along this section of SH 21 is truck traffic.

The state highway is not a limited-access facility and incurs slower travel times due to other vehicles entering and exiting the highway via side streets at lower speeds in the town of Milam. As a result, SH 21 sustains a lower capacity threshold than a freeway section with a capacity of approximately 9,000 vehicles per lane per day. Thus, the volume-to-capacity (V/C) ratio is around 0.96 for year 2025. A V/C ratio of over 0.75 is usually an indicator of an area of heavy congestion.

Widening U.S. 96 between SH 103 west of Milam and the Louisiana state line from two to four lanes is projected to decrease the V/C ratio to approximately 0.48, indicating lower congestion in 2025. Adding the proposed lanes would also allow vehicles entering SH 21 to use the outside lane, leaving the inside lanes in each direction to flow at normal speeds.

The estimated cost of the widening of SH 21 from two to four lanes between SH 103 west of Milam and the Louisiana state line is $49.4 million.

Widening of U.S. 96 from Sabine/Jasper County Line to U.S. 59 (from two to four lanes)

U.S. 96 is a two-lane roadway between the Sabine/Jasper county line and U.S. 59 east of Tenaha that passes through Center and connects to SH 87 and SH 7. In 2003, a volume of approximately 12,000 vehicles per day traveled along this section of U.S. 96. That volume is expected to increase to approximately 24,000 vehicles by year 2025. Approximately 31 percent of the daily traffic along this section of U.S. 96 is truck traffic.

The U.S. highway is not a limited-access facility and incurs slower travel times due to other vehicles entering and exiting the highway via side streets. As a result, U.S. 96 sustains a lower capacity threshold than a freeway section with a capacity of approximately 10,000 vehicles per lane per day. Thus, the V/C ratio is projected to be approximately 1.19 in 2025, indicating heavy congestion.

Widening U.S. 96 between the Sabine/Jasper county line and U.S. 59 east of Tenaha from two to four lanes is projected to decrease the V/C ratio to around 0.60, indicating only moderate congestion in year 2025. Adding the proposed lanes would also allow vehicles entering U.S. 96 to use the outside lane, leaving the inside lanes in each direction to flow at normal speeds.

The estimated cost of the widening of U.S. 96 from two to four lanes between the Sabine/Jasper county line and U.S. 59 east of Tenaha is $181.9 million.

Paris District

The TxDOT Paris District is located in the northeast corner of the state at the border with Oklahoma and the Dallas, Tyler, and Atlanta Districts. The Paris District

contains the counties of Delta, Fannin, Franklin, Grayson, Hopkins, Hunt, Lamar, Rains, and Red River. Major roadways that traverse the District include Interstate 30, U.S. 271, U.S. 69, U.S. 75, U.S. 82, and SH 19. Many of the major roadways in the District carry large volumes of truck traffic, generally over 15 percent of the total traffic volume.

The Paris District is served by the UP, BNSF, and KCS, which move significant amounts of freight over long distances and own track spanning several states. The District is also served by four shortline railroads: TNER, BLR, Dallas, Garland, and Northeastern Railroad (DGNO), and the Kiamichi Railroad.

A list of planned future network improvements has been provided by TxDOT for use in identifying areas of planned reconstruction or widening of major roadways. The majority of these planned improvements in the Paris District are widening projects along U.S. 69 and U.S. 82. The planned improvements by TxDOT are not included as proposed improvements in this study unless additional widening of the roadway was deemed necessary. The complete list of planned future improvements by TxDOT in the Paris District can be viewed in Table D-4 in Appendix D.

Potential improvements within the Paris District consist of one potential grade separation, four potential crossing closures, and one roadway capacity enhancement as listed in Table 8-3 with their associated costs and estimated public benefits.

Paris District						
Grade Separations	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
Gilmer St/ Oak Ave	Hopkins	$ 9,330,000	$ 546,000	0.06	$ 1,517,000	0.16
Crossing Closures	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
W Texas Street	Grayson	$ 50,000	$ 17,000	0.34	$ 49,000	0.98
S Broadw ay St	Grayson	$ 50,000	$ 8,000	0.16	$ 19,000	0.38
S Main St	Fannin	$ 50,000	$ 23,000	0.46	$ 53,000	1.06
Jackson St	Hopkins	$ 50,000	$ 255,000	5.10	$ 549,000	10.98
Roadw ay/Rail Capacity Enhancements	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
U.S. 271 (Paris to Oklahoma State Line)	Lamar	$ 43,680,000	N/A	N/A	N/A	N/A

Table 8-3: Paris District Potential Improvements (2008 estimates)

Grade Separations

Grade Separation of Gilmer Street and Oak Avenue on the KCS Greenville Subdivision

Gilmer Street and Oak Avenue, also known as SH 11, are currently directional two-lane roadways that cross the KCS Greenville Subdivision in Hopkins County within the city of Sulphur Springs. These roadways, with approximately 17,400 vehicles combined crossing the railroad tracks daily, have been identified as potential candidates for grade separation. The potential two-lane roadway overpasses would separate vehicular traffic from the Greenville Subdivision.

A preliminary layout of the overpasses is included in the figures in Appendix G. The land use in the vicinity of Gilmer Street and Oak Avenue consists mainly of commercial properties, including a southern portion of the central business district, with some residential properties south of the tracks.

Access to adjacent properties would not be available along the identified Gilmer Street and Oak Avenue overpasses for a length of over ¼ mile each. However, some of these adjacent properties would still have access via the Sulphur Springs local street network; those properties without access were included in the estimated cost of right-of-way acquisition. Hinnant Street would remain a through street, although access to Gilmer Street and Oak Avenue would require use of the local street network. Graham Street and Kirksey Street would connect by new side streets to Hinnant Street and Fuller Street, respectively, where connections to Gilmer Street and Oak Avenue are not viable.

The grade separation of Gilmer Street and Oak Avenue is estimated to cost $9.3 million, with an estimated public benefit of $1.5 million, which is 24 percent of the estimated cost of the grade separation.

Crossing Closures

Crossing Closure of West Texas Street on the BNSF Madill Subdivision

West Texas Street is currently a two-lane roadway that crosses the BNSF Madill Subdivision between SH 75A and U.S. 69 in Denison. Accommodating approximately 500 daily vehicles, West Texas Street provides access to and from residential areas on either side of the Madill Subdivision.

Closing the crossing would increase the travel distance to access residences from West Texas Street by ½ mile. The vehicular traffic along West Texas Street could be rerouted to cross the railroad on the existing Monterrey Street underpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of West Texas Street is $49,000, which is nearly equal to the estimated cost to implement the crossing closure.

Crossing Closure of Broadway Street on the Texas Northeastern Railroad (TNR)

Broadway Street is currently a two-lane roadway that crosses the western section of the Texas Northeastern Railroad (TNR) north of U.S. 82 and east of U.S. 69 in Bells. Accommodating approximately 100 daily vehicles, Broadway Street provides access to and from residential and commercial areas on either side of the TNR.

Closing the crossing would increase the travel distance to access properties from Broadway Street by ½ mile. The vehicular traffic along Broadway Street could be rerouted to cross the railroad via the existing U.S. 69 underpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Broadway Street is $19,000, which is 38 percent of the estimated cost to implement the crossing closure.

Crossing Closure of Main Street on the DGNO Dallas Subdivision

Main Street is currently a two-lane roadway that crosses the DGNO Dallas Subdivision south of SH 78 and west of U.S. 69 in Leonard. Accommodating approximately 500 daily vehicles, Main Street provides access to and from residential areas on the west side and commercial areas on the east side of the Dallas Subdivision.

Closing the crossing would increase the travel distance to access these residences and businesses from Main Street by one mile. The vehicular traffic along Main Street could be rerouted to cross the railroad via the existing SH 78 underpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Main Street is $53,000, which is six percent greater than the estimated cost to implement the crossing closure.

Crossing Closure of Jackson Street on the KCS Greenville Subdivision

Jackson Street is currently a two-lane roadway that crosses the KCS Greenville Subdivision south of SH 78 and west of U.S. 69 in Sulphur Springs. Accommodating approximately 900 daily vehicles, Jackson Street provides access to and from commercial areas on the north side and residential areas on the south side of the Greenville Subdivision.

Closing the crossing would increase the travel distance to access residences and businesses from Jackson Street by approximately 1-1/2 miles. The vehicular traffic along Jackson Street could be rerouted to cross the railroad over the proposed Gilmer Street and Oak Avenue overpasses.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Jackson Street is $549,000, which is nearly 11 times the estimated cost to implement the crossing closure.

Roadway/Rail Capacity Enhancements

Widening of U.S. 271 from Paris to the Oklahoma State Line (from four to six lanes)

U.S. 271 is a four-lane roadway between U.S. 82 in Paris and the Oklahoma state line, with connections to FM 1499 and FM 2648. In 2003, a volume of approximately 17,000 vehicles per day travels along this section of U.S. 271. That volume is expected to increase to 31,000 vehicles by 2025. Approximately 17 percent of the daily traffic along this section of U.S. 271 is truck traffic.

The U.S. highway is not a limited-access facility and incurs slower travel times due to other vehicles entering and exiting the highway via side streets. As a result, U.S. 271 sustains a lower capacity threshold than a freeway section with a capacity of approximately 10,000 vehicles per lane per day. Thus, the V/C ratio is projected to be approximately 0.77 for 2025, indicating heavy congestion.

Widening U.S. 271 between Paris and the Oklahoma state line from four to six lanes is projected to decrease the V/C ratio to around 0.52, indicating moderate congestion in 2025. Adding the proposed lanes would also allow vehicles entering U.S. 271 to use the outside lane, leaving the two inside lanes in each direction to flow at normal speeds.

The estimated cost of the widening of U.S. 271 from four to six lanes between U.S. 84 in Paris and the Oklahoma state line is $43.7 million.

Tyler District

The TxDOT Tyler District is located in the eastern part of the state, borders the Atlanta, Dallas, Lufkin, and Paris Districts, and contains the counties of Anderson, Cherokee, Gregg, Henderson, Rusk, Smith, Van Zandt, and Wood. Major roadways that traverse the District include I-20, U.S. 69, and U.S. 271. Many of the major roadways in the District carry large volumes of truck traffic, generally over 15 percent of the total traffic volume; however, U.S. 69 generally has less than 15 percent of trucks.

The Tyler District is served by the UP, BNSF, and KCS. The District is also served by the Texas State Railroad (TSR), owned by the State of Texas, and TXU, which owns its own railroad serving its power plants and operates its own trains as well as being served by the BNSF.

A list of planned future network improvements has been provided by TxDOT for use in identifying areas of planned reconstruction or widening of major roadways. Some of these areas in the Tyler District are I-20 within Gregg County, Loop 323 on the east side of Tyler, Loop 281 in Longview, U.S. 271 northeast of Tyler, and multiple segments of U.S. 69. The planned improvements by TxDOT are not included as proposed improvements in this study unless additional widening of the roadway was deemed necessary. The complete list of planned future improvements by TxDOT in the Tyler District can be viewed in Table D-5 in Appendix D.

Potential improvements within the Tyler District consist of three potential grade separations, two potential crossing closures, and two roadway capacity enhancements as listed in Table 8-4 with their associated costs and estimated public benefits.

Tyler District						
Grade Separations	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
U.S. 69	Wood	$ 9,770,000	$ 1,976,000	0.20	$ 5,523,000	0.57
4th St	Van Zandt	$ 6,500,000	$ 1,072,000	0.16	$ 2,955,000	0.45
N Palace Ave	Smith	$ 4,520,000	$ 395,000	0.09	$ 1,035,000	0.23
Crossing Closures	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
Stone St	Wood	$ 50,000	$ 62,000	1.24	$ 160,000	3.20
S Longview St	Gregg	$ 50,000	$ 108,000	2.16	$ 289,000	5.78
Roadway/Rail Capacity Enhancements	County	Estimated Cost	Estimated 10-year Public Benefit	Ratio: Benefit/ Cost	Estimated 20-year Public Benefit	Ratio: Benefit/ Cost
U.S. 259 (Mount Enterprise to Kilgore)	Rusk/Gregg	$ 105,440,000	N/A	N/A	N/A	N/A
U.S. 271 (Loop 323 to Interstate 20)	Smith	$ 45,180,000	N/A	N/A	N/A	N/A

Table 8-4: Tyler District Potential Improvements (2008 estimates)

Grade Separations

Grade Separation of North Palace Avenue on the UP Corsicana Subdivision

North Palace Avenue is currently a four-lane roadway that crosses the UP Corsicana Subdivision in Smith County within the city of Tyler. This roadway, with approximately 12,600 vehicles crossing the railroad tracks daily, has been identified as a potential candidate for grade separation. The potential four-lane roadway overpass would separate vehicular traffic from the Corsicana Subdivision.

A preliminary layout of the overpass is included in the figures in Appendix G. The land use in the vicinity of North Palace Avenue consists mainly of commercial properties, including a large business on the west side of the roadway and north of the tracks.

Access to adjacent properties would not be available along the North Palace Avenue overpass for a length of approximately ¼ mile. However, some of these adjacent properties would still have access via the local street network; those properties south of the tracks without access were included in the estimated cost of right-of-way acquisition. Moreover, two cross streets along the North Palace Avenue overpass would be converted to cul-de-sacs where connection to North Palace Avenue is not viable.

The grade separation of North Palace Avenue is estimated to cost $4.5 million, with an estimated public benefit of $1.0 million, which is 23 percent of the estimated cost of the grade separation.

Grade Separation of FM 47 on the UP Dallas Subdivision

FM 47, also known as 4th Street, is currently a four-lane roadway that crosses the UP Dallas Subdivision in Van Zandt County within the city of Wills Point. This roadway, with approximately 8,600 vehicles crossing the railroad tracks daily, has been identified as a potential candidate for grade separation. The potential four-lane roadway overpass would separate vehicular traffic from the Dallas Subdivision.

A preliminary layout of the overpass is included in the figures in Appendix G. The land use in the vicinity of FM 47 consists mainly of commercial properties, including a portion of the central business district of Wills Point, and some residential properties.

Access to adjacent properties would not be available along the FM 47 overpass for a length of over ¼ mile. However, some adjacent properties would still have access via the Wills Point local street network; those properties without access were included in the estimated cost of right-of-way acquisition. U.S. 80 and North Commerce Street would not have direct access to FM 47 but would not close at the overpass. The cross streets along the FM 47 overpass besides U.S. 80 and North Commerce Street would be converted to cul-de-sacs where connection to FM 47 is not viable.

The grade separation of FM 47 is estimated to cost $6.5 million, with an estimated public benefit of $3.0 million, which is 45 percent of the estimated cost of the grade separation.

Grade Separation of U.S. 69 on the UP Dallas Subdivision

U.S. 69, also known as Pacific Street, is currently a four-lane roadway that crosses the UP Dallas Subdivision in Wood County within the city of Mineola. This roadway, with approximately 12,500 vehicles crossing the railroad tracks daily, has been identified as a potential candidate for grade separation. The potential four-lane roadway underpass would separate vehicular traffic from the Dallas Subdivision.

A preliminary layout of the underpass is included in the figures in Appendix G. The land use in the vicinity of U.S. 69 consists of commercial properties, including a portion of the central business district of Mineola.

Access to adjacent properties would not be available along the U.S. 69 underpass for a length of ¼ mile. However, some adjacent properties would still have access via the Mineola local street network; those properties without access were included in the estimated cost of right-of-way acquisition. The cross streets along the U.S. 69

underpass would be converted to cul-de-sacs where connection to U.S. 69 is not viable.

The grade separation of U.S. 69 is estimated to cost $9.8 million, with an estimated public benefit of $5.5 million, which is 57 percent of the estimated cost of the grade separation.

Crossing Closures

Crossing Closure of Stone Street on the UP Dallas Subdivision

Stone Street is currently a two-lane roadway that crosses the UP Dallas Subdivision south of U.S. 80 and west of U.S. 69 in Mineola. Accommodating approximately 500 daily vehicles, Stone Street provides access to and from commercial areas on the north side and residential areas on the south side of the Dallas Subdivision.

Closing the crossing would increase the travel distance to access these residences and businesses from Stone Street by approximately 1 ¼ miles. The vehicular traffic along Stone Street could be rerouted to cross the railroad over the proposed U.S. 69 underpass, which is identified as a potential improvement in this study.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Stone Street is $160,000, which is more than three times the estimated cost to implement the crossing closure.

Crossing Closure of Longview Street on the UP Palestine Subdivision

Longview Street is currently a two-lane roadway that crosses the UP Palestine Subdivision north of SH 42 and west of U.S. 259 in Kilgore. Accommodating approximately 1,200 daily vehicles, Longview Street provides access to and from commercial areas on the southeast side and residential areas on the northwest side of the Palestine Subdivision.

Closing the crossing would increase the travel distance to access residences and businesses from Longview Street by nearly 1 ½ miles. The vehicular traffic along Longview Street could be rerouted to cross the railroad via the existing SH 135 underpass.

The crossing closure is estimated to cost $50,000. The estimated public benefit calculated for the closure of Longview Street is $289,000, which is nearly six times the estimated cost to implement the crossing closure.

Roadway/Rail Capacity Enhancements

Widening of U.S. 259 from Mount Enterprise to Kilgore (from four to six lanes)

U.S. 259 is a four-lane roadway between U.S. 84 in Mount Enterprise and SH 42 in Kilgore that bypasses the town of Henderson. In 2003, a volume of approximately 18,000 vehicles per day traveled along this section of U.S. 259. That volume is

expected to increase to approximately 42,000 vehicles by 2025. Between 17 and 30 percent of the daily traffic along this section of U.S. 259 is truck traffic.

The U.S. highway is not a limited-access facility and incurs slower travel times in the towns of Mount Enterprise and Kilgore. As a result, U.S. 259 sustains a lower capacity threshold than a freeway section with a capacity of approximately 12,000 vehicles per lane per day. The V/C ratio is projected to be approximately 0.87 in 2025, indicating heavy congestion.

Widening U.S. 259 between Mount Enterprise and Kilgore from four to six lanes is projected to decrease the V/C ratio to approximately 0.58, indicating moderate congestion in 2025. Adding the proposed lanes would also allow vehicles entering U.S. 259 to use the outside lane, leaving the two inside lanes in each direction to flow at normal speeds.

The estimated cost of the widening of U.S. 259 from four to six lanes between U.S. 84 in Mount Enterprise and SH 42 in Kilgore is $105.4 million.

Widening of U.S. 271 from Tyler to Interstate 20 (from four to eight lanes)

U.S. 271 is a four-lane roadway between Loop 323 on the northeast side of Tyler and Interstate 20 that connects to SH 155. In 2003, a volume of approximately 42,000 vehicles per day traveled along this section of U.S. 271. That volume is expected to increase to approximately 95,000 vehicles by 2025. Around 15 percent of the daily traffic along this section of U.S. 271 is truck traffic.

The U.S. highway is not a limited-access facility and incurs slower travel times due to other vehicles entering and exiting the highway via side streets. As a result, U.S. 271 sustains a lower capacity threshold than a freeway section with a capacity of approximately 12,000 vehicles per lane per day. The V/C ratio is projected to be approximately 1.98 in 2025, indicating very heavy congestion.

Widening U.S. 271 between Loop 323 and Interstate 20 from four to eight lanes would decrease the V/C ratio to around 0.99, indicating less congestion in 2025 than the existing facility. Adding the proposed lanes would also allow vehicles entering U.S. 271 to use the outside lanes, leaving the two inside lanes in each direction to flow at normal speeds. Currently, the Tyler MPO has identified widening this section of U.S. 271 from four to six lanes as an unfunded long range project (after year 2030).

The estimated cost of the widening of U.S. 259 from four to eight lanes between Loop 323 on the northeast side of Tyler and Interstate 20 is $45.2 million.

SECTION 9: TRANS-TEXAS CORRIDOR CONNECTIONS

There are currently several active transportation projects that will have an impact on the overall freight movements throughout the East Texas region. The following section provides a brief description of these projects.

Red River Commerce Park

The Red River Commerce Park (RRCP), formerly part of Red River Army Depot, consists of about 750 acres set as an industrial/commercial business area. This facility is located 1/8-mile from I-30 and US 82, near US 59 (going to Houston), and the proposed Trans-Texas Corridor (TTC) I-69. The RRCP has a “Duty Free” status for international shipments. Plans for the facility seem to be consistent with the needs defined by this Study by providing a transload facility that could easily make transfers between trucks and trains and with the space for a possible “drop-and-hook” operation for trucks.

South Central High Speed Rail Corridor

The South Central High Speed Rail Corridor is a federally designated corridor that has the potential to provide a critical link for international transportation by providing a rail bypass along the TTC and helping to alleviate rail congestion in the Dallas – Fort Worth region and open up possibilities for a high-speed passenger rail system.

Trans-Texas Corridor (TTC-35 and TTC-69)

The Trans-Texas Corridor (TTC) is a proposed multi-use network of combined freight and passenger routes in Texas that would incorporate existing and new highways, railways, and utility right-of-ways. The proposed TTC typical section may provide for a right-of-way width of up to 1,200 feet for the development and construction of this multi-use network.

Specific routes for the TTC have not been identified and are in the initial study phase. Two corridors are currently being developed through the initial study phase: TTC-35 and I-69/TTC. Both of these corridors are located along major truck and rail routes and would have a significant impact on future development and industries throughout Texas.

Existing Freight Movements

The movement of truck freight within the U.S., and more specifically in Texas, tends to follow the interstate system, including I-20 and I-30 within the East Texas study area and I-45 adjacent to the west. Furthermore, the most heavily used freight corridors along the interstates travel to and from the ports within the U.S, although much of the freight traffic within the state is local freight traffic. The majority of the truck traffic destined for the ports travel to the east and west coasts and the Great Lakes region. Local truck routes, such as US 59 and US 271, allow travel to and from the interstate system.

Large volumes of truck traffic also travel into and out of the state via the border crossings at the Texas-Mexico border. Generally, the truck traffic crossing the border travels northeast to the ports along the Great Lakes region and in the New England states; however, the truck routes are dependent on the location of the crossing. For instance, the main route for the truck freight through the border crossing at Laredo is along I-35 using east-west interstates, such as I-10 to Houston and I-30 to the northeastern U.S. The majority of trucks that cross the border in the Rio Grande Valley, however, follow US 77 into Houston and travel on either I-10 to the east or US 59 to the north.

Freight rail traffic within the United States to and from Texas tends to follow rail corridors between the ports, intermodal facilities, and the customer base. Generally, the trains travel to and from the ports in Long Beach, Houston, and the Great Lakes as well as the Powder River Basin, which produces the majority of the coal for the coal-burning power plants in the U.S. Many of the trains that cross the Texas-Mexico border travel to the northern and eastern areas of the U.S. Many of the trains that cross the Texas-Mexico border travel to the northern and eastern areas of the U.S.

TTC-35 Corridor

The proposed TTC-35 Corridor includes a 600-mile-long initial study area and generally parallels I-35, extending from north of Dallas/Fort Worth to Mexico and potentially the Gulf Coast. The TTC-35 Corridor traverses the western portion of the East Texas Freight Study area. Figure 9-1 shows the locations of the preliminary corridor alternatives, labeled in the figure as N1, N2, and N3.

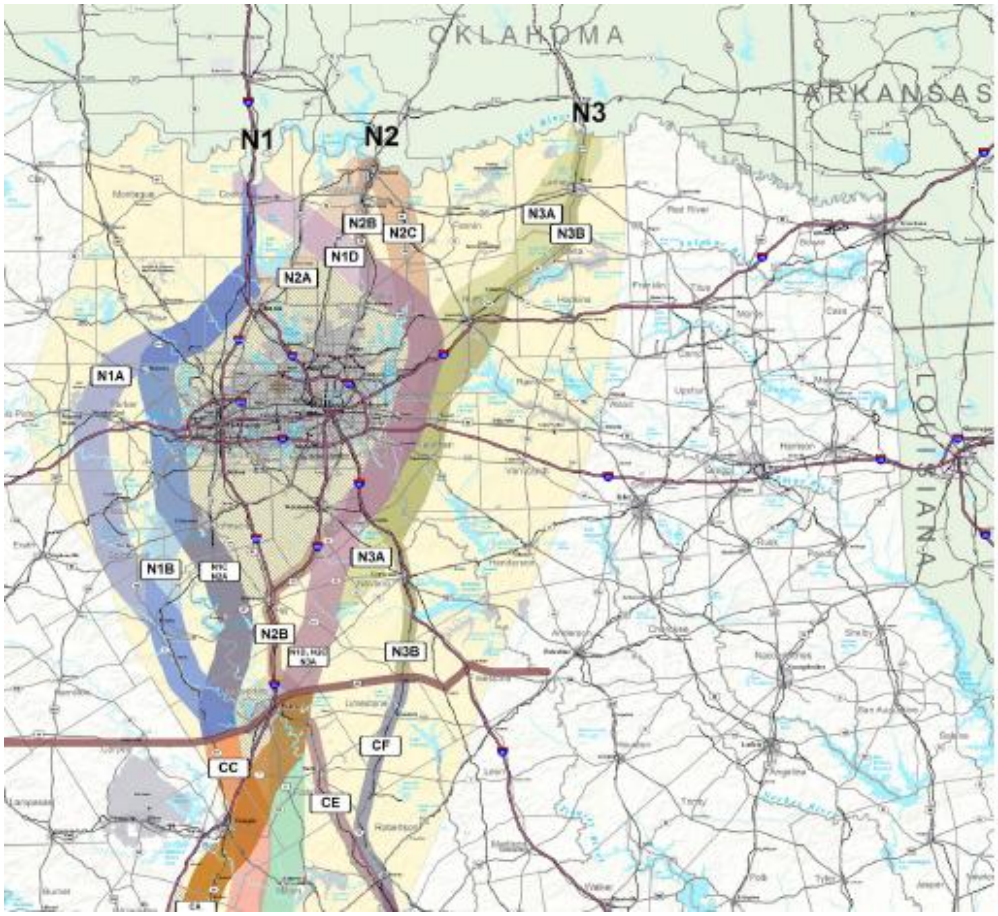


Figure 9-1: TTC-35 Preliminary Corridor Alternatives
(Source: TxDOT)

Roadway/Rail Connections to TTC-35 Corridor

The TTC-35 Corridor is planned to connect to existing major highways north of the Texas-Oklahoma border. Since additional capacity is not shown at this time north of the border, the effect on truck freight volumes along the TTC-35 Corridor within East Texas may be minimal. However, connections to the interstate system such as I-20 and I-30 and major highways such as US 271 and US 69 may provide additional freight volumes if TTC-35 continues north of the Texas-Oklahoma border.

Existing rail lines within the proposed TTC-35 Corridor are currently owned by UP and BNSF. Specifically, the UP Choctaw and Duncan Subdivisions as well as the BNSF Forth Worth and Madill Subdivisions north of Temple are located within the East Texas study area and TTC-35 Corridor. Connections between the tracks and the TTC-35 corridor are located southeast of the Dallas/Forth Worth metroplex with the BNSF DFW Subdivision, UP Fort Worth Subdivision, and the UP Ennis Subdivision.

Since the proposed TTC-35 Corridor includes right of way for freight rail traffic, one alternative is to relocate existing freight rail lines along the TTC-35 Corridor into the Corridor right of way. Existing rail corridors that could potentially be relocated to the

TTC-35 Corridor include portions of the UP Choctaw and Duncan Subdivisions and the BNSF Fort Worth and Madill Subdivisions. However, the railroads are private corporations licensed by the Federal government; the railroads own their rights of way, so they cannot be forced to relocate from their existing alignments. The willingness of the railroads to relocate to the TTC has not been determined, although some Class 1 railroads have stated their opposition to the TTC. Additionally, the public and private benefits as well as the impact to the railroads' customers within these existing rail corridors would need to be considered as part of a separate study. The area southeast of the Dallas-Fort Worth metroplex may be a potential site for an intermodal facility due to the proximity of multiple truck and rail corridors with connections to the TTC-35 Corridor.

I-69/TTC Corridor

I-69 is a planned 1600-mile-long national highway connecting Mexico, the United States, and Canada. In Texas, I-69 will be developed under the TTC Master Plan. The proposed I-69/TTC Corridor extends from Texarkana, Texas and Shreveport, Louisiana to Mexico, containing an initial study area within Texas roughly 350 miles long. Based on public hearings and comments, the I-69/TTC Corridor is planned along existing highways, notably US 59 and US 84, through the East Texas Freight Study area. Figure 9-2 shows the locations of the I-69/TTC upgradeable corridors.

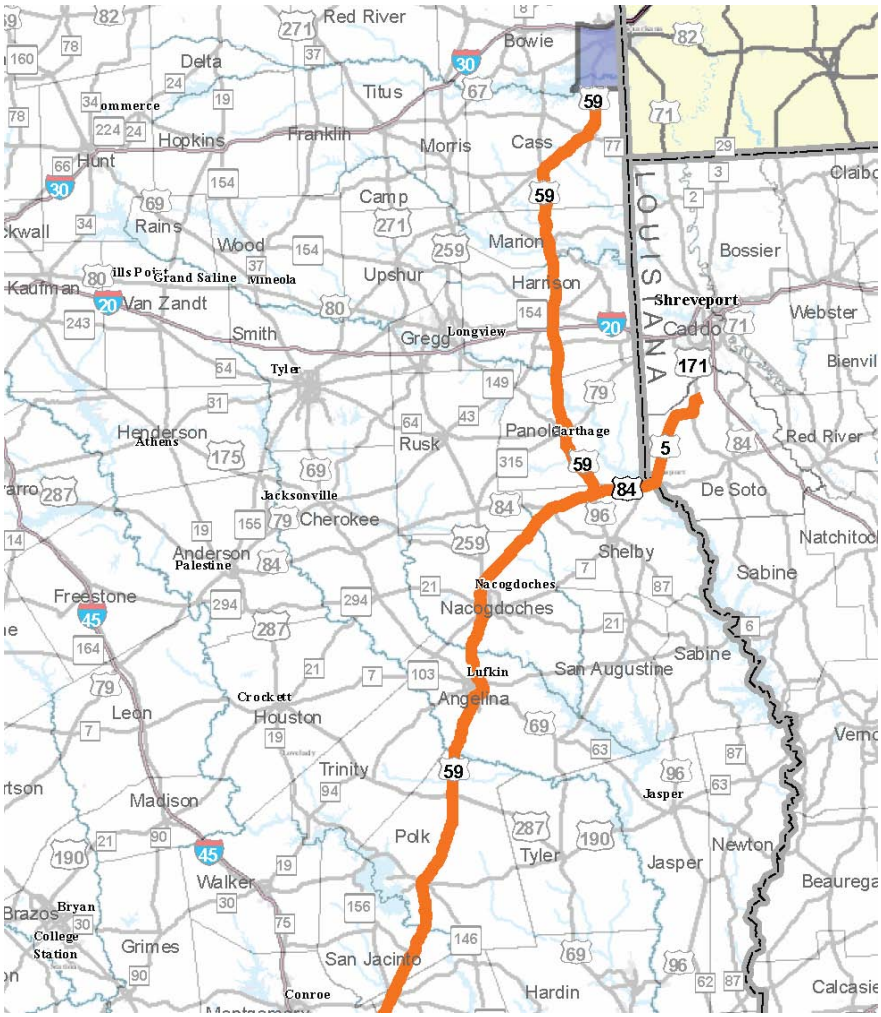


Figure 9-2: I-69/TTC Upgradeable Corridors
(Source: TxDOT)

Roadway/Rail Connections to I-69/TTC Corridor

The I-69/TTC Corridor is planned to follow US 59 through the East Texas study area. Since the existing freight traffic along US 59 slows within towns and urban areas along this route, bypass routes along US 59 may be designed to alleviate these slowdowns within the I-69/TTC Corridor. Major highway connections to US 59 may also connect to the Corridor as well; roadways with high truck volumes that could connect to I-69/TTC include US 96 and US 79.

Existing rail lines within the proposed I-69/TTC Corridor within the East Texas study area include the UP Lufkin and Little Rock Subdivisions. Additionally, the BNSF Longview, UP Dallas, UP Pine Bluff, and UP Palestine Subdivisions may potentially connect to the I-69/TTC Corridor.

Since the proposed I-69/TTC Corridor includes right of way for freight rail traffic, one alternative is to relocate existing freight rail lines along the I-69/TTC Corridor into the Corridor right of way. Existing rail corridors that could potentially be relocated to the

I-69/TTC Corridor include portions of the UP Lufkin and Little Rock Subdivisions. However, public and private benefits as well as the impact to the railroads' customers within these existing rail corridors would need to be considered as part of a separate study. Also, a potential drop-and-haul location for trucks to switch loads with other trucks could be located on the west side of Texarkana at the intersection of I-30 and the I-69/TTC Corridor.

SECTION 10: POTENTIAL INTERCITY PASSENGER AND COMMUTER RAIL

This section is the beginning of an analysis concerning potential intercity passenger and commuter rail routes within the East Texas region. As a cursory overview, the origin and destination of possible commuters on a rail system as well as passenger service will be analyzed in addition to possible rail routes along existing or abandoned rail corridors. The overview will focus primarily on commuters into the Dallas-Fort Worth metroplex from the East Texas region and possible passenger routes connecting to Amtrak's Texas Eagle route.

Existing Intercity Passenger/Commuter Rail

Existing passenger rail service in East Texas is available on Amtrak's Texas Eagle route. The Texas Eagle runs from Los Angeles to Chicago and follows the UP Dallas and UP Little Rock Subdivisions through East Texas. Stops in East Texas along the Texas Eagle route include the towns of Mineola, Longview, Marshall, and Texarkana.

Commuter rail service within the East Texas region is currently not available. The nearest commuter rail lines are operated by Dallas Area Rapid Transit (DART) and run within the Dallas-Fort Worth metroplex. According to their *2030 Transit System Plan*, DART does not foresee adding commuter rail service into the East Texas region.

Other modes of public transit in East Texas include the TRAX, which is a pick-up and drop-off service to designated points in Bowie, Cass, Delta, Franklin, Hopkins, Lamar, Morris, Red River, and Titus Counties, and TAPS, which is a bus service in Cooke, Grayson, Fannin, Montague, Clay, and Wise Counties as well as an urban express commuter bus service to the DART Plano station.

Agency Coordination

HNTB contacted agencies involved with passenger rail operations or planning in East Texas to get a better idea of their plans for long-term improvements and initiatives for passenger and commuter rail in the area. Questions ranged from the potential routes for passenger rail, the potential ridership of the potential routes, initiatives and discussions with other agencies and railroads, and planned future actions for implementation.

Amtrak

Amtrak could not release any potential routes or ridership information since it is proprietary information and a possible security issue. Any data that Amtrak could release is on the Amtrak website.

East Texas Corridor Council

The East Texas Corridor Council (ETCC) has a near-term goal of faster passenger service on the existing Texas Eagle route and long-term goals of double-tracking the UP Dallas Subdivision for passenger use and extending service through Shreveport and Bossier, Louisiana, and Meridian, Mississippi. The ETCC is also interested in the possibility of investigating higher-speed rail along the I-20 corridor. The ETCC has memorandums of understanding (MOU) with the North Central Texas Council of Governments (NCTCOG) and the East Texas Council of Governments (ETCOG) concerning their vision of rail connectivity within and east of Texas. The ETCDC is currently working on a MOU with the North Louisiana Council of Governments. The ETCC has received a federal grant to further analyze additional passenger rail corridors within the East Texas area.

Northeast Texas Railroad Association

The North Texas Railroad Association has discussed high-speed passenger rail between Dallas-Forth Worth and Shreveport with particular consideration to the current Amtrak Texas Eagle route with an additional section between Marshall and Shreveport. Many buses travel from Dallas-Fort Worth to Shreveport daily to casinos, indicating that private companies such as the casinos may become more involved in the passenger rail initiatives. The North Texas Railroad Association believes that the federal and state governments should take a lead in pushing this passenger rail section forward and acknowledges that the UP could present a potential roadblock to their plans due to expected freight growth of 25 to 30 percent over the next ten years.

Potential Routes and Ridership

The majority of potential daily intercity passenger rail riders would use the rail to commute to and from work. Therefore, data was collected from the 2000 census for daily commuter person-trips between selected cities within East Texas to determine the most logical routes for intercity passenger rail service. These person-trips do not account for trips to non-daily destinations, such as shopping or gaming locations. The most daily trips (one-way) within the East Texas region are:

- Greenville to/from Dallas – 10,900 commuters daily
- Sherman to/from Dallas – 10,285 commuters daily
- Longview to/from Marshall – 8,114 commuters daily
- Marshall to/from Shreveport – 1,929 commuters daily

Freight rail routes currently exist between these cities. The KCS Greenville Subdivision handles 8 trains per day between Greenville and Dallas. The BNSF Madill Subdivision and DGNO Sherman Subdivision run 10 and 5 trains per day, respectively, between Sherman and Dallas. The UP Little Rock Subdivision travels between Longview and Marshall with 34 trains per day, and the UP Reisor Subdivision handles 6 trains per day between Marshall and Shreveport. Of these subdivisions, the only one that currently accommodates passenger rail service is the UP Little Rock Subdivision between Longview and Marshall.

Sherman and Greenville are considered suburbs of the Dallas-Fort Worth metroplex. Both cities have two potential routes for commuter rail into Dallas. The Greenville-to-Dallas route could, as mentioned above, follow the KCS Greenville Subdivision; it could also use an abandoned line between Greenville and Alliance Junction near Wylie to connect to the KCS Greenville Subdivision. The Sherman-to-Dallas route could use the BNSF Madill or DGNO Sherman Subdivisions.

DART currently operates commuter trains within the Dallas area, so the Sherman-to-Dallas and Greenville-to-Dallas routes could potentially link into DART's existing system. For feasibility of consistent scheduling of commuter operations, the commuter trains would either require the purchase of trackage rights or right-of-way to freight trains along the commuter route. DART has agreements with the DGNO along certain commuter routes within Dallas. RTC modeling was not completed for these potential commuter lines because of these variables.

A simulation was modeled in RTC to analyze the impacts of adding a daily round trip passenger train between Dallas, Texas and Shreveport, Louisiana. The East Texas rail network as modeled in RTC does not include the Dallas-Fort Worth area, since this was included in the independent Dallas-Fort Worth Region Freight Study, or segments of track outside of the study limits such as those east to Shreveport. As a result, the impacts discussed in this section for the passenger train modeled apply only to the East Texas study limits and do not represent the impacts of the project as a whole.

Three alternative cases, which vary based on operational changes in scheduling, were modeled for a passenger train between Dallas and Shreveport. The alternative cases were compared against the base case network modeled in RTC and discussed in Section 5. The base case includes Amtrak's daily Texas Eagle passenger service, which accounts for 14 trains out of the 849 trains that operate over the Dallas to Shreveport portion of the rail network over the 14 day simulation period.

Alternative Case A added a daily passenger train departing from Dallas around 9:00 am and arriving in the early afternoon at Shreveport. The return schedule would depart Shreveport in the early afternoon and arrive in Dallas in the evening. Alternative Case B was run with the passenger train departing Dallas round 6:00 pm for an evening arrival in Shreveport. The return train would leave Shreveport in the morning and arrive in Dallas around 12:30 pm. Alternative Case C assumed a third schedule, with the passenger train leaving Dallas late in the evening and the return train arriving early in the morning. The schedule modeled for Case C would be necessary to provide for an overnight train to New Orleans or a connection with Amtrak's Crescent Limited in Meridian, Mississippi.

The RTC results for the three alternative cases are shown in Table 10-1. It should be noted that the results show the impact of an additional round trip passenger train on performance measures between Edgewood and Scottsville, and do not show any

impacts to performance in the Dallas-Fort Worth or Shreveport areas. Additionally, the RTC results shown do not include any change in performance on other rail lines in the network that may result from trains entering other routes at slightly different times due to the additional passenger train on the Dallas to Shreveport line. The changes in performance measures on other rail lines would be relatively insignificant.

	Dallas-Shreveport Line Base Case	Dallas-Shreveport Line Case A	Dallas-Shreveport Line Case B	Dallas-Shreveport Line Case C
Trains Operated	849	878	878	878
Train Miles	38,197	41,164	41,189	41,178
Run Time (Hours per Day)	107.5	118.6	120.0	117.2
Delay Time (Hours per Day)	16.5	22.1	23.4	19.8
Delay Percent	15.3%	18.7%	19.5%	16.9%
Delay per 100 Train Miles (Minutes)	36.2	45.1	47.7	40.4
Average Speed				
Passenger	44.9	40.7	43.2	43.1
Expedited Freight	26.8	26.1	25.3	25.8
Other Freight	22.4	20.8	20.7	21.3
All Trains	25.4	24.8	24.5	25.1

Table 10-1: Passenger Train RTC Results

Each of the passenger train cases resulted in increased hours of delay for all types of trains from the base case network. Alternative Case B resulted in the greatest increase in hours of delay per day and delay per 100 train miles, while Case C resulted in the least increase in delay measurements.

The added delay is also reflected in the average speed of trains by train type. In the base case, with only the Texas Eagle passenger trains, passenger service averaged 44.9 miles per hour including station dwell time. When the additional passenger round trip over the rail line was added, the average passenger train speed decreased by 1.7 to 4.2 miles per hour, depending on the alternative case. The decrease in average train speed, for both the passenger and freight trains, is a result from the added meets between trains that cause delay.

The economic impact of integrating an additional daily passenger train into existing railroad operations was measured using the operating costs listed in Table 10-2. The train mileage cost of $51.23/mile is a representative industry cost that reflects rail operating expense per train mile. The run and delay time cost of $589.24/hour assumes that all train movements involve line operations (whereas yard operating expenses are $285.82 per hour). Since the terms of fuel contracts by the railroads are not available for this analysis, the cost of fuel is based on an average price of $3.33/gallon for low sulfur diesel delivered out of Houston.[1]

[1] Argus Diesel Fuel Prices, Argus Rail Business, Vol. 14, 16, April 2008.

Interest rates	
Nominal COC	9.08%
Inflation	2.40%
Operating Costs	
Real Cost of Capital (decimal)	6.68%
Train Miles ($/mi)	51.23
Run Time ($/hour)	589.24
Delay Time ($/hour)	589.24
Fuel ($/gallon)	3.33

Table 10-2: Railroad Operating Costs

Table 10-3 lists annual operating railroad conditions based on 24 14-day RTC simulation periods. Train miles, run time, delay time, and fuel consumption were converted to annual costs according to the list of costs provided in Table 10-2. Comparing the costs associated with Case A, B, and C to the base case indicates that the private sector would incur a cost over 20 years equal to $100 million, $107 million, and $89 million, respectively.

Private Sector Cost	Base Case	Case A	Case B	Case C
Train Miles (mi/14 days)	38,197	41,164	41,189	41,178
Train Miles (100 TM/14 days)	382	412	412	412
Run Time (hours/14 days)	2580.00	2846.40	2880.00	2812.80
Delay Time (min/100 TM)	36.20	45.10	47.70	40.40
Delay Time (hours/14 days)	230.46	309.42	327.45	277.27
Summary:				
Train Miles (mi/year)	916,728	987,936	988,536	988,272
Run Time (hours/year)	61,920	68,314	69,120	67,507
Delay Time (hours/year)	5,531	7,426	7,859	6,654
Value:				
Train Miles ($ million/year)	46.96	50.61	50.64	50.63
Run Time ($ million/year)	36.49	40.25	40.73	39.78
Delay Time ($ million/year)	3.26	4.38	4.63	3.92
Fuel (gal/14 days)	1,649,589	1,658,065	1,656,752	1,656,577
Fuel ($ million/year)	131.84	132.51	132.41	132.39
Annual Value ($ million/year)	218.54	227.75	228.41	226.72
Annual Benefit ($ million/year)		-9.21	-9.87	-8.18
Total 20-Yr Benefit ($ million)		-100.04	-107.17	-88.83

Table 10-3: Change in Rail Operating Costs for Additional Passenger Service

Evaluation of Existing Passenger Rail Systems

The potential for passenger rail in East Texas has been considered by evaluating the performance of currently operating systems. Table 10-4 provides a compilation of all ridership statistics reported by commuter rail authorities to the American Public Transit Association (APTA) for years 1996 through 2006.[2] These records were used

[2] APTA Ridership Report Statistics – United States Commuter Rail Agencies Index, American Public Transportation Association. Available at: www.apta.com/research/stats/ridership/riderep/indexcr.cfm.

to identify relatively new commuter systems with sustained operations throughout the 1996-2006 period, and which might share some correlation to proposals for commuter service in East Texas.

Selection of Rail Systems for Evaluation

Commuter rail systems were selected for analysis from Table 10-4 based on the completeness of ridership information throughout the most recent ten years of records filed with APTA, with particular emphasis on regions of the U.S. having a prolonged absence of local commuter rail service prior to activation of the current lines. This in effect excluded commuter systems in the northern Midwest and the Northeast since these areas have a rich history of ongoing passenger rail operations. For example, the Long Island Railroad of New York was chartered in 1834 and is the oldest railroad still operating under its original name. While the Regional Transportation Authority was formed in 1973 to provide financial support to the railroads for commuter service in the Chicago area, the Illinois Central Railroad had previously provided service over the same rail network with private funds as early as 1923. Other systems listed in Table 10-4 also have considerable commuter rail history, particularly those now operating on lines once owned by the famed Pennsylvania and the New York Central Railroads.

Urbanized Area / Location	Transit Agency / Authority	Service Name	Reported End-of-Year Ridership (millions)										
			1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Baltimore, MD	Maryland Transit Administration	MARC	4.61	4.80	4.79	5.12	5.50	6.01	6.03	6.58	6.80		
Boston, MA	Massachuesetts Bay Trans Auth	the T	27.53	29.06	34.05	36.37	36.73	37.55	40.57	40.36		37.98	38.31
Chicago, IL	Regional Transportation Authority	METRA	73.37	75.22	70.13	71.94	72.45	72.76	69.35	68.09	67.11	69.78	72.07
Chicago, IL	Northern IN Commuter Trans District	South Shore Line	3.32	3.39	3.37	3.49	3.61	3.77	3.59	3.57	3.54	3.80	4.21
Dallas, TX	DART / Fort Worth T	Trinity Railway Exp		0.31	0.57	0.67	0.84	1.48	2.25	2.26	2.16	2.23	2.41
Los Angeles, CA	Southern California RRA	Metrolink	5.69	6.31	6.75	7.23	8.06	8.52	8.74	9.10	9.79	10.26	10.80
Miami, FL	South FL Regional Trans Auth	Tri Rail	2.30	2.38	2.22	2.18	2.40	2.55	2.63	2.76	2.82	2.62	3.18
New Haven, CT	Connecticut DOT	Shore Line East	0.31	0.29	0.28	0.27	0.30	0.30	0.35	0.38	0.41	0.42	0.46
New York, NY	Metropolitan Transportation Authority	Long Island Railroad	98.80	96.54	98.54	101.62	104.67	105.72	100.17	98.47	96.99	98.16	98.75
New York, NY	Metropolitan Transportation Authority	Metro-North Railroad		64.06	66.49	68.57	71.74	72.92	73.22	72.57	72.26	74.27	76.53
New York, NY	New Jersey Transit Corporation	NJ Transit	48.01	50.93	54.08	57.53	62.34	63.89	61.13	60.15	63.59	66.95	70.95
Oakland, CA	Capitol Corridor Joint Powers Authority	Capitol Corridor	-	-	-	-	-	-	1.08	1.14	1.17	1.27	1.30
Philadelphia, PA	Pennsylvania DOT	PennDOT	0.16	0.23	0.20	0.21	0.21	0.20	0.21	0.23	0.24	0.26	0.31
Philadelphia, PA	Southeastern Pennsylvania TA	SEPTA	22.66	23.66	25.57	26.24	28.49	29.17	28.43	27.95	28.32	29.85	30.92
Portland, Oregon	Tri-County Met Trans District of Oregon	Max Light Rail	8.904	9.684	10.356	17.851	21.165	22.279	25.424	26.12	27.431	31.92	32.606
San Diego, CA	North San Diego County TD	Coaster		0.94	1.09	1.25	1.18	1.26	1.30	1.37	1.47	1.49	1.54
San Francisco, CA	Peninsula Corridor JPB	Caltrain	7.77	8.37	8.64	8.99	10.27	10.50	8.98	8.22	8.43	9.87	10.51
San Jose, CA	ACE Joint Powers Authority	Altamont Comm Exp					0.73	0.92	0.74				
Santa Fe, NM	NM DOT	Rail Runner Exp	-	-	-	-	-	-	-	-	-	-	0.26
Seattle, WA	Sound Transit	Sounder					0.09	0.57	0.67	0.72	0.90		
Washington, DC	PTRC / NVTC	VA Railway Exp	1.83	1.60	1.61	1.86	2.23	2.61	3.06	3.36	3.71	3.73	3.51

Table 10-4: Reported Annual Ridership on Commuter Rail for Years 1996 to 2006

Commuter systems in Table 10-4 having little reported revenue history include the Altamont Commuter Express (San Jose, CA), the Capitol Corridor (Oakland, CA), Sounder (Seattle, WA), and the newly started Rail Runner Express (Santa Fe, NM). Portland's MAX light rail system has been included in APTA records due to its strong ridership, its position as a stand-alone facility, and its commonalities with commuter rail as an intercity system. As a result of the criteria for selecting systems for comparison, those most appropriate for evaluation with respect to the prospect of implementing commuter rail in East Texas are the following:

- Metrolink – Los Angeles area
- Caltrain – San Francisco area
- MAX – Portland
- Tri Rail – Miami
- Virginia Railway Express (VRE) – Northern Virginia
- Coaster – San Diego
- Trinity Railway Express (TRE) – Dallas-Fort Worth

Ridership Comparisons

Annual ridership volumes for the commuter rail systems above are plotted in Figure 10-1. While this information by itself does not reflect the magnitude of capital investment required to achieve the reported ridership volumes, it does provide a comparison of usage rates among systems. Ridership volumes for Portland's MAX system are much higher than those for the traditional commuter rail systems as might be expected for a more localized light rail facility. Even though the MAX system provides intercity rail service, the average passenger trip length is only 6 miles. Table 10-5 lists the average trip length for each commuter rail system in 2006, showing that average trip length for the other systems are typically four to six times greater than that of MAX.

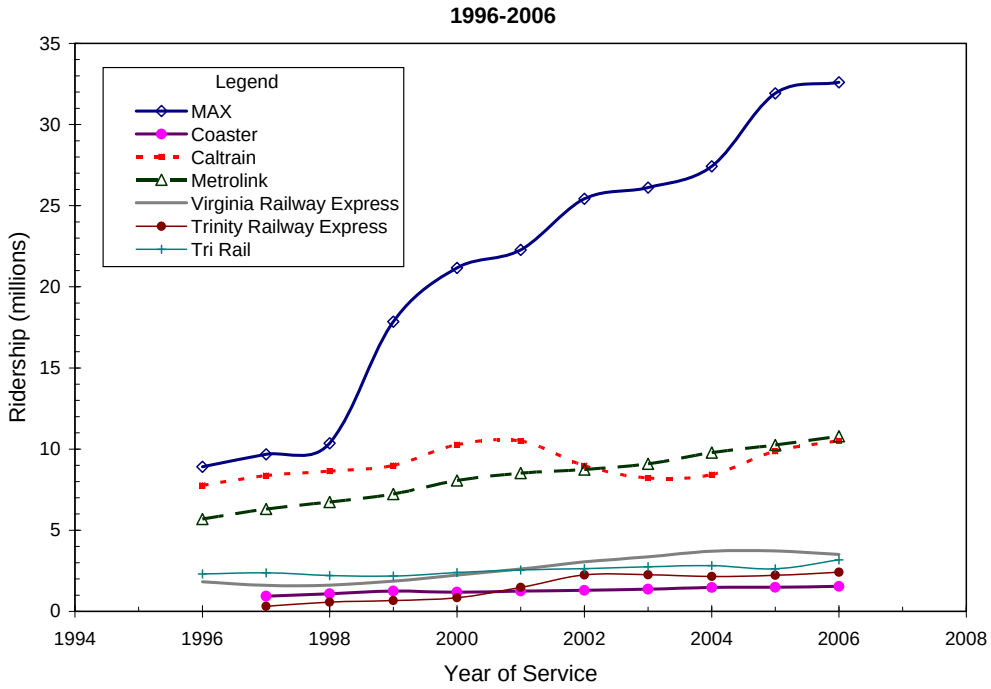


Figure 10-1: Commuter Rail Ridership for Years 1996 to 2006

The large annual increases in MAX ridership volumes (Figure 10-1) are attributable to the opening of new line segments in 1998, 2001 and 2004 subsequent to activation of its original line from Portland to Gresham in 1986. The ridership trend of Caltrain, on the other hand, has been greatly influenced by the economic collapse of the high-tech industry in the Silicon Valley. From March 2000 to October 2002, the NASDAQ composite index had fallen from 5046.86 to 1114.11, and ensuing declines in employment, retail sales, and real estate values throughout the southern San Francisco Bay area were met with proportional declines in commuter rail ridership.[3]

Commuter Line	Average Trip Length (miles)	2006 Ridership (millions)	Total Travel (million trip-miles)
Metrolink	35	10.80	378.00
Caltrain	24	10.51	252.24
Max	6	32.61	195.64
Tri Rail	35	3.18	111.30
VRE	25	3.51	87.75
Coaster	28	1.54	43.12
TRE	16	2.41	38.56

Table 10-5: Commuter Rail Trip Lengths and Passenger Miles

[3] NASDAQ composite index 10-year history available at: money.cnn.com/quote/chart/chart.html?symb=nasdaq&sid=3291&time10yr&Submit1=Refresh.

The average passenger trip lengths per commuter rail system shown in Table 10-5 are useful in understanding the relative contribution each system makes toward fulfilling the need for public transportation. Average trip lengths in 2006 have been multiplied by 2006 ridership volumes in order to approximate the total passenger miles provided by each system. Figure 10-2 plots the overall usage for each commuter rail system in 2006, showing that Metrolink provides by far the greatest amount of total commuter service, and that MAX, despite its substantial ridership volumes, essentially represents a median level of commuter service among those investigated.

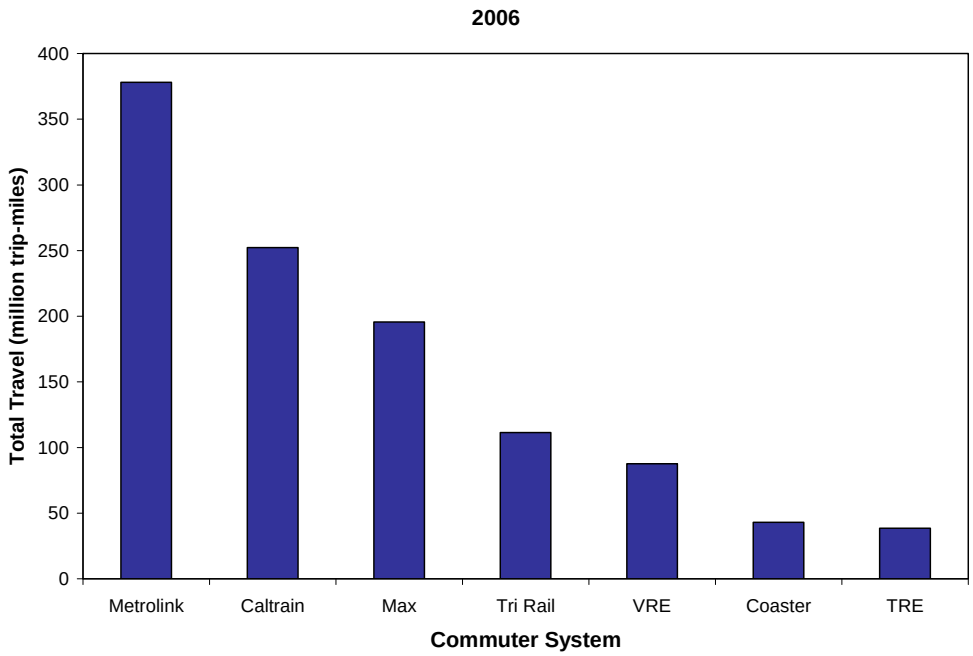


Figure 10-2: Comparison of Total Passenger Miles in 2006

The travel patterns, or average trip lengths, of commuters for each system are likely to have remained somewhat constant throughout the 1996-2006 period, which suggests that the ridership histories shown in Figure 10-1 can be converted to approximate annual passenger miles using the trip lengths reported for 2006 in Table 10-5. Figure 10-3 plots this data transformation for each commuter rail system, and shows the assumed contribution of each system to public transportation over the last decade. Figure 10-3 contrasts the resilience of Los Angeles-based Metrolink's performance to that of San Francisco-based Caltrain, even though annual passenger miles for each system were similar at the beginning of the study period. Caltrain has been able to restore passenger trips to pre-2002 volumes in part by launching its Baby Bullet service, which limits the number of stops to a few stations for specific San Jose-San Francisco trains.

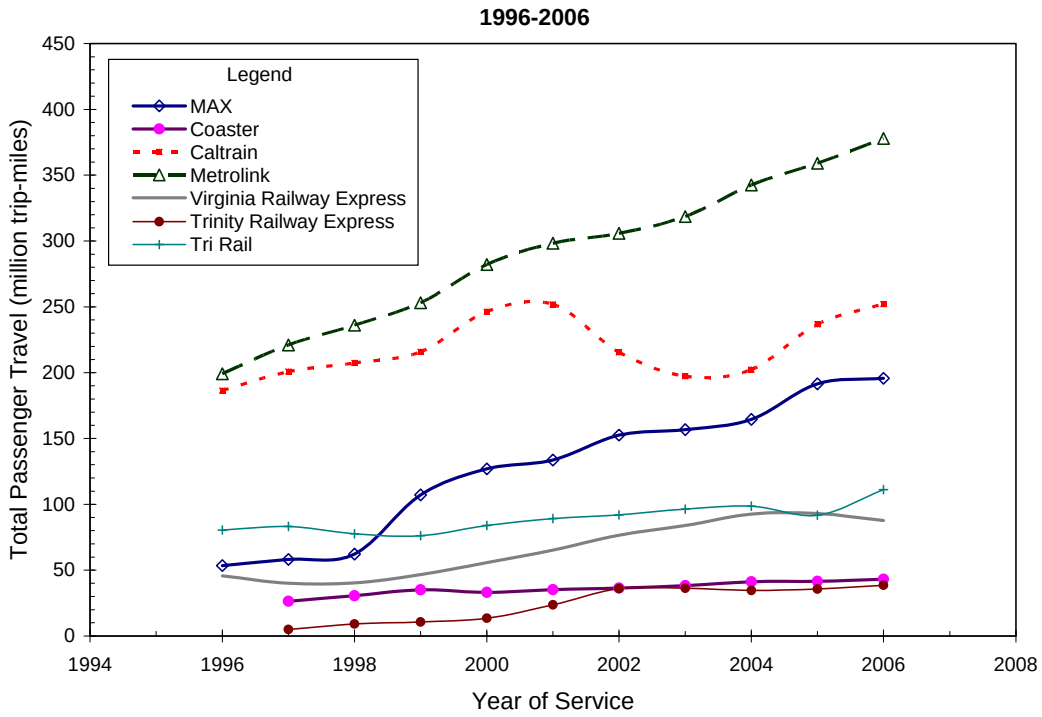


Figure 10-3: Commuter Rail Passenger Miles for Years 1996 to 2006

Overall, Metrolink and Caltrain have the greatest impact on passenger travel, whereas Coaster and the TRE show the least total usage of those systems evaluated. Dallas-Fort Worth's TRE might be expected to handle a larger number of passenger miles than Miami's Tri Rail since the TRE connects two major metropolitan areas. Despite Tri Rail service running between Miami and the much smaller city of Fort Lauderdale, this system currently handles about three times the number of total passenger miles as that of TRE.

Coverage of Operating Costs

Revenue and operating expense data for each commuter rail system in 2004 are shown in Table 10-6.[4] The expense coverages shown in this table indicate that the majority of these commuter systems generate enough revenue to cover about 30 to 50 percent of operating costs. Revenues and operating expenses for TRE are reported according to the cash flows of its joint owners; in total, these cash flows result in an expense coverage of only 6.4 percent, so approximately 94 percent of the cost of operations must come from sources other than passenger fares.

[4] APTA Commuter Rail Transit Agencies Vehicle and Financial Data, American Public Transportation Association. Available at: www.apta.com/research/stats/rail/crfinance.cfm.

Commuter Line	Revenue ($ million)	Operating Expense ($ million)	Expense Coverage (%)
Metrolink	44.6	99.5	44.8
Caltrain	18.4	59.7	30.9
Max	19.8	57.0	34.8
Tri Rail	6.4	25.2	25.4
VRE	16.9	35.8	47.3
Coaster	5.2	14.0	37.5
TRE	1.6	25.0	6.4

Table 10-6: Revenue and Operating Expenses for 2004

Descriptions of Commuter Rail Systems

Previous sections have shown that the ridership volumes, average trip lengths, and ability to cover operating costs vary among commuter rail systems. The following sections provide organizational and operating details of each system so that their relative performance can be better understood.

Metrolink (Los Angeles Area)

The Southern California Regional Rail Authority (SCRRA) is a five-county joint powers authority created to build and operate the Metrolink commuter rail system. Metrolink provides service over seven routes to 55 stations throughout the Los Angeles area, including a new station opened September 2007 at Buena Park; all but seven of these stations are owned and operated by local municipalities. Station locations on each commuter line are shown in Figure 10-4. With distances between stations on these lines averaging as much as 10 miles (Table 10-6), train speeds throughout the system average 40 miles per hour.[5] SCRRA notes that its system has the highest ridership of any commuter system in California and is the fifth largest in the United States.[6]

Metrolink surveys have shown that about 90 percent of ridership is comprised of work-related commutes, and that the average one-way distance from home to work for these riders averages 35 miles; 70 percent of these riders range in age from 35 to 64 years old. Ridership projections for this system suggest that ridership is expected to growth by 5.7 percent each year from 2010 to 2030. In 2004, ridership revenue and operating costs were $44.6 million and $99.5 million, respectively, yielding a 44.8 percent operating coverage rate.

[5] Metrolink Fact Sheet, Metrolink Communications & Development Department, 2007.
[6] SCRRA Strategic Assessment, Southern California Regional Rail Authority, January 26, 2007.

Figure 10-4: Branch Lines and Station Locations for the Metrolink System

There are currently 441 at-grade crossings and 346 grade separated crossings on the 388-mile Metrolink system. SCRRA has implemented a Sealed Corridor program, beginning with a 26.5-mile segment of the Antelope Valley line and 32-mile segment of the Ventura County line.

Commuter Line	Distance Between Stations (miles)	Average Train Speed (mph)
San Bernadino	4.7	37
Ventura County	6.4	40
Orange County	7.3	42
Inland Empire	7.2	39
91	8.8	39
Riverside	9.8	41
Antelope Valley	7.7	40

Table 10-6: Commuter Line Operational Features

Forecast of Service Requirements

SCRRA's 2007 Strategic Assessment predicts continued growth in demand for commuter rail, while acknowledging that future service must adapt to changes in the spatial distribution of residential and economic centers and in consumer expectations. A key factor to meeting the anticipated demand for service is

Metrolink's ability to increase operations over BNSF and UP infrastructure throughout the area.

The success of Metrolink service has relied on capturing a disproportionate share of the long distance commuter market. In fact, Metrolink's creation coincided with the relatively modern phenomenon of extreme commuting, which is defined by the Census Bureau as commuting times that consume more than one month out of every year. Census data indicates that one in eight commuters was classified as an extreme commuter in 1990, but that number has growth to represent one in six commuters today.

SCRRA anticipates that long distance commutes will continue to grow as more families search for affordable housing further away from employment centers, and as the growth in dual income households persist (i.e., the chance of residing near work is smaller with two workers per household). The growing demand for residential and commercial property has also limited the amount of land available around commuter stations, making the expansion of existing stations difficult. Currently, 70 percent of passengers access Metrolink commuter stations in single-occupant vehicles, contributing to a condition where 45 percent of all station parking lots operate at or near capacity.

SCRRA is concerned that an increase in fuel costs over time will threaten the financial performance of Metrolink, though this should be offset to some degree by a related increase in ridership as commuters switch from automobile to rail. Also, differences in funding capacity among member agencies could constrain their overall ability to improve county-specific line segments that would contribute to overall system performance.

Caltrain (San Francisco Peninsula)

Caltrain is a 77-mile commuter rail that provides service to 34 stations along the San Francisco Peninsula and the Santa Clara Valley in California. The Peninsula Corridor Joint Powers Board (PCJPB) administers Caltrain with funding provided by the City and County of San Francisco, the San Mateo County Transit District, and the Santa Clara Valley Transportation Authority.

Public sector support of the Caltrain line began in 1980 when the California Department of Transportation (Caltrans) entered into a purchase-of-service agreement with Southern Pacific Railroad to preserve the commuter service that the railroad had earlier filed with the state Public Utilities Commission to terminate.[7] In 1991, the PCJPB purchased Southern Pacific's mainline from San Francisco to San Jose and acquired perpetual trackage rights beyond San Jose to the town of Gilroy (see Figure 10-5). Caltrain service officially began in 1992 when the PCJPB assumed control of the commuter line from Caltrans and contracted with the

[7] Caltrain Comprehensive Annual Financial Report, For Fiscal Year Ended June 30, 2004, Peninsula Corridor Joint Powers Board. Available at: www.caltrain.org/pdf/CAFR/CAFR2004.pdf.

National Railroad Passenger Corporation (Amtrak) to perform as operator; this contract currently extends through June 2009.[8]

Caltrain currently runs 96 total weekday trains and began offering express service on 22 of these trains between San Jose and San Francisco in 2004. Commuter service on the express, or Baby Bullet, trains was made possible by constructing bypass tracks at Brisbane and Sunnyvale, and adopting a new centralized traffic control system. Trips on the San Jose-to-San Francisco Baby Bullet reduce commuter times by 33 minutes to an average of 57 minutes by stopping at only 5 out of 21 intermediate stations and, thereby, maintaining its 79 mph maximum speed over longer durations.

The popularity of Baby Bullet train service has made parking at some stations filled to capacity, forcing some riders to use public transportation (i.e., bus, light rail, or even carpooling) to access Caltrain stations. The increase in overall demand for service has required Caltrain to construct additional parking spaces at commuter stations, including some temporary off-site locations. Construction has also been completed (2004-2007) on a centralized equipment and operations facility at a former Southern Pacific rail yard in San Jose in order to consolidate separate facilities and provide for a more efficient maintenance process.

Forecast of Service Requirements

Economic growth along the Peninsula has caused the demand for transportation to exceed the region's ability to increase roadway capacity. Constraints on the availability of right-of-way, and further displacement of residences, businesses and natural resources, limit the prospect for highway expansion to address projected travel demands. Caltrain hopes to benefit from its position as a transportation corridor by meeting the needs of commuters that automobile travel will be unable to fill.

Caltrain hopes to become the preferred mode of travel along the Peninsula by providing a "world-class" travel experience, serving as a catalyst for redevelopment and economic activity, and providing mobility management throughout the Bay area. As part of this agenda, Caltrain has plans to enhance station access, passenger comfort and operational efficiencies.

Among Caltrain's longer term plans for capital investment are a San Francisco downtown extension of service to the Transbay Terminal for easier access to the city, conversion of diesel-electric to fully electric locomotive power, and the construction of a rail corridor along Dumbarton Bridge that improves commutes between the East Bay and the southern San Francisco peninsula.[9] Currently, plans are underway to electrify the rail line from San Francisco to Gilroy under the Caltrain

[8] Caltrain Comprehensive Annual Financial Report, Fiscal Year 2006, Peninsula Corridor Joint Powers Board. Available at: www.caltrain.org/pdf/CAFR/JPB_CAFR2006.pdf.
[9] Environmental Assessment/Draft Environmental Impact Report, Caltrain Electrification Program, Peninsula Corridor Joint Powers Board, 2004.

Rapid Rail Program, which is expected to increase the frequency, capacity and reliability of the system while reducing commuter travel times. As part of this program, facility rehabilitation and improvement projects are being implemented in ways that integrate existing needs with the requirements of an electrified system.

Figure 10-5: Caltrain Stations and Route

MAX (Portland, Oregon)

The Tri-County Metropolitan District of Oregon (TriMet) is a public agency that operates mass transit systems throughout the Portland area. TriMet operates the Portland area's MAX light rail line, which began to reestablish the existence of passenger rail starting in 1986 after the last interurban system was disbanded in the late 1950s.[10] The MAX light rail system has been included in the evaluation of existing commuter rail systems due to its resemblance to intercity commuter rail operations.

The Blue Line shown in Figure 10-6 consists of the 15-mile Eastside MAX extending from Portland to Gresham and the 18-mile Westside MAX extending from Portland to Beaverton and Hillsboro, with construction completed in 1986 and 1997, respectively. The 5.8-mile Yellow Line (Interstate MAX) was completed in 2004, and construction of the 8.3-mile I-205/Portland Mall MAX is scheduled for completion in

[10] Oregon Transportation Plan Update: Commuter Rail in Oregon, Oregon Department of Transportation, 2003.

2009. Each of these lines has primarily been funded with Federal money, with the remainder coming from local sources.[11]

Figure 10-6: TriMet Passenger Rail Routes

Forecast of Service Requirements

TriMet actively promotes higher density residential development near rail corridors through its transit oriented development (TOD) program. TriMet TOD staff currently serves on technical advisory committees at the local, regional and national levels to provide advocacy and expertise in planning efforts that lead to development around transit centers. As part of this effort, TriMet surplus property and funds have been used to construct several affordable housing projects near MAX stations.[12] TriMet is also involved with private developers, the community college system, and other enterprises in the selection of sites for future light rail stations.

The Federal Transit Administration approved a Full Funding Grant Agreement in October 2007 for a project that will expand TriMet's passenger rail system to include commuter rail. Construction is underway on a $117.3 million, 14.7-mile commuter rail system that will share track with the Portland & Western Railroad in eastern Washington County, generally north-south along the I-5/ Hwy 217 corridor. This line will include five stations and serve the towns of Wilsonville, Tualatin, Tigard, and the connection to the light rail system at Beaverton.[13] The commuter rail project will include the construction of four new park & ride facilities with a total of 800 parking spaces to accommodate the growing number of people who both live and work along the corridor.

[11] TriMet Fact Sheet, October 2006.
[12] TriMet Fiscal Year 2008 Transit Investment Plan.
[13] Washington County Commuter Rail Project, *Partnership Brings Oregon's First Commuter Rail Line Closer to Reality*, Tri-County Metropolitan District of Oregon, May 2007.

Tri Rail (Miami)

Tri Rail began in 1987 as a three-year, $118 million project of the Florida Department of Transportation (FDOT) to provide temporary commuter rail service while the state completed construction work to widen Interstate 95. The original 81-mile commuter line, managed by the Tri-County Commuter Rail Authority, operated on CSX's Miami Subdivision from Miami to West Palm Beach (see Figure 10-7), and was purchased by the state in 1988 for $264 million in order to continue servicing the South Florida area. This purchase included an operating right-of-way approximately 100 feet wide, 100 out-parcels adjacent to the corridor suitable for development, 83 buildings, and all railroad track, signals, bridges, and sidetrack. Also included were 20 miles of branch line with a 50-foot right-of-way, yard and industrial sites, and station sites in Miami's central business district.[14] As part of the purchase agreement CSX continued to provide dispatch and maintenance service throughout the rail corridor.

Legislation was passed in 2003 to transform the Tri-County Commuter Rail Authority into the South Florida Regional Transportation Authority (SFRTA) for the purpose of creating an entity capable of coordinating, developing, and overseeing the region's overall transportation system.

On August 2, 2006, Florida Governor Jeb Bush announced an agreement in principal between FDOT and CSX providing for the transfer of operational control of the rail corridor to the state. The intent of this agreement is to improve the reliability of Tri Rail service by controlling all dispatch and maintenance operations along the line between Miami and West Palm Beach. [15] This agreement also allows for cooperation between parties for commuter service to be extended from Miami International Airport to the rail line's terminus in Homestead.

SFRTA completed its Double Track Corridor Improvement Program in 2006 with completion of the Segment 5 Project. The $338 million cost of this program was funded by the Federal Transit Administration, FDOT, Broward, Miami-Dade, and Palm Beach Counties, and local sources. This project allowed for the Tri Rail service schedule to increase from 30 to 40 trains per day. Then, in April 2007 SFRTA completed a 55-foot tall, 2-mile rail bridge over the New River, which further increases capacity of the newly double tracked line from 40 to 50 trains per day. This 4.5-year, $78 million project eliminates the need for Tri Rail to operate over a bascule bridge that required trains to yield to high volumes of boat traffic.[16] As a result of these investments, SFRTA implemented an enhanced Tri Rail schedule on

[14] South Florida Rail Corridor Grade Crossing Memorandum, announcement to prohibit all new non-rail grade crossings on the South Florida Rail Corridor, Florida Department of Transportation, August 17, 2006.
[15] SFRTA press release, Governor Bush Announces Agreement in Principal with CSX Transportation to Turn Tri Rail Operation Over to the State, August 2, 2006.
[16] South Florida RTA Completes New River Bridge, Progressive Railroading Online, April 17, 2007. Available at: www.progressiverailroading.com/transitnews/article.asp?id=10539.

June 4, 2007 that increased service from 40 to 50 trains each weekday, and provides an additional 20 and 30-minutes of headway during peak travel times.[17]

As part of the goals and objectives in SFRTA's original 2005 Transit Development Plan, the Tri Rail passenger information system has been upgraded with real-time message boards and internet-based train tracking systems.[18] SFRTA has also retained the services of the South Florida Regional Planning Council and the Treasure Coast Regional Planning Council to assist with initiatives to attract transit-oriented development and to participate in discussions with local governments regarding land use designations around Tri Rail stations.

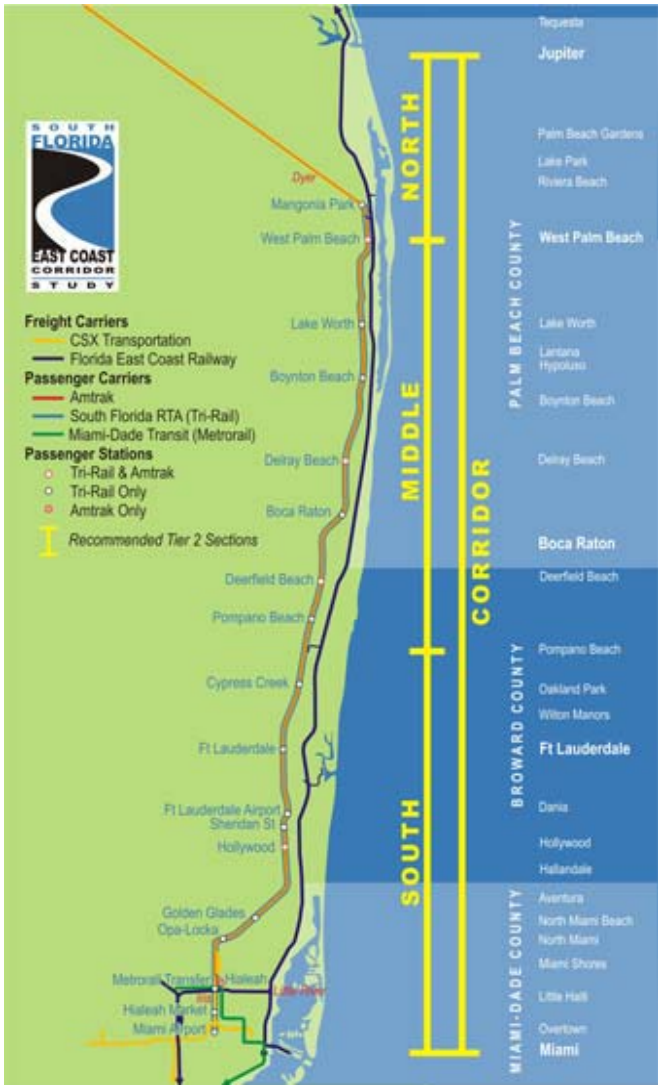


Figure 10-7: South Florida East Coast Rail Corridor

[17] Tri Rail General Announcements, South Florida Regional Transportation Authority, May 30, 2007. Available at: www.tri-rail.com/announcements.htm.

[18] South Florida Regional Transportation Authority Transit Development Plan, FY 2007-2012, July 2007.

Forecast of Service Requirements

Field observations were conducted at all 18 Tri Rail commuter stations in 2006 to evaluate parking demand during peak hours and to assess their overall quality of amenities.[19] Parking facilities at five of these stations currently exceed 90 percent of capacity, and expected regional population growth and commuter rail demand have created immediate capital improvement needs for the system.

SFRTA is currently working to meet the future transportation needs of South Florida by coordinating with local governments to develop land use initiatives that lead to transit oriented development near Tri Rail stations and to form public-private partnerships for rail facility development.

Since the Tri Rail system operates on the former CSX line to the west of I-95, plans are currently being pursued to develop a second commuter rail line on the Florida East Coast (FEC) railroad track to the east of I-95. FDOT is conducting an alternatives analysis study for an 80-mile segment of this line from Miami to Jupiter for the purpose of adding significant volumes of passenger rail capacity along the densely populated southeast coast of Florida. With Tri Rail's new infrastructure in place, the state is assessing the potential for providing local passenger rail service on the FEC line and reserving the CSX corridor for limited stop or express trains.

Virginia Railway Express (Northern Virginia)

The Virginia Railway Express (VRE) was founded in 1992 and operates as a joint venture between the Northern Virginia Transportation Commission and the Potomac and Rappahannock Transportation Commission, representing counties and municipalities throughout the service area.[20] Rail service primarily serves to meet the needs of commuters from the northern Virginia suburbs to the Washington DC central business district and to employment centers in Crystal City and Alexandria, Virginia (see Figure 10-8). Weekday service consists of 32 trains per day operating over two branch lines that consist of 90 route miles and 18 stations.

[19] Tri-Rail Parking and Circulation Study, South Florida Regional Transportation Authority, August 2007.

[20] Virginia Railway Express Financial Statements, Years Ended June 30, 2006 and 2005.

Figure 10-8: Branch Lines and Station Locations for the Virginia Railway Express

The Fredericksburg line uses the CSX mainline that runs between Fredericksburg north to Washington DC, and the Manassas line extends west from Alexandria to Manassas using the Norfolk Southern mainline. The two branch lines join at AF Interlocking in Alexandria and share right of way for 9.6 miles into Washington DC to access commuter stations within the central business district.[21]

VRE service focuses heavily on transporting suburban commuters to and from one of four stations in the Arlington-Washington DC urban core. Other than morning and evening peak commuting times, non-peak service is restricted to an early return trip from Washington DC over each line and two limited stop reverse-direction trains on the Manassas line during peak times.

Forecast of Service Requirements

Growth in public and private sector activity within Washington DC has increased commuter demand between the capital and northern Virginia suburbs to the extent that VRE operates near capacity on both the Fredericksburg and Manassas lines. Despite the need for additional capacity, train volumes are currently limited to a 32 train per day maximum based on a memorandum of understanding among VRE, the

[21] Virginia Railway Express Strategic Plan 2004-2025, May 2004.

Virginia Department of Transportation (VDOT), and CSX Transportation.[22] Consequently, increased capacity must be achieved by adding coaches to each train until such time as capital projects increase line capacity. Even then, a current lack of mid-day train storage in Washington Terminal precludes the addition of commuter trains, and VRE's mid-day storage space at Coach Yard has reached its11 trainset maximum.

The need for additional capacity has been addressed in 2006 with an approval for financing the largest fleet purchase in VRE history. New coaches will replace aging and leased equipment, and will increase the passenger capacity of existing trains. VRE has also completed construction on a new $26 million double track bridge across Quantico Creek to improve service on the Fredericksburg line. This project was completed in cooperation with CSX and represents VRE's largest investment in track work to date.[23]

The demand for parking at one half of VRE commuter stations had reached capacity by March 2004. While this capacity has been increased at some stations, continued growth in suburban areas led to increased competition for available spaces. As a result, parking lots continued to reach capacity sooner and forced commuters to either arrive for earlier and earlier trains or abandon the commuter system altogether. The need for potential passengers to compete for parking spaces and trains, coupled with reduced operating speeds during track maintenance and heat restrictions (i.e., to detect bends in the track), has led to reductions in ridership during the last few years of operation.

Coaster (San Diego)

The North San Diego County Transit Development Board was created by California Senate Bill 802 in 1975 to provide an integrated regional public transit service, and was renamed the North County Transit District (NCTD) in 2006.[24] The San Diego Coast Express Rail (Coaster) commuter rail system is administered by NCTD through a subsidiary corporation, the San Diego Northern Railway (SDNR), created to manage the mainline NCTD purchased from the Atchison, Topeka and Santa Fe in 1994.[25] NCTD's ownership of this coastal rail corridor consists of a 41-mile segment extending from the City of San Diego's northern boundary to the Orange County border (see Figure 10-9). NCTD maintains a rail yard in San Diego for the storage of train sets during the day, and a maintenance yard shared with Metrolink north of Oceanside.

Coaster commuter rail service operates between Oceanside and San Diego over track owned by NCTD plus track within the City of San Diego owned by Metropolitan

[22] Virginia Railway Express Strategic Plan 2004-2025, May 2004. Available at: www.vre.org/about/strategic/CoverSheet.pdf.
[23] Virginia Railway Express Financial Statements for the Years Ended June 30, 2005-2006. Available at: www.vre.org/about/financial_statements.htm.
[24] North County Transit District Operating Budget for Fiscal Year 2008, June 2007.
[25] North County Transit District Fact Sheet. Available at: www.gonctd.com/info/factsheets/NCTD_FactSheet.pdf.

Transit Systems. This system serves eight commuter stations with 22 trains each weekday and eight trains on Saturdays, and typically travels the entire route under one hour.

Forecast of Service Requirements

Ridership on Coaster in Fiscal Year 2007 is expected to grow by 3.2 percent over the previous year, partly due to the opening of a new Oceanside Transit Center parking garage in April 2006 that provides an additional 450 parking spaces at the station.[26] A new 22-mile light rail line (Sprinter) is currently under construction on the Santa Fe's former Escondido branch line that is also projected to increase rider ship on Coaster. This line was fully by Congress under a Full Funding Grant Agreement, and is scheduled for completion in late 2007.

Figure 10-9: Station Locations for the Coaster System

Trinity Railway Express (Dallas-Fort Worth)

The Trinity Railway Express (TRE) is a single 34-mile commuter line providing service between downtown Dallas and downtown Fort Worth with intermediate station locations shown in Figure 10-10. This system is jointly owned by Dallas Area Rapid Transit (DART) and the Fort Worth Transportation Authority (the T) pursuant to an Interlocal Agreement.[27] Service levels and budgets are submitted for approval to a TRE Advisory Committee, which is comprised of the board members from DART and the T.

[26] NCTD Amended Operating Budget Summary, Fiscal Year 2007, North County Transit District. Available at: www.gonctd.com/info/2007obs.pdf.

[27] Dallas Area Rapid Transit FY 2007 Business Plan. Available at: www.dart.org/debtdocuments/BusinessplanFY07.pdf.

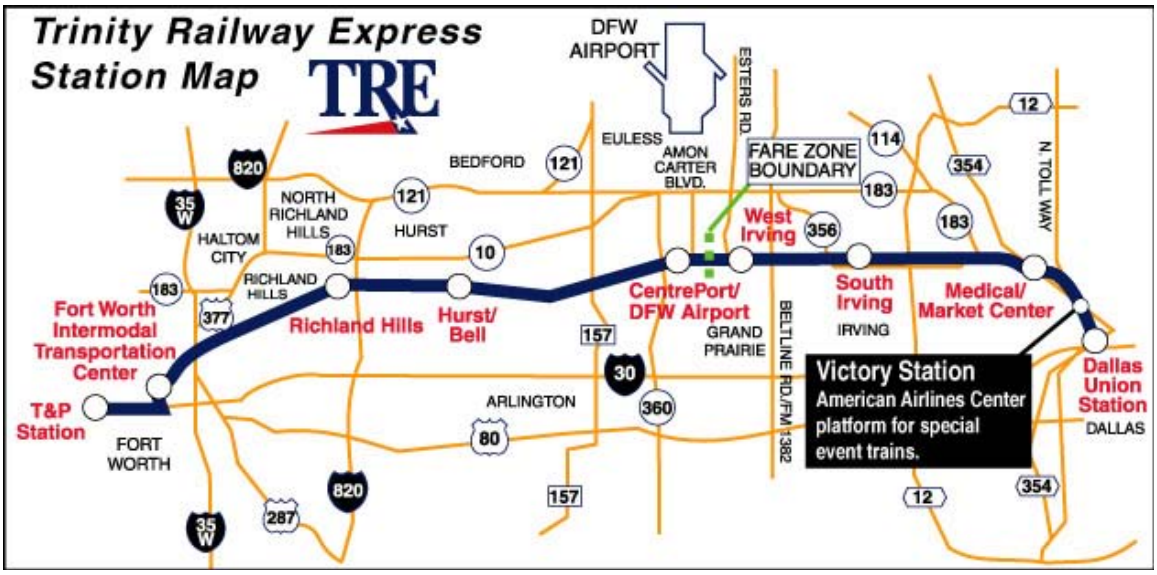


Figure 10-10: Station Locations for the Trinity Railway Express

TRE typically operate 50 trains each weekday and 22 trains on Saturday, but usually no trains on Sundays. Train speeds average 45 mph on this commuter line, where there are nine commuter stations and one-way passenger trip lengths average 16 miles.

DART and the T have operational jurisdiction extending throughout their respective counties on a rail line previously owned by the Cities of Dallas and Fort Worth as a result of acquiring mainline from a trustee of the bankrupt Rock Island Railroad in 1983. The administrative cost of operating TRE (i.e., costs net of operating revenues) is shared between DART and the T based on revenue seat miles operated in the respective county of each authority.[28] Capital for commuter stations and track storage areas are provided separately by DART and the T according to their respective counties. TRE connects to an extensive light rail system in Dallas at Union Station, and feeds into a bus system operated by the T in Fort Worth.

Forecast of Service Requirements

TRE's capital improvement plans have been targeted toward double tracking the corridor for greater system efficiency and safety, maximizing Class 4 track to increase track speeds and reduce commuter times, providing 30-minute headway to attract riders, and installing 4-quadrant gates to create a secure system and facilitate the creation of quiet zones.[29] Proposed extensions to TRE system are under review, though capital improvement projects through 2008 mainly consist of double-tracking sections of the existing line, constructing new sidings with bridges, and replacing bridges and mainline track.

[28] Dallas Area Rapid Transit Financial Statements Years Ended September 30, 2005-2006. Available at: www.dart.org/debtdocuments/investorinformation.asp?zeon=investorinformation.
[29] Regional Rail Corridor Study, North Central Texas Council of Governments, July 29, 2005.

Implementing Commuter Rail

Viable commuter rail service must be capable of matching or exceeding the overall performance of automobile travel in its cost, accessibility, total commute time, and degree of safety. These features are essentially measures of system performance that distinguish each system and reflect the circumstances in which they operate. By examining the performance of commuter rail systems currently in operation, strategies and expectations for commuter rail service in East Texas can be formulated in a way that benefits from past experience.

From a planning standpoint, the viability of commuter rail service should be assessed relative to roadway travel in its ability to adapt to evolving geographic and demographic conditions in urban areas. Moreover, commuter rail should be judged by its ability to transform residential and commercial growth patterns toward more livable and sustainable conditions.

The fact that existing rail corridors are mainly owned by the private sector implies that the implementation of commuter service will require some degree of public-private cooperation. Whether the public sector might acquire an existing rail corridor in fee title or gain trackage rights through negotiation, these corridors will likely be shared-use facilities into the foreseeable future; and case studies of commuter rail shows that the terms of shared-use have a significant impact on system performance.

Lastly, public-private cooperation in commuter rail projects now includes interaction among planners, public agencies and developers intending to influence residential growth patterns toward development that creates demand for commuter rail services. With each of these issues in mind, the commuter rail systems presented earlier are reviewed from the following perspectives:

- Shared-use cost allocation
- Commuter system performance
- Value creation

Shared-Use Cost Allocation

Public sector interest in developing commuter rail systems happens to coincide with an increased demand for freight rail services on a fixed railroad network. Though the proposition of financing rail relocations with public funds may not have made economic sense at one time, relocating some freight rail activities to new locations might be the only feasible way to implement passenger service. In doing so, public agencies may be able to capitalize on the benefits of relocated freight rail operations while creating new transportation facilities for passengers.

The expenditure of public funds toward investments in new freight rail infrastructure will likely be the result of negotiations for public use of existing rail corridors. Contractual terms may grant the public sector rights ranging anywhere from limited access to full ownership of these facilities. Under any conditions other than full

public ownership of a rail line, the operation of commuter rail will expose agencies to a series of issues related to the allocation of operating and maintenance costs for a shared-use facility. Federally funded research has identified several cost allocation methods common to cooperative commuter-freight rail agreements.[30] These cost allocation methods include:

- Avoidable Cost – The secondary user (tenant) incurs only those costs that could be avoided if their service was not provided. This incremental cost method places a greater burden on the primary user (owner) since they incur all common costs.
- Attributable Cost – Each user is assigned their share of incremental costs plus a proportion of common costs. This method includes fully allocated costs, which assigns 100 percent of common costs to each party's share of track use.
- Variable Costs – Total cost is distributed in proportion to facility use according to a specific operating measure (e.g., train-miles, ton-miles, passenger-miles, etc.)

Shared-use rail agreements must also consider costs associated with activities other than maintenance and operations. There are costs incurred when one party cannot meet train schedules or must forego the opportunity to earn greater revenue due to trackage rights held by a second party. These costs can be summarized as:

- Performance Costs – Penalties or incentives are assigned to the owner/operator according to the on-time performance of the tenant.
- Congestion Costs – Pricing is based on revenue foregone by the owner due to trackage rights obligations to the tenant.

Importance of Cost Allocation Agreements

Negotiations for trackage rights on shared-use rail corridors can take most any form, though the importance of a well-planned agreement can be demonstrated in a few simple examples. In the first case described below, Metrolink's exposure to added costs through a poorly defined avoidable cost method of cost allocation is discussed. The second case illustrates how VRE was exposed to the loss of revenue in the absence of a performance-related agreement.

Metrolink. Part of the Metrolink system consists of former Santa Fe Railroad infrastructure that was purchased by the SCRRA, which then granted the railroad trackage rights in exchange for payment of track maintenance costs incurred as the result of their freight rail operations (i.e., avoidable costs). Payments to SCRRA were based on an agreement to estimate costs based on the Santa Fe's historic maintenance cost data, and then inflate this baseline cost data according to a price indicator agreed to by both parties. Without anticipating the arrival of 286,000-pound

[30] Research Results Digest 313, *Cost-Allocation Methods for Commuter, Intercity, and Freight Rail Operations on Shared-Use Rail Systems and Corridors*, National Cooperative Highway Research Program, February 2007.

rail cars, SCRRA was unable to restrict the use of these cars on Metrolink track and, thus, was not in a position to recover the added maintenance costs imposed by heavier railcars.

Virginia Railway Express. VRE negotiated trackage rights with CSX and Norfolk Southern on a per-train-mile basis with no incentive or penalty payments related to on-time performance of commuter trains. As a result, when track maintenance and heat restrictions disrupted commuter service on the Fredericksburg line over the last few years, VRE received no payments from CSX to compensate for the loss of ridership.

Cost Allocation Methods in Industry Practice

The federally funded research on cost allocation methods for cooperative commuter-freight rail agreements also summarized earlier industry observations related to the negotiation of costs among parties.[31] Among these findings were the following:

- The choice of cost allocation method is a major facet of operating agreement negotiations.
- The avoidable cost method is usually most favorable to the secondary party, while attributable and variable cost methods are usually most favorable to the primary party.
- Contracts specifying avoidable costs are more difficult to obtain and are acceptable to the primary party only when traffic of the second party is relatively small.
- The availability of data influences decisions on the type of cost allocation method and other compensation measures.
- Operating agreements usually consist of a combination of cost allocation methods.

Commuter System Performance

The review of selected commuter rail systems in previous sections alludes to some important issues relevant to the viability of commuter rail in East Texas. These systems must match or exceed the expectations of commuters relative to automobile travel. Automobiles are generally at commuters' disposal, and trip times by this mode serve as a benchmark by which other travel options are measured. As a result, commuter rail service should provide both reliable and competitive service – the degree to which this is accomplished will be reflected in a system's expense coverage. The ramifications of these issues on the planning and budgeting of existing projects are discussed below.

Reliability

When commuter systems are integrated with freight rail operations, on-time reliability is to a large extent dependent upon a commuter system's shared-use agreement with freight rail companies. After nearly a decade of Tri Rail service, the state of

[31] Peat Marwick, *Analysis of Commuter Rail Costs and Cost Allocation Methods*, Transportation Systems Center, Department of Transportation, 1983.

Florida negotiated with CSX for control of dispatch and maintenance functions along the corridor to insure that train schedules could be met. In the case of VRE, the inability to maintain on-time performance during CSX's track maintenance program has actually led to recent declines in commuter ridership, and with no recourse to lost revenue.

Competitive Service

Reliability is only of value to commuters if the service is competitive with alternative modes of travel. In order to compete with automobile travel, commuter service must be provided at sufficient frequency and transit speeds – these performance measures typically must be addressed through capital investments. Tri Rail's $338 million Double Track Corridor Improvement Program was undertaken to increase the frequency of train service from 30 to 40 trains per day, which was then increased to 50 trains per day following the completion of the $78 million New River bridge project.

Caltrain's implementation of the Baby Bullet service cut commuter rail travel times between San Jose and San Francisco by 33 minutes, and is credited with restoring ridership volumes to levels not seen since the collapse of the high-tech industry in 2002. This project required investments in bypass track and control system infrastructure, as well as $53 million worth of new passenger cars and locomotives. Expedited service has also been a motivation for SFRTA's interest in negotiating the use of FEC's line in south Florida, which would create dual corridors capable of supporting express service between Miami and West Palm Beach.

Expense Coverage

Expense coverage measures a system's capacity to pay for operating expenses with operating revenues. The operating costs of commuter rail service will depend only in part on ridership since many expenses (e.g., fuel, maintenance, etc.) are primarily a function of total train miles traveled rather than boardings per train. The relative effectiveness of various commuter rail systems can, therefore, be determined by comparing their expense coverages. Table 10-6 shows that VRE, Metrolink, and Coaster have the highest expense coverages at 47, 45 and 38 percent, respectively. Except for TRE, revenues from each commuter rail system covered at least 25 percent of operating expenses, whereas TRE's expense coverage is only six percent.

Table 10-7 lists the roadways adjacent to each commuter rail system. In all cases other than TRE, the commuter lines are paralleled by interstates or state highways throughout the limits of the rail corridors. A large portion of the TRE corridor is not adjacent to a major highway that typically supports large numbers of residential commuters. Even though total passenger miles for Coaster and TRE are nearly identical between 2002 and 2006 (see Figure 10-3), Coaster performs at an expense coverage more than six times greater than TRE. Commuter service by the TRE would appear to cater to commutes between Dallas and Fort Worth since the route

does not parallel an existing major highway, yet the 34-mile line's average trip length is only 16 miles.

Commuter System	Adjacent Corridors
Metrolink	
San Bernardino	I-10
Ventura County	Hwy 101, Hwy 118
Orange County	I-5
Inland Empire	I-5, Hwy 91
91	I-5, Hwy 91
Riverside	Hwy 60
Antelope Valley	I-5, Hwy 14
Caltrain	
single line	Hwy 101
TriMet	
Max	I-84, Hwy 26
new commuter line	I-5
Tri Rail	
single line	I-95
VRE	
Fredericksburg	I-95
Manassas	I-495 (part way)
Coaster	
single line	I-5
TRE	
single line	Hwy 121 (Fort Worth only) Hwy 183 (Dallas only)

Table 10-7: Highway-Commuter Rail Corridor Relationship

Value Creation

Commuter rail operations can create value to stakeholders in the form of increasing the income-producing potential of adjacent sites, and thereby increasing property tax revenues, and by reducing the travel time and fuel expenditures of commuters themselves. The following sections discuss issues that are important in the creation of value and their relevance to existing commuter systems.

Supportive Development

In order to develop commuter systems that offer competitive service, facility design and land use considerations should be incorporated into planning with the goal of maximizing ridership and, thus, maximizing expense coverage. Several of the existing commuter rail systems could easily increase ridership volumes with additional parking spaces at commuter stations. Even though 45 percent of Metrolink stations operate at capacity, expansion is difficult due to a lack of available property for parking. Caltrain has resorted to using temporary off-site locations for parking to meet the needs of new passengers attracted by its baby Bullet service, and Tri Rail is forced to divert some commuters to stations that have excess parking capacity (see Figure 10-11). Limitations to parking at some VRE stations have discouraged some commuters from using the system during the last few years, leading to reduced passenger volumes and revenue.

Figure 10-11: Notice of Parking Limitations at a Tri Rail Station

Commuter rail agencies can actually create a demand for service (and parking) by collaborating with other agencies and developers in the location of residential areas that supply the commuter system with riders. TriMet (MAX light rail) and SFRTA (Tri Rail) are both engaged in transit oriented development programs to create sustainable growth patterns and maximize the use of their systems. These agencies have found innovative approaches to development, including the use of surplus property for affordable housing, partnering with the private sector in commuter station design, and becoming involved in the land use planning process.

Several commuter systems own parcels of land along rail corridors that are suitable for development. These assets can be used to increase the financial viability of commuter rail service through the generation of non-operating revenue associated with development, and then through operating revenue from the ensuing demand for commuter rail service. In fact, the 317-mile, shared-use North Carolina Railroad (NCRR) Corridor is actually a real estate investment trust (REIT) completely owned by the state of North Carolina. Planning is currently under way for passenger rail service on several segments of this corridor, with NCRR holding ownership to adjacent industrial sites and property redevelopments.

Public Tax Benefit

Economic studies have shown that property tax revenues near commuter stations along the Dallas Area Rapid Transit (DART) light rail system increase over time at a greater rate than unrelated properties. Property values within a quarter-mile radius (126 acres) of DART stations were compared to a control group consisting of similar properties located within the study area. The study area consisted of light rail stations outside of the central business district of Dallas in order to avoid the effects of tax increment financing funds being used to renovate properties and encourage development in the downtown area. Since DART stations are located at the intersection of major thoroughfares, control group properties were located at the next major intersection and usually contiguous with station areas.[32]

[32] Weinstein, B.L. and Clower, T.L., *DART Light Rail's Effect on Taxable Property Valuations and Transit-Oriented Development*, January 2003.

Assessments showed that office property values near DART stations increased by 24.7 percent between 1997 and 2001, while control group properties only increased by 11.5 percent during that time. Residential properties near stations increased in value by 32.1 percent compared to 19.5 percent for the control group. Retail property values near DART stations grew at a slightly smaller percent than the control group, while industrial properties only grew by 13.0 percent as compared to 21.5 percent growth for the control group.

Based on the results described above, passenger rail service has a positive effect on tax revenues for office and residential properties, but has no noticeable effect on retail properties. These findings reinforce the interdependence of station location, site design, and potential for development/redevelopment in creating effective commuter rail systems. By defining DART-related properties in a radial direction from each station, this study may have inadvertently discounted this system's effect on properties to the station-side of the tracks. In fact, the feasibility of developing a commuter rail system between Austin and San Antonio was investigated in 1999. As a shared-use facility, the relation of passenger station location to the rail line was seen as a major design consideration.[33] Circumstances where passengers would need to cross tracks in order to access stations were seen as undesirable. Likewise, commuters may prefer residential areas on the station-side of DART lines, resulting in higher property values within these portions of the quarter-mile radius area.

The findings for DART-related properties are generally supported by a survey of property values near passenger stations for rail systems throughout the U.S.[34] Residential property values were found to generally increase as proximity to a commuter line increases, though properties nearest Caltrain tracks in San Mateo County were found to hold less value. This anomaly was attributed higher than normal track noises for Caltrain cars and minimal separation between tracks and adjacent land uses.

Energy Conservation

Approximately 98 percent of transportation-related fuels are derived from crude oil, with the remainder coming from natural gas. The market for automobile fuel is now comprised of about three percent ethanol, though this has been made possible with large subsidies by the federal government. Most new fuel alternatives such as ethanol or hydrogen also consume large amounts of petroleum during production, and produced volumes of these fuels within the foreseeable future will only help to curtail the growth in demand for gasoline. Unfortunately, the tremendous growth in general roadway travel, and particularly commute distances, occurs in an era where 80 percent of the world's oil production comes from fields discovered more than 30 years ago.[35] This fact by itself might have little meaning if it were not for evidence

[33] *Austin-San Antonio Commuter Rail Study*, Carter-Burgess feasibility report to the Texas Department of Transportation, 1999.
[34] *The Effect of Rail Transit on Property Values, A Summary of Studies*, Parsons Brinkerhoff draft for the NEORail II Project, Cleveland, Ohio, February, 2001.
[35] Campbell, J.C and Laherrere, J.H., The End of Cheap Oil, *Scientific American*, March 1998.

that oil reservoirs typically begin to reach maximum production levels about 34 years after first discovery.[36]

A review of oil discovery history from 1915 to 1995 found that world oil discoveries peaked in about 1962 and the size of new finds have been in decline ever since.[37] Peaks in oil discoveries, whether at a national or international level, eventually lead to corresponding peaks in production, such as that exhibited by the U.S. production history shown in Figure 10-12.[38] At the international level, the world now consumes about four barrels of oil for each barrel discovered, and this problem is expected to worsen as emerging economies such as China and India increase their own consumption of energy.[39] Figure 10-13 shows that world spot prices for crude oil have increased by about $50 per barrel from 2001 to 2007, though it would be difficult to price the effects of diminishing supplies versus Middle East instability in the prevailing market.

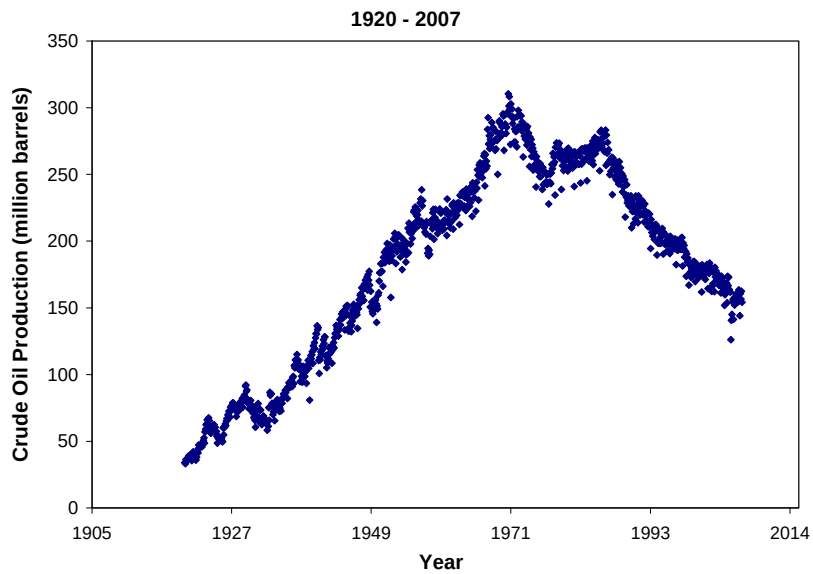


Figure 10-12: U.S. Crude Oil Production History

Worldwide production of crude oil will inevitably exhibit a trend similar to that of the U.S. (Figure 10-12), with supply no longer able to meet growing worldwide demand in years beyond that of peak production. Scholarly and professional debate within the energy industry tends to expect worldwide crude oil production to peak anywhere

[36] Deffeyes, K.S., World's Oil Production Peak Reckoned in Near Future, *Oil & Gas Journal*, Vol. 100, No. 46, November 11, 2002.
[37] Masters, C.D., Attanasi, E.D. and Root, D., World Petroleum Assessment and Analysis, Proceedings, 14th World Petroleum Congress, John Wiley & Sons, Stavanger, Norway, 1994.
[38] Historic energy data on file at the U.S. Department of Energy, Energy Information Administration. Available at: www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html.
[39] Salameh, M.G., Filling the Global Energy Gap in the 21st Century, *Petroleum Review*, Vol. 56, No. 667, August 2002.

from 2010 to 2035, which would be accompanied by an accelerated effort to conserve energy and develop alternative fuels.[40] In this regard, commuter rail systems can create value by helping to conserve energy and provide households with an alternative to incurring automobile fuel costs. Not only does commuter rail consume less fuel than individual automobile travel, but this mode can also be powered by several energy sources. For example, energy diversification is a prime motive of the SCRRA Board's plans to electrify the Caltrain system from San Francisco to San Jose by 2014.

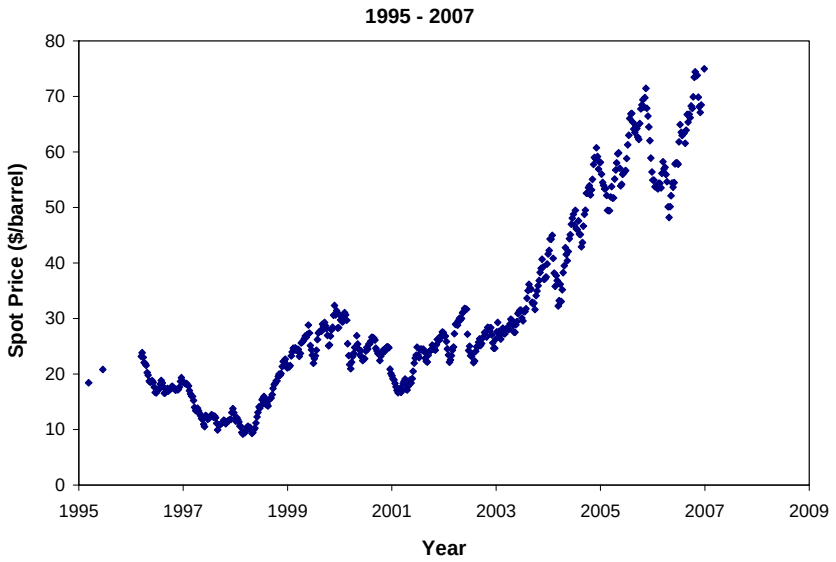


Figure 10-13: Crude Oil Spot Prices from 1995 to 2007

Summary

Several of the commuter systems reviewed in this report exhibit strong earnings potential and, most certainly, demonstrate the need for this public service. As urban land areas and population densities grow, and as two-worker households make extreme commuting more common, passenger rail systems can play an important role in directing growth patterns toward more livable and sustainable conditions. Contrary to what may appear as competition with automobiles, operating revenues for commuter rail lines that parallel high volume roadways seem to cover the largest portions of operating expenses.

The degree to which commuter rail systems provide reliable and competitive service can be greatly influenced at the planning stage. In the case of shared-use facilities, both operating and financial performance will correlate to the cost allocation structure established through negotiation with the freight railroad. Financial performance will also reflect the foresight in selecting passenger station locations

[40] Al-Jarri, A.S. and Startzman, R.A., Worldwide Petroleum-Liquid Supply and Demand, *Journal of Petroleum Technology*, Dec. 1997.

and designs, and in the acquisition of property necessary to support growth in operations.

Transportation officials can contribute to the success of commuter rail systems they implement by coordinating with local agencies and developers in the transformation of property into transit oriented development. Under an appropriate governmental structure, investments in commuter rail can be supported by through public ownership of parcels of land that are likely to earn revenues as a result of commuter operations. These systems can also produce additional tax revenue as a result of increases in property value near passenger stations, particularly when station locations and nearby development is coordinated to maximize the demand for these facilities.

Finally, given the sequence of events unfolding in terms of energy costs and supplies, population growth, and need for new transportation corridors, public officials can modify the demand on the state's resources by using commuter rail to influence travel behavior and urban development patterns.

SECTION 11: ECONOMIC DEVELOPMENT

Economic Potential of East Texas Infrastructure

The North American Free Trade Agreement (NAFTA) is considered a primary source of resurgence in rail traffic.[1] The increased use of rail infrastructure has led to a greater need for warehouse services at major hubs that are positioned at the intersection of multiple rail lines and interstate highways. East Texas has not historically been known as a transportation hub despite the existence of several rail lines in the area that connect to existing hubs in Dallas-Fort Worth (DFW), Houston, and Memphis, Tennessee. However, the same growth in both domestic and international freight traffic that has inspired plans for a new I-69 corridor has created growth opportunities for East Texas, particularly through the interaction of multiple modes of transportation.

Strategic Location of East Texas

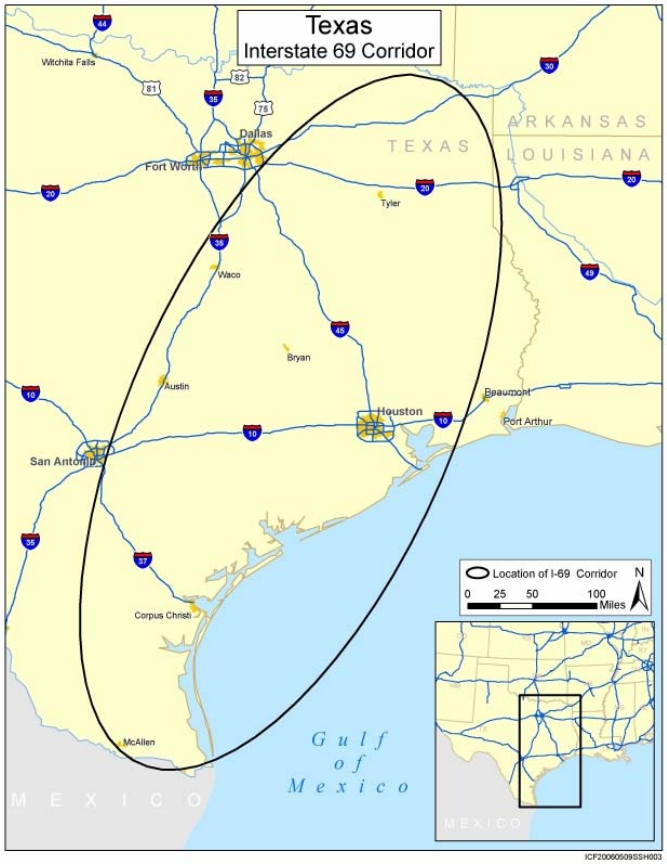
The East Texas area may gain from commerce created by the new I-69 corridor planned by the U.S. Department of Transportation that will extend from Mexico into the interior states of the U.S. As Figure 11-1 shows, the alignment of this facility has not been identified, but would make East Texas a strategically preferred location in the movement and distribution of goods throughout North America. In fact, the area has already begun to capitalize on its location and business climate by developing manufacturing and distribution centers that offer easy access to major highways and railroads. Some transportation facilities in East Texas have been designated as foreign trade zones, which provide further economic incentive for businesses to operate in the area.

Distribution centers allow retailers to hold out in the supply chain as long as possible before committing a final product to a particular destination. These types of operations are facilitated by integrated highway and railroad systems that converge at strategic points in the form of intermodal yards, transload centers, or other modal-shift facilities. The preponderance of intermodal capacity in Texas is located in DFW (AllianceTexas and Dallas Logistics Hub), Houston (Englewood), and San Antonio (currently under development), but East Texas could also gain from continued growth in trade with Mexico due to KCS Railway's ownership of lines that extend into the country.

Freight logistics and logistics management companies have become an important link in global supply chains. Companies in Texas benefit from the close proximity to Mexico, from which products are shipped into the U.S. for distribution. However, infrastructure bottlenecks in some areas of the state lessen the efficiency of shipping goods and create an opportunity for less congested areas to provide more productive transportation alternatives. The development of intermodal operations in

[1] RKG Associates, Inc., *Lone Star/Red River Reuse Master Plan 2007*, prepared for the Red River Redevelopment Authority, April 2007.

East Texas may be feasible considering KCS Railway's plan to route container trains from the Mexican Port of Lazaro Cardenas through Houston and to Little Rock, thus bypassing Dallas.[2] Expansion of the Panama Canal to accommodate the larger container ships from Asia will also increase the amount of cargo coming in to the Port of Houston, creating the need for a new intermodal facility north of Houston.



Source: U.S. Department of Transportation
Figure 11-1: Region of Consideration for the I-69 Corridor in Texas

Facilities for Commerce

Several facilities have been constructed or planned in East Texas that offers a basis for significant economic growth in the area. These facilities range from commercial centers constructed by the private sector to public transportation facilities that support private commerce. Several of the existing facilities that contribute to economic growth are discussed below.

East Texas Regional Airport

The East Texas Regional Airport is just south of I-20 in Longview, and is in proximity to UP's Palestine Subdivision approximately seven miles to the west and BNSF's Longview Subdivision approximately seven miles to the east. The airport is adjacent

[2] Landers, J., New Hub for Asian Imports? Expansion of Panama Canal seen as economic opportunity for Dallas, *The Dallas Morning News*, September 9, 2007.

to a 300-acre industrial airpark that has commercial space available for domestic and international uses such as light manufacturing, warehousing, and distribution, all of which may benefit from a direct connection to rail infrastructure. The airport has also been designated as a foreign trade zone that provides duty relief for products manufactured on-site and duty exemptions on re-export merchandise.

Red River Commerce Park

The Red River Redevelopment Authority (RRRA) oversees the redevelopment of military facilities in New Boston that were closed following the signing into law the recommendations of the 2005 Base Realignment and Closure Commission. These facilities include portions of land at the Red River Army Depot and all land at the former Lone Star Army Ammunition Plant. Federal law allows for the RRRA to purchase property at less than market value as long as the proceeds are reinvested in infrastructure and other redevelopment purposes. Red River Commerce Park, shown in Figure 11-2, is adjacent to the Red River Army Depot and is served by the Texas Northeastern shortline railroad to the north, and also served from the south side by the UP with the KCS approximately 17 miles to the east in Texarkana.

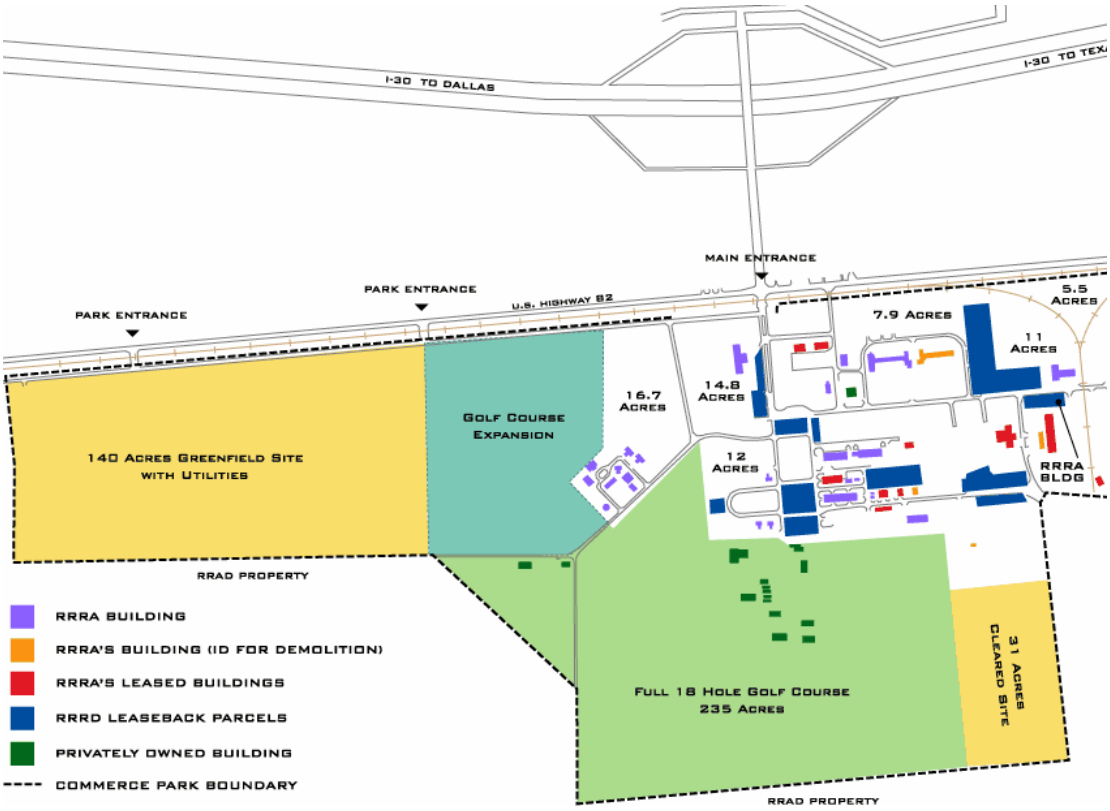


Figure 11-2: Site Plan for the Red River Commerce Park

KCS purchased controlling interest in Transportacion Ferrviaria Mexicana (TFM) in 2005, creating a ship-to-rail corridor that extends from the U.S. interior to the Port of Lazaro Cardenas on the pacific coast of Mexico. A three-phase, $290 million

expansion project at the port was initiated in 2005 that will accommodate multiple ultra large container vessels and will increase container capacity from 180,000 TEUs to 2,000,000 TEUs.[3] Red River Commerce Park is only ¼ mile from I-30, providing direct access to Dallas-Fort Worth and destinations to the southeast.

Kilgore Synergy Park

Kilgore Synergy Park is located 120 miles east of Dallas and 60 miles west of Shreveport, and provides industrial sites ranging in size from 10 to 200 acres. The park is eight miles from the East Texas Regional Airport and adjacent to both I-20 and the UP Palestine Subdivision.

Longview Business Park

The 483-acre Longview Business Park, shown in Figure 11-3, is located at the intersection of Hwy. 259 and I-20, and is designed as a commercial and industrial facility. This proximity to major roadways is enhanced by rail access to BNSF rail lines.

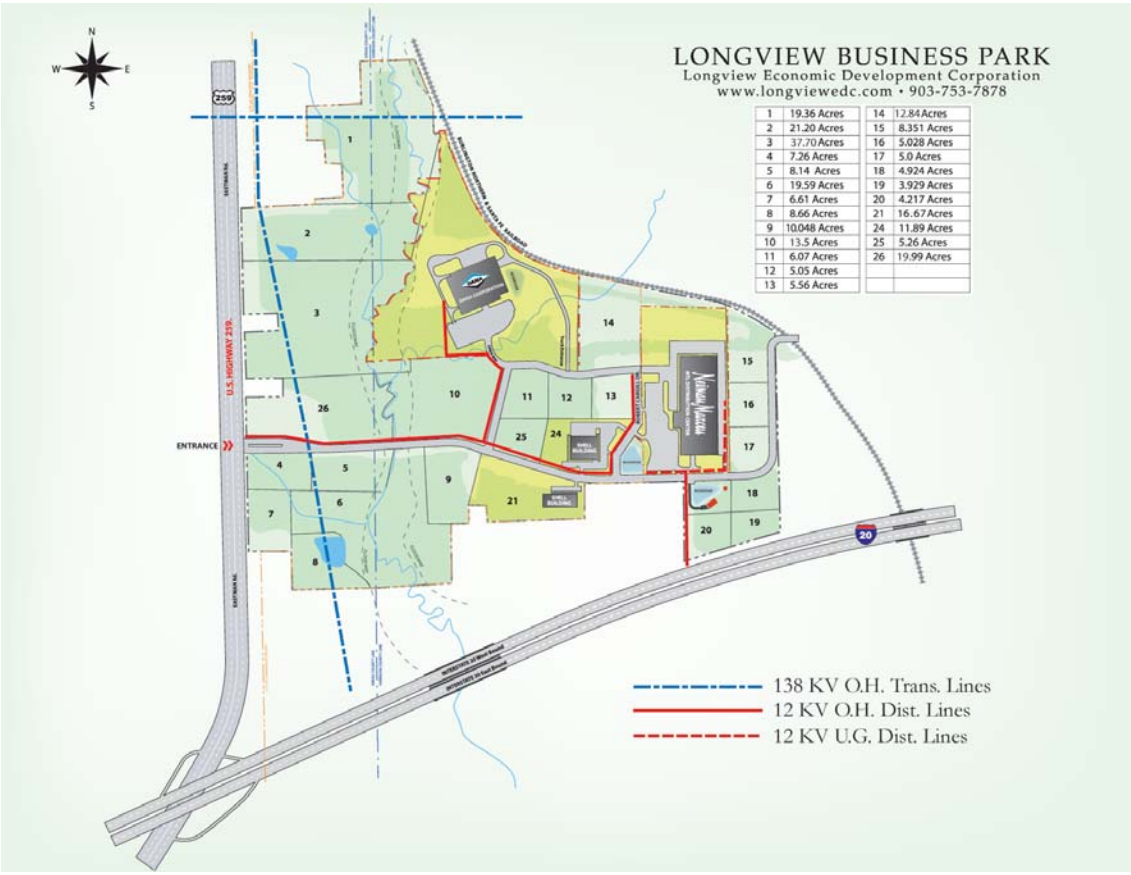


Figure 11-3: Site Plan for Longview Business Park

[3] The international standard measure of an intermodal container is a Twenty-Foot Equivalent Unit (TEU).

Prospective Industries and Facilities

Economic growth in East Texas will in part be dependent upon the existence of infrastructure that is sufficient to attract and service major industries in terms of both freight and commuter transportation. The infrastructure necessary for regional growth will range from improved access and mobility of truck freight, connectivity of rail corridors to distribution centers, passenger systems capable of providing convenient access to urban centers, and even transportation hubs that capitalize on shifts in international shipments of freight. Some of the primary industries and related infrastructure are discussed below.

Warehouse and Distribution Centers

Considerations for the location of warehouse and distribution facilities include distance from the main port of entry, distance from the warehouse to stores in the region, cost and availability of labor, real estate prices, and local tax incentives.[4] Companies have begun to place greater emphasis on the logistics of moving goods from distribution centers to retail stores than on moving imports to the distribution centers. The availability of relatively inexpensive land in East Texas makes the area an attractive location for the distribution of goods throughout the region. Experiences with distribution centers in other states have found that the labor force in rural areas is characterized by high productivity and low turnover.

Intermodal and Transload Facilities

Two important initiatives involving international waterways are underway that will have a large impact on the movement of container traffic within the U.S. First, a $5.25 billion project to expand the Panama Canal was approved by Panamanians in October 2007 for the purpose of capturing a larger share of Asian container traffic that currently enters U.S. ports on the West Coast. Once completed in 2014, the new facility will have twice its current capacity and is expected to vastly increase the number of containers entering the Port of Houston. Planners are now determining the best way for foreign cargo to be shipped from the Port of Houston to rail hubs in Dallas. East Texas could provide an alternative location to what is already a congested rail network in DFW.

Second, the decision by the Mexican government in 1995 to decentralize and partly privatize its seaports has prompted a series of international agreements and infrastructure improvements leading to expansion of the Port of Lazaro Cardenas in Michoacan, Mexico. The port is undergoing a 20-year, $290 million program to expand the existing terminal to accommodate four ultra large container vessels simultaneously. With ownership of the Texas-Mexican Railway and controlling interest in TFM, KCS has established a 1,300-mile railroad reaching from the seaports of Mexico's Pacific coast to Kansas City, Missouri.

[4] Mongelluzzo, B., Wide Open Spaces: Import distribution centers are being built farther from ports, *Journal of Commerce*, April 21-27, 2003.

In 2002, Mexico enacted the Trans-Pacific Multimodal Security System, which increased infrastructure capacity, implemented cooperative customs processes, and provides greater security along the entire supply chain between Lazaro Cardenas and Kansas City. Mexico has also recently substituted a $55,000 "through bond" covering all containers in a single shipment for the $100,000 per container bond previously required. This modification may make the shipment of containers from Asia through Lazaro Cardenas up to 15 percent less expensive than if they are shipped through the Ports of Long Beach and Los Angeles.[5] As a result, the development of intermodal or transload facilities in East Texas may a rational component of the NAFTA Rail Corridor shown in Figure 11-4.

Figure 11-4: KCS-Controlled NAFTA Rail Corridor

Biofuel Facilities

Whereas corn-based ethanol requires the use of domestic food sources for fuel production, research and development of cellulosic fuels will consume unused plant and crop materials. Pilot plants are currently being constructed in Louisiana to convert substances such as sugar cane waste into ethanol for use as transportation fuel. East Texas could become a prime location for the distribution of biofuels from nearby agricultural regions to major markets such as DFW and Houston, or for the direct production of these fuels.

Connectivity

With the continued development of industrial parks throughout the East Texas Region, the availability of rail transportation will become an important mode of travel.

[5] Lazaro Cardenas-Kansas City Transportation Corridor Offers Opportunities for International Shippers; Greater Economic Prosperity for North America, Kansas City Smart Port, Inc.

Passenger rail service is currently offered by Amtrak from Dallas to Longview, and on to Texarkana as part of the Texas Eagle route. With no connection to Shreveport, Louisiana, Texas Eagle passengers destined for Shreveport must take a shuttle bus departing from Longview into Louisiana. An Amtrak train departs each day from Longview at 9:00 am and arrives in Dallas at 12:00 pm; the train departs from Dallas at 3:40 pm and arrives back in Longview at 6:15 pm.

Shuttle bus service between Longview and Shreveport is timed so that passengers can leave Shreveport at 7:15 am and arrive in Longview at 8:30 am, in time for departure on the 9:00 am train to Dallas. Shuttle bus service is also offer to Shreveport from Longview at 6:25 pm for passengers traveling from Dallas that arrive in Longview at 6:15 pm.

Upgrades to existing rail infrastructure for greater passenger train capacity, including the construction of a rail line between Longview and Shreveport could benefit East Texas by improving travel times from potential office and residential centers along the corridor to both Dallas and Shreveport. Businesses or workers requiring frequent trips to Dallas could take advantage of the extensive DART light rail system within the city, providing a low cost and fuel efficient alternative to highway travel. Excursions from East Texas to Shreveport would also become more practical and add value to operating or living near the rail corridor.

In October 2000, the South Central High-Speed Rail Corridor was designated as a future high-speed rail system by the Department of Transportation on October 11, 2000. The purpose of this plan is to improve the mobility and efficiency of transportation between Texas, Arkansas and Oklahoma with a system that minimizes pollution and the consumption of fuel. In October 2008, the Railroad Safety Enhancement Act (HR 2095) was signed into law, authorizing $2.6 billion annually for the development of high-speed rail systems. The planned alignment of the high-speed rail system includes an easterly route along I-20 from Dallas to Longview and up to Texarkana, and a northerly route along I-35W from Fort Worth to Oklahoma City (see Figure 11-5).

Source: Texas Rail Advocates

Figure 11-5: South Central High-Speed Rail Network