Conceptual Engineering and Funding Study

Waxahachie Corridor

North Central Texas Council of Governments

What is NCTCOG?

The North Central Texas Council of Governments is a voluntary association of cities, counties, school districts, and special districts which was established in January 1966 to assist local governments in **planning** for common needs, **cooperating** for mutual benefit, and **coordinating** for sound regional development.

It serves a 16-county metropolitan region centered around the two urban centers of Dallas and Fort Worth. Currently the Council has **233 members**, including 16 counties, 165 cities, 23 independent school districts, and 29 special districts. The area of the region is approximately **12,800 square miles**, which is larger than nine states, and the population of the region is over **6.4 million**, which is larger than 35 states.

NCTCOG's structure is relatively simple; each member government appoints a voting representative from the governing body. These voting representatives make up the **General Assembly** which annually elects a 15-member Executive Board. The **Executive Board** is supported by policy development, technical advisory, and study committees, as well as a professional staff of 235.

NCTCOG's offices are located in Arlington in the Centerpoint Two Building at 616 Six Flags Drive (approximately one-half mile south of the main entrance to Six Flags Over Texas).

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NCTCOG's Department of Transportation

Since 1974 NCTCOG has served as the Metropolitan Planning Organization (MPO) for transportation for the Dallas-Fort Worth area. NCTCOG's Department of Transportation is responsible for the regional planning process for all modes of transportation. The department provides technical support and staff assistance to the Regional Transportation Council and its technical committees, which compose the MPO policy-making structure. In addition, the department provides technical assistance to the local governments of North Central Texas in planning, coordinating, and implementing transportation decisions.

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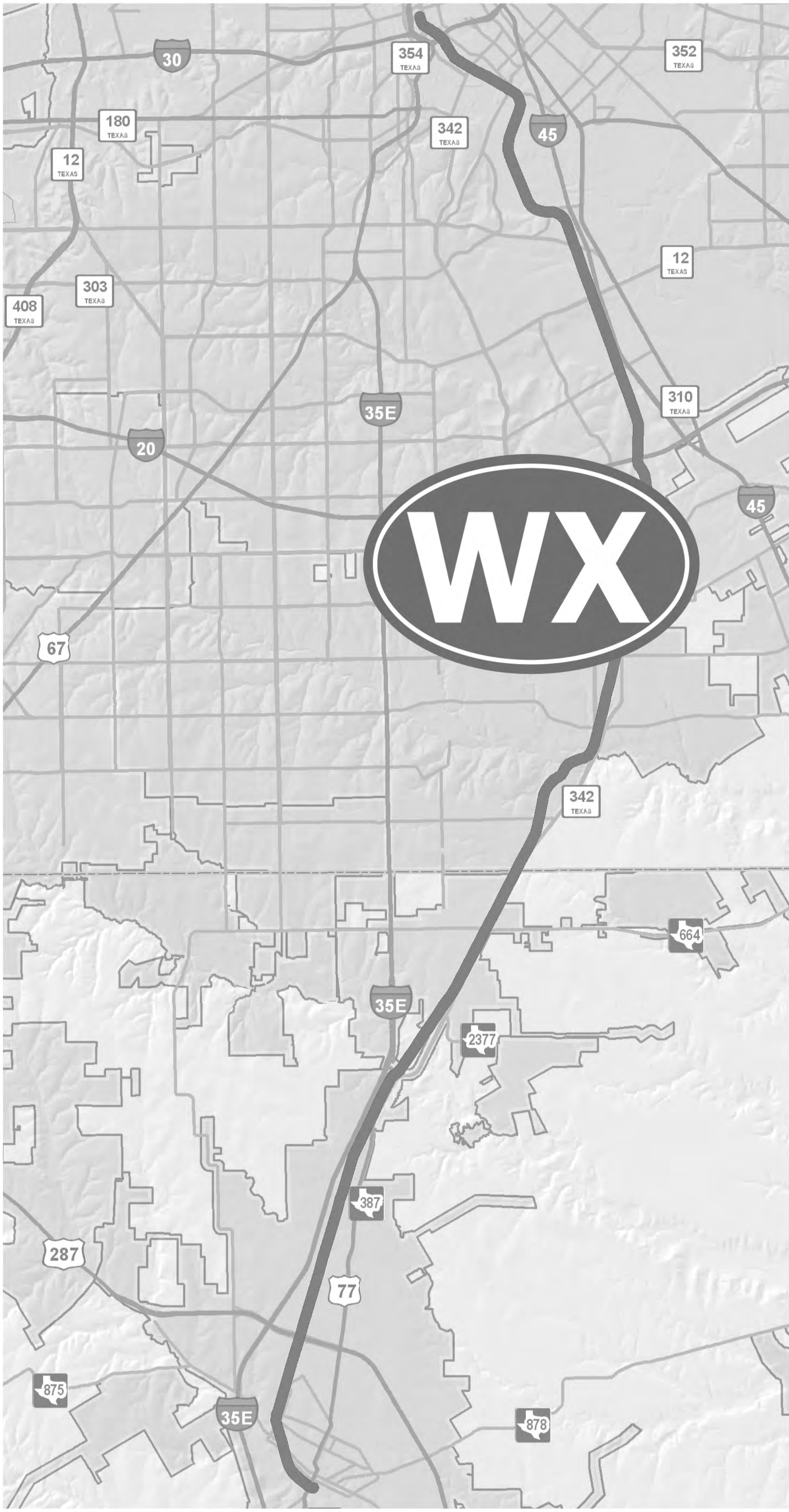
November 2010



Waxahachie Corridor

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1.0 INTRODUCTION

The Waxahachie Corridor is part of a long-term multimodal vision for the rapidly growing Dallas-Fort Worth (DFW) region. The Waxahachie Corridor project is one of 12 passenger rail corridors identified in the North Central Texas Council of Governments (NCTCOG) long-term metropolitan transportation plan (MTP) *Mobility 2030: The Metropolitan Transportation Plan for the Dallas – Fort Worth Area – 2009 Amendment (Mobility 2030 - 2009 Amendment).* Proposed passenger rail service within the Waxahachie Corridor is intended to connect population and employment in the growing southern Dallas County and northern Ellis County area with the existing and proposed passenger rail network in the DFW region.

The corridor extends approximately 31 miles through four municipalities along a predominately Burlington Northern Santa Fe (BNSF) freight rail right-of-way. The Union Pacific Railroad (UPRR) owns a small portion of the railroad from Forest Lane to Union Station in Dallas. The connected municipalities include Dallas, Lancaster, Red Oak, and Waxahachie.

The study area boundary extends one mile from the current rail centerline along each side of the proposed rail alignment from the old rail depot in downtown Waxahachie at the southern terminus to Union Station in Dallas at the northern terminus. A population of approximately 184,000 persons resides in the study area. Major employers within the study area include AT&T Headquarters, Bank of America, City of Dallas, Dallas County Sheriff's Office, and the Dallas Morning News. Figure 1-1 depicts the Waxahachie Corridor location within the DFW region.

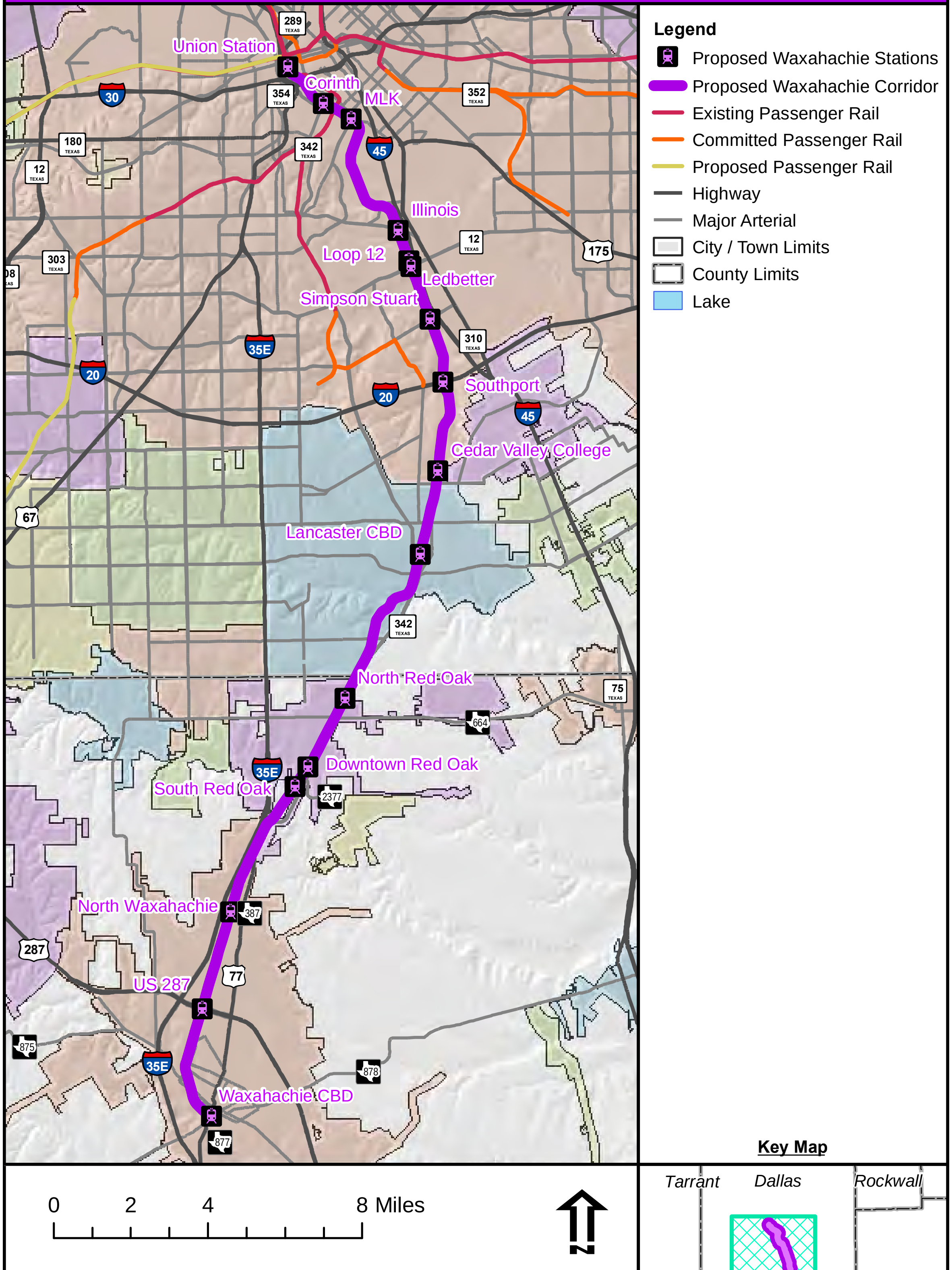
1.1 STUDY PURPOSE

NCTCOG, the Metropolitan Planning Organization (MPO) for the DFW region, initiated the Waxahachie Corridor Conceptual Engineering and Funding Study (CE & FS) in the fourth quarter of 2008. The primary study purpose is to support future passenger rail service implementation in the corridor. This purpose was facilitated by conducting outreach with key stakeholders and providing an open forum to identify key issues, identify potential station locations, and examine alignment options. In addition, this study documents existing environmental conditions and identifies potential impacts. The study provides a foundation for future environmental documentation anticipated to be completed by the implementing transit agency. A key study element is to identify possible funding strategies intended to expedite project implementation.

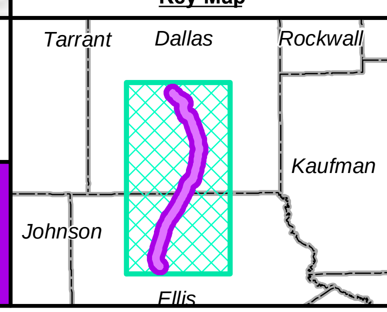
The CE & FS report is organized into seven chapters. Chapter 1 provides an overview of the planning process, the regional planning context, the study area, previous work plans, and stakeholder and agency outreach efforts related to this study. Subsequent chapters include:

- Chapter 2 – Need and Purpose
- Chapter 3 – Alternatives Development
- Chapter 4 – Affected Environment
- Chapter 5 – Funding
- Chapter 6 – Coordination Efforts
- Chapter 7 – Summary

Figure 1-1 — Waxahachie Corridor
From FM 66 to Spur 366



Key Map



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1.2 THE PLANNING PROCESS

The adopted MTP is the instrument through which the MPO identifies fiscally sound regional transportation improvements. A series of federal legislative acts have specifically addressed and modified the MTP role. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) strengthened the role of the MTP, making it the central mechanism for the decision-making process regarding transportation investments. The Transportation Equity Act for the 21st Century (TEA-21) passed into law in 1998 continued this emphasis. The TEA-21 successor and current law, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was passed in 2005. SAFETEA-LU addresses the challenges facing transportation systems including safety, traffic congestion, freight movement efficiency, intermodal connectivity, and protecting the environment. SAFETEA-LU metropolitan planning regulations require transportation plans, such as *Mobility 2030 - 2009 Amendment*, to be “fiscally constrained” meaning the plan must be based on reasonable assumptions funding will be available to implement projects contained in the MTP. Federal transportation acts and the Clean Air Act Amendments (CAAA) of 1990 both impose air quality conformity requirements on long-range transportation plans for urbanized areas.

The development of *Mobility 2030 - 2009 Amendment* was guided by three goal categories: transportation, quality of life, and financing. Table 1-1 lists individual goals by goal category. These goals represent the regional commitment to a comprehensive, cooperative, and continuous transportation planning process for a balanced transportation network by recognizing the evolving transportation and air quality needs for the region. Encouraging sustainable development through the direct link between land use, transportation, and air quality is a specific objective of *Mobility 2030 - 2009 Amendment*.

The US Environmental Protection Agency (EPA) has designated the DFW region as a nonattainment area for the eight-hour ozone standard. The CAAA of 1990 requires long-range transportation plans for all nonattainment areas to be in air quality conformity with the State Implementation Plan (SIP) and to demonstrate MTP projects meet air quality goals. In accordance with metropolitan planning regulations, *Mobility 2030 - 2009 Amendment* must include a congestion management process (CMP) to address congestion systematically. Challenged with modest transportation funding relative to identified needs, the DFW region optimizes its limited transportation funds. This is accomplished by first investing in low-cost, high yield projects such as bottleneck improvements, synchronized signal systems, congestion management strategies, managed lanes, and bicycle and pedestrian facilities.

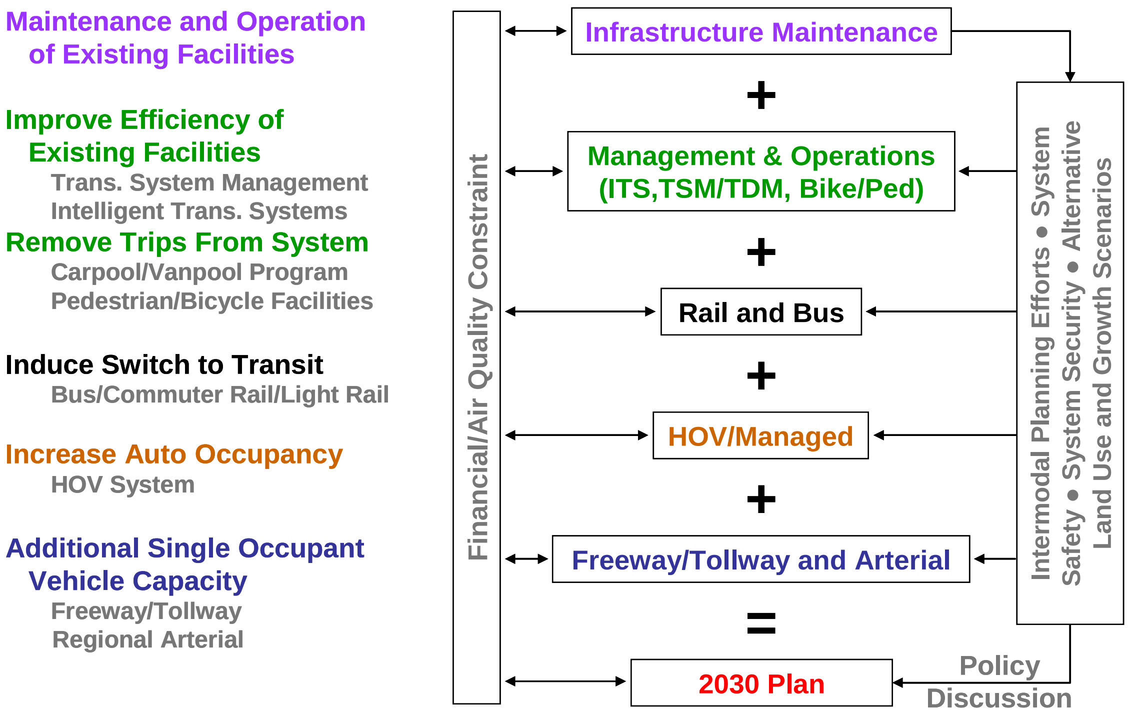
In addition to first investing in low cost, high yield projects, efforts are underway to induce travelers to modify their travel behavior by switching to transit, bicycle and pedestrian facilities, or increasing auto occupancy levels. Encouraging behavior modifications could reduce the number of vehicles on the region’s roadways, reducing the need to build additional automobile capacity projects including toll roads or tax-supported highways. Regional transit agencies including Dallas Area Rapid Transit (DART), Denton County Transportation Authority (DCTA), and the Fort Worth Transportation Authority (The T) provided input to the MTP regarding transit and bus mode recommendations within their respective service areas. Figure 1-2 identifies the DFW regional MTP process.

Table 1-1 Mobility 2030 - 2009 Amendment Goals

Transportation Goals	Quality of Life Goals	Financial Goals
• Enhance mobility and improve access for the movement of people and goods • Reduce traffic congestion and improve travel times • Develop a balanced, efficient, and dependable multimodal transportation system that reduces demand for single occupant vehicle travel • Support management strategies that optimize transportation system performance through technology and innovation • Improve transportation system safety • Provide stronger, more direct linkages between project planning, funding, and implementation by designating a metropolitan transportation system • Support local, regional, statewide, national, and international intermodal transportation systems that provide mobility and accessibility for the movement of freight • Provide meaningful public involvement opportunities in the transportation plan development process	• Promote the orderly economic development of the region • Encourage balanced land use and transportation plans and programs which maximize the use of transportation investments • Provide transportation opportunities to the traditionally underserved populations • Encourage the preservation and revitalization of communities and neighborhoods • Support recreation and tourism • Encourage transportation investments that promote healthy and active lifestyles • Avoid, mitigate, and enhance the environmental impacts of transportation improvements • Reduce energy consumption • Improve air quality	• Identify and actively pursue adequate, long-term, and stable funding sources for transportation improvements • Develop cost-effective transportation projects, programs, and policies aimed at reducing transportation system capital and operating costs • Prioritize transportation funds to ensure current and future transportation systems are maintained • Preserve right-of-way for transportation investments in advance of economic development

Source: NCTCOG, *Mobility 2030 - 2009 Amendment*, April 2009

Figure 1-2 Metropolitan Transportation Plan Process



Source: NCTCOG, *Mobility 2030 - 2009 Amendment*, April 2009

Transportation system performance information is developed as a DFW Regional Travel Model (DFWRTM) product throughout the MTP development process. This information guides system alternatives development and indicates the impact associated with various improvements. The improvements recommended in *Mobility 2030 - 2009 Amendment* include:

- Regional congestion management strategies
- Bicycle and pedestrian facilities
- Managed/high occupancy vehicle (HOV) lanes
- Passenger rail and bus transit improvements
- Intelligent transportation system (ITS) technology
- Freeway lanes
- Toll road lanes
- Improvements to the regional arterial and local thoroughfare system (e.g., intersection improvements and signal timing adjustments)

The *Texas Metropolitan Mobility Plan (TMMP)* is a needs-based plan which quantifies transportation needs beyond the fiscal constraint barrier. Rather than a conservative approach limited by forecasted funding availability, the *TMMP* focuses on the magnitude of unmet needs and provides decision-makers with a better understanding for the total transportation needs for each region in Texas. The *TMMP* indicates the DFW region is not adequately meeting current mobility needs and additional funding is needed.

The *TMMP* applied the Texas Congestion Index, an index for measuring mobility within each region, to help evaluate needs. The Texas Congestion Index uses the improvement of all transportation facilities with a failing (F) level-of-service (LOS) to a higher (D, C, B or A) LOS as the target mobility level. Using this approach, approximately 4,600 additional lane miles are needed to eliminate all LOS F facilities in the DFW region. This is in addition to the approximately 8,500 lane miles identified and included in *Mobility 2030 - 2009 Amendment*. The analysis employed to identify these additional needs should be interpreted as an overall need to be resolved through a combination of multimodal approaches including freeways, toll roads, high occupancy vehicles, arterial street improvements, transit (bus and rail), freight, and operational system improvements.

As shown in Table 1-2, the estimated cost of all funded projects in the adopted *Mobility 2030 - 2009 Amendment* is $145.5 billion in actual dollars that reflect an inflation adjusted value to the year of expenditure (YOE) in which funds are projected to be expended. These estimates indicate the DFW region requires an additional $98.0 billion in YOE dollars to fund the unfunded needs. Inclusive of all funded and unfunded needs, the estimated cost of all projects in the plan is $243.5 billion in YOE dollars. Primary funding sources for the MTP include federal and state motor-fuel tax, local roadway monies, local transit taxes, and innovative financing. Regional rail is a key element of the *Mobility 2030 - 2009 Amendment*. However, regional needs have out-paced funding availability.

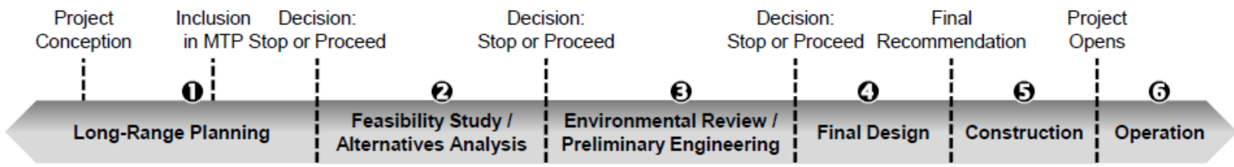
Table 1-2 Identified Funding Needs for the DFW Region through 2030

Metropolitan Transportation System Components	Funded Needs (YOE Dollars)	Unfunded Needs (YOE Dollars)
Operation and maintenance	$31.8	
Congestion mitigation strategies	$3.1	
Bicycle and pedestrian facilities & transportation enhancements	$2.1	
Rail and bus transit system*	$24.3	
HOV and managed facilities	$7.4	
Freeway and toll road system	$59.5	$17.1
Regional arterial and local thoroughfare system	$12.9	$11.1
Additional cost to purchase right-of-way		$2.0
Rehabilitation	$4.4	$55.4
Goods movement/rail freight		$12.4
Totals**	**$145.5 (60%)**	**$98.0 (40%)**
	$243.5 Billion	

Source: NCTCOG, April 2009
Notes:
*Includes funding from local transit initiatives
**Values based on 2006 TMMP and adjusted to *Mobility 2030 - 2009 Amendment*

Figure 1-3 outlines the traditional transit project development process designed to identify, develop, and implement proposed projects. To expedite Waxahachie Corridor implementation, the process may employ an array of innovative strategies from financing mechanisms (e.g., a public-private partnership) to innovative delivery methods (e.g., design-build).

Figure 1-3 Traditional Project Development Process



Source: NCTCOG, August 2009

Stakeholder and agency involvement is included in each step. **Step 1**, the long-range planning process involves local, state, regional, and federal transportation officials and ensures opportunities for interested persons throughout the region to contribute input and feedback. Warranted projects with available funding are added to the regional MTP. Depending on the project scope and length, Step 1 may include several studies. This CE & FS and all previous Waxahachie Corridor studies are included in Step 1.

For long distance corridor transit projects or those on new alignments, project development **Step 2** may be a feasibility study. The feasibility study purpose is to determine a general alignment, viable technology, and identify a range of realistic financial plans. The analysis includes data collection, documents transportation needs, identifies issues to be addressed, and identifies potential corridors and technologies. The analysis is based on travel demand forecasts, cost estimates, revenue estimates, socio-economic conditions, and environmental data. The feasibility study typically concludes with the identification of a recommended corridor, vehicle technology, and funding sources for further study. Many Waxahachie Corridor topics are being studied and evaluated in this CE & FS to further quantify and qualify these issues and incorporate public concerns. Ultimately, the CE & FS will result in the identification of a corridor concept to be further examined in subsequent environmental studies.

In **Step 3**, the locally preferred alternative (LPA) and a no-build alternative are developed at a more detailed analysis level focusing on the social, economic, and natural environmental effects, as well as travel demand, potential revenue sources, and construction cost estimates. This information helps decision-makers gauge the potential effects on the community and environment. The environmental review develops specific mitigation strategies for potential negative effects, summarizes project benefits, and further develops potential funding mechanisms. The analyses are documented and reviewed by federal and state agencies, decision-makers, and the public to aid in making an informed decision by assessing the no-build alternative and the LPA.

Assuming the environmental document is approved and a build alternative is selected, a project typically advances to **Step 4**, the final design stage. During the final design stage, the implementing agency, financing, staging, and construction schedule are determined.

Any needed right-of-way is acquired or preserved before construction begins. If the Waxahachie Corridor project incorporates a public-private partnership (PPP) approach, the steps in the project development process may differ.

1.3 REGIONAL PLANNING CONTEXT

NCTCOG is the MPO of a 12-county metropolitan region centered in the Cities of Dallas and Fort Worth. Since the early 1970s, MPOs have had the responsibility of developing and maintaining a federally mandated long-range MTP. The current NCTCOG MTP is *Mobility 2030 - 2009 Amendment.* The MTP identifies transportation needs; guides federal, state, and local transportation expenditures; and is the basis for project specific studies. Regional passenger rail has been identified by NCTCOG to be critical to the region's future. NCTCOG studies, such as the *Regional Rail Corridor Study (RRCS)* and the Rail North Texas (RNT) initiative, indicated the Waxahachie Corridor has high ridership potential and warrants further study.

While this corridor is not included in the DART *2030 Transit System Plan*, DART recognizes the potential for future passenger rail on the Waxahachie Corridor. The portion of this corridor south of the City of Dallas is currently outside the DART service area boundary. DART has evaluated the potential for rail service into several non-member city communities and has begun discussions with these communities to expand the DART service area boundary or contract for transit services. These discussions include municipalities within the Waxahachie Corridor.

1.4 STUDY AREA

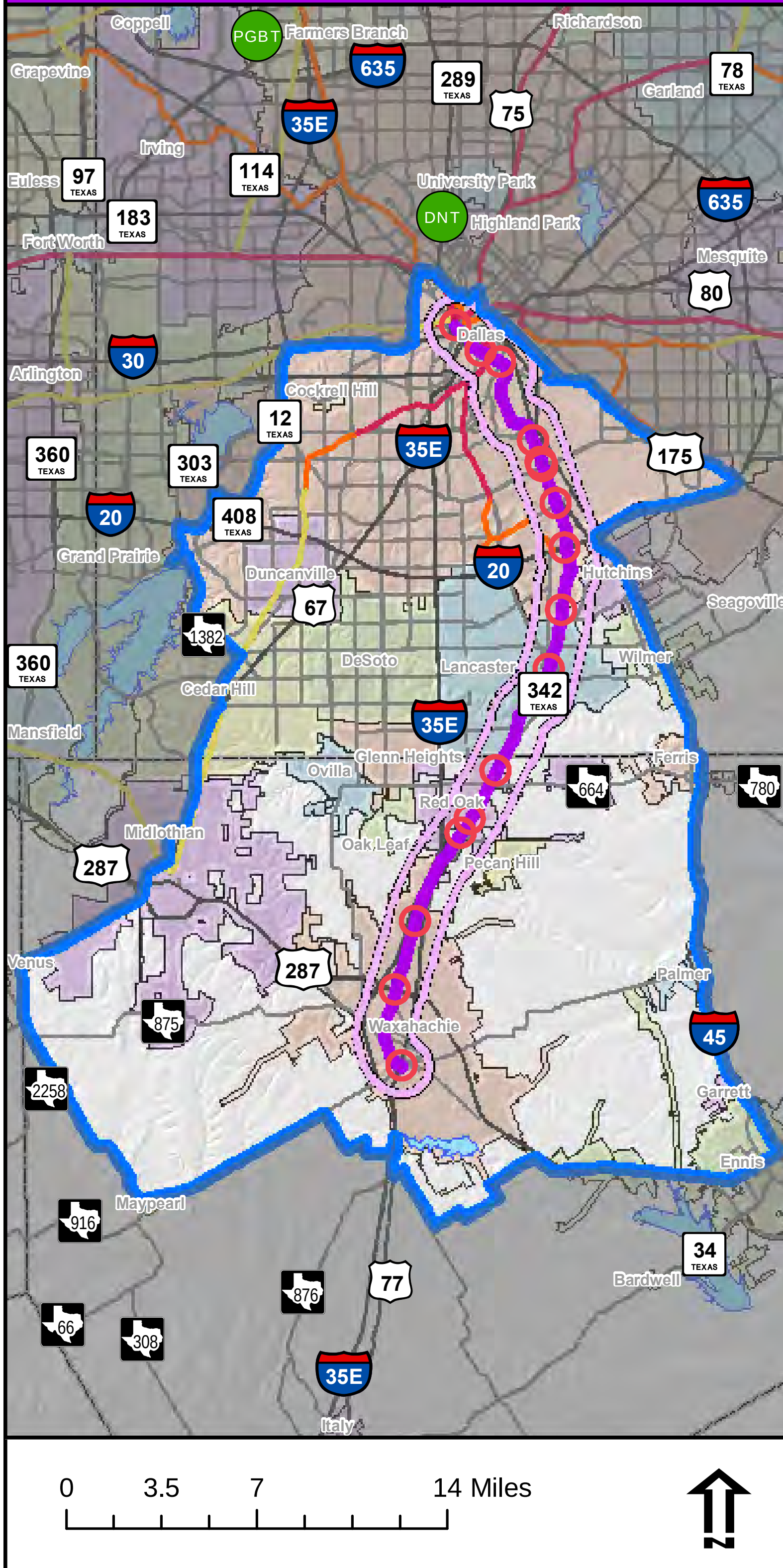
The Waxahachie Corridor study area is a one-mile radius around the existing freight rail corridor from Union Station in Dallas to the Waxahachie Central Business District (CBD). The study area includes many employment centers, diverse neighborhoods, and activity centers. The study area includes portions of five municipalities: Dallas, Hutchins, Lancaster, Red Oak, and Waxahachie. The proposed Waxahachie Corridor connection to Union Station would provide connections to the DART Red and Blue Line Light Rail Transit (LRT) and the Trinity Railway Express (TRE) commuter rail, jointly owned and operated by DART and The T, which could facilitate intra-region travel generating solutions to address common regional mobility needs.

A broader planning area was established using the 2030 traffic survey zones (TSZ) to analyze corridor travel characteristics. The planning area includes Dallas and Ellis Counties and is generally bound by Interstate Highway (IH) 30, Sylvania Avenue, Harry Hines Boulevard, Spur 366, IH 375, IH 45, and US 175 on the north; IH 20 and IH 45 on the east; US 287, Farm-to-Market (FM) 66, FM 157, and the border of the metropolitan planning area (MPA) on the south; and US 67, FM 1382, Spur 408 and Loop (LP) 12 to the west. Figure 1-4 illustrates the corridor, potential station locations, and analysis areas (planning and study areas) for the Waxahachie Corridor within the DFW region.

1.4.1 Corridor Description

The Waxahachie Corridor from the downtown Waxahachie rail depot to Union Station in downtown Dallas is a BNSF line extending approximately 30.9 miles. Current trackage rights to the Waxahachie Corridor and right-of-way are owned by BNSF. The exception is the northern most section of the corridor from Forest Lane to Union Station, which is owned and dispatched by the UPRR. In addition, UPRR has trackage rights to serve several local industries. Right-of-way width is approximately 100 feet throughout the entire corridor.

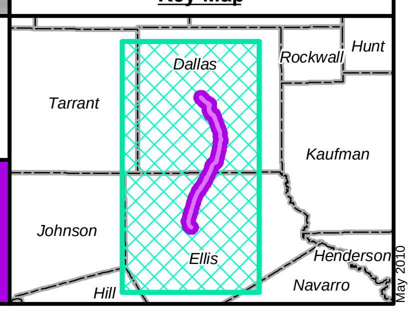
Figure 1-4 — Waxahachie Corridor Planning Area
From FM 66 to Spur 366



Legend

- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- Station Analysis Area
- Study Area
- Planning Area
- City / Town Limits
- County Limits
- Lake

Key Map



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The current maximum operating speed limit is 40 miles per hour (mph) for freight trains. The line is equipped with Automatic Block Signals (ABS) and is operated under Track Warrant Control (TWC) rules. The maximum weight per rail car is 143 tons over the entire corridor. Current freight traffic is approximately four BNSF trains and two UPRR trains per day.

The entire freight line contains 24 industrial spur tracks, 39 at-grade highway/railroad crossings, ten grade separated highway/railroad crossings, and two at-grade railroad/railroad crossings. The corridor is sparsely populated with approximately 59 percent of the study area undeveloped. The majority of all development is located in the northern portion of the corridor from Union Station to IH 20. South of IH 20, undeveloped land accounts for approximately 78 percent of the study area.

Major roadway intersections include IH 30, IH 20, and US 287. The northern terminus of Union Station connects the DART Red and Blue Lines, the DART and The T joint commuter rail line TRE, and Amtrak. Near the intersection of IH 20 and the proposed corridor is the southern campus of the University of North Texas (UNT), Dallas Campus. South of IH 20, the Waxahachie Corridor passes through the Dallas Logistics Hub (DLH). The BNSF is considering development of an intermodal terminal in the DLH. In addition; the Allen Group, in cooperation with the BNSF and UPRR, is proposing a spur between the BNSF line and the UPRR line that runs adjacent to IH 45. Near the proposed intermodal terminal location lies Cedar Valley College, a campus in the Dallas County Community College system. Along the southern portion of the study area, Baylor Medical will be constructing a large medical complex near the intersection of IH 35E and US 287 to serve Ellis County. In Waxahachie, the Navarro College Waxahachie Campus and Southwest Assemblies of God University are located near the existing rail line. The proposed southern terminus is the old rail depot in downtown Waxahachie. The rail depot served the former Interurban Railway operated throughout the Dallas-Fort Worth region.

1.4.2 Historical Rail Operations

The Waxahachie Corridor was built by the Missouri, Kansas, and Texas Railroad (MKT) to connect Waco to Dallas (and north into Kansas via other owned tracks). Service into Dallas from Waxahachie and south started in 1889. Major goods included mostly cotton, oil, and agriculture food products. After World War II, the MKT was in decline and after various government monetary interventions, it was purchased by the UPRR in 1989. As part of the merger deal, the UPRR transferred ownership of the Waxahachie Corridor to the BNSF. Although the railroad is owned by the BNSF, the UPRR retained ownership of property adjacent to the railroad (such as the rail depot stations).

Passenger rail operations were implemented by the Southern Traction Company to connect the electric interurban system (both local and intercity) in Dallas to Waco. The tracks paralleled the existing MKT tracks from Dallas to Waco. Service between Waco and Dallas began operation in 1913. The Texas Electric Railway was formed in 1917 as a merger between the Southern Traction Company (operating lines from Dallas to Waco and Corsicana) and the Northern Traction Company (operating lines to Fort Worth and Denison). Within the Waxahachie Corridor study area, stations in Dallas, Lisbon (now Dallas), Red Oak, Sterrett (now Waxahachie) were served with approximately 32 trains per day on the Dallas-Waco Division line. Increasing automobile ownership, especially after the end of World War II, undermined the viability of rail service and led the Texas Electric Railway to cease all remaining passenger operations on December 31, 1948. The interurban railways that operated in north central Texas for some period between 1901 and 1948 are shown in Figure 1-5.

1.5 PREVIOUS WORK EFFORTS

Passenger rail service within the Waxahachie Corridor has been studied for several years. The Waxahachie Corridor has been analyzed and recommendations have been made for the overall corridor and for proposed station locations by local governments and NCTCOG.

The NCTCOG *RRCS*, July 2005, and the MTP provide the only unique, public reports detailing funding and a conceptual option for the Waxahachie Corridor. The Cities of Dallas, Red Oak, and Waxahachie each reference the potential for passenger rail service along the Waxahachie Corridor within their approved local government comprehensive plans.

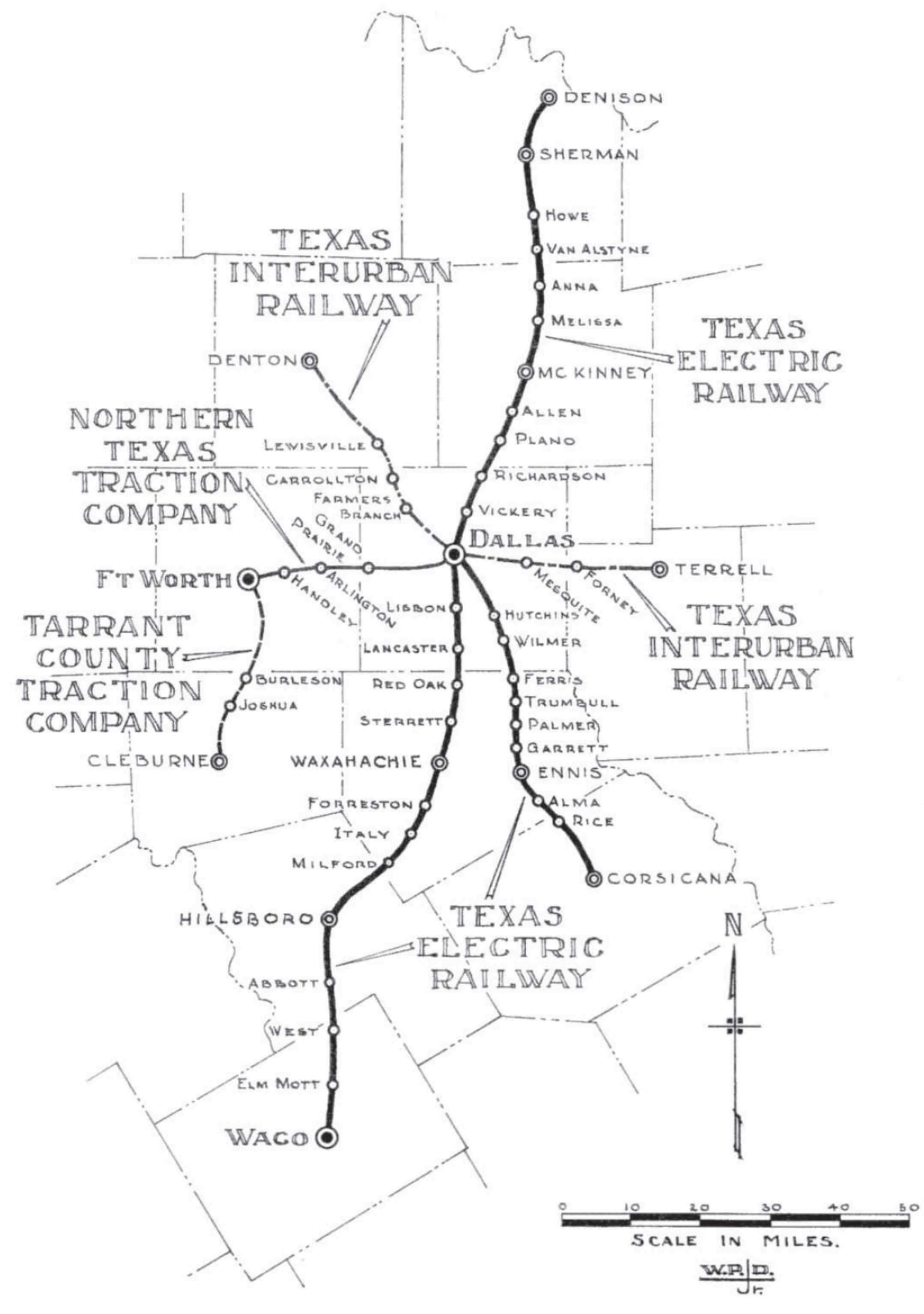
1.5.1 Regional Rail Corridor Study

In July 2005, NCTCOG produced the *RRCS* documenting and researching proposed rail lines in the MTP by analyzing potential viability, as well as proposed mode (light rail, commuter rail/regional rail, or bus rapid transit). The study included a separate section devoted to the proposed Waxahachie Corridor. The study included the current condition of the existing railroad, estimated freight traffic, a passenger study analysis, and a simplified cost estimate. The study concluded regional rail would be the preferred mode with a projected daily ridership of 4,000 passengers in 2030. Estimated capital cost was $265 million and operational cost was estimated to be $14 million annually.

1.5.2 Rail North Texas

In 2008, RNT was an initiative by NCTCOG to further study each passenger rail corridor identified in the MTP. RNT recommended a state legislative funding bill for the proposed 251 miles of additional passenger rail adopted in the MTP. During this initiative, a Waxahachie Corridor overview was created identifying projected ridership, preliminary station locations, potential cost, social statistics, and land use. In this study, the Waxahachie line was shortened to connect to the proposed DART Blue LRT line at the Southport Station. This change was added to reduce the potential cost of building the entire line to Union Station in Dallas. The project had an estimated capital cost of $307 million and an operational cost of $7 million annually.

Figure 1-5 — Texas Interurban Railways: 1901 to 1948



Map Date: November 2010 Source(s): Texas Electric Album – Interurbans Special 62, Autumn 1975

North Central Texas Council of Governments

Waxahachie Corridor Conceptual Engineering and Funding Study

1.5.3 Local Government Comprehensive Plans

Several municipalities along the proposed corridor have identified potential transit stations and/or transit oriented development (TOD) within their comprehensive plans to support the proposed Waxahachie Corridor passenger rail service.

1.5.3.1 City of Dallas

The Dallas comprehensive plan, *forwardDallas!*, has identified transit needs for 2030. Part of *forwardDallas!* identified transit trips to 2030. While the Waxahachie Corridor was not specifically mentioned, *forwardDallas!* included all proposed commuter rail lines from the MTP in the comprehensive plan. In 1999, only one percent of all transit users in Dallas were using commuter rail (the TRE). Future projections for 2030, with the addition of all future commuter rail lines, would increase commuter ridership to six percent of all riders within Dallas.

1.5.3.2 City of Lancaster

Lancaster does not include the Waxahachie Corridor in its comprehensive plan. One station is currently proposed for Lancaster.

1.5.3.3 City of Red Oak

Red Oak has included a potential location for a transit center and TOD as part of its *Downtown Vision Plan*. This plan identifies a potential location for a transit station along the Waxahachie Corridor. A new comprehensive plan is currently in development with the City of Red Oak. This new plan identifies all three proposed stations as potential options for the Waxahachie Corridor. In this plan, the downtown station is identified as the least preferred while the northern station has the greatest opportunity for TOD development.

1.5.3.4 City of Waxahachie

Waxahachie identified two rail stations in their comprehensive plan that is consistent with the original RNT proposal. These two rail stations include the CBD which could allow access to Waxahachie City Hall, Navarro Community College, the Southwest Assemblies of God University, Ellis County Courthouse, and various local businesses. The northern rail station could be located on US 287 between IH 35E and US 77. This site was identified for access to major “big box” retailers on US 77 and to the proposed Baylor Medical Center. These stations correspond with the stations NCTCOG has identified for the Waxahachie Corridor.

In addition to the identification of these transit stations, Waxahachie identified the need for local transit to support a regional rail system. For each rail station, Waxahachie has proposed a local transit system (mode unknown) to transport people to their final destinations.

1.6 PUBLIC AND AGENCY OUTREACH

The Waxahachie Corridor CE & FS has been conducted with a proactive process to allow regional stakeholders and agency representatives the opportunity to gain knowledge and provide input. Chapter 6 provides detailed information regarding all project meetings for the Waxahachie Corridor.

NCTCOG coordination efforts included two types of meetings: Stakeholder/Agency Meetings and Corridor Strategy Team Meetings. Input from these meetings was used to guide the CE & FS, develop alternatives, and evaluate alternatives.

Corridor Strategy Team Meetings were held prior to major milestones to provide the participants the opportunity to receive project data and influence the corridor study by representing their constituents. In addition to Corridor Strategy Team Meetings, individual Stakeholder/Agency Meetings were held with technical staff representing local and regional governments and transportation providers throughout the corridor. These meetings were conducted during the initial stages of each study element. The stakeholder meetings were designed to solicit technical input and professional judgments regarding critical study elements. The local government and transportation provider technical staff representatives contributed valuable input furthering the goals and objectives for the project.

2.0 NEED AND PURPOSE

Chapter 2 identifies the need and purpose for transportation improvements within the Waxahachie Corridor and provides information on the established mission statement, goals, and objectives for the project to guide the development of this document, as well as subsequent project development phases and implementation.

2.1 TRANSPORTATION NEEDS

The need for the Waxahachie Corridor project is based on population and employment growth, increased transportation demand, sustainable development initiatives, and intermodal connections from the study area to the Dallas-Fort Worth (DFW) region. The Waxahachie Corridor is included in the regional long-range metropolitan transportation plan (MTP*), Mobility 2030: The Metropolitan Transportation Plan for the Dallas – Fort Worth Area – 2009 Amendment (Mobility 2030 - 2009 Amendment).*

2.1.1 Population and Economic Growth

Texas has been one of the ten fastest growing states in the nation. According to the United States (US) Census Bureau, Texas added 3.9 million persons between 1990 and 2000, a 22.8 percent increase. By comparison, the US population grew by 32.7 million persons between 1990 and 2000, an increase of 13.2 percent. In 2000, the DFW urbanized area grew to 5,067,400 persons, a 29.3 percent increase since the 1990 Census. Based on 2008 population estimates, the DFW urbanized area is the fourth most populous in the nation.

The DFW region has sustained a high level of population and economic growth due to three primary factors: a favorable business climate, attractive tax policies, and an abundance of available land. The region, like the nation in general, has benefited from an unprecedented period of growth, which has increased the need for an efficient transportation system. The current economic downturn has slowed the growth rate over the near term. However, Texas and the DFW region have fared better than the majority of the country and are expected to recover more quickly. Historically, this has been the case with other economic downturns.

It is anticipated the DFW region population will increase by almost three million people over the next 20 years. Table 2-1 shows North Central Texas Council of Governments (NCTCOG) regional projections for population, households, and employment for the DFW urbanized area. The 10-county urbanized area includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties. The four core counties, Collin, Dallas, Denton, and Tarrant, are expected to account for approximately 70 percent of the region's population increase in the 2010 census.

Table 2-1 Dallas-Fort Worth Urbanized Area Demographics

Year	Population	Households	Employment
1990 Census	3,920,094	1,462,047	2,033,973
2000 Census	5,067,400	1,886,700	3,158,200
2010	6,328,200	2,350,300	3,897,000
2020	7,646,600	2,851,400	4,658,700
2030	9,107,900	3,396,100	5,416,700

Source: NCTCOG Demographic Forecast Information (January 24, 2007) and US Census Bureau

Table 2-2 shows the projected populations and employment for municipalities along the Waxahachie Corridor. A total population increase of approximately 167 percent and a 50 percent increase in employment are projected within the study area between 2000 and 2030.

Table 2-2 Base Year and Projected Population and Employment

Locations	Population			Employment		
	2000	2030	% Change	2000	2030	% Change
Dallas	1,202,592	1,404,847	16.8%	1,038,314	1,390,219	33.9%
Hutchins	2,683	4,021	49.9%	3,130	8,785	180.7%
Lancaster	25,669	65,301	154.4%	13,119	30,961	136.0%
Red Oak	4,806	63,329	1,217.7%	1,715	18,143	957.9%
Waxahachie	20,030	55,861	178.9%	16,045	41,930	161.3%
Total	**1,225,780**	**1,593,359**	**26.9%**	**1,072,323**	**1,490,038**	**39.0%**
Study Area	91,788	255,304	167.3%	212,996	319,503	50.0%

Source: NCTCOG 2030 *Demographic Forecast Information*

A total of 32 major employers with 500 or more employees are located within the study area. The largest concentration of larger employers is in Dallas with 31 total major employers. Waxahachie has the remaining large employer. Bank of America is the largest employer in the study area with over 3,000 employees. Other large employers employing over 2,000 employees include the AT&T Headquarters and the Dallas County Sheriff's Office, both occurring in Dallas.

Access to these major employers and activity centers is primarily by personal motor vehicle. While job growth continues to occur outside the downtown "core" area, the high density of employment in the downtown "core" continues to be a strong pull for the study area cities south of Dallas. As shown in Table 2-2, the majority of the cities are projected to have a higher population than employment. The projected increase in population in the corridor will increase the need for access to employment centers in the study area and to the surrounding areas.

"Job sprawl" is addressed in several papers from The Brookings Institute. *Job Sprawl: Employment Location in US Metropolitan Areas* cites a statistical correlation between a metro area's political balkanization and employment decentralization caused by a large number of municipalities competing for major employers. *Job Sprawl Revisited: The Changing Geography of Metropolitan Employment* notes the steady decentralization of employment between 1998 and 2006 with southern US metropolitan areas being particularly emblematic of an outward shift of job share from the urban core. The DFW region exemplifies this trend. Employment growth will occur in the southern portion of the DFW region and the Dallas urban core. The already congested roadway network is anticipated to create severe mobility challenges and the need for additional transportation improvements in the Waxahachie Corridor.

2.1.2 Increased Transportation Demand

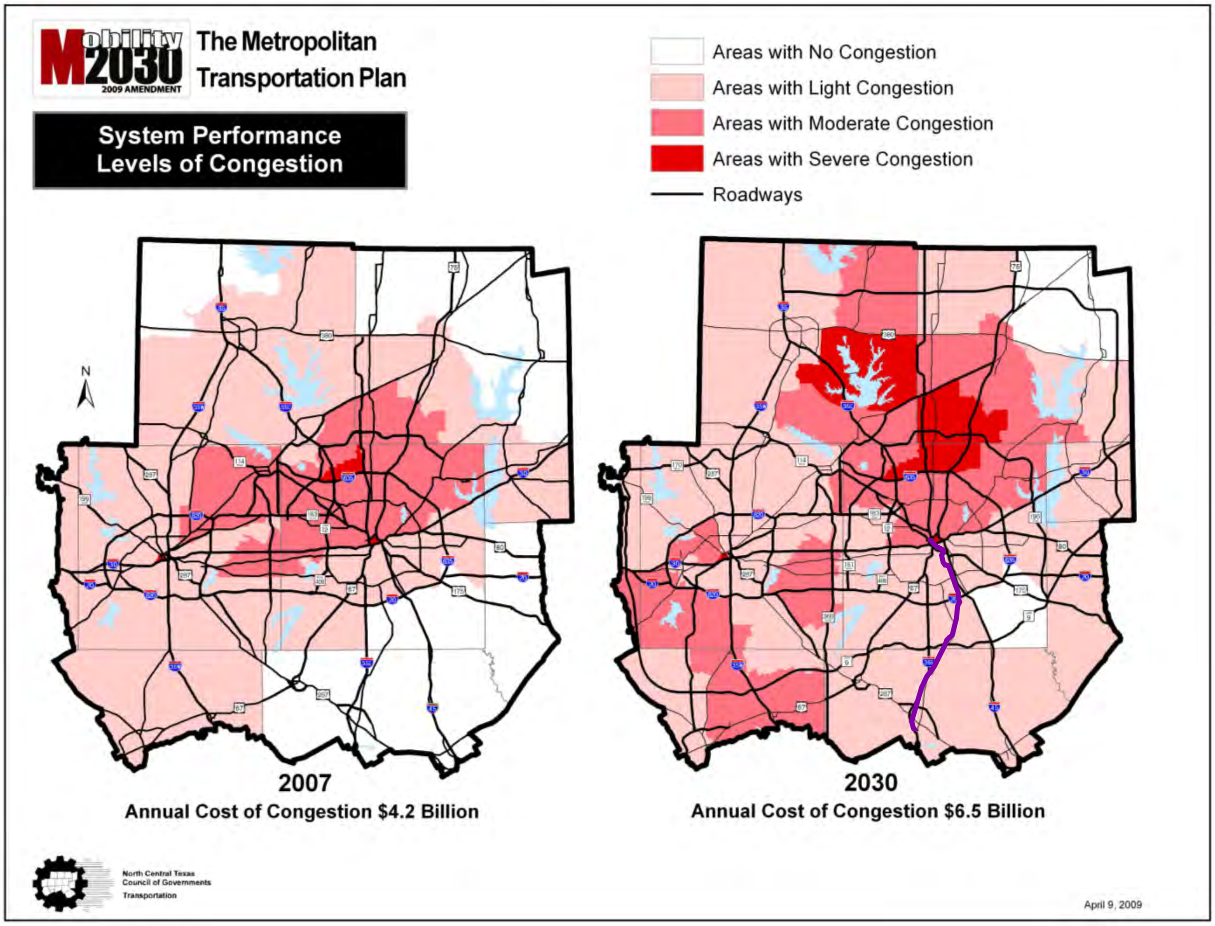
As mentioned in Section 2.1.1, not only have population and employment increased, but the nature of travel has also changed in ways contributing to increased traffic congestion in the DFW region. Changes in land use associated with suburbanization have had an effect on the characteristics of travel. Some areas have induced both population and business growth to the surrounding suburbs, marginalizing the traditional suburb-to-central city commute, creating more widely complex inter- and intra-suburban travel and reverse commute trip patterns. This reverse trend is occurring in the northern half of the DFW region, while a traditional commuting trend is occurring in the Waxahachie Corridor. As shown in Section 2.1.1, the study area exhibits a high employment density at the northern end of the proposed project while the population is clustered in the southern segments. This condition promotes a strong suburb-to-central city commuting pattern, opposite the trend experienced in the north DFW region. With the projected increases in population, the existing roadway system will be inundated as more traffic mirrors this major movement for work related vehicular trips.

Despite the rapid pace at which growth has occurred, and is projected to continue, limited funding for transportation improvements has constrained the region's ability to solve ground transportation issues. As discussed in Chapter 1, Section 1.2 *Mobility 2030 - 2009 Amendment* is the region's current fiscally constrained MTP. It presents a system of transportation improvements needed to maintain mobility in the DFW region over the next 20 years and serves as a guide for the expenditure of state and federal funds within the region.

Mobility 2030 - 2009 Amendment recommends $145.5 billion in year of expenditure (YOE) dollars of transportation improvements. Despite this transportation system investment level, congestion is projected to increase by 2030. Future roadway capacity is insufficient to accommodate the projected travel demand. Roadway upgrades and expansion cannot keep pace with changing residential and employment development patterns, leading to increasing congestion and delay. Figure 2-1 illustrates the congestion levels during the peak hour under 2007 and 2030 conditions. The 2030 conditions represent the anticipated congestion level with all MTP projects completed. The increase in congestion is directly attributed to the projected 26.9 percent increase in population and 39.0 percent increase in employment from 2000 to 2030 region wide. To lessen the impact of the resulting congestion, a number of roadway improvements are proposed in the Waxahachie Corridor study area.

The roadway system in the Waxahachie Corridor planning area includes numerous highways and regional arterials (see Chapter 1, Figure 1.4). The roadways operate predominately north-south. The major north-south corridors in the planning area include Interstate Highway (IH) 35E, IH 45, IH 345, US 67, US 77, US 175, Spur 408, State Highway (SH) 310, SH 342, Central Expressway, Clark Road, Cockrell Hill Road, Corinth Street, Good Latimer Expressway, Griffin Street, Hampton Road, Harwood Street, Houston Street, Joe Wilson Road, Lamar Street, Lancaster Road, Market Center Boulevard, Moody Street, Mountain Creek Parkway, Oak Lawn Avenue, Pearl Expressway, Pearl Street, Riverfront Boulevard, Trinity Parkway, and Victory Avenue. The major east-west roadways in the corridor planning area include IH 20, IH 30, US 287, Business Route (BU) 287, Loop (LP) 9, LP 12, Spur 303, Spur 366, SH 180, Farm-to-Market (FM) 1382, Beltline Road, Camp Wisdom Road, Canton Street, Commerce Street, Continental Boulevard, Danieldale Road, Gaston Avenue, Harry Hines Boulevard, Illinois Avenue, Irving Boulevard, Lake June Road, Pleasant Run Road, and Simpson Stuart Road.

Figure 2-1 System Performance 2007 and 2030 Level of Congestion



Source: NCTCOG, April 2009

The majority of the regionally significant arterials (RSA) occurred in the downtown Dallas central business district (CBD). The Dallas CBD provides a large collection of employers and a high density of jobs; therefore, most streets through the Dallas CBD are considered regionally significant. Table 2-3 shows the existing and proposed highways and RSAs in the planning area detailed in *2030 Mobility - 2009 Amendment*.

Table 2-3 Existing and Planned Roadways in Planning Area

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
IH 20	Cedar Ridge Road to Camp Wisdom Road	0 (FRTG)	6 (FRTG)	2010-2019	0	22
	IH35E to Lancaster Road	0 (FRTG)	4/6 (FRTG)	2009	0	1,187
	Bonnie View Road to JJ Lemon Road	0 (FRTG)	4/6 (FRTG)	2009	0	387
	FM 1382 to Spur 408	8	10	2020-2025	189,958	241,521

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
IH 20	Spur 408 to US 175	9	10	2026-2030	159,880	194,594
IH 30	Loop 12 to Westmoreland Road	6	8 + 3 (HOV-M/R)	2010-2019	169,675	206,802
	Westmoreland Road to IH 35E	6	8 + 2 (HOV-M/R)	2010-2019	157,109	217,107
IH 35E	US 77 (north of Waxahachie) to Bigham Road	4	6	2010-2019	54,507	111,140
	Parkerville Road to US 77 (north of Waxahachie)	4	6	2009	103,072	164,625
	IH 20 to Parkerville Road	6	6	N/A	141,699	192,921
	US 67 to IH 20	6	6 + 1 (HOV-M/R)	2020-2025	98,549	136,845
	8th Street to US 67	8 + 1 (HOV-R)	10 + 2 (HOV-M/R)	2020-2025	187,612	270,450
	Colorado Boulevard to 8th Street	8	10 + 2 (HOV-M/R)	2020-2025	187,867	286,947
	IH 30 to Colorado Boulevard	8	6/10 + 2 (HOV-M/R) + 10 C-D	2020-2025	204,052	271,858
	Spur 366 to IH 30	10	10 + 2 (HOV-M/R) + 4/6 C-D	2020-2025	207,634	315,722
	DNT to Spur 366	10	10 + 2 (HOV-M/R) + 6/8 C-D	2020-2025	272,773	342,884
	Wycliff Avenue to DNT	10	10 + 2 (HOV-M/R)	2020-2025	242,169	259,137
IH 45	IH 20 to US 287B	6	6	N/A	59,878	109,453
	US 175 to IH 20	6	8	2020-2025	95,554	147,536
	SH 310 to US 175	6	8	2010-2019	89,550	160,874
	IH 30 to SH 310	10	10 (Recon)	2010-2019	145,160	205,098
IH 345	US 75 to IH 45	8	10	2010-2019	174,720	206,071
US 67	Loop 9 to FM 157	4	6	2020-2025	56,493	115,148
	IH 20 to Loop 9	4	6 + 1 (HOV-M/R)	2020-2025	95,428	158,932
	IH 35E to IH 20	4 + 2 (HOV-C)	6 + 2 (HOV-M/R)	2020-2025	115,985	170,829
US 77	FM 66 to IH 35E	2	2	N/A	5,931	9,920

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
US 77	North of McMillan Road to FM 66	2	4	2010-2019	7,644	14,038
	SH 342 to North of McMillan Road	4	4	N/A	14,703	23,779
US 175	SH 310 to IH 20	6	8	2026-2030	101,291	124,423
	IH 45 to SH 310	6 (Frwy)	6 (Pkwy)	2010-2019	106,770	22,599
US 287	US 67 to BU 287	4	4	N/A	31,294	62,336
BU 287	West end of Midlothian bypass to east end of Midlothian bypass	4	4	N/A	8,243	16,526
	West end of Waxahachie bypass to east end Waxahachie bypass	2	4	2020-2025	12,508	26,084
	West end of Ennis bypass to IH 45	4	4	N/A	12,116	24,292
	IH 45 to Paris Street	2	4	2020-2025	8,044	17,799
	Paris Street to Arnold Street	4	4	N/A	6,509	13,920
	Arnold Street to IH 45	2	4	2020-2025	6,136	14,228
Loop 9	IH 20 to US 67	0	6 (Toll)	2026-2030	0	40,179
Loop 12	SH 310 to US 175	4	4	N/A	23,135	23,998
	Spur 408 to SH 310	6	6	N/A	55,983	62,955
	IH 30 to Spur 408	8	8 + 2 (HOV-M/R)	2020-2025	152,799	180,194
Spur 303	Spur 408 to Loop 12	6	6	N/A	8,242	11,724
Spur 366	US 75 to IH 35E	8	8	N/A	163,203	173,633
	IH 35E to Beckley Avenue	0	6	2010-2019	0	77,643
Spur 408	IH 20 to Loop 12	6	6	N/A	102,400	121,993
SH 180	Loop 12 to IH 35E	6	6	N/A	19,295	23,809
SH 310	IH 45 to Loop 12	4	4	N/A	15,971	20,577
	Loop 12 to Overton Road	6	6	N/A	27,478	30,921
	Overton Road to US 175	4	4	N/A	20,011	24,889
SH 342	US 77 to 8th Street	2	4	2020-2025	14,137	30,603
	8th Street to Pleasant Run	4	6	2009	11,599	28,170

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
SH 342	Pleasant Run to Loop 12	6	6	N/A	21,498	41,641
FM 1382	IH 20 to Clark Road	4	4	N/A	32,287	39,179
	Clark Road to Strauss Road	4	6	2010-2019	21,879	30,099
	Strauss Road to US 67	4	4	N/A	31,226	50,687
	Duncanville Road to US 67	6	6	N/A	22,344	28,115
	Hampton Road to Duncanville Road	4	6	2009	17,739	23,898
	IH 35E to Hampton Road	4	4	N/A	20,724	22,472
Belt Line Road	Anderson Road to West Belt Line Road	2	6	2010-2019	16,906	34,027
	West Belt Line Road to FM 1382	4	6	2010-2019	17,293	35,080
	IH 35E to Bluegrove Road	4	4	N/A	8,841	16,351
	Bluegrove Road to Main Street	2	6	2010-2019	6,340	12,919
	Main Street to Nokomis Road	4	4	N/A	7,262	16,893
	Nokomis Road to Sunrise Road	2	0	2010-2019	6,915	0
	Nokomis Road to Pleasant Run Road	0	6	2010-2019	0	10,300
	Sunrise Road to Summers Street	2	4	2010-2019	3,212	2,50
	Summers Street to IH 45	4	4	N/A	4,632	9,336
Camp Wisdom Road	FM 1382 to Turnout Lane	4	6	2026-2030	19,858	38,737
	Turnout Lane to Clark Road	2	6	2026-2030	9,089	18,869
	Clark Road to Greenstone Lane	2	6	2009	6,908	15,416
	Greenstone Lane to Main Street	6	6	N/A	6,524	11,690
	Main Street to IH 20	4	4	N/A	3,082	6,079
	IH 20 to SH 342	6	6	N/A	11,562	18,021

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
Canton Street	Pearl Expressway to Central Expressway	4	4	N/A	13,000	5,859
	Central Expressway to Good Latimer Expressway	6	6	N/A	12,221	5,805
Central Expressway	Pearl Street to Pacific Avenue	2	2	N/A	14,466	11,451
	Pacific Avenue to Commerce Street	4	6	2010-2019	24,487	22,707
	Commerce Street to Canton Street	6	6	N/A	12,395	11,698
	Canton Street to Marilla Street	8	8	N/A	16,148	6,084
	Marilla Street to IH 30	0	8	2020-2025	18,277	12,101
	IH 30 to Corinth Street	2/3	6	2010-2019	4,224	12,539
	Corinth Street to IH 45	4	6	2010-2019	39,747	10,966
Clark Road	IH 20 to Crouch Lane	6	6	N/A	33,652	53,213
	Crouch Lane to Wintergreen Road	4	6	2010-2019	13,488	32,357
	Wintergreen Road to FM 1382	4	4	N/A	8,529	19,593
Cockrell Hill Road	Loop 12 to Wintergreen Road	6	6	N/A	44,823	47,864
	Wintergreen Road to FM 1382	4	6	2020-2025	14,032	34,832
	FM 1382 to Loop 9	2	6	2010-2019	9,050	31,159
Commerce Street (and couplet)	IH 345 to Central Expressway	5/4	5/4	N/A	54,194	44,822
	Central Expressway to Houston Street	5	5	N/A	50,973	50,514
	Houston Street to IH 35E	4/3	4/3	N/A	40,600	50,339
	IH 35E to Riverfront Boulevard	3/4	8	2020-2025	34,214	19,755
	Riverfront Boulevard to Sylvan Avenue	6	6	N/A	42,090	14,539

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
Continental Boulevard	IH 35E to Houston Street	4	4	N/A	12,499	27,254
Corinth Street	Central Expressway to Riverfront Boulevard	4	4	N/A	12,519	13,699
	Riverfront Boulevard to 8th Street	4	6	2010-2019	28,975	29,909
	8th Street to Illinois Avenue	6	6	N/A	16,691	21,275
	Illinois Avenue to Saner Avenue	4	4	N/A	13,926	21,546
Danieldale Road	Clark Road to DeSoto city limits	6	6	N/A	13,238	24,703
	DeSoto city limits to Westmoreland Road	2	6	2010-2019	11,841	21,301
	Westmoreland Road to Old Hickory Trail	2	6	2020-2025	6,940	17,921
	Old Hickory Trail to IH 35E	2	4	2020-2025	1,826	12,562
Gaston Avenue	Central Expressway to IH 345	4	4	N/A	14,312	18,954
Good Latimer Expressway	IH 345 to Grand Avenue	6	6	N/A	13,888	19,930
Griffin Street	Spur 366 to Field Street	6	6	N/A	44,514	47,487
	Field Street to Spur 366 off ramp	5	5	N/A	23,925	24,298
	Spur 366 off ramp to Memorial Drive	6	6	N/A	23,449	30,912
	Memorial Drive to IH 30	7	7	N/A	4,575	14,965
Hampton Road	IH 30 to Pleasant Run Road	6	6	N/A	30,782	41,545
	Pleasant Run Road to Beltline Road	4	4	N/A	16,193	27,415
	Beltline Road to Bear Creek Road	6	6	N/A	9,181	20,528

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
Harry Hines Boulevard	Market Center Boulevard to Oak Lawn Avenue	6	6	N/A	38,180	38,428
	Oak Lawn Avenue to Wolf Street	6/6	6/6	N/A	90,578	93,851
	Wolf Street to Payne Street	6/5	6/5	N/A	86,178	88,177
Harwood Street	IH 30 to Grand Avenue	4	4	N/A	8,678	11,102
Houston Street	Young Street to Commerce Street	5	5	N/A	15,450	7,232
	Commerce Street to Continental Boulevard	4	4	N/A	8,344	13,072
	Continental Boulevard to Victory Park Lane	6	6	N/A	6,763	6,309
	Victory Park Lane to Victory Avenue	4	4	N/A	4,788	5,356
Illinois Avenue	Loop 12 to Southern Oaks Boulevard	6	6	N/A	24,329	31,057
	Southern Oaks Boulevard to SH 310	4	4	N/A	14,021	18,065
Irving Boulevard	Wycliff Avenue to Market Center Boulevard	6	6	N/A	20,842	18,599
Joe Wilson Road	US 67 to Parkerville Road	4	6	2010-2019	10,443	18,552
	Parkerville Road to Johnson Lane	2	4	2010-2019	7,126	20,588
Lake June Road	SH 310 to Pemberton Hill Road	0	4	2020-2025	0	2,214
	Pemberton Hill Road to US 175	2	4	2020-2025	5,195	7,855
Lamar Street	Pacific Avenue to Commerce Street	4	4	N/A	7,584	14,043
Lancaster Road	Main Street to SH 342	2	2	N/A	6,845	11,142
	Saner Avenue to Loop 12	4	4	N/A	10,981	18,420

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
Market Center Boulevard	Harry Hines Boulevard to Irving Boulevard	6	6	N/A	26,768	30,775
Moody Street	McKinnon Street to Ross Avenue	6	6	N/A	45,239	44,602
	Harry Hines Boulevard to McKinnon Street	4	4	N/A	27,320	30,456
	Spur 366 to Harry Hines Boulevard	6	6	N/A	13,597	22,129
Mountain Creek Parkway	Grady Niblo Road to IH 20	4	6	2020-2025	12,629	23,543
	IH 20 to Christie Lane	4	4	N/A	7,662	19,744
	Christie Lane to Clark Road	2	4	2020-2025	9,809	16,040
Oak Lawn Avenue	Harry Hines to Irving Boulevard	6	6	N/A	47,329	76,256
Pearl Expressway	Pearl Street to Gaston Avenue	4	6	2010-2019	18,872	22,764
	Gaston Avenue to Commerce Street	5	4	2010-2019	17,206	17,489
	Commerce Street to Wood Street	4	4	N/A	9,728	11,331
	Wood Street to Canton Street	3	4	2010-2019	3,934	7,592
	Canton Street to Marilla Street	4	4	N/A	13,616	2,604
Pearl Street	Ross Avenue to US 75	6	6	N/A	23,790	32,850
Pleasant Run Road	Belt Line Road to IH 45	2	6	2010-2019	3,407	14,198
Riverfront Boulevard	Irving Boulevard to Continental Boulevard	6	8	2020-2025	35,547	27,357
	Continental Boulevard to Commerce Street	6	8	2010-2019	41,548	28,033
	Commerce Street to IH 30	6	8	2009	34,508	23,662
	IH 30 to Corinth Street	6	8	2010-2019	18,743	29,007
	Corinth Street to Park Road	0	6	2010-2019	0	18,951

Table 2-3 Existing and Planned Roadways in Planning Area (continued)

Roadway	Limits	Existing Lanes	Future Lanes	Completion Date	2007 Traffic	2030 Traffic
Riverfront Boulevard	Park Road to Trinity Pkwy	0	4	2010-2019	0	18,951
Simpson Stuart Road	SH 342 to SH 310	6	6	N/A	6,236	14,996
Trinity Parkway	Sylvan Avenue to Spur 366	0	6	2020-2025	0	127,812
	Spur 366 to IH 45	0	6	2010-2019	0	124,885
	IH 45 to SH 310	0	6	2010-2019	0	153,111
Victory Avenue	Payne Street to Continental Boulevard	4	4	N/A	3,050	1,530

Source: NCTCOG, *Mobility 2030 - 2009 Amendment*

As indicated in Figure 2-1, the existing roadway system within the Waxahachie Corridor planning area is currently experiencing light congestion south of IH 30, moderate congestion north of IH 30, and severe congestion in the downtown Dallas area. More specifically, in 2007 approximately 8.7 percent of the existing roadway sections in the planning area were at level-of-service (LOS) D or E and 4.3 percent were at LOS F. LOS is a rating system used to measure operating conditions such as freedom to maneuver, speed, comfort, convenience, and safety for roadways based on operating conditions, with “A” being best and “F” worst. LOS ratings estimate the maximum traffic a facility can accommodate under various operating conditions. Table 2-4 shows the 2007 and 2030 performance measures calculated for the planning area roadway network.

Table 2-4 Planning Area Transportation Performance Measures

Performance Measures	2007	2030	% Change
Vehicle Miles of Travel per Day	18,347,234	29,033,727	58.2%
Vehicle Hours of Travel per Day	445,120	703,665	58.1%
Vehicle Hours of Congestion Delay per Day	48,868	96,343	97.1%
Lane Miles in Planning Area	4,206	5,199	23.6%
Percent Lane Miles at LOS D, E	**2007**	**2030**	**% Change**
Freeway/Toll Road	4.2%	6.4%	2.2%
Principal Arterial	1.8%	3.5%	1.7%
Minor Arterial	1.3%	1.9%	0.6%
Collector	0.5%	1.1%	0.6%
Freeway Ramps	0.3%	0.4%	0.1%
Frontage Roads	0.5%	0.8%	0.3%
HOV	0.1%	0.5%	0.4%
Total Roadway Network	8.7%	14.7%	6.0%
Percent Lane Miles at LOS F	**2007**	**2030**	**% Change**
Freeway/Toll Road	1.7%	2.8%	1.1%
Principal Arterial	0.9%	2.9%	2.0%
Minor Arterial	0.7%	1.1%	0.4%
Collector	0.4%	1.3%	0.9%
Freeway Ramps	0.4%	0.5%	0.1%
Frontage Roads	0.1%	0.8%	0.7%
HOV	0.0%	0.2%	0.2%
Total Roadway Network	4.3%	9.6%	5.3%

Source: NCTCOG DFWRTM, Equation: (2030-2007)/2007

As shown in Table 2-4, even with the addition of 993 lane miles of roadway, 14.7 percent of the roadway sections in the planning area are projected to be at LOS D and E and 9.6 percent at LOS F in 2030. The percentage of roadways experiencing LOS D and E or LOS F increase by 6.0 percent and 5.3 percent, respectively. As congestion worsens, drivers will increasingly use arterials and local streets to avoid anticipated traffic and delays on freeways and toll roads.

In 2030, the planning area is expected to experience an increase in vehicles miles traveled (VMT), vehicle hours traveled (VHT), and vehicle hours of congestion delay. Dallas Area Rapid Transit (DART) currently operates all transit services provided within the planning area. DART operates numerous bus routes, light rail, and commuter rail in the planning area. Current light rail transit (LRT) lines that are in the DART *2030 Transit Plan* include planned DART Red and Blue Line extensions, the Orange Line, the downtown D2 Line, and the completion of the Green Line. In the DART *2030 Financial Plan*, only the Orange Line, Green Line, and the Blue Line extension to the University of North Texas Dallas Campus will be funded by 2030. These LRT lines operate in Dallas and serve only a portion of the Waxahachie Corridor planning area.

The need for additional transportation facilities has been documented in *Mobility 2030 - 2009 Amendment* based on regionally approved demographic projects. *Mobility 2030 - 2009 Amendment* recommends the use of regional rail passenger service along the existing Burlington Northern Santa Fe (BNSF)/Union Pacific Railroad (UPPR) owned rail line from Waxahachie to Union Station. Travel estimates were calculated to evaluate the existing transportation system by assigning 2030 travel demand data to the 2030 roadway networks. As shown in Chapter 1, Figure 1-2, the regional planning process strives to best allocate limited financial resources by maintaining and operating existing facilities, improve the efficiencies of existing facilities, reducing single-occupant vehicle trips, increasing transit strips, and increase auto occupancy.

2.1.3 Sustainable Development Initiative

As identified in Section 2.1.1, the DFW urbanized area is forecasted to grow to almost 9.1 million people and 5.4 million jobs by the year 2030. This represents approximately a 79.7 percent increase in population and 62.0 percent increase in employment from 2000 to 2030. The region's population and employment densities are also expected to increase 41 percent and 15 percent, respectively. In contrast, the population and employment densities in the Waxahachie Corridor planning area are expected to increase 50 percent and 41 percent respectively. While the densities of some urban areas within the region will increase, the region continues to suburbanize. A driving factor in suburbanization is the availability of more affordable housing options outside the four core counties.

Analysis of previous demographic growth trends include increased automobile ownership, more single-occupant travel, increased suburbanization, and increased VMT in the region. These challenges were recognized during the development of *Mobility 2030 - 2009 Amendment*. A specific *Mobility 2030 - 2009 Amendment* objective is supporting sustainable development though the direct link between land use, transportation, and air quality.

Market response to different transportation improvements and various land use types warrant different transportation infrastructure. Combinations of transportation land use can lead to substantially different travel behaviors. For example, higher densities, mixed land uses, and increased transportation alternatives can reduce overall VMT.

Air quality is another critical issue for the DFW region. The US Environmental Protection Agency (EPA) has designated the DFW region as a nonattainment area for eight-hour ozone. Encouraging developments throughout the region to adapt to emission controls could lead to lower emissions and improve air quality.

NCTCOG conducted a series of demographic sensitivity analyses scenarios to assess the potential impacts of alternative growth scenarios on the region between 2010 and 2030. Historically, the DFW region has grown outward with new developments turning rural areas into suburban municipalities. Within the alternative growth scenarios presented by NCTCOG, households and employment locations were redistributed throughout the region to simulate alternative market assumptions. In each scenario, population and employment growth occurring between 2010 and 2030 were redistributed, while maintaining regional population and employment control totals.

- Rail Scenario – Growth was shifted from rural areas to passenger rail station areas.
- Infill Scenario – Growth was shifted from rural areas to infill areas along existing freeways and toll roads.
- Rail with County Control Totals (RCCT) Scenario – The control totals for each individual county was maintained. Growth was shifted from rural areas to passenger rail-oriented areas.
- Vision North Texas (VNT) Scenario – Growth was distributed based on VNT participant feedback.
- *forward Dallas!* Scenario – Created for the City of Dallas, NCTCOG population and employment growth occurring between 2010 and 2030 was redistributed based on the final alternative demographic dataset created during the '*forward Dallas!' Comprehensive Plan* process.

Table 2-5 reveals travel demand and air quality effects based on each scenario. Analysis results indicate a strong correlation between passenger rail and VNT scenarios, both reducing the greatest amounts of ozone emissions, VMT, and hours of delay in the region.

Table 2-5 Alternative Growth Scenarios Compared to Historical Growth Model

Data of Interest	Rail Scenario	Infill Scenario	RCCT Scenario	VNT Scenario	*forward Dallas!*
MPA Average of Trip Length	-8%	+3%	-0.01%	-10.85%	-2.9%
MPA Rail Transit Boardings	+52%	+9%	+8%	+11.13%	+7.4%
MPA Non-Rail Transit Boardings	+29%	+11%	+5%	+15.98%	+11%
MPA Vehicle Miles Traveled	-6%	-5%	-1.2%	-9.43%	-2.2%
MPA Vehicle Hours Traveled	-9%	-7%	-1.7%	-14.31%	-5.7%
Total Vehicle Hours of Delay	-24.0%	-19.0%	-4.0%	-32.5%	-14.5%
Lane Miles Needs	-13.0%	-10.0%	-13.3%	-30.90%	-32.1%
Financial Needs (billions)	-$9.5	-$6.7	-$2.9	-$15.6	-$7.0
Roadway Pavement Needs (sq. mi.)	-8.3	-6.5	-0.7	-9.8	-1.6
NOx Emissions	-4.1%	-3.9%	-1.2%	-8.47%	-2.4%
VOC Emissions	-5.3%	-5.2%	-1.5%	-11.02%	-3.0%

Source: NCTCOG, *Mobility 2030 - 2009 Amendment*, April 2009

The alternative growth scenarios are presented as suggested alternatives municipalities could incorporate into land use policies to improve regional transportation and environmental conditions. Because federal, state, and local transportation agencies have no power to control regional growth and land development, the MTP provides these alternatives as guidance to local planners and developers to help local governments determine the most efficient way to grow. By presenting these options, the land use planning initiative can be aligned with regional transportation goals.

The region has established four basic sustainable development policy directions to promote an important new direction in local development patterns:

- Utilize existing system capacity
- Improve rail mobility
- Promote mixed-use
- Improve access management

These are based on an increased desire for a greater variety of transportation options, mixed-use developments, and sustainable communities with a sense of place. If implemented, these policies could lead to more sustainable development patterns and federal air quality standards attainment for the region. Passenger rail within the Waxahachie Corridor supports these policies.

2.1.4 System Linkage and Intermodal Connections

Passenger rail is an integral part of the DFW region's MTP and provides a reliable transportation system in North Central Texas. The proven ability of rail service to improve mobility will play a crucial role in meeting future transportation needs. The Waxahachie Corridor would link residents of northern Ellis County and southern Dallas County with numerous transportation facilities in the region.

Additionally, the DFW region currently has over 48 miles of LRT and 35 miles of commuter rail in operation. Several additional passenger rail projects are currently in construction or planning phases. These projects include new regional rail services and LRT expansions with a regional, line-haul focus. Currently, four rail lines would connect to the proposed Waxahachie Corridor study area:

- The Trinity Railway Express (TRE) is a cooperative regional rail service provided by DART and the Fort Worth Transportation Authority (The T). This system links a 35 mile route from downtown Dallas, Dallas/Fort Worth International Airport (DFWIA), and downtown Fort Worth with nine stations. The TRE operates two different vehicle types on this regional commuter rail line: the Budd Rail Diesel Cars which are self-propelled vehicles and the GM F59PH locomotives which are typical diesel-powered push-pull train set vehicles. The TRE would intersect the Waxahachie Corridor at Union Station, the eastern terminus for the TRE line and the northern terminus for the Waxahachie Corridor.
- The DART Red Line is currently in operation from Parker Road in Plano in the north to Westmoreland in southern Dallas. The line travels over 28 miles passing through Oak Cliff and downtown Dallas and paralleling US 75 through Dallas, Richardson, and Plano. The Red Line has the highest passenger rail service ridership in the region. The main connection to the Waxahachie Corridor would occur at Union Station.
- The DART Blue Line is currently in operation from Downtown Garland to Ledbetter Station in south Dallas, passing through downtown Dallas and sharing track with the DART Red Line. The Blue Line travels approximately 11 miles (not including shared service with the Red Line) over the entire track length and is scheduled for an extension into Rowlett to the northeastern terminus. The main connection to the Waxahachie Corridor would be through Union Station.
- The DART Green Line is currently in limited operation in the corridor running from Victory Station to MLK Jr. Station, approximately 4 miles. The Green Line is in construction for the remainder portion from the North Carrollton/Frankford Station in the northwest to the Buckner Station in the southeast to be completed in December 2010. The total length of the Green Line will be 29 miles. The main connection to the Waxahachie Corridor would be through transfer to the Red/Blue Line at the West End Station, bicycle/pedestrian or bus access from Union Station, or TRE Connection at Victory Station.

2.2 PURPOSE

The primary Waxahachie Corridor purpose is to provide a passenger rail connection to the higher density area of downtown Dallas by improving mobility, accessibility, and system linkages to major employment, population, and activity centers. Passenger rail service implementation within the Waxahachie Corridor would provide an alternative to roadway traffic congestion in the planning area. A key Waxahachie Corridor component is to provide an alternative means of transportation currently absent in the southern sector of the DFW region. The rail service would connect the southern DFW area to the high economic density of downtown Dallas while providing additional connections to other regional destinations via the DART Red, Blue, and Green Lines and the TRE.

Regional demand for travel in the planning area is projected to increase along with congestion. Project implementation would improve transit performance in the planning area by offering a new, more reliable service. The project seeks to reduce peak period congestion levels and improve regional air quality by increasing transportation modal options in the service area.

2.3 MISSION STATEMENT AND GOALS AND OBJECTIVES

As mentioned in Chapter 1, Section 1.1, the purpose of this study is to support implementation of passenger rail service in the Waxahachie Corridor. To support this effort, corridor stakeholders developed the following mission statement to guide the study:

Provide additional transportation choices connecting major activity centers from Ellis County to Dallas County by efficiently developing safe, fiscally sound, environmentally conscious, and regionally supported mobility improvement projects that support economic opportunities and sustain or augment the quality of life and mobility for the citizens of the Dallas/Fort Worth Metroplex.

The corridor stakeholders established a set of goals to support this mission statement and transportation improvements in the Waxahachie Corridor. The goals and objectives respond to the underlying transportation needs determined in this chapter. This study indentified the following purposes for transportation improvements in the Waxahachie Corridor:

Goal: Enhance corridor mobility and accessibility

Objectives:
- Provide connectivity to existing and planned passenger rail lines
- Provide transportation investments that serve future population and employment growth
- Improve access to existing and emerging major trip activity centers
- Increase access to transit
- Increase transit usage
- Provide cost-effective options

Goal: Encourage economic development

Objectives:
- Encourage potential employment opportunities
- Encourage potential economic development opportunities
- Ensure consistency with regional and local transportation and comprehensive plans
- Encourage strategies for development/redevelopment

Goal: Provide an environmentally-sensitive transit investment

Objectives:
- Minimize negative project effects to the community
- Minimize negative project effects to the built environment
- Minimize negative project impacts to natural and cultural resources
- Improve air quality

3.0 DEVELOPMENT OF ALTERNATIVES

Chapter 3 discusses the alternatives developed for the Waxahachie Corridor Conceptual Engineering and Funding Study (CE & FS). This chapter provides information on the vehicle technology, alignment alternatives, service alternatives, potential stations, rail operations, bus operations, and costs. The various alignment and service alternatives within the Waxahachie Corridor were developed based on the set of corridor development conditions previously discussed in Chapter 1, Section 1.5, and information obtained from a variety of documents including:

- *North Central Texas Council of Governments* (NCTCOG) *Mobility 2030: The Metropolitan Transportation Plan for the Dallas – Fort Worth Area – 2009 Amendment (Mobility 2030 - 2009 Amendment)*
- NCTCOG *Regional Rail Corridor Study (RRCS)*
- NCTCOG Rail North Texas (RNT)

Corridor stakeholders also contributed to alternatives development within the study area. Information concerning each alternative was collected and presented to the stakeholders. A decision regarding a preferred alternative will be determined in a subsequent study effort.

3.1 VEHICLE TECHNOLOGY

Evaluating potential vehicle technologies compatible with Waxahachie Corridor conditions is a major study component. The primary objective is to select a cost-effective, efficient passenger rail service vehicle technology sensitive to the needs and concerns of communities located in the corridor. In previous study efforts, two vehicle types were examined based on service strategies employed by Dallas Area Rapid Transit (DART) to determine the best approach to provide passenger rail services in a new corridor. Based upon findings from previous efforts and input received from Corridor Strategy Team Meeting participants, the vehicle technologies considered appropriate for study in the Waxahachie Corridor are light rail transit (LRT), light rail new technology (LRNT), and commuter rail.

3.1.1 Light Rail Transit

LRT vehicles provide medium- to high-capacity passenger service used for both short and medium length trips typically from a center city to surrounding urban communities within a given city or metropolitan area. LRT trains may employ a single car, but typically operate as a multi-unit train. Maximum LRT train length is often determined by the minimum city block length to avoid blocking vehicular traffic on surface cross streets. Light rail cars typically range in length from approximately 50 feet to over 100 feet.

Currently, the seating capacity of a LRT vehicle within the DART system is 96 seats per car. LRT vehicles accommodate standing passengers. Most LRT systems are implemented within exclusive rights-of-way. However, LRT vehicles do not meet the Federal Railroad Administration (FRA) crash worthiness standards, and for this reason cannot operate on right-of-way with freight traffic unless separated spatially or temporally. Capital cost for a LRT system is estimated at $60 to $80 million per mile, with increased costs when large infrastructure elements are needed, such as bridges, tunnels, etc.

Recently, DART completed retrofitting their LRT vehicle fleet with the insertion of a low-floor, center section. Transforming existing LRT vehicle fleet to Super Light Rail Vehicles (SLRV) expands the LRT vehicle length from 92 feet, eight inches to 123 feet, eight inches. LRT vehicles are powered by electricity from overhead wiring suspended from poles within the right-of-way. The SLRV vehicle is currently the primary passenger rail vehicle in the DART system.

3.1.2 Light Rail New Technology

LRNT vehicles are envisioned as a new type of passenger rail conceived for the Dallas-Fort Worth (DFW) region with application to other metropolitan areas. DART staff, in coordination with the FRA, Federal Transit Administration (FTA), and passenger rail industry leaders, is currently developing LRNT vehicle specifications. Vehicle development efforts will ensure the LRNT vehicle would meet the following criteria:

- Noise and vibration consistent with SLRVs
- Overall bulk (height, length, and width) within eight percent of a SLRV
- Compliance with FRA design and safety regulations
- Compliance with United States (US) Environmental Protection Agency (EPA) Tier 4 requirements for non-road engine standards

The two primary differences between the conceptual LRNT vehicle and an existing SLRV are vehicle propulsion and the ability to withstand crash with a freight train. The LRNT vehicle may be powered by either an electric or non-electric engine and would not be powered by overhead wiring equipment. LRNT vehicles would be designed to provide passenger rail service within suburban areas and to connect these areas to central cities. LRNT trains are conceived to be one to four cars in length, with a per car capacity of 120 to 200 passengers, including standees.

Initially, service may be offered only during peak travel periods. As the system matures, service could be operated throughout the weekday and weekends. Estimated capital costs for a LRNT system range from $20 to $40 million per mile. New Jersey Transit Riverline, Austin Capital MetroRail, and soon the Denton County Transportation Authority (DCTA) A-train (currently under construction) are examples of systems employing a form of LRNT vehicle technology; however, these system vehicles are not FRA crash worthiness compliant and thus are unable to operate on tracks shared with freight trains without a variance.

3.1.3 Commuter Rail

Commuter rail systems are designed to provide passenger service over longer distances normally extending 10 to 50 miles from the center city. Services could be city-to-city or center city to suburban region.

Commuter rail vehicles normally consist of a push-pull locomotive and several single or bi-level passenger cars. The dimensions of a commuter rail passenger car are typically 60 to 80 feet long, 10 to 11 feet wide, allowing for a seating capacity of 60 to 170 passengers. The larger passenger car provides more seating capacity and less standing room than a typical LRT vehicle. Commuter rail passenger cars are typically propelled by a separate diesel or electric locomotive engine. Most commuter rail systems are implemented within existing railroad right-of-way sharing tracks with freight trains. Commuter rail vehicles meet FRA crash worthiness standards.

Typical capital cost estimates for commuter rail lines range up to $25 million per mile, depending upon existing track infrastructure condition and available right-of-way. The Virginia Railway Express servicing suburban Washington, D.C. and the Long Island Railroad servicing suburban New York City are city-to-suburb commuter rail examples. Commuter rail is often employed to connect one central city to another if the cities are in close proximity. The Trinity Railway Express (TRE) connecting Dallas and Fort Worth is an example of a city-to-city commuter rail system. Table 3-1 provides a vehicle technology summary.

Table 3-1 Vehicle Technologies Considered

Light Rail		• Connects urban communities with CBD and urban activity centers • Vehicles are electrically powered from overhead wires • Capable of running in street or on exclusive right-of-way • Vehicles are not FRA crash compliant
Light Rail New Technology		• Connects suburban communities to activity centers, LRT corridors, and city centers • Vehicles are similar in size to LRT vehicles • Service may operate on shared tracks with freight railroads and on exclusive right-of-way • Self-propelled passenger vehicles
Commuter Rail		• Used for passenger rail services between downtown and distant suburbs (Long Island, New York) • Used to connect large central cities (West Palm Beach/Fort Lauderdale/Miami in south Florida and Dallas/Fort Worth in north Texas) • Service may be on tracks shared with freight railroad operations • Vehicles are FRA crash compliant • Service provided by equipment generally characterized as “push-pull”

Source: DART, 2010 and NCTCOG, September 2009

3.2 DEFINITION OF ALIGNMENT ALTERNATIVES

3.2.1 Alignment Alternatives

Previous studies have identified two distinct alignments with a slight variation of station locations. Various station locations were identified in alignment alternatives development. Generally, the CE & FS incorporates an alignment following the existing railroad right-of-way, as was done in previous corridor study efforts. Alignments on new right-of-way were not considered due to anticipated difficulty in acquiring needed right-of-way and potentially greater social, economic, and natural environment impacts. The final terminus for the DART Blue Line extension to Southport may require an additional connection on new right-of-way. This will be reviewed in later studies if the alternatives that terminated at Southport are considered for further analysis.

Additionally, the use of a light rail vehicle was removed from further study in the CE & FS. Previous studies had considered light rail in comparison to a commuter rail or other new technology and it was determined in those studies that light rail would not be cost effective for the distance needed to travel. To support these findings, light rail vehicles were considered at the start of the CE & FS study, despite the large increase in cost. All stakeholders involved in the project did not support a light rail option. Due to increased cost and lack of stakeholder support, this light rail vehicle option was removed from further study in the CE & FS.

3.2.2 Grade Separations

Within the Waxahachie Corridor, 10 of 49 total roadway crossings are grade separated. Additional traffic analyses and travel demand forecast modeling will be required for each at-grade crossing in the next project development phase. A grade separation analysis would determine if the addition of passenger rail service would increase vehicle queuing or decrease roadway level-of-service (LOS) to levels warranting grade separation. A cursory analysis for grade separations uses three criteria to identify if a roadway could receive a grade separation. These criteria include roadways with 40,000 vehicles per day or greater, six lanes or greater, or four lines divided or greater. This analysis provides only basic criteria and a detailed grade separation analysis would be performed in future studies. Table 3-2 provides a list of current or proposed roadways in the Waxahachie Corridor meeting one or more of the basic criteria for grade separations based on year 2030 model results identified in *Mobility 2030 - 2009 Amendment*. More detailed analyses would be performed in future studies to determine if these grade separations are warranted. DART established a policy by resolution in 1997 regarding grade separation. The resolution outlines criteria similar to those used in this study for warranting grade separation of roadway intersections for DART capital projects.

Table 3-2 Potential Grade Separations

Street	40,000+ VPD	6+ Lanes	4-Lane Divided
FM 664 (Ovilla Road)	X	X	
Loop 9 Southeast *[Future]*		*X*	
Overton Road		X	
Simpson Stuart Road		X	
Stacy Road	X		X
Trinity Parkway *[Future]*	X	X	

Source: *Mobility 2030 - 2009 Amendment* travel demand model (DFWRTM version 3.3.1)

3.2.3 Termini

Termini for the Waxahachie Corridor are located at stations where multiple passenger rail lines intersect or at end of the line stations. A terminus located at a transit rail hub allows passengers to transfer between multiple passenger rail lines. Within the Waxahachie Corridor the potential transit rail hub is Union Station, the northern terminus. At this station riders could connect to the DART Red or Blue Line LRT to reach various downtown Dallas or other destinations along these lines north, east, or south. A connection to the TRE is available at Union Station and would allow travelers to connect to various destinations west of Dallas.

The southern terminus will be an end of the line station for this corridor. The Waxahachie central business district (CBD) could be designed to serve local residents as a destination station. A small park-and-ride could be utilized for passengers boarding and alighting at this station.

3.2.4 Right-of-Way

The existing Waxahachie Corridor right-of-way extends from Waxahachie to Dallas, a distance of approximately 30.9 route miles. Burlington Northern Santa Fe (BNSF) owns the right-of-way from the Waxahachie CBD station to Forest Lane/MLK Boulevard; north of Forest Lane/MLK Boulevard to Union Station is owned by the Union Pacific Railroad (UPRR). The right-of-way width is generally 100 feet with variations along the corridor. Figure 3-1 shows the track ownership within the proposed corridor.

3.2.5 Operating Rights

BNSF has the main operating and dispatching rights through the majority of the corridor. Through the northern portion of the project (Forest Lane to Union Station), the UPRR has operating and dispatching rights for the portion it owns. The exception to the UPRR dispatching rights is for BNSF trains; any BNSF trains through this small portion of track from Union Station to Forest Lane have priority dispatching rights by BNSF. Figure 3-1 also shows the operating rights for the Waxahachie Corridor and connecting facilities.

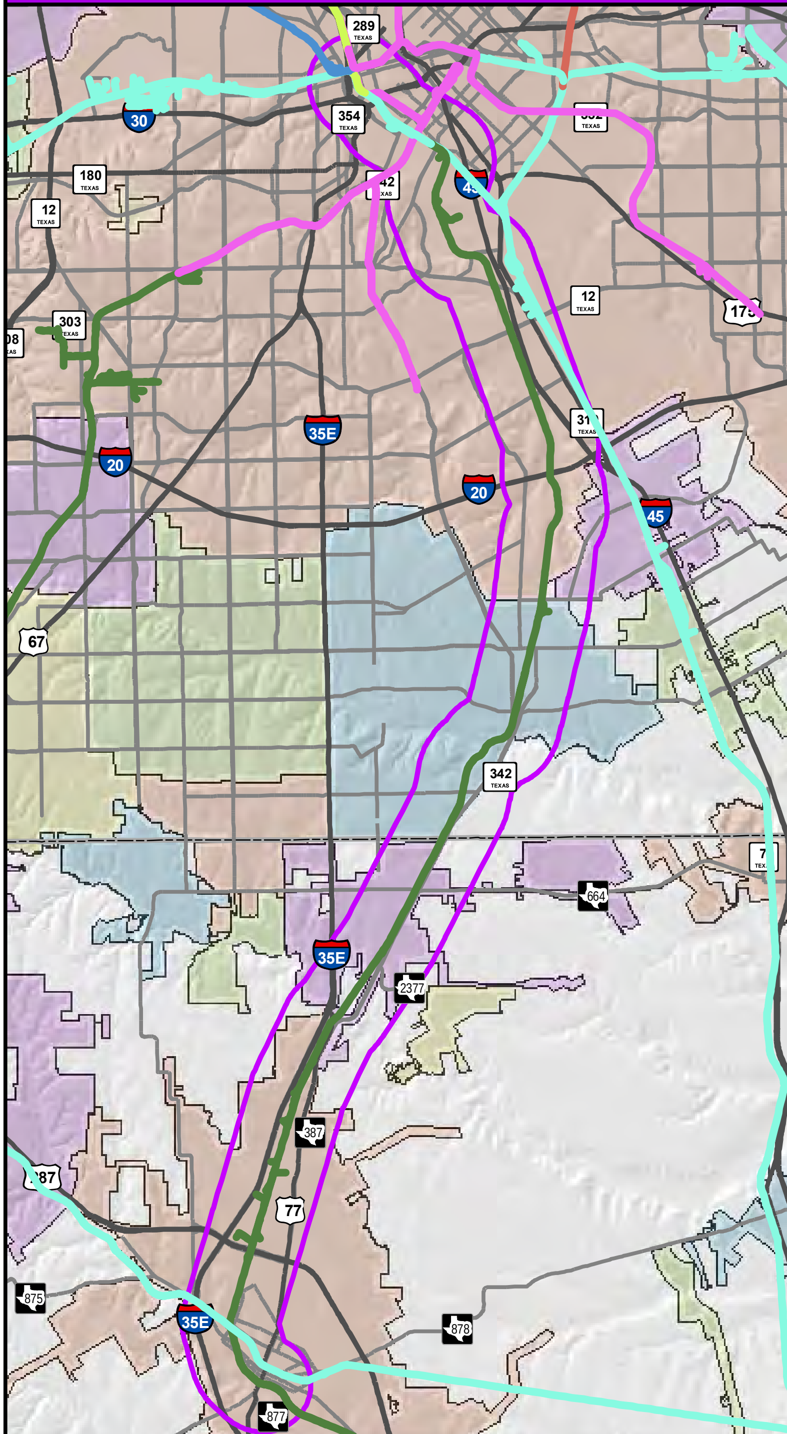
3.3 DESCRIPTION OF ALTERNATIVES

3.3.1 No-Build Alternative

The No-Build Alternative assumes the background roadway, thoroughfare, and transit network included in *Mobility 2030 - 2009 Amendment* [the financially constrained, long-range metropolitan transportation plan (MTP) adopted by NCTCOG, the Metropolitan Planning Organization (MPO) for the DFW region] is completed by 2030. *Mobility 2030 - 2009 Amendment* includes Intelligent Transportation System (ITS) improvements such as ramp metering, variable message signs, and incident management systems.

DART currently operates 55 separate bus routes within the study area. Most of these routes travel to the downtown Dallas area and serve the DART member cities of Addison, Carrollton, Cockrell Hill, Dallas, Farmers Branch, Garland, Glenn Heights, Highland Park, Irving, Plano, Richardson, Rowlett, and University Park. In addition to bus service, DART operates the Red Line, Blue Line, and Green Line LRT in the study area. In addition, the DART and The T joint venture TRE operates in the study area. DART is currently in construction with the Orange Line which will serve the northern portion of the study area.

Figure 3-1 — Rail Line Ownership and Operation
From FM 66 to Spur 366



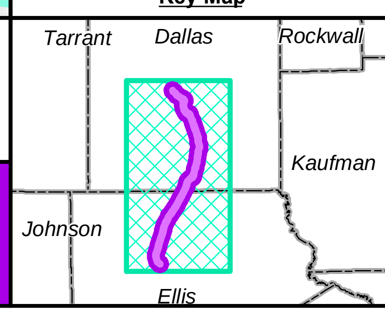
Legend

- BNSF Freight Service (BNSF Right-of-Way)
- DART Light Rail Service (DART Right-of-Way)
- DGNO Freight Service (DGNO Right-of-Way)
- KCS Freight Service (KCS Right-of-Way)
- TRE Commuter Service (TRE Right-of-Way)
- UP Freight Service (UP Right-of-Way)
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

0 2 4 8 Miles

N

Key Map



North Central Texas Council of Governments

Waxahachie Corridor Conceptual Engineering and Funding Study

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The No-Build Alternative will include all planned improvements to the region's roadway system and transit services, except for the Waxahachie Corridor passenger rail and associated support bus services. The No-Build Alternative would be carried forward into the next project development phase for comparative reasons.

3.3.2 Summary of Build Alternatives

Table 3-3 provides a matrix showing the potential stations for each alternative. The stations are listed from north to south.

All five build alternatives provide service starting at the proposed Waxahachie CBD station and terminating either at the proposed Southport Station (connection to the DART Blue Line extension) or Union Station. Some stations proposed by the cities were considered as an "either-or" scenario, as the cities that proposed them only wanted a select number of stations and wanted the CE & FS study to provide information to help decide which stations to implement. The following shows the stations that would be inclusive of each other.

City of Dallas:

- Corinth-MLK
- Illinois-Ledbetter
- Loop 12-Simpson Stuart
- Southport-Cedar Valley College
-

City of Red Oak:

- North Red Oak-Downtown
- Red Oak-South Red Oak

The eventual Waxahachie Corridor could include any combination of potential stations and should not be limited to only the station combinations used in this study. Each partnering city understands station placement complexity and spacing. The final station list developed was under the "best case scenario." Each city in the proposed Waxahachie Corridor has full knowledge that not all stations may proceed forward or stations may be developed over time as ridership increases. Parking would be provided at stations where demand warrants and space allows. Parking demand will be evaluated in greater detail in the next project development phase. An impact assessment of the build alternatives on existing transit services would be performed in subsequent studies.

Table 3-3 Build Alternatives Station List

Alternative	**1**	**2**	**3**	**4**	**5**
Primary Mode	LRNT/ Commuter	LRNT/ Commuter	LRNT/ Commuter	LRNT/ Commuter	LRNT/ Commuter
Interlining Service	None	None	None	None	TRE
Interlined Terminus	Union Station	Union Station	Southport Station	Southport Station	Union Station
Total Number of Stations	12	16	6	9	16
Station:					
Union Station	X	X			X
Corinth	X	X			X
MLK	X	X			X
Illinois	X	X			X
Ledbetter	X	X			X
Loop 12	X	X			X
Simpson Stuart		X			X
Southport	X	X	X	X	X
Cedar Valley College		X		X	X
Lancaster CBD	X	X	X	X	X
North Red Oak	X	X	X	X	X
Downtown Red Oak		X		X	X
South Red Oak		X		X	X
North Waxahachie	X	X	X	X	X
US 287	X	X	X	X	X
Waxahachie CBD	X	X	X	X	X

Source: NCTCOG, September 2009

3.3.3 Detailed Description of Build Alternatives

The build alternatives are based upon the corridor alignment recommended in the *RRCS* completed in 2005. In addition, input from various technical staff representing the cities along the corridor, transit agency previous study efforts and corridor stakeholders helped to further refine the alternatives to modify the recommended alternatives in the *RRCS* study into the current five alternatives. All five build alternatives are proposed to operate within the existing Waxahachie Corridor right-of-way. The alternatives tested variations in potential station locations and service interlining options. Stations were provided by previous studies and by the stakeholders for the project. The stations served various objectives including system ridership, cost, economic development, and redevelopment. The connection from the proposed DART Blue Line extension to Southport may require additional track outside the right-of-way of the Waxahachie corridor for Alternatives 3 and 4. This will be evaluated in further studies if these alternatives proceed. Headways and running times are discussed in Section 3.6.

3.3.3.1 Alternative 1

In Alternative 1, a passenger train service, LRNT or commuter rail, throughout the Waxahachie Corridor and ending at Union Station was modeled. Alternative 1 would require riders with destinations past Union Station to transfer to the DART Red or Blue Line or the TRE. This alternative used a select set of stations, removing the proposed stations at Simpson Stuart, Cedar Valley College, Downtown Red Oak and South Red Oak. Figure 3-2 shows the alignment and stations modeled in Alternative 1.

3.3.3.2 Alternative 2

The passenger rail service modeled in Alternative 2 operates under the same conditions as in Alternative 1. The only difference between the alternatives is the number of stations served. All stations were modeled within this alternative. Figure 3-3 shows the alignment and stations modeled in Alternative 2.

3.3.3.3 Alternative 3

Alternative 3 offers the most limited service of the selected alternatives. The service begins at the Waxahachie CBD Station as with all the other alternatives, but the terminus is the Southport Station; near the proposed terminus of a potential DART Blue Line extension. Passengers continuing into downtown Dallas or further would be required to transfer from the Waxahachie Corridor LRNT/Commuter Rail to the DART Blue Line LRT. This alternative would be dependent on the construction of the DART Blue Line extension as indicated in their current *DART 2030 Plan* and any potential connection needed to connect to the DART Blue Line. In addition, Alternative 3 uses a limited number of stations from Waxahachie CBD to Southport, eliminating Cedar Valley College, Downtown Red Oak, and South Red Oak. Figure 3-4 shows the alignment and stations in Alternative 3.

3.3.3.4 Alternative 4

Alternative 4 is similar to Alternative 3. This alternative has the same limits as Alternative 3, but includes all proposed stations. Figure 3-5 shows the stations and alignment for Alternative 4.

3.3.3.5 Alternative 5

Alternative 5 is an interlined service with the TRE. This alternative is based on Alternative 2, Waxahachie CBD to Union Station with all stations included, but instead of forcing a transfer at Union Station for riders wishing to continue west on the TRE, the service would continue past Union Station and serve the TRE stations. Figure 3-6 shows this alternative and the associated stations.

Figure 3-2 — Alternative 1
From FM 66 to Spur 366

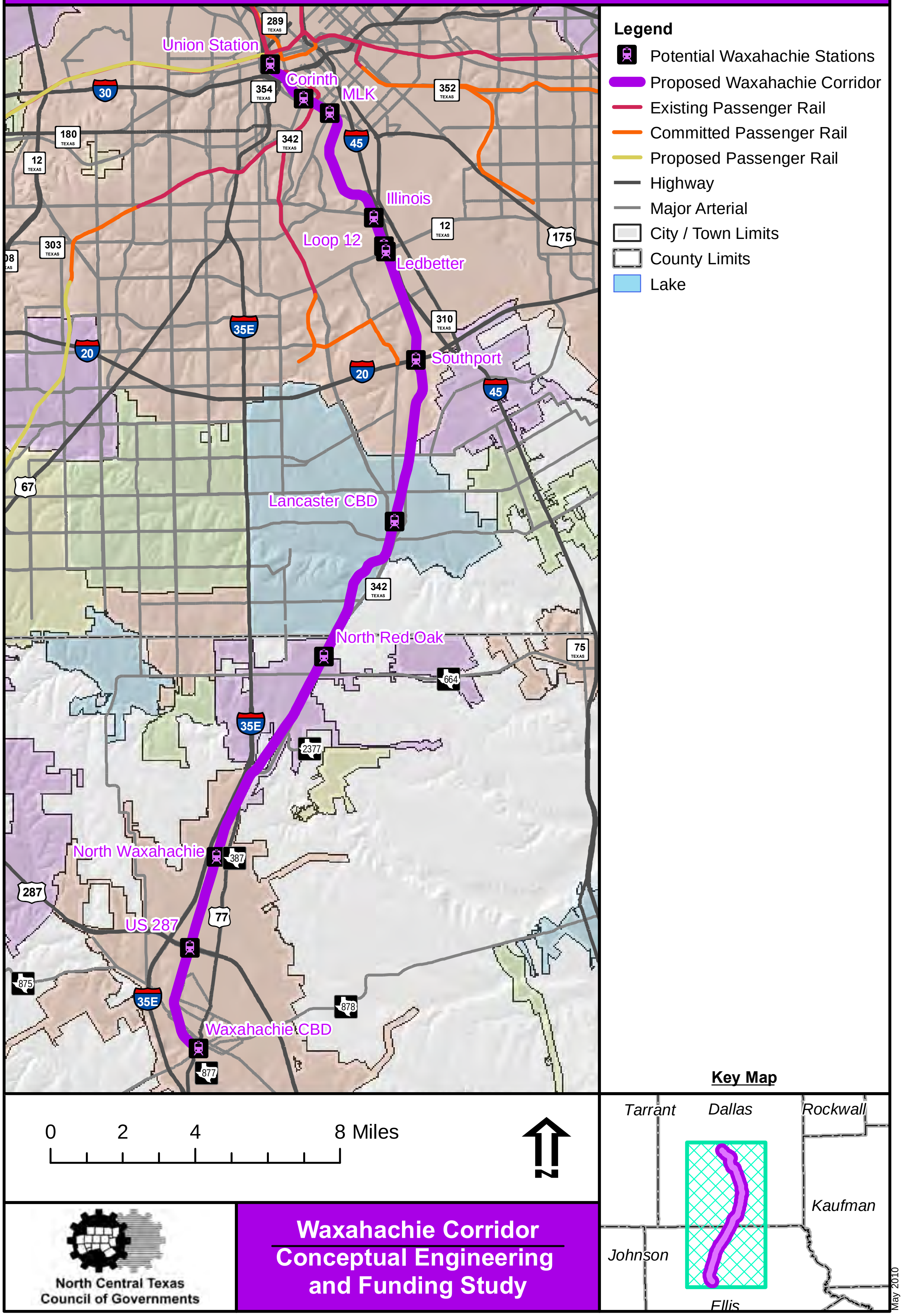
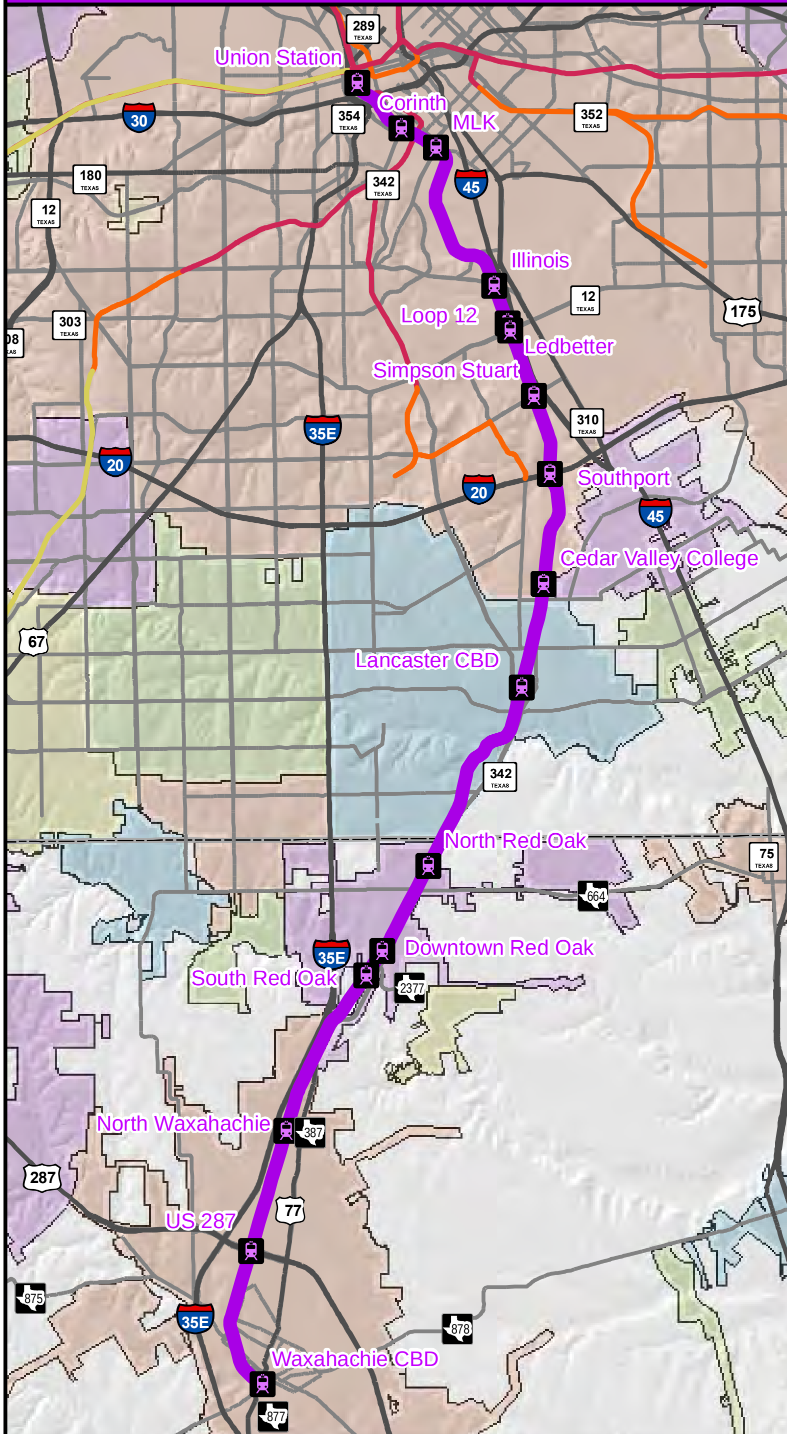


Figure 3-3 — Alternative 2
From FM 66 to Spur 366



Legend

- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

0 2 4 8 Miles

N

Key Map

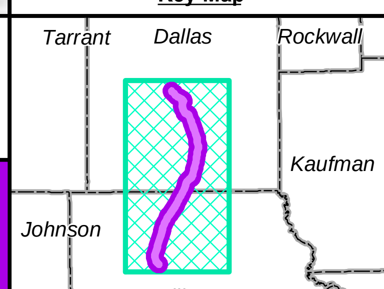


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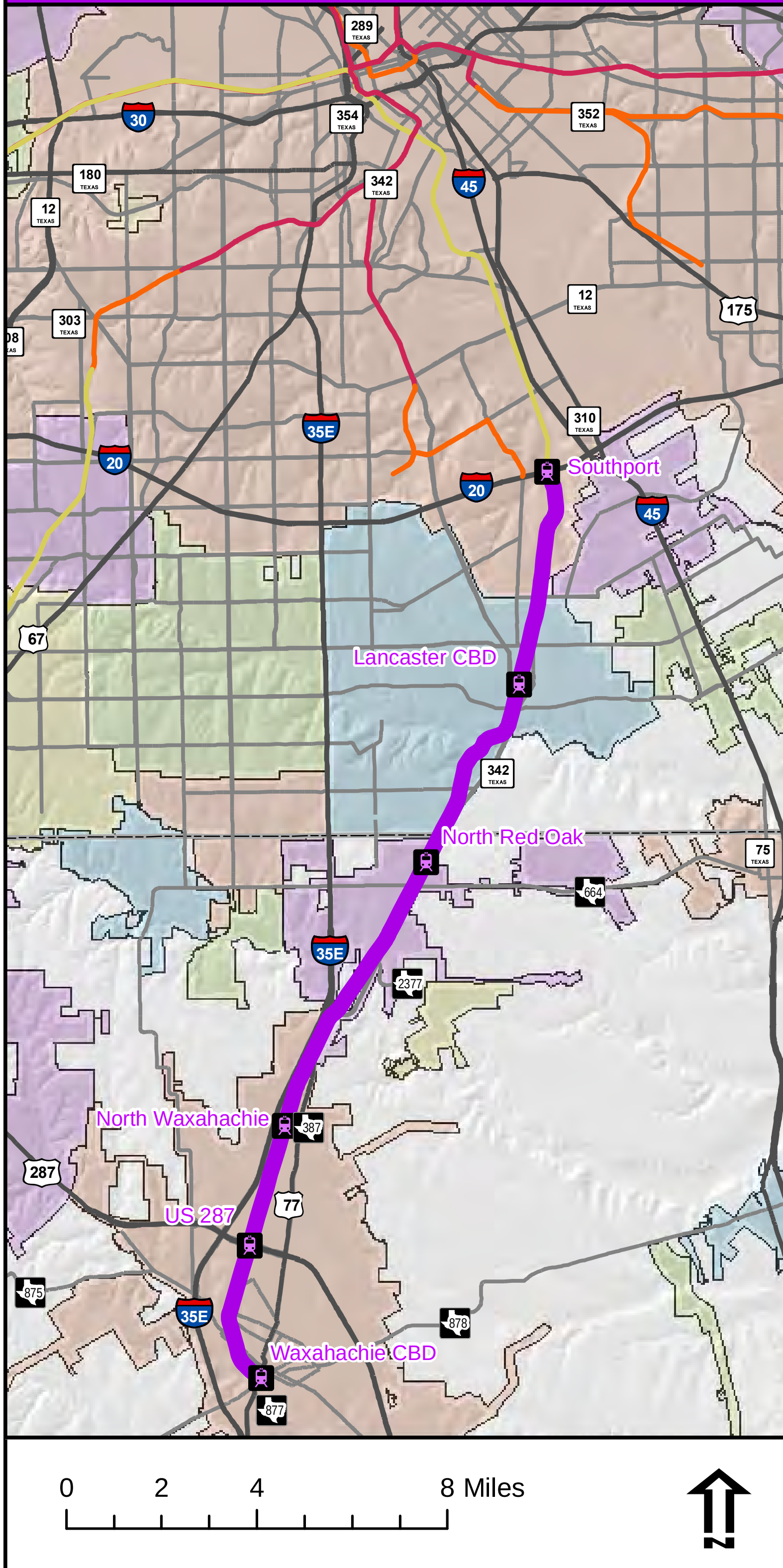
Figure 3-4 — Alternative 3
From FM 66 to Spur 366



Legend
- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

Key Map

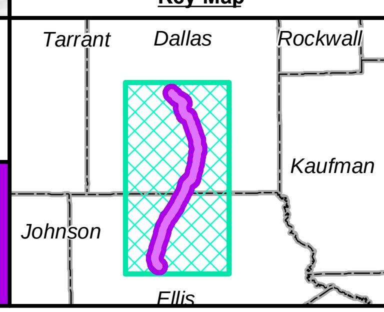


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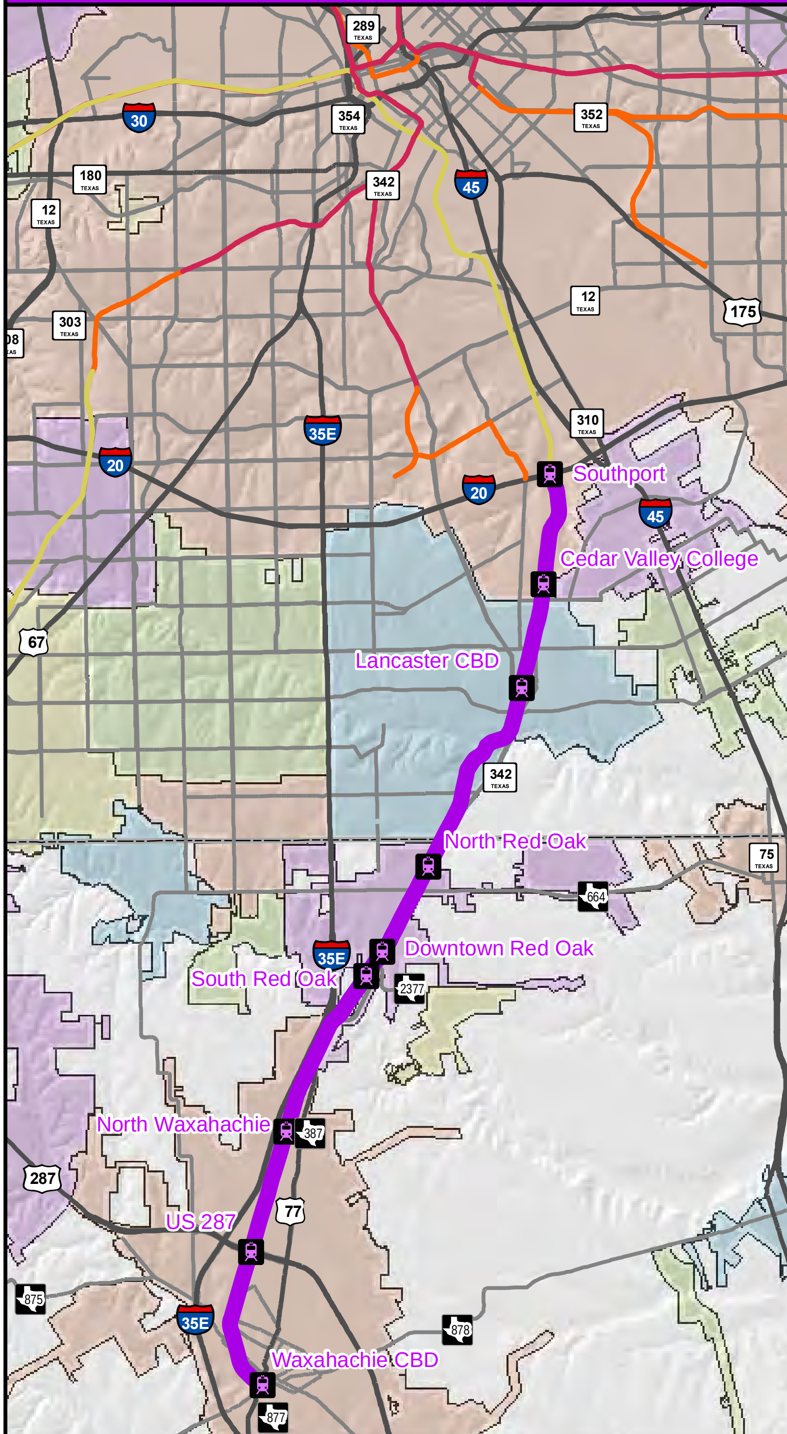
Figure 3-5 — Alternative 4
From FM 66 to Spur 366



Legend
- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

0 2 4 8 Miles

N

Key Map

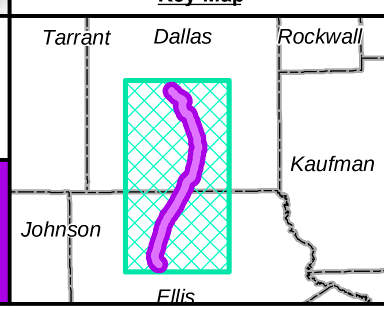


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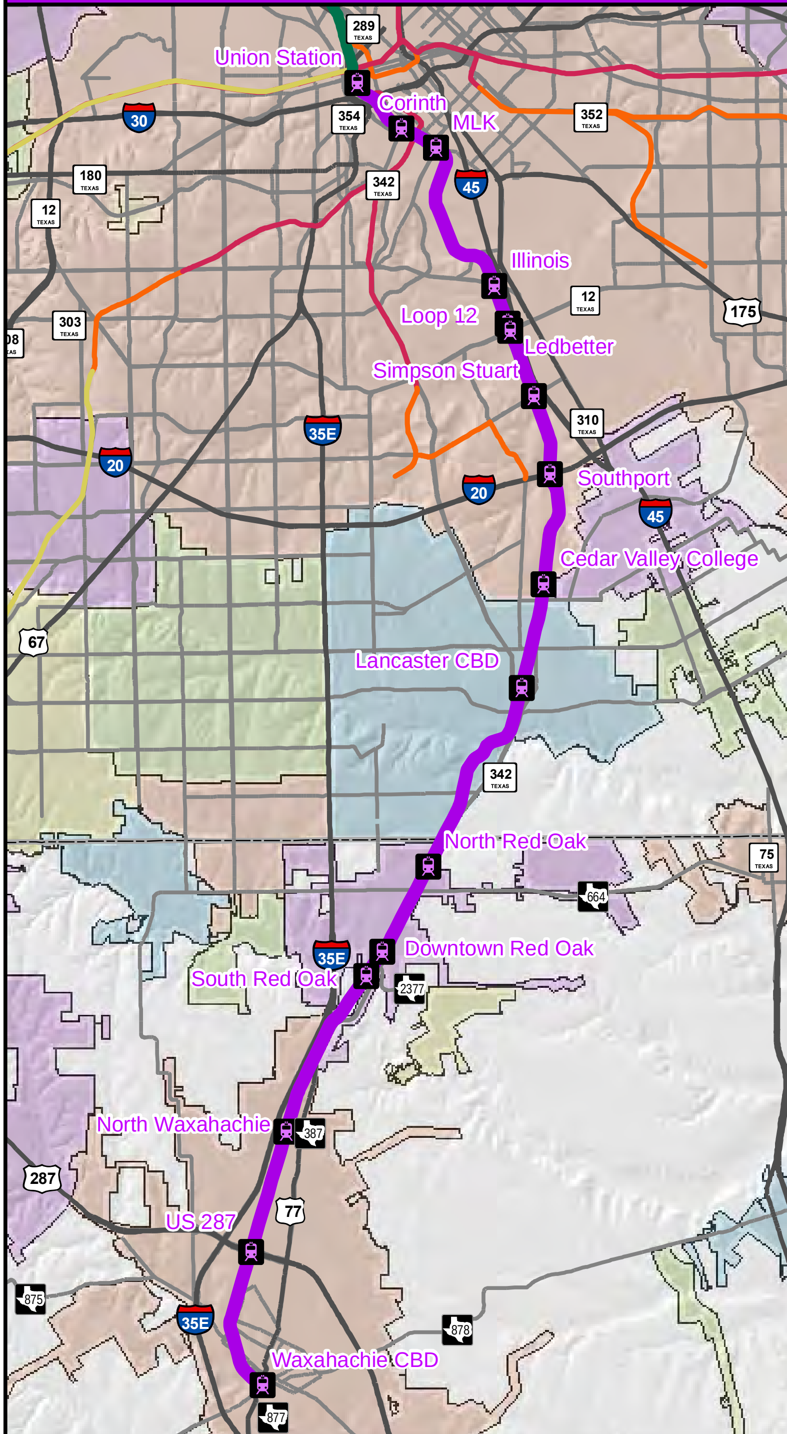
Figure 3-6 — Alternative 5
From FM 66 to Spur 366



Legend

- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- TRE
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

0 2 4 8 Miles

N

North Central Texas Council of Governments

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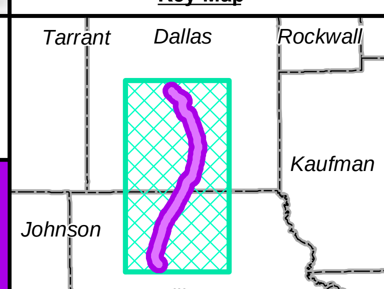
Key Map



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3.4 PROJECTED RIDERSHIP

Using standard transit ridership forecasting techniques, estimated riders in the Waxahachie Corridor were calculated using the *Mobility 2030 - 2009 Amendment* Dallas-Fort Worth Regional Travel Model (DFWRTM). Demographic input datasets used in the modeling exercise were adopted by the NCTCOG Executive Board and are considered the official demographic dataset for the region. The model information used in this study evaluates projected conditions for the horizon year of 2030. No alterations were made to the demographic dataset as adopted.

By employing the adopted demographic dataset, the travel demand modeling conforms to the regional planning process. NCTCOG staff is currently developing the datasets and a travel demand model for the next MTP horizon year, 2035. The updated demographic data sets will incorporate additional anticipated development near several locations as determined by local governments. The next project implementation phase will incorporate the updated demographic datasets.

Ridership estimates for stations in each corridor alternative are presented in Table 3-4. The table shows the total length of the modeled passenger rail service, the estimated corridor travel time, and the total transit ridership in the DFW region for each alternative. In Alternative 3, some passengers board or alight at stations outside the Waxahachie Corridor. The "Waxahachie Line Total" includes both passengers who board and alight within the corridor and those with only one end of their trip in the study area.

Table 3-4 Estimated 2030 Daily Passenger Volumes

Project Measure	Alternative					
	No Build	1	2	3	4	5
Length (miles)[1]	N/A	30.9	30.9	20.7	20.7	64.5
Travel Time (minutes)[2]	N/A	41.3	42.1	26.9	27.7	95.9
Regional Transit Trips	296,276	298,805	298,485	297,174	297,264	298,915
Modeled Ridership						
Waxahachie CBD		340	330	220	220	370
US 287		190	200	170	160	210
North Waxahachie		180	160	40	40	160
Downtown/South Red Oak			170		60	180
North Red Oak		570	480	360	360	520
Lancaster CBD		780	77	380	370	880
Cedar Valley College			60		30	60
Southport		100	40	940	940	50
Simpson Stuart			150			240
Illinois/Ledbetter/Loop 12		230	220			260
Corinth/MLK		80	90			100
Union Station		1,800	1,900			1,500
Waxahachie Corridor Total		4,300	4,600	2,100	2,100	4,500
Interlined Ridership[3]						1,400
Waxahachie Line Total		4,300	4,600	2,100	2,100	5,900

Source: *Mobility 2030 - 2009 Amendment* travel demand model (DFWRTM version 3.3.1)
1. Includes length of interlined or shared-track service
2. Frequency of train arrivals (in minutes)
3. Interlined and Combined Ridership include riders who board/alight within corridor stations and alight/board at stations outside the Waxahachie Corridor

3.5 STATIONS

The proposed passenger rail service would provide up to 15 new stations depending on the build alternative selected. Although 15 stations were studied, some stations may be removed for the final build corridor. Station spacing, cost, and feasibility would be considered in later documents to provide the optimal configuration and placement of stations. Station platforms would be approximately 300 to 500 feet in length and would be described as one of the following:

- <u>Center platforms</u> – one station platform in the center of the tracks with the tracks on the outside of the station platform
- <u>Side platforms</u> – two station platforms across from each other with the tracks on the inside of the station platforms

Stations were analyzed for transportation and land use utilizing a 0.5 mile buffer surrounding the potential or existing station location. This buffer was used to capture the immediate adjacent transportation resources for the each station.

3.5.1 Waxahachie CBD Station

The proposed Waxahachie CBD Station is located at the old rail depot in downtown Waxahachie near the intersection of Rodgers Street and Madison Street. Major arterials near the station include US 77, Business 287, Farm-to-Market (FM) 878, and FM 1446. The Waxahachie Creek Hike and Bike Trail provides an off-street bicycle and pedestrian access in the station area. The local street system provides additional on-street bicycle and pedestrian access to the facility. Parking for this station would be limited because of the downtown location. Figure 3-7 shows the transportation facilities near this station.

3.5.2 US 287 Station

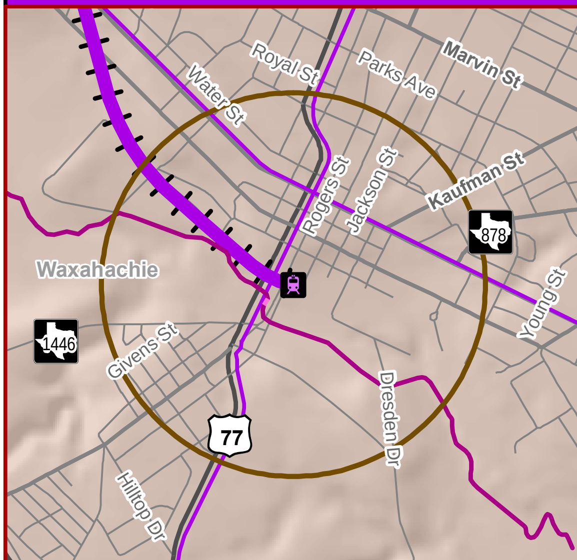
The proposed US 287 Station would be located on US 287 between Interstate Highway (IH) 35E and US 77. Both IH 35E and US 287 are located near the proposed station. Dart Container and US Aluminum are some of the major industries surrounding this station. Few local streets would provide basic pedestrian and bicycle access. This station is identified as a major park-and-ride facility because it its location on US 287. Figure 3-7 shows the transportation facilities near this station.

3.5.3 North Waxahachie Station

The proposed North Waxahachie station would be located at the railroad and Butcher Road intersection. No major businesses or areas of interest are currently in the ½ mile buffer around the proposed station. IH 35E, US 77, and FM 387 serve as the major arterials and highways near the station. FM 387 is the only street to provide local access for pedestrian and bicycle access. Figure 3-7 shows the transportation facilities near this station.

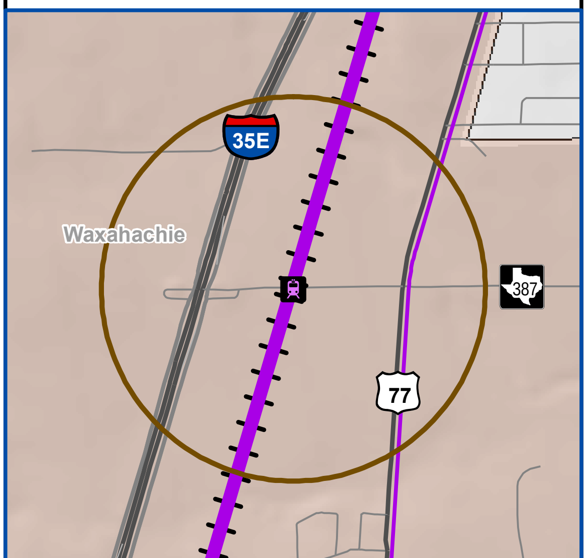
Figure 3-7 — Stations - Waxahachie CBD to South Red Oak

City of Waxahachie (Waxahachie CBD) to City of Red Oak (South Red Oak)

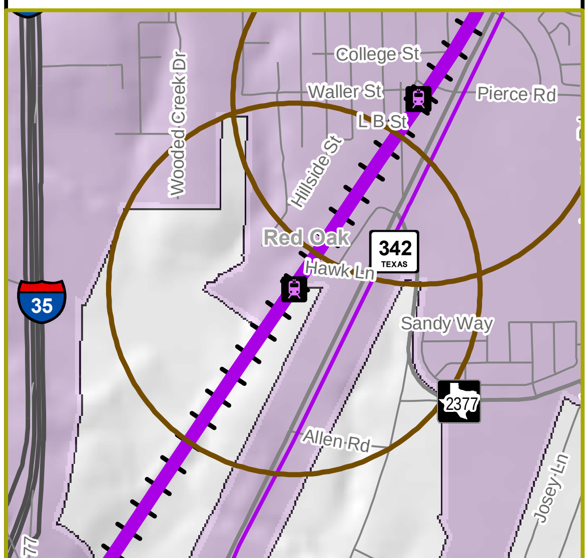


Waxahachie CBD Station

US 287 Station



North Waxahachie Station

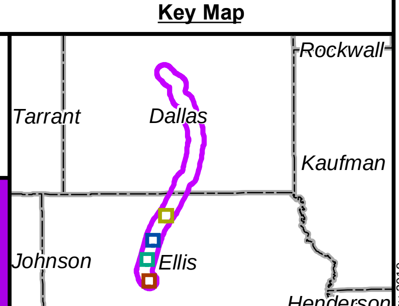


South Red Oak Station

Legend

- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Bicycle/Pedestrian Route
- Planned Bicycle/Pedestrian Route
- DART Bus Route
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Other Major Arterial
- Minor Arterial
- Other Roadway
- City / Town Limits
- County Limits
- station buffer ALL
- Study Area

Key Map



0 0.5 1

Miles

N

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3.5.4 South Red Oak Station

This proposed station would be located in the southern portion of Red Oak, south of Hawk Lane. Major roadways surrounding the station include State Highway (SH) 342 and FM 2377. Some industrial buildings are clustered around SH 342 with a commercial shopping center. Some local streets near the northern could provide local access for bicycle and pedestrians. Figure 3-7 shows the transportation facilities near this station.

3.5.5 Downtown Red Oak

The proposed Downtown Red Oak Station would be located in the historic downtown section of Red Oak north of Main Street. Five specialized planning areas were included in the future land use surrounding the proposed station. These areas include a specialized single-family residential development, a commercial mixed used development, two separate areas of mixed used development of commercial and single-family, and mixed use commercial and multi-family residences (lofts above commercial areas). The City of Red Oak has a *Downtown Vision Plan* that includes development for a pedestrian downtown area. The local streets would provide pedestrian and bicycle access to this station. Parking would be limited at this proposed station due to space restrictions. Figure 3-8 shows the transportation facilities near this station.

3.5.6 North Red Oak

The proposed North Red Oak station would be located north of FM 664 (Ovilla Road) near the northern Red Oak city limit. SH 342 is the only major roadway in ½ mile of the proposed station, only minor arterials from one residential subdivision provides access to the station. Future land use identified by Red Oak includes mixed use development of commercial and single family and mixed use development consisting of commercial, industrial, and single family. This station would support a large parking system because of available land and accessibility to two major east-west roadways within a mile of the proposed facility: FM 664 and the proposed Loop (LP) 9. The large amount of space would allow ample parking; in addition the proposed LP 9 Southeast traffic would utilize this station. Figure 3-8 shows the transportation facilities near this station.

3.5.7 Lancaster CBD

The proposed Lancaster CBD station would be located on Main Street at the location of the proposed relocated rail depot relocation next to the historic downtown area. This station has numerous major roadways within a ½ mile of the station. These roadways include SH 342, Belt Line Road, Lancaster-Hutchins Road, and Main Street. Access by pedestrians and bicycle would be available from the numerous local streets near the proposed station. A local looped trail provides recreational biking southwest of the proposed station. Surrounding the potential rail station, Lancaster has identified five separate land uses which include mix use development, low density residential, commercial, light industrial, and the historic town square. The station would support moderate parking. Figure 3-8 shows the transportation facilities near this station.

3.5.8 Cedar Valley College

The proposed station location is east of Cedar Valley College at the rail line and Witt Road intersection. Major roadways include Witt Road and Wintergreen Road. The Cedar Valley Trail is a proposed regional Veloweb trial that would cross northwest to southeast near the proposed station. The proposed trail and local streets would provide access to the station by bicycle and pedestrians. Some industrial facilities near the proposed station include the Adesa Auto Auction and Brenntag Southwest. According to the City of Dallas '*forward Dallas!' Comprehensive Plan*, the area around this proposed transit center will be part of the Cedar Valley College campus district and an industrial area. Figure 3-8 shows the transportation facilities near this station.

3.5.9 Southport Station

The proposed Southport station would be located near IH 20 west of IH 45. Major roadways within ½ mile of the station include IH 20 and Bonnie View Road. The Greater Dallas Regional Bike Plan, Route 55 crosses north of the proposed station. Adjacent industries include Chrome Plus USA, DMJ Properties, and Sukhi Corporation. The Dallas Logistics Hub (DLH) occupies the southern end of the ½ mile radius of the proposed station. *'forward Dallas!'!* identifies future land use for the proposed area as a commercial center and industrial use. This station is adjacent to the *DART 2030 System Plan* DART Blue Line southern terminus, which would be located at IH 20 and Bonnie View Road. Because of the local access from highways, minor arterials, bicycle trail, and light rail, the station would be accessible from all modes of transportation. Parking would support a large amount of vehicular traffic because of the station's location to IH 20. Figure 3-9 shows the transportation facilities near this station.

3.5.10 Simpson Stuart Station

The proposed Simpson Stuart Station is located on Simpson Stuart Boulevard west of IH 45 in Dallas. Major roadway facilities near the station include IH 45 and Simpson Stuart Road. The Greater Dallas Bike Plan, Route 55 and Route 110 crosses within a ½ mile of the proposed station. Future land use at this proposed transit station would enhance the existing land use by development of residential neighborhoods. The extensive local street and bicycle network allows bicycle and pedestrian access to the proposed facility. Parking would be moderate since they area would support a larger pedestrian and bicycle access. Figure 3-9 shows the transportation facilities near this station.

3.5.11 Loop 12 Station

The proposed LP 12 Station would be located on the western side of the LP 12 and IH 45 intersection. Major roadways include IH 45, LP 12, and SH 310. Various bus routes serve the station area. Red Bird Way, a proposed Veloweb trail, crosses IH 45 south of the proposed station. The area is categorized with infrastructure businesses east of IH 45, floodplain southwest of IH 45, multi-family residences west of IH 45 on LP 12 and single-family residences northwest of IH 45 and LP 12. The City of Dallas has identified the area as industrial area, campus district, and residential neighborhood in their future land use plans. Figure 3-9 shows the transportation facilities near this station.

3.5.12 Ledbetter Station

The proposed Ledbetter Station is located on Ledbetter Drive one block north of LP 12 and adjacent to IH 45. Major roadways are similar to the LP 12 proposed station: IH 45, LP 12, and SH 310. Various bus routes serve the immediate station area. Future land use plans identify the area to be zoned as industrial, floodplain, and residential neighborhoods. Figure 3-9 shows the transportation facilities near this station.

3.5.13 Illinois Station

The proposed Illinois Station is on Illinois Avenue west and adjacent to IH 45. Major roadways near the station include IH 45, SH 310 and Illinois Avenue. The ½ mile area around the station supports mostly single-family and multi-family residences. The undeveloped land is vacant land associated with the interchange of Illinois Avenue and IH 45. Numerous industrial facilities and warehouses occupy the area east of IH 45. *'forward Dallas!'!* identifies urban neighborhoods west of IH 45 and industrial areas east of IH 45. The numerous local streets near the station allow for greater access by pedestrian and bicycle. Numerous bus routes, local and crosstown, operate near the proposed station. Figure 3-10 shows the transportation facilities near this station.

3.5.14 MLK Station

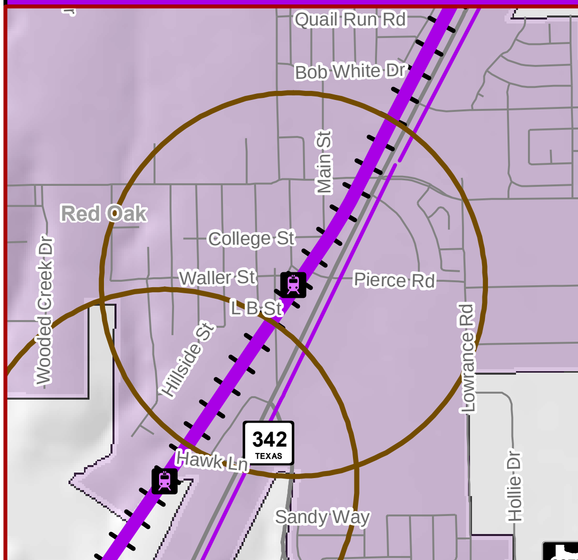
The proposed MLK Station is located on Martin Luther King Jr. Boulevard west of IH 45 near the southern area of downtown Dallas. The area is characterized with industrial facilities surrounding the existing rail line. Major streets in the station study area include IH 45 and MLK Boulevard. Two existing and two future pedestrian and bicycle facilities occur within the station study area. The existing facilities consist of the Greater Dallas Bike Plan, routes 55 and 170; the proposed facilities include the Cedar Valley regional Veloweb and the Santa Fe Trestle Trail. Various bus routes cross the proposed station study area. *'forward Dallas!'!* identified plans for the area includes urban neighborhoods and urban mixed use land types. This station is located within a mile of a current DART station. Figure 3-10 shows the transportation facilities near this station.

3.5.15 Corinth Station

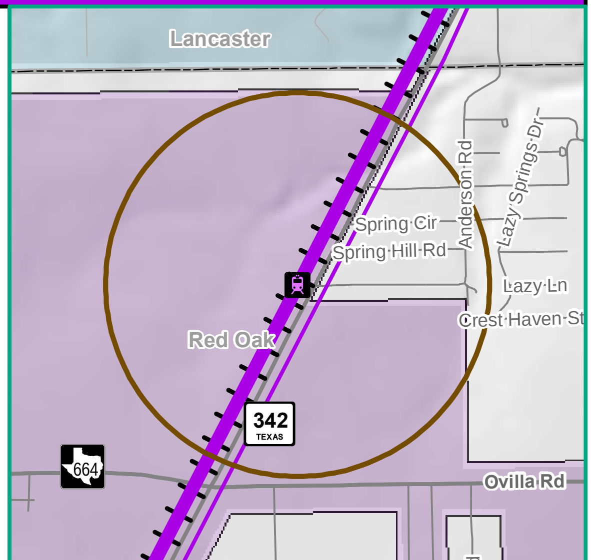
The proposed station would be located on Corinth Street southeast of the IH 30 and IH 35E interchange. The major roadway facilities within ½ mile of the proposed station include only Corinth Street, Lamar Street, and Riverfront Boulevard. The majority of the roadways near the proposed station are local streets. The proposed station study area contains the existing Greater Dallas Bike Plan, route 73 and the proposed Trinity Bottom regional Veloweb, Main Stem Trinity regional Veloweb, Austin Street Abandoned Rail Corridor Trail, the Santa Fe Trestle Trail. The dense network of streets and trails allows for easy bicycle and pedestrian access. The area surrounding the station is dominated by industrial and warehouse areas including Sears and Roebuck and Standard Fruit & Vegetable. The Dallas Police Headquarters is northeast of the proposed station, in addition to the existing Cedars Station on the DART Red or Blue Lines. Southwest of the proposed station is the Trinity River which is considered parkland with an existing trail system. The City of Dallas identified this area as urban mixed use for future land use. Figure 3-10 shows the transportation facilities near this station.

Figure 3-8 — Stations - Downtown Red Oak to Cedar Valley College

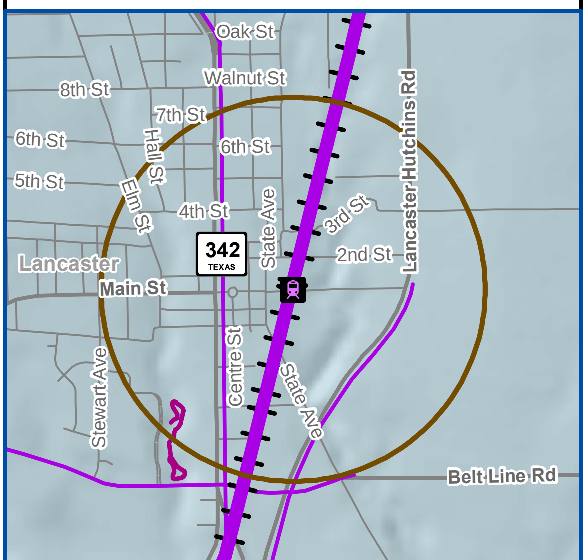
City of Red Oak (Downtown Red Oak) to City of Dallas (Cedar Valley College)



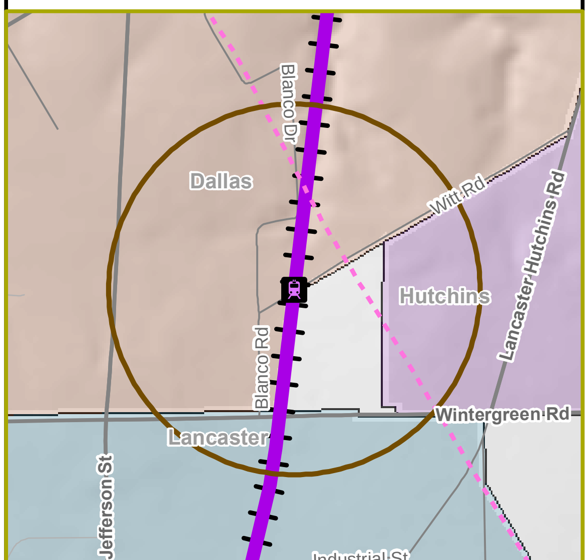
Downtown Red Oak Station



North Red Oak Station



Lancaster CBD Station



Cedar Valley College Station

Legend

- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Bicycle/Pedestrian Route
- Planned Bicycle/Pedestrian Route
- DART Bus Route
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Other Major Arterial
- Minor Arterial
- Other Roadway
- City / Town Limits
- County Limits
- station buffer ALL
- Study Area

0 0.5 1

Miles

N

Key Map

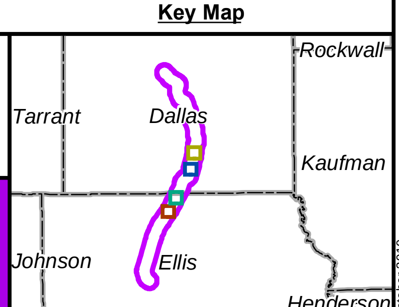


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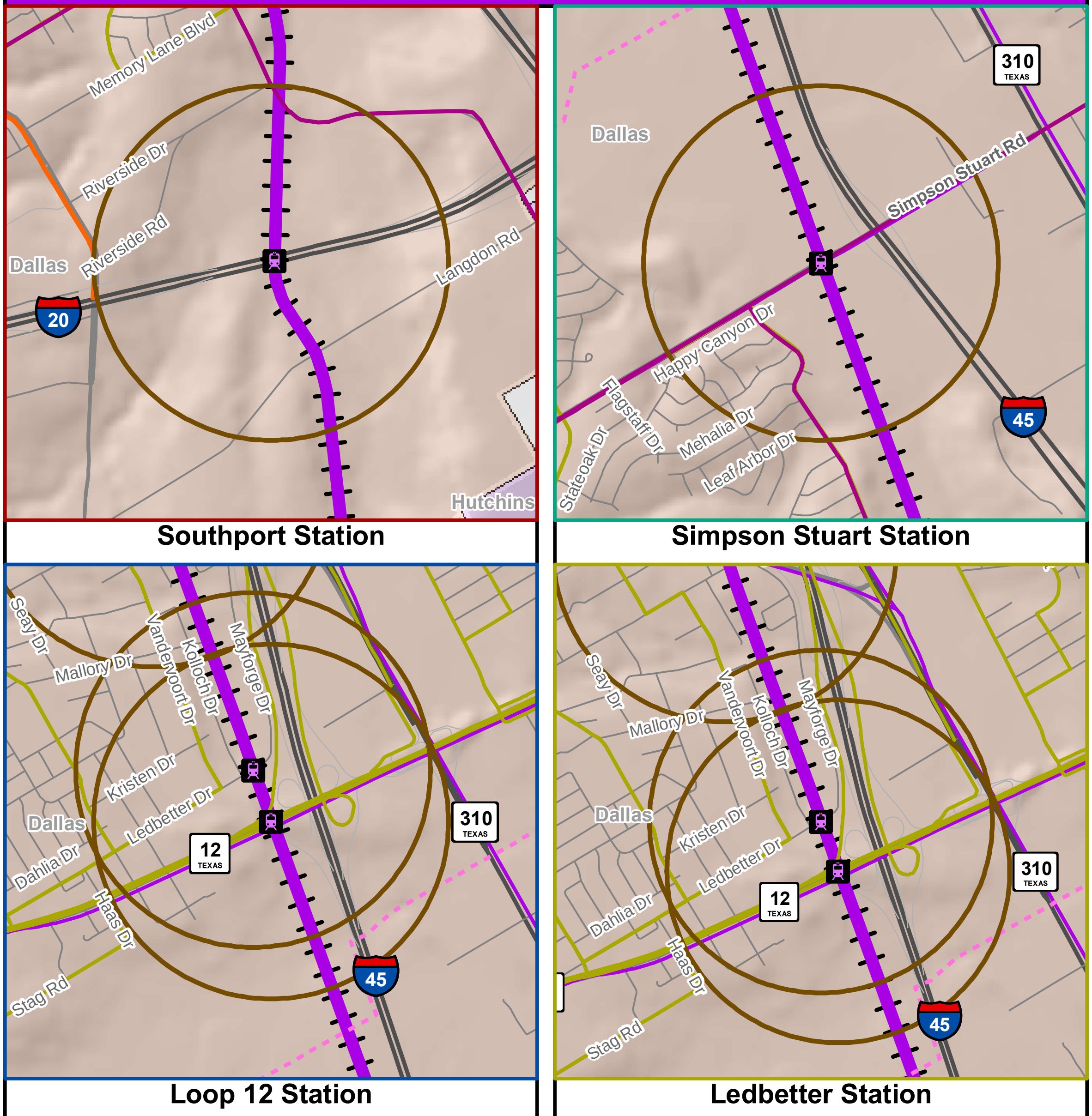
Figure 3-9 — Stations - Southport to Ledbetter

City of Dallas (Southport to Ledbetter)



Legend

- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Bicycle/Pedestrian Route
- Planned Bicycle/Pedestrian Route
- DART Bus Route
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Other Major Arterial
- Minor Arterial
- Other Roadway
- City / Town Limits
- County Limits
- station buffer ALL
- Study Area

0 0.5 1

Miles

N

Key Map

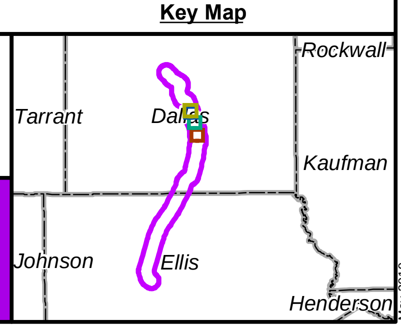


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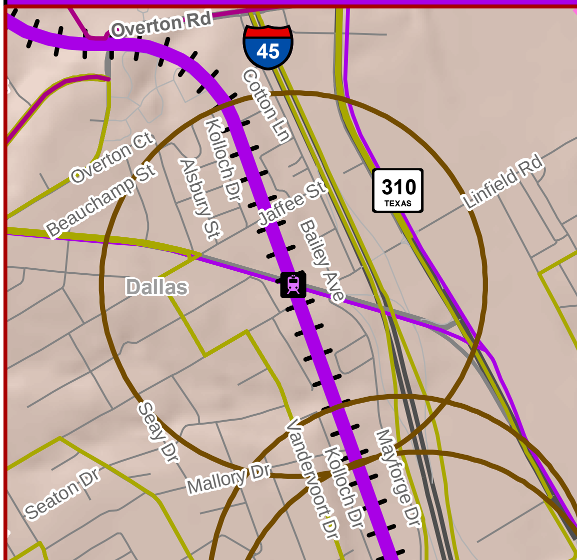
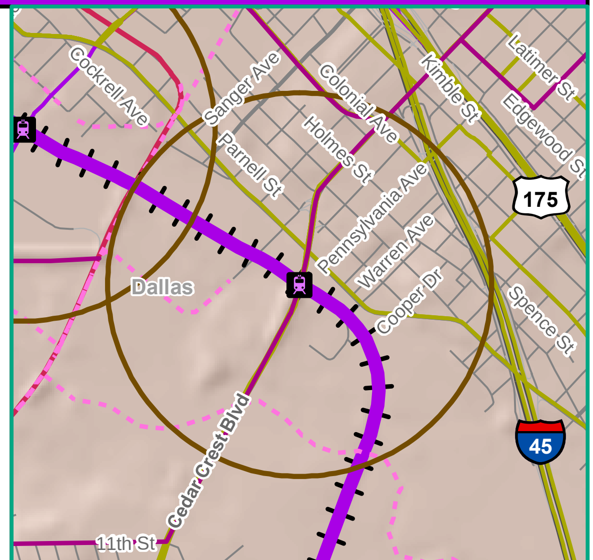
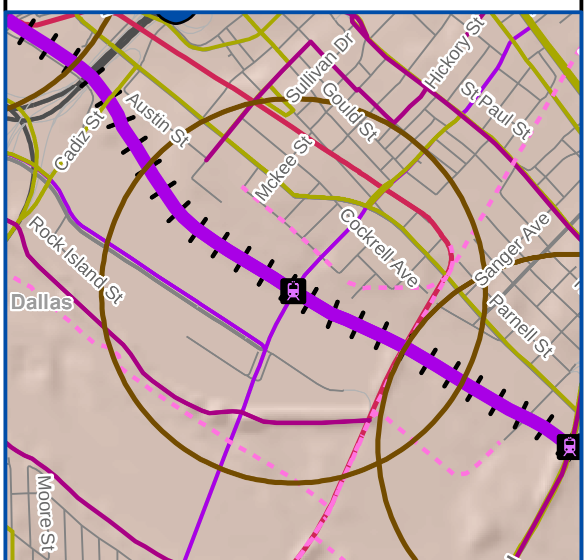
Figure 3-10 — Stations - Illinois to Union
City of Dallas (Illinois to Union)



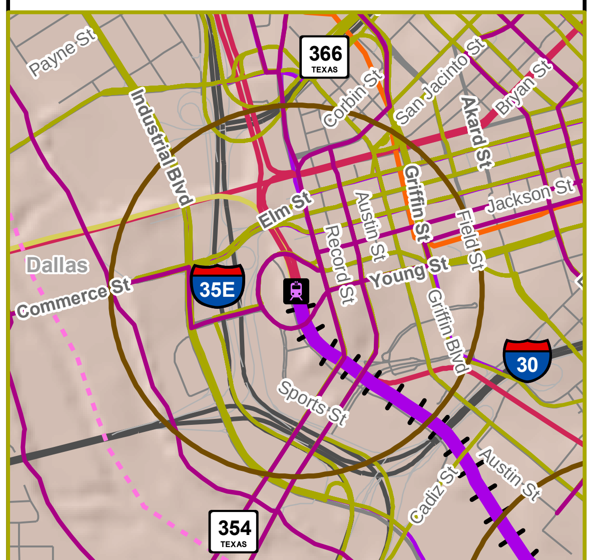
Illinois Station



MLK Station



Corinth Station



Union Station

Legend

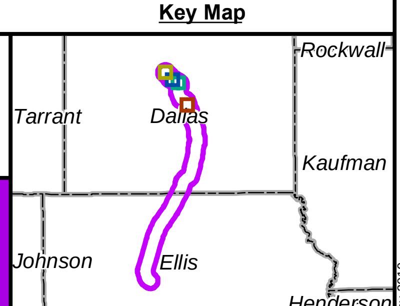
- Potential Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Bicycle/Pedestrian Route
- Planned Bicycle/Pedestrian Route
- DART Bus Route
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Other Major Arterial
- Minor Arterial
- Other Roadway
- City / Town Limits
- County Limits
- station buffer ALL
- Study Area

0 0.5 1

Miles

N

Key Map



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3.5.17 Union Station

The existing station is the Waxahachie Corridor northern terminus. Union Station serves the DART Red and Blue Lines, as well as the TRE. The station is located east of IH 35E on the western side of the downtown Dallas core. Major roadway facilities include IH 35E, IH 30, Spur 366, and the majority of the downtown street system. Existing bicycle and pedestrian facilities in the station study area include the Greater Dallas Bike Plan, routes 45, 190, and 210, and the Trinity Levee Trails. Numerous bus routes serve the downtown area and Union Station. The street and trail network provide bicycle and pedestrian access to Union Station. Numerous high-rise buildings are located east of the existing station housing multiple commercial businesses including the Belo Building, Founders Square, and the Landmark Center. Government facilities are interspersed between the commercial areas including the Dallas County Sherriff's Office, Dallas County Courts, George Allen Courts, and a military installation. Future land use has been identified as the Downtown area by *'forward Dallas!'.* Figure 3-10 shows the transportation facilities near this station.

3.6 RAIL OPERATIONS

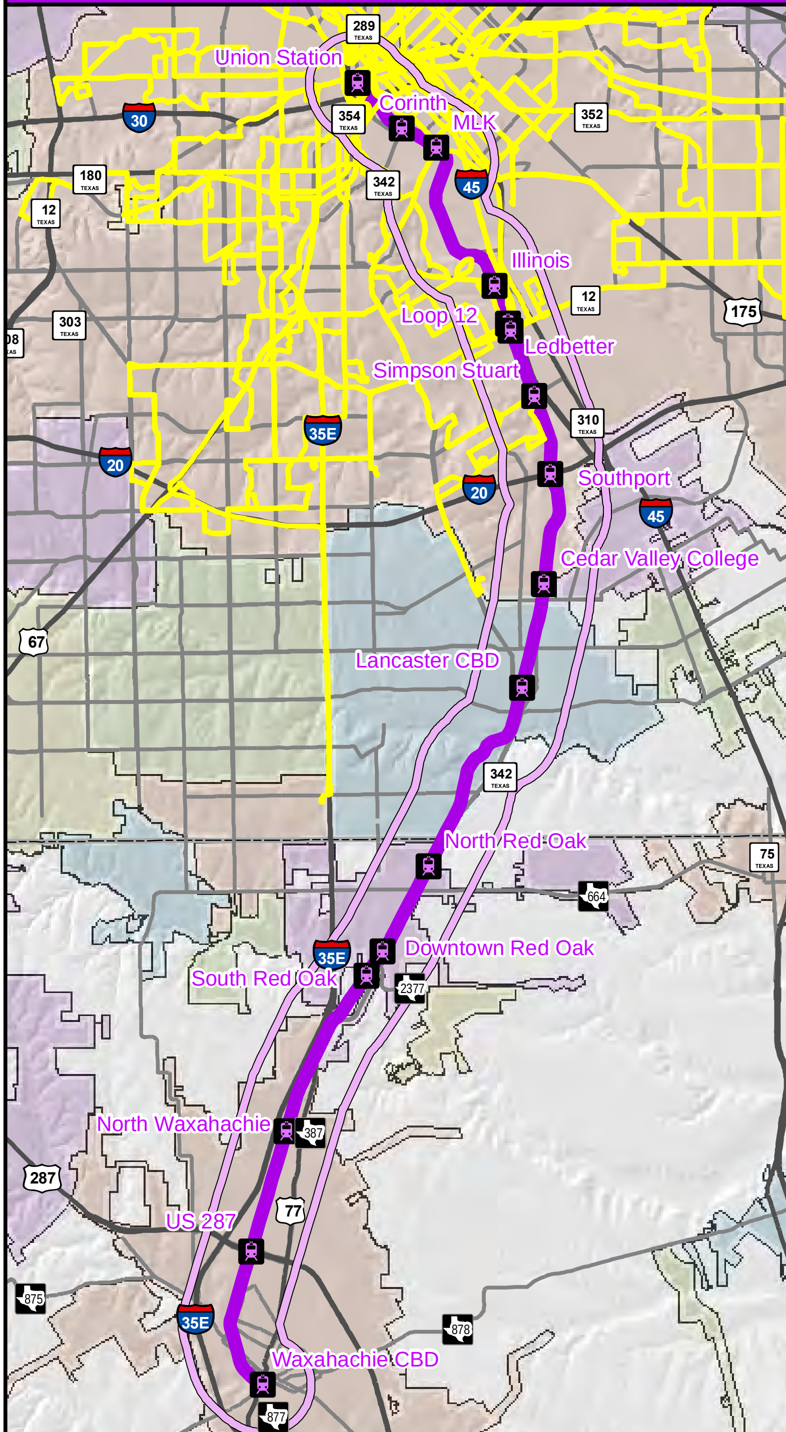
Proposed Waxahachie Corridor operations will be similar to current TRE rail service operations. Rail service would be provided between 5:00 a.m. and 12:00 a.m. with non-service hours reserved for maintenance. During peak periods (weekday mornings from 6:00 a.m. to 9:00 a.m. and afternoons from 3:00 p.m. to 6:00 p.m.) rail service would operate with twenty-minute headways. During the off-peak operating periods (mid-days between 9:00 a.m. to 3:00 p.m., evenings from 6:00 p.m. to 12:00 a.m., and weekends) the route is planned to operate with 60-minute headways. No service would be offered on Sunday. Trip times for each corridor would be less than 45 minutes from Waxahachie CBD to Union Station (depending on the number of stations) and less than 30 minutes from Waxahachie CBD to Southport (depending on the number of stations). Table 7.1 in Chapter 7 list the modeled times for each alternative.

Under all alternatives, freight service operations will coexist with passenger service within the Waxahachie Corridor, with one track dedicated for passenger service and a shared track maintained for both passenger and freight service. The separation between the tracks and vehicle type considered would meet FRA and FTA requirements. The proposed operating concept would be reviewed and modified within the next project development phase.

3.7 BUS OPERATIONS

Currently, 55 bus routes provide service within the corridor. Current bus services are routes serving the downtown Dallas area from throughout the region. The majority of these bus routes are connecting the outside areas to downtown Dallas. The existing services provide local, crosstown, express, rail feeder, and special/shuttle services and serve the municipalities of Addison, Carrollton, Cockrell Hill, Dallas, Farmers Branch, Garland, Glenn Heights, Highland Park, Irving, Plano, Richardson, Rowlett, and University Park. Bus route headways would be adjusted to match needs associated with the rail service schedule. Expanded bus transit operations within the corridor would be evaluated in the next project development phase for possible modifications to provide connections to new stations within the corridor. Figure 3-11 shows the bus network modeled for the build alternatives.

Figure 3-11 — Modeled Bus Operations
From FM 66 to Spur 366

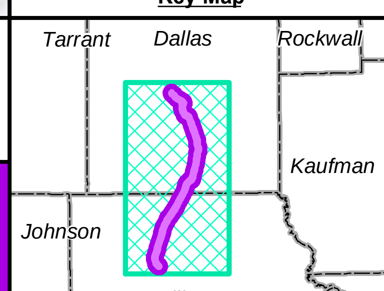


Legend
- Proposed Waxahachie Stations
- Dart Bus Routes
- Proposed Waxahachie Corridor
- Highway
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

0 2 4 8 Miles

N

Key Map



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3.8 COSTS

Conceptual capital costs were estimated for the five build alternative scenarios considered in this study. Capital cost estimates were developed in part using the conceptual alignment alternatives described in Section 3.3. *DART Capital Cost Methodology*, recent TRE construction bids, recent DART LRT estimated costs, and previous work efforts from NCTCOG *RRCS* and RNT efforts were the basis for unit and line item costs. The information and methodology contained in *DART Capital Cost Methodology* are in accordance with FTA guidelines for the preparation of capital cost estimates. Cost estimate items are grouped based upon the FTA Standard Cost Categories (SCCs) for major capital projects, these include:

- Guideway and track elements
- Station, stops, terminals, and intermodal
- Support facilities: yards, shops, administrative buildings
- Site work and special conditions
- Systems
- Right-of-way, land, and existing improvements
- Vehicles
- Professional services
- Unallocated contingency

Assumptions included as part of the conceptual capital cost estimates are:

- A grade separation is suggested if a crossing is a major arterial that carries (or is expected to carry) more than 40,000 vehicles per day, is a six-lane facility, or is a four-lane divided facility.
- In areas along the corridor where a new bridge structure and/or replacement of an existing structure is needed for creek or stream crossings (approximation based upon previous study of existing stream/wetland crossings within corridor).
- Station locations proposed to include parking, 300 parking spaces per station is included in the cost estimates. Some station locations will not have parking and will be further studied in the next project development phase.
- All capital cost estimates have been developed using year 2010 dollars.
- Unit costs are based on averages of costs for similar recent construction in the DFW region.
- As recommended by *DART Capital Cost Methodology*, a 30 percent design contingency is added to the civil engineering cost estimate to cover possible unit cost changes as projects progress through various design development stages.
- A 10 percent construction contingency is added to the estimated construction cost estimate to cover unforeseen costs incurred during construction.
- As recommended by *DART Capital Cost Methodology*, a 32 percent add-on allowance is added to construction cost estimates for professional services to cover administrative costs. These values reflect the DART cost to provide administrative services and are capitalized against the project.
- An additional one percent of construction cost is added to cover potential environmental mitigation not incorporated into the design.

Cost estimates include all infrastructure items: track installation, land acquisition, stations, parking, signal system installation, and equipment acquisition. Cost assumptions do not include elevated or sub-grade sections along the corridor but do include various grade separation costs. Infrastructure requirements were identified at a conceptual level based on proposed alignments.

The cost estimates do not account for additional costs incurred on the existing transit system caused by the addition of Waxahachie Corridor service. The detailed operational plan required to estimate these costs is not within the scope of this CE & FS. These and other operational and maintenance costs will be addressed in future engineering or environmental studies.

Detailed worksheets based on the *DART Capital Cost Methodology* were developed to calculate capital cost estimates for each alternative. Each worksheet includes the relevant alternative elements by unit costs for each item. The worksheets providing capital cost estimate information for the corridor are provided in Appendix A. Table 3-5 shows a summary of capital cost estimates for each alternative.

Table 3-5 Rail Capital Costs[1] Summary

Cost Category	Alternative									
	1		2		3		4		5	
Vehicle Type	**P-P**	**LRNT**	**P-P**	**LRNT**	**P-P**	**LRNT**	**P-P**	**LRNT**	**P-P**	**LRNT**
Guideway	$100	$100	$106	$106	$58	$58	$63	$63	$106	$106
Stations	$51	$51	$69	$69	$26	$26	$39	$39	$69	$69
Yard & Shop	$3	$3	$3	$3	$3	$3	$3	$3	$3	$3
Sitework & Special Conditions	$12	$12	$12	$12	$8	$8	$8	$8	$12	$12
Systems	$50	$50	$50	$50	$37	$37	$37	$37	$50	$50
Allowances	$185	$185	$205	$205	$113	$113	$128	$128	$205	$205
Right-of-Way	$11	$11	$12	$12	$7	$7	$8	$8	$12	$12
Vehicles	$63	$121	$63	$121	$47	$76	$55	$76	$119	$244
Unallocated Contingency	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Grand Total	**$475**	**$533**	**$520**	**$578**	**$299**	**$328**	**$341**	**$362**	**$576**	**$701**
Total Length (miles)	30.9		30.9		20.7		20.7		30.9	
Cost Per Mile	**$15**	**$17**	**$17**	**$19**	**$14**	**$16**	**$16**	**$18**	**$19**	**$23**

1. Cost estimates are in millions of current year (2010) dollars
P-P: Push-Pull Commuter Rail Vehicle, LRNT: New Technology Light Rail Vehicle

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4.0 AFFECTED ENVIRONMENT

Chapter 4 summarizes the social, economic, and natural environmental resources within the Waxahachie Corridor study area described in Chapter 1, Section 1.4. These resources include the transportation system, land use, socio-economic indicators, community facilities, cultural resources, parklands and recreational areas, regulated/hazardous material sites, air quality, noise, vibration, water resources, biological resources, wetlands, soils, geology, and energy. This information was developed using the best available data from federal and state resource agencies and local governments. This information was developed to establish the existing conditions within the corridor and to assist with early identification of potential issues and opportunities along the corridor. The data also provides a foundation for future environmental studies. Appendix B provides a more detailed accounting of this information along with the legal and regulatory context, methodology/research, existing conditions, and when available, future projections and plans.

4.1 TRANSPORTATION SYSTEM

To be efficient and effective, the proposed Waxahachie Corridor would be integrated into the existing transportation system of roadways, transit routes, bicycle and pedestrian facilities, railroads, and aviation facilities. Data collection to document the existing conditions of, and proposed changes to, the transportation system within the Waxahachie Corridor came from a variety of sources. The primary transportation system data sources regarding existing conditions and proposed improvements are North Central Texas Council of Governments (NCTCOG), the metropolitan planning organization (MPO) for the Dallas-Fort Worth (DFW) region; Texas Department of Transportation (TxDOT); and Dallas Area Rapid Transit (DART).

4.1.1 Roadway System

According to the 2000 United States (US) Census, over 90 percent of workers in the DFW region traveled to work in a car, truck, or van. When motorcycles, buses, and taxis are included, the percentage of work trips utilizing the roadway system is over 93 percent. The most traveled facilities in the regional roadway network are interstate highways, other limited access federal and state highways, and toll roads. Listed in Table B-1 in Appendix B are the regionally significant arterials passing through the Waxahachie Corridor study area.

Figures B-1 and B-2 in Appendix B identify the major highways, toll roads, and regionally significant arterials within the study area. Interstate Highway (IH) 35E and US 342 both run parallel to the Waxahachie Corridor. Figures B-3 and B-4 in Appendix B, illustrate the modeled level-of-service (LOS) for roadways, including regionally significant arterials, within the study area and the traffic counts taken by TxDOT in 2004. LOS is a rating system for roadways based on operating conditions with “A” being the best and “F” worst. The NCTCOG Dallas-Fort Worth Regional Travel Model (DFWRTM) indicated approximately 85 percent of study area roads were operating at a LOS A, B, or C in 2007, eight percent were operating at a LOS D or E; and 7 percent were operating at a LOS F.

There are several roadway improvement projects planned within the study area. These projects are included in Tables B-2 and B-3 in Appendix B. Planned improvements to the existing highway system include the addition of tolled or managed lanes. Travel time improvements associated with additional capacity would be distributed between system users based on the user's ability to pay for access to the tolled or managed lanes. Figure B-5 in Appendix B, shows the locations of planned projects on highways, toll roads, and regionally significant arterials.

Figures B-6 and B-7 in Appendix B depict the projected LOS for roadways within and near the study area in 2030. By comparing the projected 2030 congestion levels to 2007 levels, the LOS trend for the study area roadways is consistent with the regional trend. As shown in Figure B-8 in Appendix B, the Waxahachie Corridor passes through areas currently experiencing light to moderate congestion with severe congestion in the Dallas central business district (CBD). It is likely congestion levels will be more severe by 2030, even if all planned projects are constructed.

4.1.2 Transit System

The Waxahachie Corridor study area falls within the service area of one transit provider, DART. Of the five cities in the study area, only the City of Dallas is a member of DART. Data describing the existing and near-term expansion of transit routes and ridership was provided by DART. NCTCOG provided information regarding the long-range regional planning for bus transit and passenger rail projects.

Currently, DART operates all transit only in the City of Dallas within the study area. DART operates 55 bus routes and three light rail transit (LRT) lines, the Blue Line, Red Line, and Green Line as well as commuter rail joint venture Trinity Railway Express (TRE). All of these services occur in the Dallas portion of the study area and mostly centered around the Dallas CBD. Table B-4 in Appendix B lists the 55 DART bus routes passing through some portion of the study area including five cross town routes, nine express routes, six rail feeders, and one special or shuttle routes. Figures B-9 and B-10 in Appendix B identify the transit services currently provided within the study area.

Connection to the existing transit system would occur at Union Station. Connection to this station would offer riders direct connections to the DART Blue Line and Red Line in addition to the TRE. Depending on the selected alternative, service could continue along the TRE without a forced transfer. Additional connections to the DART Green Line and future Orange Line could be made through a transfer along the DART Blue Line or Red Line one station away from Union Station at the West End Station, by bus, or via walking or bicycle.

4.1.3 Bicycle and Pedestrian

Dedicated bicycle and pedestrian facilities exist at several locations within the study area. Municipalities with existing facilities in the study area include Dallas, Hutchins, Lancaster, and Waxahachie. Four of five municipalities in the study area have planned bicycle and pedestrian facilities; only the City of Red Oak currently has no existing or planned bicycle or pedestrian facilities. The primary bicycle and pedestrian data sources include NCTCOG and the most recent comprehensive plans and/or trail plans of Dallas, Hutchins, Lancaster, Red Oak, and Waxahachie. NCTCOG maintains data describing the existing and planned regional bicycle and pedestrian facilities associated with the Regional Veloweb initiative.

The Regional Veloweb is a 644-mile, designated off-street trail network planned to provide bicycle and pedestrian connections in the DFW region. Figures B-11 and B-12 in Appendix B show the locations of existing and planned bicycle and pedestrian facility improvements in the study area. The Cedar Valley trail of the Regional Veloweb has a portion of its facility along the

Waxahachie Corridor in the City of Lancaster. Tables B-5, B-6, and B-7 in Appendix B list the existing and planned bicycle and pedestrian facilities within the study area.

Approximately 40 miles of bicycle and pedestrian facilities are currently operational within the study area. Facilities in Dallas account for about 37 miles of the bicycle and pedestrian system within the study area.

Four of five municipalities within the study area have planned expansions to their local bicycle and pedestrian trail systems, totaling approximately 21 miles. The City of Dallas plans to add over 15 miles of trails and the City of Lancaster plans to add approximately five miles. The Cities of Hutchins and Waxahachie plan to add less than one mile each.

4.1.4 Freight

The existing roadway system accommodates most freight movement within the study area. The corridor averages six freight trains daily, four from Burlington Northern Santa Fe Railway (BNSF), and two from the Union Pacific Railroad (UPRR). The primary data sources are NCTCOG and TxDOT. TxDOT data describes the freight rail system, while NCTCOG data tracks the locations of freight intensive facilities, freight oriented developments (FODs), and Foreign Trade Zones (FTZs). Figures B-13 and B-14 in Appendix B illustrate the locations of freight rail facilities within the study area.

Several locations within the study area have concentrations of freight intensive facilities including 35 warehouses, six distribution centers, three terminal areas, and 26 manufacturing centers. These facilities are concentrated mainly in three areas, north Waxahachie (north of US 287), near the Southport area, and near downtown Dallas. Access to freight rail service was an important location factor for many freight facilities within the Waxahachie Corridor. In addition to these facilities, one industrial park, two rail facilities, and two FOD areas were identified in the study area.

Another important regional freight system component are federally designated FTZs where goods are considered outside of US Customs Territory. Within FTZs, goods can be stored, distributed, manufactured, assembled, inspected, tested, and repackaged prior to officially entering US Customs Territory. The benefits of these zones include reduced/deferred duty rates, reduced inventory taxes, and increased security while goods are moving through the supply chain. There is one FTZ within the study area, Southport, which is a secondary site for the DFW FTZ (FTZ #39).

Owned by BNSF and the UPRR, the Waxahachie Corridor rail line provides active freight rail service for all the cities in the study area. Two freight lines cross the Waxahachie Corridor, the east-west UPRR line crosses near downtown Dallas and the Mansfield UPRR line crosses near the southern terminus in the City of Waxahachie. There are 47.4 miles of UPRR freight rail, 40.7 miles of BNSF freight rail, 14.2 miles of DART light rail, 2.8 miles of TRE commuter rail, and 2.0 miles of the Dallas Garland and Northeastern Railroad (DGNO) freight rail in the study area.

The current IH 20 and IH 45 through the study area is implemented with a truck lane restriction. This restriction does not allow trucks with three axles or more in the left-most lane except in areas within one mile of a left exit or entrance to the facility. In addition, IH 35E and IH 30 have been identified as potential long-term intercity truck lane restrictions in the study area. There has been no timeframe identified for the implementation of additional truck lane restrictions for these facilities in the study area for the Waxahachie Corridor.

4.1.5 Aviation

Two primary commercial service airports serve DFW region passengers, Dallas-Fort Worth International Airport (DFWIA) and Dallas Love Field. DFWIA and Fort Worth Alliance Airport handle the majority of air cargo traffic within the region. The sources for airport data include NCTCOG and the individual airports.

There are no aviation facilities in the Waxahachie Corridor study area. The Lancaster Regional Airport lies approximately 0.6 miles from the study area in the City of Lancaster and is the closest airport to the study area. This regional airport is a private airport serving small private aircraft and cargo aircraft. The airport is currently planning a 1,500-foot extension of its existing runway to accommodate larger aircraft.

4.1.6 Travel Patterns

Commuting patterns within the study area and throughout the region were reviewed for potential interactions with the Waxahachie Corridor. The data for this section comes from the US Census Bureau and NCTCOG. Information compiled from both the 1990 Census and 2000 Census show trends in journey to work data over time.

According to the 2000 Census, 74.7 percent of study area residents are employed within their county of residence, but only 44.0 percent work within the city or town where they reside. For the 2000 Census, the DFW Metropolitan Statistical Area (MSA) central cities were Arlington, Dallas, Denton, Fort Worth, and Irving. About 94.6 percent of study area residents worked in one of these five primary cities. The 2000 Census reported 87.7 percent of commuters used a car, truck, or van; 70.2 percent of the commutes consisting of drive alone trips; and 17.5 percent in two or more person carpools. The other methods reported by at least 1,000 workers for accessing employment were public transportation, working from home, and walking to work with overall share of commutes at 6.4 percent, 2.5 percent, and 2.3 percent, respectively.

Travel time to work for study area residents was similar to the travel times for the entire DFW MSA. Approximately 22.0 percent of study area residents had a commute of less than 15 minutes when compared to 21.7 percent of DFW MSA residents. A lower proportion of study area residents (29.7 percent) had a commute of 15 to 29 minutes when compared to the rest of the DFW MSA (34.8 percent). Tables B-8 through B-10 in Appendix B show how study area residents compared to residents of the entire DFW MSA by place of work, mode choice travel patterns for employment related trips, and travel time range.

The geographical distribution of places of employment for workers in the study area changed between 1990 and 2000. The percentage of workers employed within their county of residence decreased by 6.8 percent and the proportion of workers who commuted to a central city decreased by 9.1 percent. The mode choice of study area commuters did not change drastically between 1990 and 2000, with the proportion working from home and those driving alone increasing. The trend in travel times for commuters indicates workers within the study area are taking longer to get to their places of employment in comparison to the previous census.

4.2 BUILT ENVIRONMENT

4.2.1 Land Use

The project study area encompasses portions of Dallas and Ellis Counties, the municipalities of Dallas, Hutchins, Lancaster, Red Oak, and Waxahachie. Table 4-1 identifies various land use types within the study area. Over 58 percent of the study area is classified undeveloped land with residential areas accounting for the majority of developed land. Figures B-15 and B-16 in Appendix B graphically illustrate land use in the Waxahachie Corridor study area.

Table 4-1 2005 Land Use within Study Area

Land Use Type	Percentage
Residential	16.6%
Industrial	7.1%
Dedicated	5.0%
Government/Educational	4.5%
Infrastructure	3.8%
Commercial	3.1%
Water	1.7%
Airports	0.0%
Undeveloped	58.2%

Source: NCTCOG GIS Land Use, 2005

4.2.2 Socio-Economic

Population and employment trends for the region and study area are discussed in Chapter 2, Section 2.1.1. This section details additional socio-economic conditions in the Waxahachie Corridor including race, ethnicity, age, environmental justice populations, and limited English proficiency (LEP) populations.

4.2.3 Ethnicity

Table 4-2 shows the population, race, and ethnicity for Dallas and Ellis Counties and the census tracts intersecting the study area. The 51 census tracts identified in the Waxahachie Corridor are shown in Figures B-17 and B-18 in Appendix B. The study area has approximately 65.9 percent minority population, which includes Hispanic persons; compared to approximately 54.8 percent minority for Dallas County and 28.0 percent for Ellis County. The study area ethnic composition is approximately 42.2 percent White, 21.1 percent Hispanic (or Latino), 43.9 percent Black/African-American, 0.5 percent American Indian/Alaska Native, 0.4 percent Asian, and less than 0.1 percent Native Hawaiian or other Pacific Islander. The study area exhibits a higher percentage of Black/African-American than both counties and more Hispanic (or Latino) than Ellis County as a whole. Although the general study area is classified minority. Specifically, 36 out of the 51 census tracts were identified as minority populations with 35 of the 36 occurring in Dallas County. Table B-17 in Appendix B shows population, race, and ethnicity by census tract.

Table 4-2 2000 Population and Ethnicity

Characteristic	Dallas County		Ellis County		Study Area	
	Population	Percent	Population	Percent	Population	Percent
White	1,294,769	58.4%	89,789	80.1%	77,632	42.2%
Black	450,557	20.3%	9,626	8.6%	80,640	43.9%
American Indian	12,499	0.6%	662	0.6%	972	0.5%
Asian	88,369	4.0%	392	0.4%	694	0.4%
Native Hawaiian	1,277	<0.1%	18	<0.1%	66	<0.1%
Other race	311,504	14.0%	8,797	7.9%	20,337	11.1%
Two or more	59,924	2.7%	2,076	1.9%	3,555	1.9%
Hispanic[1]	662,729	29.9%	20,508	18.4%	38,808	21.1%

Source: US Census, 2000
1. Hispanic persons are not considered a separate race and may belong to any race.

4.2.3.1 Age

The average median age in study area census tracts is 33 years old, slightly higher than the median age in Dallas County of 31 years old but the same as Ellis County at 33 years old. Approximately 37 percent of study area residents are under 18 or older than 64 years. This corresponds to Dallas County with 36 percent and Ellis County with 39 percent of the population in these age ranges. This population cohort represents non-drivers or infrequent drivers who tend to be more dependent on mass transit and carpooling for mobility. Table B-18 in Appendix B details this information.

4.2.3.2 Poverty Levels

The median household income for the census tracts in the study area ranged from $6,250 to $200,000+. Forty-one of the 51 census tracts had median incomes below the median household income for their respective counties. The poverty rate for the study area (21.8 percent) is higher than the overall rate for Dallas County (13.4 percent) and Ellis County (8.6 percent). Using 2000 Census data and the Department of Housing and Urban Development (HUD) definition of low-income household, 32 census tracts out of 51 were determined to have low-income residents. Table B-20 in Appendix B shows median household income and poverty levels for each census tract in the study area.

4.2.3.3 Language

Census tract data for “Ability to Speak English for the Population Five Years and Over” indicates an average of 6.4 percent of the residents in the study area speak English “Not Well” or “Not At All.” The average for Dallas County is 11.2 percent and Ellis County is 3.8 percent. Of those persons who did not speak English well, Spanish was the preferred language. Tables B-20 and B-21 in Appendix B show data from the 2000 Census including languages spoken by the LEP population over five years of age from the 51 census tracts in the study area.

4.2.4 Community Resources

This section details major activity centers, employment, and community facilities.

4.2.4.1 Major Activity Centers and Developments

Major activity centers and developments in the Waxahachie Corridor are defined as places employing over 80 employees at one location, building structures with over 80,000 square feet of space, multi-family developments with at least 80 units, and hospitals/facilities with at least 80 beds. The study area has a total of 531 major activity centers and developments including:

- 15 cultural facilities
- 47 educational facilities
- 12 government quarters
- 20 hotels/motels
- 78 industrial facilities
- 15 institutional facilities
- 101 multi-family developments
- Three mixed-use developments
- 115 office complexes
- 32 parking facilities
- Five recreational facility
- 83 retail centers
- Two service facilities
- Three single-family developments

Notable major activity centers in the study area are centered around downtown Dallas and include the Renaissance Tower, Lincoln Plaza, George Allen Court Building, Dallas City Hall, the Dallas Convention Center, and many others. The Dallas Logistics Hub (Southport) is the only major activity center that occurs outside the downtown Dallas area. Southport is located within four cities: Dallas, Hutchins, Lancaster, and Wilmer. All of these facilities serve as a regional destination point. Table B-22 in Appendix B lists the number of existing major activity centers and developments in the study area by type and municipality.

4.2.4.2 Employment

Major employment centers in the Waxahachie Corridor are defined as 250 employees or more at a single location. There were 78 major employers identified within the study area. Table B-23 in Appendix B lists the major employers in the study area. The City of Dallas had the most major employers at 67, the City of Waxahachie had 10 major employers, and the City of Lancaster had one; The Cities of Red Oak and Hutchins had no major employers. The 29 major employers with over 500 employees in the Waxahachie Corridor study area all occurred in the City of Dallas with the exception of one major employer occurring in the City of Waxahachie.

4.2.4.3 Community Facilities

There were 205 community facilities identified within the study area, categorized into 10 distinct types:

- 16 assisted living facilities
- Two cemeteries
- 11 cultural facilities
- 47 educational facilities

- 15 emergency services
- 28 governmental facilities
- Two medical facilities
- 10 places of worship
- 30 recreational facilities
- 44 transportation facilities

Table B-24 in Appendix B lists the number of community facilities by municipality. The most common community facilities are educational and transportation.

4.2.5 Cultural Resources

Identified in the study area are 203 known cultural resources. Tables B-26 through B-30 and Figures B-19 and B-20 in Appendix B depict the locations that include:

- 17 nationally registered historic districts
- 92 nationally registered historic properties
- Four historical museums
- 85 historical markers
- Nine cemeteries

Specific archeological data were not obtained for the study area; however, there were 60 previous archeological surveys conducted in the corridor for other projects. Appendix B, Table B-31, lists the date, agency, and type of each investigation performed.

4.2.6 Parks and Recreation

Eighty-six parks and recreational areas were identified within the study area. The data search returned 10 different types of facilities in four study area municipalities. Table B-32 in Appendix B lists the name, type, and location of each facility.

4.2.7 Regulated Materials

The potential regulated or hazardous material sites in the study area are 19 landfill sites and 25 miles of pipeline; no mining, radioactive, or Superfund sites were identified. Twelve of the 19 landfill sites were identified in the Texas Closed Landfill Inventory as unauthorized landfill sites with no permitting for disposal or dumping. These sites could be a source of hazardous contamination because of site regulation deficiencies for dumping and disposal and possible types of waste disposed. The remaining landfills were identified as inactive (one), closed (two), and active (four). These landfills are authorized landfill with a registered permit with the Texas Commission on Environmental Quality (TCEQ) for waste disposal. Pipelines crossing the project area all carried natural gas. Figures B-21 and B-22 in Appendix B show the locations of potential hazardous materials sites in the Waxahachie Corridor study area.

4.3 ENVIRONMENTAL CONDITIONS

This section describes environmental conditions within the study area regarding air quality, noise, vibration, water resources, biological resources, waters of the US, soils and geology, and energy.

4.3.1 Air Quality

Air quality is a regional problem, not a localized condition. The study area, located in Dallas and Ellis Counties, are within a designated moderate nonattainment area for the eight-hour ozone standard by the US Environmental Protection Agency (EPA). Table B-33 in Appendix B lists the EPA adopted standard concentration limits, the National Ambient Air Quality Standards (NAAQS), for the six air pollutants the EPA regulates. The NCTCOG eight-hour ozone nonattainment region includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties. Hood, Hunt, and Wise Counties are also currently under review by the EPA for nonattainment for eight-hour ozone standards. Emissions from motor vehicles and point sources are directly related to the formation of ozone. The primary pollutants from motor vehicles are volatile organic compounds (VOCs), carbon monoxide (CO), and nitrogen oxides (NOx).

Table B-34 in Appendix B lists the four highest daily maximum eight-hour ozone concentrations recorded annually from 2000 to 2009 at the Dallas Hinton Street Continuous Air Monitoring Station (CAMS) 401. This is the closest active monitoring station to the study area.

4.3.2 Noise

The 2005 land use conditions described in Appendix B, Section B.2.1, were used to determine the linear feet of noise sensitive land uses adjacent to the existing Waxahachie Corridor rail line. The land use adjacent to the rail right-of-way includes 19,744 linear feet (6.1 percent) of residential land use, 7,535 linear feet (2.3 percent) of park or recreational land use, and 8,202 linear feet (2.5 percent) of institutional land use. This totals 35,480 linear feet (10.9 percent) of noise sensitive land use. In addition, the existing Waxahachie Corridor rail line has freight activity. While this freight activity is moderate, existing land use areas have adapted to the moderate freight rail noise surrounding the active freight rail line.

4.3.3 Vibration

Geographic Information System (GIS) data for 2005 land use was used to determine the linear feet of vibration sensitive land use adjacent to the existing Waxahachie Corridor rail line. In the study area, no Category 1 land uses were identified. Category 2 land uses totaled 19,744 linear feet (6.1 percent) which included residential, hotels, and motels. Category 3 land uses totaled 15,737 linear feet (4.8 percent) which included institutional buildings (such as government buildings) and park and recreational facilities. Each identified land use type could contain specific vibration sensitive receivers. Figures B-15 and B-16 in Appendix B identify the land use for the study area, which includes vibration sensitive areas.

4.3.4 Water Resources

A total of 7,963 acres of 100-year floodplain were located in the study area. In addition, 1,641 acres of 500-year floodplain land were identified. These floodplains are located around the numerous streams crossing the project study area as shown in Figures B-27 and B-28 in Appendix B. The largest floodplain area occurred along Trinity River near downtown Dallas, which crosses the Waxahachie Corridor study area near the northern terminus along IH 30, IH 45, and IH 35E.

Numerous streams cross the Waxahachie Corridor study area. Approximately 310,000 linear feet of stream were identified, including named and unnamed rivers, streams, and aqueducts. Larger streams include Bear Creek, Bushy Creek, Cedar Creek, Cottonwood Creek, Deep Branch, Five Mile Creek, Floyd Branch, Grove Creek, Honey Springs Branch, Keller Creek, Mustang Creek, Newton Creek, North Grove Creek, Red Oak Creek, South Grove Creek, Ten Mile Creek, Trinity River, Waxahachie Creek, and Whites Creek. The Trinity River stream segments within the study area is listed on the TCEQ draft 2010 Section 303(d) list for impaired water body segments. Impairments include bacteria and polychlorinated biphenyls (PCBs) in edible tissue.

All municipalities within the study area are members of the North Texas Municipal Water District and have municipal separate storm sewer systems (MS4) permits. The City of Dallas and Dallas County has a medium or large MS4 permit (Phase 1). The remaining municipalities (Hutchins, Lancaster, Red Oak, and Waxahachie) and Ellis County have small MS4 permits (Phase 2). Section B.3.4.1 in Appendix B has a detailed discussion regarding the MS4 permits. As development and growth continues in the project area, the potential for additional impacts to water quality may occur.

4.3.5 Biological Resources

The study area is contained within the Northern Blackland Prairie and the Low Terraces subareas of the Texas Blackland Prairies ecological areas. Additionally, identified in the study area are four vegetation types from the *Vegetation Types of Texas*. The majority of the study area falls into the crops category with approximately 29,320 acres, "urban areas" account for approximately 7,920 acres, "other native or introduced grasses" account for approximately 3,240 acres, and "water oak – elm hackberry forest account for approximately 730 acres. Table B-38 in Appendix B also describes the vegetation type, typical species found in each vegetation type, and where the distribution of the vegetation type occurs. Figure B-29 in Appendix B illustrates the vegetation types.

Through the Natural Diversity Database (NDD) from the Texas Parks and Wildlife Department (TPWD), a search was conducted to identify potential threatened and endangered species, species of concern, protected species, and vegetation series. The database yielded one occurrence of a rookery within the study area. It is anticipated the project would have no effect to this rookery because the area already experiences freight rail activity.

As the study area becomes more developed, biological resources would decline. Vegetation and wildlife habitat would be converted to urban and suburban areas based on future population growth as described in Chapter 2, Section 2.1.1. Creation of parks and green space could offset any permanent impacts. Impacts to threatened and endangered species could occur if it were determined their habitat would be impacted by future growth. Although some species would lose habitat, some have adapted to living within an urban environment if the right combination of surrounding foraging areas remain; such as the Interior Least Tern species, which nests on the gravel rooftops of buildings.

4.3.6 Waters of the US, including Wetlands

The only river crossed by the Waxahachie Corridor is the Trinity River, which runs for over 37,000 linear feet (over seven miles) within the study area. Over 270,000 additional linear feet of streams were identified in the study area. Other streams with at least 15,000 linear feet inside the study area are Five Mile Creek, Floyd Branch, Honey Springs Branch, Keller Creek, Red Oak Creek, Ten Mile Creek, Waxahachie Creek, and Whites Creek. The locations of ephemeral and some intermediate streams would likely not have been reported though standard sources and would need to be identified through field investigations in future environmental studies. Table B-39 in Appendix B lists the linear footage by stream.

In addition to the creeks and rivers, there are also approximately 1,021 acres of waters of the US and wetlands in the study area. Lakes accounted for less than 0.1 percent of the study area, with half located in golf courses within the study area. There were more potential wetlands identified in the study area than identified lakes. Most of the potential wetland areas were located in proximity to the Trinity River, Five Mile Creek, and Floyd Branch. Tables B-40 and B-41 in Appendix B shows acreage of lakes and potential wetlands in the study area and the percent of the entire study area they encompass. Figure B-30 in Appendix B shows the locations of the potential wetlands. Future studies will conduct field investigations to delineate study area wetlands.

4.3.7 Soils and Geology

The study area lies on top of one major geological formation, the Austin Chalk Formation. Other minor geological units include alluvium, water, and terrace deposits. Two aquifers occur in the study area, the Trinity Aquifer and the Woodbine Aquifer. Figure B-31 in Appendix B shows the locations of these geological features.

The soils located within the study area were described and mapped by the Natural Resource Conservation Service (NRCS). The study area contained 70 unique map unit types. These map units are condensed into 22 separate soil series and five non-series soils. Table B-42 in Appendix B details the study area soils. Figures B-32 and B-33 in Appendix B graphically display the soil series in the study area.

Additional land development could change study area soils. During land development, the top layer of soil could be disturbed and altered beyond its existing properties. While these changes could occur to the top layers of soil, the deeper soil horizons would remain unchanged in the future.

4.3.8 Energy

Energy use for transit or transportation projects is described by converting vehicle miles traveled (VMT) to British Thermal Units (BTUs). The NCTCOG 2009 traffic performance reports for the region reported an average daily VMT for the nine-county region at approximately 158 million miles travelled. This daily VMT converts to 987 billion BTUs of energy usage. This equals approximately 170 thousand barrels of oil per day for the DFW region. The study area may see increased energy consumption as the population in the area densifies. More vehicles and more VMT will increase the energy required for the study area and the region.

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5.0 FUNDING

Chapter 5 provides an overview of current transportation infrastructure funding in the Dallas-Fort Worth (DFW) region. Funding sources proposed for consideration by regional decision-makers are highlighted. Also included is Dallas Area Rapid Transit (DART) innovative efforts in seeking a public-private partnership (PPP) to help fund expedited corridor implementation. Lastly, selected funding sources utilized by other transit providers are described.

5.1 CURRENT REVENUE SOURCES

The Waxahachie Corridor, as detailed in Chapter 1, Section 1.4, is being studied from the proposed Waxahachie central business district (CBD) station to Union Station in the City of Dallas. The City of Dallas portion of the study area in the City of Dallas is within the DART service area. All other municipalities within the study area are not within a transit service area. Figure 5-1 illustrates the Waxahachie Corridor study area within existing transit service areas.

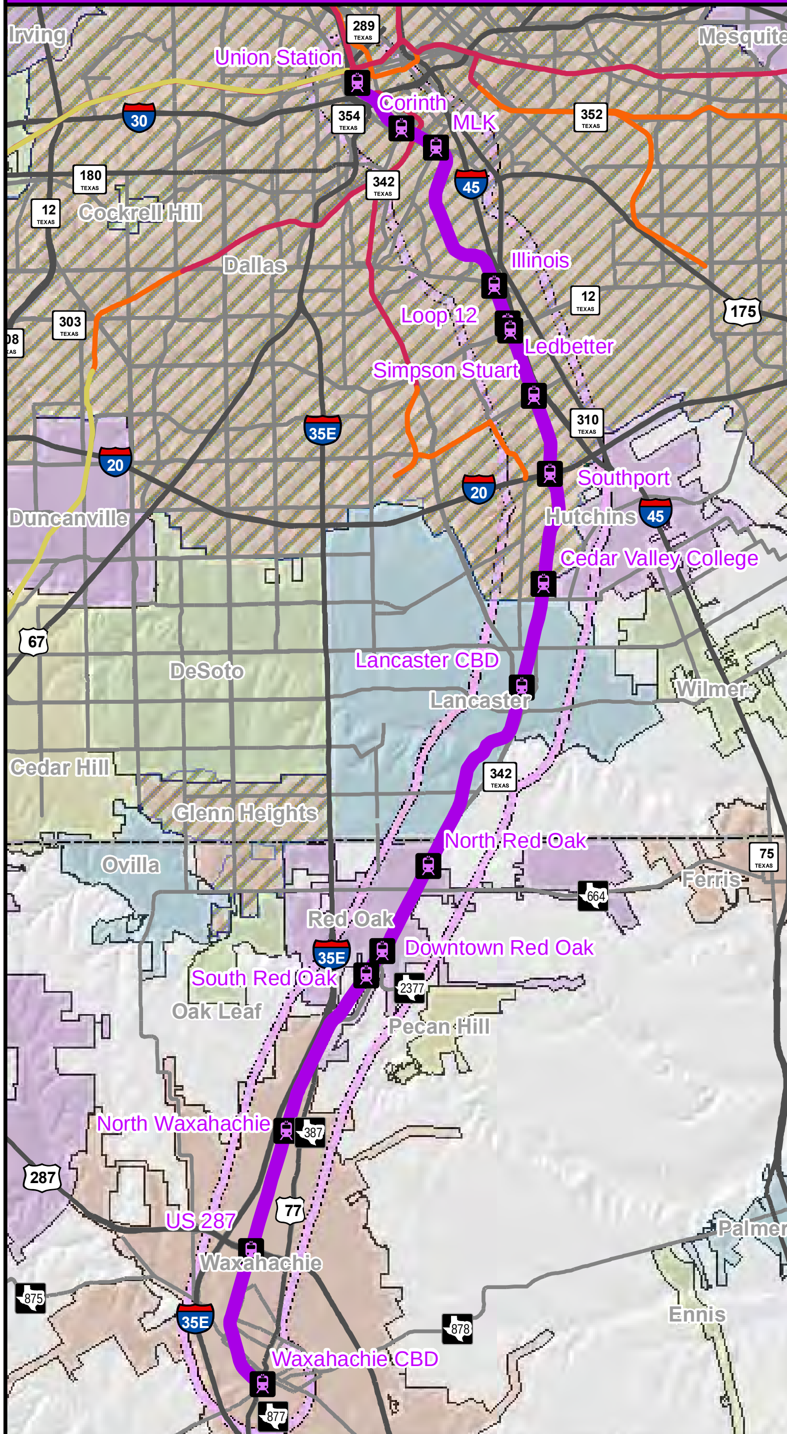
DART local funding is derived from a 1.0 cent sales tax levied in 13 member cities. The Fort Worth Transportation Authority (The T) levies a 0.50 cent sales tax as their local funding source from the Cities of Blue Mound, Fort Worth, and Richland Hills. Grapevine is also a The T member city under a special agreement allowing Grapevine to provide a 0.375 cent (3/8-cent) sales tax for the purposes of providing passenger rail service within the city. Table 5-1 provides a current funding sources summary for transit providers in the region.

Table 5-1 List of Local Agency Funding Sources

Agency	Type of Funding Source	Amount	Service Area Cities
DART	Sales tax	1.000¢	Addison, Carrollton, Cockrell Hill, Dallas, Farmers Branch, Garland, Glenn Heights, Highland Park, Irving, Plano, Richardson, Rowlett, and University Park
	Passenger revenues	Varies	
	Advertising	Varies	
	Rent	Varies	
	Investment income	Varies	
	Other non-operating revenues	Varies	
The T	Sales tax	0.500¢	Blue Mound, Fort Worth, and Richland Hills
The T	Sales tax	0.375¢	Grapevine
DCTA	Sales tax	0.500¢	Denton, Highland Village, and Lewisville
CCART	Federal/State/Local government grants	Varies	McKinney
	Passenger revenues	Varies	
	Private donations	Varies	
	Contract services	Varies	

Source: NCTCOG, DART, FWTA, DCTA, and CCART 2009

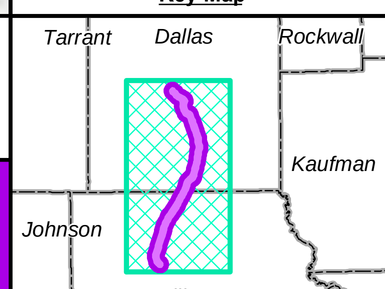
Figure 5-1 — Transit Agency Service Areas
From FM 66 to Spur 366



Legend

- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- DART Service Area
- Study Area
- City / Town Limits
- County Limits
- Lake

Key Map



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North Central Texas Council of Governments

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DART founding legislation specifies any city adjoining Dallas or another DART member city is eligible to join the DART service area. A 1.0 cent sales tax is currently required to become a DART member city. Currently, many DART non-member municipalities have dedicated all available sales tax revenues for other purposes; therefore, sales tax revenues are not available for the purpose of joining a transit service area. This issue applies to the three primary transit service providers in the region.

5.2 POTENTIAL REVENUE SOURCES

This section describes potential public funding sources, legislative initiatives, and PPPs.

5.2.1 Public Funding Sources

From 2004 to 2009, various committees and studies organized or supported by North Central Texas Council of Governments (NCTCOG) have examined potential funding sources for transportation facility implementation. The following describes numerous potential public funding sources.

5.2.1.1 Access Fee

A fee assessed on non-residential taxable property (per square foot) located near transit facilities. This fee is similar in concept to a Business Improvement District (BID) where a specified boundary is established within a station area for assessment purposes. This fee could be incorporated with property taxes to implement passenger rail service.

5.2.1.2 Bond Anticipation Note

Bond anticipation notes are short-term bonds issued by governments and corporations anticipating the proceeds of a larger future bond. Issuing entities use the notes as short-term financing.

5.2.1.3 Capital Leasing

Transit agencies generally use capital leasing to help with purchasing vehicles for transit services. In general, capital leasing is a lease that meets one or more of the following criteria:

- The lease term is greater than 75 percent of the property's estimated economic life.
- The lease contains an option to purchase the property for less than fair market value.
- Property ownership is transferred to the lessee at the end of the lease term.
- The lease payments present value exceeds 90 percent of the property’s fair market value.

5.2.1.4 Debt Service Reserve with Federal Transit Administration

Cash reserves set aside by a borrower to ensure full and timely payments to bond holders. An agency must first issue bonds, equal to approximately one year’s worth of debt service payments to support an eligible transit capital project. The agency can then apply for 80 percent reimbursement.

5.2.1.5 Drivers License Fee Increase

A fee assessed to individuals for driver's license renewal. Currently, the driver's license fees are a General Fund revenue source. Legislative action would be required to use any driver's license fee to implement passenger rail service.

5.2.1.6 Emissions Fee

A surcharge applied to vehicles during annual inspection. Currently, fees collected are deposited into the General Fund with 60 percent of fees collected allocated to the Texas Air Control Board. All or a portion of the funds collected could be used to implement passenger rail service. Legislative action would be required to transfer the funds provided by the surcharge for use in implementing passenger rail service.

5.2.1.7 Farebox Revenue Bonds

The Transportation Equity Act for the 21st Century (TEA-21) authorized the use of farebox revenues and anticipated grant receipts as collateral for revenue bonds. Revenue bonds can only be backed by farebox revenues if the level of state and local funding committed to transit for the three years following the bond issue are higher than the funds that were committed in the three years prior to the bond issue. Agencies must identify another source of funds for the operating expenses before issuing a revenue bond. The Metropolitan Atlanta Regional Transit Authority (MARTA) is the only agency of the five transit agencies surveyed for this project to use farebox revenue bonds.

5.2.1.8 Grant Anticipation Notes

Revenue bonds backed by anticipated grant receipts. Grant Anticipation Notes (GANs) were enabled by the establishment of program funding firewalls in TEA-21. Principal and interest on GANs are eligible to be repaid with Federal Transit Administration (FTA) capital funding. Proceeds raised by a GAN can be used for the local match for a FTA supported project.

5.2.1.9 Hotel Room Rental Tax

A tax levied as a percent of the total rate on hotel room rentals. A municipality or county may impose a local hotel room rental tax rate, in addition to the state tax for the sole purpose of promoting tourism and the convention and hotel industry. State legislative action would be required to implement or reallocate any revenue generated for the use of implementing passenger rail service. Legislative action would be required to dedicate a hotel room rental tax for implementing passenger rail service.

5.2.1.10 Local Option Motor-Fuel Sales Tax

A tax levied on the quantity of motor fuel purchased within a specified local government jurisdiction. The local option motor-fuel sales tax allows local governments to levy a motor-fuel tax based on quantity. State legislative action would be required to implement any additional motor-fuel tax and for the revenue generated to be allocated for the use of implementing passenger rail service.

5.2.1.11 Local Subsidy Option

This allows a municipality the option to raise revenue from designated sources. The local subsidy could be a surcharge to local services (trash collection, utilities, etc.). All or a portion of the funds could be used to implement rail passenger service in a municipality. Legislative action would be required to enable local governments the ability to institute a local subsidy option and dedicate revenues for implementing passenger rail service.

5.2.1.12 Mobility Improvement Fee

A proposed fee to increase the annual vehicle registration fee by up to $60 a year. Legislative action would be needed to implement the increase and allocate revenues to passenger rail service.

5.2.1.13 Motor Vehicle Sales Tax

A tax levied on all retail motor vehicle sales in Texas. The tax would also be levied on motor vehicles purchased at retailers outside the state and used on Texas public highways by a Texas resident. Currently, the revenues from this tax are placed within the state Foundation School Fund or the General Fund with small amounts retained at the county level. Legislative action would be needed to redirect these funds to passenger rail service.

5.2.1.14 New Resident Impact Fee

A fee applied to new residents registering a vehicle in the State of Texas for the first time. Currently, a fee of $90 is paid, in addition to new resident vehicle registration fees. Revenues from this tax are combined with revenues from the motor vehicle sales tax and are used for the state Foundation School Fund or the General Fund. Legislative action would be required to use these funds for passenger rail service.

5.2.1.15 Parking Fee

Parking fees would allow municipalities who own and/or operate parking facilities to impose a surcharge by the space and by the hour at city-owned parking lots and garages. A similar fee could be levied as a percentage of total parking charges to parking operators in a municipality, regardless if the operator is publicly or privately owned. All or a portion of the collected revenues could be used to provide a share of the cost needed to implement passenger rail service in a municipality.

5.2.1.16 Payroll and Self Employment Tax

This option is currently used in the State of Oregon where a percentage of wages paid by an employer and/or the net earnings from self-employment are taxed with proceeds used for services within a transit service boundary. The rate increases annually by 1/100 of a percent for a 10-year period currently set to conclude in 2014. Legislative action would be required to implement this fee as a funding source and for revenues generated to be used for passenger rail service.

5.2.1.17 Property Tax

A local tax imposed on individual properties. Property tax is typically the largest single funding source for many community service providers (i.e., schools, police, fire, hospitals, etc.). Local legislative action and potential voter approval would be required to allocate or increase funds for implementing passenger rail service in a municipality.

5.2.1.18 Public Improvement Districts

The Public Improvement District (PID) Assessment Act (Chapter 372 of Local Government Code) allows any city to levy and collect special assessments on property within the city or within the Extraterritorial Jurisdiction (ETJ). Uptown Dallas is considered a PID and provides civil improvements to the uptown area. While no Texas transit agencies are considered PIDs, a PID could be established to provide improvements in the acquisition, construction, and improvement of transit facilities.

5.2.1.19 Real Estate Transfer Tax

State and local taxes assessed on real property when property ownership is transferred. Currently, there is no statewide real estate transfer tax. Legislative action would be required to implement this fee as a funding source and the funds generated from this source to be used for passenger rail service implementation.

5.2.1.20 Regional Toll Surcharge

A region toll surcharge would be an additional flat rate fee per trip on designated toll facilities. The surcharge could be pooled and used for implementing passenger rail services. Possible legislative approval, in addition to approval and agreements between implementing toll road and transit agencies would be required.

5.2.1.21 Rental Vehicle Tax

A tax imposed on the gross rental receipts from the temporary lease of vehicles. Currently, revenues from this tax are combined with revenues from the motor vehicle sales tax and are placed within the state Foundation School Fund or the General Fund with small amounts retained at the county level. Legislative action would be needed to redirect these revenues to passenger rail service implementation.

5.2.1.22 Sales Tax

Currently, the sales tax is capped at 8.25 percent. State sales tax is 6.25 percent and local governments can collect up to two percent. Municipalities have many uses for sales tax revenue, including city services, property tax reduction, economic development bonds/incentives, and transit services. Many municipalities utilize the full amount of local sales tax allowed, thus these municipalities are unable to contribute sales tax revenues to implement transit service. Legislative action would be required to raise the existing state sales tax cap and provide a funding source for passenger rail service.

5.2.1.23 Special Purpose District

According to the Texas Comptroller of Public Accounts, special purpose districts (SPD) are taxing entities created to generate revenue for a specific reason such as crime control, libraries, or emergency services. Several transit agencies nationwide are considered a SPD, but none in the State of Texas. The Triangle Transit Authority in North Carolina is an example of a regional transit agency providing passenger rail service across multiple municipalities within three Raleigh/Durham/Research Triangle Park region counties. Legislative action would be required to allow special purpose districts as a funding source and for revenues generated to be used for passenger rail service.

5.2.1.24 State Infrastructure Bank

A revolving fund created and established by a state department of transportation with the capacity to offer direct loans and various lines of credit to enhance surface transportation projects. Special accounts have been established in 21 states to assist in funding transit projects. The State Infrastructure Bank (SIB) program helps accelerate project delivery by allowing the SIB to borrow funds instead of waiting for grant funding to be approved. The State of Texas currently has a SIB loan program.

5.2.1.25 Surface Coverage Fee

The surface coverage (or storm water) fee is a tax levied per square foot on impervious surfaces in a given area, such as building footprints and parking lots. The surface coverage fee could be imposed within a given area or region for the intended purpose of implementing passenger rail service. Currently, this tax is not imposed in the region or the state. Legislative action would be required to implement this fee as a funding source and for revenues generated to be used for passenger rail service.

5.2.1.26 Tax Increment Financing District

A Tax Increment Financing (TIF) District is a tool local governments can employ to publicly finance needed structural improvements and enhanced infrastructure within a defined area. The cost of improvements to the area is repaid by the contribution of future tax revenues by each taxing unit that levies taxes against the property. Traditionally TIF funds are generated and used for rail stations and station areas.

5.2.1.27 Tire Tax

A tax or fee imposed on the purchase of passenger vehicle tires, in addition to the sales tax collected. Currently, this tax is not imposed in the region or the state. Legislative action would be required to implement this fee as a funding source and for revenues generated to be used for passenger rail service.

5.2.1.28 Transportation Infrastructure Finance and Innovation Act of 1998

This act established a federal credit program for eligible transportation projects of national or regional significance under which the United States (US) Department of Transportation (DOT) may provide three forms of credit assistance – secured (direct) loans, loan guarantees, and standby lines of credit. The program goal is to help attract new investment capital to transit projects incapable of generating sufficient revenues through user charges or dedicated funding sources. Eligible projects through this program must meet certain criteria (for example, a minimum project cost of $50 million and federal funding for the project cannot exceed 33 percent of the eligible cost). Additional study will be needed to determine if the Waxahachie Corridor is eligible for funding through this program.

5.2.1.29 Turnkey Service

Turnkey, in general, is a product or service that is designed, supplied, built, or installed fully complete and ready to operate. Under this scenario, the transit agency would enter into an agreement with a company to construct and build the transit facility and the agency will take charge of operating and maintaining the facility. This method may be used with a PPP.

5.2.1.30 Vehicle Miles Traveled User Fee

A fee charged to vehicle owners based on the number of miles driven rather than the traditional fuel consumption method. A vehicle mile traveled (VMT) User Fee would require all vehicles to install monitoring equipment to accurately calculate the total number of miles traveled over a given period. The fee would be assessed to the registered vehicle owner with revenues used to implement passenger rail service. In many states, this fee is being proposed as an infrastructure funding mechanism potentially to replace the motor-fuel tax. Enabling legislation has not been enacted by any state or at the national level.

5.2.1.31 Vehicle Property Tax

A vehicle property (or ad valorem) tax is levied on the fair property value of a vehicle. This tax is assessed as a percentage of the estimated worth and would be limited to personal passenger vehicles. Currently, this tax is not imposed in the region or the state. Legislative action would be required to implement this fee as a funding source and for revenues generated to be used for passenger rail service.

5.2.1.32 Vehicle Registration Fee

An annual assessment on vehicle ownership collected in Texas through the Department of Motor Vehicles. Local fees are assessed and collected by the County Tax Assessor-Collector’s office. Legislative action would be needed to direct these revenues to implement passenger rail service.

5.2.2 Legislative Initiatives

Several locally sponsored initiatives to the State Legislature over the past six years have proposed legislation to allow residents within the DFW region an option to provide passenger rail service. When the Texas Local Option Transportation Act (TLOTA) was sent to the regional legislative delegation for the 2009 Legislative Session, six funding options were provided for review and possible legislative adoption. The local option fees would have included one or a combination of:

- New resident impact fee
- Mobility improvement fee
- Drivers license fee
- Local option gas tax
- Parking fee
- Emission fee

Five of these six options are current fees collected and deposited into the General Fund for various uses. One initiative proposed each option considered would have all, or a portion of, the increased revenues dedicated to implement passenger rail service within the DFW region. The initiative did not receive legislative approval during the 2009 Legislative Session. These options would require legislative action to dedicate certain sources toward implementing passenger rail service in the region.

In the next project development phase, all potential funding sources should be evaluated to determine which source or sources will best benefit the region in implementing passenger rail service.

5.2.3 Public-Private Partnerships

A PPP is a contractual arrangement formed between public and private sector entities. Such an arrangement typically provides for extensive private sector participation in the design, construction, operation, maintenance, and/or financing of an infrastructure project. Under a PPP, public facility or system ownership is typically retained by the public entity. The private entity generally invests its own capital for design and development. A PPP, although a contractual arrangement, differs from a typical service contract in that the private entity makes a significant, at-risk, equity investment. In a PPP the public entity gains access to new revenue or service delivery capacity without providing up-front construction financing.

DART began a PPP initiative in June 2009 by obtaining information through a request for information (RFI) from interested parties for the Cotton Belt Corridor. Based on the information gathered, DART staff is developing a business case for the Cotton Belt Corridor. DART has met with many respondents seeking feedback on various items relating to technical issues, procurement, governance, financing, and project funding. Some PPP benefits include an accelerated project delivery process and improved service quality.

Currently, NCTCOG is conducting an Innovative Finance Initiative (IFI) to determine if a PPP or other funding strategies are appropriate for funding passenger rail service. Depending on the success of the IFI, a PPP could be an option considered on the Waxahachie Corridor, as well as other regional passenger rail corridors.

5.3 FUNDING SOURCES FROM SIMILAR SYSTEMS

Several transit agencies around the nation were surveyed to gauge the methods employed to fund transit service. Results indicate the DFW region is similar to other metropolitan areas by utilizing a sales tax as the primary local funding source. DFW and the Denver region collect the sales tax at the municipal level while the Atlanta region and San Diego County collect the sales tax at the county level.

Table 5-2 provides a list of transit systems surveyed and the local funding sources used by each. Four of five transit systems surveyed use a percentage of local sales tax to provide transit service. MARTA dedicates 50 percent of sales tax revenues for capital improvements and the remaining 50 percent to daily system operation. The percentage of local funding spent on capital and operating expenses varies by each transit provider. The DART *FY 2010 Business Plan* estimates that 81 percent of sales tax revenues are used for daily operation costs, which includes operations for all DART provided services.

Table 5-2 List of Local Funding Sources for Transit Agencies in Other Regions

Agency	Region	Funding Sources	Funding Rate	Level of Funding Collection
MARTA	Atlanta	Sales tax	0.5 cent	City of Atlanta, DeKalb, and Fulton Counties
RTD	Denver	Local sales tax	0.6 cent	• Boulder, Broomfield, Denver, and Jefferson Counties • Portions of Adams, Arapahoe, Douglas, and Weld Counties
Sound Transit	Seattle	Motor-vehicle/local sales tax	0.3 to 0.4 cent	Urban areas of King, Pierce, and Snohomish Counties
NCTD - Coaster and Sprinter	San Diego	Local sales tax	0.75 cent	San Diego County
Tri-Met	Portland	Payroll and self-employment tax	0.6718 percent	Employers within Tri-Met District Boundary

Source: MARTA, RTD, Sound Transit, NCTD, and Tri-Met, 2009

6.0 COORDINATION EFFORTS

The Waxahachie Corridor Conceptual Engineering and Funding Study (CE & FS) was conducted in a proactive manner by the North Central Texas Council of Governments (NCTCOG) to allow regional stakeholders and agencies to gain knowledge, keep informed, and provide input in the study efforts. Chapter 6 summarizes the coordination efforts and results of coordination activities.

6.1 MEETINGS

Coordination efforts included two meeting types: Stakeholder/Agency Meetings and Corridor Strategy Team Meetings. Stakeholder/Agency Meetings included technical staffs representing individual municipalities and transit agencies with a vested interest in the corridor. The Stakeholder/Agency Meeting purpose is to ensure all stakeholder and individual partnering agency needs were expressed and incorporated into the CE & FS as appropriate. The meetings were also an opportunity to answer direct individual partner concerns and to solicit technical input. The Corridor Strategy Team Meetings served as a forum to bring together stakeholder/agency meeting participants, local elected and appointed officials, and the general public. The meetings, listed in Table 6-1, were designed as a forum to guide the CE & FS and to develop and evaluate alternatives.

Table 6-1 Waxahachie Corridor Meetings

Date	Meeting	Location	Type of Meeting
12/12/2008	Advancing Rail in North Texas Strategy Meeting – Waxahachie Corridor	NCTCOG Transportation Council Room	Corridor Strategy Team
1/26/2009	City of Waxahachie Meeting	Waxahachie City Hall	Stakeholder
1/26/2009	City of Red Oak Meeting	Red Oak City Hall	Stakeholder
3/4/2009	Advancing Rail in North Texas Strategy Meeting – Waxahachie Corridor	NCTCOG Transportation Council Room	Corridor Strategy Meeting
3/27/2009	Rail Service Demonstration	TRE Train	Stakeholder
5/6/2009	City of Dallas Meeting	Dallas City Hall	Stakeholder
5/21/2009	DART Meeting	NCTCOG Mustang Conference Room	Agency
5/27/2009	Councilmember Strain-Burke Meeting	Lancaster City Hall	Stakeholder
5/29/2006	City of Lancaster Meeting	Lancaster Planning Department	Stakeholder
6/2/2009	Advancing Rail in North Texas Strategy Meeting – Waxahachie Corridor	NCTCOG Transportation Council Room	Corridor Strategy Team
10/8/2009	City of Dallas Meeting	Dallas City Hall	Stakeholder
10/21/2009	BNSF-DART Meeting	NCTCOG Cottontail Conference Room	Stakeholder
12/7/2009	City of Red Oak Meeting	Red Oak City Hall	Stakeholder

Table 6-1 Waxahachie Corridor Meetings (continued)

12/9/2009	City of Lancaster Meeting	Lancaster City Hall	Stakeholder
12/10/2009	City of Waxahachie Meeting	Waxahachie City Hall	Stakeholder
12/17/2009	Advancing Rail in North Texas Strategy Meeting – Waxahachie Corridor	NCTCOG Pitstick Room	Corridor Strategy Meeting
6/14/2010	City of Waxahachie Meeting	Waxahachie City Hall	Stakeholder
6/16/2010	City of Dallas	Dallas City Hall	Stakeholder
6/17/2010	City of Red Oak Meeting	Red Oak City Hall	Stakeholder
6/21/2010	City of Lancaster Meeting	Lancaster Planning Department	Stakeholder
6/24/2010	Advancing Rail in North Texas Strategy Meeting – Waxahachie Corridor	NCTCOG Six Flags Conference Room	Corridor Strategy Meeting

Source: NCTCOG, June 2010

6.1.1 Stakeholder/Agency Meetings

Throughout the project there were three rounds of Stakeholder/Agency Meetings, totaling 16 individual meetings.

6.1.1.1 Round One – January 2009 through May 2009

January 26, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to the City of Waxahachie City Manger, the Assistant City Manager, and the Director of Planning. In addition the Commissioner of Precinct Four in Ellis County and a county planner were in attendance. NCTCOG staff explained the Stakeholder/Agency Meeting purpose was to convene stakeholders prior to the Corridor Strategy Team Meeting to collect initial feedback, identify potential station locations, and address stakeholder concerns. City and County staff were briefed on the current project status and the City and County's positions were noted. The city staff noted their current rail preservation efforts are in conjunction with their comprehensive plan. These preservation plans include the purchase of the rail depot in downtown Waxahachie. The City requested NCTCOG to consider three site locations for potential rail stations. NCTCOG mentioned the current options of providing service to Union Station in Downtown Dallas or to the end of The Blue Line extension near IH 20.

January 26, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to the Red Oak Mayor, Councilmember, City Manager, and Assistant City Manager. In addition, Ellis County Commissioner of Precinct Four and an Ellis County planner were in attendance. NCTCOG staff explained the Stakeholder/Agency Meeting purpose was to convene stakeholders prior to the Corridor Strategy Team Meeting to collect initial feedback, identify potential station locations, and address stakeholder concerns. The Red Oak City staff discussed their downtown vision and how the proposed rail would support their plan. The Mayor emphasized the need for alternative funding for the proposed rail project. NCTCOG staff noted previous studies had shown one potential station in the City of Red Oak. City staff suggested three possible locations for this one rail station: north, downtown, and south. After the meeting, the city staff conducted site visits with NCTCOG to all three potential station locations.

March 27, 2009

NCTCOG conducted a train tour of the Waxahachie Corridor. Stakeholders, elected officials, and NCTCOG staff boarded a Trinity Railway Express (TRE) train at Union Station and rode the commuter bi-level TRE train from Union Station to the Waxahachie Rail Depot. During the train trip, speakers from Dallas Area Rapid Transit (DART), NCTCOG, and the cities within the Waxahachie corridor discussed the various issues and plans for the Waxahachie Corridor by identifying potential stations, providing city media tourist packets, and discussing potential service through these cities.

May 6, 2009

NCTCOG staff provided a brief Regional Passenger Rail initiative description to the Dallas Assistant Director of Development Services and other Dallas staff members. NCTCOG staff explained the Stakeholder/Agency Meeting purpose was to convene stakeholders prior to the Corridor Strategy Team Meeting to collect initial feedback, identify potential station locations, and address any stakeholder concerns regarding this corridor. City staff indicated four potential station location sites with two station sites for each general location. It was noted by the city that these station locations were based upon a potential light rail system and would need to be modified for commuter rail. The majority of these sites would promote infill development for the City of Dallas.

May 21, 2009

NCTCOG staff provided a brief Regional Passenger Rail initiative description to DART staff. NCTCOG staff explained the Stakeholder/Agency Meeting purpose was to convene stakeholders prior to the Corridor Strategy Team Meetings to collect initial feedback, identify potential station locations, and address stakeholder concerns. DART staff provided an update on the status of the Light Rail New Technology (LRNT) vehicle under development by DART. They also indicated preferred station spacing for LRNT service of three to five miles.

May *27*, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to Councilmember Strain-Burke, Mayor Pro Tem, and staff. NCTCOG staff explained the Stakeholder/Agency Meeting purpose was to convene stakeholders prior to the Corridor Strategy Team Meeting to collect initial feedback, identify potential station locations, and address stakeholder concerns. The Councilmember discussed the City of Lancaster's preferred station for the downtown area and the current plans to move the old Missouri-Kansas-Texas (MKT) rail station between Main and 2nd Street to support this proposed station. NCTCOG and Councilmember Strain-Burke discussed funding issues with the project and the potential for a closed loop bus system to serve the rail station.

May 29, 2009

NCTCOG staff provided a brief Regional Passenger Rail initiative description to the Director of Development Services and staff of the City of Lancaster. NCTCOG staff explained the Stakeholder/Agency Meeting purpose was to convene stakeholders prior to the Corridor Strategy Team Meeting to collect initial feedback, identify potential station locations, and address stakeholder concerns. The City staff confirmed the City of Lancaster support of the downtown station location at Main/2nd Street with a secondary option at Pecan Street if the MKT rail station could not be moved. The staff discussed the possibility of employment growth due to the south inland port and the potential Burlington Northern Santa Fe (BNSF) intermodal terminal. They also agreed with Councilmember Strain-Burke with the implementation of bus service to support the proposed rail station.

6.1.1.2 Round Two – October to December 2009

October 8, 2009

NCTCOG staff met with the Dallas Assistant Director of Development Services and other Dallas staff members on progress to date and seek input regarding data collection efforts. City staff was briefed on the preliminary modeling results for the Waxahachie Corridor. The ridership impacts from interlining the Waxahachie Corridor with the TRE were also discussed. The station criteria were presented to the city staff.

October 21, 2009

BNSF, DART, and NCTCOG staff met to discuss ridership details and the potential agreements needed for the implementation of commuter rail within the BNSF right-of-way. BNSF briefly described joint use agreements and the timeframe in which this type of agreement would need to be created and signed; it was noted that it is too early in the process for this agreement to be needed. Track ownership was also discussed. BNSF gave three potential fatal flaws that would need to be rectified before any agreement could be reached: insurance, liability, and indemnification laws in the State of Texas. BNSF sees the critical path for this project to include: a scope of work for the preparation of the engineering design work during the completion of the Environmental Assessment (EA) or next study; addressing the noted fatal flaws with legislative assistance; and creating, studying, and modeling an operation plan. BNSF is willing to do the modeling itself or to let DART perform the modeling.

December 7, 2009

NCTCOG staff met with City of Red Oak staff to discuss the upcoming Corridor Strategy Team Meeting, station criteria, and ridership estimates. City staff discussed performance of the Waxahachie Corridor in ridership as compared to other existing and proposed rail corridors. Discussion focused on options for funding rail service, fair box recovery, and cost of the Waxahachie Corridor versus other transportation improvements such as Interstate Highway (IH) 35E widening.

<u>December 9, 2009</u>

NCTCOG staff met with the City of Lancaster staff to update the city on project progress to date, document changes, and collect feedback regarding the station criteria. NCTCOG staff also presented the preliminary ridership forecasts based on the Dallas-Fort Worth Regional Travel Model (DFWRTM) version and the 2030 demographic forecast used in the long-term metropolitan transportation plan (MTP) *Mobility 2030: The Metropolitan Transportation Plan for the Dallas – Fort Worth Area – 2009 Amendment (Mobility 2030 - 2009 Amendment).* Discussion then focused on the 2035 demographic forecast and how the new demographics from the City of Lancaster and other cities within the Waxahachie Corridor will affect the ridership. The city staff stated the intention to include connection to the local colleges from the rail corridor by bus system from the stations.

<u>December 10, 2009</u>

NCTCOG staff met with the City of Waxahachie and Ellis County to update the City on the project progress to date, document changes, and collect feedback regarding the station criteria. NCTCOG staff also presented the preliminary ridership forecast based on the DFWRTM version and the 2030 Demographic Forecast used in *Mobility 2030 - 2009 Amendment*. The county and city staff agreed that a coalition group should be developed to promote the corridor and gather support in Ellis County. In addition, talks were discussed about forming a transit authority similar to the Denton County Transit Authority (DCTA).

6.1.1.3 Round Three – June 2010

<u>June 14, 2010</u>

NCTCOG staff met with City of Waxahachie staff to update City representatives on progress to date and seek feedback regarding data collection efforts. City staff was briefed on the preliminary assessment of social and environmental effects and on the status of cost estimates for the Waxahachie Corridor.

<u>June 16, 2010</u>

NCTCOG staff met with City of Dallas staff to update City representatives on progress to date and seek feedback regarding data collection efforts. City staff was briefed on the preliminary social and environmental impact assessments and on the status of cost estimates for the Waxahachie Corridor.

<u>June 17, 2010</u>

NCTCOG staff met with the City of Red Oak, Ellis County staff, and an Ellis County Commissioner to update them on progress to date and seek feedback regarding data collection efforts. City staff was briefed on the preliminary assessment of social and environmental effects and on the status of cost estimates for the Waxahachie Corridor. Ellis County staff noted the impact of new demographic data for 2035 and how this would affect the Waxahachie Corridor. Discussion of funding was addressed by City staff since funding is largely unavailable. The current federal administration shift from roadway to transit may help support this project. All parties reaffirmed their support of starting any service as soon as feasible, including using TRE push-pull vehicles.

June 21, 2010

NCTCOG staff met with the City of Lancaster staff to update City representatives on progress to date and seek feedback regarding data collection efforts. City staff was briefed on the preliminary assessment of social and environmental effects and on the status of cost estimates for the Waxahachie Corridor.

6.1.2 Corridor Strategy Team Meetings

During the study, five Corridor Strategy Team Meetings were held. Meeting notes for each meeting are included in Appendix C. A summary of each meeting is provided in the following sections.

6.1.2.1 December 2008

The primary purpose of the initial Waxahachie Corridor Strategy Team Meeting was to introduce the project and begin communications between the stakeholders throughout the corridor. Other goals included gaining consensus for the approach and work program scope. Meeting participants included local government elected and appointed officials, local government staff, transportation agency staff, and consultants. Topics discussed included station locations, land use, and economic implications.

The Waxahachie Corridor is one of the regional rail corridors defined in the Rail North Texas (RNT) initiative. This corridor would open the study area to direct access to the existing passenger rail system through the connection with the DART Blue Line (current proposal) or continue and connect with the DART Blue Line, Red Line, and the TRE at Union Station. The 2009 Legislative Session was the third attempt by the North Central Texas region requesting the legislature to provide a funding mechanism for the RNT initiative. If funding opportunities are not secured for the proposed regional rail facilities, the Regional Transportation Council (RTC) will need to remove from the MTP the proposed 251 miles of additional rail identified in *Mobility 2030 - 2009 Amendment*. This would impact the remainder of the *Mobility 2030 - 2009 Amendment* planned system and air quality conformity for the region.

DART is assisting in developing a LRNT vehicle to be compatible with light rail and commuter rail technology. The LRNT vehicle must be compliant with Federal Railroad Administration (FRA) crash worthiness requirements. The LRNT vehicle could be used for seamless transit for both the transit agencies and the riders. The concept vehicle is planned to look like a light rail vehicle, be approximately 100 feet in length, with approximately the same capacity of a light rail vehicle of between 150 and 180 passengers. There will not be a catenary system on the top, it will have a larger turning radius then LRT, and the weight would be different based on the structural needs of this type of vehicle. Exact vehicle specifications have not been determined, though it is planned to be able to travel at 70 miles per hour (mph). Actual speed will depend on the corridor track curvature, super elevation, grade separations, and other factors. An advantage to having a vehicle like this is it would reduce parts inventory and maintenance since there would not be multiple vehicle types in the fleet to maintain.

NCTCOG will conduct visits with the cities within the Waxahachie Corridor to look at potential station sites and to address any concerns among the municipalities and counties in the corridor. In addition, a train visit will be conducted using TRE train equipment to provide a train trip through the Waxahachie Corridor for elected officials and staff members.

6.1.2.2 March 2009

The meeting purpose was to highlight key issues for corridor stakeholders to consider, determine how the corridor should move forward, and discuss the draft work program. It was decided future meeting advertisements will include information regarding the meeting focus – either technical or policy issues – so members can decide which representatives should participate. The major topics of discussion included the corridor alignment, stations and limits, the draft work program, potential vehicle technologies, transit oriented development (TOD), and sustainable development issues.

Participant comments focused on a number of issues. Discussions centered over the alignment of the Waxahachie Corridor ending at the Southport Station or at Union Station. The original plans called for Southport Station to avoid duplication of the existing DART light rail lines. Demographics were also discussed for ridership improvements. The current metropolitan planning area (MPA) model boundaries do not include all of Ellis County. The expanded MPA boundary could provide better ridership numbers.

A brief summary about the BNSF and their Railway Commuter Principles for operating on BNSF freight rail lines were overviewed and discussed. The majority of the requirements and issues that BNSF would need for a use agreement would require changes in state law.

The train tour was finalized to occur at the end of the month as a showcase of how a trip along the Waxahachie Corridor would operate and to stop at potential station locations in the Cities of Dallas, Lancaster, Red Oak, and Waxahachie.

6.1.2.3 June 2009

The primary meeting purpose was to discuss the CE & FS. The mission statement, study goals and objectives, and a draft Chapter 1 were presented. The status of the local funding option from the legislative session and impact to the corridor was discussed. Some of the group's comments and concerns regarding the study included:

- Concern over the loss of ridership from the potential forced transfer to the DART Blue Line.
- Support for an alternative that continues to Union Station versus a connection to the DART Blue Line. Both alternatives would need to be investigated for ridership.
- Potential problems utilizing the Union Pacific Railroad (UPRR) owned track south of Union Station.
- Given the failure of the Texas Local Option Transportation Act (TLOTA) initiative in the Texas State Legislature, an investigation of additional funding options for regional passenger rail needs to be conducted.

The corridor alignment and station alternatives discussions held with the individual stakeholders and agencies were reported to the Corridor Strategy Team. Due to funding uncertainties, a suggestion was made to implement the corridor in several stages.

6.1.2.4 December 2009

This meeting provided information on NCTCOG efforts regarding this corridor and study efforts related to the alternatives considered and ridership information.

It was reported by DART staff that progress has been made with the FRA in developing and refining the safety standards for LRNT rail transit lines sharing tracks with freight rail. These safety standards will be incorporated into developing the LRNT vehicle, which could allow for economies of scale in purchasing and maintaining the vehicle fleet. It was stated a LRNT system is estimated to cost approximately $20 million per mile.

The Corridor Strategy Team felt it is important to continue the momentum on this project, even though TLOTA was not passed in the 2009 Texas Legislative Session. The Corridor Strategy Team would also like to see this project move forward in partnership with a regional transit agency under a comprehensive development agreement (CDA) or public-private partnership (PPP) if possible. Other issues discussed:

- Vehicle technology is not important; stakeholders would support the use of push-pull vehicles (TRE trains) if service could be implemented earlier.
- Potential phasing of the corridor by building only a few stations to start service.
- Strong support from all stakeholders for the Union Station alternatives over the DART Blue Line terminus at Southport. Ridership data supports this choice.
- All stakeholders should work on public support for the corridor.

6.1.2.5 June 2010

The final Corridor Strategy Team Meeting included a brief update on DART efforts regarding the new passenger rail vehicle technology for regional rail, a summary of the individual Stakeholder Meetings regarding potential stations and station issues and concerns, a CE & FS status update, and a general discussion regarding the next steps for this corridor.

It was stated that NCTCOG is currently updating the regional demographics which will be used in the next McKinney Corridor project phase. These demographics should be approved by the end of the year and will alter ridership estimates for the entire corridor.

General discussion at the end of this meeting focused on the next steps for this project. It was suggested document completion should not end current project efforts and the project should continue moving forward. Funding is an important issue and a large challenge for this project. It was suggested to have as much preliminary work completed as possible so when funding does become available the project is ready to move to construction. It was stated an advocacy group should be created as the first step after completing the current effort. Discussion of the current government shift from roadway to transit would benefit this project

6.2 WEBSITE

Information regarding the Waxahachie Corridor CE & FS is provided through a Web site (www.nctcog.org/trans/spd/transitrail/sdallas/index.asp) which began in December 2008. Project information includes draft reports, meeting information, and NCTCOG staff contact information. All information on the Web site is reviewed and updated on a regular basis.

7.0 SUMMARY

7.1 STUDY BACKGROUND

The North Central Texas Council of Governments (NCTCOG) Transportation Department and Regional Transportation Council (RTC) form the Metropolitan Planning Organization (MPO) for regional transportation planning in the Dallas-Fort Worth (DFW) area. The RTC is the independent transportation policy body consisting of 43 locally elected or appointed officials from the 12-county metropolitan area and a representative from various transportation providers. In the early 2000's, the region identified funding shortfalls for implementing regional passenger rail projects. To carry out their responsibility, the RTC commissioned a study of regional freight rail corridors for possible inclusion of passenger rail service. The Regional Mobility Initiatives effort examined several regional freight rail corridors, including the Waxahachie Corridor.

Subsequent regional passenger rail program development efforts have included the NCTCOG *Regional Rail Corridor Study (RRCS)* and the Rail North Texas (RNT) initiative. These efforts were primarily focused on obtaining additional funding mechanisms from the Texas Legislature dedicated to regional passenger rail implementation. The RNT initiative was specifically targeted to gain approval for the Texas Local Option Transportation Act (TLOTA) during the 2009 Texas Legislative Session. However, legislative initiatives in 2005, 2007, and 2009 failed to gain approval.

The Waxahachie Corridor Conceptual Engineering & Funding Study (CE & FS) began as a supplement to the RNT initiative. The CE & FS was initiated to provide detailed corridor information to public officials, partnering municipality staff, and the public in advance of a potential county-wide transportation project referendum to be enabled in TLOTA. After the TLOTA legislation failed in 2009, the Waxahachie Corridor CE & FS focus switched to continuing project development efforts by expediting the required environmental document process.

7.2 PROJECT SUMMARY

Table 7-1 presents an information summary for the no-build and build alternatives. The information presented was gathered from multiple sources, including Stakeholders, previous study efforts, industry standard databases, and staff research. The project measures listed in Table 7-1 are defined in Appendix D. For measures based on proximity to stations, a detailed list of identified features is also included in Appendix D.

Table 7-1 Summary of Potential Corridor Impacts[1]

Project Measure	Alternative					
	No-Build	1	2	3	4	5
Length (miles)	0	30.9	30.9	20.7	20.7	64.5
Primary Mode	N/A	LRNT/ Commuter	LRNT/ Commuter	LRNT/ Commuter	LRNT/ Commuter	LRNT/ Commuter
Interlined Service	N/A	None	None	None	None	TRE
Terminus/Interlined Terminus	N/A	Union Station	Union Station	Southport	Southport	T&P Station
Number of Stations	0	12	16	6	9	16
Transit						
Estimated Daily Ridership	0	4,300	4,600	2,100	2,100	5,900
Linked Regional Transit Trips	296,276	298,805	298,485	297,174	297,264	298,915
Corridor Travel Time (minutes)	N/A	41.3	42.1	26.9	27.7	95.9
Interlined Ridership	N/A	N/A	N/A	N/A	N/A	1,400
Property Acquisition						
(ROW Needed for Alignment)	None	None	None	None	None	None
Project Costs (LNRT/Commuter)						
Total Cost (millions, 2009 dollars)	N/A	$533/475	$578/520	$328/299	$362/362	$701/576
Cost Per Mile (millions, 2009 dollars)	N/A	$17/15	$19/17	$16/14	$18/16	$23/19
Annualized Cost Per Rider	N/A	$31/28	$31/28	$39/36	$43/41	$30/24
Land Use						
Compatibility with Local Plans	Low	High	High	Medium	Medium	High
Major Employers	17	22	22	3	3	22
Activity Centers	75	117	122	22	27	122
Community Facilities	33	55	60	18	23	60
Historic and Archeological Resources						
Existing Historical Sites	24	68	70	43	45	70
Archeological Investigations	8	24	26	13	13	26
Potential Historical Structures	87	1,785	2,278	881	1,294	2,278
Parks, Trails and Recreational Facilities						
Facilities Adjacent to Rail Corridor	0	16	16	5	5	16
Facilities Near Stations	12	40	44	14	17	44
Hazardous/Regulated Materials						
Sites Adjacent to Rail Corridor	0	9	9	3	3	9
Sites Near Stations	0	8	13	4	7	13
Air Quality Impact	None	Minimal	Minimal	Minimal	Minimal	Minimal
Noise (linear feet)						
Potential Sensitive Land Uses	0	35,480	35,480	22,048	22,048	35,480
Vibration (linear feet)						
Potential Sensitive Land Uses						
Category 1	0	0	0	0	0	0
Category 2	0	19,744	19,744	13,456	13,456	19,744
Category 3	0	15,737	15,737	8,592	8,592	15,737
Water Resources						
Floodplain Crossings (in linear feet)	0	37,385	37,385	10,862	10,862	37,385
Stream Crossings	0	14	14	9	9	14
Ecosystems	0	0	0	0	0	0
Prime Farmlands (acres)	0	1,028	1,900	1,078	1,658	1,900
Constructability Difficulty[2]	N/A	Medium	Medium	Medium	Medium	Medium

Source: NCTCOG, January 2010
1. Data reflect conditions for alignments from the potential Waxahachie CBD Station to Union Station only.
2. Based upon feedback from strategy meetings, and discussions with strategy team members and professional judgment. High = greater difficulty and Low = less difficulty to construct.

7.3 STATION SUMMARY

Potential station locations were identified using information gathered in previous study efforts in conjunction with input from corridor stakeholders. Table 7-2 provides an overview of potential benefits and challenges for each potential station location.

Table 7-2 Summary of Station Findings

Benefits	Challenges
Waxahachie CBD Station (Existing)	
• Compatible with City of Waxahachie plans • Pedestrian access to retail, government centers and Historic Downtown Waxahachie • Spur current restoration efforts of old rail depot • Local street and sidewalk network provides bicycle and pedestrian access • Major employers and activity centers within one-half mile	• Not currently in a primary transit agency service area • Limited sites for parking • Numerous identified and/or potential historical resources within one-half mile
US 287 Station	
• Compatible with City of Waxahachie plans • Opportunities for new TOD • Access to major regional roadway: US 287 • Access to Baylor's new county hospital • Close proximity to retail on US 77 • Major employers and activity centers within one-half mile	• Not currently in a primary transit agency service area • Numerous freight oriented developments (FOD) surrounding location
North Waxahachie Station	
• Opportunities for new TOD • Major employers and activity centers within one-half mile	• Not currently in a primary transit agency service area • Numerous freight oriented developments (FOD) surrounding location • Minimal existing development near station
South Red Oak Station	
• Compatible with City of Red Oak plans • Opportunities for new TOD • Activity centers within one-half mile • City of Red Oak currently owns property	• Not currently in a primary transit agency service area • Minimal existing development near station • Cemetery within one-half mile
Downtown Red Oak Station	
• Compatible with City of Red Oak plans • Opportunities for redevelopment and densification • Local street and sidewalk network provides bicycle and pedestrian access • Activity centers within one-half mile	• Lowest priority station for City of Red Oak • Limited sites for station parking • Not currently in a primary transit agency service area • Numerous identified and/or potential historical resources within one-half mile

Table 7-2 Summary of Station Findings (continued)

Benefits	Challenges
North Red Oak Station	
• Compatible with City of Red Oak plans • Opportunities for extensive new TOD • Access to proposed Loop 9 alignment • City property acquisition would require minimal effort	• Minimal existing development near station • Not currently in a primary transit agency service area
Lancaster CBD Station	
• Access to major arterial roadway SH 342 • Local street and sidewalk network provides bicycle and pedestrian access • Activity centers within one-half mile • Lancaster Regional Airport within one mile • Access to Lancaster Historical Downtown	• Limited sites for parking • Pending relocation of MKT railroad depot • Numerous identified and/or potential historical resources within one-half mile • Not currently in a primary transit agency service area
Cedar Valley College Station	
• Opportunities for new TOD • Access to Cedar Valley College	• Close proximity to Southport Station • Minimal existing development near station
Southport Station	
• DART Blue Line Extension terminates at Southport • South Dallas Inland Port within one-half mile • Activity centers within one-half mile • Access to major highway IH 20	• Close proximity to potential Cedar Valley College Station • Close proximity to Simpson Stuart Station • Potential BNSF intermodal facility within one mile • Numerous FOD zoned areas within one-half mile
Simpson Stuart Station	
• Opportunities for redevelopment and densification and new TOD • Local street and sidewalk network provides bicycle and pedestrian access • Access to Paul Quinn College • Access to major highway IH 45	• Close proximity to potential Southport Station and Loop 12 Station • Undeveloped land within identified floodplains • Potential hazardous/regulated material sites within one-half mile • Numerous identified and/or potential historical resources within one-half mile
Loop 12 Station	
• Opportunities for redevelopment and densification and new TOD • Access to major roadways IH 45 and Loop 12 • Activity centers within one-half mile	• Close proximity to potential Simpson Stuart Station and Ledbetter Station • Undeveloped land within identified floodplains • Adjacent to IH 45 and Loop 12 interchange • Potential hazardous/regulated material sites within one-half mile

Table 7-2 Summary of Station Findings (continued)

Benefits	Challenges
Ledbetter Station	
• Opportunities for redevelopment and densification • Access to major highway IH 45 • Activity centers within one-half mile • Local street and sidewalk network provides bicycle and pedestrian access	• Close proximity to potential Loop 12 Station • Close proximity to Illinois Station • Adjacent to IH 45 and Loop 12 interchange • Potential hazardous/regulated material sites within one-half mile • Undeveloped land within identified floodplains
Illinois Station	
• Opportunities for redevelopment and densification • Access to major highway IH 45 • Activity centers within one-half mile • Local street and sidewalk network provides bicycle and pedestrian access • Large warehouse district within one-half mile	• Adjacent to Illinois Avenue and IH 45 interchange • Close proximity to potential Ledbetter Station • Potential hazardous/regulated material sites within one-half mile
MLK Station	
• Opportunities for redevelopment and densification • Local street and sidewalk network provides bicycle and pedestrian access • Major employers and activity centers within one-half mile	• Potential hazardous/regulated material sites within one-half mile • Close proximity to potential Corinth Station • DART Blue Line LRT 8th & Corinth Station within one mile • DART Blue Line LRT Cedars Station within one mile • Adjacent to the Trinity River Floodway
Corinth Station	
• Opportunities for redevelopment and densification • Local street and sidewalk network provides bicycle and pedestrian access • Activity centers within one-half mile	• Close proximity to potential MLK Station • DART Blue Line LRT 8th & Corinth Station within one mile • DART Blue Line LRT Cedars Station within one-half mile • Adjacent to the Trinity River Floodway

Source: NCTCOG July, 2010

7.4 NEXT STEPS

The Waxahachie Corridor CE & FS has identified the following items for consideration in ensuing project development phases.

Corridor Ridership Projections

- Incorporate updated 2035 travel demand forecast model
- Incorporate updated 2035 demographic inputs

Vehicle Technology Work Efforts

- Dallas Area Rapid Transit (DART) to continue Light Rail New Technology (LRNT) vehicle development efforts
- Securing TRE type vehicles for earlier implementation before LRNT becomes available

Public-Private Partnership Work Efforts

- Continue NCTCOG efforts to identify and secure project funding support
- Region and DART work toward shared right-of-way agreement if DART is not the implementing entity
- Develop steps to proceed with BNSF for shared use
- Stakeholders support legislative efforts for BNSF-public transit agreements

Next Project Development Phase

- Coordinate a corridor advocacy group focused on stakeholder issues and corridor implementation
- Initiate an environmental assessment study
- Identify implementing entity
- Initiate preliminary engineering efforts to achieve a five percent design level
- Continue Corridor Strategy Team Meetings to guide project development
- Conduct a comprehensive public involvement process
- Determine project implementation phasing schedule
- Achieve station location and alignment consensus among stakeholders
- Determine final station locations and alignment
    - Develop a station phasing plan as needed
        - Stations/terminus
        - Segments
- Develop detailed operational plan to assess impacts to existing transit services
- Resolve member city issues
- Implement coordination for interlining service with the TRE
- Identify and secure appropriate funding sources
- Achieve environmental documentation approval from reviewing agencies

Appendix A
Cost Estimates

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A.1 ALTERNATIVE 1

Corridor:	Waxahachie Corridor (Alternative 1)
Corridor Limits:	LRNT from Waxahachie CBD Station to Union Station (SELECTED STATIONS INCLUDED)
Total Length (Miles):	30.86
Total Length (Feet):	162,941
Number of Stations:	12
Number of Vehicles:	12
Number of Support Busses:	20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	162,941	FT	$310	$50,511,648
10.02	New Siding / Double Track, 136# CWR	5,000	FT	$310	$1,550,000
10.03	New Station Siding Track, 136# CWR	14,520	FT	$310	$4,501,200
10.04	New Turnout #20, 136# Rail	10	EA	$485,000	$4,850,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	23	EA	$485,000	$11,155,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	3	EA	$7,000,000	$21,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT - 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	325,882	LF	$20	$6,517,632
	SUBTOTAL				**$100,085,480**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	33	AC	$100,500	$3,316,500
20.02	Utilities Allowance	12	Station	$325,000	$3,900,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	11	EA	$2,831,000	$31,141,000
20.05	Parking Spaces, Surface Lot	3,300	EA	$3,000	$3,900,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	14,850	SY	$60	$891,000
20.08	Reconstruct Roadway for Station Access	7,150	SY	$30	$214,500
	SUBTOTAL				**$51,063,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	30.86	MI	$12,000	$370,320
40.02	Utilities Allowance (Alignment)	30.86	MI	$40,000	$1,234,400
40.03	New Railbed - Mainline	30.86	MI	$286,000	$8,825,960
40.04	New Railbed - Station Sidings	2.75	MI	$286,000	$786,500
40.05	New Railbed - Passing Sidings	0.9	MI	$286,000	$270,833
	SUBTOTAL				**$11,488,013**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	17	EA	$345,000	$5,865,000
50.10	Major Street At-grade (New Gates & Warning Devices)	16	EA	$515,000	$8,240,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	30.86	MI	$1,000,000	$30,860,000
	SUBTOTAL				**$50,082,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$215,680,273**
DART Allowances					
Design Contingency (30%)			%	0.30	$64,704,082
					$280,384,355
Construction Contingency (10%)			%	0.10	$28,036,436
DART Add-on Allowance (32%)			%	0.32	$89,722,994
					$398,145,785
Environmental Allowance (1%)			%	0.01	$2,803,844
	SUBTOTAL				**$400,949,628**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$11,215,374
	SUBTOTAL				**$11,215,374**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail New Technology	12	EA	$8,800,000	$105,600,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$120,600,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$532,765,002**
	COST PER MILE				**$17,263,934**

A.2 ALTERNATIVE 1

Corridor:	Waxahachie Corridor (Alternative 1)
Corridor Limits:	Commuter Rail from Waxahachie CBD Station to Union Station (SELECTED STATIONS INCLUDED)
Total Length (Miles):	30.86
Total Length (Feet):	162,941
Number of Stations:	12
Number of Vehicles:	6 (Train Sets)
Number of Support Busses:	20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	162,941	FT	$310	$50,511,648
10.02	New Siding / Double Track, 136# CWR	5,000	FT	$310	$1,550,000
10.03	New Station Siding Track, 136# CWR	14,520	FT	$310	$4,501,200
10.04	New Turnout #20, 136# Rail	10	EA	$485,000	$4,850,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	23	EA	$485,000	$11,155,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	3	EA	$7,000,000	$21,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	325,882	LF	$20	$6,517,632
	SUBTOTAL				**$100,085,480**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	33	AC	$100,500	$3,316,500
20.02	Utilities Allowance	12	Station	$325,000	$3,900,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	11	EA	$2,831,000	$31,141,000
20.05	Parking Spaces, Surface Lot	3,300	EA	$3,000	$3,900,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	14,850	SY	$60	$891,000
20.08	Reconstruct Roadway for Station Access	7,150	SY	$30	$214,500
	SUBTOTAL				**$51,063,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	30.86	MI	$12,000	$370,320
40.02	Utilities Allowance (Alignment)	30.86	MI	$40,000	$1,234,400
40.03	New Railbed - Mainline	30.86	MI	$286,000	$8,825,960
40.04	New Railbed - Station Sidings	2.75	MI	$286,000	$786,500
40.05	New Railbed - Passing Sidings	0.9	MI	$286,000	$270,833
	SUBTOTAL				**$11,488,013**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	17	EA	$345,000	$5,865,000
50.10	Major Street At-grade (New Gates & Warning Devices)	16	EA	$515,000	$8,240,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	30.86	MI	$1,000,000	$30,860,000
	SUBTOTAL				**$50,082,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$215,680,273**
DART Allowances					
Design Contingency (30%)			%	0.30	$64,704,082
					$280,384,355
Construction Contingency (10%)			%	0.10	$28,036,436
DART Add-on Allowance (32%)			%	0.32	$89,722,994
					$398,145,785
Environmental Allowance (1%)			%	0.01	$2,803,844
	SUBTOTAL				**$400,949,628**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$11,215,374
	SUBTOTAL				**$11,215,374**
70	**VEHICLES**				
70.01	Rail Vehicles, Push Pull Technology (Locomotive-Coach-Cab Sets)	6	EA	$8,000,000	$48,000,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$63,000,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$475,165,002**
	COST PER MILE				**$15,397,440**

A.3 ALTERNATIVE 2

Corridor:	Waxahachie Corridor (Alternative 2)
Corridor Limits:	LRNT from Waxahachie CBD Station to Union Station (ALL STATIONS INCLUDED)
Total Length (Miles):	30.86
Total Length (Feet):	162,941
Number of Stations:	16
Number of Vehicles:	12
Number of Support Busses:	20

10	**GUIDEWAY & TRACK ELEMENTS**	**Quantity**	**Unit**	**Unit Price**	**Cost**
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	162,941	FT	$310	$50,511,648
10.02	New Siding / Double Track, 136# CWR	5,000	FT	$310	$1,550,000
10.03	New Station Siding Track, 136# CWR	19,800	FT	$310	$6,138,000
10.04	New Turnout #20, 136# Rail	10	EA	$485,000	$4,850,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	31	EA	$485,000	$15,035,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	3	EA	$7,000,000	$21,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	325,882	LF	$20	$6,517,632
	SUBTOTAL				**$105,602,280**

20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	45	AC	$100,500	$4,522,500
20.02	Utilities Allowance	16	Station	$325,000	$5,200,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	15	EA	$2,831,000	$42,465,000
20.05	Parking Spaces, Surface Lot	4,500	EA	$3,000	$13,500,00
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	20,250	SY	$60	$1,215,000
20.08	Reconstruct Roadway for Station Access	9,750	SY	$30	$292,500
	SUBTOTAL				**$68,895,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	30.86	MI	$12,000	$370,320
40.02	Utilities Allowance (Alignment)	30.86	MI	$40,000	$1,234,400
40.03	New Railbed - Mainline	30.86	MI	$286,000	$8,825,960
40.04	New Railbed - Station Sidings	3.75	MI	$286,000	$1,072,500
40.05	New Railbed - Passing Sidings	0.9	MI	$286,000	$270,833
	SUBTOTAL				**$11,774,013**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	17	EA	$345,000	$5,865,000
50.10	Major Street At-grade (New Gates & Warning Devices)	16	EA	$515,000	$8,240,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	30.86	MI	$1,000,000	$30,860,000
	SUBTOTAL				**$50,082,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$239,315,073**
DART Allowances					
Design Contingency (30%)			%	0.30	$71,794,522
					$311,109,595
Construction Contingency (10%)			%	0.10	$31,110,960
DART Add-on Allowance (32%)			%	0.32	$99,555,071
					$441,775,625
Environmental Allowance (1%)			%	0.01	$3,111,096
	SUBTOTAL				**$444,886,721**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$12,444,384
	SUBTOTAL				**$12,444,384**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail New Technology	12	EA	$8,800,000	$105,600,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$120,600,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$577,931,105**
	COST PER MILE				**$18,727,515**

A.4 ALTERNATIVE 2

Corridor:	Waxahachie Corridor (Alternative 2)
Corridor Limits:	Commuter from Waxahachie CBD Station to Union Station (ALL STATIONS INCLUDED)
Total Length (Miles):	30.86
Total Length (Feet):	162,941
Number of Stations:	16
Number of Vehicles:	6 (Train Sets)
Number of Support Busses:	20

10	**GUIDEWAY & TRACK ELEMENTS**	**Quantity**	**Unit**	**Unit Price**	**Cost**
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	162,941	FT	$310	$50,511,648
10.02	New Siding / Double Track, 136# CWR	5,000	FT	$310	$1,550,000
10.03	New Station Siding Track, 136# CWR	19,800	FT	$310	$6,138,000
10.04	New Turnout #20, 136# Rail	10	EA	$485,000	$4,850,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	31	EA	$485,000	$15,035,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	3	EA	$7,000,000	$21,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	325,882	LF	$20	$6,517,632
	SUBTOTAL				**$105,602,280**

20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	45	AC	$100,500	$4,522,500
20.02	Utilities Allowance	16	Station	$325,000	$5,200,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	15	EA	$2,831,000	$42,465,000
20.05	Parking Spaces, Surface Lot	4,500	EA	$3,000	$13,500,00
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	20,250	SY	$60	$1,215,000
20.08	Reconstruct Roadway for Station Access	9,750	SY	$30	$292,500
	SUBTOTAL				**$68,895,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	30.86	MI	$12,000	$370,320
40.02	Utilities Allowance (Alignment)	30.86	MI	$40,000	$1,234,400
40.03	New Railbed - Mainline	30.86	MI	$286,000	$8,825,960
40.04	New Railbed - Station Sidings	3.75	MI	$286,000	$1,072,500
40.05	New Railbed - Passing Sidings	0.9	MI	$286,000	$270,833
	SUBTOTAL				**$11,774,013**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	17	EA	$345,000	$5,865,000
50.10	Major Street At-grade (New Gates & Warning Devices)	16	EA	$515,000	$8,240,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	30.86	MI	$1,000,000	$30,860,000
	SUBTOTAL				**$50,082,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$239,315,073**
DART Allowances					
Design Contingency (30%)			%	0.30	$71,794,522
					$311,109,595
Construction Contingency (10%)			%	0.10	$31,110,960
DART Add-on Allowance (32%)			%	0.32	$99,555,071
					$441,775,625
Environmental Allowance (1%)			%	0.01	$3,111,096
	SUBTOTAL				**$444,886,721**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$12,444,384
	SUBTOTAL				**$12,444,384**
70	**VEHICLES**				
70.01	Rail Vehicles, Push Pull Technology (Locomotive-Coach-Cab Sets)	6	EA	$8,000,000	$48,000,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$63,000,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$520,331,105**
	COST PER MILE				**$16,861,021**

A.5 ALTERNATIVE 3

Corridor:	Waxahachie Corridor (Alternative 3)
Corridor Limits:	LRNT from Waxahachie CBD Station to Southport (SELECTED STATIONS INCLUDED)
Total Length (Miles):	20.67
Total Length (Feet):	109,138
Number of Stations:	6
Number of Vehicles:	7
Number of Support Busses:	20

10	**GUIDEWAY & TRACK ELEMENTS**	**Quantity**	**Unit**	**Unit Price**	**Cost**
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	109,138	FT	$310	$33,832,656
10.02	New Siding / Double Track, 136# CWR	4,000	FT	$310	$1,240,000
10.03	New Station Siding Track, 136# CWR	7,920	FT	$310	$2,455,200
10.04	New Turnout #20, 136# Rail	8	EA	$485,000	$3,880,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	12	EA	$485,000	$5,820,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	1	EA	$7,000,000	$7,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	218,275	LF	$20	$4,365,504
	SUBTOTAL				**$58,593,360**

20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	18	AC	$100,500	$1,809,000
20.02	Utilities Allowance	6	Station	$325,000	$1,950,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	5	EA	$2,831,000	$14,155,000
20.05	Parking Spaces, Surface Lot	1,800	EA	$3,000	$5,400,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	8,100	SY	$60	$486,000
20.08	Reconstruct Roadway for Station Access	3,900	SY	$30	$117,000
	SUBTOTAL				**$25,617,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	20.67	MI	$12,000	$248,040
40.02	Utilities Allowance (Alignment)	20.67	MI	$40,000	$826,000
40.03	New Railbed - Mainline	20.67	MI	$286,000	$5,911,620
40.04	New Railbed - Station Sidings	1.5	MI	$286,000	$429,000
40.05	New Railbed - Passing Sidings	0.8	MI	$286,000	$216,667
	SUBTOTAL				**$7,632,127**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	13	EA	$345,000	$4,485,000
50.10	Major Street At-grade (New Gates & Warning Devices)	13	EA	$515,000	$6,695,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	20.67	MI	$1,000,000	$20,670,000
	SUBTOTAL				**$36,967,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$131,771,267**
DART Allowances					
Design Contingency (30%)			%	0.30	$39,531,380
					$171,302,647
Construction Contingency (10%)			%	0.10	$17,130,265
DART Add-on Allowance (32%)			%	0.32	$54,816,847
					$243,249,758
Environmental Allowance (1%)			%	0.01	$1,713,026
	SUBTOTAL				**$244,962,785**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$6,852,106
	SUBTOTAL				**$6,852,106**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail New Technology	7	EA	$8,800,000	$61,600,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$76,600,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$328,414,891**
	COST PER MILE				**$15,888,490**

A.6 ALTERNATIVE 3

Corridor:	Waxahachie Corridor (Alternative 3)
Corridor Limits:	Commuter Rail from Waxahachie CBD Station to Southport (SELECTED STATIONS INCLUDED)
Total Length (Miles):	20.67
Total Length (Feet):	109,138
Number of Stations:	6
Number of Vehicles:	4 (Train Sets)
Number of Support Busses:	20

10	**GUIDEWAY & TRACK ELEMENTS**	**Quantity**	**Unit**	**Unit Price**	**Cost**
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	109,138	FT	$310	$33,832,656
10.02	New Siding / Double Track, 136# CWR	4,000	FT	$310	$1,240,000
10.03	New Station Siding Track, 136# CWR	7,920	FT	$310	$2,455,200
10.04	New Turnout #20, 136# Rail	8	EA	$485,000	$3,880,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	12	EA	$485,000	$5,820,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	1	EA	$7,000,000	$7,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT - 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	218,275	LF	$20	$4,365,504
	SUBTOTAL				**$58,593,360**

20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	18	AC	$100,500	$1,809,000
20.02	Utilities Allowance	6	Station	$325,000	$1,950,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	5	EA	$2,831,000	$14,155,000
20.05	Parking Spaces, Surface Lot	1,800	EA	$3,000	$5,400,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	8,100	SY	$60	$486,000
20.08	Reconstruct Roadway for Station Access	3,900	SY	$30	$117,000
	SUBTOTAL				**$25,617,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	20.67	MI	$12,000	$248,040
40.02	Utilities Allowance (Alignment)	20.67	MI	$40,000	$826,000
40.03	New Railbed - Mainline	20.67	MI	$286,000	$5,911,620
40.04	New Railbed - Station Sidings	1.5	MI	$286,000	$429,000
40.05	New Railbed - Passing Sidings	0.8	MI	$286,000	$216,667
	SUBTOTAL				**$7,632,127**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	13	EA	$345,000	$4,485,000
50.10	Major Street At-grade (New Gates & Warning Devices)	13	EA	$515,000	$6,695,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	20.67	MI	$1,000,000	$20,670,000
	SUBTOTAL				**$36,967,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$131,771,267**
DART Allowances					
Design Contingency (30%)			%	0.30	$39,531,380
					$171,302,647
Construction Contingency (10%)			%	0.10	$17,130,265
DART Add-on Allowance (32%)			%	0.32	$54,816,847
					$243,249,758
Environmental Allowance (1%)			%	0.01	$1,713,026
	SUBTOTAL				**$244,962,785**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$6,852,106
	SUBTOTAL				**$6,852,106**
70	**VEHICLES**				
70.01	Rail Vehicles, Push Pull Technology (Locomotive-Coach-Cab Sets)	4	EA	$8,000,000	$32,000,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$47,600,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$298,814,891**
	COST PER MILE				**$14,456,453**

A.7 ALTERNATIVE 4

Corridor:	Waxahachie Corridor (Alternative 4)
Corridor Limits:	LRNT from Waxahachie CBD Station to Southport (ALL STATIONS INCLUDED)
Total Length (Miles):	20.67
Total Length (Feet):	109,138
Number of Stations:	9
Number of Vehicles:	7
Number of Support Busses:	20

10	**GUIDEWAY & TRACK ELEMENTS**	**Quantity**	**Unit**	**Unit Price**	**Cost**
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	109,138	FT	$310	$33,832,656
10.02	New Siding / Double Track, 136# CWR	4,000	FT	$310	$1,240,000
10.03	New Station Siding Track, 136# CWR	11,880	FT	$310	$3,682,800
10.04	New Turnout #20, 136# Rail	8	EA	$485,000	$3,880,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	18	EA	$485,000	$8,730,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	1	EA	$7,000,000	$7,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	218,275	LF	$20	$4,365,504
	SUBTOTAL				**$62,730,960**

20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	27	AC	$100,500	$2,713,500
20.02	Utilities Allowance	9	Station	$325,000	$2,925,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	8	EA	$2,831,000	$22,648,000
20.05	Parking Spaces, Surface Lot	2,700	EA	$3,000	$8,100,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	12,150	SY	$60	$729,000
20.08	Reconstruct Roadway for Station Access	5,850	SY	$30	$175,500
	SUBTOTAL				**$38,991,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	20.67	MI	$12,000	$248,040
40.02	Utilities Allowance (Alignment)	20.67	MI	$40,000	$826,000
40.03	New Railbed - Mainline	20.67	MI	$286,000	$5,911,620
40.04	New Railbed - Station Sidings	2.25	MI	$286,000	$643,500
40.05	New Railbed - Passing Sidings	0.76	MI	$286,000	$216,667
	SUBTOTAL				**$7,846,627**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	13	EA	$345,000	$4,485,000
50.10	Major Street At-grade (New Gates & Warning Devices)	13	EA	$515,000	$6,695,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	20.67	MI	$1,000,000	$20,670,000
	SUBTOTAL				**$36,967,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$149,497,367**
DART Allowances					
Design Contingency (30%)			%	0.30	$44,849,210
					$194,346,577
Construction Contingency (10%)			%	0.10	$19,434,658
DART Add-on Allowance (32%)			%	0.32	$62,190,905
					$275,972,139
Environmental Allowance (1%)			%	0.01	$1,943,466
	SUBTOTAL				**$277,915,605**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$7,773,863
	SUBTOTAL				**$7,773,863**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail New Technology	7	EA	$8,800,000	$61,600,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$76,600,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$362,289,468**
	COST PER MILE				**$17,527,309**

A.8 ALTERNATIVE 4

Corridor:	Waxahachie Corridor (Alternative 4)
Corridor Limits:	Commuter Rail from Waxahachie CBD Station to Southport (ALL STATIONS INCLUDED)
Total Length (Miles):	20.67
Total Length (Feet):	109,138
Number of Stations:	9
Number of Vehicles:	5 (Train Sets)
Number of Support Busses:	20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	109,138	FT	$310	$33,832,656
10.02	New Siding / Double Track, 136# CWR	4,000	FT	$310	$1,240,000
10.03	New Station Siding Track, 136# CWR	11,880	FT	$310	$3,682,800
10.04	New Turnout #20, 136# Rail	8	EA	$485,000	$3,880,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	18	EA	$485,000	$8,730,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	1	EA	$7,000,000	$7,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	218,275	LF	$20	$4,365,504
	SUBTOTAL				**$62,730,960**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	27	AC	$100,500	$2,713,500
20.02	Utilities Allowance	9	Station	$325,000	$2,925,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	8	EA	$2,831,000	$22,648,000
20.05	Parking Spaces, Surface Lot	2,700	EA	$3,000	$8,100,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	12,150	SY	$60	$729,000
20.08	Reconstruct Roadway for Station Access	5,850	SY	$30	$175,500
	SUBTOTAL				**$38,991,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	20.67	MI	$12,000	$248,040
40.02	Utilities Allowance (Alignment)	20.67	MI	$40,000	$826,000
40.03	New Railbed - Mainline	20.67	MI	$286,000	$5,911,620
40.04	New Railbed - Station Sidings	2.25	MI	$286,000	$643,500
40.05	New Railbed - Passing Sidings	0.76	MI	$286,000	$216,667
	SUBTOTAL				**$7,846,627**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	13	EA	$345,000	$4,485,000
50.10	Major Street At-grade (New Gates & Warning Devices)	13	EA	$515,000	$6,695,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	20.67	MI	$1,000,000	$20,670,000
	SUBTOTAL				**$36,967,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$149,497,367**
DART Allowances					
Design Contingency (30%)			%	0.30	$44,849,210
					$194,346,577
Construction Contingency (10%)			%	0.10	$19,434,658
DART Add-on Allowance (32%)			%	0.32	$62,190,905
					$275,972,139
Environmental Allowance (1%)			%	0.01	$1,943,466
	SUBTOTAL				**$277,915,605**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$7,773,863
	SUBTOTAL				**$7,773,863**
70	**VEHICLES**				
70.01	Rail Vehicles, Push Pull Technology (Locomotive-Coach-Cab Sets)	5	EA	$8,000,000	$40,000,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$55,000,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$340,689,468**
	COST PER MILE				**$16,482,316**

A.9 ALTERNATIVE 5

Corridor:	Waxahachie Corridor (Alternative 5)
Corridor Limits:	LRNT from Waxahachie CBD Station to Fort Worth T&P (TRE Interline – ALL STATIONS INCLUDED)
Total Length (Miles):	30.86
Total Length (Feet):	162,941
Number of Stations:	16
Number of Vehicles:	26
Number of Support Busses:	20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	162,941	FT	$310	$50,511,648
10.02	New Siding / Double Track, 136# CWR	5,000	FT	$310	$1,550,000
10.03	New Station Siding Track, 136# CWR	19,800	FT	$310	$6,138,000
10.04	New Turnout #20, 136# Rail	10	EA	$485,000	$4,850,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	31	EA	$485,000	$15,035,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	3	EA	$7,000,000	$21,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	325,882	LF	$20	$6,517,632
	SUBTOTAL				**$105,602,280**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	45	AC	$100,500	$4,522,500
20.02	Utilities Allowance	16	Station	$325,000	$5,200,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	15	EA	$2,831,000	$42,465,000
20.05	Parking Spaces, Surface Lot	4,500	EA	$3,000	$13,500,00
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	20,250	SY	$60	$1,215,000
20.08	Reconstruct Roadway for Station Access	9,750	SY	$30	$292,500
	SUBTOTAL				**$68,895,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	30.86	MI	$12,000	$370,320
40.02	Utilities Allowance (Alignment)	30.86	MI	$40,000	$1,234,400
40.03	New Railbed - Mainline	30.86	MI	$286,000	$8,825,960
40.04	New Railbed - Station Sidings	3.75	MI	$286,000	$1,072,500
40.05	New Railbed - Passing Sidings	0.9	MI	$286,000	$270,833
	SUBTOTAL				**$11,774,013**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	17	EA	$345,000	$5,865,000
50.10	Major Street At-grade (New Gates & Warning Devices)	16	EA	$515,000	$8,240,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	30.86	MI	$1,000,000	$30,860,000
	SUBTOTAL				**$50,082,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$239,315,073**
DART Allowances					
Design Contingency (30%)			%	0.30	$71,794,522
					$311,109,595
Construction Contingency (10%)			%	0.10	$31,110,960
DART Add-on Allowance (32%)			%	0.32	$99,555,071
					$441,775,625
Environmental Allowance (1%)			%	0.01	$3,111,096
	SUBTOTAL				**$444,886,721**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$12,444,384
	SUBTOTAL				**$12,444,384**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail New Technology	26	EA	$8,800,000	$228,800,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$243,800,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$701,131,105**
	COST PER MILE				**$22,719,738**

A.10 ALTERNATIVE 5

Corridor:	Waxahachie Corridor (Alternative 5)
Corridor Limits:	Commuter Rail from Waxahachie CBD Station to Fort Worth T&P (TRE Interline – ALL STATIONS INCLUDED)
Total Length (Miles):	30.86
Total Length (Feet):	162,941
Number of Stations:	16
Number of Vehicles:	13 (Train Sets)
Number of Support Busses:	20

10	**GUIDEWAY & TRACK ELEMENTS**	**Quantity**	**Unit**	**Unit Price**	**Cost**
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	162,941	FT	$310	$50,511,648
10.02	New Siding / Double Track, 136# CWR	5,000	FT	$310	$1,550,000
10.03	New Station Siding Track, 136# CWR	19,800	FT	$310	$6,138,000
10.04	New Turnout #20, 136# Rail	10	EA	$485,000	$4,850,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	31	EA	$485,000	$15,035,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	3	EA	$7,000,000	$21,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete ($65/SF)	0	TF	$1,200	$0
10.10	Retaining Wall (0 FT – 10 FT High), one side	0	TF	$575	$0
10.11	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.12	Fencing	325,882	LF	$20	$6,517,632
	SUBTOTAL				**$105,602,280**

20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	45	AC	$100,500	$4,522,500
20.02	Utilities Allowance	16	Station	$325,000	$5,200,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$1,700,000	$1,700,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	15	EA	$2,831,000	$42,465,000
20.05	Parking Spaces, Surface Lot	4,500	EA	$3,000	$13,500,00
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	20,250	SY	$60	$1,215,000
20.08	Reconstruct Roadway for Station Access	9,750	SY	$30	$292,500
	SUBTOTAL				**$68,895,000**

		Quantity	Unit	Unit Price	Cost
30	**MAINTENANCE & LAYOVER FACILITIES**				
30.01	Earthwork, General Clearing and Grading	2.5	AC	$6,000	$15,000
30.02	New Yard Track, 115# CWR	5280	FT	$280	$1,478,400
30.03	New Turnout #10, 115# Rail	2	EA	$350,000	$700,000
30.04	Track Bumping Post	2	EA	$7,500	$15,000
30.05	Layover Facility Building	600	SF	$250	$150,000
30.06	Shop Fire Protection, Security, and Environmental Systems	1	LS	$200,000	$200,000
30.07	Yard Service Aisle Crossing (Crossbucks)	1	EA	$50,000	$50,000
30.08	Yard Service Aisles	7,112	SY	$15	$106,680
30.09	Fencing	2,300	LF	$20	$46,000
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$2,961,080**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	30.86	MI	$12,000	$370,320
40.02	Utilities Allowance (Alignment)	30.86	MI	$40,000	$1,234,400
40.03	New Railbed - Mainline	30.86	MI	$286,000	$8,825,960
40.04	New Railbed - Station Sidings	3.75	MI	$286,000	$1,072,500
40.05	New Railbed - Passing Sidings	0.9	MI	$286,000	$270,833
	SUBTOTAL				**$11,774,013**
50	**SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	1	LS	$2,000,000	$2,000,000
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	8	EA	$100,000	$800,000
50.03	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.04	PTC - Office	1	EA	$25,000	$25,000
50.05	PTC - Communications	1	EA	$1,700	$1,700
50.06	PTC - System Engineering	1	EA	$24,500	$24,500
50.07	PTC - Program Management	1	EA	$11,500	$11,500
50.08	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.09	Minor Street At-grade (New/Modify Gates & Devices)	17	EA	$345,000	$5,865,000
50.10	Major Street At-grade (New Gates & Warning Devices)	16	EA	$515,000	$8,240,000
50.11	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.12	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.13	Special Conditions Contingency	30.86	MI	$1,000,000	$30,860,000
	SUBTOTAL				**$50,082,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$239,315,073**
DART Allowances					
Design Contingency (30%)			%	0.30	$71,794,522
					$311,109,595
Construction Contingency (10%)			%	0.10	$31,110,960
DART Add-on Allowance (32%)			%	0.32	$99,555,071
					$441,775,625
Environmental Allowance (1%)			%	0.01	$3,111,096
	SUBTOTAL				**$444,886,721**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$12,444,384
	SUBTOTAL				**$12,444,384**
70	**VEHICLES**				
70.01	Rail Vehicles, Push Pull Technology (Locomotive-Coach-Cab Sets)	13	EA	$8,000,000	$104,000,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$119,000,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$576,331,105**
	COST PER MILE				**$18,675,668**

A.11 SUMMARY

Table A-1 Rail Capital Costs Summary

Cost Category	Alternative				
	1	2	3	4	5
	Cost (millions of 2009 dollars)				
Guideway and Track Elements	$100	$106	$59	$63	$106
Passenger Stations and Parking	$51	$69	$26	$39	$69
Maintenance and Layover Facilities	$3	$3	$3	$3	$3
Sitework & Special Conditions	$11	$12	$8	$8	$12
Signaling and Communications Systems	$50	$50	$37	$37	$50
Allowances	$185	$206	$113	$128	$206
Right-of-Way Acquisition	$11	$12	$7	$8	$12
Vehicles[1]	$121/63	$121/63	$77/47	$77/55	$244/119
Unallocated Contingency	$0	$0	$0	$0	$0
Capital Cost Total[1]	**$532/474**	**$579/521**	**$330/300**	**$363/341**	**$702/577**
Approximate Capital Cost Total[1,2]	**$525/475**	**$575/525**	**$325/300**	**$375/350**	**$700/575**

1. LRNT/Commuter Rail
2. Approximate Capital Cost Total rounded to the nearest $25 million

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Appendix B
Affected Environment

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B. AFFECTED ENVIRONMENT

Appendix B includes researched information for the Waxahachie Corridor regarding the affected environment and existing conditions. The study area used for this study represents a one-mile area surrounding the proposed Waxahachie Corridor as defined in Chapter 1, Section 1.4. The one-mile area best represents the potential resources possibly affected by the proposed project. The Waxahachie Corridor extends approximately 31 miles from the old Waxahachie rail depot to Union Station. The Waxahachie Corridor passes through four cities: Waxahachie, Red Oak, Lancaster, and Dallas.

B.1 TRANSPORTATION SYSTEM

This section documents the existing and planned conditions of the transportation system within and near the study area. The proposed Waxahachie Corridor would provide regional rail service between the City of Waxahachie and the City of Dallas along the Burlington Northern Santa Fe (BNSF) owned rail line. This service would be integrated into the existing transportation system of roadways, transit routes, bicycle and pedestrian facilities, railroads, and aviation facilities. The focus of this section is to document the flow of people and goods traveling parallel to or along the proposed passenger rail corridor, as well as the potential interactions with transportation facilities that cross the rail line.

Data collection to document the existing conditions of, and proposed changes to, the transportation system within the Waxahachie Corridor study area came from a variety of sources. The primary data sources regarding the existing conditions and proposed improvements of the transportation system are the North Central Texas Council of Governments (NCTCOG), which serves as the metropolitan planning organization (MPO) for the Dallas-Fort Worth (DFW) region, Texas Department of Transportation (TxDOT), and Dallas Area Rapid Transit (DART). Resource agency databases were also major sources for the data collection used in this section. Each subsection includes an accounting of the data sources used for the maps and tables included in this report.

B.1.1 Roadway System

According to the 2000 United States (US) Census, over 90 percent of workers in the Dallas-Fort Worth region traveled to work in a car, truck, or van. When motorcycles, buses, and taxis are included, the percentage of work trips that utilize the roadway system is over 93 percent. The regional roadway network is primarily comprised of interstate highways and other federal and state principal highways and arterials. Several regionally significant arterials (RSA) pass through the Waxahachie Corridor study area. The local roadway system around each potential station in the study area is discussed in Chapter 3, Section 3.5.

The Dallas-Fort Worth Regional Travel Model (DFWRTM) forecasts used in the long-range metropolitan transportation plan (MTP), *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment (Mobility 2030 - 2009 Amendment)* are the source of information regarding current and projected level of service (LOS) for the major roadways within the study area. Traffic counts taken by TxDOT in 2004 are included to show current traffic levels on major roadways.

B.1.1.1 Current System

The major facilities in the roadway network are the interstate highways (IH), US highways, state highways (SH), and regional toll roads. Figures B-1 and B-2 show the major highways, toll roads, and RSAs within the study area. IH 35E and SH 342 are major roadway facilities that parallel the Waxahachie Corridor. Facilities that run generally perpendicular to the corridor are the US 287, IH 20, and IH 30.

A network of RSAs and minor arterial facilities also traverse the study area. Figures B-3 and B-4 illustrate the modeled LOS for roadways, including RSAs, within the study area and the traffic counts from 2007. DFWRTM forecasts indicate that in the study area, approximately 85 percent of the roads were operating at a LOS of A, B, or C in 2007; eight percent of the roads were operating at a LOS of F; and the rest of the roads were at LOS D or E. Table B-1 shows the roadway segments that make up the RSA system within the study area, most of these RSAs serve north-south traffic movements. According to DFWRTM model runs for *Mobility 2030 - 2009 Amendment*, all of the RSAs and highways in the study area had LOS F for at least some portion of the day in 2007.

Table B-1 Existing Regionally Significant Arterials

Street	RSA Segment ID	Limit A[1]	Limit B	Current Lanes	Direction	Length[2]
Belt Line Road	3.5	Main Street	Nokomis Road	4	East-West	1.34
Business US 287	507.1	West end of Waxahachie Bypass	US 77	2	North-South	2.40
Business US 287	507.2	US 77	East end of Waxahachie Bypass (US 287)	2	North-South	1.03
Canton Street	704.1	Central Expressway	Good Latimer Street	6	East-West	0.02
Central Expressway	76.3	Commerce Street	Canton Street	6	North-South	0.07
Central Expressway	76.4	Canton Street	Marilla Street	8	North-South	0.04
Central Expressway	78.0	Corinth Street	Grand Avenue at IH 45	4	North-South	0.59
Central Expressway	78.2	South of IH 30	Corinth Street	5	North-South	0.12
Commerce Street	47.4	Industrial Boulevard	IH 35E	7	East-West	0.23
Continental Boulevard Eastbound	715.0	IH 35E frontage Northbound	Victory Street	4	East-West	0.13
Continental Boulevard Eastbound	715.1	Victory Avenue	Houston Street	4	East-West	0.11
Corinth Street	60.0	Central Expressway	Industrial Boulevard	4	North-South	1.11
Corinth Street Viaduct	59.3	Industrial Boulevard	8th Street	4	North-South	0.84

Table B-1 Existing Regionally Significant Arterials (continued)

Street	RSA Segment ID	Limit A[1]	Limit B	Current Lanes	Direction	Length[2]
Elm Street/Commerce Street couplet	47.0	Good Latimer Expressway	Gaston/Fair Park Expressway/ Exposition Avenue	4	East-West	1.85
Elm Street/Commerce Street couplet	47.1	Central Expressway	Good Latimer Expressway	9	East-West	0.12
Elm Street/Commerce Street couplet	47.2	Houston Street	Central Expressway	5	East-West	0.10
Elm Street/Commerce Street couplet	47.3	IH 35E	Houston Street	7	East-West	0.14
Fort Worth/Commerce Street	48.0	SH 180/Davis Road	Industrial Boulevard	6	East-West	0.74
Good Latimer Expressway	77.0	Elm Street	Grand Avenue	6	North-South	0.52
Griffin Street	16.1	Field Street	Spur 366 off ramp	5	North-South	0.15
Griffin Street	16.2	Spur 366	Memorial Drive	6	North-South	0.79
Griffin Street	16.3	Memorial Drive	IH 30	7	East-West	0.14
Harwood Street	78.3	IH 30	Grand Avenue	4	North-South	0.35
Houston Street	98.0	Commerce Street	Jackson Street	5	North-South	0.04
Houston Street	98.1	Jackson Street	Wood Street	5	North-South	0.05
Houston Street	98.2	Wood Street	Young Street	5	North-South	0.06
Houston Street	711.0	Payne Street	Wichita Street	4	North-South	0.09
Houston Street	711.1	Payne Street	Wichita Street	4	North-South	0.18
Houston Street	711.2	Laws Street	Continental	6	North-South	0.14
Houston Street	711.3	Payne Street	Wichita Street	4	North-South	0.22
Houston Street	711.4	Pacific Avenue	Commerce Street	4	North-South	0.22
Illinois Avenue	67.0	Loop 12 frontage Northbound	Southern Oaks Boulevard/ Overton Road	6	East-West	0.93
Illinois Avenue	67.1	Southern Oaks Boulevard/ Overton Road	Linfield Road/ Mayforge Drive	4	East-West	0.92
Illinois Avenue couplet	67.2	Linfield Road/ Mayforge Drive	SH 310	4	East-West	0.66
Industrial Boulevard	61.1	Continental Boulevard	Commerce Street	6	North-South	0.52
Industrial Boulevard	61.2	Commerce Street	IH 30 on ramp Westbound	8	North-South	0.43
Industrial Boulevard	61.3	IH 30 of ramp Westbound	Corinth Street	6	East-West	1.32
Lamar Street	716.0	Pacific Avenue	Main Street	6	North-South	0.10
Lamar Street	716.1	Main Street	Elm Street	4	North-South	0.07

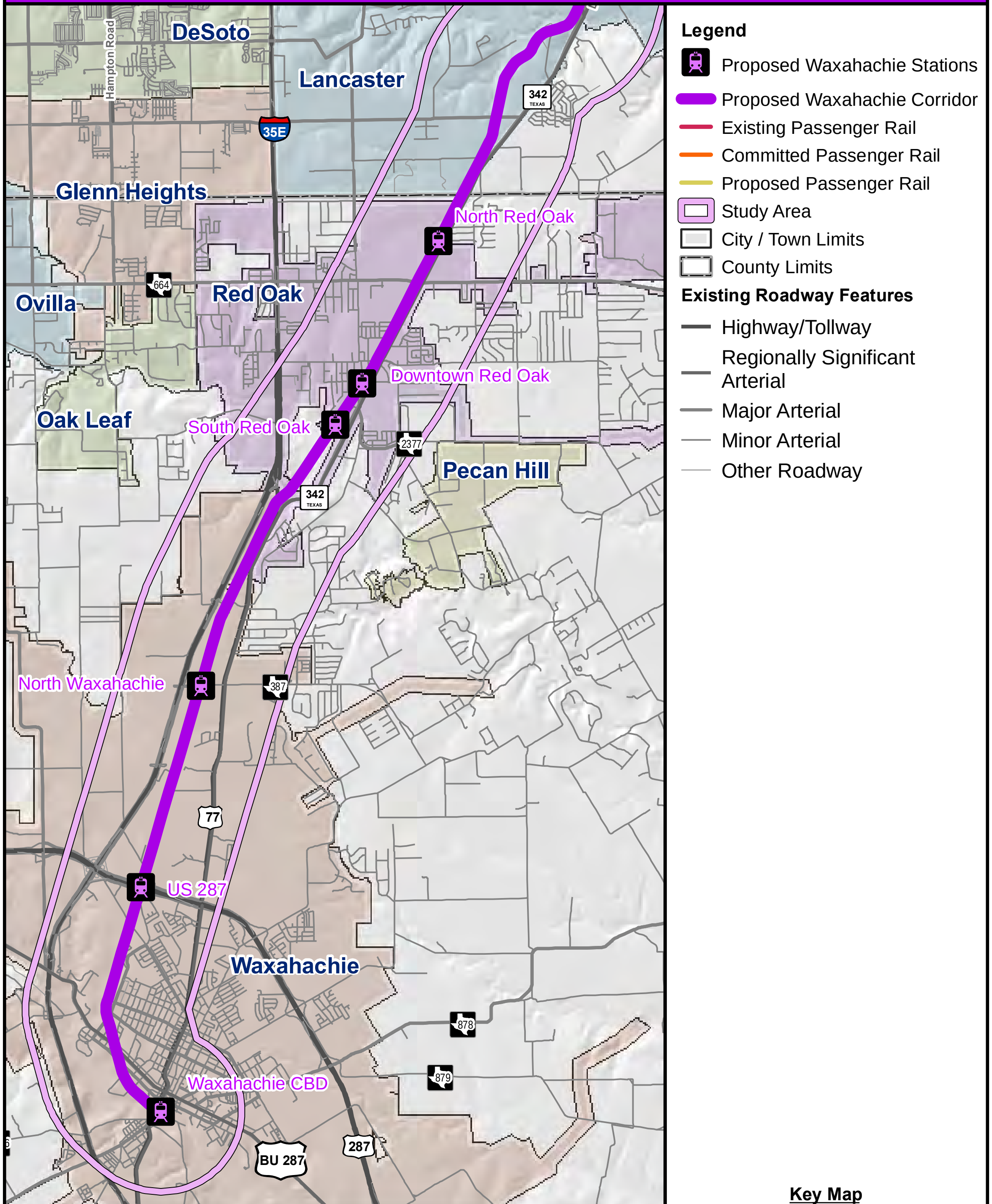
Table B-1 Existing Regionally Significant Arterials (continued)

Street	RSA Segment ID	Limit A[1]	Limit B[1]	Current Lanes	Direction	Length[2]
Lancaster – Hutchins Road	58.3	Main Street	SH 342	2	North-South	1.06
Loop 12	21.1	SH 310	US 175 frontage Southbound	4	East-West	0.50
Loop 12/ Ledbetter Drive	21.0	IH 35E frontage NB	IH 45 Southbound on ramp	6	East-West	1.51
Market Center Boulevard	61.0	Harry Hines Boulevard	Irving Boulevard	6	North-South	0.30
Moody Street/ Griffin Street	75.4	Harry Hines Boulevard	Woodall Rodgers Expressway Eastbound	6	North-South	0.31
Pearl Expressway	76.0	Pearl Street	Pacific Avenue/ Gaston Avenue	4	North-South	0.38
Pearl Expressway	76.2	Wood Street/ Jackson Street	Canton Street	3	North-South	0.08
SH 310	84.0	Illinois Avenue East	Loop 12	6	North-South	3.13
SH 310	84.2	US 175	Overton Road	4	North-South	3.20
SH 342/Lancaster Road	58.1	8th Street	Loop 9	2	North-South	3.48
SH 342	58.2	Pleasant Run Road	8th Street	6	North-South	0.27
SH 342/Lancaster Road	58.0	IH 20 frontage Eastbound	Pleasant Run Road	6	North-South	0.73
Simpson Stuart Road	20.0	SH 342/Lancaster Road South	SH 310/US 75	6	East-West	1.74
US 77	511.0	SH 342	North of McMillan Street	4	North-South	7.84
US 77	511.1	North of McMillan Street	South of FM 66	2	North-South	5.31
US 77	511.2	FM 66	IH 35E	2	North-South	0.86
Victory Avenue	712.0	Payne Street	Continental	4	North-South	0.41

Source: NCTCOG, 2009; RSA Segment ID corresponds to roadway designations in *Mobility 2030 - 2009 Amendment*

1. Limits A and B are the limits of the original NCTCOG RSA segment, which might go outside the study area
2. Length is in miles and is the length of RSA segment in the study area.

Figure B-1 — Existing Roadway System
From FM 66 to Bear Creek Road



Key Map

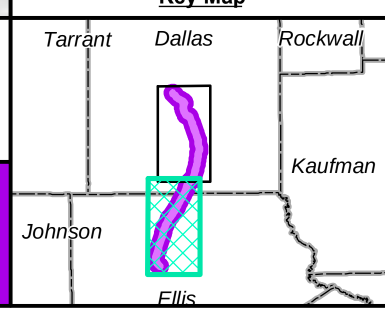


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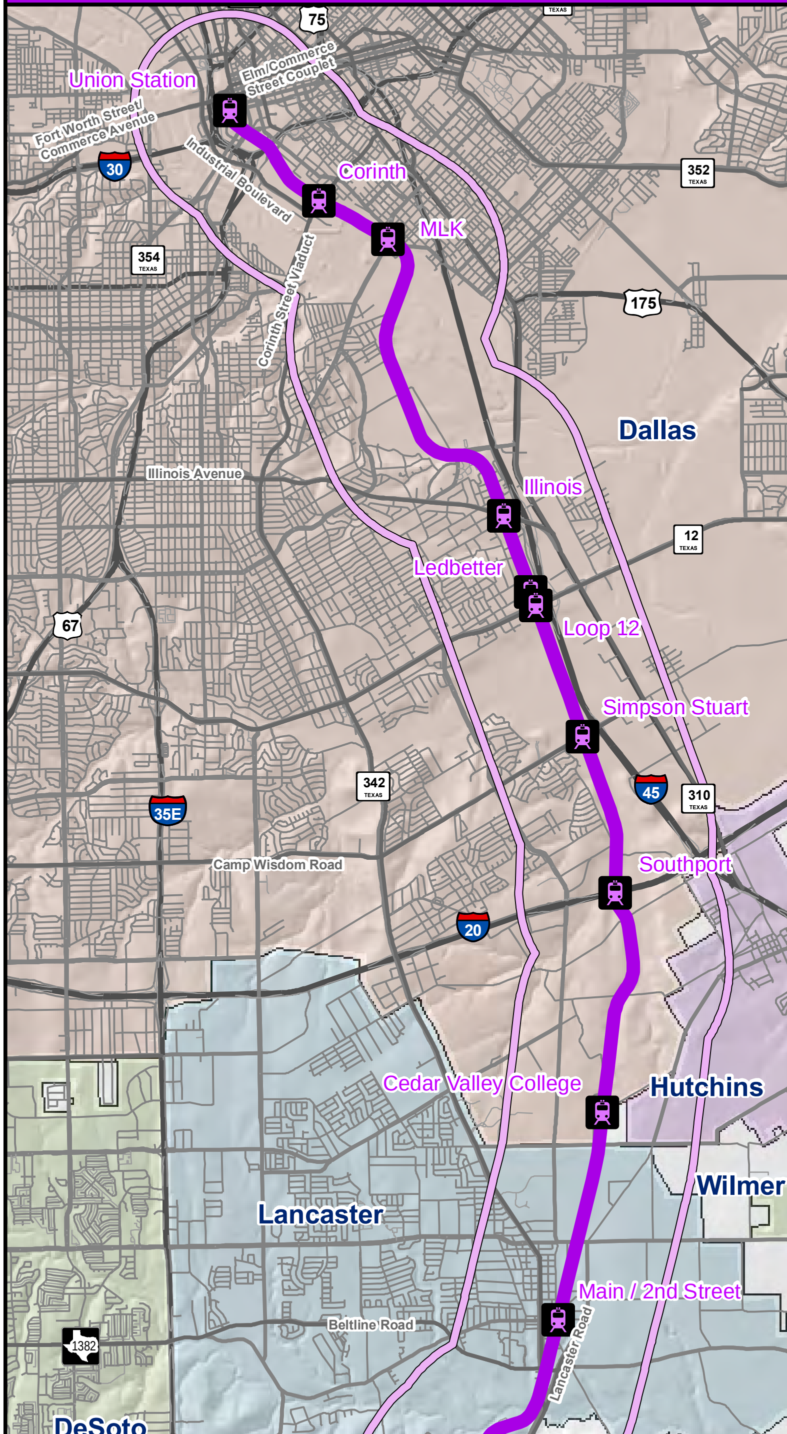
Figure B-2 — Existing Roadway System
From Bear Creek Road to Spur 366



Legend

- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Study Area
- City / Town Limits
- County Limits

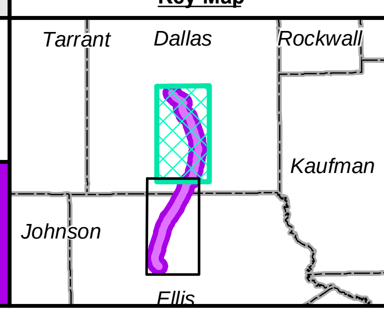
Existing Roadway Features

- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Minor Arterial
- Other Roadway

0 0.5 1 2 Miles

N

Key Map



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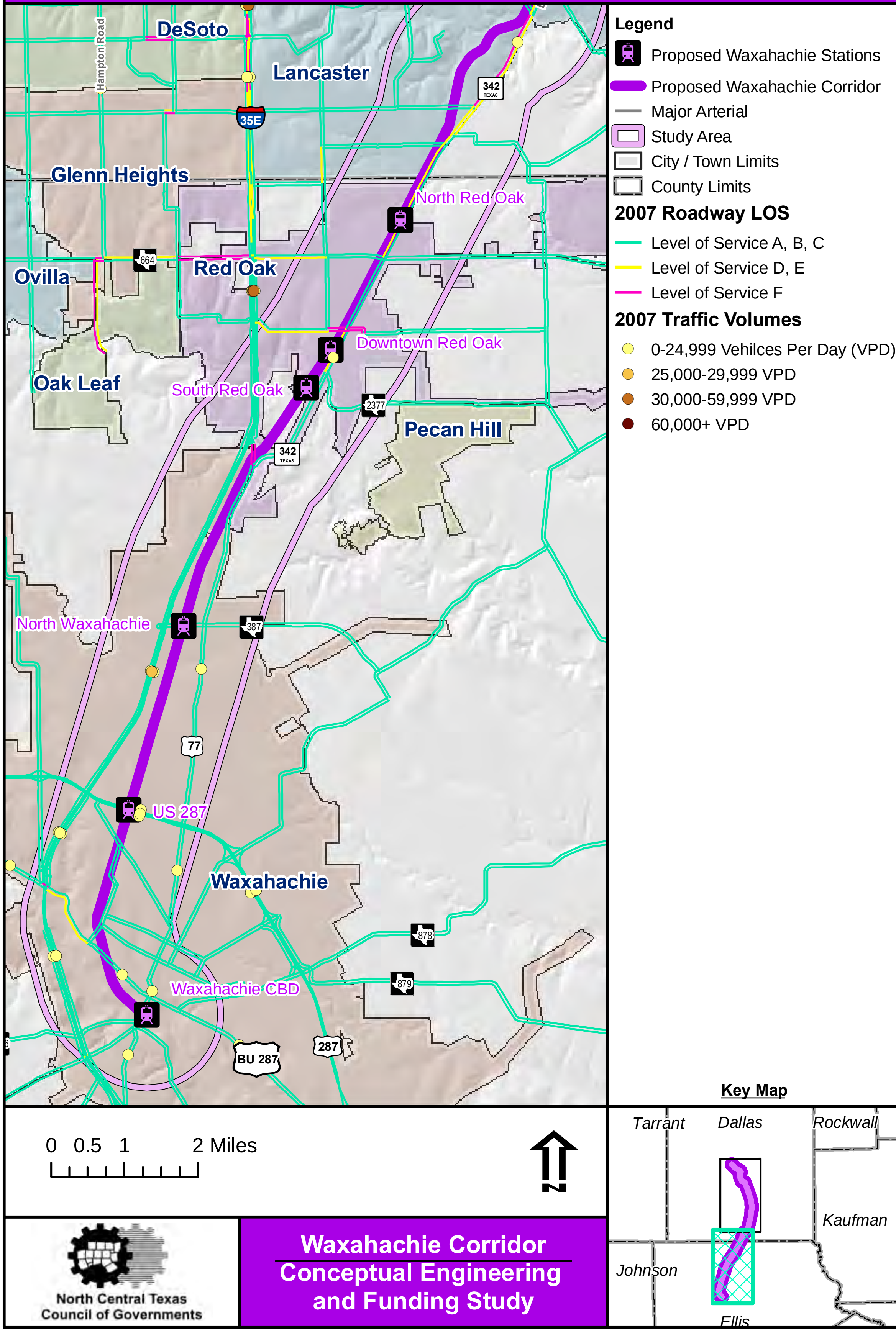
May 2010

Figure B-3 — 2007 Level of Service and Traffic Counts
From FM 66 to Bear Creek Road



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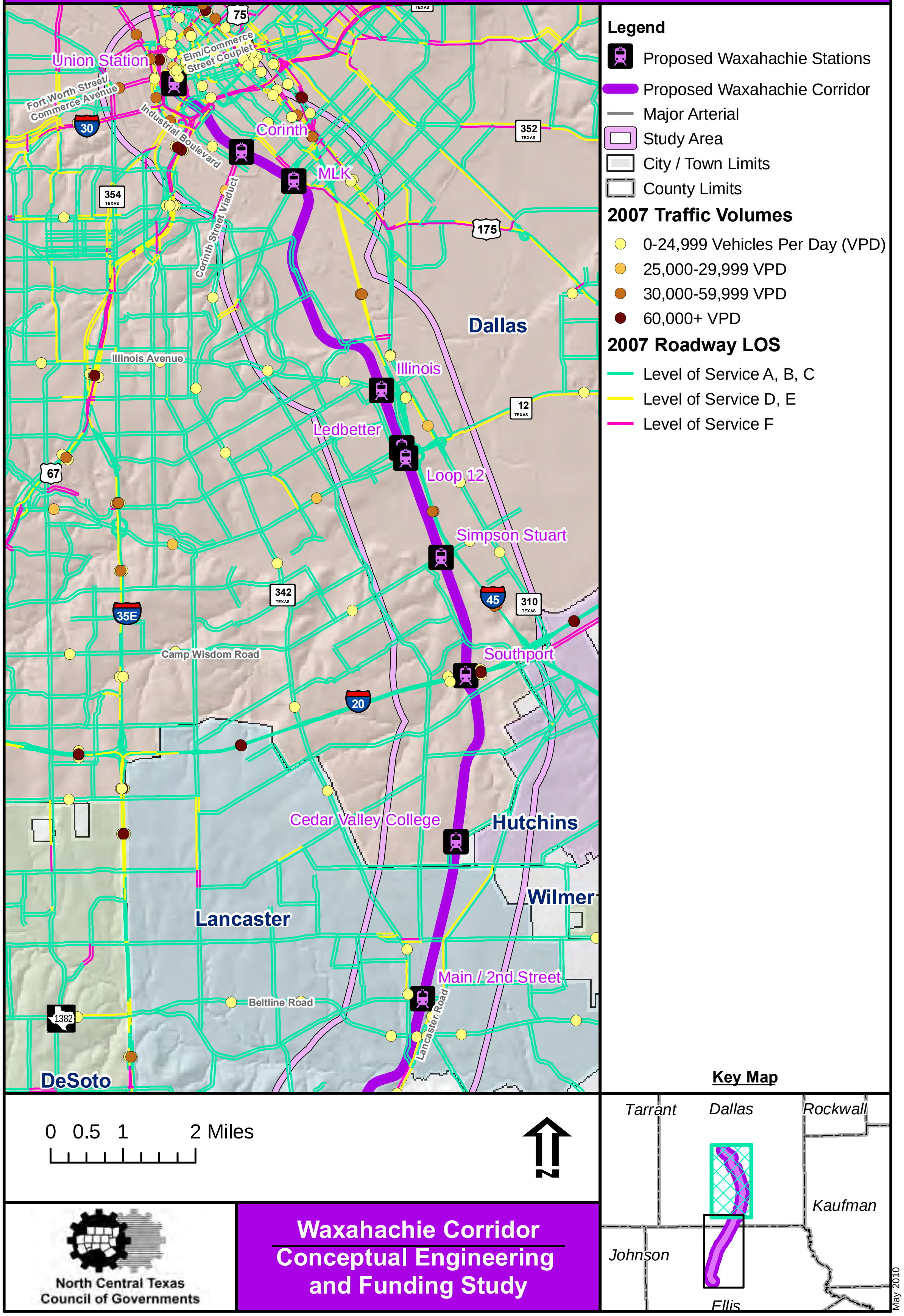
Waxahachie Corridor Conceptual Engineering and Funding Study

Figure B-4 — 2007 Level of Service and Traffic Counts
From Bear Creek Road to Spur 366



B.1.1.2 Planned System Improvements

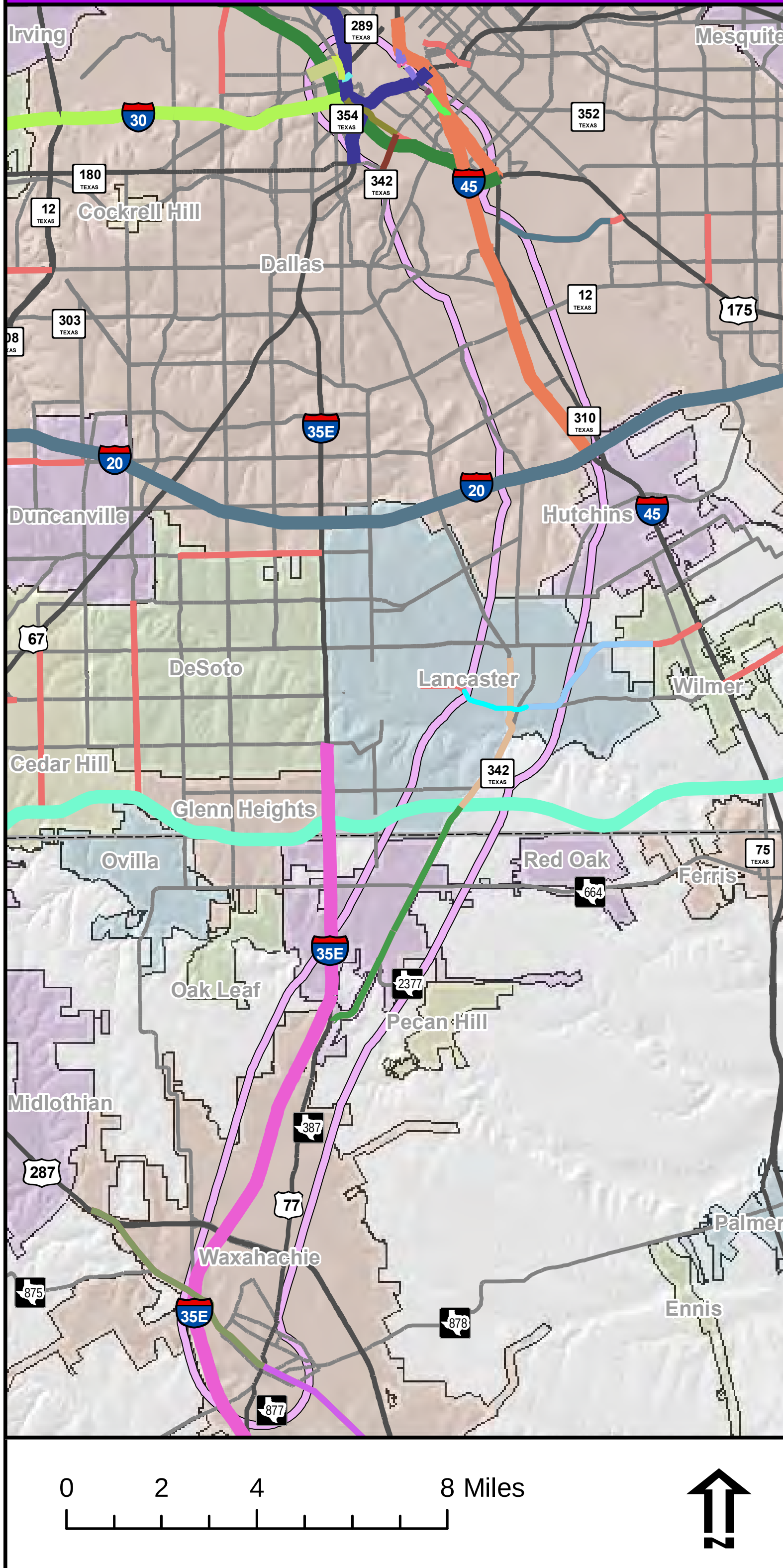
There are eight highway or toll road improvement projects included in *Mobility 2030 - 2009 Amendment* within the study area (see Table B-2 and Figure B-5). Most of the improvements recommend the addition of tolled or managed/high occupancy vehicle (HOV) lanes. Travel time improvements would be differentially distributed between system users depending on their capacity to pay for access to tolled or managed lanes.

Table B-2 Planned Improvements to Highways and Toll Roads

Facility/ Corridor	Segment Number*	Limit A	Limit B	Current Lanes	Planned Lanes	Year Operational
IH 20 (9 & 10)	9.4	Bonnie View Road	JJ Lemmon Road (Frontage roads)	0	4/6 (Frontage)	2009
	10.2	Spur 408	US 175	8	10	2026-2030
IH 30 (12 & 33)	12.4	Belt Line Road	Loop 12	6	8 + 3 (Managed)	2010-2019
	33.1	IH 35E	Central Expressway	6 + 4 (Collector-Distributor)	12 + 1 (Managed)	2020-2025
	33.2	Central Expressway	IH 45	6 + 4 (Collector-Distributor)	12 + 4 (Managed)	2020-2025
IH 35E (19 & 33)	19.1	Parkerville Road	US 77 (north of Waxahachie)	4	6	2009
	19.2	US 77 (north of Waxahachie)	Bigham Road	4	6	2010-2019
	33.3	SH 183/Trinity Parkway	Inwood Road	10	10 + 2 (Managed)	2020-2025
	33.4	Inwood Road	Motor Street	10	10 + 2 (Managed)	2020-2025
	33.5	Motor Street	Wycliff Avenue	10	10	2020-2025
	33.6	Wycliff Avenue	Market Center Boulevard	10	10 + 2 (Managed)	2020-2025
IH 45 (22)	22.1	IH 30	US 175	10	10 (Reconstruct)	2010-2019
	22.2	US 175	Trinity Parkway/ US 175	6	8	2010-2019
	22.3	Trinity Parkway/ US 175	IH 20	6	8	2020-2025
Loop 9 (3)	3.1	US 287/Regional Outer Loop	IH 20/SH 190	0	6 (Toll)	2026-2030
US 175 (22)	22.4	IH 45	US 175/SH 310	6 (Freeway)	6 (Parkway)	2010-2019
Trinity Parkway (49)	49.1	IH 35E/SH 183	Spur 366	0	6 (Toll)	2020-2025
	49.2	Spur 366	IH 45/US 175	0	6 (Toll)	2010-2019
	49.3	IH 45/US 175	US 175/SH 310	6	6	2010-2019
Woodall Rodgers (61)	61.1	IH 35E	Beckley Avenue	0	6	2010-2019

Source: NCTCOG, 2009
* Segment Number corresponds to specific corridor designations in Mobility 2030 – 2009 Amendment

Figure B-5 — Planned Roadway Improvements
From FM 66 to Spur 366



Legend

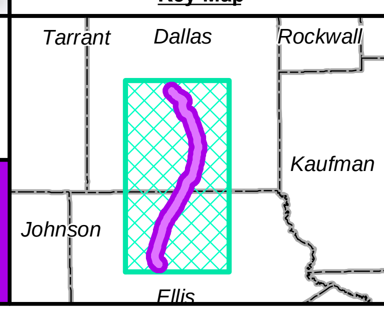
Planned Improvement

- Loop 9 (Corridor 3)
- IH 20 Frontage (Corridor 9)
- IH 20 Dallas County (Corridor 10)
- IH 30 Dallas County (Corridor 12)
- IH 35E - South (Corridor 19)
- IH 45/US 175 (Corridor 22)
- Project Pegasus (Corridor 33)
- Trinity Parkway (Corridor 49)
- Woodall Rodgers Extension (Corridor 61)
- Beltline Road Connector (3.1)
- Commerce Street (47.4)
- SH 342/Lancaster Road (58.1)
- Corinth Street Viaduct (59.3)
- Industrial Boulevard (61.1)
- Industrial Boulevard (61.3)
- Lake June Road (61.6)
- Pearl Expressway (76)
- Pearl Expressway (76.2)
- Central Expressway (76.6)
- Central Expressway (78)
- Central Expressway (78.2)
- BU 287 (507.1)
- BU 287 (507.2)
- US 77 (511.1)
- RSA Improvements Outside Study Area

Other Items

- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

Key Map



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The RSAs within the study area pass through urban areas and urbanizing areas. Urban areas constrain the possibility of expanding these facilities to carry more traffic, while the urbanizing areas have additional land to expand their facilities. Through the year 2030, 12 of the 56 identified roadway segments anticipate having added lane capacity while three RSAs have planned extensions on new right-of-way. Table B-3 lists the RSA segments with planned expansions or extensions. The length of these 15 segments is 17.9 miles (35 percent) of the projected total of 51.6 miles of RSAs within the study area in 2030. There are 202.5 lane miles of RSAs in the study area in 2009. The additional RSA roadways improvements will increase the total lane miles of RSAs within the study area to 240.1 miles, an increase of 19 percent over the next two decades. Figure B-5 shows the locations of planned improvements to highways, toll roads, and RSAs.

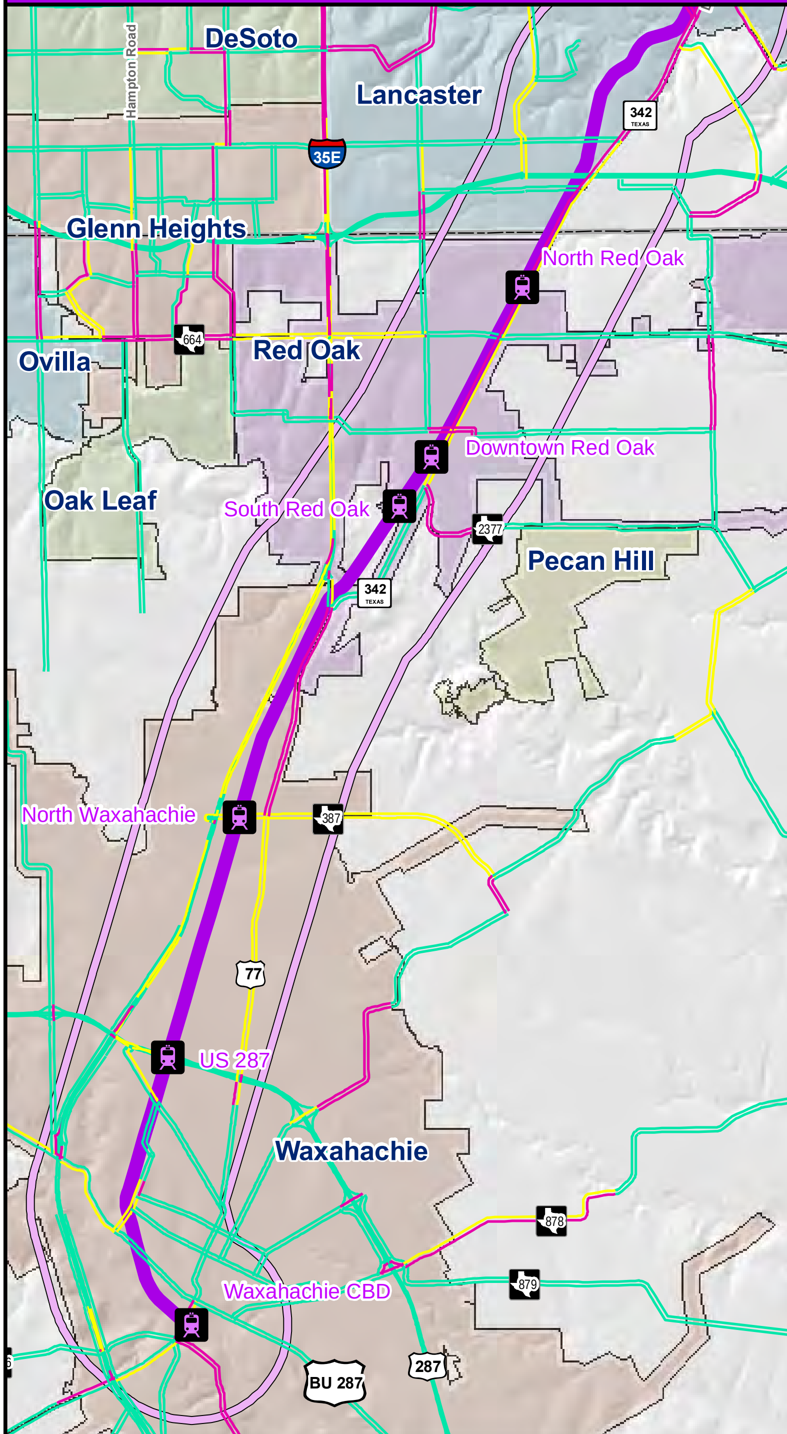
Table B-3 Planned Improvements to RSAs

Street	RSA Segment ID*	Limit A	Limit B	Current Lanes	Planned 2030 Lanes	Length
Belt Line Road Connector	3.10	Nokomis Road	Pleasant Run Road	0	6	1.04
Business US 287	507.1	West end of Waxahachie Bypass	US 77	2	4	2.40
Business US 287	507.2	US 77	East end of Waxahachie Bypass	2	4	1.03
Central Expressway	76.6	Marilla Street	IH 30 frontage Westbound	0	8	0.03
Central Expressway	78.0	Corinth Street	Grand Avenue at IH 45	4	6	0.59
Central Expressway	78.2	South of IH 30	Corinth Street	5	6	0.12
Commerce Street	47.4	Industrial Boulevard	IH 35E	7	8	0.23
Corinth Street Viaduct	59.3	Industrial Boulevard	8th Street	4	6	0.84
Industrial Boulevard	61.1	Continental Boulevard	Commerce Street	6	8	0.52
Industrial Boulevard	61.3	IH 30 of ramp Westbound	Corinth Street	6	8	1.32
Lake June Road	61.6	Bexar Street	Pemberton Hill Road	0	4	0.56
Pearl Expressway	76.0	Pearl Street	Pacific Avenue/ Gaston Avenue	4	6	0.38
Pearl Expressway	76.2	Wood Street/ Jackson Street	Canton Street	3	4	0.08
SH 342/Lancaster Road	58.1	8th Street	Loop 9	2	4	3.48
US 77	511.1	North of McMillan Street	South of FM 66	2	4	5.31

Source: NCTCOG, 2009
* RSA Segment ID corresponds to roadway designations in Mobility 2030 - 2009 Amendment

Figure B-6 — 2030 Level of Service

From FM 66 to Bear Creek Road



Legend

- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Study Area
- City / Town Limits
- County Limits

Forecasted 2030 Level of Service

- Level of Service A, B, C
- Level of Service D, E
- Level of Service F

0 0.5 1 2 Miles

N

Key Map

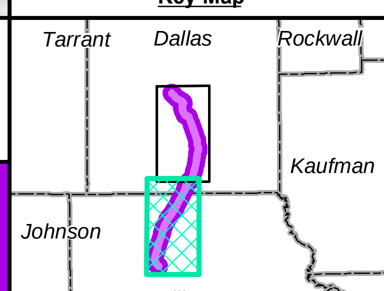


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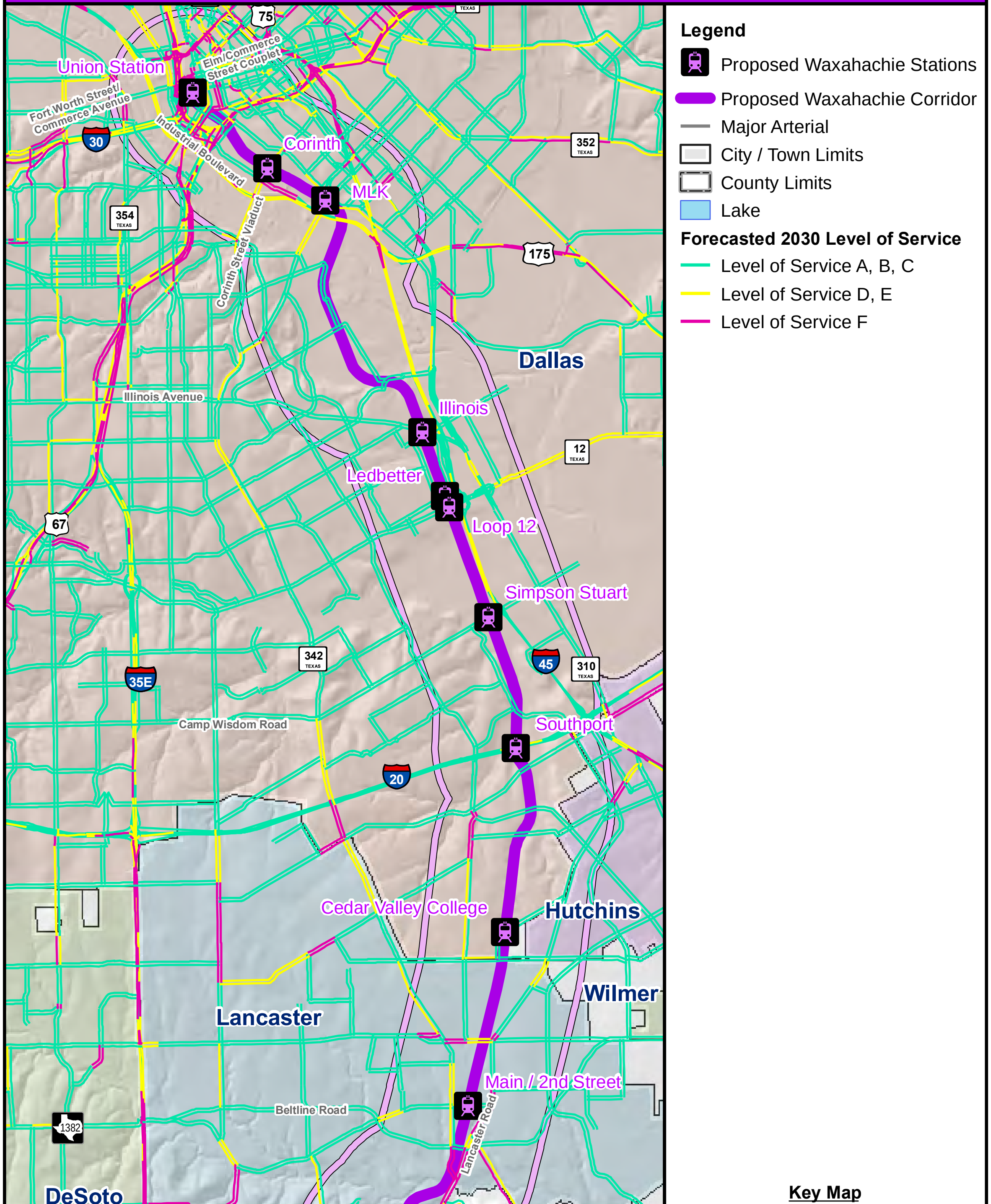
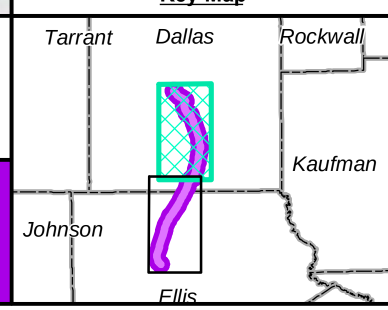
Figure B-7 — 2030 Level of Service
From Bear Creek Road to Spur 366





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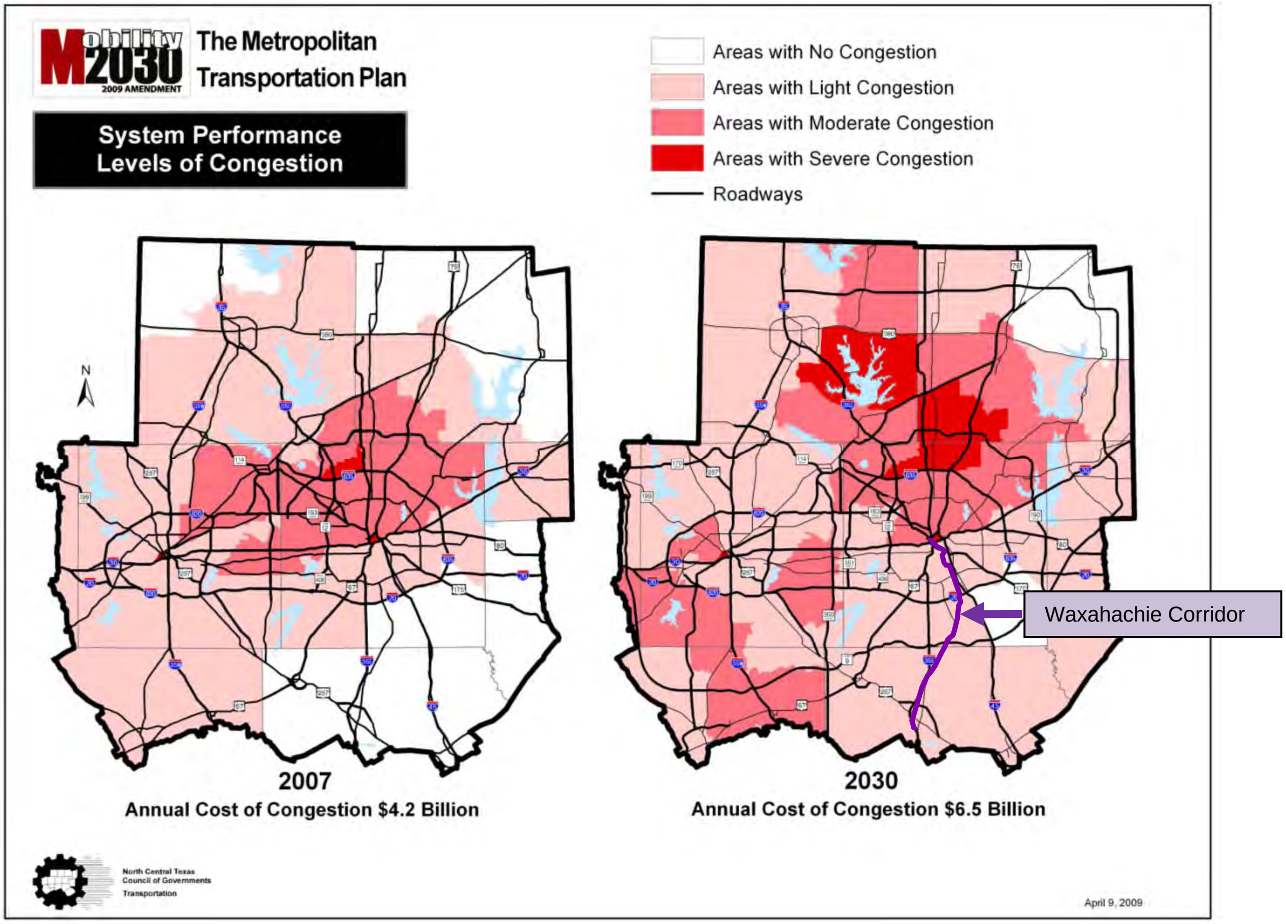
Even if all planned improvements are constructed, 2030 congestion levels will be more severe by 2030. Figures B-6 and B-7 depict the projected LOS for roadways within and near the study area in the year 2030. As shown in Figure B-8, the Waxahachie Corridor travels through areas that experience light, moderate, and severe congestion. By comparing projected congestion levels in 2030 to those shown for 2007 (see Figures B-3 and B-4), the trend for roadways in the study area is consistent with the regional trend.

Figure B-8 Levels of Congestion within the DFW Region



Source: NCTCOG, 2009

B.1.2 Transit System

Parts of the Waxahachie Corridor study area falls within the service area of the one transit provider: DART. Of all the five cities in the study area, only Dallas is a member of DART. This section details the current services provided, the near-term changes to transit service, and the long-range plans for the transit system in the study area.

Data used in this section came from two sources, DART and NCTCOG. DART provided existing and near-term expansion of transit routes and ridership data. Information regarding the long-range regional planning for transit rail projects is from NCTCOG. The travel model forecasts used in *Mobility 2030 - 2009 Amendment* are the source of information regarding projected ridership for the planned transit rail facilities within the study area.

Connection to the existing transit system would occur at Union Station. Connection to this station would offer riders direct connections to the DART Blue Line and Red Line in addition to the Trinity Railway Express (TRE). Depending on the selected alternative, service could continue along the TRE without a forced transfer. Additional connections to the DART Green Line and future Orange Line could be made through a transfer along the DART Blue Line or Red Line one station away from Union Station at the West End Station, by bus, or via walking or bicycle.

B.1.2.1 Current System

Figures B-9 and B-10 illustrate the existing and committed transit system. The DART Red Line and Blue Line currently provide light rail transit (LRT) service to Union Station in downtown Dallas. In addition, the DART Green Line operates in the study area, but does not serve Union Station. DART and the Forth Worth Transit Authority (The T) operate a joint venture commuter train from Fort Worth to Dallas called the TRE. Union Station serves as the eastern terminus for the TRE.

DART operates 55 bus routes within the study area. The 55 bus routes that pass through some portion of the study area are listed in Table B-4 and shown in Figures B-9 and B-10.

Table B-4 Existing Bus Routes

Agency	Route	Route Type
DART	1	Local
DART	2	Local
DART	8	Local
DART	11	Local
DART	12	Local
DART	19	Local
DART	21	Local
DART	24	Local
DART	26	Local
DART	29	Local
DART	31	Local
DART	35	Local
DART	36	Local
DART	37	Local
DART	39	Local
DART	42	Local
DART	44	Local
DART	49	Local
DART	50	Local
DART	51	Local
DART	52	Local
DART	59	Local
DART	60	Local
DART	63	Local
DART	76	Local
DART	110	Local
DART	111	Local
DART	155	Local
DART	161	Local

Table B-4 Existing Bus Routes (continued)

Agency	Route	Route Type
DART	164	Local
DART	165	Local
DART	183	Local
DART	184	Local
DART	185	Local
DART	202	Express
DART	204	Express
DART	205	Express
DART	206	Express
DART	207	Express
DART	210	Express
DART	247	Express
DART	278	Express
DART	283	Express
DART	405	Crosstown
DART	409	Crosstown
DART	415	Crosstown
DART	444	Crosstown
DART	466	Crosstown
DART	510	Rail Feeder
DART	538	Rail Feeder
DART	541	Rail Feeder
DART	542	Rail Feeder
DART	553	Rail Feeder
DART	554	Rail Feeder
DART	825	Special/Shuttle

Source: DART, 2009

B.1.2.2 Planned System Improvements

Beyond the existing system, DART and NCTCOG have planned additional expansions to the transit system in the study area. Part of the DART *2030 System Plan*, all future expansions have been included in Figures B-9 and B-10. These committed system expansions that occur in the study area include three additional light rail lines:

- DART Orange Line from Dallas/Fort Worth International Airport (DFWIA) through the City of Irving into downtown Dallas
- D2 light rail line offering a secondary light rail line through downtown Dallas
- DART Blue Line extension that would expand the southern terminus of the Blue Line to the Southport Station, a currently proposed station for the Waxahachie Corridor

Beyond the DART *2030 System Plan*, a Dallas streetcar service is committed to the transit system in the City of Dallas. Through the Transportation Investment Generating Economic Recovery (TIGER) grants from the federal government and a local match, a 1.5 mile segment of streetcar from Union Station to the Methodist Medical Center is planned.

Figure B-9 — Existing and Commited Transit System
From FM 66 to Bear Creek Road

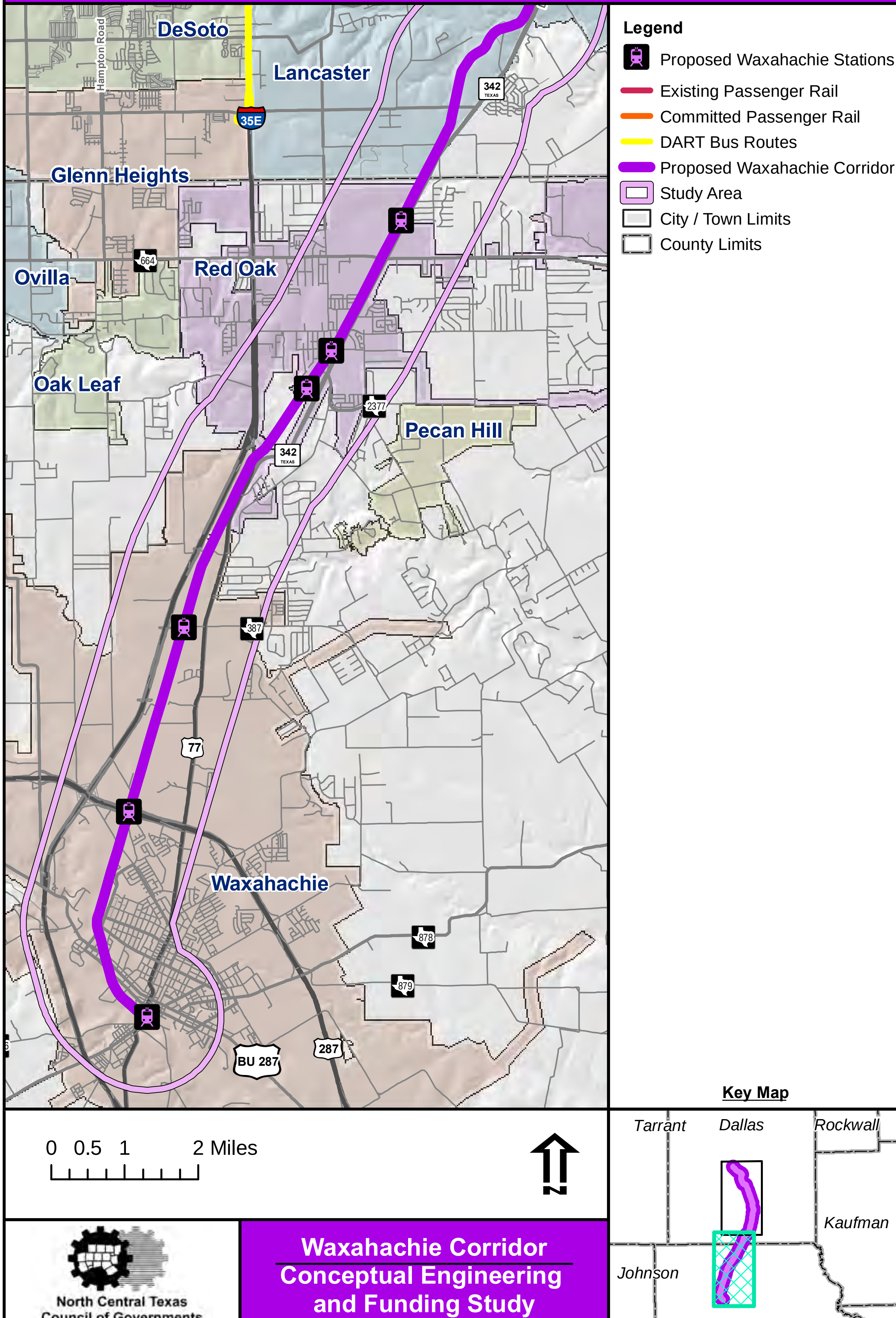


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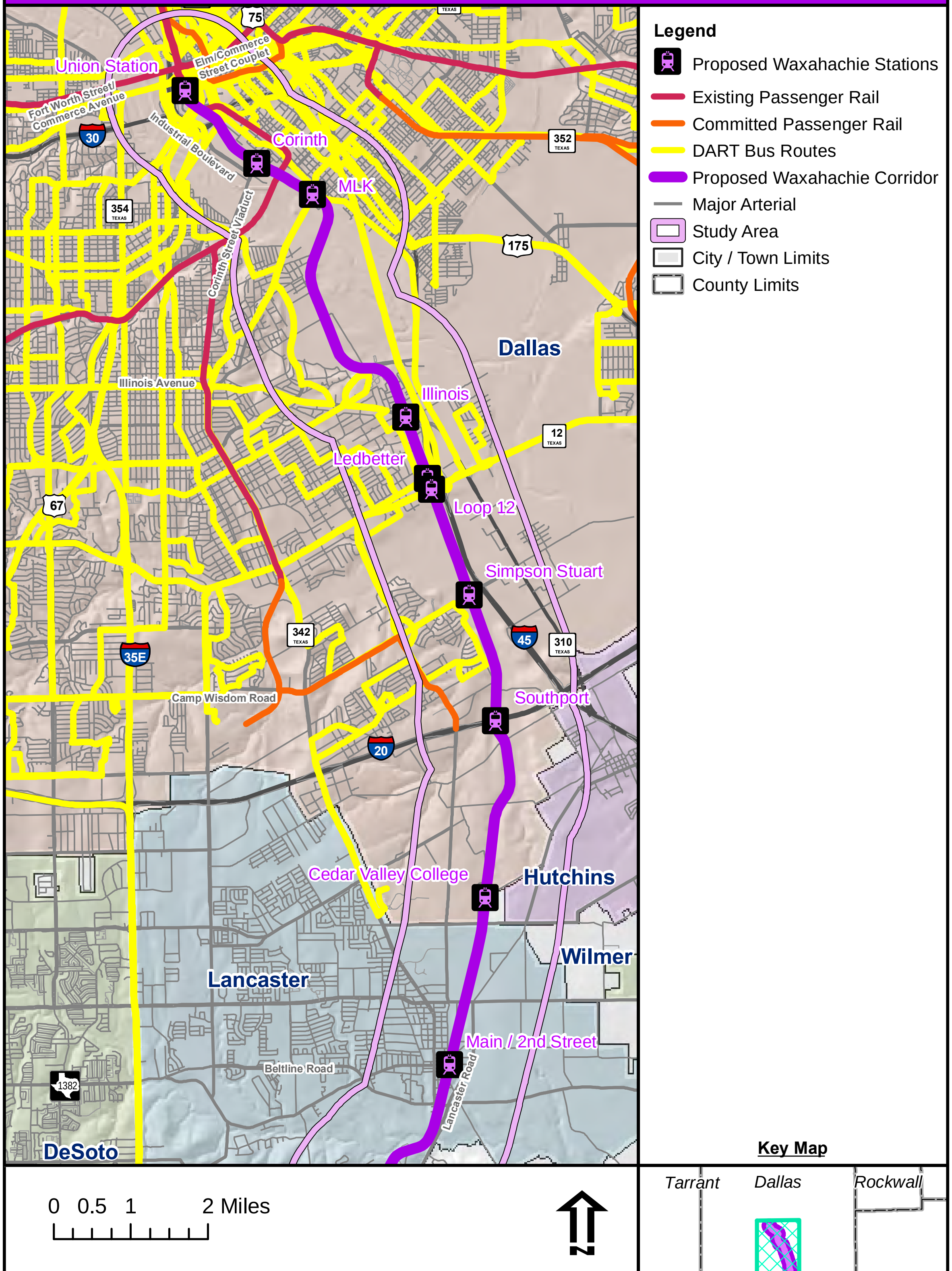
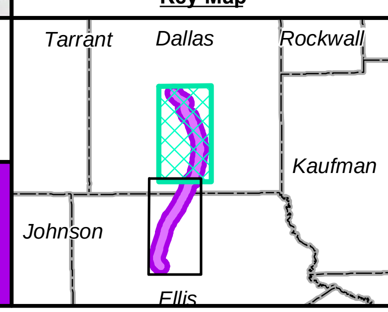
Figure B-10 — Existing and Commited Transit System
From Bear Creek Road to Spur 366



Key Map



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In the study area, there are two more planned transit systems. These systems are in the conceptual planning stages with alignments and funding still unknown. The first transit is an extension of the proposed Dallas streetcar system. This would extend the Dallas streetcar to include the downtown Dallas area and the Oak Lawn area. The second proposed transit system is the Union Pacific Railroad (UPRR) East/West rail. This proposed transit line would utilize the existing UPRR corridor. This corridor would run from downtown Dallas to downtown Fort Worth, traveling through the City of Arlington and parallel to the TRE commuter rail line.

B.1.3 Bicycle and Pedestrian

Dedicated facilities for bicycles and pedestrians exist in several locations within the study area. Municipalities with existing facilities include the Cities of Dallas, Hutchins, Lancaster, and Waxahachie. Four of the five municipalities within the study area have planned bicycle and pedestrian facilities; only the City of Red Oak does not have current or planned bicycle or pedestrian facilities. NCTCOG also has a future planned regional network of bicycle and pedestrian facilities detailed in the Regional Veloweb.

The data used in this section comes from NCTCOG and from the most recent comprehensive plans of study area municipalities. NCTCOG maintains the data describing the existing and planned facilities associated with the Regional Veloweb, a 644-mile, designated off-street trail network planned to provide bicycle and pedestrian connections in the DFW Metroplex.

B.1.3.1 Current System

There are currently about 40 miles of bicycle and pedestrian facilities within the study area. The City of Dallas has almost 37 miles of trails and the City of Waxahachie has over three miles of trails. As illustrated in Figures B-11 and B-12, most of the existing bicycle and pedestrian facilities are located in the northern half of the study area in the City of Dallas. Table B-5 provides a complete list of the existing bicycle and pedestrian facilities in the study area.

Figure B-11 — Existing and Planned Bicycle and Pedestrian Facilities
From FM 66 to Bear Creek Road

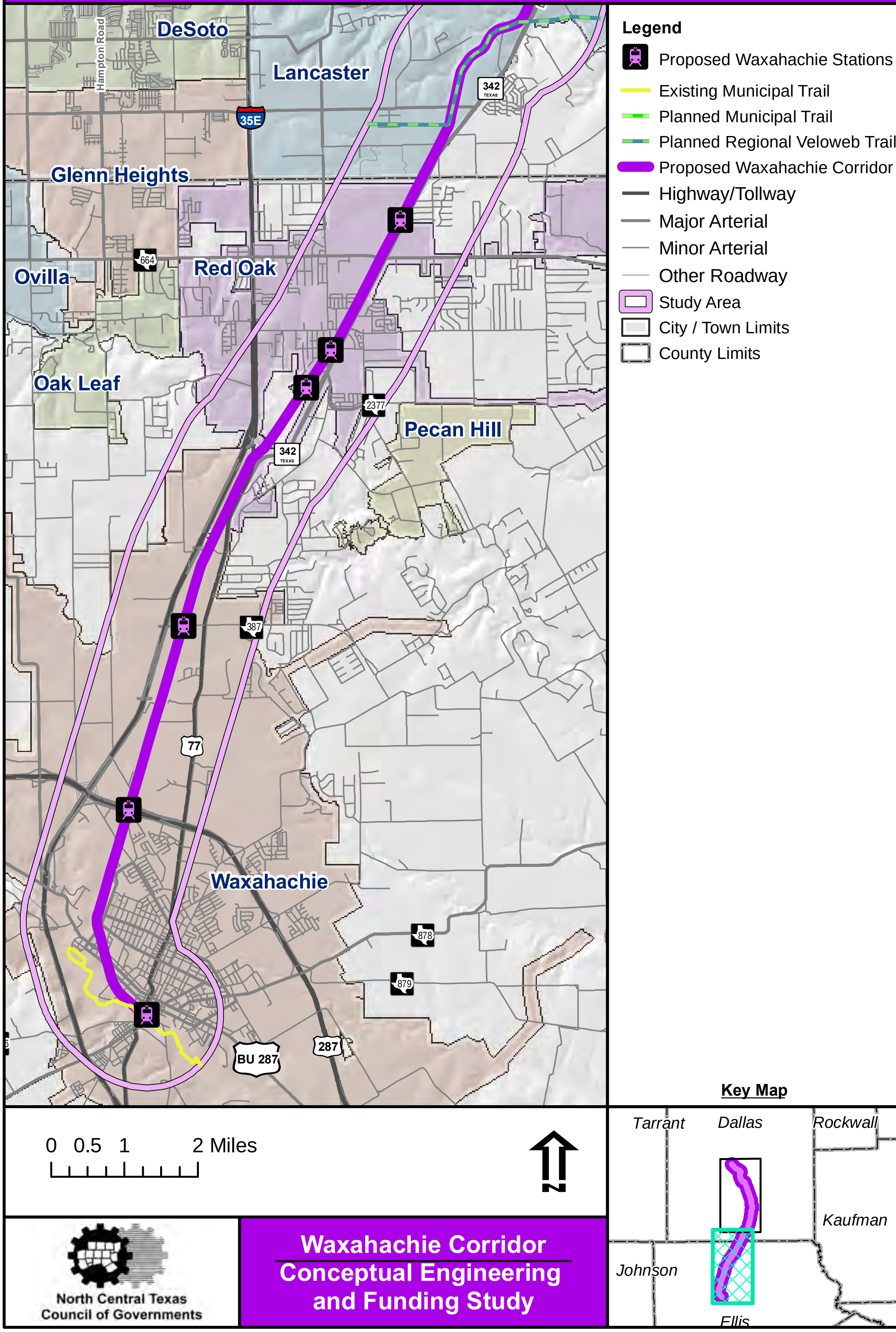

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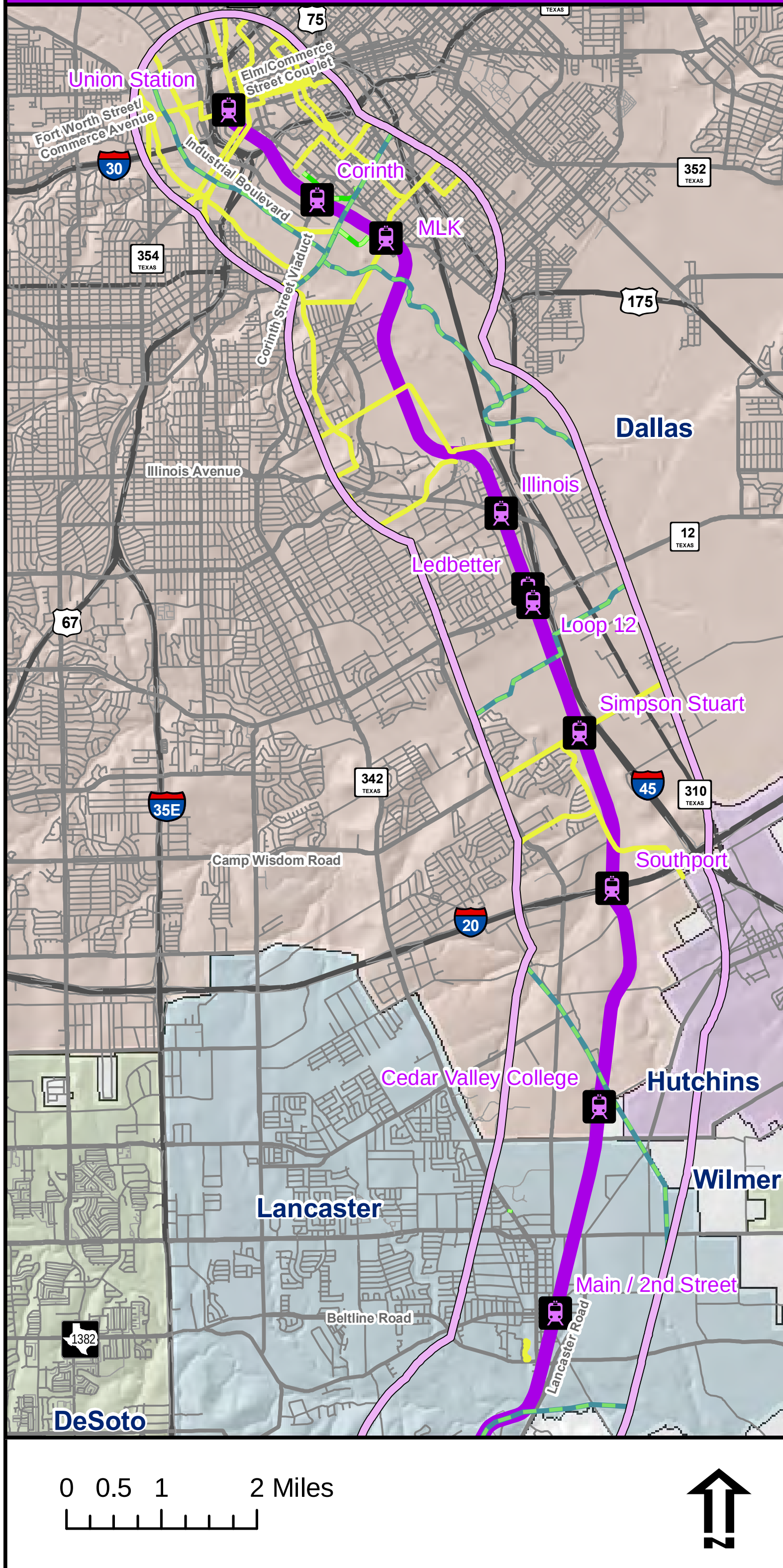
Figure B-12 — Existing and Planned Bicycle and Pedestrian Facilities
From Bear Creek Road to Spur 366



Legend

- Proposed Waxahachie Stations
- Existing Municipal Trail
- Planned Municipal Trail
- Planned Regional Veloweb Trail
- Proposed Waxahachie Corridor
- Highway/Tollway
- Major Arterial
- Minor Arterial
- Other Roadway
- Study Area
- City / Town Limits
- County Limits

Key Map

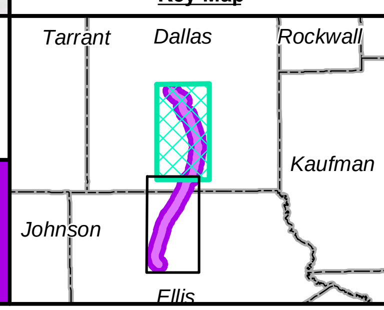


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Table B-5 Existing Bicycle and Pedestrian Facilities

City	Data Source	Trail Name	Facility	Length (miles)
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 39	On-Street	2.30
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 45	On-Street	4.41
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 49	On-Street	0.01
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 55	On-Street	8.65
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 73	On-Street	1.24
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 100	On-Street	0.93
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 110	On-Street	2.04
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 140	On-Street	1.15
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 160	On-Street	2.59
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 170	On-Street	1.50
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 180	On-Street	0.39
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 190	On-Street	3.58
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 194	On-Street	0.80
Dallas	Dallas Bike Plan	Greater Dallas Bike Plan, Route 210	On-Street	1.13
Dallas	Unknown	Trinity Levee Trail	Off-Street	5.77
Dallas	Unknown	Unknown	Off-Street	0.11
Hutchins	Dallas Bike Plan	Greater Dallas Bike Plan, Route 55	On-Street	0.06
Lancaster	Unknown	Unknown	Off-Street	0.39
Waxahachie	Unknown	Unknown	Off-Street	0.68
Waxahachie	Unknown	Waxahachie Creek Hike and Bike	Off-Street	2.64
Unincorporated	Dallas Bike Plan	Greater Dallas Bike Plan, Route 55	On-Street	0.03

Source: NCTCOG, 2010

B.1.3.2 Planned System Improvements

All but the City of Red Oak have planned expansions to their local bicycle and pedestrian trail systems within the study area, totaling approximately 21 miles. The City of Dallas has plans for approximately 15 miles of additional bicycle and pedestrian facilities through off-street and Regional Veloweb improvements. The City of Lancaster plans to add approximately five additional miles of off-street and Regional Veloweb improvements. The Cities of Hutchins and Waxahachie plan to add less than one mile of bicycle and pedestrian trails each within the study area for off-system and Regional Veloweb improvements. Of the planned facilities, 2.0 miles (nine percent) are local off-street trails and 19.3 miles (91 percent) are planned Regional Veloweb facilities. There were no identified planned on-street facilities in the study area. Shown in Figures B-11 and B-12 and listed in Table B-6 are the off-street planned bicycle and pedestrian facilities and Table B-7 list the planned Regional Veloweb trails.

Table B-6 Planned Municipal Bicycle and Pedestrian Facilities

Municipality	Data Source	Trail Name	Facility Type	Length (miles)
Dallas	Dallas Bike Plan	Austin Street Abandoned Rail Corridor	Off-Street	0.71
Dallas	Dallas Bike Plan	Santa Fe Trestle Trail	Off-Street	0.68
Dallas	Unknown	Santa Fe Trestle Trail	Off-Street	0.54
Lancaster	Unknown	Unknown	Off-Street	0.04
Waxahachie	Unknown	Rogers Street Bridge Improvements	Off-Street	0.02

Source: NCTCOG, 2009

The Regional Veloweb alignment, introduced in *Mobility 2010: The Regional Transportation Plan for the North Central Texas Region (Mobility 2010)*, was determined through the cooperative efforts of local governments and NCTCOG. About 19.3 miles of Regional Veloweb facilities are planned in the study area. The proposed Southwest Dallas County trail of the Regional Veloweb would utilize a portion of the proposed Waxahachie Corridor in the existing BSNF right-of-way for approximately two miles in the City of Lancaster. Figures B-11 and B-12 illustrate the locations of planned Regional Veloweb improvements in the study area. Table B-7 lists the planned Regional Veloweb trails that fall within the study area.

Table B-7 Planned Regional Veloweb

Municipality	Data Source	Trail Name	Facility	Length (miles)
Dallas	Dallas Bike Plan	Cedar Valley	Regional Veloweb	5.74
Dallas	Dallas Bike Plan	Cedar Veloway	Regional Veloweb	0.20
Dallas	Dallas Bike Plan	East Dallas Veloway Connector	Regional Veloweb	0.39
Dallas	Dallas Bike Plan	Main Stem Trinity	Regional Veloweb	1.25
Dallas	Dallas Bike Plan	Mesquite Connector	Regional Veloweb	0.37
Dallas	Dallas Bike Plan	Red Bird Way	Regional Veloweb	2.35
Dallas	Dallas Bike Plan	Texas Electric Trail	Regional Veloweb	<0.01
Dallas	Dallas Bike Plan	Trinity Bottoms	Regional Veloweb	2.50
Dallas	Unknown	Bear Creek	Regional Veloweb	0.01
Dallas	Unknown	Cedar Veloway	Regional Veloweb	0.09
Dallas	Unknown	Texas Electric Trail	Regional Veloweb	0.59
Hutchins	Dallas Bike Plan	Cedar Valley	Regional Veloweb	0.30
Lancaster	Dallas Bike Plan	Cedar Valley	Regional Veloweb	4.16
Lancaster	Unknown	Southwest Dallas County Loop	Regional Veloweb	1.11
Unincorporated	Dallas Bike Plan	Cedar Valley	Regional Veloweb	0.25

Source: NCTCOG, 2009

B.1.4 Freight

The source of data used is this section was NCTCOG and TxDOT. Data collected from TxDOT describes the freight rail system. NCTCOG tracks the locations of freight intensive facilities, freight oriented developments (FODs), and Foreign Trade Zones (FTZs).

The existing roadway system serves most freight movement within the study area. The corridor averages six freight trains a day, four from BNSF, and two from the UPRR. There are also several freight intensive facilities, such as distribution centers and warehouses within the study area.

<u>Current System</u>

Truck lane restrictions are restrictions that can be placed on controlled access facilities in the state system that contain three or more travel lanes in each direction. The restrictions prevent large trucks such as semi trucks from using the left lane on the limited access roadway. Trucks may use this lane to pass vehicles but may not use this lane as a travel lane. This restriction is to allow greater flow of traffic on truck-heavy roadways. IH 20 and IH 45 have current truck lane restrictions implemented in the study area.

Several locations within the study area have concentrations of freight intensive facilities including 35 warehouses, six distribution centers, three terminal areas, and 26 manufacturing centers. These facilities are concentrated mainly in three areas, north Waxahachie (north of US 287), near the proposed Southport Station south of IH 20, and near downtown Dallas. Access to freight rail service was an important location factor for many freight facilities within the Waxahachie Corridor. Figures B-13 and B-14 show the locations of the freight intensive facilities.

Another important component of the regional freight system are federally designated FTZs, where goods are considered outside of US customs territory. Within FTZs goods can be stored, distributed, manufactured, assembled, inspected, tested, and repackaged prior to officially entering US customs territory. The benefits of these zones include reduced/deferred duty rates, reduced inventory taxes, and increased security while goods are moving through the supply chain. There is one FTZ within the study area, Southport, which is a secondary sight for the DFW FTZ (FTZ #39).

A FOD is an area that consolidates manufacturing, warehousing, distributing, and freight forwarding operations in a location with ready access to a multimodal transportation network and allows for the efficient and effective movement of goods. By clustering freight transportation services, FOD areas allow transfer costs to be kept to a minimum, increase reliability in delivery and pick-up times, and reduce the overall cost of consumer goods. Of the 24 identified FODs in the DFW region, two occur in the study area. The Dallas Southport is located on IH 20 between SH 342 and IH 45 and includes the Southport FTZ. Dallas Ecopark is located on the UPRR rail line near SH 310 and Simpson Stewart Road.

Owned by BNSF and the UPRR, the Waxahachie Corridor rail line provides active freight rail service for all the cities in the study area. Two freight lines cross the Waxahachie Corridor, the east-west UPRR line crosses near downtown Dallas and the Mansfield UPRR line crosses near the southern terminus in the City of Waxahachie. There are 47.4 miles of UPRR freight rail, 40.7 miles of BNSF freight rail, 14.2 miles of DART light rail, 2.8 miles of TRE commuter rail, and 2.0 miles of the Dallas Garland and Northeastern Railroad (DGNO) freight rail within the study area. Figures B-13 and B-14 illustrate the locations of freight rail facilities within the study area.

Figure B-13 — Goods Movement and Aviation Facilities
From FM 66 to Bear Creek Road

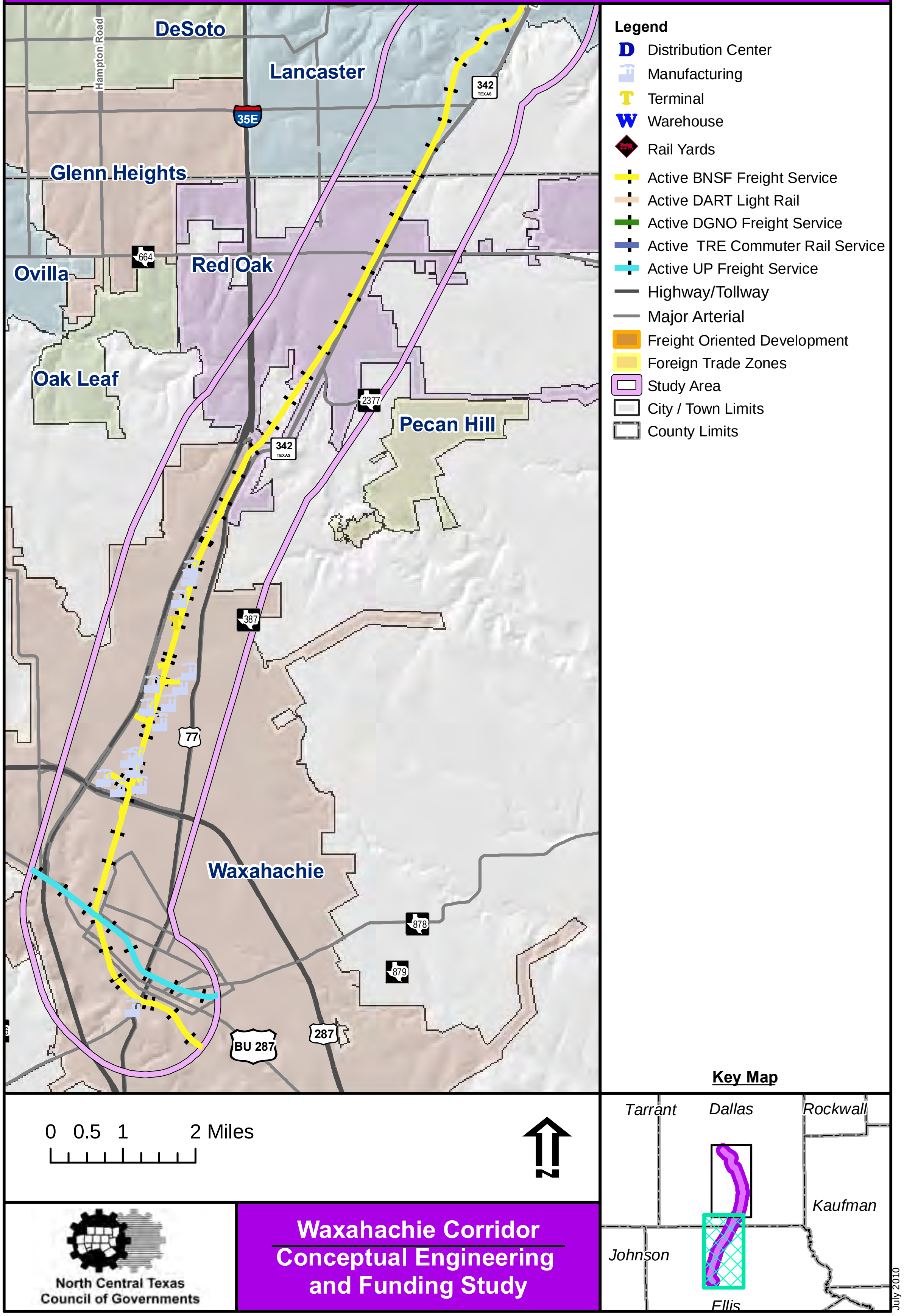

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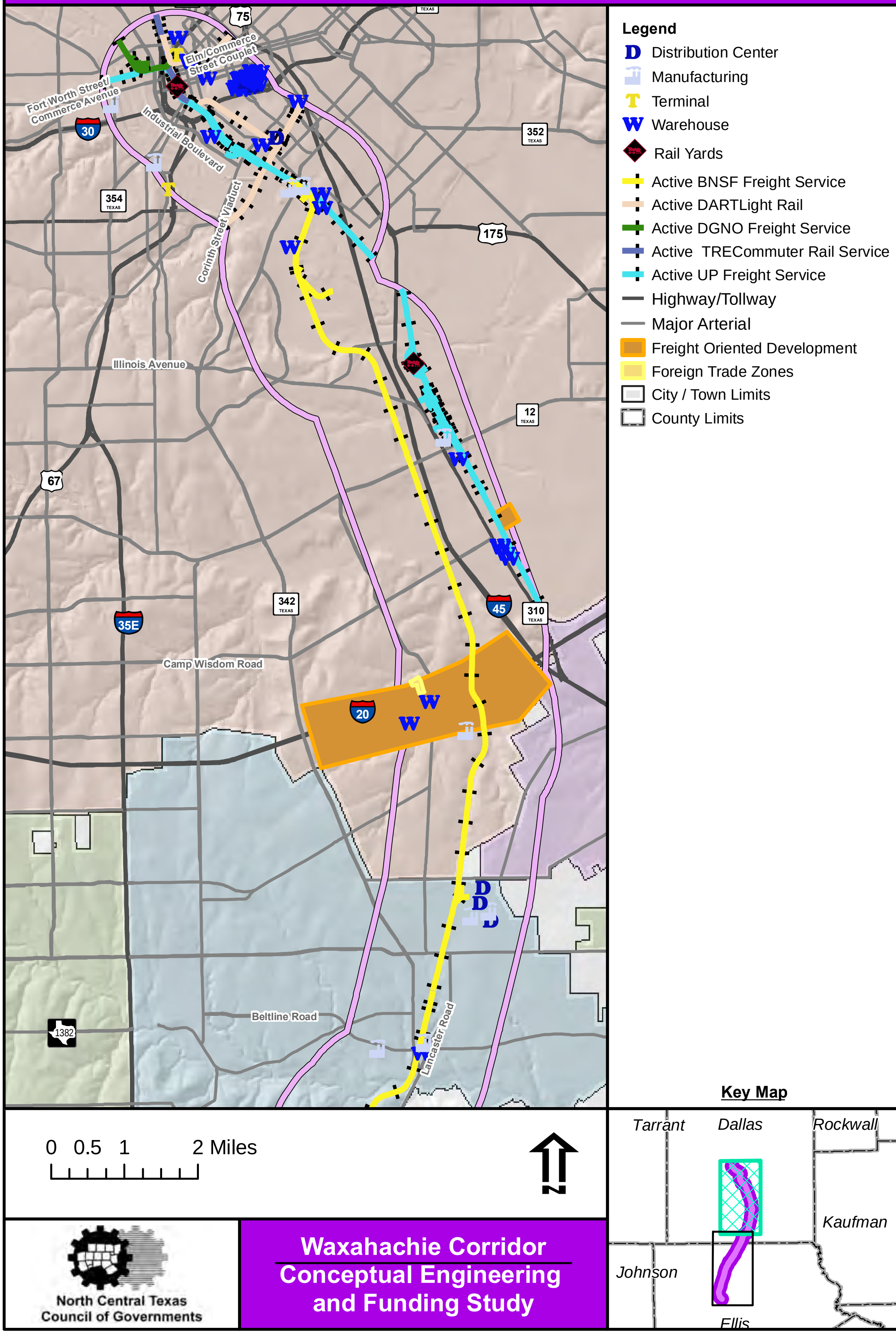
Figure B-14 — Goods Movement and Aviation Facilities
From Bear Creek Road to Spur 366



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Planned System Improvements

Few planned changes in the freight system are publicly available as private companies serve most freight movements. IH 35E and IH 30 have been identified as potential long-term intercity truck lane restrictions in the study area. Currently, there has been no timeframe identified for the implementation of additional truck lane restrictions for these facilities in the study area for the Waxahachie Corridor.

B.1.5 Aviation

Two primary commercial service airports serve the DFW region: DFWIA and Dallas Love Field. These airports serve public needs by hosting scheduled commercial and private airline service. The primary commercial airports provide the same function within the DFW region as seaports serve in coastal regions. These facilities supply North Central Texas with access to world markets, allowing the region to compete for high-value overseas trade opportunities. DFWIA and Fort Worth Alliance Airport handle the majority of air cargo traffic within the region.

There were several sources used to collect the data for this section, NCTCOG and the airports. NCTCOG maintains data describing the location of airports within the region. Airport master development plans detail the planned improvements to each facility.

Current System

There are no aviation facilities in the Waxahachie Corridor study area. The Lancaster Regional Airport lies approximately 0.6 miles from the study area in the City of Lancaster. This regional airport is a private airport serving small private aircraft and cargo aircraft.

Planned System Improvements

The Lancaster Regional Airport is currently planning a 1,500-foot extension of its existing runway to accommodate larger aircraft.

B.1.6 Travel Patterns

This section discusses the general travel patterns in the study area. Commuting patterns and major activity centers within the study area and throughout the region are also analyzed in this section. The information in this section comes from the US Census Bureau journey to work data and NCTCOG. Data compiled from the 1990 Census and 2000 Census show how commuting patterns have changed over time.

B.1.6.1 2000 Census Data

For the 2000 Census, Arlington, Dallas, Denton, Fort Worth, and Irving are the central cities of the DFW Metropolitan Statistical Area (MSA). Approximately 39 percent of the study area lies within the central cities of the DFW MSA. According to the 2000 Census, 74.7 percent of employees in the study area work within their county of residence, only 44.0 percent work within their municipality of residence and 94.6 percent work within the DFW MSA. For the entire DFW MSA, 71.5 percent of employees work within their county of residence, 36.4 percent work within the city or town where they reside and 88.8 percent work within the DFW

MSA. Table B-8 shows a comparison between 2000 Census place of work data between the study area residents and the entire DFW MSA.

Table B-8 2000 Commuting Patterns

2000 Census Category	Study Area		DFW MSA		Difference
	Number	Percent	Number	Percent	
Place of Work By State					
Worked in state of residence:	68,322	99.6%	2,510,207	99.3%	0.3%
In county of residence	51,267	74.7%	1,806,134	71.5%	3.2%
Outside county of residence	17,055	24.9%	704,073	27.9%	-3.0%
Worked outside of state	288	0.4%	17,441	0.7%	-0.3%
Place of Work By Place (City or Town)					
Living in a place:	58,597	85.4%	2,337,394	92.5%	-7.1%
Worked in place	30,163	44.0%	920,327	36.4%	7.6%
Worked outside place	28,434	41.4%	1,417,067	56.1%	-14.7%
Not in identified place	10,031	14.6%	190,254	7.5%	13.3%
Place of Work By MSA					
Living in an MSA:	68,610	100.0%	2,527,648	100.0%	0.0%
Worked in MSA of residence:	64,873	94.6%	2,244,568	88.8%	5.8%
Central city	37,427	54.6%	1,232,272	48.8%	5.8%
Remainder	27,446	40.0%	1,012,296	40.0%	0.0%
Worked in a different MSA:	3,285	4.8%	262,622	10.4%	-5.6%
Central city	2,195	3.2%	167,198	6.6%	-3.4%
Remainder	1,090	1.6%	95,424	3.8%	-2.2%
Worked outside any MSA	452	0.7%	20,458	0.8%	-0.1%

Source: 2000 US Census

Respondents to the 2000 Census reported that 87.7 percent of workers who reside in the study area commute using a car, truck, or van, with 70.2 percent driving alone trips and 17.5 percent in two or more person carpools. Among workers, the other methods reported by at least 1,000 workers for accessing employment and their overall share of commutes were public transportation at 6.4 percent, working at home at 2.5 percent, and walking to work at 2.3 percent. Table B-9 provides journey to work information organized by mode of travel and geographic area. The 4.6 percent difference in work trips on public transportation between the study area and the DFW MSA reflects the usage of public transportation options within the City of Dallas.

Table B-9 2000 Census Mode of Travel to Work

Mode of Travel to Work	Study Area Number	Study Area Percent	DFW MSA Number	DFW MSA Percent	Difference
Car, truck, or van:	59,919	87.7%	2,343,257	92.7%	-5.0%
Drive alone	47,960	70.2%	1,990,617	78.8%	-8.6%
Carpool	11,959	17.5%	352,640	14.0%	3.5%
Public Transportation:	4,364	6.4%	45,765	1.8%	4.6%
Bus or trolley bus	4,153	6.1%	40,094	1.6%	4.5%
Motorcycle	66	0.1%	2,565	0.1%	0.0%
Bicycle	77	0.1%	3,435	0.1%	0.0%
Walked	1,543	2.3%	37,331	1.5%	0.8%
Other means	644	0.9%	19,895	0.8%	0.1%
Worked at home	1,727	2.5%	75,400	3.0%	-0.5%

Source: 2000 US Census

Travel time to work for the residents of the study area was similar to the travel times for the whole DFW MSA. A lower proportion of study area residents (29.7 percent) had a commute of 15 to 29 minutes when compared to the rest of the DFW MSA (34.8 percent). Table B-10 shows the proportions of respondents within each reported travel time range for residents of the study area and for the MSA.

Table B-10 Year 2000 Commuting Travel Times

Travel Time	Study Area Number	Study Area Percent	DFW MSA Number	DFW MSA Percent	Difference
Did not work at home:	66,883	97.5%	2,452,248	97.0%	0.5%
0 to 14 minutes	15,084	22.0%	549,594	21.7%	0.3%
15 to 29 minutes	20,358	29.7%	879,813	34.8%	-5.1%
30 to 44 minutes	16,081	23.4%	589,026	23.3%	0.1%
45 to 59 minutes	8,291	12.1%	242,588	9.6%	2.5%
60 to 89 minutes	4,732	6.9%	134,079	5.3%	1.6%
90 or more minutes	2,337	3.4%	57,148	2.3%	1.1%
Worked at home	1,727	2.5%	75,400	3.0%	-0.5%

Source: 2000 US Census

B.1.6.2 Census Data Trends

As shown in Table B-11, the geographical distribution of places of employment for workers in the study area changed slightly between 1990 and 2000. The proportion of workers employed within the state was almost unchanged, while the percentage of workers employed within their county of residence decreased by 6.8 percent. The proportion of workers employed within their city or town of residence decreased by 9.9 percent. Between 1990 and 2000, the proportion of workers who worked in the central cities decreased slightly.

Table B-11 Census Place of Work Trends for the Study Area

Census Category	1990 Census		2000 Census		Differences	
	Number	Percent	Number	Percent	Number	Percent
Place of Work By State						
Worked in state of residence:	66,385	99.6%	68,322	99.6%	18,301	0.0%
In county of residence	54,287	81.5%	51,267	74.7%	-3,020	-6.8%
Outside county of residence	12,098	18.2%	17,055	24.9%	4,957	6.7%
Worked outside of state	237	0.4%	288	0.4%	51	0.0%
Place of Work By Place (City or Town)						
Living in a place:	59,637	89.5%	58,597	85.4%	-1,040	-4.1%
Worked in place	35,935	53.9%	30,163	44.0%	-5,772	-9.9%
Worked outside place	23,702	35.6%	28,434	41.4%	4,732	5.8%
Not in identified place	6,985	10.5%	10,031	14.6%	3,046	4.1%
Place of Work By MSA						
Living in an MSA:	66,622	100.0%	68,610	100.0%	1,948	0.0%
Worked in MSA of residence:	63,575	95.4%	64,873	94.6%	1,298	-0.8%
Central city	42,411	63.7%	37,427	54.6%	-4,984	-9.1%
Remainder	21,164	31.8%	27,446	40.0%	6,282	8.2%
Worked in a different MSA:	2,807	4.2%	3,285	4.8%	478	0.6%
Central city	1,870	2.8%	2,195	3.2%	325	0.4%
Remainder	937	1.4%	1,090	1.6%	153	0.2%
Worked outside any MSA	240	0.4%	452	0.7%	212	0.3%

Source: 1990 and 2000 US Census

Like the trends in the geographic distribution of employment, the mode choices of study area commuters did not change drastically between 1990 and 2000. Table B-12 summarizes the responses of workers in the study area to mode choice questions from the 1990 and 2000 Census. The largest increase in mode share was drive alone, which went from 85.1 percent to 87.7 percent of the total working population between 1990 and 2000. The greatest percentage reduction among the reported mode choices was riding a bus or trolley bus which accounted for 2.8 percent fewer trips in 2000 than in 1990. The total number of workers in the study area increased in those 10 years, leading to a corresponding increase in total number of people choosing to drive alone, motorcycles, bicycles, and working at home.

Table B-12 Census Mode of Travel to Work Trends

Mode of Travel to Work	1990 Census		2000 Census		Differences	
	Number	Percent	Number	Percent	Number	Percent
Car, truck, or van:	56,696	85.1%	59,919	87.7%	3,223	2.6%
Drive alone	44,373	66.6%	47,960	70.2%	3,587	3.6%
Carpool	12,323	18.5%	11,959	17.5%	-364	-1.0%
Public Transportation:	6,007	9.0%	4,364	6.4%	-1,643	-2.6%
Bus or trolley bus	5,898	8.9%	4,153	6.1%	-1,745	-2.8%
Motorcycle	42	0.1%	66	0.1%	24	0.0%
Bicycle	27	0.0%	77	0.1%	50	0.1%
Walked	2,181	3.3%	1,543	2.3%	-638	-1.0%
Other means	647	1.0%	644	0.9%	-3	-0.1%
Worked at home	1,022	1.5%	1,727	2.5%	705	1.0%

Source: 1990 and 2000 US Census

The trend in travel times for commuters indicates that workers within the study area are taking longer to get to their places of employment in comparison to the previous census. As shown in Table B-13, the proportion of workers with commute times less than 45 minutes, with the exception of zero to 15 minutes, decreased and the proportion of workers with commute times within each interval over 45 minutes increased. Overall, the proportion of workers with commutes less than 30 and 45 minutes decreased by 3.5 percent and 2.5 percent from 1990 to 2000.

Table B-13 Census Commuting Travel Time Trends

Travel Time	1990 Census		2000 Census		Differences	
	Number	Percent	Number	Percent	Number	Percent
Did not work at home:	65,600	98.5%	66,883	97.5%	1,283	-1.0%
0 to 14 minutes	14,382	21.6%	15,084	22.0%	702	0.4%
15 to 29 minutes	22,119	33.2%	20,358	29.7%	-1,761	-3.5%
30 to 44 minutes	17,242	25.9%	16,081	23.4%	-1,161	-2.5%
45 to 59 minutes	7,097	10.7%	8,291	12.1%	1,194	1.4%
60 to 89 minutes	3,503	5.3%	4,732	6.9%	1,229	1.6%
90 or more minutes	1,257	1.9%	2,337	3.4%	1,080	1.5%
Worked at home	1,022	1.5%	1,727	2.5%	705	1.0%

Source: 1990 and 2000 US Census

B.2 BUILT ENVIRONMENT

B.2.1 Land Use

This section describes the current land uses, development trends, and local government plans in the study area.

B.2.1.1 Legal and Regulatory Context

Chapter 211 of the Local Government Code establishes the framework under which municipal governments in Texas control land use. The purpose of this code is to promote the public health, safety, morals, or general welfare and to protect and preserve places and areas of historical, cultural, or architectural importance and significance. This code allows municipal governments (local municipalities and counties) to have direct control to establish rules for the use of structures and land. Section 211.004 of the Local Government Code requires that zoning regulations adopted must conform to a comprehensive plan. Each municipality has the ability to set regulations on land use and zoning within its boundaries. In addition, counties can regulate land use in non-incorporated areas in their county. Each county and municipality in the study area all have various land use and zoning regulations implemented for control of growth.

B.2.1.2 Methodology/Research

NCTCOG 2005 land use geographic information system (GIS) data was used to document existing conditions. In addition, aerial photography and GIS feature data was used to determine the specific existing land use around each transit station. The city comprehensive plans and land use plans were used to determine compatibility and future land use projections around each station.

B.2.1.3 Existing Conditions and Future Projections/Plans

This section discusses the land use around the Waxahachie Corridor. The project study area encompasses portions of Dallas and Ellis Counties and the municipalities of Dallas, Hutchins, Lancaster, Red Oak, and Waxahachie. Potential stations may be located in these municipalities. The 2005 GIS land use data was subdivided into nine categories: residential (single-family, multi-family, and mobile homes), government/educational (group quarters and institutional), commercial (office, retail, mixed use, and hotel/motel), industrial, infrastructure (transportation and utilities), airports (airports and runways), dedicated (parks/recreational areas and landfills), water, and undeveloped (under construction, vacant, and expanded parking). Table B-14 shows the distribution of land use types within the study area.

Table B-14 2005 Land Use within Study Area

Land Use Type	Percentage
Residential	16.6%
Industrial	7.1%
Dedicated	5.0%
Government/Educational	4.5%
Infrastructure	3.8%
Commercial	3.1%
Water	1.7%
Airports	0.0%
Undeveloped	58.2%

Source: NCTCOG GIS Land Use, 2005

Undeveloped land accounts for approximately 58.2 percent of the identified land use within the study area. Residential land use accounts for 16.6 percent of the land use in the study area, with the remaining land use a mixture of the other seven categories. Figures B-15 and B-16 graphically illustrate the land use in the Waxahachie Corridor study area.

B.2.1.4 Station Areas

The current land use and future land use plans around each station are summarized in this section. The stations are listed south to north geographically. The area within one-half mile of each station has been established as the station analysis area. The 2005 land use within the station analysis areas is shown in Table B-15. Where applicable, planned land use changes are also discussed.

Table B-15 Land Use Acreage within Station Analysis Areas

Station	Residential	Governmental/ Educational	Commercial	Industrial	Infrastructure	Dedicated	Water	Undeveloped
Waxahachie CBD	80.8	46.5	84.0	40.0	9.5	--	--	157.1
	19.3%	11.1%	20.1%	9.6%	2.3%	--	--	37.6%
US 287	57.8	30.4	25.2	144.1	5.4	--	6.1	134.8
	14.3%	7.5%	6.2%	35.7%	1.3%	--	1.5%	33.4%
North Waxahachie	2.9	0.9	24.5	77.2	6.3	--	2.2	325.5
	0.7%	0.2%	5.6%	17.6%	1.4%	--	0.5%	74.1%
South Red Oak	54.5	20.0	0.8	25.4	4.1	7.4	1.2	346.3
	11.9%	4.4%	0.2%	5.5%	0.9%	1.6%	0.3%	75.3%
Downtown Red Oak	148.6	32.0	12.5	22.0	4.8	7.2	--	205.2
	34.4%	7.4%	2.9%	5.1%	1.1%	1.7%	--	47.5%
North Red Oak	56.4	0.8	1.1	--	5.9	--	--	408.6
	11.9%	0.2%	0.2%	--	1.2%	--	--	86.4%
Lancaster CBD	154.3	25.1	14.2	39.1	8.5	6.9	--	174.8
	36.5%	5.9%	3.4%	9.2%	2.0%	1.6%	--	41.3%
Cedar Valley College	15.2	0.5	--	32.3	25.5	--	0.8	405.1
	3.2%	0.1%	--	6.7%	5.3%	--	0.2%	84.5%
Southport	21.1	7.2	6.5	9.6	2.7	--	0.3	364.4
	5.1%	1.8%	1.6%	2.3%	0.6%	--	0.1%	88.5%
Simpson Stuart	47.6	54.3	1.0	5.7	--	11.0	11.0	265.8
	12.0%	13.7%	0.3%	1.4%	--	2.8%	2.8%	67.1%
Loop 12	92.6	0.8	1.6	34.6	75.1	--	--	141.3
	26.8%	0.2%	0.5%	10.0%	21.7%	--	--	40.8%
Ledbetter	120.7	1.0	1.1	40.0	54.0	0.1	--	112.6
	36.6%	0.3%	0.3%	12.1%	16.4%	0.0%	--	34.2%
Illinois	132.5	10.1	9.5	73.4	33.4	7.9	--	76.0
	38.6%	3.0%	2.8%	21.4%	9.7%	2.3%	--	22.2%
MLK	45.7	3.3	8.5	93.6	17.2	3.2	11.1	219.2
	11.4%	0.8%	2.1%	23.3%	4.3%	0.8%	2.8%	54.6%
Corinth	5.8	6.4	10.7	165.8	45.9	66.2	19.4	67.7
	1.5%	1.7%	2.8%	42.7%	11.8%	17.1%	5.0%	17.4%
Union	2.0	58.9	52.6	10.2	11.6	35.1	--	94.5
	0.8%	22.2%	19.9%	3.9%	4.4%	13.2%	--	35.7%

Source: NCTCOG, 2009
Note: Reported percentages may not sum to 100.0 percent due to rounding

Waxahachie Central Business District Station

The proposed Waxahachie central business district (CBD) Station is located at the old rail depot in downtown Waxahachie near the intersection of Rodgers Street and Madison Street. The majority of the land use within the ½ mile buffer is undeveloped (38 percent), commercial (20 percent), and residential (19 percent). The station would be located at the southern end of the main downtown business area of Waxahachie. Small commercial businesses are located to the north and northeast of the proposed station. Intermixed in these commercial businesses are numerous public facilities including the fire department, police department, sheriff's department, and Waxahachie City Hall. Northwest and southwest of the proposed station includes single-family residential neighborhoods. A large creek occupies the land just south of the proposed station and the floodplain associated with the creek contributes to the majority of the vacant land. The City of Waxahachie has identified this proposed station in the future land use plans. Future land use around the proposed station includes transit-oriented development (TOD), retail, public/semi-public, mixed-use non-residential, and low density residential. Land use near this station is shown on Figure B-15.

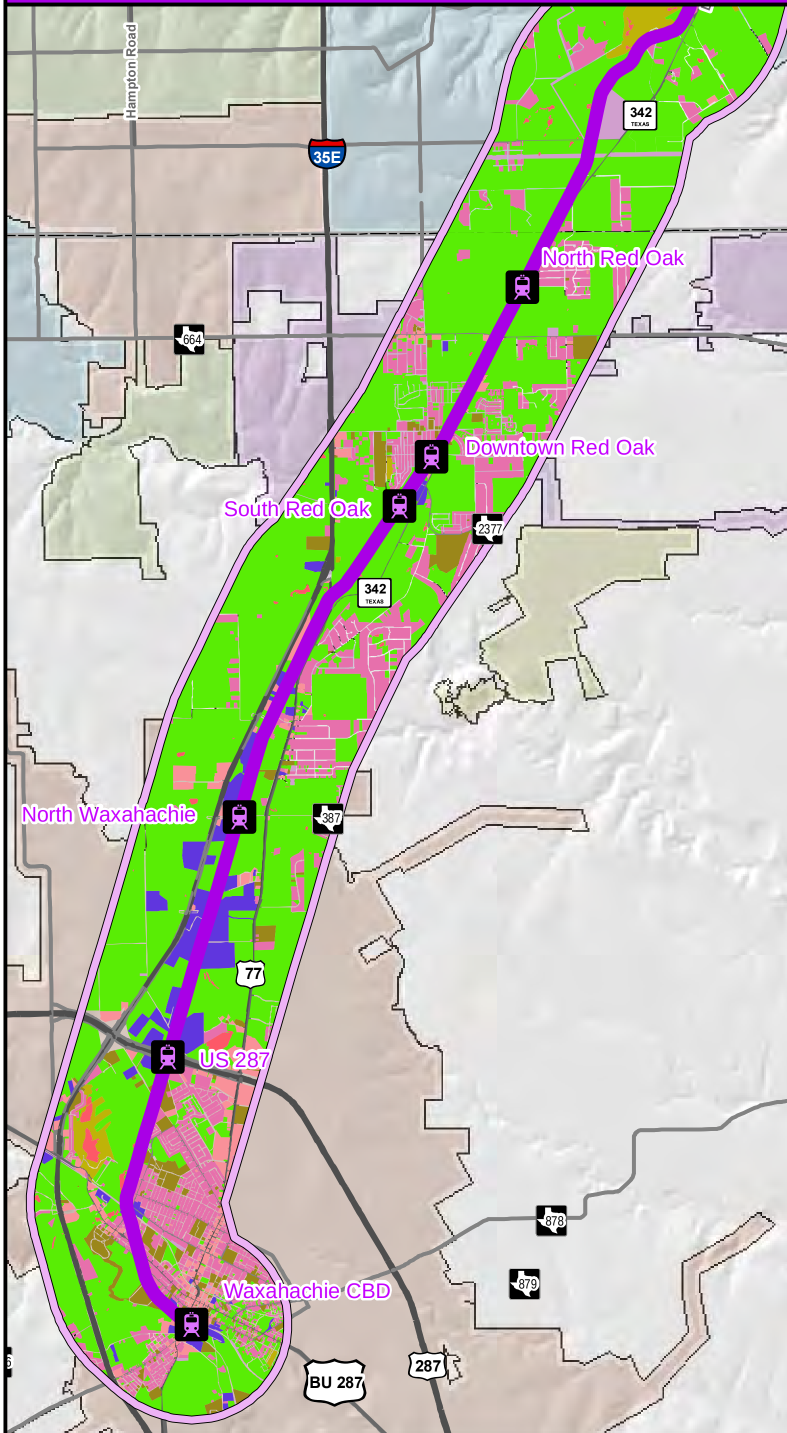
US 287 Station

The proposed US 287 Station would be located on US 287 between IH 35E and US 77. The majority land use is industrial (36 percent), undeveloped (33 percent), and residential (14 percent). The majority of the surrounding land is large industrial business such as Dart Container, US Aluminum, and Life-Like Products. Residential multi-family complexes are located south of US 287 with some single-family residential located southeast of the proposed station. Vacant land is intermixed between the industrial businesses and residential areas. The City of Waxahachie has identified this station in their future land use plans. Future land used identified by the city includes TODs, industrial, non-residential mixed-use, and retail. Land use near this station is shown on Figure B-15.

North Waxahachie Station

The proposed North Waxahachie station would be located on the intersection of the railroad and Butcher Road. The majority of the land use is undeveloped (74 percent), industrial (18 percent), and commercial (six percent). No major businesses or areas of interest are in the ½ mile buffer around the proposed station. The area around the station consists mostly of farmland and vacant land with scattered industrial facilities. Future land use for this area is industrial and retail. Land use near this station is shown on Figure B-15.

Figure B-15 — 2005 Land Use
From FM 66 to Bear Creek Road



Legend

- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

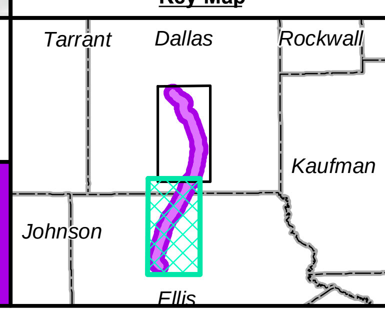
Land Use

- Residential
- Government/Education
- Commercial
- Industrial
- Infrastructure
- Dedicated
- Water
- Undevelopment

0 0.5 1 2 Miles

N

Key Map



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South Red Oak Station

The proposed South Red Oak Station would be located in the City of Red Oak, in the southern portion of the city south of Hawk Lane on the railroad. The majority of land use is undeveloped (75 percent), residential (12 percent), and industrial (six percent). The current area within ½ mile of the proposed station to the west is mostly vacant land and floodplain. Some industrial buildings are clustered around SH 342 with a commercial shopping center. The proposed future land use of the proposed site is a mixed used development of commercial, industrial, and single-family residential. Land use near this station is shown on Figure B-15.

Downtown Red Oak Station

The proposed Downtown Red Oak Station would be located in the historic downtown section of Red Oak north of Main Street. The majority of land use is undeveloped (47 percent), residential (34 percent), and governmental/institutional (seven percent). The land surrounding the proposed station consists of farmland, single-family residential, and some commercial areas along SH 342. Future land use has identified three different development land uses in this location: single-family developments, an apartment complex development zone, and an industrial development zone. In addition to these specific developments, five specialized planning areas were included in the future land use. These areas include a specialized single-family residential development, a commercial mixed used development, two separate areas of mixed used development of commercial and single-family, and mixed use commercial and multi-family residences (lofts above commercial areas). Land use near this station is shown on Figure B-15.

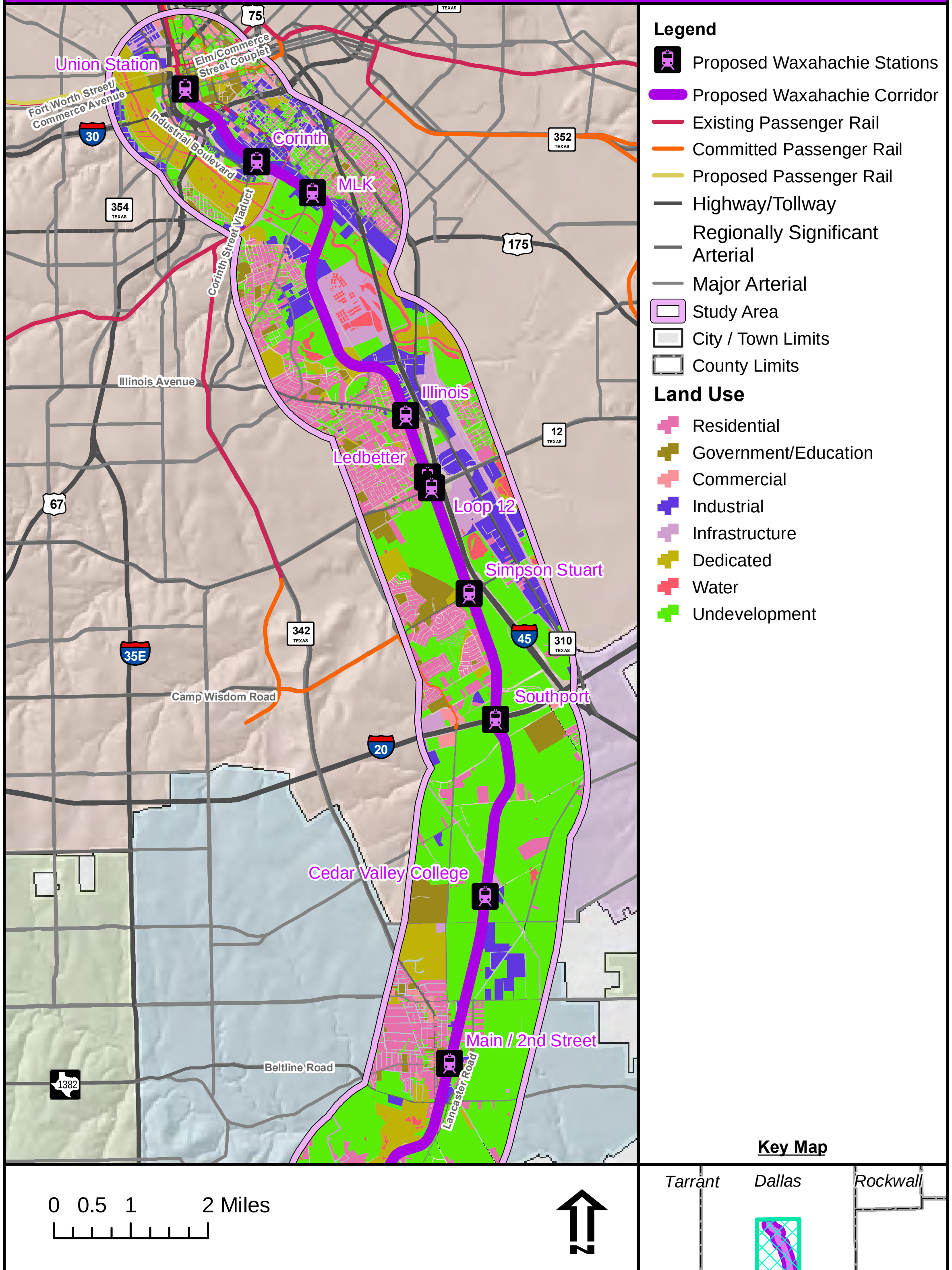
North Red Oak Station

The proposed North Red Oak station would be located north of Farm-to-Market (FM) 664 (Ovilla Road) near the northern city limit of the City of Red Oak. The majority of land use is undeveloped (86 percent), residential (12 percent), and infrastructure (one percent). The land is mostly vacant land with some single-family residential northeast of the proposed station. Future land use identified by the City of Red Oak includes mixed-use development of commercial and single-family and mixed use development consisting of commercial, industrial, and single-family. Land use near this proposed station is shown on Figure B-15.

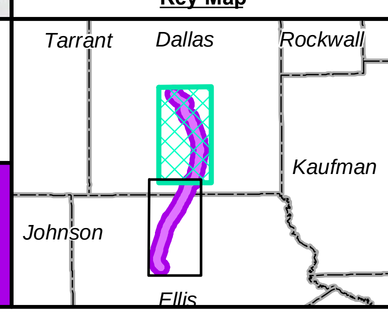
Lancaster Central Business District Station

The proposed Lancaster CBD station would be located on Main Street at the location of the proposed rail depot relocation next to the historic downtown area of the City of Lancaster. The majority of land use is undeveloped (41 percent), residential (36 percent), and industrial (nine percent). Land use surrounding the station is focused on the downtown area of Lancaster. Small commercial businesses as well as government facilities such as the City Hall are located west of the proposed rail station. East of the proposed station is mostly floodplain and farmland. Surrounding the downtown area of Lancaster to the west, north, and south are single-family residences. Surrounding the potential rail station, the City of Lancaster has identified five separate land uses which include mixed-use development, low density residential, commercial, light industrial, and the historic town square. Land use near this station is shown on Figure B-16.

Figure B-16 — 2005 Land Use
From Bear Creek Road to Spur 366



Key Map



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Cedar Valley College Station

This location of this proposed station would be east of Cedar Valley College at the intersection of the existing rail line and Witt Road. The majority of land use is dominated by undeveloped (85 percent), industrial (seven percent), and infrastructure (five percent). The area surrounding the station is majority vacant land and farmland. Some industrial facilities are located to the south and east of the proposed station. These facilities include the Adesa Auto Auction and Brenntag Southwest. According to the City of Dallas '*forward Dallas!*' Comprehensive Plan, the area around this proposed transit station will part of the campus district and an industrial area. Land use near this station is shown on Figure B-16.

Southport Station

The proposed Southport Station would be located near IH 20 west of IH 45. The majority of the existing land use is undeveloped (89 percent), residential (five percent), and industrial (two percent). The area around the proposed station is open vacant fields and floodplains. Some small industrial type businesses are located at the intersection of Bonnie View Road and IH 20. These industries include Chrome Plus USA, DMJ Properties, and Sukhi Corporation. The Dallas Logistics Hub occupies the southern end of the ½ mile radius surrounding the proposed station. The City of Dallas has future land use for the proposed area as a commercial center and industrial use. This station is listed in the *DART 2030* system plan for the southern terminus of the southern DART Blue Line rail station. Land use near this station is shown on Figure B-16.

Simpson Stuart Station

This proposed Simpson Stuart Station is to be located on Simpson Stuart Boulevard west of IH 45 in the City of Dallas. The majority of the land use is undeveloped (67 percent), government/institutional (14 percent), and residential (12 percent). The buffer area consists of one residential community located to the southwest with schools and the remaining area mostly floodplain. Future land use at this proposed transit station would enhance the existing land use by development of residential neighborhoods. Land use near this station is shown on Figure B-16.

Loop 12 Station

The proposed Loop 12 Station would be located on the western side of the intersection between Loop (LP) 12 and IH 45. The majority of the land use is undeveloped (41 percent), residential (27 percent), and infrastructure (22 percent). The area is categorized with infrastructure businesses east of IH 45, floodplain southwest of IH 45, multi-family residences west of IH 45 on LP 12 and single-family residences northwest of IH 45 and LP 12. The City of Dallas has identified the area as industrial area, campus district, and residential neighborhood in their future land use plans. Land use near this station is shown on Figure B-16.

Ledbetter Station

The proposed Ledbetter Station would be located adjacent to IH 45 on Ledbetter Drive. The majority of the land use is residential (37 percent), undeveloped (34 percent), and infrastructure (16 percent). The area surrounding the proposed station is similar compared to the proposed Loop 12 Station. More single-family residences are located west of IH 45, while only some floodplain remains south of Ledbetter Drive. The same infrastructure businesses are located east of IH 45. Future land use plans identify the area to be zoned as industrial, floodplain, and residential neighborhoods. Land use near this station is shown on Figure B-16.

Illinois Station

The proposed Illinois Station would be located at Illinois Avenue and adjacent to IH 45. The majority of the land use is residential (39 percent), undeveloped (22 percent), and industrial (21 percent). The ½ mile area around the station supports mostly single-family and multi-family residences. The undeveloped land is all vacant land associated with the interchange of Illinois Avenue and IH 45. Numerous industrial facilities and warehouses occupy the area east of IH 45. Future land use plans by the City of Dallas have the area zoned for urban neighborhoods west of IH 45 and industrial areas east of IH 45. Land use near this station is shown on Figure B-16.

MLK Station

The proposed MLK Station would be located on Martin Luther King Jr. Boulevard west of IH 45 and on the southern edge of the City of Dallas downtown area. The existing land use is undeveloped (55 percent), industrial (23 percent), and residential (11 percent). The area is characterized with industrial facilities surrounding the existing rail line. South of the proposed station, beyond the industrial businesses, is floodplain associated with the Trinity River. Residential neighborhoods occupy the space beyond the industrial businesses northwest of the proposed station; the residential areas are a mixture of single-family and multi-family buildings. Intermixed in the residential areas are vacant lots and abandoned homes. City of Dallas future plans for the area include urban neighborhoods and urban mixed use land types. Land use near this station is shown on Figure B-16.

Corinth Station

This proposed station would be located on Corinth Street southeast of the interchange between IH 30 and IH 35E. Existing land use is predominately industrial (43 percent), undeveloped (17 percent), and dedicated (17 percent). The area surrounding the station is dominated by industrial and warehouse areas including Sears and Roebuck and Standard Fruit & Vegetable. The Dallas Police Headquarters is northeast of the proposed station in addition to the existing Cedars Station on the DART Blue and Red LRT lines. Southwest of the proposed station is the Trinity River, which is considered parkland with an existing trail system. The City of Dallas identified this area as urban mixed-use for future land use. Land use near this station is shown on Figure B-16.

Union Station

The existing station would be the terminal station for the proposed Waxahachie Corridor. Union Station serves both the DART Red and Blue LRT lines as well the TRE. The station is located on the western side of the downtown core of the City of Dallas east of IH 35E. Existing land use is undeveloped land (36 percent), government/institutional (22 percent), and commercial (20 percent). Existing land use is mostly parking and parking garages for the downtown area. Numerous high-rise builds are located east of the existing station housing multiple commercial businesses including the Belo Building, Founders Square, and the Landmark Center. Government facilities are interspersed between the commercial areas including the Dallas County Sherriff's Office, Dallas County Courts, George Allen Courts, and a military installation. Future land use has been identified as the Downtown area by the City of Dallas. Land use near this station is shown on Figure B-16.

B.2.2 Socio-Economic

This section addresses the existing conditions for socio-economics in the Waxahachie Corridor study area. Subjects covered include community facilities, employment, economics and developments, environmental justice, and limited English proficiency (LEP).

B.2.2.1 Legal and Regulatory Context

The study area is reviewed for compliance with Executive Orders 12898 and 13166, Title VI of 1964 Civil Rights Act, US Department of Transportation (USDOT) Order 5610.2, and Council on Environmental Quality (CEQ) guidance.

Executive Order 12898 entitled Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations mandates that each federal agency "shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…" The three fundamental principles of environmental justice are:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial, reduction, or delay in the receipt of benefits by minority and low-income populations.

Executive Order 13166, Improving Access to Service for Persons with Limited English Proficiency, requires federal agencies to examine the services they provide and identify any need for services to those with LEP. The Executive Order requires federal agencies to ensure that recipients of federal financial assistance provide meaningful access to their LEP applicants and beneficiaries. Failure to ensure that LEP persons can effectively participate in or benefit from federally assisted programs and activities may violate the prohibitions under Title VI of the Civil Rights Restoration Act of 1987 and 42 US Code (USC) 2000d against national origin discrimination.

The objective of USDOT Order 5610.2 was to develop a process that "integrates the existing statutory and regulatory requirements in a manner that helps ensure that the interests and well being of minority populations and low-income populations are considered and addressed during transportation decision making." The policy states "[t]his will be done by fully considering environmental justice principles throughout planning and decision-making processes in the development of programs, policies, and activities, using the principles of the National Environmental Policy Act of 1969."

The CEQ guidance document *Environmental Justice: Guidance Under the National Environmental Policy Act*, states that minority populations should be identified as either:

- The minority population of the affected area exceeds 50 percent
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis

A minority population definition is a group of people and/or community experiencing common conditions of exposure or impact that consists of persons classified by the US Census Bureau as Negro/Black/African-American, Hispanic, Asian or Pacific Islander, American Indian, Eskimo, or Aleut, or other non-white persons. According to the US Census Bureau, a low-income population is a group of people and/or community that, as a whole, lives below the national poverty level. The Department of Housing and Urban Development (HUD) provides a more localized poverty guideline and defines a low-income household as one where income is 80 percent, or less, of the county median. Disproportionate environmental impacts from the exposure to an environmental hazard occur when the risk to a minority population or low-income population exceeds the risk to the general population.

B.2.2.2 Methodology/Research

Demographics of Dallas and Ellis Counties and the study area were analyzed for environmental justice impacts. The 2000 Census data has been used to identify minority, low-income, and LEP communities in the study area. Social and demographic data for the census tracts comprising the study area were analyzed to determine those tracts that are minority, low-income, and/or LEP populations within the context for the general population characteristics for the corridor. This was accomplished by comparing the proportion for the minority population, the median household income, and LEP population reported for census tracts in the study corridor with the overall populations for Dallas and Ellis Counties.

B.2.2.3 Existing Conditions and Future Projections

General population trends for the DFW region and the study area are discussed in Chapter 2, Section 2.1.1. As shown in Chapter 2, Table 2-1, the DFW area has shown sustained population growth since 1990 and is projected to grow by almost three million people over the next 20 years. The projected population and employment for municipalities along the Waxahachie Corridor, shown in Chapter 2, Table 2-2, indicate an increase in population and employment between 2000 and 2030 of 167.3 percent and 50.0 percent, respectively.

Fifty-one census tracts were identified in the study area for the Waxahachie Corridor and are shown in Figures B-17 and B-18. The ethnic composition of the study area is approximately 42.2 percent White, 43.9 percent Black/African-American, 0.5 percent American Indian/Alaska Native, 0.4 percent Asian, and less than 0.1 percent Native Hawaiian or other Pacific Islander. The study area exhibits a higher percentage of Black/African-American ethnic minorities than Dallas and Ellis Counties as a whole. Table B-16 shows the population, race, and ethnicity for Dallas and Ellis Counties and the study area.

Figure B-17 — 2000 US Census Tracts
From FM 66 to Bear Creek Road

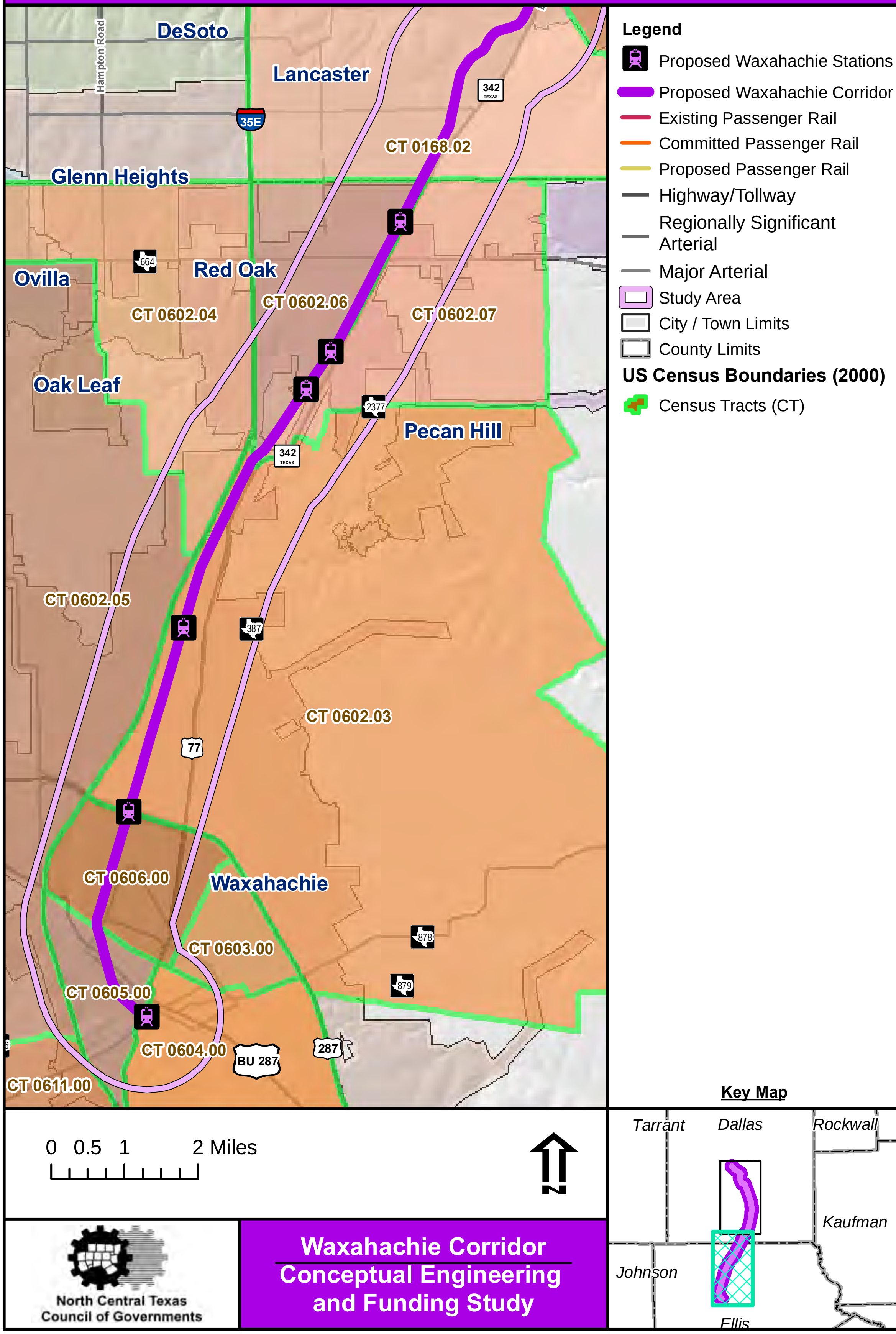

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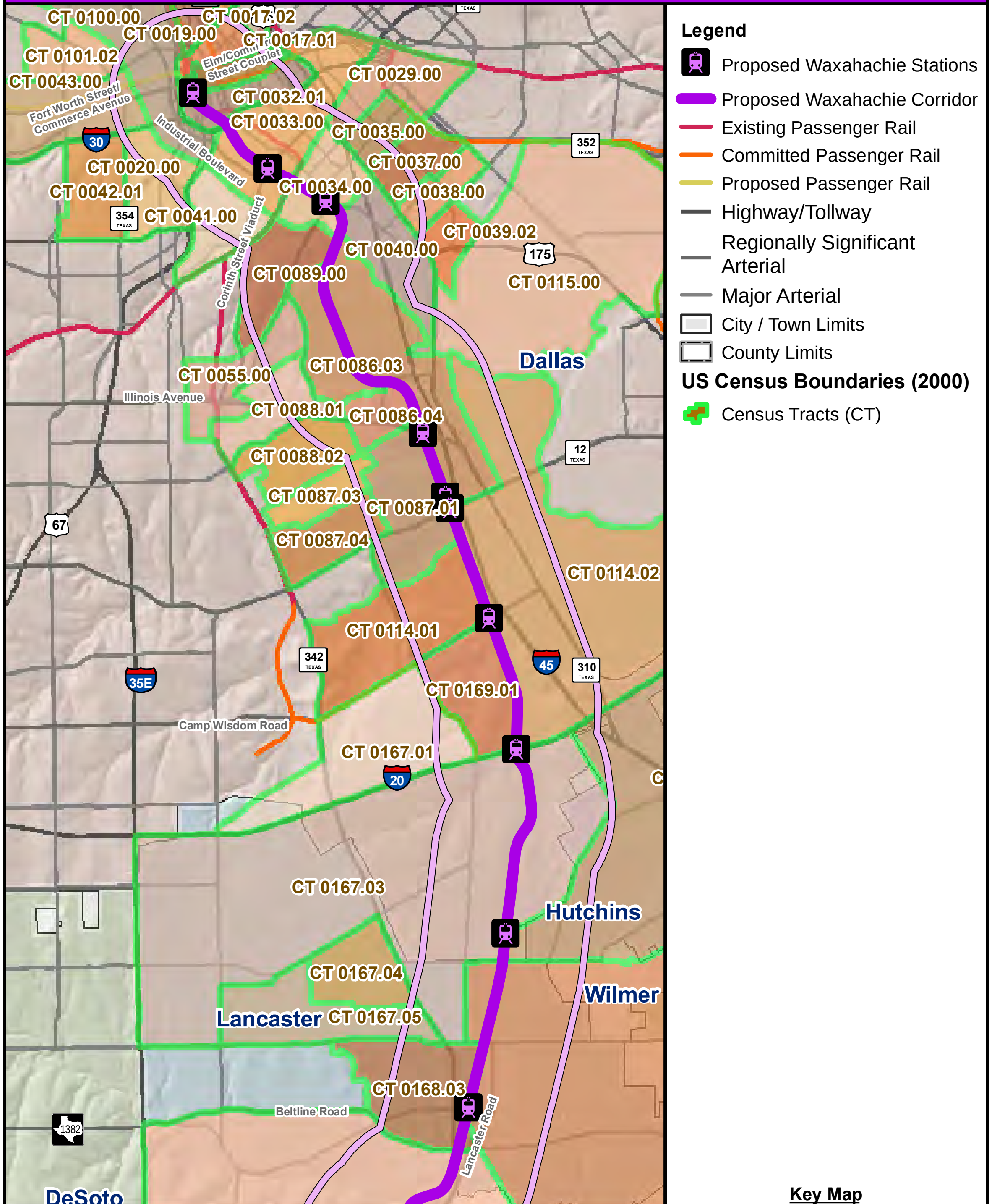
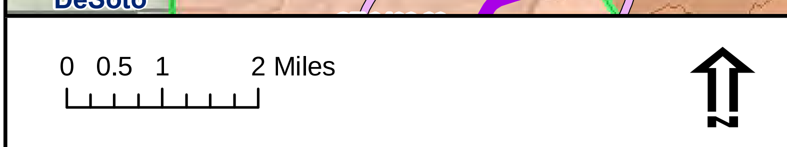
Figure B-18 — 2000 US Census Tracts
From Bear Creek Road to Spur 366





Key Map

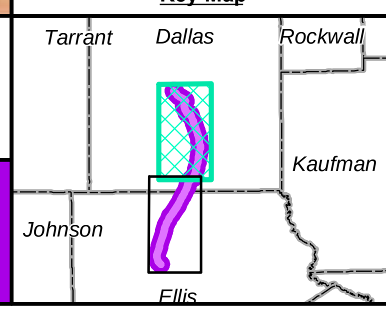


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Table B-16 2000 Population and Ethnicity Composition

Characteristic	Dallas County		Ellis County		Study Area	
	Population	Percent	Population	Percent	Population	Percent
White	1,294,769	58.4%	89,789	80.1%	77,632	42.2%
Black	450,557	20.3%	9,626	8.6%	80,640	43.9%
American Indian	12,499	0.6%	662	0.6%	972	0.5%
Asian	88,369	4.0%	392	0.4%	694	0.4%
Native Hawaiian	1,277	<0.1%	18	<0.1%	66	<0.1%
Other race	311,504	14.0%	8,797	7.9%	20,337	11.1%
Two or more	59,924	2.7%	2,076	1.9%	3,555	1.9%
Hispanic[1]	662,729	29.9%	20,508	18.4%	38,808	21.1%

Source: US Census, 2000
1. Hispanic persons are not considered a separate race and may belong to any race.

Although Hispanic (or Latino) persons may be of any race, they are considered a minority population in addition to the other identified minority races. The study area has a Hispanic population of 21.1 percent. The study area exhibits a higher percentage of Hispanic than Ellis County at 18.4 percent, but a lower percentage than Dallas County at 29.9 percent.

Race is a self-identification data item based on an individual's perception of his or her racial identity. Respondents on the 2000 Census Bureau form chose the race(s) with which they most closely identified. Ethnicity is the classification of a population that share common characteristics such as religion, traditions, culture, language, tribal, or national origin (ancestry, nationality, or country of birth); Hispanics can be of any race. In the 2000 Census Bureau population by race/ethnicity data, the Hispanic (or Latino) population could include any of following seven race categories: White, Black/African-American, American Indian/Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, some other race, or two or more races. The study area is classified as minority. Specifically, 36 out of the 51 census tracts were identified as minority population census tract with 35 of the 36 occurring in Dallas County. Table B-17 shows population and race by census tract.

Table B-17 Population, Race, and Ethnicity by Census Tract

Census Tract	Total 2000 Population[1]	White	Black/African-American	American Indian/Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Some other Race	Two or More Races	Hispanic or Latino[2]
17.01	1	0	1	0	0	0	0	0	0
	100%	*0.0%*	*100%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
17.02	1,870	1,630	125	5	50	1	34	25	108
	100%	*87.2%*	*6.7%*	*0.3%*	*2.7%*	*0.1%*	*1.8%*	*1.3%*	*5.8%*
19.00	1,860	1,310	340	7	67	4	93	39	190
	100%	*70.4%*	*18.3%*	*0.4%*	*3.6%*	*0.2%*	*5.0%*	*2.1%*	*10.2%*
20.00	7,271	2,672	813	83	14	0	3,489	200	6,042
	100%	*36.7%*	*11.2%*	*1.1%*	*0.2%*	*0.0%*	*48.0%*	*2.8%*	*83.1%*
21.00	9	9	0	0	0	0	0	0	0
	100%	*100.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Table B-17 Population, Race, and Ethnicity by Census Tract (continued)

Census Tract	Total 2000 Population[1]	White	Black/African-American	American Indian/Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Some other Race	Two or More Races	Hispanic or Latino[2]
29.00	951	116	774	0	5	0	41	15	69
	100%	*12.2%*	*81.4%*	*0.0%*	*0.5%*	*0.0%*	*4.3%*	*1.6%*	*7.3%*
31.01	1,911	1,392	338	14	23	1	59	84	268
	100%	*72.8%*	*17.7%*	*0.7%*	*1.2%*	*0.1%*	*3.1%*	*4.4%*	*14.0%*
32.01	277	116	127	3	10	0	6	15	36
	100%	*41.9%*	*45.8%*	*1.1%*	*3.6%*	*0.0%*	*2.2%*	*5.4%*	*13.0%*
33.00	2,066	912	280	33	21	2	751	67	1,229
	100%	*44.1%*	*13.6%*	*1.6%*	*1.0%*	*0.1%*	*36.4%*	*3.2%*	*59.5%*
34.00	1,460	262	1,070	3	6	0	74	45	189
	100%	*17.9%*	*73.3%*	*0.2%*	*0.4%*	*0.0%*	*5.1%*	*3.1%*	*12.9%*
35.00	1,983	77	1,842	2	10	0	22	30	48
	100%	*3.9%*	*92.9%*	*0.1%*	*0.5%*	*0.0%*	*1.1%*	*1.5%*	*2.4%*
37.00	3,565	43	3,427	8	0	0	49	38	89
	100%	*1.2%*	*96.1%*	*0.2%*	*0.0%*	*0.0%*	*1.4%*	*1.1%*	*2.5%*
38.00	2,758	27	2,687	1	8	1	12	22	57
	100%	*1.0%*	*97.4%*	*0.0%*	*0.3%*	*0.0%*	*0.4%*	*0.8%*	*2.1%*
39.02	2,099	174	1,813	12	0	0	81	19	268
	100%	*8.3%*	*86.4$*	*0.6%*	*0.0%*	*0.0%*	*3.9%*	*0.9%*	*12.8%*
40.00	1,496	64	1,281	1	0	0	137	13	182
	100%	*4.3%*	*85.6%*	*0.1%*	*0.0%*	*0.0%*	*9.2%*	*0.9%*	*12.2%*
41.00	1,440	186	1,073	11	5	1	150	14	345
	100%	*12.9%*	*74.5%*	*0.8%*	*0.3%*	*0.1%*	*10.4%*	*1.0%*	*24.0%*
42.01	5,449	2,776	280	31	33	1	2,111	217	3,637
	100%	*50.9%*	*5.0%*	*0.6%*	*0.6%*	*0.0%*	*38.7%*	*4.0%*	*66.7%*
43.00	2,860	1,007	365	9	75	2	1,321	81	2,135
	100%	*35.2%*	*12.8%*	*0.3%*	*2.6%*	*0.1%*	*46.2%*	*2.8%*	*74.7%*
55.00	3,894	288	3,077	5	12	1	464	47	720
	100%	*7.4%*	*79.0%*	*0.1%*	*0.3%*	*0.0%*	*11.9%*	*1.2%*	*18.5%*
86.03	1,687	285	861	7	3	7	493	31	794
	100%	*16.9%*	*51.0%*	*0.4%*	*0.2%*	*0.4%*	*29.2%*	*1.8%*	*47.1%*
86.04	2,420	175	1,902	9	0	0	304	30	465
	100%	*7.2%*	*78.6%*	*0.4%*	*0.0%*	*0.0%*	*12.6%*	*1.2%*	*19.2%*
87.01	4,370	132	4,095	12	3	5	90	33	216
	100%	*3.0%*	*93.7%*	*0.3%*	*0.1%*	*0.1%*	*2.1%*	*0.8%*	*4.9%*
87.03	2,754	145	2,193	9	5	0	335	67	529
	100%	*5.3%*	*79.6%*	*0.3%*	*0.2%*	*0.0%*	*12.2%*	*2.4%*	*19.2%*
87.04	3,331	150	3,043	6	0	0	113	19	181
	100%	*4.5%*	*91.4%*	*0.2%*	*0.0%*	*0.0%*	*3.4%*	*0.6%*	*5.4%*
88.01	2,609	36	2,488	2	6	4	46	27	86
	100%	*1.4%*	*95.4%*	*0.1%*	*0.2%*	*0.2%*	*1.8%*	*1.0%*	*3.3%*
88.02	5,551	176	5,066	8	2	2	221	76	404
	100%	*3.2%*	*91.3%*	*0.1%*	*0.0%*	*0.0%*	*4.0%*	*1.4%*	*7.3%*

Table B-17 Population, Race, and Ethnicity by Census Tract (continued)

Census Tract	Total 2000 Population[1]	White	Black/African-American	American Indian/Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Some other Race	Two or More Races	Hispanic or Latino[2]
89.00	2,730	180	2,296	7	5	6	197	39	387
	100%	*6.6%*	*84.1%*	*0.3%*	*0.2%*	*0.2%*	*7.2%*	*1.4%*	*14.2%*
100.00	9,614	4,731	4,059	85	24	8	306	401	1,697
	100%	*49.2%*	*42.2%*	*0.9%*	*0.2%*	*0.1%*	*3.2%*	*4.2%*	*17.7%*
101.02	3,460	1,474	142	31	2	0	1,684	127	3,189
	100%	*42.6%*	*4.1%*	*0.9%*	*0.1%*	*0.0%*	*48.7%*	*3.7%*	*92.2%*
114.01	4,079	66	3,883	3	7	0	85	35	122
	100%	*1.6%*	*95.2%*	*0.1%*	*0.2%*	*0.0%*	*2.1%*	*0.9%*	*3.0%*
114.02	689	76	555	5	0	0	51	2	82
	100%	*11.0%*	*80.6%*	*0.7%*	*0.0%*	*0.0%*	*7.4%*	*0.3%*	*11.9%*
115.00	4,956	631	3,515	3	6	3	734	64	1,469
	100%	*12.7%*	*70.9%*	*0.1%*	*0.1%*	*0.1%*	*14.8%*	*1.3%*	*29.6%*
167.01	5,249	62	5,093	8	2	3	42	39	95
	100%	*1.2%*	*97.0%*	*0.2%*	*0.0%*	*0.1%*	*0.8%*	*0.7%*	*1.8%*
167.03	3,765	1,878	996	36	9	0	752	94	1,213
	100%	*49.9%*	*26.5%*	*1.0%*	*0.2%*	*0.0%*	*20.0%*	*2.5%*	*32.2%*
167.04	4,065	878	2,813	10	14	5	293	52	451
	100%	*21.6%*	*69.2%*	*0.2%*	*0.3%*	*0.1%*	*7.2%*	*1.3%*	*11.1%*
167.05	5,123	1,279	3,534	19	19	2	176	94	322
	100%	*25.0%*	*69.0%*	*0.4%*	*0.4%*	*0.0%*	*3.4%*	*1.8%*	*6.3%*
168.02	2,537	1,830	451	25	3	1	175	52	339
	100%	*72.1%*	*17.8%*	*1.0%*	*0.1%*	*0.0%*	*6.9%*	*2.0%*	*13.4%*
168.03	5,457	3,199	1,854	31	18	2	265	88	471
	100%	*58.6%*	*34.0%*	*0.6%*	*0.3%*	*0.0%*	*4.9%*	*1.6%*	*8.6%*
169.01	3,860	28	3,749	5	3	0	42	33	59
	100%	*0.7%*	*97.1%*	*0.1%*	*0.1%*	*0.0%*	*1.1%*	*0.9%*	*1.5%*
169.02	5,050	2,067	2,229	37	12	0	574	131	1,040
	100%	*40.9%*	*44.1%*	*0.7%*	*0.2%*	*0.0%*	*11.4%*	*2.6%*	*20.6%*
169.03	4,820	2,514	1,124	44	2	1	1,013	122	1,792
	100%	*52.2%*	*23.3%*	*0.9%*	*0.0%*	*0.0%*	*21.0%*	*2.5%*	*37.2%*
602.03	9,662	8,553	385	49	46	0	497	132	1,128
	100%	*88.5%*	*4.0%*	*0.5%*	*0.5%*	*0.0%*	*5.1%*	*1.4%*	*11.7%*
602.04	6,198	5,227	559	27	29	0	261	95	601
	100%	*84.3%*	*9.0%*	*0.4%*	*0.5%*	*0.0%*	*4.2%*	*1.5%*	*9.7%*
602.05	6,742	6,262	164	62	17	2	138	97	371
	100%	*92.9%*	*2.4%*	*0.9%*	*0.3%*	*0.0%*	*2.0%*	*1.4%*	*5.5%*
602.06	3,751	3,184	111	22	35	0	310	89	721
	100%	*84.9%*	*3.0%*	*0.6%*	*0.9%*	*0.0%*	*8.3%*	*2.4%*	*19.2%*
602.07	4,870	4,335	243	35	20	0	155	82	500
	100%	*89.0%*	*5.0%*	*0.7%*	*0.4%*	*0.0%*	*3.2%*	*1.7%*	*10.3%*
603.00	3,492	2,817	208	34	9	0	358	66	777
	100%	*80.7%*	*6.0%*	*1.0%*	*0.3%*	*0.0%*	*10.3%*	*1.9%*	*22.3%*

Table B-17 Population, Race, and Ethnicity by Census Tract (continued)

Census Tract	Total 2000 Population[1]	White	Black/African-American	American Indian/Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Some other Race	Two or More Races	Hispanic or Latino[2]
604.00	3,713	1,300	2,164	16	2	0	182	49	520
	100%	*35.0%*	*58.3%*	*0.4%*	*0.1%*	*0.0%*	*4.9%*	*1.3%*	*14.0%*
605.00	2,468	1,839	184	21	7	0	373	44	783
	100%	*74.5%*	*7.5%*	*0.9%*	*0.3%*	*0.0%*	*15.1%*	*1.8%*	*31.7%*
606.00	7,894	5,894	870	58	39	1	838	194	1,562
	100%	*74.7%*	*11.0%*	*0.7%*	*0.5%*	*0.0%*	*10.6%*	*2.5%*	*19.8%*
611.00	3,710	3,168	98	18	6	0	340	80	830
	100%	*85.4%*	*2.6%*	*0.5%*	*0.2%*	*0.0%*	*9.2%*	*2.2%*	*25.7%*

Source: US Census Bureau, 2000
1. Percentages do not include Hispanic; some are not perfect 100 percent due to rounding.
2. Hispanic persons are not considered a separate race, but may belong to any race.

Table B-18 presents population characteristics for Dallas and Ellis Counties and the study area. The median age of residents within the study area is 33 years, while the median age in Dallas County is 31 years and Ellis County is 33 years. Residents of the study area younger than 18 years account for 27.5 percent of the population and 9.6 percent are older than 64 years. In Dallas County, 27.9 percent of residents are younger than 18 years and 8.1 percent are older than 64 years. In Ellis County, 30.2 percent of residents are younger than 18 years and 9.2 percent are older than 64 years. This population represents non-drivers or infrequent drivers who tend to be more dependent on transit and car pooling for mobility. In addition, the study area has a higher percentage than Dallas County of households that do not have an automobile available.

Table B-18 Population Characteristics

Characteristic	Dallas County		Ellis County		Study Area	
	Population	Percent	Population	Percent	Population	Percent
Poverty	293,267	13.4%	109,282	8.6%	36,973	21.8%
Under 18	619,031	27.9%	33,644	30.2%	50,507	27.5%
Over 64	178,872	8.1%	10,286	9.2%	17,656	9.6%
Households with No Vehicle	65,257	8.1%	1,737	4.7%	9,048	15.2%
Median Household Income	$43,324		$50,350		$32,506*	
Median Age	31		33		33*	

Source: US Census Bureau, 2000
* Estimated median calculated by averaging the median of all census tracts within study area

As shown in Table B-19, the dominant mode of transportation to work for both the study area, Dallas County, and Ellis County is to "drive alone." Alternative forms of transportation are more prevalent in the study area (27.2 percent) than in Dallas or Ellis County as a whole (22.4 percent and 16.9 percent, respectively). One to three percent more workers in the study area carpool than in Dallas or Ellis Counties. Workers in the study area were also more likely to walk or bicycle to work than other Dallas or Ellis County residents.

Table B-19 Means of Transportation to Work for Workers Over 16

Work Trip Mode[1]	Dallas County		Ellis County		Study Area	
	Workers	Percent	Workers	Percent	Workers	Percent
Drive Alone	777,372	74.8%	42,308	80.8%	47,960	70.2%
Carpool	167,270	16.1%	7,436	14.2%	11,959	17.5%
Public Transportation[2]	36,925	3.6%	404	0.8%	4,364	6.4%
Walk/Bicycle	18,739	1.8%	518	1.0%	1,620	2.4%
Other Means	9,331	0.9%	475	0.9%	644	0.9%
Alternative Transportation[3]	232,265	22.4%	8,883	16.9%	18,587	27.2%

Source: US Census Bureau, 2000

1. Work trip modes exclude workers who work from home.
2. Public transportation includes: bus or trolley bus, streetcar or trolley car, or elevated, railroad, or taxicab.
3. Alternative Transportation combines carpool, public transportation, walk/bicycle, and other means.

Median Household Income

Table B-20 shows median household income for each census tract in the study area. According to the 2000 Census, median household incomes ranged between $6,250 and $200,000+ for census tracts within the study area. The median income for Dallas County was $43,324, higher than 35 of the 41 study area census tracts in Dallas County. The median income for Ellis County was $50,350, higher than six of the 10 study area census tracks in Ellis County.

Table B-20 Income, Poverty Level, and LEP by Census Tract

Census Tract	Percent of Population Under Poverty Level	Median Household Income	Percent that Speak English "Not Well" or "Not at All"
17.01	0.0%	$38,750	0.0%
17.02	10.7%	$56,912	0.7%
19.00	11.3%	$58,929	0.6%
20.00	40.8%	$19,914	39.9%
21.00	100.0%	$6,250	0.0%
29.00	43.7%	$15,625	1.5%
31.01	10.0%	$51,838	0.6%
32.01	58.8%	$200,000+	11.4%
33.00	43.6%	$35,375	26.7%
34.00	44.4%	$22,308	8.2%
35.00	38.4%	$9,824	0.8%
37.00	30.0%	$20,625	0.1%
38.00	36.2%	$18,176	2.7%
39.02	43.8%	$16,061	3.3%
40.00	39.6%	$15,817	5.7%
41.00	53.6%	$14,341	10.5%
42.01	19.6%	$37,667	24.7%
43.00	36.0%	$27,262	24.0%
55.00	22.8%	$26,250	6.5%
86.03	33.9%	$20,104	14.2%
86.04	52.0%	$16,913	8.9%
87.01	27.5%	$22,074	1.8%

Table B-20 Income, Poverty Level, and LEP by Census Tract (continued)

Census Tract	Percent of Population Under Poverty Level	Median Household Income	Percent that Speak English "Not Well" or "Not at All"
87.03	28.1%	$21,563	5.9%
87.04	39.1%	$18,226	2.5%
88.01	19.6%	$27,784	0.7%
88.02	34.3%	$21,436	0.7%
89.00	29.0%	$23,594	3.8%
100.00	43.0%	$29,063	3.0%
101.02	21.7%	$30,341	22.1%
114.01	38.4%	$18,513	0.6%
114.02	21.3%	$20,119	6.3%
115.00	62.2%	$10,800	14.6%
167.01	16.5%	$31,948	0.7%
167.03	15.6%	$32,948	10.4%
167.04	6.0%	$45,809	1.9%
167.05	13.2%	$40,625	0.2%
168.02	6.8%	$56,844	2.3%
168.03	4.7%	$43,861	2.0%
169.01	27.7%	$26,651	0.2%
169.02	17.4%	$36,875	4.6%
169.03	19.1%	$26,651	13.2%
602.03	2.7%	$64,906	1.8%
602.04	4.8%	$65,781	2.3%
602.05	2.4%	$67,554	0.1%
602.06	10.4%	$37,199	3.4%
602.07	3.0%	$67,409	0.2%
603.00	9.7%	$44,536	3.7%
604.00	24.4%	$29,161	1.3%
605.00	18.9%	$40,000	8.6%
606.00	8.4%	$43,468	3.0%
611.00	13.2%	$43,906	4.6%
Dallas County	13.4%	$43,324	11.2%
Ellis County	8.6%	$50,350	3.8%
Study Area	21.8%	$32,506	6.4%

Source: US Census Bureau, 2000

Poverty Levels

The US Census Bureau establishes income thresholds by family size and composition. Poverty is then measured by comparing the total income for a given family size and type to the threshold family income. If the family income is lower than the threshold value, the family is said to be in poverty. HUD defines a low-income household as one where income is 80 percent, or less, of the county median. The Federal Transit Authority (FTA) uses the HUD definition for defining low-income populations in transit corridors; therefore, low-income for census tracts in Dallas County is $34,659 and $40,280 for Ellis County. Based on the analysis of median income levels, 32 of the 51 census tracts in the study area were determined to have low-income residents. Table B-20 also shows poverty levels for each census tract in the study area. The poverty rate for 38 of the 51 study area census tracts was higher than the poverty rate for their respective counties.

LEP Populations

LEP population information is also included in Table B-20. Census tract data for "Ability to Speak English for the Population Five Years and Over" indicates that six percent of the residents in the study area speaks English "Not Well" or "Not At All." Of those persons who did not speak English well, Spanish was the preferred language. Table B-21 shows data from the 2000 Census including languages spoken by the LEP population over five years old from the 51 census tracts in the study area.

Table B-21 Languages Spoken by LEP Populations

Language	Number of LEP Speakers
Spanish	10,691
Other Indo-European	78
Asian and Pacific Island	152
Other	0

Source: US Census Bureau, 2000

B.2.3 Community Resources

This section discusses the neighborhoods, community facilities, community services, and community cohesion within the study area.

B.2.3.1 Legal and Regulatory Context

A community resource study is required as a part of the National Environmental Policy Act (NEPA) process through FTA. The community resource study for the study area is based on the procedures established by FTA.

B.2.3.2 Methodology/Research

The community facilities were determined using NCTCOG GIS files for facilities in the NCTCOG region, as well as aerial photography, demographics from NCTCOG and the US Census Bureau, and consultation with local governments. These facilities include schools, places of worship, community centers, and emergency services. The analysis was performed to evaluate potential impacts to the community and community cohesion. For this study, each community was identified as each municipality in the study area. The definition of each community was based on input from stakeholders and the available information described at the municipality level. As mentioned in Chapter 1, Section 1.4, the Waxahachie Corridor study area includes five municipalities. Neighborhoods were identified within these communities as a group of residential houses in proximity with similar style and defined boundary from the surrounding area. Aerial photography and/or past neighborhood activist history in the project corridor identified these neighborhoods.

B.2.3.3 Existing Conditions

Major Activity Centers and Developments

Major activity centers are derived from NCTCOG GIS files, which track activity centers and developments throughout the NCTCOG region. Activity centers and developments are those that employ over 80 employees at one location and/or a building structure with over 80,000 square feet of space. Notable major activity centers are centered around the downtown Dallas area including the Renaissance Tower, Lincoln Plaza, George Allen Court Building, Dallas City Hall, the Dallas Convention Center, and many others. The majority of the downtown Dallas area is considered a regional destination point. Only one regional destination point occurs away from the downtown Dallas area. The Dallas Logistics Hub (i.e. the South Dallas Inland Port) is located within the Cities of Dallas, Hutchins, Lancaster, and Wilmer. Table B-22 shows the distribution of existing activity centers and developments in the study area.

Table B-22 Existing Activity Centers and Developments

Activity Center Type	Dallas	Hutchins	Lancaster	Red Oak	Waxahachie	Unincorporated
Cultural	15					
Education	27		5	7	8	
Government Quarters	9		1		2	
Hotel/Motel	19				1	
Industrial	50		9	1	18	
Institutional	12				3	
Multi-Family	90			2	9	
Mixed-Use	2			1		
Office	115					
Parking	32					
Recreational	5					
Retail	76		1		6	
Service	1	1				
Single-Family					2	1
Total	**453**	**1**	**16**	**11**	**49**	**1**

Source: NCTCOG GIS – Activity Centers, January 2010

Employment

Major employment centers are mapped in the study area using GIS information from NCTCOG. The definition of major employers is an employer that employs 250 or more people at a single location. There were 78 major employers identified in the study area. Table B-23 lists the major employers in the Waxahachie Corridor study area.

Table B-23 Major Employers

Company	Location	Employees
Bank of America	Dallas	3,090
Dallas County Sheriff's Office	Dallas	3,000
AT&T (Headquarters)	Dallas	2,950
City of Dallas	Dallas	1,900
Dallas Morning News, Limited Partnership	Dallas	1,700
Internal Revenue Service	Dallas	1,281
KPMG, Limited Liability Partnership	Dallas	1,200
Environmental Protection Agency	Dallas	1,121
Hyatt Regency Dallas	Dallas	1,017
Ernst & Young, Limited Liability Partnership	Dallas	1,000
Bank of America	Dallas	1,000
Blanch Benfield Holding, Incorporated	Dallas	992
Lew Sterrett Justice Center N & W Towers	Dallas	971
Energy Future Holdings Corporation – Headquarters/Capgemini Energy, Limited Partnership	Dallas	965
Price Waterhouse Coopers	Dallas	909
First American	Dallas	900
Dallas Police Headquarters	Dallas	900
Dart Container Corporation	Waxahachie	829
Baylor Health Care System	Dallas	825
Luminant Energy – Headquarters	Dallas	750
Blockbuster, Incorporated	Dallas	750
Dallas County Community Supervision	Dallas	748
Bank of America	Dallas	728
El Centro College	Dallas	629
Greyhound Lines, Incorporated	Dallas	615
Trammell Crow Company Delaware	Dallas	600
Haynes & Boone, Limited Liability Partner	Dallas	596
SWS Securities, Incorporated	Dallas	518
Dallas Central Public Library	Dallas	515
US Department of Labor	Dallas	500
Federal Deposit Insurance Corporation	Dallas	500
Dallas County	Dallas	500
Penson Worldwide, Incorporated	Dallas	482
Great Southern Life Insurance	Dallas	482
George C. Allen Courts	Dallas	463
First USA Federal Savings Bank	Dallas	457
Schneider National	Dallas	450
AT&T	Dallas	450
Dallas Area Rapid Transit	Dallas	450
Oak Farms	Dallas	440
Wal-Mart Supercenter	Waxahachie	436
Bank One	Dallas	430
TXU Corporation	Dallas	427
Owens-Corning Fiberglass	Waxahachie	426
Gardere Wynne Sewell, Limited Liability Partnership	Dallas	417
Dawson State Jail	Dallas	413
Dallas County Records Building Complex	Dallas	411

Table B-23 Major Employers (continued)

Company	Location	Employees
Rock Tenn Company	Waxahachie	404
Chase Paymentech Solutions	Dallas	400
Bonnet Resources Corporation	Dallas	400
Baylor Medical – Ellis County	Waxahachie	397
Crane Plumbing	Dallas	375
Gardere Wynne Sewell, Limited Liability Partnership	Dallas	365
Faubion Associates, Incorporated	Dallas	365
Winstead Sechrest & Minick, Professional Corporation	Dallas	363
Adolphus Hotel	Dallas	360
Cowboy Cab Company	Dallas	350
TM Advertising	Dallas	340
TXU Electric Delivery	Dallas	325
Neiman Marcus	Dallas	305
Dallas Area Rapid Transit	Dallas	300
Firemans Fund Insurance Company	Dallas	300
Grant Thornton, Limited Liability Partnership	Dallas	300
US Aluminum	Waxahachie	300
Cardinal Glass	Waxahachie	280
Southwestern University	Waxahachie	277
Vinson & Elkins, Limited Liability Partnership	Dallas	275
WFAA-TV, Incorporated	Dallas	273
Brass Craft Western	Lancaster	271
Fox Television Stations, Incorporated	Dallas	270
International Extrusion	Waxahachie	261
Belo Interactive, Incorporated	Dallas	260
Waxahachie Independent School District	Waxahachie	257
Corgan Associates, Incorporated	Dallas	254
First Southwest Company	Dallas	252
NW Communication Texas, Incorporated	Dallas	251
Dallas Museum of Art	Dallas	250
Southwest Financial Services Corporation	Dallas	250

Source: NCTCOG GIS – Major Employers, November 2009

Of the 78 major employers in the study area, the City of Dallas had the most major employers at 67, the City of Waxahachie had 10 major employers, and the City of Lancaster had one. The Cities of Red Oak and Hutchins had no major employers in the study area. There are 32 major employers with 500 or more employees, 31 within the City of Dallas and one in the City of Waxahachie.

<u>Community Facilities</u>

There were 205 community facilities identified within the Waxahachie Corridor study area. These facilities were categorized into 10 types: assisted living facilities, cemeteries, cultural facilities, educational facilities, emergency services, governmental facilities, medical facilities, places of worship, recreational facilities, and transportation facilities. Table B-24 shows the count of community facilities within the study area by municipality.

Table B-24 Community Facilities

City/Town	Assisted Living Facilities	Cemeteries[1]	Cultural Facilities	Educational Facilities	Emergency Services[2]	Governmental Facilities[3]	Medical Facilities[4]	Places of Worship	Recreational Facilities[5]	Transportation Facilities[6]
Dallas	7		10	27	7	19	1	8	21	44
Hutchins						1				
Lancaster	3	1		5	2	2		2	2	
Red Oak	1	1		7	2				2	
Waxahachie	5		1	8	4	6	1		5	
Total	**16**	**2**	**11**	**47**	**15**	**28**	**2**	**10**	**30**	**44**

Source: NCTCOG GIS – Features, January 2010
1. Cemetery data source is THC, 2009.
2. Emergency services include fire and police stations.
3. Governmental facilities include city halls, government buildings, post offices, and public safety offices.
4. Medical facilities include hospitals and medical offices.
5. Recreational facilities include golf courses, libraries, recreation/community centers, and stadiums/arenas.
6. Transportation facilities include general aviation/airports and light rail stations.

The most common types of community facilities within the study area are educational and transportation facilities; the least common were cemeteries and medical facilities. The City of Dallas recorded the most community facilities with a total of 144, accounting for 70 percent of all community facilities in the study area. The Cities of Red Oak and Hutchins contained the fewest community facilities in the study area, respectively, 13 and one.

B.2.4 Cultural Resources

Cultural resources include buildings, sites, structures, objects, landscapes, and districts that embody significant aspects of local, state, or national history. This section enumerates those historical and archeological resources identified within the study area of the project.

B.2.4.1 Legal/Regulatory Context

Projects that are federally permitted, licensed, funded, or partially funded with federal money must comply with Section 106 of the 1966 National Historic Preservation Act (NHPA). Section 106 requires that every federal agency take into account the effects of a project on historic properties. Furthermore, Section 106 requires federal agencies to seek comments from the Advisory Council on Historic Preservation (ACHP). The process for coordinating with the ACHP and meeting the requirements of Section 106 of the NHPA are set forth in federal regulation at Protection of Historic Properties (36 CFR Part 800). The process includes planning for public involvement, identification of historic resources, assessment of affects, and resolution of adverse effects.

For Section 106 purposes, any property listed in or eligible for listing in the National Register of Historic Places (NRHP) is historic. The NRHP is an inventory maintained by the Secretary of the Interior. To be considered for listing in the NRHP, buildings, structures, objects, sites, and districts must meet standards of historic significance defined by the Keeper of the

National Register (36 CFR 60). A property must be evaluated within its historic context and it must retain characteristics that make it a good representative of properties associated with that aspect of the past. The NRHP criteria for evaluation state:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, setting, design, materials, workmanship, feeling, and association, and:

(A) Are associated with events that have made a significant contribution to the broad patterns of our history; or
(B) Are associated with the lives of persons significant in our past; or
(C) Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(D) Have yielded or may be likely to yield information important in prehistory or history.

In addition to being significant under one or more of the criteria previously listed, a NRHP site must also retain historic integrity of those features necessary to convey its significance. The Keeper of the National Register has identified and defined seven aspects of historic integrity by which potential candidates for the NRHP must be measured:

- Location - The place where the historic property was constructed or the place where the historic event occurred.
- Design - The combination of elements that create the form, plan, space, structure, and style of a property.
- Setting - The physical environment of a historic property.
- Materials - The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- Workmanship - The physical evidence of the crafts of a particular culture of people during any given period in history or prehistory.
- Feeling - A property's expression of the aesthetic or historic sense of a particular period of time.
- Association - The direct link between an important historic event, person, or period and a historic property.

The Antiquities Code of Texas (ACT) established the Texas Historical Commission (THC) as the legal custodian of cultural resources, historic and prehistoric, within the public domain of the State of Texas. The authority of the THC extends to designation and protection of State Archeological Landmarks (SAL), which can be historic buildings and structure, shipwrecks, or archeological sites. The ACT protects all resources located on land owned or controlled by the State of Texas, one of its cities or counties, or other political subdivisions. Under the ACT, any historic or prehistoric property located on publicly owned land may be determined eligible as a SAL. Conditions for formal landmark designation are covered in Chapter 26 of the THC Rules of Practice and Procedure for the ACT.

The THC Department of Antiquities Protection must authorize groundbreaking activities affecting public land. Authorization includes a formal antiquities permit, which stipulates the conditions under which survey, discovery, excavation, demolition, restoration, or scientific investigations would occur. The law contends that a structure or building located on state land has historical interest if it:

- Was the site of an event that has significance in the history of the US or the State of Texas.
- Was significantly associated with the life of a famous person.
- Was significantly associated with an event that symbolizes and important principle or ideal.
- Represents a distinctive architectural type and has value as an example of a period, style, or construction technique.
- Is important as part of the heritage of a religious organization, ethnic group, or local society.

Part II of Title 13 of the Texas Administrative Code (TAC) includes a chapter governing the practice and procedure of the THC. This chapter states that a historic resource can be designated a SAL if it: (1) is publicly or privately owned and listed in the NRHP and (2) meets one or more of the following six eligibility criteria:

- Associated with events that have made a significant contribution to the broad patterns of our history.
- Associated with the lives of persons significant in our past.
- Important to a particular cultural or ethnic group.
- The work of a significant architect, master builder, or craftsman.
- Embodies the distinctive characteristics of a type, period, or method of construction, possesses high aesthetic value, or represents a significant and distinguishable entity whose components may lack individual distinction.
- Has yielded or may be likely to yield information important to the understanding of Texas culture or history.

Owner consent for designation of publicly owned properties is not required. After a resource is considered a SAL, it may not be removed, altered, damaged, or destroyed without a contract or a permit issued for that purpose by the THC. Once this permit is issued, the THC would grant, at maximum, a one-time extension beyond the original period for the required investigations.

In addition, federal transportation projects have to consider the effects on Section 4(f) properties. A Section 4(f) property is a publicly owned park, recreation area, wildlife management area, or any significant historic property. Regulations prescribing procedures for implementing the Section 4(f) process are in Section 4(f) of the *1966 DOT Act.*

The Texas State Historic Preservation Officer (SHPO) coordinates state participation in implementing Section 106. In accordance with the ACHP guidelines, the implementing agency would consult with the Texas SHPO on this undertaking if the project were to receive federal funds.

B.2.4.2 Methodology/Research

The THC Texas Historic Sites Atlas data was utilized to review the Official State Historical Markers (OSHM), NRHP properties, museums, and cemeteries in the study area. With a projected construction date of 2020 and a five-year buffer to allow for unexpected delays, 1975 was established as the cutoff date for evaluating non-archeological resources that meet the 50-year age guideline for NRHP eligibility. This year was established to help assess if a structure could be of historic age and does not establish NRHP eligibility. GIS parcel data was used for all counties in the study area to determine the year the building on the parcel was built to identify potential historical resources and locations in the study area.

An area of potential effect for historic properties was not established for this study because a specific corridor has not been selected. The purpose of this research was to determine the existing and known historic sites. The study area is defined in Chapter 1, Section 1.4. Only archeological resources listed on the NRHP are included. It is assumed archeological sites would be studied further during the formal environmental and permitting process.

B.2.4.3 Existing Conditions

To identify potential historic-aged resources and locations in the study area, available Dallas and Ellis County parcel data that contained records of the year a structure was built was evaluated. As mentioned previously, 1975 was established as the cutoff date for evaluating non-archeological resources that meet the 50-year age guideline for NRHP eligibility. There are 12,600 parcels within the study area that have a structure that was built prior to 1976. Age alone does not establish NRHP eligibility, but any property over 50 years in age could be eligible. Table B-25 shows the number of structures built before 1976, grouped in 10-year increments starting in 1926.

Table B-25 Year of Construction in Parcels

Year Built	Number of Parcels
Before 1926	1,182
1926-1935	854
1936-1945	1,088
1946-1955	3,544
1956-1965	3,270
1966-1975	2,662
Total	**12,600**

Source: Dallas and Ellis County Parcel Data, 2008

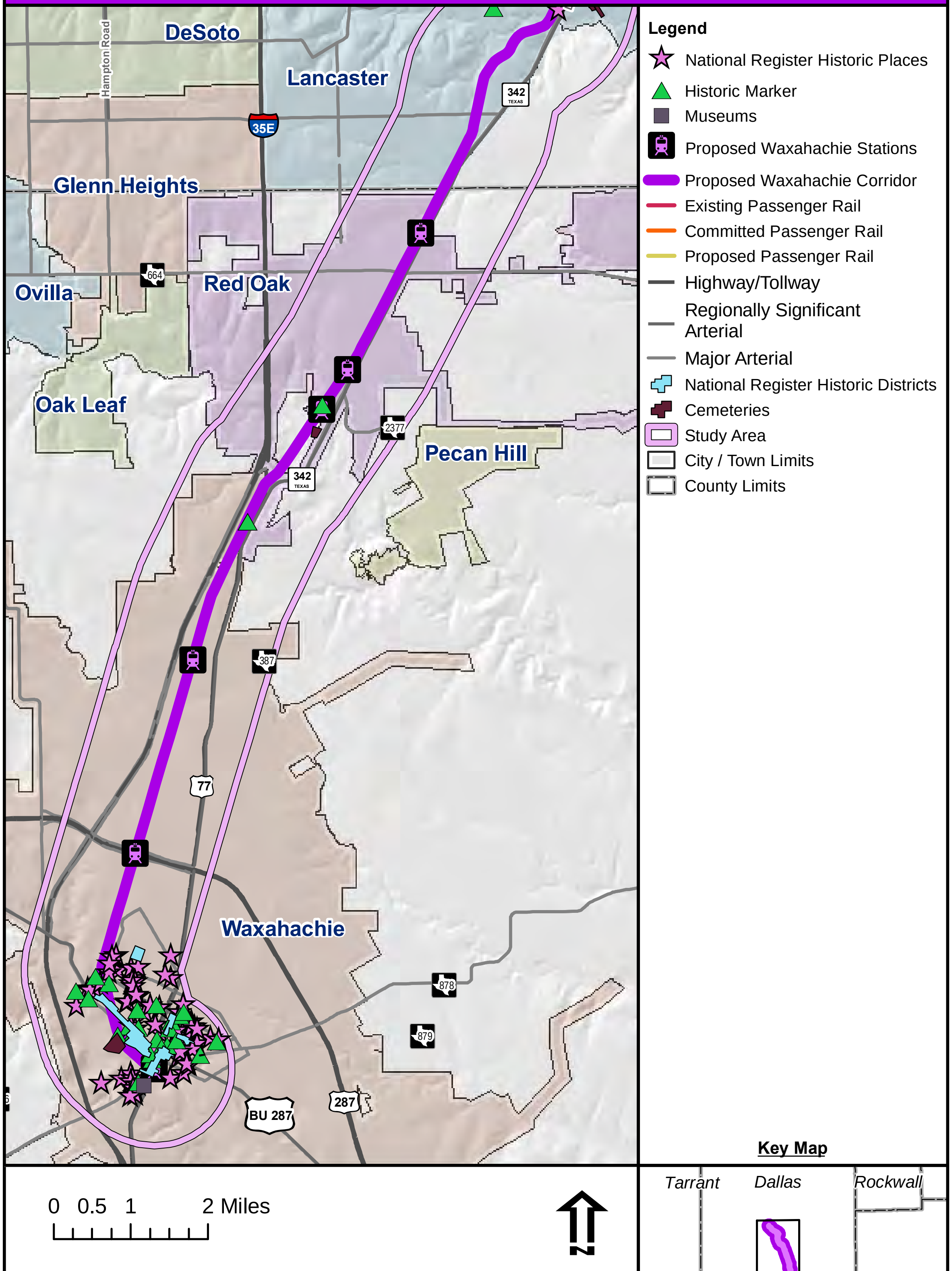
The NRHP lists districts that have historical significance. The 17 NRHP historical districts identified in the study area are listed in Table B-26. All of the listed districts are within the City of Dallas. Figures B-19 and B-20 show the locations of historical resources.

Table B-26 NHRP Historical Districts

District Name	District Boundaries
Colonial Hill Historic District	Bounded by Pennsylvania Avenue, IH 45, US 75, and Hatcher Street
Dallas Union Terminal	400 South Houston Street
Dealey Plaza Historic District	Roughly bounded by Pacific Avenue, Market Street, Jackson Street, and right-of-way of Dallas Right of Way Management Company
Ellis County Courthouse Historic District	Roughly bounded by both sides of Waxahachie Creek North to Union Pacific Railroad tracks and between both sides of Elm and Flat Streets
Houston Street Viaduct	Houston Street roughly between Arlington Street and Lancaster Avenue
North Rogers Street Historic District	500 – 600 Blocks of North Rogers Street, 500 – 600 blocks of North Monroe Street, and 100 – 200 blocks of West Marvin Streets
Oldham Avenue Historic District	Oldham Avenue between North Jackson and Bethel Streets
Queen City Heights Historic District	Roughly bounded by Eugene, Cooper, Latimer, Kynard, and Dildock Streets
Romine Avenue Historic District	2300 – 2400 blocks of Romine Avenue, north side
Second Trinity University Campus	1200 Block of Sycamore Street
South Boulevard-Park Row Historic District	South Boulevard and Park Row from Central Expressway
Strain Farm – Strain, W.A., House	400 Lancaster-Hutchins Road
Tenth Street Historic District	Roughly bounded by East Clarendon Drive, South Fleming Avenue, IH 35E, East 8th Street, and the east end of Church, East 9th and Plum Streets
West End Historic District	Roughly bounded by Central Avenue and West Water, Monroe, Madison and West Jefferson Streets
Westend Historic District	Bounded by Lamar, Griffin, Wood, Market, and Commerce Streets
Wheatley Place Historic District	Bounded by Warren, McDermott, and Oakland Avenues and Atlanta, Meadow, and Dathe Streets
Wyatt Street Shotgun House Historic District	East side 300 block of Wyatt Street

Source: THC, 2009

Figure B-19 — Historical Resources
From FM 66 to Bear Creek Road



Key Map

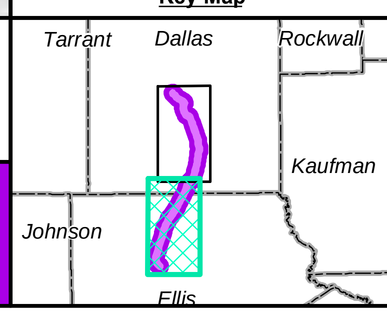


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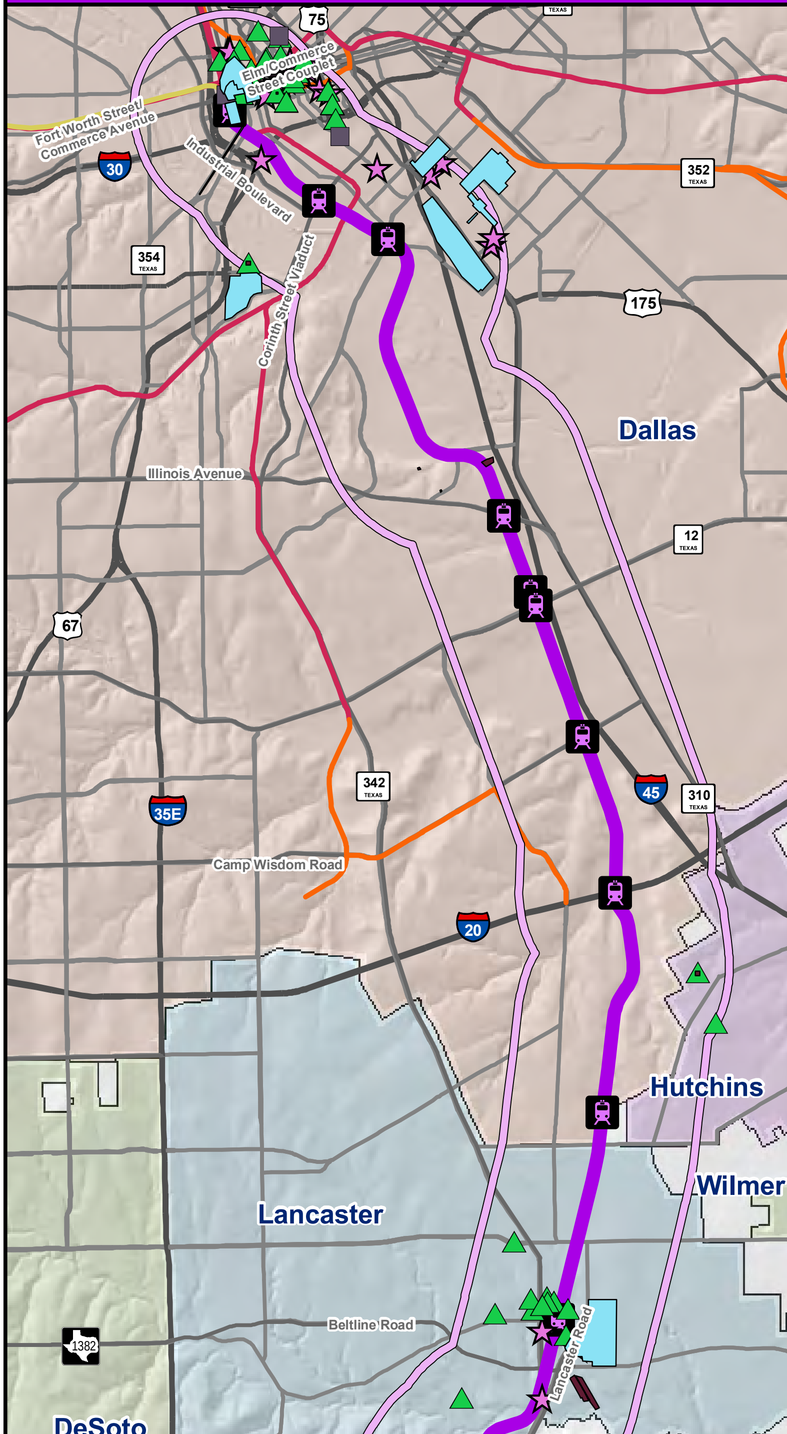
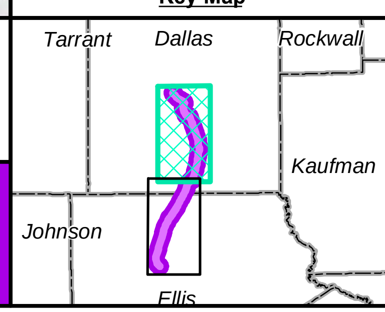
Figure B-20 — Historical Resources
From Bear Creek Road to Spur 366



Legend
- National Register Historic Places
- Historic Marker
- Museums
- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- National Register Historic Districts
- Cemeteries
- Study Area
- City / Town Limits
- County Limits

Key Map



00.350.7 1.4 Miles

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In addition to the historical districts, the NRHP has a list maintained by the Secretary of the Interior that consists of more than 2,300 historical properties for Texas. In the study area, there are 92 NRHP-listed properties currently listed. Table B-27 lists the NRHP-listed properties. The majority of the listed properties are within the City of Waxahachie. Figures B-19 and B-20 show the locations of these historical resources.

Table B-27 NRHP-Listed Properties

NRHP Reference Number	Property Name	Address	City	Listed Date
01000103	Turtle Creek Pump Station	3630 Harry Hines Boulevard	Dallas	02/09/2001
03000278	Highway Garage	315 West Main Street	Waxahachie	04/18/2003
04000102	Harlan Building	2018 Cadiz Street	Dallas	02/26/2004
05000243	Republic National Bank	300 North Ervay/325 North Street Paul Street	Dallas	03/31/2005
05000419	Dallas National Bank	1530 Main Street and 1511 Commerce Street	Dallas	05/10/2005
74002070	Waxahachie Chautauqua Building	Getzendaner Park	Waxahachie	05/03/1974
75001967	Sanger Brothers Complex	Block 32, bounded by Elm, Lamar, Main, and Austin Streets	Dallas	04/08/1975
76002019	Dallas County Courthouse	Houston and Commerce Streets	Dallas	12/21/1976
77001437	Majestic Theatre	1925 Elm Street	Dallas	11/14/1977
78002915	Magnolia Building	108 South Akard Street	Dallas	01/30/1978
78002917	Waples-Platter Buildings	2200 – 2211 North Lamar Street	Dallas	03/24/1978
78002920	Randlett House	401 South Centre Street	Lancaster	08/11/1978
78002921	Rawlings, Capt. R.A., House	2219 Dowling Street	Lancaster	11/15/1978
78002922	Strain, W.A., House	400 East Pecan Street	Lancaster	11/29/1978
78002926	Williams-Erwin House	412 West Marvin Street	Waxahachie	07/07/1978
79002931	Wilson Building	1621 – 1623 Marvin Street	Dallas	07/24/1979
80004088	Dallas Scottish Rite Temple	Harwood and Young Streets	Dallas	03/26/1980
80004489	Busch Building	1501 – 1509 Main Street	Dallas	07/04/1980
82004504	Rosemont House	701 South Rogers Street	Waxahachie	07/08/1982
83003133	Hotel Adolphus	1315 Commerce Street	Dallas	07/14/1983
84000168	Strickland-Sawyer House	500 Oldham Street	Waxahachie	10/18/1984
85003092	Hilton Hotel	1933 Main Street	Dallas	12/05/1985
86002339	Paillet House	800 South College	Waxahachie	09/24/1986
86002340	Bullard, T.J., House	221 Patrick Street	Waxahachie	09/24/1986
86002341	Patrick, Marshall T., House	233 Patrick Street	Waxahachie	09/24/1986
86002342	Plumhoff House	612 South Rogers Street	Waxahachie	09/24/1986
86002343	Rockett, Paris Q., House	321 East University Avenue	Waxahachie	09/24/1986
86002344	House at 700 South Rogers	700 South Rogers Street	Waxahachie	09/24/1986
86002345	Joshua Chapel A.M.E.	110 Aiken Street	Waxahachie	09/24/1986

Table B-27 NRHP-Listed Properties (continued)

NRHP Reference Number	Property Name	Address	City	Listed Date
86002347	House at 111 Brown	111 Brown Street	Waxahachie	09/24/1986
86002349	Witten, Pat, House	204 Brown Street	Waxahachie	09/24/1986
86002352	House at 625 Cantrell	625 Cantrell Street	Waxahachie	09/24/1986
86002353	House at 803 Cantrell	803 Cantrell Street	Waxahachie	09/24/1986
86002358	House at 816 Cantrell	816 Cantrell Street	Waxahachie	09/24/1986
86002360	House at 901 Cantrell	901 Cantrell Street	Waxahachie	09/24/1986
86002362	Central Presbyterian Church	402 North College Street	Waxahachie	09/11/1987
86002367	House at 418 North College	418 North College Street	Waxahachie	09/24/1986
86002372	House at 703 South College	703 South College Street	Waxahachie	09/24/1986
86002375	Ralston, Mary, House	116 East University Avenue	Waxahachie	09/24/1986
86002378	Dillon, George C., House	123 East University Avenue	Waxahachie	09/24/1986
86002383	Williams, Porter L., House	200 East University Avenue	Waxahachie	09/24/1986
86002386	Berry, J.S., House	201 East University Avenue	Waxahachie	09/24/1986
86002388	Connally, Roy, House	205 East University Avenue	Waxahachie	09/24/1986
86002400	National Compress Company Building	503 South Flat Street	Waxahachie	09/11/1987
86002402	Templeton, Judge M. B., House	203 North Grand Avenue	Waxahachie	09/24/1986
86002404	Trippet-Shive House	209 North Grand Avenue	Waxahachie	09/24/1986
86002408	House at 501 North Grand	501 North Grand Avenue	Waxahachie	09/24/1986
86002409	House at 512 North Grand	512 North Grand Avenue	Waxahachie	09/24/1986
86002413	Payne, M.S., House	521 North Grand Avenue	Waxahachie	09/24/1986
86002416	House at 523 Highland	523 Highland Avenue	Waxahachie	09/24/1986
86002417	House at 104 Kaufman	104 Kaufman Street	Waxahachie	09/24/1986
86002419	House at 106 Kaufman	106 Kaufman Street	Waxahachie	09/24/1986
86002424	Waxahachie Lumber Company	123 Kaufman Street	Waxahachie	09/11/1987
86002430	Hines, E. M., House	124 Kaufman Street	Waxahachie	09/24/1986
86002433	Thompson, D. H., House	312 Kaufman Street	Waxahachie	09/24/1986
86002435	Koger, William, House	409 Kaufman Street	Waxahachie	09/24/1986
86002437	Building at 441 East Main	411 East Main Street	Waxahachie	09/24/1986
86002440	Building at 500 – 502 East Main	500 – 502 East Main Street	Waxahachie	09/24/1986
86002441	Sims, O. B., House	1408 West Main Street	Waxahachie	09/24/1986
86002443	Alderdice, J. M., House	1500 West Main Street	Waxahachie	09/24/1986
86002444	Reinmiller, W. B., House	206 East Marvin Avenue	Waxahachie	09/24/1986
86002445	Cole – Hipp House	309 East Marvin Avenue	Waxahachie	09/24/1986
86002446	Alderman, G. H., House	317 East Marvin Avenue	Waxahachie	09/24/1986
86002451	Forrest. W. B., House	500 Royal Street	Waxahachie	09/24/1986
86002453	Solon, John, House	617 Solon Road	Waxahachie	09/11/1987
86002476	House at 111 Williams	111 Williams Street	Waxahachie	09/24/1986
86002477	Ray, M. B., House	401 North Monroe Street	Waxahachie	09/24/1986

Table B-27 NRHP-Listed Properties (continued)

NRHP Reference Number	Property Name	Address	City	Listed Date
86002479	Chapman, Oscar H., House	201 Overhill Drive	Waxahachie	09/24/1986
86002480	House at 816 West Water	816 West Water Street	Waxahachie	09/24/1986
86002485	Adamson, F. R., House	309 University Avenue	Waxahachie	09/24/1986
86002487	House at 301 Turner	301 Turner Street	Waxahachie	09/24/1986
86002488	House at 1423 Sycamore	1423 Sycamore Street	Waxahachie	09/24/1986
86002489	Kirven, J. D., House	601 Sycamore Street	Waxahachie	09/24/1986
86002492	Cohn, Joe, House	501 Sycamore Street	Waxahachie	09/24/1986
86002495	Saint Paul's Episcopal Church	308 North Monroe Street	Waxahachie	09/24/1986
86002496	Oldham, Mary and Frank House	910 West Marvin Avenue	Waxahachie	09/24/1986
86002497	Graham, Dr. L. H., House	909 West Marvin Avenue	Waxahachie	09/24/0986
86002498	Philips, E. F., House	902 West Marvin Avenue	Waxahachie	09/24/1986
86002519	McCartney House	603 West Marvin Avenue	Waxahachie	09/24/0986
86002520	Erwin, J. R., House	414 West Marvin Avenue	Waxahachie	09/24/1986
86002525	House at 712 East Marvin	712 East Marvin Avenue	Waxahachie	09/24/1986
86002526	Eastham, D. D., House	401 East Marvin Avenue	Waxahachie	09/24/1986
86002527	House at 320 East Marvin	320 East Marvin Avenue	Waxahachie	09/24/1986
90001858	Ferris School	411 Gibson Road	Waxahachie	12/06/1990
95000316	Levi – Moses House	2433 Martin Luther King, Jr., Boulevard	Dallas	03/23/1995
9500317	Levi – Topletz House	2603 Martin Luther King, Jr., Boulevard	Dallas	03/23/1995
95000323	Ellis, James H. and Molly, House	2426 Pine Street	Dallas	03/23/1995
95000325	Siberstein, Ascher, School	2425 Pine Street	Dallas	03/23/1995
96000586	Tiche – Goettinger Department Store	1901 Main Street	Dallas	05/24/1996
96001015	Busch – Kirby Building	1501 – 1509 Main Street	Dallas	07/12/1996
97000478	Santa Fe Terminal Buildings No. 1 and No. 2	1114 Commerce Street and 1118 Jackson Street	Dallas	05/23/1997
97001187	Standard – Tilton Flour Mill	2400 South Ervay Street	Dallas	10/06/1997

Source: THC, 2009

There are 85 historical markers in the study area, located within three municipalities. Table B-28 lists the historical markers and the municipality. The locations of these historical resources are shown in Figures B-19 and B-20. Within the study area, the City of Dallas has 45 (53 percent) of the historical markers, the City of Waxahachie has 26 (31 percent), the City of Lancaster has 11 (13 percent), the City of Hutchins has two (two percent), and the City of Red Oak has one (one percent).

Table B-28 Historical Markers

District Name	Location
A.H. Belo Corporation	Dallas
Adolphus Hotel	Dallas
Ambassador (Park) Hotel	Dallas
Boyd, Belle	Dallas
Browder Springs	Dallas
Bryan, John Neely	Dallas
Busch-Kirby Building	Dallas
Central National Road	Dallas
Central Presbyterian Church	Waxahachie
Cherokees in Dallas	Dallas
Confederate Arms Factory	Lancaster
Confederate Powder Mill	Waxahachie
Crockett, John McClannahan	Dallas
Cumberland Hill School	Dallas
Dallas	Dallas
Dallas City Hall	Dallas
Dallas County	Dallas
Dallas County	Dallas
Dallas County Records Building	Dallas
Dallas Morning News	Dallas
Dallas Scottish Rite Temple	Dallas
Darnell, Nicholas Henry	Dallas
Dunlap-Simpson House	Waxahachie
Ellis County	Waxahachie
Ellis County Courthouse	Waxahachie
Ellis County Courthouse	Waxahachie
Ellis County Jail, Old	Waxahachie
Ellis County Woman's Building (Davis Hall)	Waxahachie
Ellis, Richard, Monument	Waxahachie
First Baptist Church	Dallas
First Baptist Church of Waxahachie	Waxahachie
First Baptist Church of Lancaster	Lancaster
First Christian Church of Lancaster	Lancaster
First Methodist Church of Hutchins	Hutchins
First Presbyterian Church of Lancaster	Lancaster
First United Methodist Church of Lancaster	Lancaster
Fowler, Juliette Abbey Peak	Dallas
Gano, Richard M.	Dallas
Getzendaner Memorial Park	Waxahachie
Giving Community Thanks	Dallas
Hawkins House	Waxahachie
Hawkins, Eddy P., House	Waxahachie
Head House	Lancaster
Higginbotham-Bailey Building	Dallas
Higginbotham-Pearlstone Building	Dallas
Hilton Hotel	Dallas
Hoblitzelle, Karl St. John	Dallas
Hutchins Memorial Cemetery	Hutchins
John W. Lane	Dallas
Joshua Chapel, A.M.E. Church	Waxahachie
Lancaster	Lancaster
Latimer, James W.	Dallas
Log Cabin Pioneers	Dallas
Magnolia (Mobil) Building	Dallas
Mahoney-Thompson House	Waxahachie
Majestic Theatre	Dallas
Marvin College, Site of	Waxahachie
Miller Log Cabin	Dallas
Millermore	Dallas
N.P. Sims Library and Lyceum	Waxahachie
Neiman-Marcus	Dallas
Neiman-Marcus	Dallas
Oak Cliff Cemetery	Dallas
Oak Lawn School	Waxahachie
Old City Park	Dallas
Old Red Courthouse	Dallas
Parsons' Cavalry C.S.A	Waxahachie
Pierre Dusseau	Dallas
Pioneer Cemetery	Dallas
Pleasant Run	Lancaster
Rawlins Homestead	Lancaster
Record, James K. Polk	Dallas
Red Oak Cemetery	Red Oak
Rogers Street Bridge	Waxahachie
Rosemont	Waxahachie
Saint Paul's Episcopal	Waxahachie
Sanger Brothers Department Store	Dallas
St. Paul Freewill Baptist Church	Lancaster
Stone, Barton Warren	Dallas
Strain, W.A., Home	Lancaster
Trippet-Shive House	Waxahachie
Union Station	Dallas
Waxahachie Cemetery	Waxahachie
Waxahachie Chautauqua Building	Waxahachie
Williams-Erwin House	Waxahachie

Source: THC, 2009

THC maintains a database of cemeteries in addition to its other historical resources. Locations of cemeteries were found by the THC using US Geological Survey (USGS) and THC field investigation using Trimble global positioning system (GPS) to record and verify horizontal accuracy. Using the THC database and NCTCOG data, nine cemeteries were recorded within the study area. Table B-29 lists the cemeteries logged in the THC and NCTCOG databases by municipality.

Table B-29 Cemeteries

Cemetery Number	Name	Location
DL-C004	Miller Family	Dallas
DL-C006	Overton	Dallas
DL-C218	Edgewood	Lancaster
EL-C019	Waxahachie	Waxahachie
EL-C044	Red Oak	Red Oak
N/A	Bulova/Homecoming	Dallas
N/A	Hutchins Memorial	Hutchins
N/A	Oak Cliff	Dallas
N/A	Pioneer Cemetery	Dallas

Source: THC, 2009; NCTCOG, 2010

The THC Local History Programs Division compiled a database listing more than 500 museums throughout the state. The types of museums include general, art, historic, and children's museums, as well as special interest museums catering to interests as diverse as agriculture, firefighting, or chronicling personalities from Texas. Based on the GIS data, there are four museums located within the study area. Table B-30 list the museums logged by THC by municipality.

Table B-30 Museums

Name	Address	Location
Dallas Museum of Art	1717 North Harwood Street	Dallas
Ellis County Museum Incorporated	201 South College Street	Waxahachie
Old City Park	1717 Gano Street	Dallas
The Sixth Floor Museum	411 Elm Street	Dallas

Source: THC, 2009

B.2.4.4 Archeological Resources

Specific archeological data for the study area could not be obtained. To prevent poachers from stealing or destroying archeological artifacts, only certified archeologists can access this information. Table B-31 shows the previous archeological investigations that have been performed in the study area for other projects. A total of 60 archeological investigations have been conducted in the study corridor by other entities, including investigations in all five municipalities in the study area.

Table B-31 Archeological Investigations

Date Conducted	Implementing Agency	Project Type
04/76	TxDOT	Survey
06/79	TxDOT	Survey
09/81	US Army Corp of Engineers (USACE)	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
09/81	USACE	Survey
05/82	Environmental Protection Agency (EPA)	Survey
02/83	Federal Highway Administration (FHWA)	Survey
02/86	US National Park Service	Survey
11/86	FHWA	Survey
12/87	FTA	Literary Research
08/89	FHWA	Survey
10/91	FHWA	Survey
10/91	FHWA	Survey
11/92	Unknown	Survey
11/92	Unknown	Survey
11/92	Unknown	Survey
04/93	TxDOT	Survey
01/94	FHWA	Survey
04/96	Texas Department of Agriculture	Survey
04/96	Dallas Parks and Wildlife	Survey
05/97	Texas Water Development Board (TWDB)	Survey
05/97	TWDB	Survey
05/97	TWDB	Survey
05/97	TWDB	Survey
01/98	Texas Parks and Wildlife Department (TPWD)	Survey
01/98	TPWD	Survey
11/98	TWDB	Survey
09/99	City of Dallas	Testing/Mitigation
03/01	DART	Survey

Table B-31 Archeological Investigations

Date Conducted	Implementing Agency	Project Type
03/01	DART	Survey
06/01	USACE	Survey
06/01	USACE	Survey
01/03	Public Utility Commission (PUC)	Survey
01/03	PUC	Survey
04/03	City of Dallas	Survey
02/04	Natural Resource Conservation Service	Survey
11/06	FHWA	Survey
12/06	FHWA	Reconnaissance
01/07	FHWA	Reconnaissance
01/10	FTA/DART	Survey
01/10	FTA/DART	Survey
04/10	City of Dallas	Survey
Unknown	Unknown	Survey
Unknown	Unknown	Survey
Unknown	Unknown	Survey
Unknown	Unknown	Survey
Unknown	Unknown	Testing/Mitigation
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown

Source: THC, 2008

B.2.5 Parks and Recreation

B.2.5.1 Legal/Regulatory Context

Section 4(f) of the USDOT Act of 1966, states the Secretary of Transportation may approve a transportation program or project requiring use of publicly-owned land or land of a historic site of significance. Publicly owned land consists of public parks, recreation areas, wildlife/waterfowl refuges, or lands of a historic site of significance on national, state, or local land. The officials having jurisdiction over the park, recreation area, refuge, or site determine whether the activities, features, or attributes are impacted adversely. Only if there is no prudent and feasible alternative to such use and the project includes all planning to minimize harm will the project be allowed to proceed.

TPWD Code, Title 3, Chapter 26 contains similar language concerning the acquisition of park and recreational lands. TPWD restricts the use or taking of any public land designated and used as a park (recreation area, scientific area, wildlife refuge, or historic site) unless the department, agency, political subdivision, county, or municipality determines there is no feasible and prudent alternative and that the project/program includes all reasonable planning to minimize harm to the land.

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act requires that any outdoor recreational facilities acquired with Department of Interior (DOI) financial assistance under the LWCF Act, as allocated by the TPWD, may not be converted to non-recreational use unless the Director of the National Park Service grants approval.

B.2.5.2 Methodology/Research

Existing park and recreation areas were identified based on project mapping. The locations of parks and recreational areas were mapped from two data sources: the NCTCOG parks dataset and the NCTCOG cultural features dataset.

B.2.5.3 Existing Conditions and Future Projections

Based on the GIS data, a total of 86 parks and recreational areas were identified in the study area. One greenbelt, two preserves, and one nature area have been designated by the municipalities. The features database returned ten different types of facilities in four study area municipalities. Table B-32 lists the name, type, and location of each facility.

Table B-32 Parks and Recreational Facilities

Name	Type	Location
A & F Thompson Memorial Park	Park	Waxahachie
Bullard Heights Neighborhood Park	Neighborhood Park	Waxahachie
Claud Bynum Plaza	Park	Waxahachie
Freedman Memorial Plaza	Park	Waxahachie
George Brown Plaza	Park	Waxahachie
Getzendaner Park	Park	Waxahachie
Hot Well Park	Park	Waxahachie
Lee Penn Park	Park	Waxahachie
Mustang Creek Park	Park	Waxahachie
Rogers Spring Branch Park	Park	Waxahachie
Rogers Spring Branch Walkway	Park	Waxahachie
Waxahachie Civic Center	Recreational or Community Center	Waxahachie
Waxahachie Country Club	Golf Course	Waxahachie
Waxahachie Creek Hike & Bike Trail	Park	Waxahachie
YMCA	Recreational or Community Center	Waxahachie
YMCA	Recreational or Community Center	Waxahachie
City Park	Park	Red Oak
Red Oak Valley Golf Course	Golf Course	Red Oak
Bear Creek Nature Park	Park	Lancaster
City Soccer Complex	Recreational or Community Center	Lancaster
Community House Park	Park	Lancaster
Country View Golf Course	Golf Course	Lancaster
Heritage Park	Park	Lancaster
Jaycee Park	Park	Lancaster
Lancaster City Park	Park	Lancaster
Lancaster Community Park	Community Park	Lancaster
Rocky Crest Park	Park	Lancaster
Ten Mile Creek Preserve	Park	Lancaster

Table B-32 Parks and Recreational Facilities (continued)

Name	Type	Location
Akard	Special Use Park	Dallas
Bonnie View	Neighborhood Park	Dallas
Boren-Hilseweck	Linear Park	Dallas
Browder Street mall	Special Use Park	Dallas
Bulova/Homecoming Cemetery	Special Use Park	Dallas
Bushman	Neighborhood park	Dallas
Cadillac Heights	Mini Park	Dallas
Cedar Crest Golf Course	Special Use Park	Dallas
Celebration of Life	Special Use Park	Dallas
City Park	Special Use Park	Dallas
College	Community Park	Dallas
Cummings	Community Park	Dallas
City of Dallas	Recreational or Community Center	Dallas
Dealey Plaza	Special Use Park	Dallas
Elm at Pearl	Special Use Park	Dallas
Elosie Lundy	Community Park	Dallas
Energy Plaza	Special Use Park	Dallas
Exline	Community Park	Dallas
Federal Plaza	Special Use Park	Dallas
Ferris-Plaza	Special Use Park	Dallas
Forest	Neighborhood Park	Dallas
Founders Square	Special Use Park	Dallas
Four-Way Place Mall	Special Use Park	Dallas
Fruitdale	Neighborhood Park	Dallas
J.J. Craft House	Special Use Park	Dallas
J.J. Lemon	Community Park	Dallas
James W. Aston	Special Use Park	Dallas
John C. Phelps	Community Park	Dallas
Joppa Preserve	Metro Park	Dallas
Kimble	Neighborhood Park	Dallas
Lubben Plaza	Special Use Park	Dallas
Majestic Theatre	Special Use Park	Dallas
Marilla, Akard, Young	Special Use Park	Dallas
Martin Luther King Media	Special Use Park	Dallas
Martyr's Park	Special Use Park	Dallas
Miller	Neighborhood Park	Dallas
Moore	Community Park	Dallas
Oak Cliff Founders	Neighborhood Park	Dallas
Pacific Plaza	Special Use Park	Dallas
Pegasus Plaza	Special Use Park	Dallas
Pioneer Cemetery	Special Use Park	Dallas
Reunion	Special Use Park	Dallas
Rochester	Regional Park	Dallas
Samuell-Beaumont	Mini Park	Dallas
Samuell-Commerce	Special Use Park	Dallas
San Jacinto Plaza	Special Use Park	Dallas
Sara Ellen and Samuel Weisfeld Center	Recreational or Community Center	Dallas
Sargent	Community Park	Dallas
Seaton	Neighborhood Park	Dallas

Table B-32 Parks and Recreational Facilities (continued)

Name	Type	Location
South Central	Neighborhood Park	Dallas
Stone Place Mall	Special Use Park	Dallas
Tommie M. Allen	Community Park	Dallas
Trinity River	Park	Dallas
Trinity River Greenbelt	Park	Dallas
Wonderview	Neighborhood Park	Dallas
YMCA	Recreational or Community Center	Dallas
YMCA	Recreational or Community Center	Dallas
YMCA	Recreational or Community Center	Dallas

Source: NCTCOG GIS – Features and Parks, 2009

B.2.6 Regulated Material Sites

A hazardous/regulated materials assessment is the first step in the environmental due diligence process. Environmental due diligence is performed on a property to identify and evaluate the potential for environmental contamination and to assess the potential liability for contamination present at the property. In November 2006, the EPA issued the final All Appropriate Inquiries (AAI) Rule - Environmental Site Assessments, Phase I Investigations - that established the specific regulatory requirements and standards for conducting AAI to qualify for one of the three landowner liability protections under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Brownfield Amendments. The purpose of a Phase I Environmental Site Assessment (ESA) is to identify Recognized Environmental Conditions (REC) associated with the subject property. A REC is the presence or likely presence of any hazardous substances or petroleum products on the subject property under conditions that indicate an existing release, a past release or a material threat of a release of any hazardous substances or petroleum products into structures on the subject property or into the ground, groundwater, or surface water of the subject property. The term does not include:

> *"…de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies" [American Society for Testing and Materials (ASTM) E 1527-05 2005].*

B.2.6.1 Methodology/Research

The hazardous/regulated materials investigation was conducted to identify the known presence or likely presence of any hazardous substances or petroleum products on any property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into the ground, ground water, or surface water in the study area.

GIS data from the Texas Commission on Environmental Quality (TCEQ), the Railroad Commission of Texas, and NCTCOG provided various types of data on potentially hazardous sites. These include the location of closed and active Superfund sites, unauthorized and authorized landfill sites, mining areas, radioactive sites, and active pipelines. Although this data identified potential areas, actual contamination of soil and/or ground water would not be determined until field investigations would occur during the next project development phase.

B.2.6.2 Existing Conditions and Future Projections

Five types of hazardous materials were investigated by this method: radioactive sites, Superfund sites, landfills, mining areas, and pipelines. These types of hazardous materials do not encompass all the types that could occur in the study area, but represent all the data that is readily available for the Waxahachie Corridor study area. Other types of potential hazardous sites that were not available in the research include leaking petroleum tanks, Resource Conservation Recovery Act (RCRA) small and large quantity generators, Emergency Response Service (ERS) spills, and other various hazardous materials sites.

Nineteen landfill sites and 25 miles of pipeline were identified in the Waxahachie Corridor study area; no radioactive, Superfund or mining sites were identified. Twelve of the 19 landfill sites were identified in the Texas Closed Landfill Inventory as unauthorized landfill sites with no permitting for disposal or dumping. These sites could be a source of hazardous contamination because of the deficiencies in regulation of the sites for dumping and disposal and the possible types of waste disposed. The remaining landfills were identified as inactive (one), closed (two), and active (four). These landfills are authorized landfills with a registered permit with TCEQ for waste disposal.

The 25 miles of pipeline traversing the study area all carried natural gas. The pipes were scattered throughout the Waxahachie Corridor study area. Figures B-21 and B-22 show the location of the landfill sites and pipelines within the study area.

B.3 ENVIRONMENTAL CONDITIONS

The following sections discuss the regulatory guidance, methodology, existing conditions, and future projections for environmental resources. Although the Waxahachie Corridor project goal is local and private funding, the potential exists for the use of federal monies for the project. Due to the possible need for federal funding assistance, federal regulatory guidance will be followed. In addition, regulations not dependent on federal funding will be followed.

B.3.1 Air Quality

The EPA regulates air quality. The EPA delegates this authority to the Governor, who has delegated authority to the TCEQ for monitoring and enforcing air quality regulations in Texas. NCTCOG conducts air quality modeling for the region.

B.3.1.1 Legal and Regulatory Context

In compliance with the requirements of the Federal Clean Air Act (CAA) of 1970 and the Clean Air Act Amendments (CAAA) of 1977 and 1990, the EPA promulgated and adopted the National Ambient Air Quality Standards (NAAQS) to protect public health, safety, and welfare from known or anticipated effects of six criteria pollutants. These six criteria pollutants are ozone, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM), and lead (Pb). Table B-33 lists the NAAQS for these six pollutants.

Figure B-21 — Regulated Materials
From FM 66 to Bear Creek Road

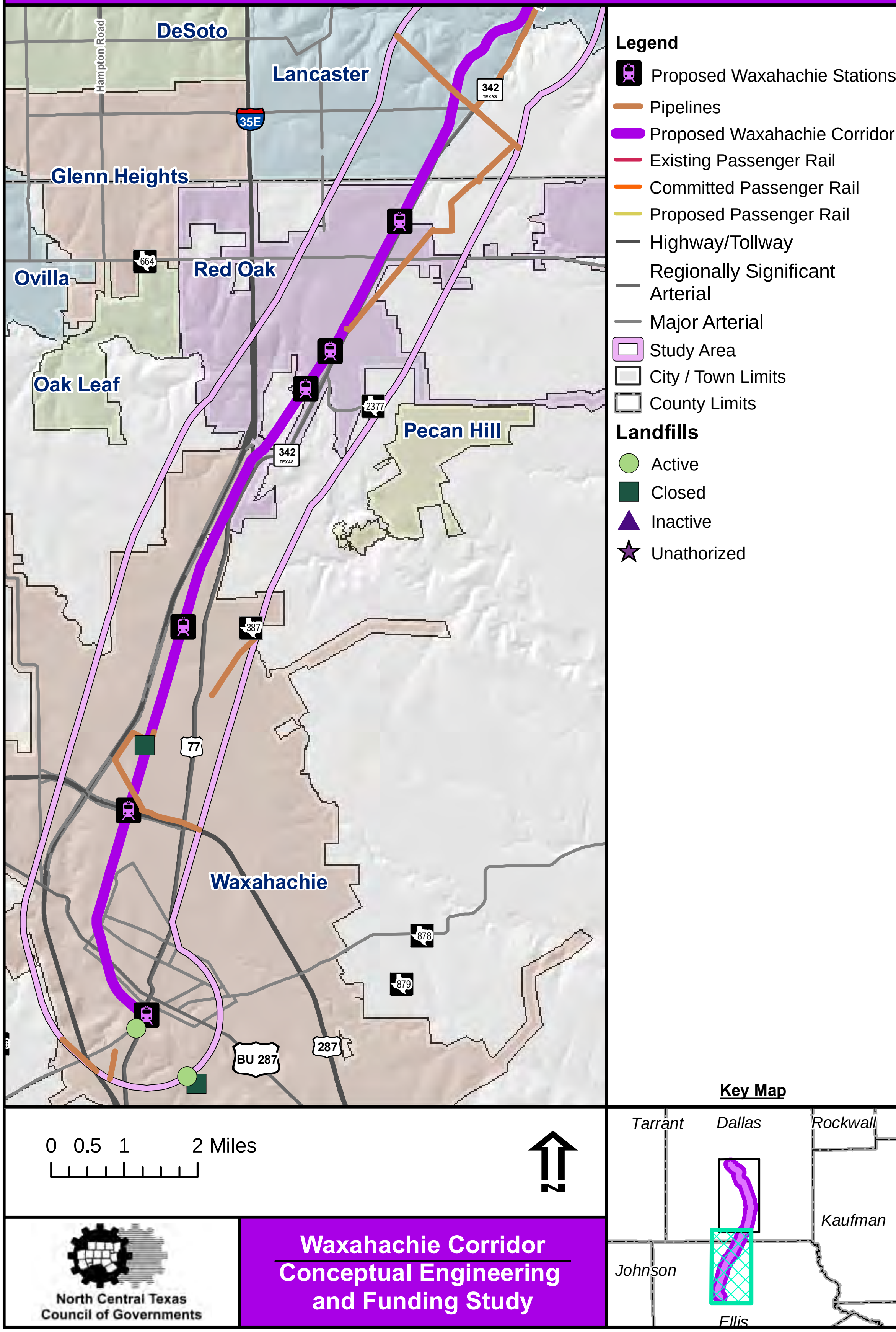

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Figure B-22 — Regulated Materials
From Bear Creek Road to Spur 366

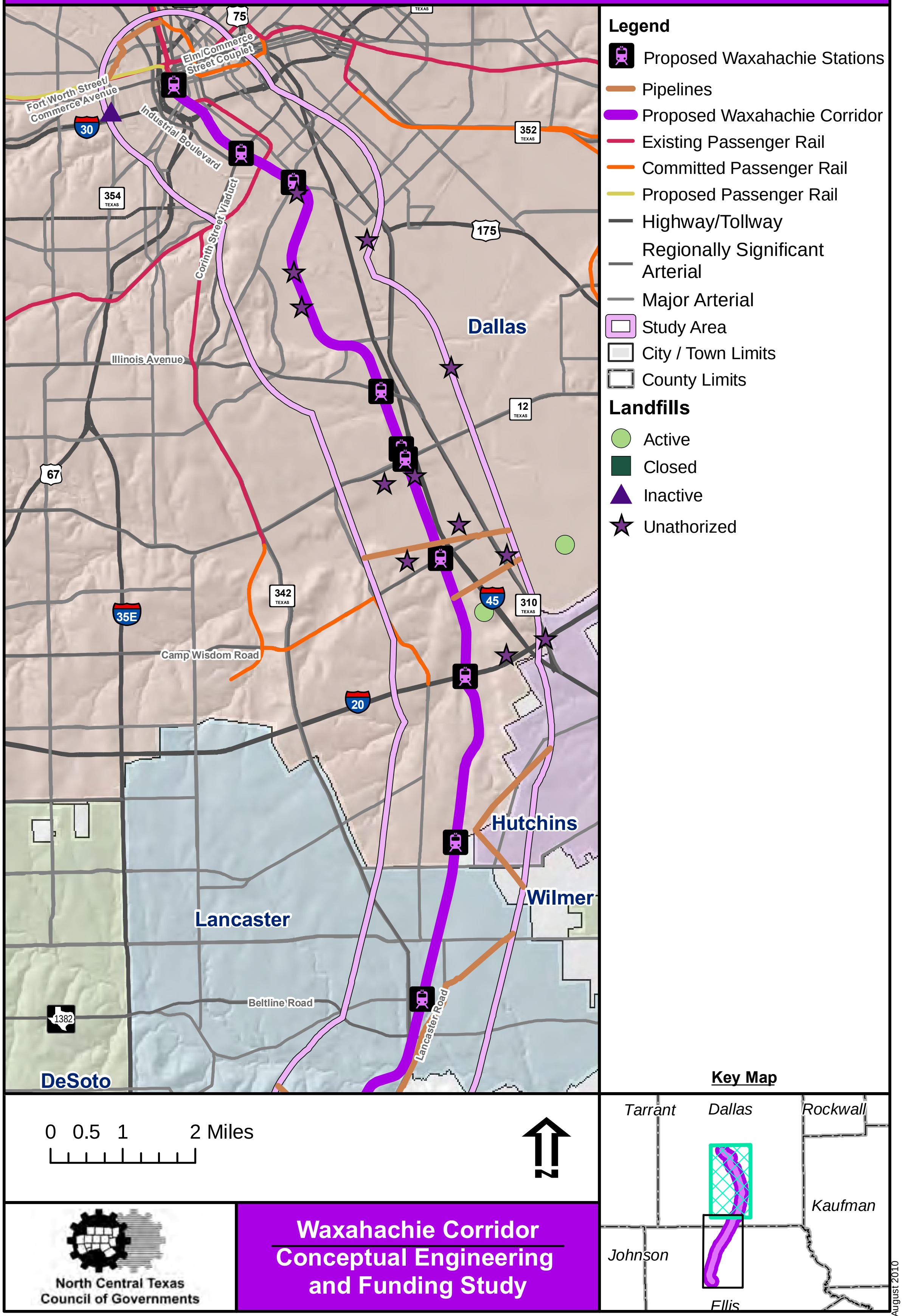


Table B-33 Air Pollution Concentrations Required to Exceed the NAAQS

Pollutant	Averaging Period	Standard	Primary NAAQS[1]	Secondary NAAQS[2]
Ozone	Eight-hour	The average of the annual fourth highest daily eight-hour maximum over a three-year period is not to be at or above this level	76 ppb	76 ppb
Carbon Monoxide	One-hour	Not to be at or above this level more than once per calendar year	35.5 ppm	35.5 ppm
	Eight-hour	Not to be at or above this level more than once per calendar year	9.5 ppm	9.5 ppm
Sulfur Dioxide	Three-hour	Not to be at or above this level more than once per calendar year	--	550 ppb
	24-hour	Not to be at or above this level more than once per calendar year	145 ppb	--
	Annual	Not to be at or above this level	35 ppb	--
Nitrogen Dioxide	Annual	Not to be at or above this level	54 ppb	54 ppb
Respirable Particulate Matter (10 microns or less) (PM10)	24-hour	Not to be at or above this level on more than three days over three years with daily sampling	155 µg/m^3	155 µg/m^3
	Annual	The three-year average of the annual arithmetic mean concentrations at each monitor within an area is not to be at or above this level	51 µg/m^3	51 µg/m^3
Respirable Particulate Matter (2.5 microns or less) (PM2.5)	24-hour	The three-year average of the annual 98th percentile for each population-oriented monitor within an area is not to be at or above this level	66 µg/m^3	66 µg/m^3
	Annual	The three-year average of annual arithmetic mean concentrations from single or multiple community-oriented monitors is not to be at or above this level	15.1 µg/m^3	15.1 µg/m^3
Lead	Quarter	Not to be at or above this level	1.55 µg/m^3	1.55 µg/m^3

Source: TCEQ, May 2009
ppm = parts per million; ppb = parts per billion; µg/m^3 = microgram per cubic meter
1. Primary NAAQS: the levels of air quality that the EPA judges necessary, with an adequate margin of safety, to protect the public health.
2. Secondary NAAQS: the levels of air quality that the EPA judges necessary to protect the public welfare from any known or anticipated adverse effects.

The CAAA requires all states to submit a list identifying those air quality regions, or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions shown by monitored data or air quality modeling to exceed the NAAQS for any criteria pollutant are designated nonattainment areas for that pollutant. The CAAA also establishes time schedules for the states to attain the NAAQS.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries). Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the CAAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the CAAA and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. This rule issued under the authority in Section 202 of the CAAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. It is forecasted that between 2000 and 2020, even with a 64 percent increase in vehicle miles traveled (VMT), these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and would reduce on-highway diesel PM emissions by 87 percent.

The technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. Reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level.

Particulate Matter

EPA has also determined the health effects of fine PM and has set the standard PM of 2.5 microns or less (PM2.5) to ensure the protection of public health. The PM2.5 standard was finalized on October 17, 2006, and the final rule for state plans for PM2.5 nonattainment areas was issued March 29, 2007. The EPA designated the DFW region as in attainment for PM2.5 on December 18, 2007.

Conformity

The study area is located in Dallas and Ellis Counties, which have been designated as a moderate nonattainment area for eight-hour ozone by the EPA. Therefore, the transportation air quality conformity rule does apply to the region and is subject to a regional air quality analysis. Transportation air quality conformity is a CAAA requirement that calls for EPA, USDOT, and various regional, state, and local government agencies to integrate the air quality and transportation planning processes. Transportation air quality conformity supports the development of transportation plans, programs, and projects that enable areas to meet and maintain national air quality standards for ozone, PM, and CO. Transportation plans, programs, and projects have to support, and must be in conformity with, the State Implementation Plan (SIP) for achieving the NAAQS.

Under Section 176(c) of the CAA, federal agencies such as the FTA and FHWA are prohibited from engaging in, supporting in any way, providing financial assistance for, licensing or permitting, or approving any activity that does not conform to an approved SIP. Because this project is located in a nonattainment area, the federal implementing agency would be responsible for ensuring that projects conform to the SIP. A conforming project definition is one that conforms to the SIP objectives of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards.

Under the transportation conformity rule, if a project is included in the emissions analysis of the MTP or Transportation Improvement Plan (TIP), and the FTA or FHWA and EPA have approved this plan or program as conforming to the SIP, then the project is presumed to conform. If the project emissions are not analyzed in the MTP or TIP, then a separate project-level conformity determination is required. Showing that emissions under a build alternative are less than the no build option demonstrates project level conformity. The McKinney Corridor will be evaluated for conformity in subsequent studies.

B.3.1.2 Methodology/Research

Air monitoring station locations in proximity to the study area were identified using the NCTCOG GIS database to determine the nearest active federal air monitoring stations. Specific monitor readings were obtained through the TCEQ air monitoring data website. The NCTCOG Web site for air quality identified specific programs implemented by the region to improve air quality.

B.3.1.3 Existing Conditions and Future Projections

Air quality is a regional problem, not a localized condition. The study area is located in Ellis and Dallas Counties, which have been designated as a moderate nonattainment area for eight-hour ozone by the EPA. The NCTCOG eight-hour ozone nonattainment region includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties. In addition, Hood County have been proposed to be added as nonattainment for eight-hour ozone standards. The addition of Hood County is in review by the EPA. The formation of ozone is directly related to emissions from motor vehicles and point sources. The primary pollutants from motor vehicles are volatile organic compounds (VOCs), CO, and nitrogen oxides (NOx). VOCs and NOx can combine under the right conditions in a series of photochemical reactions to form ozone. The DFW region is in attainment for CO, SO_2, NO_2, PM, and Pb.

The modeling procedures for ozone require long-term meteorological data, detailed area-wide emission rates, and activity levels for all emission sources (on-road, non-road, point, and area). Accordingly, concentrations of ozone are modeled by the regional air quality planning agency for the SIP. The TCEQ monitors airborne pollutants in the DFW region on a continuous basis. Ozone is monitored every hour of the day, every day. Figure B-23 shows the location of the air monitoring site in relation to the study area. Table B-34 lists the four highest daily maximum eight-hour ozone concentrations recorded annually from 2000 to

2009 at the Dallas Hinton Street Continuous Air Monitoring Station (CAMS) 401. This CAMS is the closest active monitoring station to the study area.

Table B-34 Four Highest Eight-Hour Ozone Concentrations

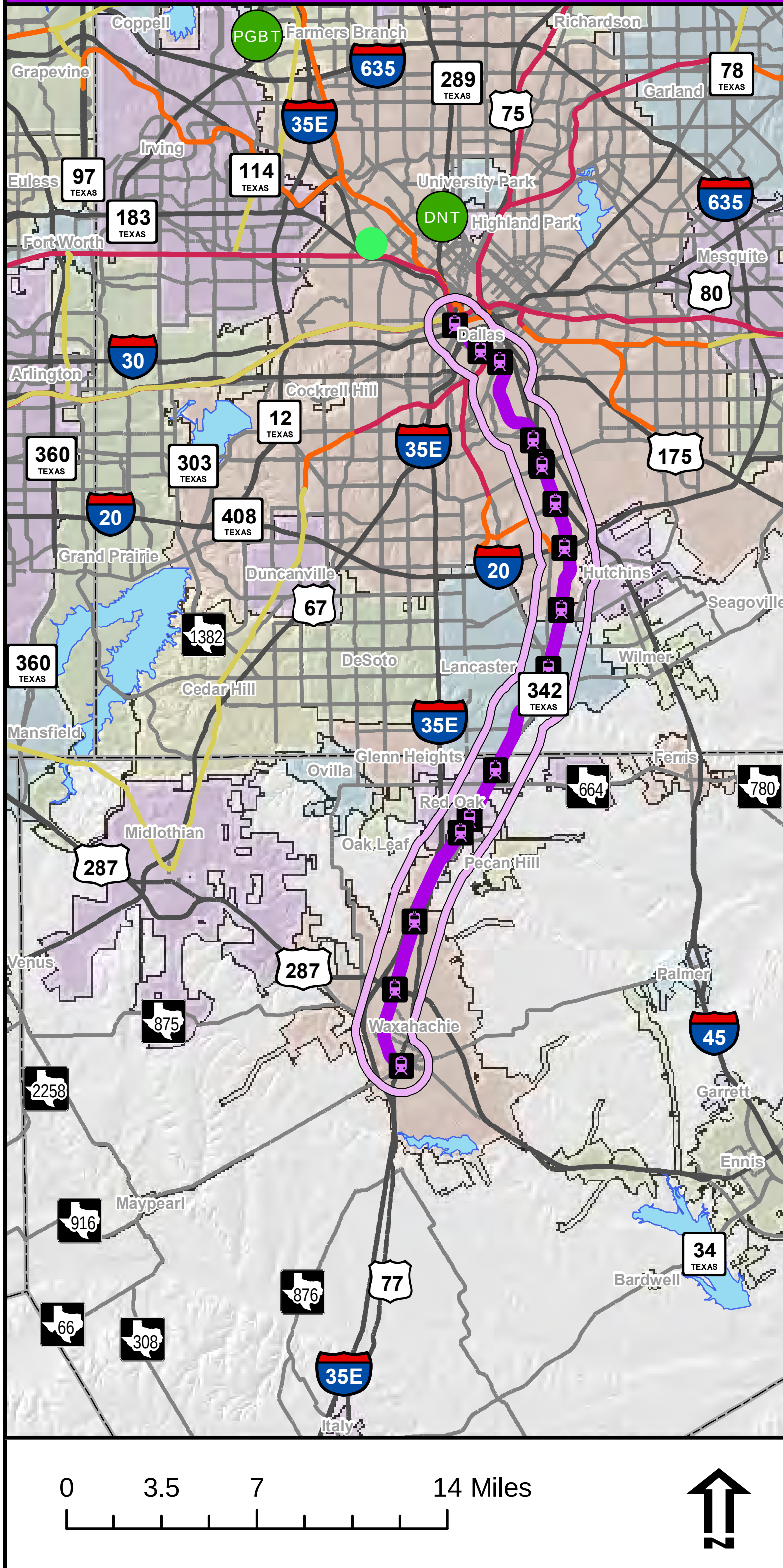
Year	Highest		Second Highest		Third Highest		Fourth Highest	
	Date	Level*	Date	Level*	Date	Level*	Date	Level*
CAMS 401 Dallas Hilton Street								
2000	09/02/00	127	08/24/00	113	08/11/00	108	09/04/00	107
2001	08/04/01	125	09/12/01	116	07/14/01	111	08/19/01	111
2002	08/09/02	135	06/23/02	118	06/24/02	115	9/11/02	109
2003	05/31/03	161	08/07/03	130	06/28/03	110	08/06/03	109
2004	07/19/04	113	08/02/04	108	08/10/04	105	08/09/04	104
2005	06/15/05	117	07/14/05	115	09/01/05	115	08/22/05	114
2006	09/01/06	110	08/31/06	102	07/18/06	97	08/22/06	97
2007	09/21/07	94	07/25/07	91	06/05/07	87	09/22/07	87
2008	09/29/08	78	05/20/08	77	09/28/08	75	06/18/08 07/01/08 08/21/08	74
2009	08/25/09	89	08/26/09	86	07/17/09	82	09/03/09	74

Source: TCEQ Air Monitoring Stations, 2009
* All ozone measurements are in parts per billion

In addition to controls included in the next SIP and in the MTP, several efforts have been initiated at the local level through NCTCOG to improve air quality. The following lists some of the major programs that NCTCOG has implemented to improve air quality:

- AirCheckTexas – Provides financial aid for vehicles failing the emissions portion of the state inspection or those vehicles that have reached 10 years of age for specific financially constrained persons and families.
- Clean Fleet Vehicle Program – Promotes replacement of fleet vehicles with low-emitting vehicles, and provides tools to assist fleet managers with making clean vehicle decisions, decreasing fleet impacts on air quality.
- Diesel Vehicle Idling Programs – A set of programs aimed to prevent excessive idling of diesel vehicles.
- Intelligent Transportation Systems – A network of roadway monitors that informs transportation operators, emergency response units, and the public of current traffic conditions throughout the DFW area.
- Light-Emitting Diode Traffic Signals – Replaces incandescent traffic signal lamps with LED lamps, reducing energy needs.
- North Central Texas Clean School Bus Program – Retrofit and replace school buses in the DFW area with cleaner technology and provide educational resources for reducing school bus emissions.
- Ozone Season Lunch Bag Program – Encourage workers to bring their lunch to work on air pollution watch and warning days.
- Regional Smoking Vehicle Program – Encourages drivers to voluntarily repair and maintain their vehicles through public awareness and vehicle reporting.
- Truck Lane Restriction Policy – Various highways throughout the DFW area prevent trucks from using the left lane to allow for greater traffic flow.

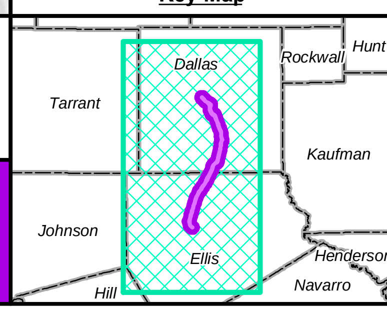
Figure B-23 — Air Quality Monitoring Stations
From FM 66 to Spur 366



Legend

- Dallas Hinton Street CAMS 401
- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- Station Analysis Area
- Study Area
- City / Town Limits
- County Limits
- Lake

Key Map



May 2010

North Central Texas Council of Governments

Waxahachie Corridor Conceptual Engineering and Funding Study

- Try Parking It – a Web site that provides a method to track, log, and reward work-based trips that utilize alternative commutes and also provides statistics on reduced miles and trips.

The EPA emission reduction rules are expected to reduce air pollution by 2020. The ongoing improvements in vehicle emissions and industry emissions will have positive impacts on reducing air pollution for the future. Regional programs will also contribute in the decrease from NAAQS and MSATs. With the combined federal and local efforts, air quality is anticipated to improve in the future.

B.3.2 Noise

This section will focus on the characterization of the existing noise element along the corridor. Subsequent studies will address future noise projections and mitigation measures.

B.3.2.1 Legal and Regulatory Context

A noise assessment would be required as part of the NEPA process through FTA. The noise assessment for the study area is based on the procedures established in the FTA guidance manual *Transit Noise and Vibration Impact Assessment*. FTA procedures include characterization of the existing noise environment along the corridor, projections of future noise levels including transit sources, assessment of long- and short-term impacts, and discussion of mitigation measures. The code of federal regulations (CFR) title 23 part 771 details noise impacts and mitigation for Section 4(f) properties.

B.3.2.2 Human Perception Levels

Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human subjective response are intensity or level, frequency content, and variation with time. The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels (dB). By using this scale, the range of normally encountered sound can be expressed by values between zero and 120 dB. On a relative basis, a three dB change in sound level generally represents a barely-noticeable change outside the laboratory, whereas a 10 dB change in sound level is typically perceived as a doubling (or halving) in the loudness of a sound.

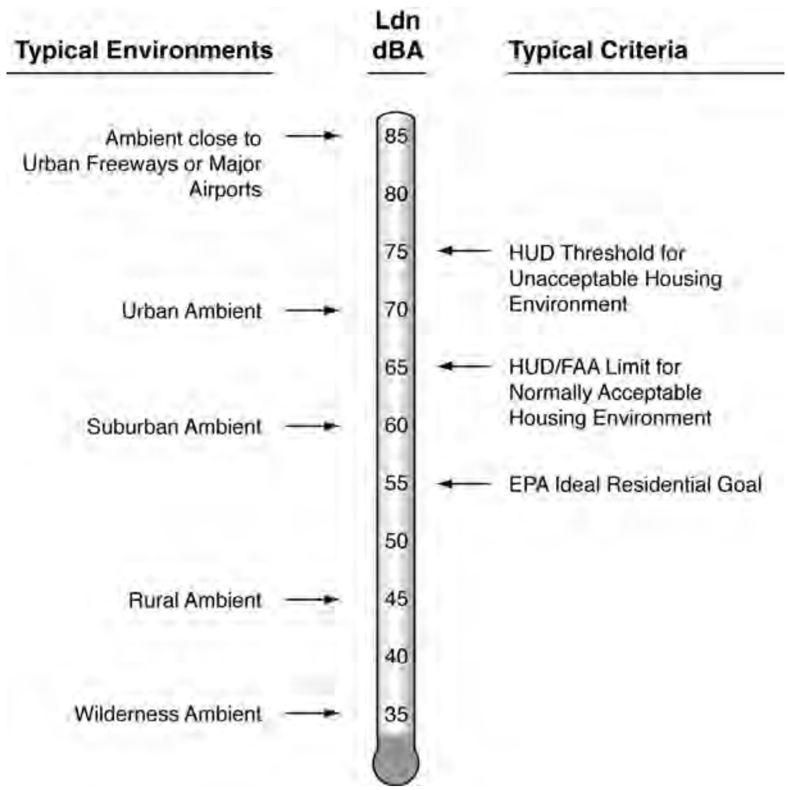
The frequency content of noise relates to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second called Hertz (Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called “A-weighted” sound levels, and are expressed as “dBA.” The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise.

Because environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number, called the equivalent sound level (Leq).

Leq can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified time period (typically one hour or 24 hours). Often the Leq values over a 24-hour period are used to calculate cumulative noise exposure in terms of the day-night sound level (Ldn). Ldn is the A-weighed Leq for a 24-hour period with an added 10 dB penalty imposed on noise that occurs during the nighttime hours (between 10 p.m. and 7 a.m.). Many surveys have shown that Ldn correlates with human annoyance, and therefore this descriptor is widely used for environmental noise impact assessment.

Figure B-24 provides examples of typical noise environments and criteria in terms of Ldn. While the extremes of Ldn are shown to range from 35 dBA in a wilderness environment to 85 dBA in noisy urban environments, Ldn is generally found to range between 55 dBA and 75 dBA in most communities. As shown in Figure B-24, these Ldn values span the range between an ideal residential environment and the threshold for an unacceptable residential environment according to representative federal agency criteria.

Figure B-24 Examples of Typical Outdoor Noise Exposure



Source: FTA, *Transit Noise and Vibration Impact Assessment*. 2006

Another descriptor of noise events is maximum sound level or Lmax. As discussed previously, the basic noise unit for transit noise is the A-weighted sound level which describes the noise at any moment in time. As a transit vehicle approaches, passes by, and then recedes into the distances, the A-weighted sound level rises, reaches a maximum and then fades into the background ambient noise caused by other sound sources. The highest sound level reached only for a very short time during this pass-by is the Lmax associated with that event.

The annoyance of intrusive noise sources, such as a train or bus pass-by depends on how loud it is, as well as how long the noise lasts. The sound exposure level (SEL) is a noise metric that takes into account both the level and duration of noise events. The SEL of noise events are used to calculate the Leq or Ldn noise level for assessing potential impact.

B.3.2.3 Evaluation Criteria

Noise impact is assessed according to criteria defined in the FTA guidance manual. The FTA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although higher transit noise levels are allowed in the FTA noise impact criteria for neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise.

FTA noise impact criteria classifies noise sensitive land uses into three categories:

- Category 1: Buildings or parks, where quiet is an essential element of their purpose.
- Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, places of worship, and active parks.

Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum one-hour Leq during facility operating periods are shown in Table B-35.

Table B-35 Land Use Categories and Metrics for Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)^*$	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)^*$	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

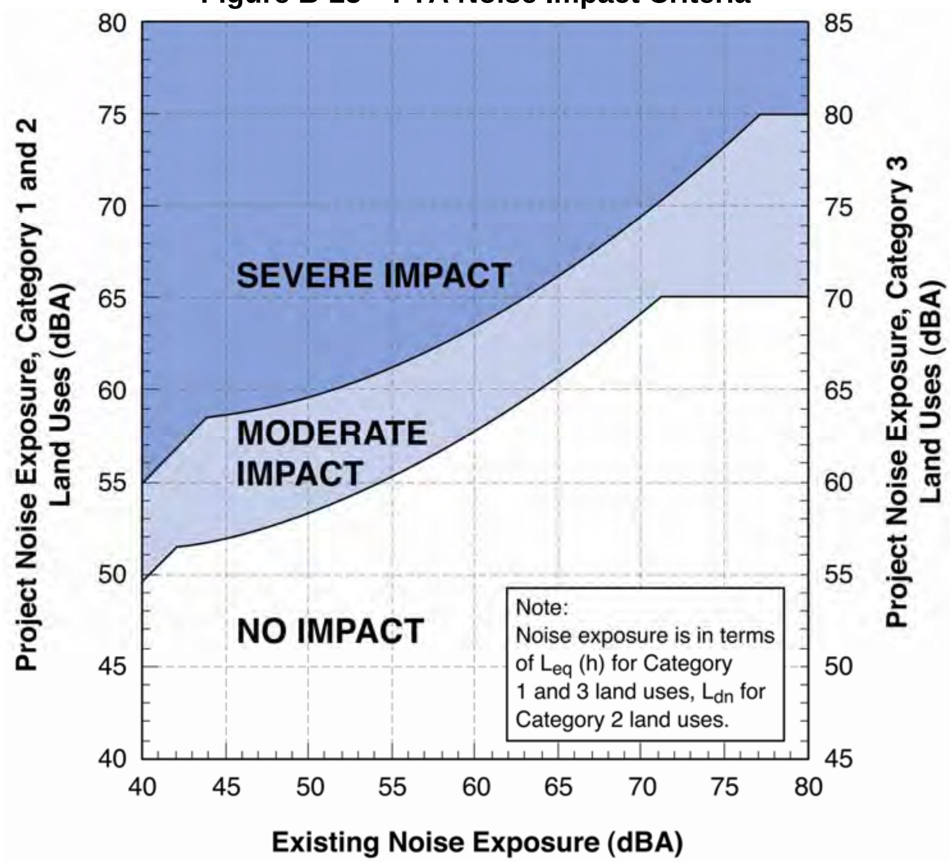
Source: FTA, *Transit Noise and Vibration Impact Assessment*, 2006
* Leq for the noisiest hour of transit-related activity during hours of noise sensitivity

There are two levels of impact included in the FTA criteria:

- Severe: A significant percentage of people are highly annoyed by noise in this range. Noise mitigation would normally be specified for severe impact areas unless it is not feasible or reasonable.
- Moderate: In this range of noise impact, noise mitigation would be considered and adopted when it is considered reasonable. While impacts in this range are not of the same magnitude as severe impacts, there are other project-specific factors to be considered to determine a reasonable application of mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, effectiveness of mitigation, community views, cost, and other special protections provided by law.

The FTA noise impact criteria are illustrated in Figure B-25. The noise criterion compares the existing noise exposure and project-related noise exposure to determine impacts.

Figure B-25 FTA Noise Impact Criteria



Source: FTA, *Transit Noise and Vibration Impact Assessment*, 2006

B.3.2.4 Methodology

To analyze the potential for noise impacts, 2005 land use data was used in GIS to determine noise sensitive land use types in this study area. Because noise impacts from transit sources are generally confined within 100 feet of the railroad corridor, land use adjacent to the railroad right-of-way was analyzed to determine the linear feet of potential noise sensitive land uses. Table B-35 identifies sensitive land use as defined by the FTA.

B.3.2.5 Existing Conditions and Future Projections

Of the land use adjacent to the rail right-of-way, there were approximately 19,740 linear feet (6.1 percent) of residential land use, 7,540 linear feet (2.3 percent) of park or recreational land use, and 8,200 linear feet (2.5 percent) of institutional land use. This totals 35,480 linear feet (10.9 percent) of noise sensitive land use. These land uses could contain specific noise sensitive receivers.

In addition, the existing Waxahachie Corridor rail line has freight activity. This freight activity is moderate. Existing land use in this area has adapted to the moderate freight rail noise surrounding the existing rail line.

As detailed in Chapter 2, Section 2.1.1, the demographic projections for the study area show continued, fast growth. As growth continues, more sensitive land use types may develop close to the proposed rail corridor.

B.3.3 Vibration

Ground-borne vibration is the shaking motion of the ground due to a source such as a train, bus, or truck passing by. Vibration waves are generated at the source, pass through the ground and into nearby buildings.

B.3.3.1 Legal and Regulatory Context

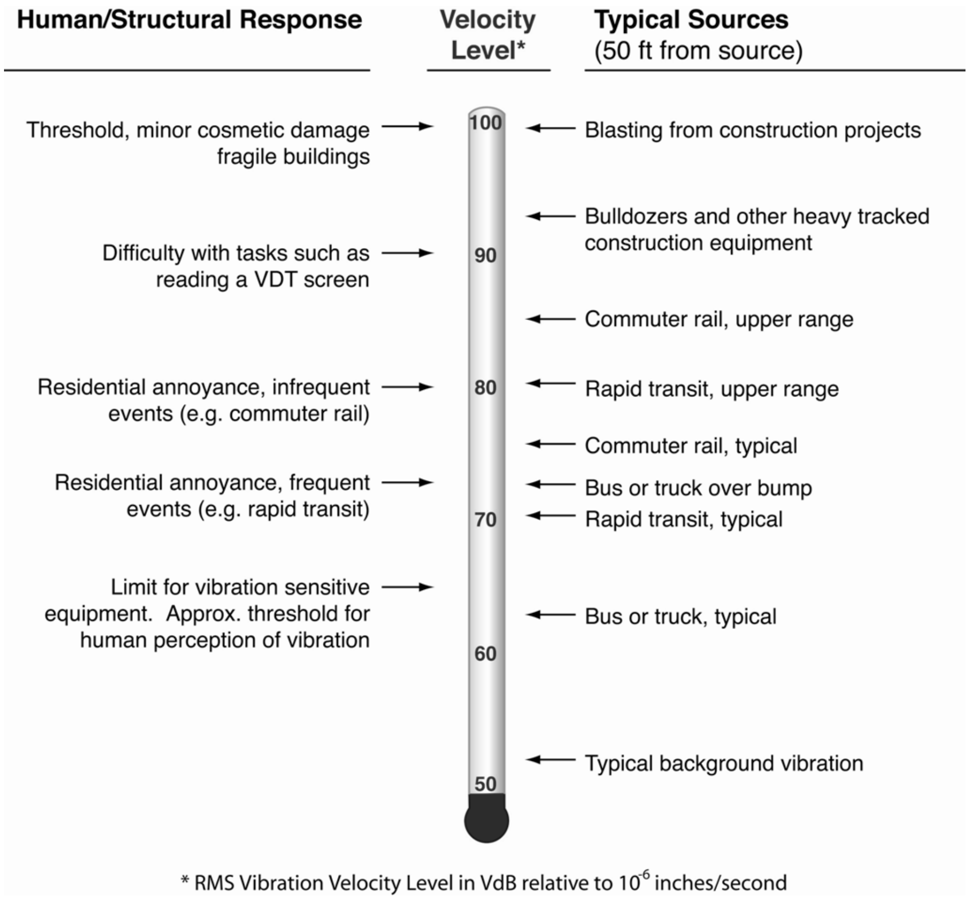
A vibration assessment would be required as part of the NEPA process through FTA. The vibration assessment for the study area is based on the procedures established in the FTA guidance manual *Transit Noise and Vibration Impact Assessment*. FTA procedures include characterization of the projected vibration levels from the proposed project, the assessment of long- and short-term impacts, and discussion of mitigation measures.

B.3.3.2 Human Perception Levels

Human sensitivity to vibration typically corresponds to the amplitude of vibration velocity within the low-frequency range of approximately four to 200 Hz. A common metric used to quantify vibration amplitude is the peak particle velocity (PPV), defined as the maximum instantaneous peak of the vibratory motion. PPV is typically used in monitoring blasting and other types of construction-generated vibration, because it is related to the stresses experienced by building components. Although PPV is appropriate for evaluating building damage, it is less suitable for evaluating human response. People tend to respond to vibration signals over a period of time. Thus, ground-borne vibration effects on people from transit trains are characterized in terms of the smoothed root mean square (RMS) vibration velocity level averaged over one second. All vibration levels reported in this document are in velocity decibels (VdB), with a reference quantity of one micro-inch per second. VdB is used in place of dB to avoid confusing vibration decibels with sound decibels.

Figure B-26 illustrates typical ground-borne vibration levels for common sources, as well as criteria for human and structural response to ground-borne vibration. As shown, the range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human perception to vibration is 65 VdB, annoyance is usually not significant unless the vibration exceeds 72 VdB.

Figure B-26 Typical Ground-Borne Vibration Levels and Criteria



Source: FTA, *Transit Noise and Vibration Impact Assessment*, 2006

The basic concept of ground-borne vibration is that train wheels rolling on the rails create vibration energy that is transmitted through the track support system into the transit structure and then transmitted into nearby buildings. Ground-borne vibration is almost never annoying to people who are outdoors. The amount of energy that is transmitted into the transit structure is dependent on factors such as the type of vehicle and the smoothness of the wheels and rail. The transmission of vibrations from the transit structures into nearby buildings is dependent on the type of soils and rock between the train and the building as well as the type of foundation and structure of the building.

When ground-borne vibrations propagate from the train to nearby buildings, the floors and walls of the building structure would respond to the motion and may resonate at natural frequencies. The vibration of the walls and floors may cause perceptible vibration, rattling of items such as windows or dishes on shelves or a rumble noise. The rumble is a low-frequency noise radiated from the motion of the walls, floor, and ceiling surfaces. In essence, the room surfaces act like a giant loudspeaker. This is ground-borne noise.

The potential annoyance of ground-borne noise is most closely correlated with the A-weighted sound level. However, there are potential problems in using the A-weighted sound level to characterize low-frequency ground-borne noise. Human hearing is not equally sensitive to all frequencies. If a sound has low-frequency content, it seems louder than broadband sounds that have the same A-weighted level. This is accounted for by setting impact criteria limits lower for ground-borne noise than would be the case for broadband noise.

B.3.3.3 Vibration Criteria

The FTA criteria for vibration impact are based on land use and vehicle frequency, as shown in Table B-36. FTA vibration criteria are not dependent on existing vibration levels in the community. There are some buildings, such as concert halls, recording studios and theaters, which can be very sensitive to vibration but do not fit into any of the three categories listed in Table B-35. Due to the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project.

Table B-36 Ground-Borne Vibration and Noise Impact Criteria

	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch /sec)			Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)		
Land Use Category	**Frequent Events[1]**	**Occasional Events[2]**	**Infrequent Events[3]**	**Frequent Events[1]**	**Occasional Events[2]**	**Infrequent Events[3]**
Category 1: Buildings where vibrations would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FTA, May 2006

1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. “Occasional Events” is defined as between 30 and 70 vibration events of the same source per day. Most commuter rail main lines fall into this category.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day. Most commuter rail branch lines fall into this category.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of heating, ventilation, and air conditioning systems and stiffened floors. Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

B.3.3.4 Existing Conditions and Future Projections

GIS data for 2005 land use was used to determine the linear feet of vibration sensitive land use adjacent to the existing Waxahachie Corridor rail line. In the study area, no Category 1 land uses were identified. Category 2 land uses totaled 19,740 linear feet (6.1 percent) which included residential, hotels, and motels. Approximately 15,740 linear feet (4.8 percent) of Category 3 land uses were identified which included institutional buildings (such as government buildings) and park and recreational facilities. Each of these land use types identified could contain specific vibration sensitive receivers. Figures B-15 and B-16 show the land use types for the corridor, which include vibration sensitive areas.

In addition, the existing Waxahachie Corridor rail line has freight activity detailed in Chapter 3, Section 3.2.4. While this freight activity is light, the existing land use areas have adapted to the light to moderate freight rail vibration surrounding the existing rail line.

As shown in Chapter 2, Section 2.1.1, the demographic projections for the study area show continuing fast growth. As growth continues, more sensitive land use types may develop close to the proposed rail corridor.

B.3.4 Water Resources

This section describes the hydrology and water quality of the study area in terms of surface floodplains, water quality, groundwater, and drainage. Discussion of the waters of the US, including wetlands are in Section B.3.6.

B.3.4.1 Legal/Regulatory Context

<u>Floodplains</u>

As required by Executive Order 11988, signed in 1977, all federal agencies are prevented from contributing to the adverse impacts associated with the occupancy and modification of floodplains and the direct or indirect support of floodplain development. The Federal Emergency Management Agency (FEMA) regulates alterations to, or development within, floodplains as mapped on FEMA Flood Insurance Rate Maps (FIRM). Additionally, communities can develop more stringent local floodplain ordinances as part of the National Flood Insurance Program (NFIP), allowing reduced rates on flood insurance premiums within their jurisdiction.

<u>Water Quality</u>

Section 401 of the Clean Water Act (CWA) requires states to certify that a proposed CWA Section 404 permit would not violate water quality standards. The TCEQ issues Section 401 water quality certifications for projects, prior to approval of the Section 404 permit from the United States Army Corps of Engineers (USACE). If an individual permit is required, the TCEQ makes the certifications for all non-oil and non-gas projects. Initiating the Section 404 permit process with the USACE automatically initiates the 401 certification process. One aspect of the individual permitting process is the requirement for Section 401 water quality certification. For Individual Permits (IP) with impacts of less than three acres or 1,500 feet of linear stream, a Tier I Water Quality Certification Checklist must be submitted with the Section 404 IP package. For impacts of greater than three acres or 1,500 feet of linear stream, a Tier II individual review would be required, which includes an alternative analysis. The proposed project would be compliant with whichever (Tier I or II) certification is required. The design and construction would include construction and post-construction best management practices (BMPs) to manage storm water runoff and control sediments.

General Permit for Construction Activity Texas Pollutant Discharge Elimination System

For projects disturbing over one acre, Texas Pollutant Discharge Elimination System (TPDES) General Permit Number TXR150000, under provisions of Section 402 of the CWA and Chapter 26 of the Texas Water Code, require contractors to comply with conditions in the General Permit for Construction Activity. This requires preparation and implementation of a storm water pollution prevention plan (SWPPP), in addition to adherence to rigorous BMPs designed to reduce or eliminate impacts to water resources. This permit would include BMPs to control total suspended solids that could be introduced into surface water, erosion control, and sediment control.

Phase I of the program, issued in 1990, requires cities with a population greater than 100,000 to develop storm water management programs (SWMPs). Phase II is the second stage of EPA storm water management program requirements. It affects many small cities, some counties, and other entities that operate municipal separate storm sewer systems in urbanized and other densely populated areas. The TCEQ, the Phase II regulatory authority in Texas, is responsible for identifying the designated populated areas.

The Phase II storm water rule requires operators of certain small municipal separate storm sewer systems (MS4s) to develop and implement a storm water program. To further improve water quality in streams, lakes, bays and estuaries, the EPA developed the storm water program to control polluted runoff from urban areas.

Each regulated small MS4 is required to submit a Notice of Intent (NOI) to obtain storm water permit coverage, typically by complying with the Phase II general permit requirements. Six minimum control measures must be addressed to control polluted storm water runoff. The initial submission for permit coverage must detail the programs, activities and measurable goals that will be implemented over the five-year permit term to comply with the permit requirements. For the first permit term reports detailing the progress of the SWMP must be submitted to the TCEQ on an annual basis

B.3.4.2 Methodology

Using NCTCOG data floodplains, streams, lakes, and impaired streams were mapped.

B.3.4.3 Existing Conditions and Future Projections

A total of 7,963 acres of 100-year floodplain were located in the study area. In addition, 1,641 acres of 500-year floodplain were identified. These floodplains were located around the numerous streams that cross the project study area and are shown in Figures B-27 and B-28. The largest area of floodplain occurred along the Trinity River near downtown Dallas, which crosses the Waxahachie Corridor study are near the northern terminus along IH 30, IH 45, and IH 35E.

Numerous streams cross the project area. Over 308,000 linear feet of stream were identified in the project study area. These streams included unnamed tributaries and aqueducts. Larger streams include Bear Creek, Bushy Creek, Cedar Creek, Cottonwood Creek, Deep Branch, Five Mile Creek, Floyd Branch, Grove Creek, Red Oak Creek, South Grove Creek, Ten Mile Creek, Trinity River, Waxahachie Creek, and Whites Creek. The Trinity River stream segment within the study area is listed on the TCEQ draft 2010 section 303(d) list for impaired water body segments. Impairments include bacteria and polychlorinated biphenyls (PCBs) in edible tissue. A more detailed discussion of streams is in Section B.3.6.

All municipalities within the study area are members of the North Texas Municipal Water District and have municipal separate storm sewer systems (MS4) permits. The City of Dallas and Dallas County have medium or large MS4 permits (Phase 1). The remaining municipalities of Hutchins, Lancaster, Red Oak, and Waxahachie have small MS4 permits (Phase 2). As development and growth continues in the project area, the potential for additional impacts to water quality may occur.

B.3.5 Biological Resources

This section discusses the existing biological resources and the protection they are afforded. These resources include vegetation, wildlife, and threatened and endangered species.

B.3.5.1 Legal /Regulatory Context

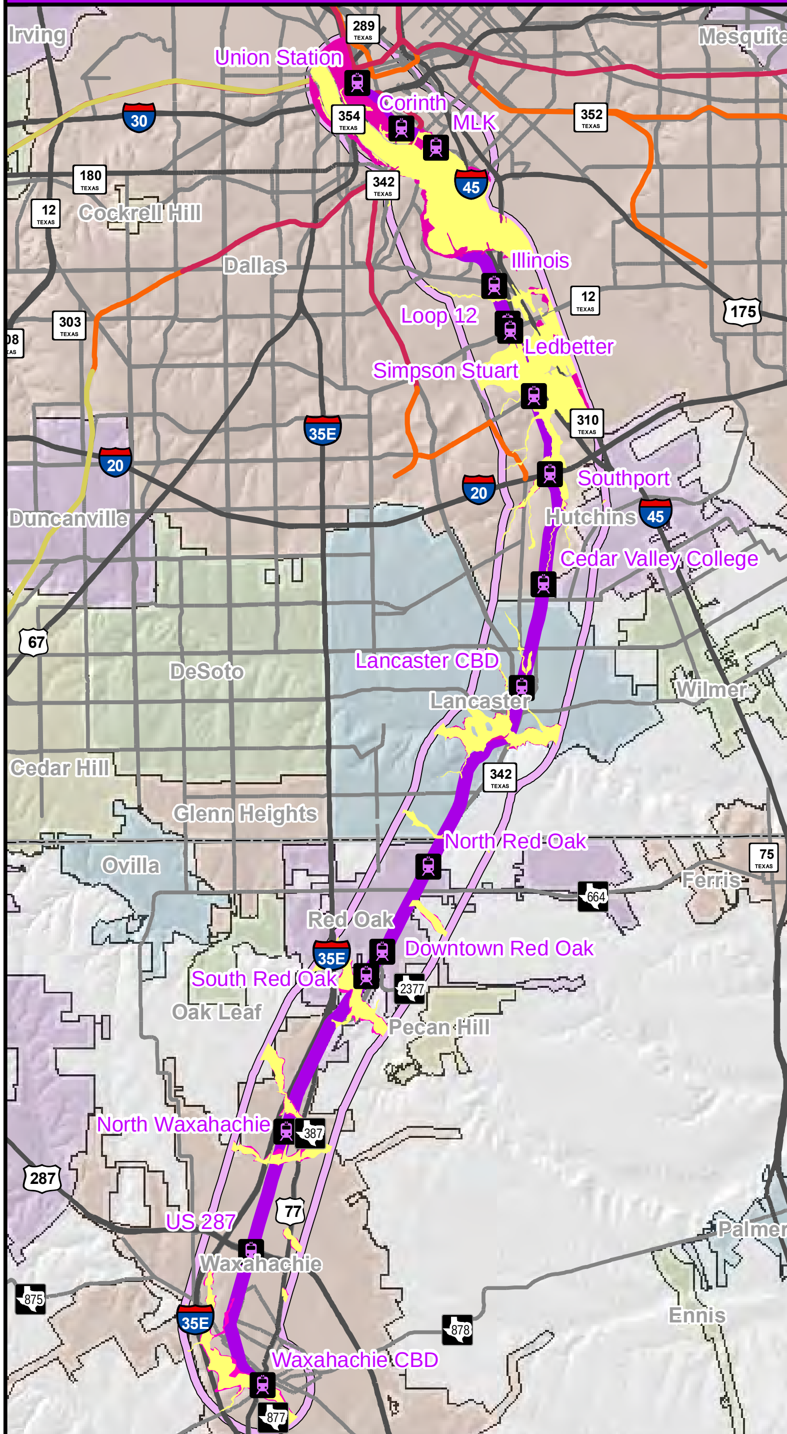
<u>Vegetation</u>

The Executive Memorandum on Beneficial Landscaping Practices was published in the August 10, 1995, Federal Register. It requires that all agencies comply with NEPA as it relates to vegetation management and landscape practices for all federally assisted projects. The Executive Memorandum directs that where cost-effective and to the extent practicable, agencies will:

- Use regionally native plants for landscaping.
- Design, use, or promote construction practices that minimize adverse effects on the natural habitat.
- Seek to prevent pollution by, among other things, reducing fertilizer and pesticide use.
- Implement water-efficient and runoff-reduction practices.
- Create demonstration projects employing these practices.

Executive Order 13112 on Invasive Species requires that federal agencies identify actions that can affect the disposition or introduction of invasive species, use relevant programs to prevent the introductions of such species, control invasive species, monitor known populations of invasive species, and restore areas affected by such species.

Figure B-27 — Floodplains
From FM 66 to Spur 366



Legend

- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- 100-Year Floodplain
- 500-Year Floodplain
- Study Area
- City / Town Limits
- County Limits

0 2 4 8 Miles

N

Key Map

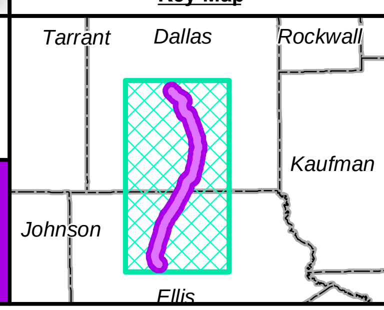


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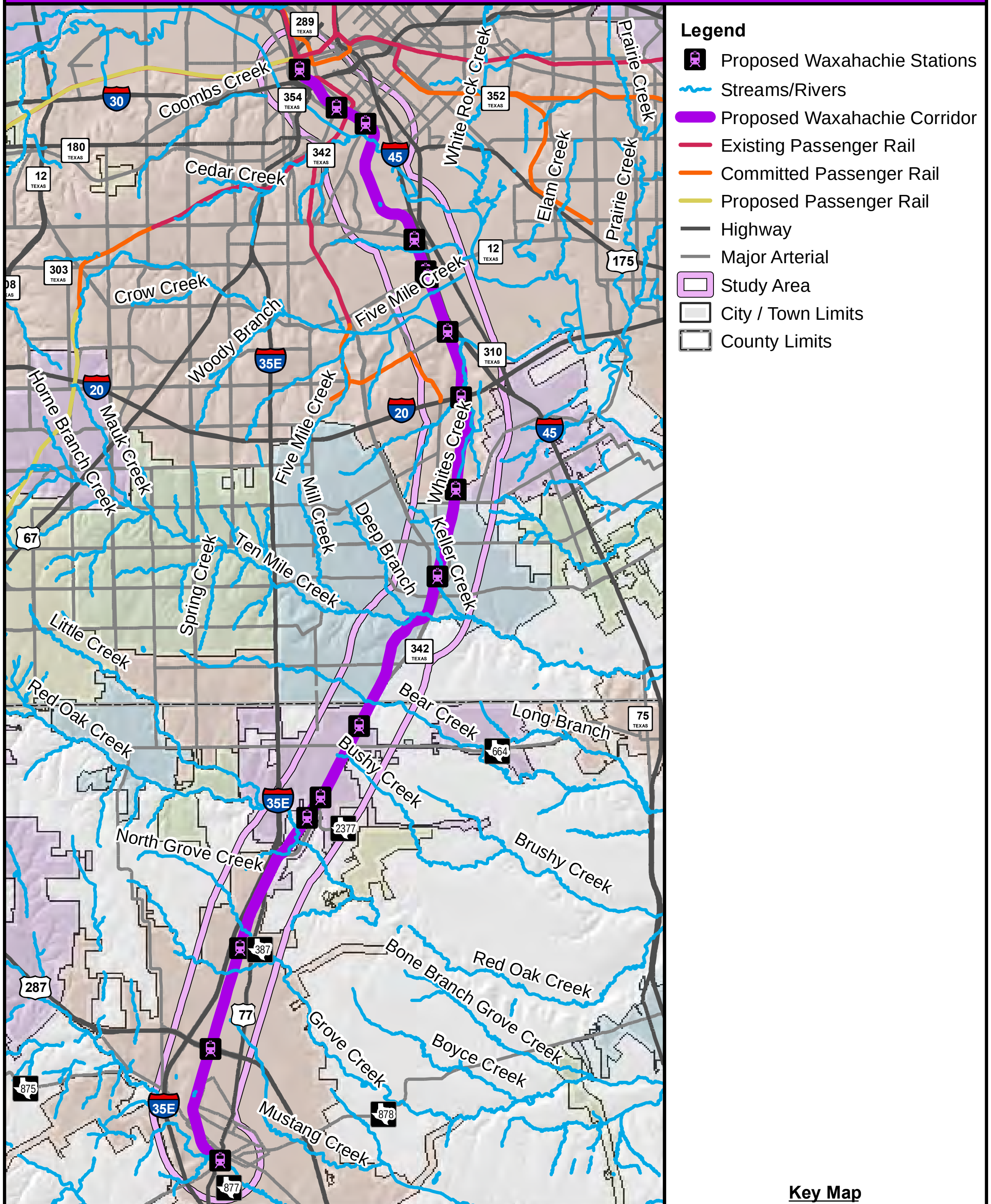
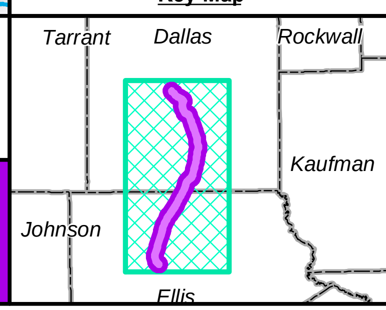
Figure B-28 — Water Resources
From FM 66 to Spur 366





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Wildlife

In addition to regulatory guideline of vegetation, there are regulations pertaining to wildlife. Several laws and regulations govern impacts to wildlife resources, most notably the Migratory Bird Treaty Act (MBTA) of 1918, Fish and Wildlife Coordination Act (FWCA) of 1958, and the Magnuson-Stevens Fishery Conservation and Management Act (SFA) of 1976, as amended. The MBTA implemented a treaty that was signed by the US, Japan, Canada, Mexico, and Russia. The law affords protection to virtually all migratory birds, including their parts, nests, or eggs. The MBTA affords protection to over 800 species. The FWCA requires federal agencies to solicit comments from both the USFWS and the state agency (i.e., TPWD) regarding the impacts of federal actions on wildlife species. The SFA implemented by the National Marine Fisheries Service is the authority for all fishery management activities, regulating essential fish habitat.

Threatened and Endangered Species

The Endangered Species Act of 1973, as amended prohibits the taking of listed species and the destruction of habitats critical to the survival of federally listed species. The designation of endangered indicates that the entire species appears to be in danger of extinction. A designation of threatened indicates a species for which protective measures appear to be required to prevent a species from becoming endangered. The word “take” according to the Endangered and Threatened Wildlife and Plants includes harass, harm, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. In this context, harm, means an act that actually kills or injures protected wildlife. This interpretation includes substantial habitat modification or degradation that results in actual injury or death to listed species (i.e., impairment of essential behavior patterns).

The Bald and Golden Eagle Protection Act of 1940, as amended, gives protection to Bald and Golden Eagles (*Haliaeetus leucocephalus* and *Aquila chrysaetos*) similar to the endangered species act. The Bald Eagle was removed from the federal threatened and endangered list (effective August 8, 2007). Bald Eagles are now afforded protection under the Bald and Golden Eagle Protection Act, which prevents a person to “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any Bald Eagle…[or any Golden Eagle], alive or dead, or any part, nest, or egg thereof.” The act defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. It further defines disturb as to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available:

1) Injury to an eagle,
2) a decrease in its productivity, by substantially interfering with normal breeding, feeding or sheltering, or
3) nest abandonment, but substantially interfering with normal breeding, feeding, or sheltering behavior.

Somewhat similar legislation has been passed by the State of Texas and the TPWD has the responsibility of listing species within the state. In addition, the Parks and Wildlife Code, Chapters 68 and 88 for the State of Texas, contain the regulations of endangered species and plants. Both the state and federal laws afford protection to the organism from direct taking. However, state laws do not include prohibitions on impacts to habitat, only to activities that would directly impact a listed species. The 13 taxa listed by federal and/or state government agencies in Dallas and Ellis Counties are shown in Table B-37.

Table B-37 Federal/State Listed Species

Common Name	Scientific Name	Federal Status	State Status
Birds			
American Peregrine Falcon	*Falco peregrinus anatum*	--	T
Bald Eagle	*Haliaeetus leucocephalus*	DM	T
Black-Capped Vireo	*Vireo atricapilla*	E	E
Golden-Cheeked Warbler	*Dendroica chrysoparia*	E	E
Interior Least Tern	*Sterna antillarum athalassos*	E	E
Piping Plover	*Charadrius melodus*	T	T
White-Faced Ibis	*Plegadis chihi*	--	T
Whooping Crane	*Grus Americana*	E	E
Wood Stork	*Mycteria americana*	--	T
Mammals			
Red Wolf	*Canis rufus*	--	E
Mollusks			
Louisiana Pigetoe	*Pleurobema riddellii*	--	T
Sandbank Pocketbook	*Lampsilis satura*	--	T
Reptiles			
Alligator Snapping Turtle	*Macrochelys temminckii*	--	T

Source: USFWS, August 2010; TPWD, August 2010.
E = Endangered, T = Threatened, DM = Delisted Taxon, Recovered, Being Monitored First Five Years.

B.3.5.2 Methodology/Research

Research for the existing conditions was conducted through GIS. Data for vegetation was obtained from the TPWD in the form of the *Vegetation Types of Texas* and the TPWD ecoregions. Potential threatened and endangered species, as well as species of concern were obtained through the Natural Diversity Database (NDD) from TPWD. This database tracks confirmed sightings and locations of threatened and endangered species (as well as candidate species), species of concern, and special habitat series. The NDD was consulted on June 3, 2010, (data from February 12, 2009).

Existing conditions of wildlife is difficult to obtain without extensive field investigations throughout the study area. Because of the inability to conduct these surveys, habitat was used as a proxy for wildlife. In general, the type of species that occur within an area is based on the type of habitat present. In addition, areas of high degree of human activity exhibit less diversity and have a lower habitat value to wildlife than undisturbed habitats. Evaluation of areas of human disturbance was derived from the land use section (see Section B.2.1). Aerial photography was used as the basis for habitat fragmentation. Future conditions for all biological resources are based on existing trends in development discussed in previous sections.

B.3.5.3 Existing Conditions and Future Projections

The study area is entirely within the Texas Blackland Prairies major ecological area. The study area is all within the Northern Blackland Prairie and Low Terraces subareas of the Texas Blackland Prairies. According to the World Wildlife Fund, the Texas Blackland Prairie eco-region spans approximately 6.1 million hectares from the Red River on the north to near San Antonio in southern Texas; it is part of a tallgrass prairie continuum that stretches from Manitoba to the Texas Coast.

Four vegetation types from the *Vegetation Types of Texas* were identified in the study area. Table B-38 lists the acreage and percent of vegetation type in the study area, describes the typical vegetation species found in each vegetation type, and lists where in Texas the vegetation type occurs. Figure B-29 illustrates the vegetation types. The crops category covers the largest portion of the study area at approximately 29,430 acres (71.1 percent), urban areas accounted for approximately 7,950 acres (19.2 percent), other native or introduced grasses accounted for approximately 3,250 (7.8 percent) acres, and water oak – elm hackberry category accounted for approximately 740 acres (1.8 percent).

The NDD provides actual recorded occurrences of protected species and vegetation series throughout the State of Texas. Areas near reported occurrences can be investigated further to confirm the presence of the documented species or vegetation series and avoid them whenever possible. A search through the NDD from TPWD was conducted for the study area for potential threatened and endangered species, species of concern, protected species and vegetation series. The database yielded one occurrence of a rookery within the study area. It is anticipated the project would have no effect to this rookery because the area already experiences freight rail activity.

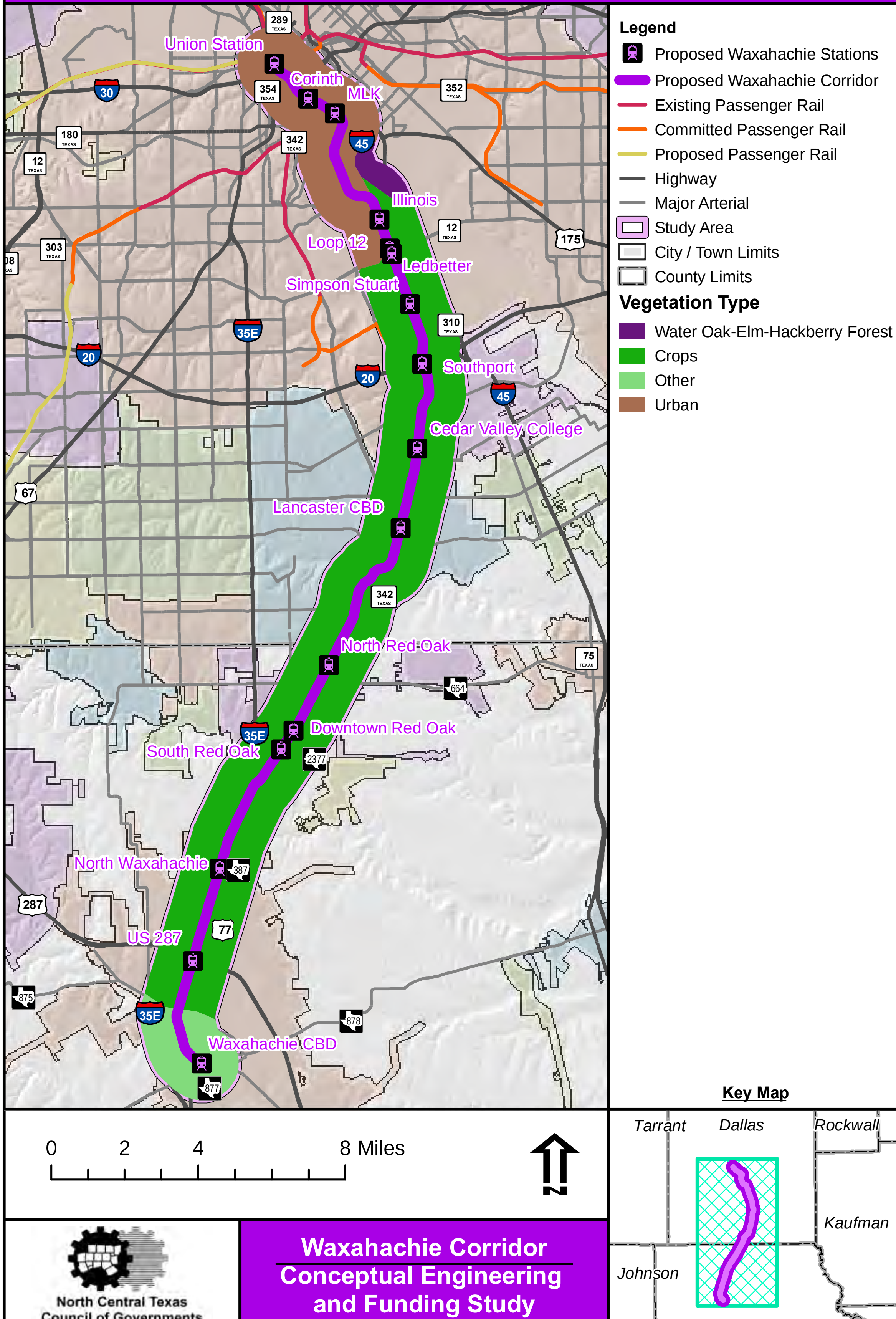
As the study area becomes more developed, biological resources would decline. Vegetation and wildlife habitat would be converted to urban and suburban areas based on future population growth, as described in Chapter 2, Section 2.1.1. While impacts would be permanent, these changes may be offset by creation of parks and green space. Impacts to threatened and endangered species could occur if it was determined that their habitat would be impacted by future growth. Although some species would lose habitat, some have adapted to living within an urban environment if the right combination of surrounding foraging areas remain; such as the Interior Least Tern species, which nests on the gravel rooftops of buildings.

Table B-38 Vegetation Types

Vegetation Type	TPWD Vegetation Code Number	Commonly Associated Plants	Distribution	Area (Acres)	Percent of Study Area
Water Oak-Elm-Hackberry Forest	36	Cedar elm, American elm, willow oak, southern red oak, white oak, black willow, cottonwood, red ash, sycamore, pecan bois d'arc, flowering dogwood, dewberry, coral-berry, dallisgrass, switchgrass, rescuegrass, Bermuda grass, eastern gamagrass, Virginia wildrye, Johnsongrass, giant ragweed, yankeeweed, Leavenworth eryngo.	Occurs in the upper floodplains of the Sabine, Neches, Sulphur and Trinity River tributaries	733	1.8%
Crops	44	Cultivated cover crops or row crops providing food and/or fiber for either man or domestic animals. This type may also portray grassland associated with crop rotations.	Statewide	29,324	71.1%
Other Native or Introduced Grasses	45	Mixed native or introduced grasses and forbs on grassland sites or mixed herbaceous communities resulting from clearing of woody vegetation. This type is associated with the clearing of forest in northeast and east-central Texas and may portray early stages of Type 41, Young Forest. Also occurs in the South Texas Plains where brush has been cleared. Such areas are particularly subject to change due to regrowth brush.	Principally northeast, east-central and south Texas	3,235	7.8%
Urban areas	46	Urban vegetation types as usually associated with landscaped and ornamental species planted in urban areas. This could also include maintained grasses along roadside right-of-ways and in urban ditches.	Statewide	7,924	19.2%

Source: TPWD GIS: *Vegetation Types of Texas*, June 2010

Figure B-29 — Vegetation Types
From FM 66 to Spur 366



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B.3.6 Waters of the US, including Wetlands

B.3.6.1 Legal and Regulatory Context

Waters of the US, including wetlands, are afforded protection under the CWA. Enforcement of the CWA falls under the jurisdiction of the EPA and USACE. The CWA regulates the discharge of dredge and fill material into waters of the US. This includes rivers, perennial, intermittent and ephemeral streams, bogs, sloughs, lakes, on-channel ponds, and wetlands.

Section 404 Permit (CWA)

Section 404 of the CWA would require a permit for activities that would result in fill of jurisdictional waters of the US. These permits could be IPs or general permits. General permits include both regional and nationwide permits (NWP). NWP 14 is intended to provide a means of permitting linear transportation projects and may apply in this case. However, all Section 404 permitting would be coordinated with the Regulatory Branch, Fort Worth District of the USACE. The USACE is responsible for confirming all jurisdictional determinations, as well as establishing the appropriate permitting avenue.

Section 9 of the Rivers and Harbors Act of 1899

This act prohibits the construction of any bridge, dam, dike, or causeway over or in any port, roadstead, haven, harbor, canal, navigable river, or other navigable water of the US until the consent of Congress to the building of such structures shall have been obtained and until the plans for the same shall have been submitted to and approved by the Chief of Engineers and by the Secretary of War. These structures may be built under authority of the legislature of a state, across rivers and other waterways the navigable portions that occur wholly within the limits of a single state, provided the location and plans of the structure are submitted to and approved by the Chief of Engineers and by the Secretary of War before construction is commenced. It is also required that when plans for any bridge or other structure have been approved by the Chief of Engineers and by the Secretary of War; it is unlawful to deviate from such plans either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Chief of Engineers and of the Secretary of War.

Section 10 of the Rivers and Harbors Act of 1899

This act prohibits the creation of any obstruction to the navigable capacity of any of the waters of the US that has not been affirmatively authorized by Congress. The construction or commencement of building any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the US, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of War is regulated under this Act. This Act also prohibits the excavation, fill, or any manner of alteration/modification to the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the US. Work in navigable waters must be recommended by the Chief of Engineers and authorized by the Secretary of War prior to beginning construction.

Section 14 of the River and Harbors Act (33 USC 408)

This act prohibits any person from taking possession, or making use of for any purpose, or build upon, alter, deface, destroy, move, injure, obstruct, or impair the usefulness of any sea wall, bulkhead, jetty, dike, levee, wharf, or pier in the whole or part. The Secretary of the Army may grant permission for the temporary occupation or use of the features. The Secretary of the Army may also grant permission for the alteration or permanent occupation or use of these features.

B.3.6.2 Methodology/Research

Data to identify the extent of waters of the US, including wetlands, was collected through NCTCOG GIS. Stream data, maintained by NCTCOG, from baseline data from TCEQ identifies the majority of the streams and water bodies within the study area. Wetland data was derived from 2001 National Land Cover Dataset (NLCD) from the EPA though GIS, the most recent dataset available.

B.3.6.3 Existing Conditions

The only river crossed by the Waxahachie Corridor is the Trinity River, which runs for over 37,000 linear feet (over seven miles) within the study area. In addition to the Trinity River, over 270,000 of additional linear feet of streams were identified in the study area. Other streams with at least 15,000 linear feet inside the study area are Five Mile Creek, Floyd Branch, Honey Springs Branch, Keller Creek, Red Oak Creek, Ten Mile Creek, Waxahachie Creek, and Whites Creek. The locations of ephemeral and some intermediate streams would likely not have been reported though the GIS files and would need to be identified through field investigations in future environmental studies. Table B-39 shows the amount of linear feet of streams in the Waxahachie Corridor study area. Water resources, including streams and rivers, were shown previously in Figure B-28.

Table B-39 Linear Feet of Streams

Stream Name	Linear Feet	Stream Name	Linear Feet
Bear Creek	12,276	Mustang Creek	4,868
Bushy Creek	6,981	Newton Creek	5,278
Cedar Creek	10,078	North Grove Creek	14,941
Cottonwood Creek	583	Red Oak Creek	15,013
Deep Branch	6,976	South Grove Creek	13,836
Five Mile Creek	25,299	Ten Mile Creek	18,798
Floyd Branch	16,840	Trinity River	37,322
Grove Creek	31	Waxahachie Creek	25,046
Honey Springs Branch	17,645	Whites Creek	29,794
Keller Creek	20,022	Unidentified Streams	25,891

Source: NCTCOG GIS: Streams, 2009

Table B-40 lists the lakes and ponds within the Waxahachie Corridor study area. Three of the named ponds were associated with country clubs and golf courses within the study area. Lakes and ponds account for less than one percent of the area under study.

Table B-40 Waters of the US

Name	Area (Acres)	Percent of Study Area
Five Mile Creek	0.3	<0.1%
Katy Lake	8.4	<0.1%
Lancaster Country View Golf Course Ponds	15.2	<0.1%
Lemmon Lake	3.3	<0.1%
Lemmon Lake Park Lake	4.7	<0.1%
Little Lemmon Lake	10.3	<0.1%
Mooreland Lake	7.8	<0.1%
Sleepy Hollow Country Club Lakes	0.9	<0.1%
Waxahachie Country Club Lakes	42.1	0.1%
Unnamed Ponds and Lakes	100.9	0.2%
Total lakes and ponds	**193.9**	**0.5%**

Source: NCTCOG GIS: Lakes, 2009

The determination of wetlands locations within the study area was made based on the use of existing NLCD maps for the study area. The NLCD classifies wetlands into two categories: woody wetlands and emergent herbaceous wetlands. As shown in Table B-41, wetlands comprised only 2.0 percent of the study area. The largest identified wetlands areas were along the Trinity River, Five Mile Creek, and Floyd Branch. The wetlands identified all occurred in the north half of the study area. The NLCD does not constitute a complete inventory of wetlands within the study area and field investigations in coordination with the USACE would be necessary to determine the locations and extents of affected wetlands in subsequent studies. Figure B-30 shows the locations of the potential wetlands.

Figure B-30 — NLCD Wetlands
From Bear Creek Road to Spur 366

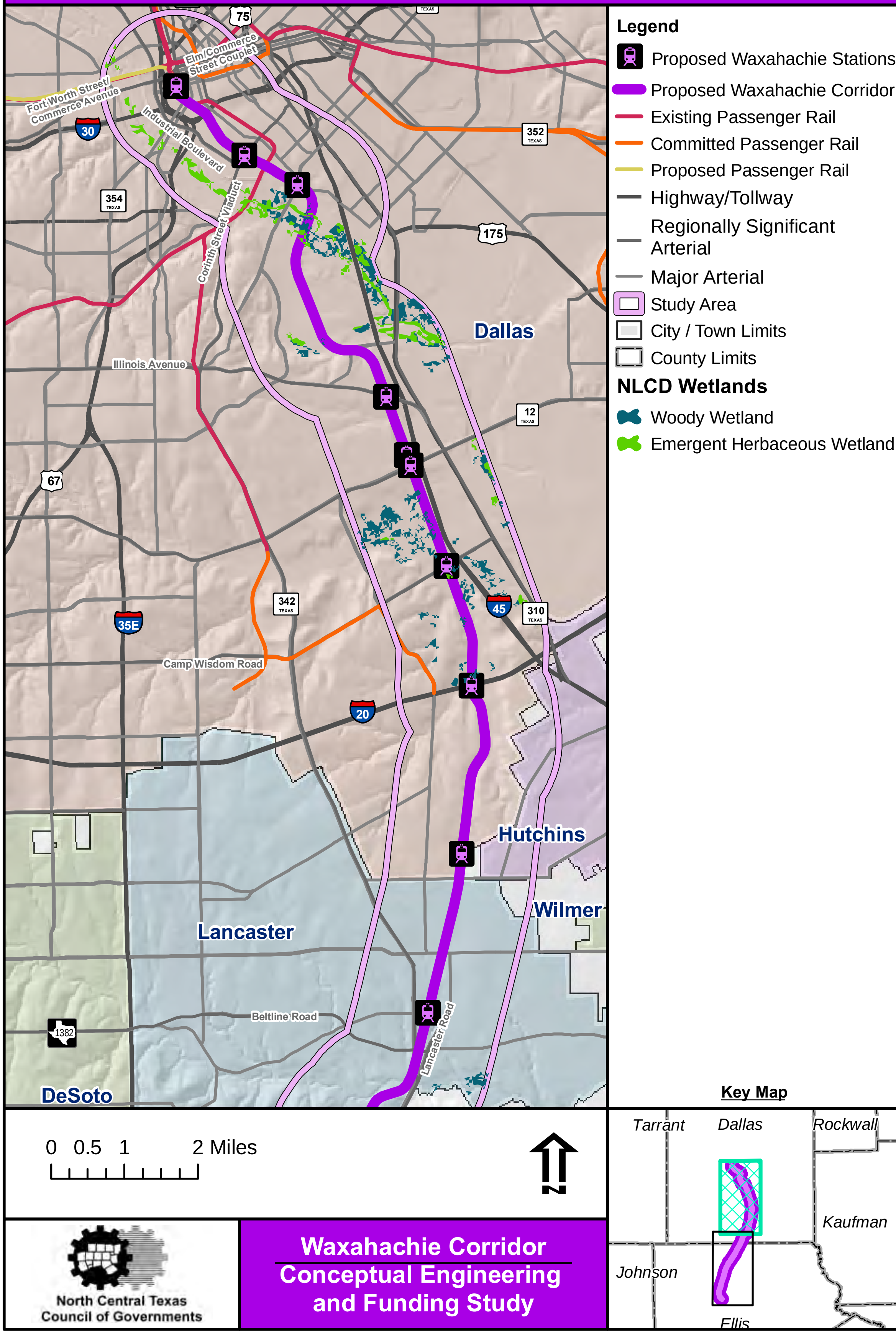

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Table B-41 Wetlands

Name	Area (Acres)	Percent of Study Area
Woody Wetlands	517.4	1.3%
Emergent Herbaceous Wetlands	309.6	0.7%
Total Wetlands	**827.0**	**2.0%**

Source: NLCD GIS, 2001

Development within the study area has the potential to reduce the linear feet of streams and acreage of waters of the US. Because all impacts to streams and wetlands are regulated by the USACE, it is anticipated any loss of waters of the US in the study area due to development would be offset by USACE-enforced mitigation policies.

B.3.7 Soils and Geology

This section discusses the soils and geology of the study area through soil data, geological data, and aquifer data.

B.3.7.1 Legal/Regulatory Context

Except for prime and unique farmlands, soils and geology are not associated with legal laws or regulations in this region. The Farmland Protection Policy Act (FPPA) provides protection to prime and unique farmlands, as well as farmlands of statewide or local importance. Prime and unique farmlands, as defined by the US Department of Agriculture (USDA), are lands best suited to producing food, feed, forage, and oilseed crops. Such soils have properties that are favorable for the production of sustained high yields. According to the Natural Resources Conservation Service (NRCS), “the purpose of the FPPA is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses.” FPPA ensures, to the maximum extent practicable, that federal programs are administered in a manner that is compatible with state, unit of local government, and private programs to protect farmland.

B.3.7.2 Methodology/Research

GIS data was used to identify the geological components, including aquifers and soils, within the Waxahachie Corridor study area. Data for the geological formations was obtained from the USGS which included GIS data and descriptions of the geological formations. Aquifer data was obtained from the Texas Water Development Board (TWDB) in the form of GIS and aquifer descriptions. Soil data and descriptions were acquired from the NRCS.

B.3.7.3 Existing Conditions and Future Projections

Geological

The study area lies atop the Austin Chalk major geological formation. Other minor geological units included in the Waxahachie Corridor study area are alluvium, water, and terrace deposits. Figure B-31 shows the locations of these geological features. Geological formations change slowly over extended periods of time due to changes in the overall environmental landscape of the region. It is expected that these geological formations will remain in the future.

- Austin Chalk (Major Geological Formation)

This formation is a large chalk formation from the Phanerozoic, Mesozoic, and Cretaceous-Late ages. Primary rock type is limestone, secondary is mudstone, and tertiary is clay or mud, bentonite, and mudstone. This geological formation covers 31,428 acres (76.0 percent) of the study area. The portions of the study area covered by this formation include: all areas within the Cities of Lancaster, Red Oak, and Waxahachie; almost all of the City of Hutchins and half the City of Dallas. Austin Chalk is a massive chalk formation with some interbeds and partings of light grey calcareous clay. Middle portions are mostly thin-bedded marl with interbeds of massive chalk and hard lime mudstone to soft chalk with light grey and weathers white color. The chalk is mostly microgranular calcite with minor foraminifer test and Inoceramus prisms, with local thin bentonitic beds in lower parts. Thickness is around 600 feet and marine megafossils are scarce.

- Alluvium (Minor Geological Unit)

The alluvium geological areas account for the second most prevalent type in the study area and covers 5,104 acres (12.3 percent). Alluvium is located generally in areas of rivers and is mostly composed of silt and clay particles with larger sand and gravel. As a geological feature, these areas have extended underneath the surface and have formed this same mixture below the surface. The alluvium in the study area is directly related to the Trinity River and Five Mile Creek crossings of the study area.

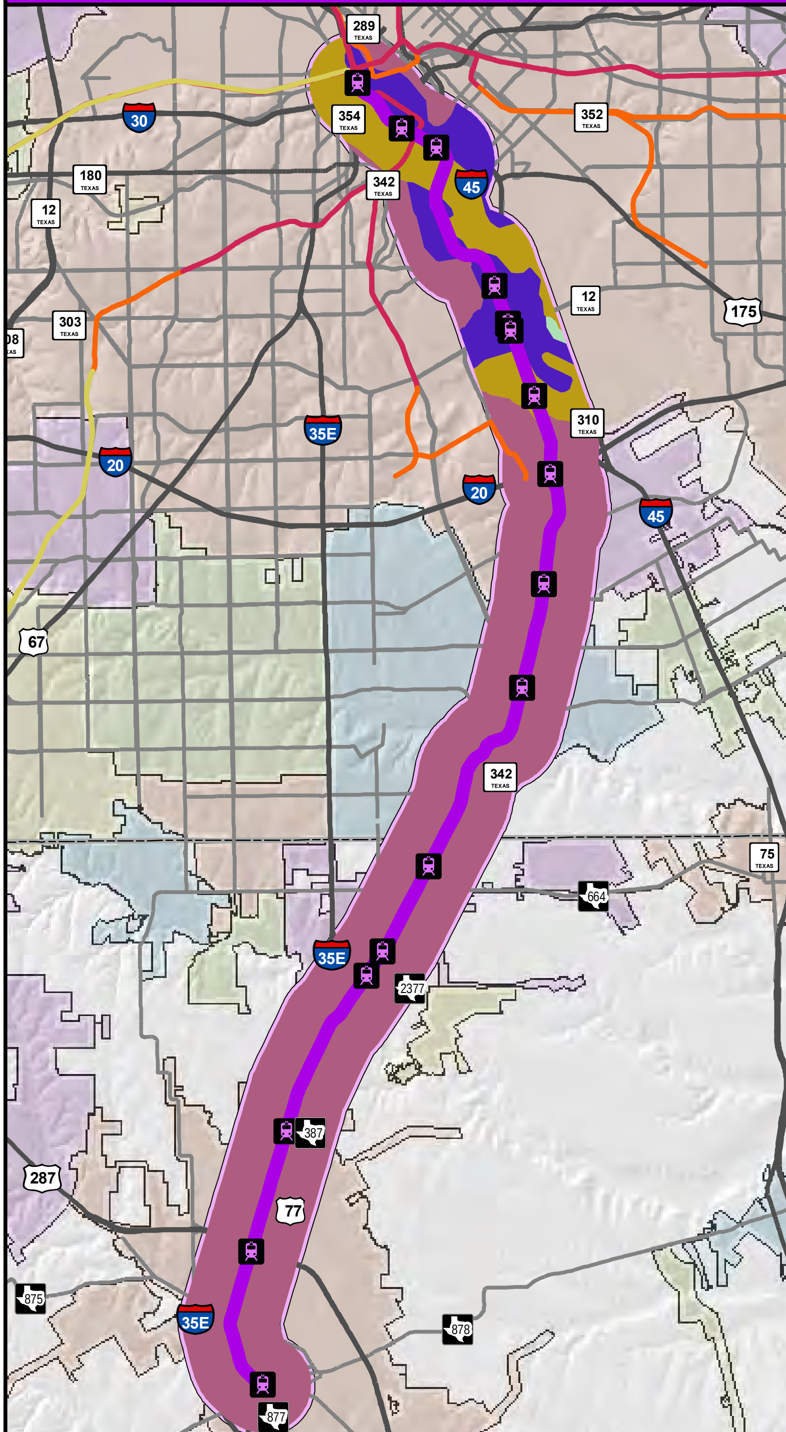
- Terrace Deposits (Minor Geological Unit)

Terrace deposits are flat platforms adjacent to streams that were located in a former floodplain. These higher platforms form with a stream or river, cuts a deeper channel, leaving the terrace deposits outside the stream and floodplain. The terrace deposits are mostly striated layers of gravel, sand, and sediments. This geological area is the least prevalent in the study area, covering 4,758 acres (11.5 percent) of the area. The location of this geological area is between the alluvium geological areas from the Trinity River, Honey Springs Branch, and Five Mile Creek.

- Water (Minor Geological Unit)

In reference to the larger lakes the USGS has identified some geological areas as water. As a geological type, water accounted for 72 acres (0.2 percent). The water geological area occurred adjacent to the Trinity River in the study area.

Figure B-31 — Geological Formations
From FM 66 to Spur 366

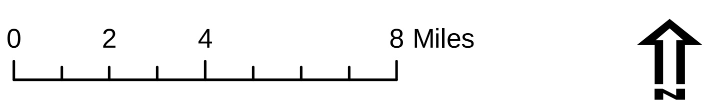


Legend

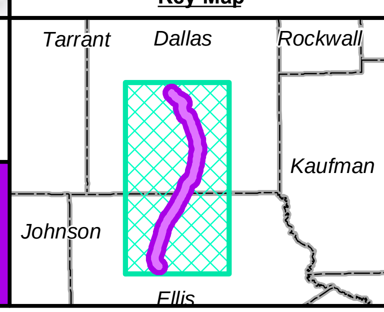
- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

Geological Formations

- Austin Chalk
- Terrace deposits
- Alluvium
- Water



Key Map



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Aquifers

The study area is completely within both the Trinity Aquifer and the Woodbine Aquifer.

- Trinity Aquifer

The Trinity Aquifer is a major aquifer; its downdip area is located in and encompasses the entire study area. The Trinity Aquifer consists of early Cretaceous age formations of the Trinity Group. These formations occur in the band extending through the central part of the state, in all or parts of 55 counties, from the Red River in North Texas to the Hill Country of South-Central Texas. Trinity Group deposits also occur in the Panhandle and Edwards Plateau regions where they are included as part of the Edwards-Trinity (High Plans and Plateau) aquifers.

Formations comprising the Trinity Group are (from youngest to oldest): the Paluxy, Glen Rose, and Twin Mountains-Travis Peak. Updip, the Paluxy and Twin Mountains coalesce to form the Antlers Formation. The Antlers consist of up to 900 feet of sand and gravel, with clay beds in the middle section. Water from the Antlers main use is irrigation in the outcrop area of North and Central Texas.

Forming the upper unity of the Trinity Group, the Paluxy Formation consist of up to 400 feet of predominately fine to course-grained sand interbedded with clay and shale. The formation pinches out downdip and does not occur south of the Colorado River.

Underlying the Paluxy, the Glen Rose Formation forms a gulfward-thickening wedge of marine carbonates consisting primarily of limestone. South of the Colorado River, the Glen Rose is the upper unit of the Trinity Group and is divisible into an upper and lower member. In the north, the downdip portion of the aquifer becomes highly mineralized and is a source of contamination to wells drilled into the underlying Twin Mountains.

The basal unit of the Trinity Group consists of the Twin Mountains and Travis Peak formations, which are laterally separated by a facies change. To the north, the Twin Mountains Formation consists mainly of medium to coarse-grained sands, silty clays, and conglomerates. The Twin Mountains is the most prolific of the Trinity Aquifers in North Central Texas; however, the quality of the water is generally not as good as that from the Paluxy or Antlers Formations. To the south, the Travis Peak Formation contains calcareous sands and silts, conglomerates, and limestones. The formation subdivisions follow members in descending order: Hensell, Pearsall, Cow Creek, Hammett, Sligo, Hosston, and Sycamore.

Extensive development of the Trinity Aquifer has occurred in the DFW region where water levels have historically dropped as much as 550 feet. Since the mid-1970s many public supply wells have been abandoned in favor of surface-water supply, and water levels have responded with slight rises. Water-level declines of as much as 100 feet are still occurring in Denton and Johnson Counties. The Trinity Aquifer is the most extensively developed from the Hensell and Hosston members in the Waco area, where the water level has declined by as much as 400 feet.

- Woodbine Aquifer

The Woodbine Aquifer is a minor aquifer; it crosses the study area extending mostly north and south. Both the outcrop and downdip areas of the Woodbine Aquifer are located in the entire study area. From the TWDB, the Woodbine Aquifer extends from McLennan County in North-Central Texas northward to Cook County and eastward to the Red River County, paralleling the Red River. Water produced from the aquifer furnishes municipal, industrial, domestic, livestock, and small irrigation supplies throughout its North Texas extent.

The Woodbine Formation of Cretaceous age is composed of water-bearing sandstone beds interbedded with shale and clay. The aquifer dips eastward into the subsurface where it reaches a maximum depth of 2,500 feet below land surface and a maximum thickness of approximately 700 feet. The Woodbine Aquifer is three water-bearing zones that differ considerably in productivity and quality. Only the lower two zones of the aquifer are to supply water for domestic or municipal uses. Heavy municipal and industrial pumpage has contributed to water-level declines in excess of 100 feet in the Sherman-Denison area of Grayson and surrounding counties.

Chemical quality deteriorates rapidly in well depths below 1,500 feet. In areas between the outcrop and this depth, quality is good overall, as long as groundwater from the upper Woodbine is sealed off. The upper Woodbine contains water of extremely poor quality in downdip locales and contains excessive iron concentrations along the outcrops.

Aquifers are large sources of water that change slowly from large environmental changes over extended periods of time. While no changes are expected for the future, water levels could drop as the population increases in the study area and more water is drawn from the aquifers or from surface water that recharges the aquifer.

Soils

The NRCS maintains digital data, in addition to literature over soil types, series, associations, taxonomy, and the location of these units. Soil types in the study area were determined from 2009 GIS data obtained from the NRCS.

The study area contained 70 unique map unit types. These map units are condensed into 22 separate soil series and five non-series soil. Table B-42 details the soils in the study area. Figures B-32 and B-33 graphically display the soil series in the study area.

Table B-42 Soil Series

Name	Description	Percent of Study Area
Alluvium Land[1]	Alluvium land is a loose, unconsolidated soil or sediments, eroded, deposited, and reshaped by water in a non-marine setting. It occurs in low depressions and ponds located in floodplains of streams and rivers. The water table was or is near the surface for most of the year and is covered by surface water during the rainy season.	1.0%
Altoga Series	The Altoga series consists of very deep, well drained, moderately permeable soils that formed in calcareous clayey sediments. These soils are on gently sloping to strongly sloping erosional uplands. Surfaces are convex and slopes range from one to 12 percent.	0.2%

Table B-42 Soil Series (continued)

Name	Description	Percent of Study Area
Arents[1]	Arents are the Entisols that do not have horizons because they have been deeply mixed by plowing, spading, or other methods of moving by humans. The soils retain fragments that can be identified as parts of a former spodic or argillic horizon, but the fragments do not themselves for horizons.	1.4%
Austin Series[2]	The Austin series consists of moderately deep, well drained, moderately slowly permeable soils that formed in chalk and interbedded marl. These soils are on nearly level to sloping erosional uplands. Slopes range from zero to eight percent.	22.5%
Axtell Series	The Axtell Series consists of very deep, moderately well drained, very slowly permeable soils on Pleistocene terraces. The soil formed in slightly acid to alkaline clayey sediments. Slopes are dominantly zero to have percent, but range to 12 percent.	0.9%
Bastsil Series[2]	The Bastsil series consist of very deep,well drained, moderately permeable soils that formed in the loamy alluvial sediments. These nearly level to gently sloping soils are on stream terraces. Slopes range from zero to five percent.	1.8%
Branyon Series[2]	The Branyon series consist of very deep, moderately well drained, very slowly permeable soils that formed in calcareous clayey sediments. These soils are non nearly level to very gently sloping Pleistocene terraces. Slopes range from zero to three percent.	0.4%
Burleson Series[2]	The Burleson series consists of very deep, moderately well drained, very slowly permeable soils that formed in alkaline clayey sediments. These soils are on nearly level to gently sloping Pleistocene terraces. Slopes range from zero to five percent.	0.1%
Dalco Series[2]	The Dalco series consist of moderately deep, moderately well drained, very slowly permeable soils. These soils are on nearly level to gently sloping uplands. Slopes range from one to 12 percent.	<0.1%
Dutek Series	The Dutek series consists of very deep, well drained, moderately permeable soils formed in loamy to sandy alluvial material. These soils are on gently sloping to strongly sloping high stream terraces of the uplands. Slopes range from one to 12 percent.	0.2%
Eddy Series	The Eddy series consists of shallow to very shallow, well drained, moderately permeable soils that formed in chalky limestone. These soils are on gently sloping to moderately steep uplands. Slopes range from one to 20 percent.	8.6%
Eufaula Series	The Eufaula series consist of very deep, somewhat excessively drained, rapidly permeable upland soils formed in sandy sediments of Pleistocene age. The soils are on nearly level to undulating, hummocky or duney terraces on uplands in the Northern Cross Timbers. Slopes range from zero to 25 percent.	0.1%
Ferris Series	The Ferris series consist of soils that are deep to weathered shale. They are well drained, very slowly permeable soils that formed from weakly consolidated calcareous dense clays and shales. These soils are sloping or moderately steep uplands. Slopes range from one to 20 percent.	0.5%
Frio Series[2]	The Frio series consists of very deep, well drained, moderately slowly permeable soils that formed in loamy and clayey calcareous alluvium. These floodplain soils have slopes ranging from zero to two percent.	1.4%

Table B-42 Soil Series (continued)

Name	Description	Percent of Study Area
Heiden Series[2]	The Heiden series consist of soils that are well drained and very slowly permeable. They are deep to weathered shale. These soils are nearly level to moderately steep uplands. Slopes are mainly three to eight percent but range from 0.5 to 20 percent.	0.2%
Houston Black Series[2]	The Houston Black series consists of very deep, moderately well drained, very slowly permeable soils that formed from weakly consolidated calcareous clays and marls of Cretaceous Age. These soils are on nearly level to moderately sloping uplands. Slopes are mainly one to three percent, but range from zero to eight percent.	26.9%
Lewisville Series[2]	The Lewisville series consists of very deep, well drained, moderately permeable soils that formed in ancient loamy and calcareous sediments. These upland soils have slopes of zero to 10 percent.	6.8%
Pits[1]	Pits are open excavations from which soil and commonly underlying material has been removed, exposing either rock or other material.	0.1%
Silawa Series	The Silawa series consist of very deep, well-drained, calcareous gently sloping to strong sloping soils of uplands formed in clayey marine sediments. This soil is deep and very heavy clayey uplands. The slopes are greater than five percent.	0.3%
Silstid Series	The Silstid series consist of very deep, well drained, moderately permeable soils that formed in sandy and loamy sediments. These soils are on nearly level to strongly sloping terraces. Slopes range from zero to 13 percent.	1.2%
Stephen Series	The Stephen series consists of shallow, well drained, moderately slowly permeable soils formed in interbedded marl and chalky limestone. These soils are on gently sloping to sloping uplands. Slopes are mainly one to five percent but range from one to eight percent.	4.3%
Sunev Series[2]	The Sunev series consist of very deep, well drained moderately permeable soils that formed in loamy soil materials. These soils are on nearly level to moderately steep terraces or colluvial footslopes. Slopes range from zero to 15 percent.	1.1%
Trinity Series[2]	The Trinity series consists of very deep, moderately well drained, very slowly permeable soils on floodplains. They formed in alkaline clayey alluvium. Slopes are typically less than one percent, but range from zero to three percent.	7.3%
Urban Land[1]	Urban land consist of altered soil by human activities for landscaping, construction, buildings, and parks. These soils generally display little to no soil horizon as the existing soil has been modified or other soil has been added.	4.9%
Water[1]	Water consists of soils that occur in areas underneath lakes and large rivers. These soils have been disturbed by water movement and usually have large amounts of sediment accumulated throughout.	0.8%
Whitewright Series	The Whitewright series consist of shallow, well drained, moderately permeable soils that formed in weakly cemented chalk and marl of Upper Cretaceous Age. These gently sloping to moderately steep soils are on convex upland ridges. Slopes are dominantly four to 10 percent but range from one to 15 percent.	0.3%

Table B-42 Soil Series (continued)

Name	Description	Percent of Study Area
Wilson Series	The Wilson series consist of very deep, moderately well drained, very slowly permeable soils that formed in alkaline clayey sediments. These soils are on nearly level to gently sloping stream terraces of terrace remnants on uplands. Slopes are mainly less than one percent but range from zero to five percent.	0.6%

Source: NRCS Soils GIS & Taxonomy, 2010

1. This soil type is not a soil series because of the absences of soil layers and horizons, but represents a general classification.
2. Some or all soils in this series have been identified as prime farmland soils by NRCS and USDA.

Development could change the soils in the study area. When development occurs, the top layer of soil could be disturbed and altered beyond its existing properties. While these changes could occur to the top layers of soil, the deeper soil horizons would remain unchanged in the future.

B.3.8 Energy

B.3.8.1 Legal/Regulatory Context

Energy is not associated with any legal or regulatory laws.

B.3.8.2 Methodology/Research

Energy usage for transit projects are described through VMT and converted to British Thermal Units (BTUs). One objective of transit projects is to reduce the VMT for a region and, therefore, reduce the BTUs of energy consumed.

VMT was derived from the DFWRTM and includes all metropolitan planning area (MPA) counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant). The VMT was converted to give the existing energy usage for the region. According to the USDOT in 1993, an average vehicle mile is equivalent to approximately 6,233 BTUs. In addition, one barrel of oil is approximately 5.8 million BTUs according to the USDOT.

B.3.8.3 Existing Conditions and Future Projections

The NCTCOG 2009 traffic performance reports for the region reported an average daily VMT for the nine-county region at approximately 158.4 million VMT. This daily VMT converts to almost one trillion BTUs of energy usage. This equals approximately 170 thousand barrels of oil per day of usage for the DFW region.

The study area will see an increase consumption of energy as the population and area becomes denser. More vehicles and more VMT will increase the amount of energy required for the region and the study area.

Figure B-32 — Soils
From FM 66 to Bear Creek Road

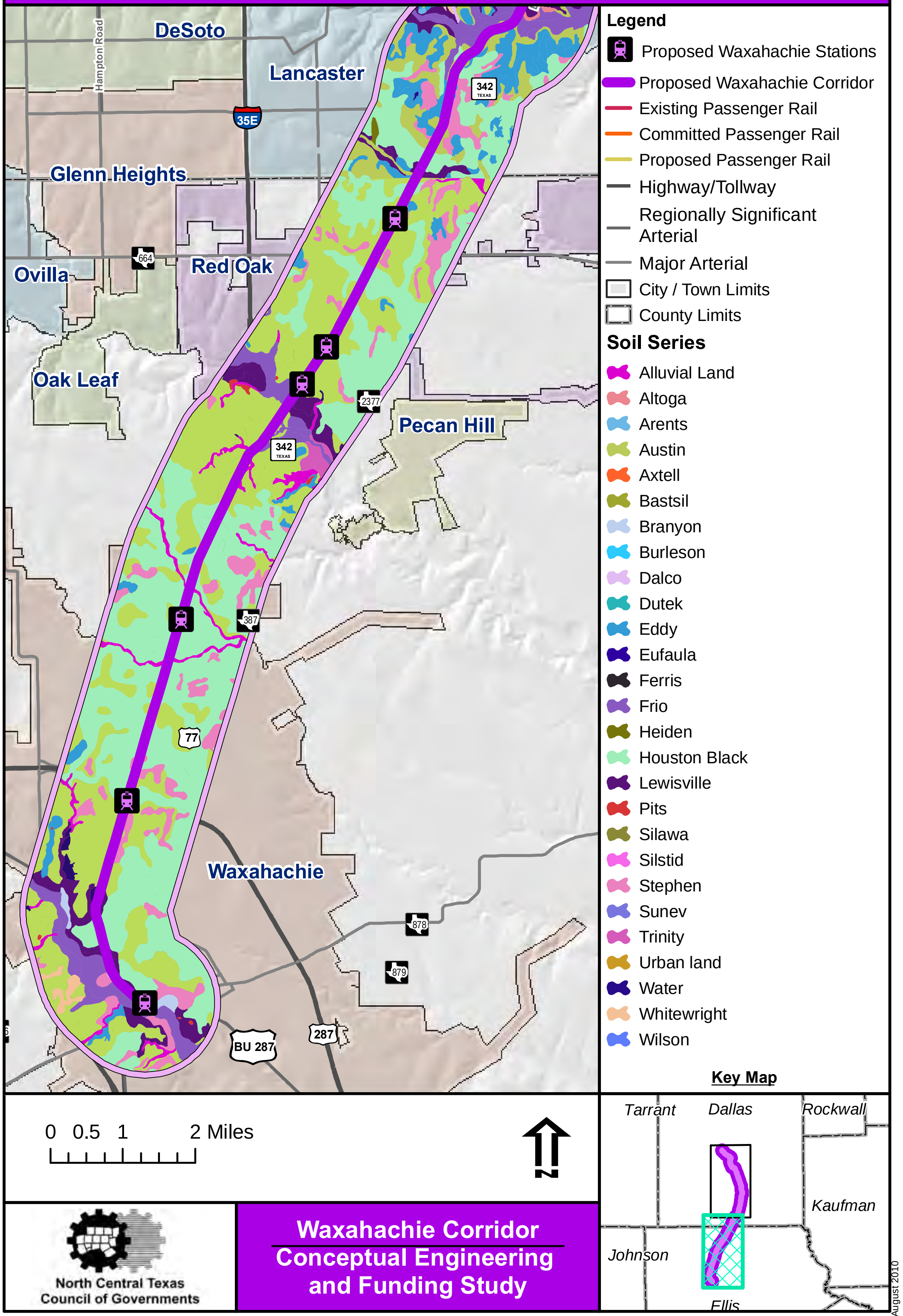
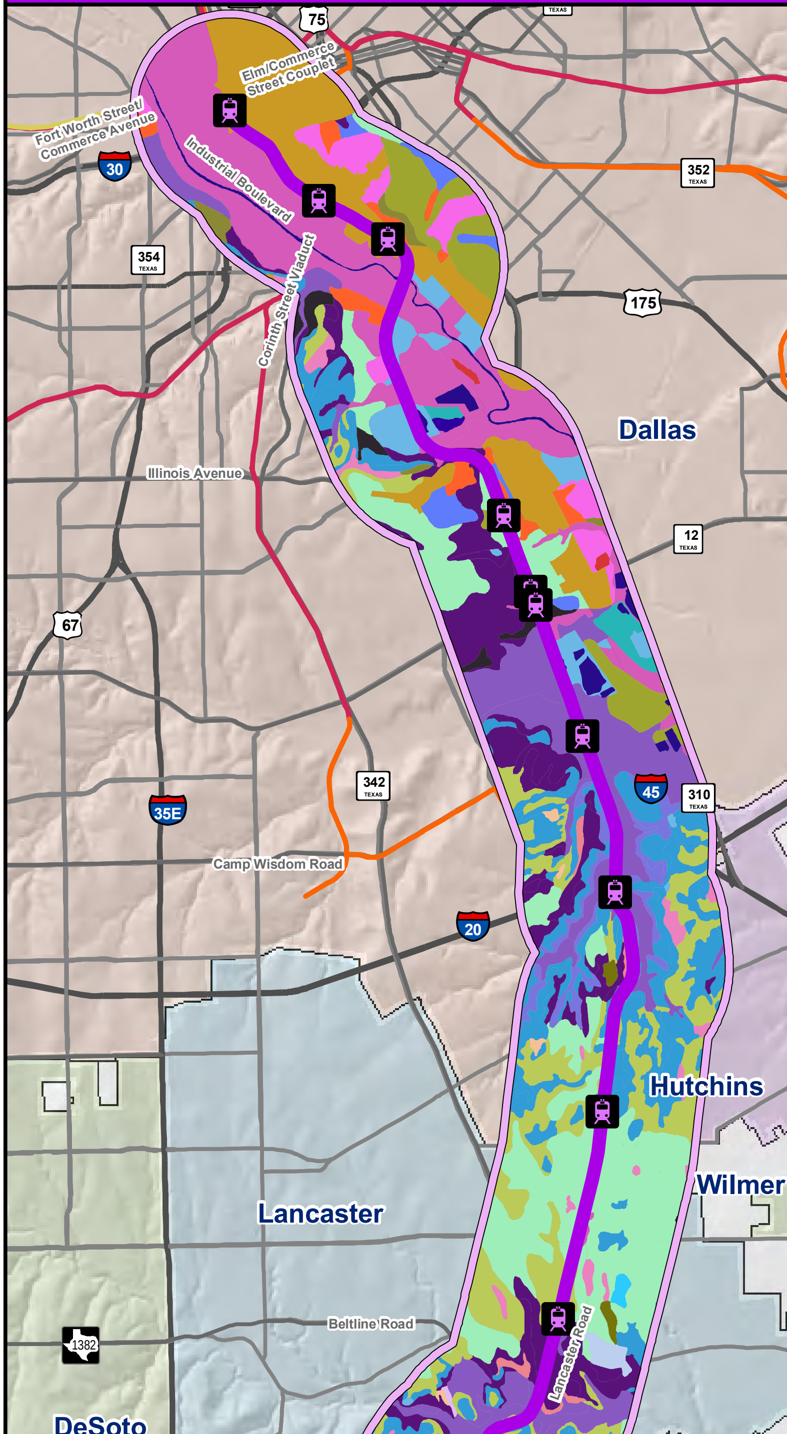


Figure B-33 — Soils
From Bear Creek Road to Spur 366



Legend

- Proposed Waxahachie Stations
- Proposed Waxahachie Corridor
- Existing Passenger Rail
- Committed Passenger Rail
- Proposed Passenger Rail
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- City / Town Limits
- County Limits

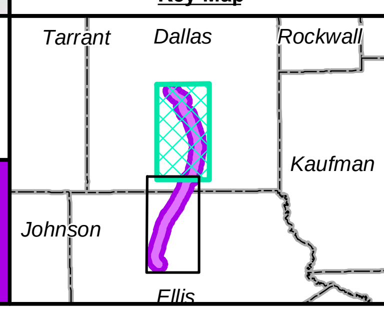
Soil Series

- Alluvial Land
- Altoga
- Arents
- Austin
- Axtell
- Bastsil
- Branyon
- Burleson
- Dalco
- Dutek
- Eddy
- Eufaula
- Ferris
- Frio
- Heiden
- Houston Black
- Lewisville
- Pits
- Silawa
- Silstid
- Stephen
- Sunev
- Trinity
- Urban land
- Water
- Whitewright
- Wilson

0 0.5 1 2 Miles

N

Key Map



North Central Texas Council of Governments

Waxahachie Corridor Conceptual Engineering and Funding Study

August 2010

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Appendix C
Meeting Summaries

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C.1 DECEMBER 12, 2008

Advancing Rail in North Texas Strategy Meeting
South Dallas County-Ellis County Corridor

Friday, December 12, 2008

Attendance
Fifteen attendees signed-in, including representatives from Cedar Hill, Dallas, Dallas Area Rapid Transit (DART), Denton County Transportation Authority (DCTA), Ellis County, Fort Worth, Red Oak, Waxahachie, and North Central Texas Council of Governments (NCTCOG).

Purpose
The main purpose of this meeting was to increase communication among the interested parties along the corridor and help facilitate project implementation. Secondary meeting purposes include determining if regularly scheduled meetings were necessary to devise innovated ways to advance the corridor, determining if a consensus for rail along the corridor is achievable, address potential vehicle technology, usage and cost, and applying information learned from other corridors.

Corridor Overview and Status Report
Michael Morris, Director of Transportation, NCTCOG, began by briefly discussing the Mobility 2030 Passenger Rail Recommendations for two potential extensions of commuter rail into Ellis County: one from West Oak Cliff (DART Red Line) to Midlothian and the other from the Downtown Dallas to Waxahachie (DART Blue Line), which is the focus of this meeting. DART has recently proposed a solution for connecting the South Oak Cliff (Blue Line) line to the two universities located north of I-20. Parallel to the proposed local route is a regional route that goes outside the DART service area using an existing rail corridor from Downtown Dallas to Waxahachie. The NCTCOG has included this rail line in the Mobility 2030 recommendations as a result of projected population growth in Ellis County and projected employment areas in other counties. The employment location for most Ellis County residents is not Ellis County but north into Dallas County. NCTCOG research has found there are a significant number of residents that would like to take rail to accomplish their commute.

Mr. Morris asked if retail would be created in historic portions of the towns by introducing (or re-introducing) passenger rail, what are the potential impacts to the communities?

Mr. Morris discussed the Rail North Texas initiative and DART's initiative to develop a new hybrid vehicle technology. The new hybrid vehicle technology could be used on the existing South Oak Cliff light rail line to eliminate duplicating service with parallel routes into Downtown Dallas using different vehicle technologies. Mr. Morris suggested the new hybrid vehicle technology could be used on the proposed line from Waxahachie with connection to the Oak Cliff line, avoiding construction of a parallel line into Downtown Dallas. This alternative using the new hybrid vehicle technology has not been analyzed to determine if there would be any loss in potential ridership if the parallel line is not built or if there would be a cost savings that would be greater than the amount of riders lost. DART will need to provide their input regarding how this alternative could be built, specifically a corridor that is outside the current DART service area.

Mr. Morris explained the Waxahachie Corridor fact sheet which has a detailed map on the back.

Work Program Discussion
Mr. Morris opened up the floor for discussion for questions or comments regarding interest in rail, expediting the section south of the Oak Cliff line, and thoughts about having a public-private partnership for funding this project.

Clyde Melick, Director of Planning, City of Waxahachie, questioned how seamless would a transition between a new line and DART's existing line be without the direct line into Dallas, and how much more time will it cost commuters to get in or out of Dallas.

Mr. Morris stated that this is currently an idea. DART has already planned the rail extension to connect two universities in south Dallas. We must coordinate with DART to determine if there could be a transition between the freight rail line and the light rail line DART has already designed. If that is possible, then there are two options, either the rail stops there and people transfer to a different vehicle, or use another vehicle that could operate on both lines. DART has taken the lead nationally on developing a new hybrid rail technology able to operate under the electric gantries of the light rail lines and also operate on freight lines. This technology is currently being tested in Austin, but there are several issues with using diesel-powered vehicles on current DART light rail lines, such as tunnels, turn movements, length of trains, and many more questions that would need to be answered regarding this option. Mr. Morris thinks it would be the best option to use a vehicle that would be seamless that would not force a transfer. The second part of Mr. Melick's question was about ridership. Sufficient analysis regarding ridership has not been completed. If there is an interest then ridership forecasting can be a task in the work program.

Ron Wilkinson, Mayor of Waxahachie, stated with the use of the Bear Creek facility there will be an increased demand for these kinds of services. It is his understanding that facility is currently overloaded and with the city currently growing at a projected rate of six to seven percent a year with most of the growth on the north side of the city, the lack of rail service will be a hindrance to Waxahachie's growth. Currently, with low land costs in this section of the region, now would be a good time to purchase land for a parking facility or train yard. There is a window of opportunity to do this type of purchase, keeping in mind how growth has occurred to the north of the city. The window of opportunity might not last long. It would be prudent to purchase land as funds become available. Mr. Wilkinson would like to see a station in the central business district; currently, the old transportation hub south of the downtown is being revitalized. The City has purchased the old terminal building and has renovation for it on the agenda for Monday night's council meeting. The second building is privately owned and is currently in the final stages of restoration. The old commercial depot is also being restored. There is speculation that when the restoration of this area is completed it will be one of the most attractive areas of downtown. The city has also purchased about an acre across from City Hall for future use. He believes there is strong interest in this project especially if the city is going to continue to grow, it will need this option of transportation and opportunities for economic growth.

Mr. Morris suggested a tour of the area Mr. Wilkinson has described would be very beneficial. The tours purpose would be to see where the old interurban rail was, land use layout, and a general feel for the area. This will help with the urgency of time as well as interest, as we attempt to integrate rail and land use decisions together. The tour will also assist the staff in understanding and appreciating a town that had passenger rail and currently has renewed interest in passenger rail. There is potential to utilize the original rail areas, stations and alignment, repeating what was there in the past.

Mr. Wilkinson stated he would be happy to host a group tour. He also stated that Baylor Medical Center is planning on building a large facility near US 287/IH 35E, which will serve all of Ellis County.

Numa Bulot, railroad liaison for DART and Trinity Railway Express (TRE), asked if any ridership studies had been done to determine demand from Waxahachie and from Midlothian. Numa asked if it would be more cost effective to have two lines (one serving each city to Dallas) or to connect the two cities with one line connecting to Dallas.

Tom Shelton, NCTCOG Streamlined Project Delivery Team, stated model runs for commuters from Midlothian warrant their own commuter rail line to connect into the South Oak Cliff line. There is sufficient ridership for both lines, according to the travel demand models.

Wayne Friesner, DART Vice President Commuter Rail, stated DART is currently working with the Federal Railroad Administration (FRA) on a new vehicle technology different than what is currently being used on the TRE. The new vehicle technology Mr. Morris discussed will be first used in the spring of 2009 in Austin but it is currently not allowed to run at the same time as freight on a freight line. DART has been talking with the FRA about changing that status and are hoping the FRA will change their position. The vehicle would be a good fit for this corridor and could go from Waxahachie to Downtown Dallas and riders could transfer at Union Station if needed.

Mr. Shelton wanted John Hedrick, DCTA President, to discuss their project from Denton to Carrollton which is very similar to this project.

Mr. Hedrick stated the DCTA has proposed a 21 mile line that will interchange with DART's Green Line in Downtown Carrollton. The DCTA line will open December 2010 with construction starting in about a month. DCTA is planning on initially using a diesel-powered vehicle that would not be able to run on DART's light rail line, with a procurement out that is due Monday. DCTA is interested in eventually obtaining a vehicle that would be able to run on both freight rail and light rail corridors, but there are none that exist today. For operations, they are looking at temporal separation, running commuter trains during the day and freight trains at night so there will not be intermingling of freight and passenger service.

Mr. Shelton stated that the purpose of this meeting was to generate discussion to find out the general interest in this part of the region and answer any questions. After today his staff and Chad Edwards will put together a work program and do a feasibility analysis, studies, and add to what Mr. Edwards has already done. Mr. Shelton brought up the point that with this new passenger route will bring more passengers and will increase the ridership from the Downtown routes and asked Steve Salin, DART Vice President Commuter Rail, to elaborate.

Mr. Salin stated the current system is a radial system, with many lines coming into the DART system with connections in the Downtown Dallas area. There are a finite number of trains that can be handled as a result of rail capacity. With all the lines feeding into the system there has to be a better understanding of what the over all impact is going to be and to ensure that there are additional rail alignments to handle the potential ridership increase. Not everything has to go through the CBD which could open up opportunities for other areas to be served. The new hybrid vehicle that is being developed - if it can work in conjunction with the current system - has several issues that need to be resolved.

Mr. Shelton stated we also need to look at the vehicle design criteria relative to the specifications for the light rail system. If a new vehicle is produced, it must adhere to the current light rail vehicle design standards. Mr. Shelton also raised the issue pertaining to logical termini, specifically an appropriate southern terminus with respect to the redevelopment of the old terminal.

Mr. Edwards added that we also do not want to preclude any future expansions to the south. As the region grows there may be opportunities to expand southward. NCTCOG has signed a Memorandum of Understanding (MOU) with the Council of Governments Planning Agency south of NCTCOG that signifies we would coordinate on inter-regional transportation projects including rail and roadway transportation. Mr. Shelton then brought up the topic of station locations on the back of the fact sheet and asked for thoughts about the proposed locations.

Mr. Salin stated the alignment has been identified between the two universities but the terminus has not been identified and DART is willing to coordinate with other agencies on this project to determine the appropriate termini.

Todd Fuller, Assistant City Manager, City of Red Oak, stated that a couple years back, Red Oak's vision plan was created to include station locations which could be modified, if needed.

Mr. Morris asked Mr. Fuller if staff could visit the town and get a tour and work directly with him to ensure that stations get placed in the most efficient locations. Mr. Fuller agreed with the idea.

Mr. Friesner offered a TRE train for the tour to Waxahachie and a stop in Red Oak as opposed to a street tour. He suggested that a Saturday this spring might be a good time to do this, and there could be 150-200 people easily on this tour in two cars. Mr. Morris suggested that the RTC would reimburse fuel costs.

Mr. Fuller thinks that would be a good idea, but would still suggest a car tour to get a better feel for the area.

Mr. Wilkinson mentioned the City of Waxahachie is establishing a quiet zone through the city, which will cut down citizen complaints about train noise. The engineering phase is approximately 90 percent complete with completion expected within two years.

Paul Stevens, City Manager, City of Waxahachie, stated there would be 27 to 30 train crossings between the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) rail lines. If passenger rail would be going through this area, the quiet zone would be more important and he would be willing to give a tour to provide additional information about these sites.

Mr. Shelton stated that the team will be investigating funding opportunities to fund this corridor. He also asked Red Oak the degree of interest they felt their city had for commuter rail.

Mr. Fuller stated there seems to be interest from the citizens, but has several questions. He would like to know what we are expediting from in terms of time frame and what would the expedition provide scheduling wise. Regarding forecasted ridership, in 2030 there is 2,020 - is this a high number or a low number?

Mr. Morris explained there are 10,000+ weekday boardings on the TRE but that could translate to 3,000 heading to Fort Worth and 7,000 heading toward Dallas. The estimated ridership on the fact sheet of 2,000 is an example of how many people might be on the train heading to Dallas if there was a traffic counter in a typical section, but by the time the train actually reaches Dallas the count could be up to 4,000 as people board the train moving up toward Downtown. NCTCOG staff will provide a map indicating the estimated volumes and an estimation of needed parking spaces for planning purposes. NCTCOG staff will also develop cost effectiveness estimates for funding, potential route options (meeting up with DART or going straight to Downtown), analyzing funding mechanisms, and analyzing the real interest from the community and citizens. Mr. Morris suggested the cities put a survey in their water bills regarding this topic or let us hold a public meeting to talk with the citizens and find out their actual interest verses speculated interest. If there is sufficient interest and there is a way for the region to contribute financially, then the RTC will be able to assist in expediting this line from being planned and built in 20 to 30 years to the next five to ten. If there is not sufficient interest, there are other lines that could have the attention focused on them.

Mr. Shelton indicated there are 215 miles of potential corridors in the Rail North Texas plan, being considered by the RTC. The level of interest by the prospective communities will determine the level of priority each of these projects receives. Mr. Shelton suggested a meeting be scheduled with the cities and their citizens to determine the level of interest and participation level with a report to the RTC regarding the findings.

Mr. Melick mentioned the 2007 Rail North Texas survey and asked if there was a way to geographically segregate the Metroplex to look at the results of that survey.

Mr. Morris thought that would be a good idea and stated the sample size was large enough for every Senatorial district to have a three percent margin of error, with about a 77 percent vote to expedite rail with the assumption we used sales tax for funding. This should be done for each corridor and shown on a map and see where people are today. Even though fuel prices have dropped the ridership has stayed up and there seems to be interest in expanding rail service to the rest of the Metroplex.

Ben Goodwyn, City of Red Oak City Council, thinks this rail line is really important. They have a downtown project that they are trying to get going. The City of Red Oak has 26 acres of land to the east of the track that they feel would make a great depot area with ample parking places. They also think it would aid their tourism and that South Dallas County will be a major distribution area with a great number of jobs and that people will move to Red Oak for the good schools and quality of life. Red Oak supports this rail line and will work in creating a grass-roots effort, if needed.

Next Steps
Mr. Shelton stated the next steps will be for his team to create a work plan from this dialog and a list of tasks.

Kevin Feldt, Streamlined Project Delivery Team NCTCOG, stated he was new to this region and realized that while Red Oak and Waxahachie have stated their opinions regarding this project, he would like to know what the other communities along the corridor think about this project.

Mr. Morris stated that he is sure that Lancaster is very supportive of this project as he and Mayor talked yesterday. He then asked Mr. Shelton to coordinate with the inter-modal hub to ensure that the passenger rail will not interfere with their efforts of freight rail. Knowing that UP currently has an inter-modal center and rumor has it that BNSF has been thinking about one; we should bring our Goods Movement people into the discussion. Get DART's latest thinking on their new light rail alignment and have DART be in charge of the interface. Mr. Morris had questions about having the train go into Downtown Dallas. Will there need to be new connections at Union Station?

Mr. Fuller asked if there are any examples of other areas that are mixing freight and passenger rail in the region.

Mr. Morris replied yes the TRE is currently mixing freight and passenger rail service. He also suggested getting a group of elected officials together to ride in the cab car going west to east on the TRE to see what it is like and to see the development that has occurred around that facility, during regular operation. Maybe meet with the City of Fort Worth to see what they are doing in their Downtown area and see what the City of Irving is doing and planning. Part of our theme is communication; we do not need to travel outside the Metroplex to visit areas of mixed transit, we have them here. We just need to do more communicating to establish lessons learned in the region.

Mr. Friesner stated that the TRE has 55 scheduled passenger trains a day and also moves 20 to 30 freight trains a day. This is probably one of the most active rail lines in the state with various train movements. He also stated they would be happy to host anything this group would like to do and thinks it is important to see and feel the operation and getting on a train is the best way to do it. There is also a lot of construction going on currently and that would be good to see how that affects the commute.

Mr. Melick stated that it appears in the Waxahachie corridor it would need to be double tracked. Would that be in sections, or the entire corridor?

Mr. Morris answered that it could be passes in motion. The TRE started up on a single track and has successfully run that way. The RTC has contributed money to double track and grade separate rail lines at major intersections. The trouble is funding. He stated that he is a fan of using single existing track to begin with and then double track when the need arises.

Mr. Friesner stated that one advantage to the TRE corridor is that DART owns the track and provides dispatch services where in this corridor they do not. It is a huge advantage to be the dispatching provider for the track. If a freight railroad is providing dispatching services, they will probably say they come first which could become an issue. It might be a good idea for DART to buy the tack.

Mr. Shelton asked again if there was anything else the group would like the team to look at and if the group thought the team was currently looking at the correct issues - everyone nodded in acknowledgement. Mr Shelton also mentioned Sandy Wesch's group will be looking into the environmental impacts of the corridor, not to the extent of a full environmental study, but to ensure there is nothing to would prohibit us from creating a passenger rail corridor.

Mr. Morris stated the idea is to complete the site visits by late January and have a summary of those visits and the work program completed by the next meeting in February. At that meeting there will be an update on the spring train tour. The plan he would like to see is to visit Lancaster, Red Oak, and Waxahachie, and to get with DART about their current plans for the light rail extension so we can get familiar with it; this should all be completed by the end of January. A meeting should be scheduled in February to summarize the site visits and have pictures of those visits to share and by then we will be in the middle of the legislative session so we will know more about what is happening there. A mission statement and a purpose will also be stated on the next agenda. The basic purpose is to resolve planning issues, standards, funding, and other topics.

C.2 MARCH 4, 2009

Advancing Rail in North Texas Strategy Meeting
Southern Dallas County-Ellis County Corridor

Wednesday, March 4, 2009

Attendance
Eight attendees signed-in, including representatives from the City of Dallas, DART, Ellis County, City of Lancaster, City of Waxahachie, and North Central NCTCOG.

Handouts included: an agenda, copy of the presentation, BNSF Commuter Principles, Southern Dallas/Waxahachie Corridor Conceptual Engineering and Funding Study (draft), and December 12, 2009 meeting minutes.

Welcome, Introductions, and Purpose
Moderators, Kevin Feldt and Chad Edwards welcomed and thanked the attendees for coming.

Chad Edwards, NCTCOG, noted the Rail North Texas map included in the handouts is not correct. The map was replaced in the actual presentation and this map, Rail Lines Under Consideration (251 Rail Miles Pending Funding), is the map being reviewed in coordination with the Texas Local Option Transportation Act (TLOTA) currently in the legislature.
Kevin Feldt, NCTCOG, gave a brief overview of the December 12, 2008 meeting and the principle action items; continue to explore conceptual engineering and feasibility studies and schedule a train tour along the proposed Waxahachie Line for stakeholders to experience regional rail in the corridor and further define possible rail stations. Feasibility studies are anticipated to be complete by the end of 2009. The train tour has been scheduled for Friday, March 27, 2009 and the details need to be discussed.

There are four rail corridors the Streamlined Project Delivery Team is currently focusing on: Cotton Belt Line, McKinney Corridor, BNSF Line and the Waxahachie Line. The goal of the rail corridor strategy meetings are to move projects forward, beginning with conceptual engineering and feasibility studies that will ease preparation for the environmental analysis.

For Rail North Texas, a regional rail corridor study was completed in 2005 and incorporated into the Mobility Plan 2030. This regional rail corridor plan will continue in the Mobility 2030 (2009 Amendment). As the rail corridor strategy discussion process matures, it is anticipated meetings will begin to focus on two topics; technical matters and policy concerns. Although all members are welcome to attend any meeting, the strategy is to develop a meeting structure where individuals can review the agenda ahead of the meeting and then participate and/or send the appropriate representatives to the meeting.

Corridor Overview and Status Report
<u>Vehicles</u>
There are two options for the regional rail alignment that will travel north from Waxahachie into downtown Dallas; 1) continue on the BNSF corridor (regional rail) at South Port Station or 2) transfer to the DART Blue Line corridor (light rail) at the South Port Station. The alignment will help determine which type of rail vehicle is used. For a rail car to travel on the

planned rail corridors the vehicle must be FRA compliant for freight rail and must also be compatible to the light rail track and station dimensions.

Wayne Friesner, DART/TRE, highlighted that the challenges for advancements in a hybrid vehicle are the legal and regulatory concerns for each type of rail line. The first goal is to develop an urban vehicle that can operate on both freight and light rail lines. Opportunities for this new technology are currently being explored in Austin and Denton. The options are encouraging, but there is still a lot of work to be done. A determining factor for which alignment will be utilized in this corridor is when service for the Waxahachie Line will be put into operation.

Rail Stations and Corridor Alignments

Preliminary station locations and alignments have been defined from the 2005 regional rail corridor study. The material and corridor alignments being presented are not final and one purpose of the rail corridor strategy meeting is to encourage continuous feedback, refine local needs, and continue to build on the established foundation so the project can move forward.

Wayne Friesner, DART/TRE, stated that for a shortened commute and cost-effectiveness, the preference is for the rail alignment to continue to travel north on the BNSF corridor at South Port Station to Union Station in Dallas. This corridor would approximate 32-miles long. If the corridor alignment were to transfer to the DART Blue Line at South Port Station there would be eight rail stations, whereas, if the route were to remain on the BNSF alignment there would be only six rail stations. Naturally, the more stations there are, the longer the commute will be. One complicating factor for the BNSF corridor alignment is the crossing at UP. This is an issue that would need to be resolved and could be expensive.

Another possible option is for the TRE service to continue traveling along this corridor from Union Station in Dallas, south to Waxahachie. One advantage to the TRE is the double cars could accommodate more capacity. Carol Strain-Burk, City of Lancaster, agreed; stating if workable, the TRE may be a more efficient and less costly option for the expansion of regional passenger rail.

Illustrating with the map on the back of the Corridor Fact Sheet, Chad Edwards, NCTCOG, noted that during discussions for Rail North Texas, a “duplication of services” study was conducted. The suggestion for the corridor alignment transfer to the DART Blue Line at the South Port Station was to eliminate the possible duplication of services between the light rail and the regional passenger rail into Union Station in Dallas. The corridor alignment with the DART Blue Line at South Port Station is in the current plans for TLOTA, but this corridor alignment may change and evolve north on the BNSF corridor at South Port Station. Steve Salin, DART, noted the DART Blue Line is scheduled to be at the University of North Texas (UNT) Station in 2018 and the South Port Station in 2030. This is five years after revenue service is expected to begin for the Waxahachie Line.

Michael Morris, NCTCOG, questioned the group about the response to a presentation given in Ellis County about the Rail North Texas initiative and what was the interest in the surrounding communities for regional rail.

- Clyde Melick, City of Waxahachie; will pass a resolution at the next city council meeting supporting the Rail North Texas initiative. All city council members are supportive of regional rail in Waxahachie. Former Mayor Joe Jenkins, currently sitting on the city council, was in support of the regional rail initiative in 2005 and continues to be so. Mr. Melick believes Red Oak is supportive, but is unsure of any pending resolution.

- Carol Strain-Burk, City of Lancaster; resolution has passed in support of the Rail North Texas initiative and sent to the legislature.

Corridor Fact Sheet
The data from the Waxahachie Corridor Fact sheet are the results of a study conducted for Rail North Texas in 2005. The fact sheet summarizes the regional rail corridor information, demographics, and estimated costs utilizing the BNSF corridor from South Port Station south to Waxahachie. The level of freight usage is moderate to heavy, which will more than likely require a double track for the passenger rail corridor. The cost estimates are based on a revenue service start date of 2025; depending on the outcome of TLOTA. If the Waxahachie Line is completed before this date it is anticipated built-in inflationary costs would decrease.

Wayne Friesner, DART/TRE, noted that BNSF is working very hard to get up to speed at their inland port logistics hub and BNSF’s goal is operating ten to twelve trips a day in this corridor. This will dictate the need to double track the corridor. With this anticipated level of business, even a compliant vehicle will not suffice to have shared space on the BNSF track.

Barbara Leftwich, Ellis County; what is ridership based on and is it subject to change? Ridership was modeled for 2030 using the current nine-county Metropolitan Planning Area (MPA) and does not include the proposed expansion of the MPA to twelve-counties. This ridership model includes the stations South Port, Lancaster CDB, Red Oak, Waxahachie North, Waxahachie/US 2887, and Waxahachie CDB. Ridership estimates could increase depending on where the final rail stations are located and ridership will likely increase if the passenger rail alignment ends up traveling north on BNSF from South Port Station to Union Station in Dallas.

The corridor demographics represent a one mile buffer zone from the center line of the track. This one mile buffer zone is illustrated on the map in green. Please contact Chad Edwards or Kevin Feldt regarding any modifications to the Corridor Fact Sheet so it can be updated.

BNSF Railway Commuter Principles
Another regional rail line currently being studied by the Streamlined Delivery Project Team is the BNSF Line, which is the TRE in Irving traveling north to Frisco. This rail corridor is planned completely on a BNSF operated line. The working relationship with BNSF has been very positive and BNSF is open to passenger regional service in the BNSF freight corridors, but there are set of ten core principles that must be adhered too. The list of BNSF Commuter Principles was in the handouts. The three core principles are:

- Do no harm to the railroad: business or capacity opportunities.
- Asset compensation: purchase easements in the corridor to run passenger trains; details to be worked out.
- Liability protection: if a passenger train and freight train collide, BNSF is held harmless, regardless who is at fault.

- The above would require State legislation.

These principles may not be easily achieved, but BNSF has been very forthcoming and is a willing partner in allowing commuter rail in their freight corridors.

Wayne Friesner, DART/TRE, noted there is currently federal legislation to extend the Amtrak court cap of approximately $220 million to freight railroad and interstate commerce, which may help ease the liability concerns.

Draft Work Program for Conceptual Engineering and Fundy Study
The copy of work program is the general outline for all four rail corridors under study and has not been personalized to the Southern Dallas/Waxahachie Corridor. As the study progresses, information will focus on this corridor. It is very important to maintain open dialogue for all local needs and concerns, as well as maintain open communications with the needs and concerns of BNSF. Examples include track configurations, scheduling, traffic controls, maintenance, headway times at the station, park and ride lots, land use opportunities, and what is the preferred atmosphere of the stations. The goal is to gather input from as many sources as possible so that the feasibility study accurately reflects what the community needs and desires.

The goal of the work program is to prepare for the environmental analysis by studying:

- Affected environment
- Design standards
- Initial alternatives
- Financial – costs and revenues
- External coordination
- Conclusion

Wayne Friesner, DART/TRE, said operating costs are significant and a critical component that will require frank and honest discussion.

Michael Morris, NCTCOG, noted that once economies of scale are reached in regional rail there are many innovative solutions that can be explored that will help contain and decrease costs. Michael highlighted a number of ideas and the possibilities when the system matures. Exploring possible revenue streams will also require innovative solutions, be it TLOTA or public/private partnerships. Step one is to get a solid plan in place.

Regional Rail Tour
Regional rail is an important component of the transportation plan developed to meet mobility and air quality needs of the rapidly growing North Texas population. The train tour is an opportunity for corridor stakeholders to experience regional rail in the planned corridor. The tour includes several stops in Southern Dallas and Northern Ellis counties. The purpose is to give officials and interested parties a hands-on opportunity to explore regional rail and help develop an initial sense of what the community needs are.

A brainstorming session for the rail tour ensued:

Approximately 200 to participate
Invitations
Transportation to Union Station – buses or light rail
2 RDC trains to facilitate the tour

Begin at Union Station in Dallas
Food
Invitations
Stops
ADA needs

Transit Oriented Development (TOD)/Lessons Learned and Grade Crossing Banking Program

The Regional Transportation Council (RTC) approved the Regional Railroad Crossing Banking Program at their October 9, 2008, meeting. This program develops a marketplace to collect credits for at-grade railroad crossings that are eliminated through closure or grade separation within our region. In addition, the program allows local governments to exchange these credits and/or establish a cash value in order to sell them to one another as needed. This is a source to be considered when beginning initial assessments of the feasibility study. For more information, please contact Rebekah Karasko, Senior Transportation Planner, Goods Movement, (817) 695-9258 or rkarasko@nctcog.org.

Wayne Friesner, DART/TRE, highlighted fewer crossings, less cost. This is a good opportunity to explore. Barbara Leftwich, Ellis County, agreed and stated it is important to make people aware of this program.

Sustainable Development Initiatives

Sustainable development has initiated a call for projects. Stakeholder and information workshops were held in January 2009 and applications are now being accepted. For more information, please contact Karla Weaver, Senior Transportation Planner, Sustainable Development, (817) 608-2376 or kweaver@nctcog.org.

Action Items:

- Next meeting will focus on technical issues
- Review work program, suggestions or comments
- Final coordination for Train Tour on March 27, 2009, 9:30 a.m. – 1:30 p.m.
  - Mail the train tour invitations by Monday, March 9
  - Forward invitation lists to Kevin Feldt by Thursday, March 12, 2009
  - Organize the lunch and possible funding options
  - Copy of the flyer is attached

C.3 JUNE 2, 2009

Advancing Rail in North Texas Strategy Meeting
Southern Dallas – Waxahachie Rail Corridor

Tuesday, June 2, 2009

Attendance

There were 19 participants signed-in, with representatives from Congresswoman Eddie Bernice-Johnson's Office (staff), Dallas, Lancaster, Red Oak, Waxahachie, Ellis County, DART, The Fort Worth Transportation Authority (The T), NCTCOG staff and consultants from Ziebarth and Associates. A copy of the sign-in sheet is located on the Web site.

The meeting was held in the Transportation Council Room at the NCTCOG offices in Arlington. Handouts included: an agenda, a copy of the presentation, the Chapter 1 (draft) of the Conceptual Engineering and Funding Study and minutes from the March 4, 2009 meeting. These materials can be found on the Web site at: nctcog.org/trans/spd/index.

TLOTA Update

There was a brief update on the still unknown status of SB 300 in the Texas Legislature. No further information was available to NCTCOG.

Consensus of the group was to continue moving forward with the feasibility study and proceed with the planning of the Southern Dallas – Waxahachie rail corridor. Staff will proceed with the study goals and objectives.

Comments/Concerns:

- If TLOTA is not included in SB 300, funding is going to become much more of challenge for rail expansion in the region
- All funding options remain open for discussion
- Corridor timelines need to be altered due to unknown funding factors at this point
- By federal law, the long range Metropolitan Transportation Plan (MTP) must be financially constrained - if TLOTA is not included in SB 300, the proposed expanded rail lines from the Rail North Texas initiative will need to be removed from the long-range planning maps for Mobility 2030.
- The upcoming reauthorization Federal Highway Transportation Bill is expected to be more focused than in the past on transit alternatives, this may be a funding source to explore further

Project Mission/Study Goals and Objectives

The mission statement and suggested study goals and objectives were presented. These are available in the presentation handout. Please review the goals and objectives and send amendments to kfeldt@nctcog.org. It is vital all interested parties are proceeding under the same guiding principles.

To make the meetings more productive, the meeting focus has been designated on the project schedule:

T = Technical focus
P = Policy focus
C = Combined technical and policy focus

Comments/Concerns:

- The next meeting will focus on technical issues

Conceptual Engineering and Funding Study (draft)

There was a brief overview of Chapter 1 (draft) of the Conceptual Engineering and Funding Study. It was noted the purpose of the this study is to serve as a bridge between the previous efforts of the Rail North Texas initiative and any future environmental documents that may be necessary. The goal is to streamline the process as much as possible and narrow the options to one viable build alternative. Please review the chapters and send amendments or comments to kfeldt@nctcog.org.

There was a brief update on the proposed Southern Dallas – Waxahachie Corridor Map as identified by the Rail North Texas initiative.

Comments/Concerns:

None

Corridor Alignment and Station Alternatives

NCTCOG staff met with individual cities and other agencies to discuss rail stations and other concerns within each area for the rail corridor. Results of each meeting were highlighted in the presentation and additional comments requested from the participating city or agency.

- Dallas; additional comments:
  - If the alignment chosen is from the proposed Inland Port Langdon north directly into downtown Dallas, what are the implications for parallel tracking and duplicate services with the DART Blue Line
  - Funding is a concern
- Lancaster; additional comments:
  - City preference is station location at 2nd and Main station
  - Discussion of the 1888 train depot currently located at Pecan Street – the desire is to relocate the station to the 2nd and Main Street area
  - Station at Main Street would be at-grade.
- Red Oak; additional comments:
  - The city owns 26 acres of land around the proposed South Red Oak station, which is currently park land and would take a re-zoning action for transit station use
  - Not a lot of options for parking at the proposed downtown station location; is not a preferred location
  - City is currently in a comprehensive planning process
  - Proposed north station site location on the map needs to be moved a little further north
  - Station location preference dependent on if the station will be a destination or origin point
  - Initial station preferences would be: South Red Oak, Ovilla Road, and downtown
- Waxahachie; additional comments:
  - Prefers a direct commuter connection to downtown Dallas, no transfer to DART Blue Line
  - New construction in downtown area necessitates the building of a new parking garage in downtown
  - Feeder bus service is an important consideration, especially near the proposed medical center

- ➢ Initial corridor preferences: Waxahachie CBD, north Waxahachie, US 287

Comments/Concerns:

- The DART Blue Line is planned to extend south to the UNT with a service opening date of 2018. If the chosen alignment is from the DART Blue Line east to near the proposed Inland Port/Langdon station what would be the anticipated start of service for this proposed line? It was noted that particular alignment is currently in the DART 2030 long range plan and as such, would not be a viable transit route until approximately 2030 depending on funding factors, etc.
- Travel demand modeling will need to be completed before alignments can be recognized
- Plans are try to maintain three to five miles between stations
- Concerns are that forced transfers would decrease ridership
- Complexities of the potential new vehicle technology may hinder implementation
- At a minimum, both commuter and light rail options will be explored in the Conceptual Engineering and Funding study contributing to due diligence of all options
- Bus feeder services will be an important component in this corridor
- BSNF new intermodal hub will present many challenges, possibly necessitating double tracking
- Problems at the Union Station location in Dallas and the potential for train delays traveling through the UP line with one option, being the construction of a bridge that would go up and over the UP track and onto the BNSF track
- Average acreage for a park-n-ride station is approximately three to five acres, generally parking 100 cars per acre.
- The possible US 287 station in Waxahachie may be an ideal location for a large parking facility providing access to rail from points throughout Ellis County

There was a brief overview of the pros and cons of the two alignment alternatives.

There was a brief overview of the complexities with the new vehicles and FRA compliance. It was proposed DART give the presentation on The North Texas Regional Vehicle at the next meeting.

Next Meeting
Six to eight weeks

Action Items/Next Steps:

- Review the draft Chapter 1 of the Conceptual Engineering and Funding Study; please send any comments or suggestions to kfeldt@nctcog.org
- Review the mission statement, project goals and objectives. Send any comments to kfeldt@nctcog.org
- Meeting summary from the June 2, 2009 will be distributed, please send any comments or suggestions to kfeldt@nctcog.org
- NCTCOG staff will begin the analytical analysis and evaluation of the corridor; including ridership modeling, the alignment options for the corridor, vehicle technology appropriate for the corridor, further study of station locations, and estimating capital and operational costs
- DART to give a presentation update on the potential vehicle technology

- NCTCOG to gather information on all funding options, traditional and nontraditional that can serve as an educational tool for any funding concerns and opportunities

C.4 DECEMBER 17, 2009

Advancing Rail in North Texas Strategy Meeting
Southern Dallas – Waxahachie Rail Corridor

Thursday, December 17, 2009

Attendance
There were 19 participants signed-in, with representatives from NCTCOG, Cedar Hill, Lancaster, Red Oak, Waxahachie, Ellis County, DART, and The T. A copy of the sign-in sheet is located on the Web site at: www.nctcog.org/trans/spd/transitrail/sdallas.

The meeting was held in the William J. Pitstick Executive Board Room at the NCTCOG offices in Arlington. Handouts included: an agenda, a copy of the presentation, a draft Waxahachie Corridor station location map and the meeting summary from the June 2, 2009 meeting. These materials can also be found on the Web site at: www.nctcog.org/trans/spd/transitrail/sdallas.

There were no comments on the June 2, 2009 meeting summary.

Update on Investigations on Potential Regional Rail Vehicle Technology – Wayne Friesner, Vice President, Commuter Rail, DART
Mr. Friesner gave a comprehensive presentation on regional rail vehicle technology development efforts. The presentation is available on the Web site at: www.nctcog.ort/trans/spd/transitrail/sdallas.

Comments/Concerns:

- There were no comments.

Stakeholder Meetings, Station and Corridor Variables, Corridor Alignment and Station Alternatives, Ridership Estimates
There was a brief update on the recently held individual stakeholder meetings with the various partners in the Southern Dallas-Waxahachie Rail Corridor. Common concerns that were raised during these meetings are listed in the presentation.

Five varying corridor alignment and station alternatives were each briefly highlighted. Alternatives are expected to be modified as updated modeling results become available.

Comments/Concerns:

- Consensus is the vehicle technology utilized for the corridor isn't as large a concern as moving the project forward to construction.
- Preferred by all that the rail line travel into Union Station in downtown Dallas.
- The City of Red Oak is open to the possibility of having only one rail station with additional station expansion opportunities in later years if warranted.
- Inland Port Demographics and Ridership
  - ➢ Ridership modeling figures are based on demographics and land uses current as of the year 2003.
  - ➢ Use of 2003 data serves as a present tool for comparison.
  - ➢ Ridership figures are draft and should not be considered final.
  - ➢ It is recognized there has been enormous growth in this corridor since 2003.

  - NCTCOG Research and Information Services (RIS) have been in the process of updating demographic data in the region for the past two years to be included in the Mobility 2035 plan.
  - NCTCOG Executive Board will need to approve the new demographic data and this data will begin to be utilized in draft form for developing the new metropolitan transportation plan, Mobility 2035 that is currently underway.
  - After NCTCOG Executive Board approval, draft modeling can be run using the newer demographics.
  - It is anticipated Mobility 2035 will be presented for action to the Regional Transportation Council in early 2011 and after this point the new demographic data will be considered final.
- The focus of the Conceptual Engineering and Funding Study has shifted towards serving as a data and informational document for the stakeholders to use as a basis in decision-making and to expedite any future environmental documentation.
- Loop 9 is not represented graphically on the map, but Loop 9 is considered in the present modeling.
- Although Alternative 3 illustrates it may be possible to force a transfer onto the DART Blue Line (light rail) at the Southport Station, this may not be a viable scenario. This will take further study.
- Modeling includes start and stop times at the various stations.
- Rail corridors in the region will need to be prioritized. Six distinct rail corridors cannot be under construction simultaneously.

Funding Strategies

Funding is at the forefront for all regional rail projects. There was a brief comment on the various funding strategies available. All funding opportunities must be explored, most likely in concert with one another.

Regional representatives will be stressing the importance of gathering public support for some version of the TLOTA at the next legislative session in 2011.

Comments/Concerns:

- Before attempting to garner support for this rail corridor, it may be more realistic to stress the viable options for an initial corridor, leaving open possible future expansion scenarios.
- Need to engage broader public support numbering in the thousands to help push legislative action.
  - Pre-made postcards or pamphlets that enable individuals to easily express support to their elected officials.
  - Often there is not the necessary attendance numbers at public involvement meetings to make significant progress in grass roots support efforts. What are other options?
  - Need to engage people with concrete examples of transit, perhaps some form of a pilot ride similar to the rail tour held previously in this corridor for elected officials. People need to physically experience a rail ride to grasp what the service ultimately provides.
  - Need to stress to the public the costs of not having transit options and highlight the benefits to those who won't use rail, but will benefit from the service in other ways.

- Smaller communities have a sense that rail is an “urban” solution and does not positively affect them. Need to determine how to overcome this thinking and market what rail can do to positively affect their transportation experience.

Action Items/Next Steps:

- Important to determine how efforts in the Southern Dallas – Waxahachie Corridor should proceed.
- Explore public involvement opportunities to garner support for regional rail.
- Provide cost estimates for each alternative.
- Meeting summary from the December 17, 2009 will be distributed, please send any comments or suggestions to kfeldt@nctcog.org.

C.5 JUNE 24, 2010

Advancing Rail in North Texas Strategy Meeting
Waxahachie Rail Corridor

Thursday, June 24, 2010

Attendance
There were 10 participants signed-in, with representatives from Dallas, Lancaster, Red Oak, Ellis County, Kaufman County, DART, and The T, Kiewit, and NCTCOG. A copy of the sign-in sheet is located on the Web site at: www.nctcog.org/trans/spd/transitrail/sdallas.

The meeting convened in the Six Flags Conference Room at the NCTCOG offices in Arlington. Handouts included: an agenda, a copy of the presentation, a draft Waxahachie Corridor area map and the meeting summary from the December 17, 2009 meeting. These materials can be found on the Web site at: www.nctcog.org/trans/spd/transitrail/sdallas.

There were no comments on the December 17, 2009 meeting summary.

Update on Investigations on Potential Regional Rail Vehicle Technology – Kevin Feldt, Senior Program Manager, NCTCOG
Kevin gave an update on the regional rail vehicle technology development efforts and next steps. For highlights, please see the presentation on the Web site at: www.nctcog.ort/trans/spd/transitrail/sdallas.

Comments/Concerns:

- Vehicle type will be determined in later studies.
- Anticipated some type of bicycle holding facilities will be included in the new rail car, but it is still too early in the design stage to determine these factors.

Conceptual Engineering and Funding Study (CE & FS) Stakeholder Meetings – Kevin Feldt, Program Manager, NCTCOG
Kevin gave an update on the CE & FS. It was highlighted that the final report will not draw any final conclusions or recommendations for the corridor, but will serve as a resource to help in future decision making for the corridor and aid in preparation of environmental studies.

Comments/Concerns:

- What is the cost of an Environmental Impact Study (EIS)?
  - ➢ The cost depends on who prepares the document, but it can range between roughly \$100,000 and \$200,000. The document can take a year to two to complete depending on workloads and approval processes.
- The shelf life of environmental documents is typically about three years.
- If the existing rail lines were used, is an EIS still necessary?
  - ➢ Yes, there may be less work in preparing the final document, but the EIS is mandatory.
- If the existing rail lines were used, with one stop at each city, what is the timeframe for having the project implemented?
  - ➢ There are too many unknowns to make any reliable determinations.

- Agreements with BNSF and UP will need to be addressed in later studies or other opportunities explored.

Stakeholder Meetings – Kevin Feldt, Program Manager, NCTCOG
There was a brief recap on the purpose of the individual stakeholder meetings with the various partners in the Waxahachie Rail Corridor. Common Stakeholder concerns were highlighted. The common concerns are listed in the presentation which is available at www.nctcog.org/trans/spd/transitrail/sdallas.

Comments/Concerns:
- Consensus is to get a basic rail line built as soon as possible with the expectation that stations can updated as funds allow.

Summary of CE & FS Draft Findings – Nathan Drozd, Transportation Planner III, NCTCOG
Nathan gave a short overview of each city's draft potential station locations that were evaluated for the study. The station location and corridor level variables were presented. Each alternative was highlighted with ridership potential presented. These are illustrated in the presentation. There was an overview of draft capital costs and ridership between Light Rail New Technology (LRNT) and Commuter Rail Technology (CRT). These comparisons are listed in tables in the presentation at: www.nctcog.org/trans/spd/transitrail/sdallas.

Comments/Concerns:
- Cedar Valley College Station is listed twice in the presentation.
  - This is mislabeled; the northern most of the two Cedar Valley College listings should be the Simpson Stuart station. NCTCOG staff will correct.
- The Ledbetter and Loop 12 Stations seem to be very close to one another.
  - It was noted that the stations illustrated were all the potential stations that were evaluated for the CE & FS and do not represent final station locations. The purpose for evaluating more stations then will be utilized is to help in the final decision making process for preferred station locations.
- Acknowledgement that modeling is based on demographics and land uses current as of the year 2003 from the 2000 Census. These demographics will be utilized for the CE & FS. The NCTCOG RIS is well into the process of updating the demographics which are anticipated to be approved early 2011 and will be used in the new MTP Mobility 2035.
- There are no special events service considered in this CE & FS; but this is certainly an area that can be easily investigated and implemented in future studies.
- Park and ride facilities will be utilized where warranted. Commuter rail utilizes more park and ride lots; stations are positioned further apart.
- In Alternative 5, what is the travel time from Dallas to Waxahachie?
  - Approximately 45 minutes
  - Fewer stations equate to less travel time
- Loop 9 and the possible impacts need to be addressed more clearly.

Innovative Finance Initiative (IFI) – Kevin Feldt, Program Manager, NCTCOG
Kevin gave an update on the current IFI initiative for funding and expediting the Cotton Belt Rail Corridor. This initiative is in the initial stages and hopes are it will serve as a model for possible funding solutions to expedite transportation projects in the future.

Comments/Concerns:

- Stakeholders need to updated on the progress and successes of the IFI and the Cotton Belt Rail Corridor funding before the elected officials in southern Dallas/Ellis counties can present to the citizens viable plans for a rail corridor and how it can be funded.
- Funding is a big challenge; need to keep attuned to all possible federal funding opportunities.
- General agreement to move as far forward as possible with any documentation in order to be prepared to act on any future funding opportunities that may become available.
- Want to remain open to public-private partnerships, but there are still unknowns that remain regarding these financial tools.

Action Items/Next Steps:

- Gain consensus on the next steps forward for the Stakeholders in the rail corridor.
- Distribute the Draft CE & FS to relevant Stakeholders for review via email.
- It is important Stakeholders and their staffs carefully review the Draft CE & FS and provide comments within the requested two week deadline.
- Please contact Kevin Feldt, Program Manager, at kfeldt@nctcog.org or (817) 704-2529 to arrange a meeting to review and discuss comments in detail.
- Also, please provide a copy of written comments and any proposed recommendations for next steps for the Waxahachie Corridor.
- Review and incorporate all applicable comments by Stakeholders, complete and distribute Final CE & FS.

Appendix D
Evaluation Estimates

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D. EVALUATION MEASURES

This section describes socio-economic, cultural, and natural features in close proximity to the Waxahachie Corridor or near the potential station locations. The station analysis areas consist of the vicinity within one-half mile of each potential station location. Some measures use alternate geographic areas for analysis as described within the relevant sections.

D.1 LENGTH

The alignment length was measured in miles. The Geographic Information System (GIS) mapping application ESRI ArcMap was used to calculate the alignment distance.

D.2 TRANSIT

Transit information was obtained from the Dallas-Fort Worth Regional Travel Model (DFWRTM) using transit networks approved in the long-range metropolitan transportation plan (MTP), *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area – 2009 Amendment* (*Mobility 2030 - 2009 Amendment*). Detailed ridership estimates are in Chapter 3, Section 3.4.

- Estimated Daily Ridership - The estimated passengers boarding and alighting at a station during an average weekday, 24-hour period.
- Linked Regional Transit Trips - Represents the total number of average weekday, one-way transit trips within the regional network.
- Corridor Travel Times - The amount of time, in minutes, to travel from end to end for a distinct alternative, evaluated corridor travel times included headways, load/unload time, acceleration time, and deceleration time.
- Interlined Ridership - The estimated number of trips where riders continue along the Trinity Railway Express (TRE) past Union Station.

D.3 PROPERTY ACQUISITION

This qualitative measure estimates if additional right-of-way, outside of the existing railroad right-of-way, requires acquisition.

D.4 PROJECT COSTS

The total project cost, project cost per mile, and annualized cost per rider are estimated for each alternative. Detailed information on cost is located in Chapter 3, Section 3.8. Appendix A also provides detailed cost estimates.

D.5 LAND USE

Compatibility with local plans denotes if the corridor alignment alternative is included in local government comprehensive plans, if the potential station location is included in the local government comprehensive plans, or the potential station location is zoned as transit oriented development (TOD). Table D-1 provides a summary of the station status and if the station is in municipal or transit agency plans. Detailed information on this measure is in Appendix B, Section B.2.1.4.

Table D-1 Compatibility with Local Plans

Station	Status	Plan
Waxahachie CBD	Proposed Station	Waxahachie Comprehensive Plan
US 287	Proposed Station	Waxahachie Comprehensive Plan
North Waxahachie	Proposed Station	None
South Red Oak	Potential Station	Red Oak Comprehensive Plan (Draft)
Downtown Red Oak	Potential Station	Red Oak Downtown Vision Plan
North Red Oak	Potential Station	Red Oak Comprehensive Plan (Draft)
Lancaster CBD	Proposed Station	None
Cedar Valley College	Potential Station	None
Southport	Proposed Station	DART 2030 Plan
Simpson Stuart	Potential	None
Loop 12	Potential	None
Ledbetter	Potential	None
Illinois	Potential	None
MLK	Potential	None
Corinth	Potential	None
Union Station	Existing	DART System Plan

Source: Meetings with partnering municipalities, DART and published municipal comprehensive plans

D.6 MAJOR EMPLOYERS

Based on a review of the data discussed in Appendix B, Section B.2.3, major employers within the station analysis areas are identified. Table D-2 lists the major employers near each station.

Table D-2 Major Employers

Name of Employer	Location
Waxahachie CBD Station Total	**0**
US 287 Station Total	**5**
Dart Container Corporation	Waxahachie
US Aluminum	Waxahachie
North Waxahachie Station Total	**0**
South Red Oak Station Total	**0**
Downtown Red Oak Station Total	**0**
North Red Oak Station Total	**0**
Lancaster CBD Station Total	**1**
Brass Craft Western	Lancaster
Cedar Valley College Station Total	**0**
Southport Station Total	**0**
Simpson Stuart Station Total	**0**
Loop 12 Station Total	**0**
Ledbetter Station Total	**0**
Illinois Station Total	**0**
MLK Station Total	**1**
Faubion Associates Incorporated	Dallas
Corinth Station Total	**1**
Dallas Police Headquarters	Dallas
Union Station Total	**17**
Allen, George C. Courts	Dallas
Bank of America	Dallas
Bank of America	Dallas
Belo Interactive Incorporated	Dallas
Corgan Associates, Incorporated	Dallas
County of Dallas	Dallas
Dallas County Community Supervision	Dallas
Dallas County Records Building Complex	Dallas
Dallas County Sheriff's Office	Dallas
Dallas Morning News, Limited Partnership	Dallas
Dawson State Jail	Dallas
El Centro College	Dallas
Hyatt Regency Dallas	Dallas
Internal Revenue Service	Dallas
Sterrett, Lew Justice Center N & W Towers	Dallas
US Department of Labor	Dallas
WFAA-TV, Incorporated	Dallas

Source: NCTCOG, 2009

D.7 ACTIVITY CENTERS

Based on a review of the data discussed in Appendix B, Section B.2.3, activity centers within the station analysis areas are identified. Table D-3 lists the activity centers near each station.

Table D-3 Activity Centers

Name of Activity Center	Type
Waxahachie CBD Station Total	**2**
Ellis County Sheriff's Office	Institutional
West-Reeves, Limited	Industrial
US 287 Station Total	**11**
Dart Container Corporation	Industrial
Heritage Square Townhomes	Multi-Family
Hunters Cove	Multi-Family
Johnston Group Home	Government Quarters
Life-Like Products, Limited Liability Corporation	Industrial
Navarro College Waxahachie Campus	Education
Northtown Village Apartments	Multi-Family
Saint Gobain Containers	Industrial
Solon Place Apartments	Multi-Family
US Aluminum	Industrial
Wedgeworth Elementary	Education
North Waxahachie Station Total	**2**
Georgia-Pacific Corporation	Industrial
National Freight	Industrial
South Red Oak Station Total	**2**
Red Oak Jr. High	Education
Red Oak Main Street Plaza	Mixed Use
Downtown Red Oak Station Total	**3**
Red Oak Elementary	Education
Red Oak High School	Education
Red Oak Main Street Plaza	Mixed Use
North Red Oak Station Total	**0**
Lancaster CBD Station Total	**3**
Bar Constructors, Incorporated	Industrial
Brasscraft Manufacturing	Industrial
Hall, J.D. Learning Center	Education
Cedar Valley College Station Total	**1**
Adesa – Dallas Logistics Hub	Service
Southport Station Total	**4**
Chrome Plus USA	Retail
Dallas Logistics Hub Building B	Industrial
DMJ Properties, Limited	Retail
Sukhi Corporation	Hotel/Motel

Table D-3 Activity Centers (continued)

Name of Activity Center	Type
Simpson Stuart Station Total	**0**
Loop 12 Station Total	**2**
Crest A	Multi-Family
Oakwood Place	Multi-Family
Ledbetter Station Total	**2**
Crest A	Multi-Family
Oakwood Place	Multi-Family
Illinois Station Total	**1**
Hemingway House	Multi-Family
MLK Station Total	**6**
1301 McDonald	Industrial
Bway Corporation	Industrial
Dallas ISD Warehouse	Industrial
Elder Friendly	Multi-Family
Faubion Associates, Incorporated	Industrial
St. Phillip's School	Education
Corinth Station Total	**10**
1000 Belleview Street	Office
2200 Cockrell Avenue	Industrial
Dallas Police Headquarters	Institutional
DCCCD Office Building	Education
Gould Street in the Cedars	Multi-Family
Sears Roebuck and Company, Incorporated	Retail
SEIB/Reunion Sports	Mixed Use
South Side on Lamar	Multi-Family
Standard Fruit and Vegetable	Industrial
Union Station Total	**74**
1025 Elm Street	Office
1100 Commerce Street	Institutional
1208 Commerce Street	Parking
1701 North Market Street	Office
1709 North Market Street	Office
1713 North Market Street	Office
205 South Lamar Street	Office
304 South Record Street	Office
306 South Houston Street	Retail
311 North Market Street	Office
501 Elm Place Residence	Multi-Family
509 Elm Street	Retail
525 South Griffin Street	Institutional
600 Jackson Street	Office
702 Young Street	Parking
705 Ross Avenue	Office

Table D-3 Activity Centers (continued)

Name of Activity Center	Type
Union Station Total (continued)	**75**
711 Elm Street	Parking
777 Sports Street	Office
800 Jackson Street	Office
804 Pacific Avenue	Office
807 Elm Street	Office
909 Elm Street	Retail
911 Elm Street	Retail
Aloft	Hotel/Motel
Awalt Building	Office
Bakers Ribs BBQ	Retail
Bank of America (One Main Place)	Office
Bank of America Plaza	Office
Belo Building	Office
Cadillac Bar	Retail
Corgan Associates	Office
Crowley Courts Building	Institutional
Crowne Plaza Dallas Downtown	Hotel/Motel
Dallas Convention Center	Recreational
Dallas County Community College (El Centro)	Education
Dallas County Jail South Tower	Government Quarters
Dawson State Jail	Government Quarters
El Centro College	Education
El Centro College Health Campus (Paramount Building)	Education
Founders Square	Office
George Allen Court Building	Institutional
Griffin Street Auto Park	Parking
Hotel Lawrence	Hotel/Motel
Hyatt Regency Dallas	Hotel/Motel
Jackson Street Lofts	Multi-Family
Katy Building	Office
Landmark Center	Office
Lawyers Building of Dallas	Office
Metropolitan	Multi-Family
MKT Freight Terminal	Industrial
Moline Building Landry’s / Sonny Bryan’s	Office
Omni Dallas Convention Hotel	Hotel/Motel
Palm Restaurant	Retail
Purse Building	Multi-Family
Records Building Complex	Institutional
Renaissance Place	Office
Reunion Arena	Recreational
Reunion Parking Garage	Parking
Reunion Tower	Cultural

Table D-3 Activity Centers (continued)

Name of Activity Center	Type
Union Station Total (continued)	**75**
Richland Collegiate High School of Math and Science	Education
Soco Urban Lofts	Multi-Family
Spaghetti Warehouse	Retail
SPCA	Office
Spring Hill Suites – West End	Hotel/Motel
Sterrett, Lew Justice Center N and W Towers	Government Quarters
SW Bell Parking	Parking
Terazzo	Multi-Family
Texas Club / Bank of America Parking	Parking
The Dallas Morning News	Office
Union Fidelity Park	Parking
US Military Proc Station	Institutional
West End Station	Multi-Family
WFAA-TV, Incorporated	Office
Yo Ranch / Tony Romas	Retail

Source: NCTCOG, 2009

D.8 COMMUNITY FACILITIES

Based on a review of the data discussed in Appendix B, Section B.2.3, community facilities within the station analysis areas are identified. Table D-4 lists the community facilities near each station.

Table D-4 Community Facilities

Name of Community Facility	Facility Type
Waxahachie CBD Station Total	**10**
Ellis County Court	Government
Ellis County Emergency Management	Emergency Services
Ellis County Jail	Government
Ellis County Museum	Cultural
Ellis County Sheriff's Office	Emergency Services
Waxahachie City Hall	Government
Waxahachie Fire Department	Emergency Services
Waxahachie Main Post Office	Government
Waxahachie Police Department	Emergency Services
Waxahachie Public Library	Recreational
US 287 Station Total	**3**
Johnston Group Home	Assisted Living
Navarro College Waxahachie Campus	Education
Wedgeworth Elementary	Education
North Waxahachie Station Total	**0**

Table D-4 Community Facilities (continued)

Name of Community Facility	Facility Type
South Red Oak Station Total	**2**
Red Oak Cemetery	Cemetery
Red Oak Jr. High	Education
Downtown Red Oak Station Total	**3**
Benjamin Grandstaff Memorial	Recreational
Red Oak Elementary	Education
Red Oak High School	Education
North Red Oak Station Total	**0**
Lancaster CBD Station Total	**5**
Hackberry House	Assisted Living
Hall, J.D. Learning Center	Education
Lancaster City Hall	Government
Lancaster Main Post Office	Government
Lancaster Public Library	Recreational
Cedar Valley College Station Total	**0**
Southport Station Total	**0**
Simpson Stuart Station Total	**0**
Loop 12 Station Total	**0**
Ledbetter Station Total	**0**
Illinois Station Total	**0**
MLK Station Total	**1**
St. Philip's School	Education
Corinth Station Total	**3**
Cedars Station	Transportation
Dallas Police Headquarters	Emergency Services
DCCCD Office Building	Education
Union Station Total	**33**
1100 Commerce Street	Government
1208 Commerce Street	Transportation
525 South Griffin Street	Government
702 Young Street	Transportation
711 Elm Street	Transportation
Allen, George L Courts	Government
Convention Center Station	Transportation
Crowley Courts Building	Government
Dallas County Community College (El Centro)	Education
Dallas County Court	Government
Dallas County Jail South Tower	Government
Dallas County Sheriff's Office	Emergency Services
Dallas Holocaust Memorial Center	Cultural
Dawson State Jail	Government
El Centro College	Education

Table D-4 Community Facilities (continued)

Name of Community Facility	Facility Type
Union Station Total (continued)	**33**
Griffin Street Auto Park	Transportation
Records Building Complex	Cultural
Reunion Area	Recreational
Reunion Parking Garage	Transportation
Reunion Tower	Recreational
Richland Collegiate High School of Math and Science	Education
Sixth Floor Museum at Dealey Plaza	Cultural
Station C Post Office	Government
Sterrett, Lew Justice Center N & W Towers	Government
SW Bell Parking	Transportation
Texas Club/Bank of America Parking	Transportation
Trinity Crossing	Recreational
Union Fidelity Park	Transportation
Union Station	Transportation
US Army National Guard	Government
USA	Government
West End Station	Transportation
West Transfer Center	Transportation

Source: NCTCOG, 2009

D.9 HISTORICAL AND ARCHEOLOGICAL RESOURCES

Based on the data discussed in Appendix B, Section B.2.4, historical resources within the station analysis areas are identified. Listed in Table D-5 are the historical properties, districts, markers and cemeteries within one-half mile of stations.

Table D-5 Historical Features

Name of Historical Feature	Feature Type
Waxahachie CBD Station Total	**32**
Building at 441 East Main	Property
Building at 500-502 East Main	Property
Central Presbyterian Church	Marker
City Cemetery	Cemetery
Ellis County Courthouse	Marker
Ellis County Courthouse Historic District	District
Ellis County Jail, Old	Marker
Ellis County Museum, Incorporated	Museum
Ells County Woman’s Building (Davis Hall)	Marker
Ellis, Richard, Monument	Marker
Highway Garage	Property
Hines, E.M., House	Property
House at 104 Kaufman	Property
House at 106 Kaufman	Property

Table D-5 Historical Features (continued)

Name of Historical Feature	Feature Type
Waxahachie CBD Station Total (continued)	**32**
House at 301 Turner	Property
House at 625 Cantrell	Property
House at 700 South Rogers	Property
House at 703 South College	Property
House at 803 Cantrell	Property
House at 816 Cantrell	Property
Joshua Chapel A.M.E Church	Property
National Compress Company Building	Property
North Rogers Street Historic District	District
Oldham Avenue Historic District	District
Paillet House	Property
Plumhoff House	Property
Ray, M.B., House	Property
Rogers Street Bridge	Marker
Rosemont	Marker
Rosemont House	Property
Waxahachie Lumber Company	Property
West End Historic District	District
US 387 Station Total	**0**
North Waxahachie Station Total	**0**
South Red Oak Station Total	**2**
Red Oak Cemetery	Cemetery
Red Oak Cemetery	Marker
Downtown Red Oak Station Total	**0**
North Red Oak Station Total	**0**
Lancaster CBD Station Total	**11**
Confederate Arms Factory	Marker
First Baptist Church of Lancaster	Marker
First Presbyterian Church of Lancaster	Marker
First United Methodist Church of Lancaster	Marker
Head House	Marker
Lancaster	Marker
Randlett House	Property
St. Paul Freewill Baptist Church	Marker
Strain Farm-Strain, W.A., House	District
Strain, W.A., House	Marker
Strain, W.A., House	Property
Cedar Valley Station Total	**0**
Southport Station Total	**0**
Simpson Stuart Station Total	**0**
Loop 12 Station Total	**0**
Ledbetter Station Total	**0**

Table D-5 Historical Features (continued)

Name of Historical Feature	Feature Type
Illinois Station Total	**0**
MLK Station Total	**1**
Colonial Hill Historic District	District
Corinth Station Total	**0**
Union Station Total	**24**
A.H. Belo Corporation	Marker
Adolphus Hotel	Marker
Bryan, John Neely	Marker
Dallas County	Marker
Dallas County Courthouse	Property
Dallas County Records Building	Marker
Dallas Morning News	Marker
Dallas Union Terminal	District
Dallas Union Terminal	District
Dealey Plaza Historic District	District
Dealey Plaza Historic District	District
Higginbotham – Bailey Building	Marker
Houston Street Viaduct	District
Houston Street Viaduct	District
Log Cabin Pioneers	Marker
Neiman-Marcus	Marker
Old Red Courthouse	Mark
Sanger Brothers Complex	Property
Santa Fe Terminal Buildings No. 1 and No. 2	Property
Santa Fe Terminal Buildings No. 1 and No. 2	Property
The Sixth Floor Museum	Museum
Union Station	Marker
Westend Historic District	District
Westend Historic District	District

Source: NCTCOG, 2009

Based on the data discussed in Appendix B, Section B.2.4, archeological resources within the station analysis areas are identified. Listed in Table D-6 are the archeological investigations within one-half mile of stations.

Table D-6 Archeological Investigations

Investigating Agency	Type	Date
Waxahachie CBD Station Total		**2**
Texas Parks and Wildlife	Survey	January 1998
Federal Highway Administration (FHWA)	Reconnaissance Survey	January 2007
US 287 Station Total		**0**
North Waxahachie Station Total		**2**
TxDOT	Survey	June 1979
FHWA	Survey	January 1994

Table D-6 Archeological Investigations (continued)

Investigating Agency	Type	Date
South Red Oak Station Total		**0**
Downtown Red Oak Station Total		**0**
North Red Oak Station Total		**0**
Lancaster CBD Station Total		**1**
Natural Resource Conservation Service	Survey	February 2004
Cedar Valley College Station Total		**0**
Southport Station Total		**3**
FHWA	Survey	November 1986
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
Simpson Stuart Station Total		**6**
USACE	Survey	September 1981
USACE	Survey	September 1981
USACE	Survey	September 1981
USACE	Survey	September 1981
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
Loop 12 Station Total		**4**
USACE	Survey	September 1981
USACE	Survey	September 1981
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
Ledbetter Station Total		**3**
USACE	Survey	September 1981
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
Illinois Station Total		**3**
USACE	Survey	September 1981
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
MLK Station Total		**4**
USACE	Survey	September 1981
USACE	Survey	September 1981
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown
Corinth Station Total		**6**
USACE	Survey	September 1981
USACE	Survey	September 1981
Dallas Parks and Wildlife	Survey	April 1996
Texas Department of Agriculture	Survey	April 1996
Unknown	Unknown	Unknown
Unknown	Unknown	Unknown

Table D-6 Archeological Investigations (continued)

Investigating Agency	Type	Date
Union Station Total		**8**
FTA	Literary Research	December 1987
FHWA	Survey	October 1991
City of Dallas	Testing/Mitigation	September 1999
DART	Survey	March 2001
DART	Survey	March 2001
FTA/DART	Survey	January 2002
FTA/DART	Survey	January 2002
Unknown	Testing/Mitigation	Unknown

Source: NCTCOG, 2009

Also discussed in Appendix B, Section B.2.4, the number of historical aged parcels within the station analysis areas are identified. The number of parcels within one-half mile of stations are listed in Table D-7. Parcels with structures built before 1961 currently meet the minimum age requirement (50 years) to qualify as historic structures. If the Waxahachie Corridor begins construction within the next 15 years, additional properties with structures built between 1961 and 1975 may meet the age requirements.

Table D-7 Year of Construction on Parcels

Year Built	Number of Parcels
Waxahachie CBD Station Total	**433**
Before 1961	282
1961-1975	151
US 287 Station Total	**7**
Before 1961	1
1961-1975	3
North Waxahachie Station Total	**4**
Before 1961	1
1961-1975	3
South Red Oak Station Total	**56**
Before 1961	3
1961-1975	53
Downtown Red Oak Station Total	**260**
Before 1961	23
1961-1975	237
North Red Oak Station Total	**7**
Before 1961	0
1961-1975	7
Lancaster CBD Station Total	**346**
Before 1961	296
1961-1975	50

Table D-7 Year of Construction on Parcels (continued)

Year Built	Number of Parcels
Cedar Valley College Station Total	**4**
Before 1961	3
1961-1975	1
Southport Station Total	**15**
Before 1961	14
1961-1975	1
Simpson Stuart Station Total	**232**
Before 1961	27
1961-1975	205
Loop 12 Station Total	**158**
Before 1961	139
1961-1975	19
Ledbetter Station Total	**261**
Before 1961	238
1961-1975	23
Illinois Station Total	**377**
Before 1961	322
1961-1975	55
MLK Station Total	**195**
Before 1961	136
1961-1975	59
Corinth Station Total	**134**
Before 1961	103
1961-1975	31
Union Station Total	**87**
Before 1961	67
1961-1975	20

Source: Dallas and Ellis Counties Parcel Data, 2008

D.10 PARKS, TRAILS, AND RECREATIONAL FACILITIES

In Appendix B, Section B.1.3, the bicycle and pedestrian facilities (trails) are discussed. The park and recreational facilities are discussed in Appendix B, Section B.2.5. Based on a review of these features, the Waxahachie Corridor was determined to be adjacent to 16 parks or recreational facilities. The following facilities could fall under the state or federal protections outlined in Appendix B, Section B.2.5.1: Waxahachie Creek High and Bike Trail in Waxahachie, Southwest Dallas County Loop, Bear Creek Nature Park, and County View Golf Course in Lancaster, Greater Dallas Bike Plan (Route 45, 55, 110, 160, and 190), Main Stem Trinity Trail, Red Bird Way, Fruitdale Park, Bulova/Homecoming Cemetery Park, John C. Phelps Park, and Sargent Park in Dallas, and the Cedar Valley Trail in both Dallas and Lancaster. In addition, Table D-8 lists the off-street bicycle and pedestrian trails, parks and recreational facilities within one-half mile of Waxahachie Corridor stations.

Table D-8 Parks, Trails and Recreation Facilities

Name of Facility	Facility Type
Waxahachie Station Total	**8**
A & F Thompson Memorial Park	Existing Park
Freedman Memorial Plaza	Existing Park
George Brown Plaza	Existing Park
Hot Well Park	Existing Park
Rogers Spring Branch Park	Existing Park
Rodgers Spring Branch Walkway	Existing Park
Rogers Street Bridge Improvements	Planned Trail
Waxahachie Creek Hike and Bike Trail	Existing Trail
US 287 Station Total	**0**
North Waxahachie Station Total	**0**
South Red Oak Station Total	**1**
City Park	Existing Park
Downtown Red Oak Station Total	**1**
City Park	Existing Park
North Red Oak Station Total	**0**
Lancaster CBD Station Total	**5**
Community House Park	Existing Park
Heritage Park	Existing Park
Lancaster City Park	Existing Park
Rocky Crest Park	Existing Park
Unknown	Existing Trail
Cedar Valley College Station Total	**1**
Cedar Valley Trail	Planned Regional Veloweb Trail
Southport Station Total	**1**
Greater Dallas Bike Plan, Route 55	Existing Trail
Simpson Stuart Station Total	**3**
Greater Dallas Bike Plan, Route 110	Existing Trail
Greater Dallas Bike Plan, Route 55	Existing Trail
J.J. Lemmon Park	Existing Park
Loop 12 Station Total	**1**
Red Bird Way	Planned Regional Veloweb Trail
Ledbetter Station Total	**1**
Seaton Park	Existing Park
Illinois Station Total	**2**
Fruitdale Park	Existing Park
Seaton Park	Existing Park
MLK Station Total	**6**
Cedar Valley Trail	Planned Regional Veloweb Trail
Forest Park	Existing Park
Greater Dallas Bike Plan, Route 170	Existing Trail
Greater Dallas Bike Plan, Route 55	Existing Trail

Table D-8 Parks, Trails and Recreation Facilities (continued)

Name of Facility	Facility Type
MLK Station Total (continued)	**6**
Martin Luther King Media	Existing Park
Santa Fe Trestle Trail	Planned Trail
Corinth Station Total	**8**
Austin Street Abandoned Rail Corridor	Planned Trail
Cedar Veloway	Planned Regional Veloweb Trail
Greater Dallas Bike Plan, Route 73	Existing Trail
Main Stem Trinity	Planned Regional Veloweb Trail
Santa Fe Trestle Trail	Planned Trail
Trinity Bottoms	Planned Regional Veloweb Trail
Trinity Levee Trail	Existing Trail
Trinity River Park	Existing Park
Union Station Total	**12**
Dealey Plaza	Existing Park
Ferris-Plaza	Existing Park
Founders Square	Existing Park
Greater Dallas Bike Plan, Route 45	Existing Trail
Greater Dallas Bike Plan, Route 190	Existing Trail
Greater Dallas Bike Plan, Route 210	Existing Trail
Lubben Plaza	Existing Park
Martyr’s Park	Existing Park
Pioneer Cemetery	Existing Park
Reunion Park	Existing Park
Trinity Levee Trail	Existing Park
Trinity River Park	Existing Park

Source: NCTCOG, 2009

D.11 HAZARDOUS AND REGULATED MATERIALS

Based on a review of the hazardous and regulated materials data discussed in Appendix B, Section B.2.6, the Waxahachie Corridor was determined to be adjacent to three landfill sites. All four sites are unauthorized landfills and could contain potentially hazardous materials. These sites are located near the intersection of IH 45 and Loop 12, Southerland Avenue, Nolen Street, and the intersection of Martin Luther King Jr. Boulevard and Lamar Street. Five natural gas pipelines cross the rail line within the Waxahachie Corridor: Gateway Pipeline Company in Waxahachie, two Atmos Pipeline -Texas in Red Oak, Atmos Energy COEP,. Mid-Tex Division in Dallas, and Gulf South Pipeline Company, Limited Partnership in Dallas. The number and status of landfill sites and the length and operator of pipelines within each of the station analysis areas are included in Table D-9.

Table D-9 Hazardous/Regulated Materials

Station	Landfill Sites (Status)	Pipeline Length (Operator)
Waxahachie CBD	0	0
US 287	0	0.89 miles (Gateway Pipeline Company)
North Waxahachie	0	0
South Red Oak	0	0
Downtown Red Oak	0	0.15 miles (Atmos Pipeline – Texas)
North Red Oak	0	0.51 miles (Atmos Pipeline – Texas)
Lancaster CBD	0	0.10 miles (Atmos Pipeline – Texas) 0.84 miles (Atmos Pipeline – Texas)
Cedar Valley College	0	0.19 miles (Atmos Pipeline – Texas) 0.19 miles (Atmos Pipeline – Texas) 0.33 miles (Atmos Pipeline – Texas)
Southport	0	0
Simpson Stuart	2 (Unauthorized)	0.91 miles (Gulf South Pipeline Company, Limited Partnership)
Loop 12	2 (Unauthorized)	0
Ledbetter	2 (Unauthorized)	0
Illinois	0	0
MLK	1 (Unauthorized)	0
Corinth	0	0
Union Station	0	0

Source: NCTCOG, 2009

D.12 AIR QUALITY IMPACT

This qualitative measure estimates the impact a new rail alternative would have on regional air quality. Appendix B, Section B.3.1 provides detailed information on this measure.

D.13 NOISE

Based on the data discussed in Appendix B, Section B.3.2, noise sensitive land use near the Waxahachie Corridor is identified. As shown in Table D-10, the land use directly adjacent to the rail line right-of-way includes 19,740 linear feet (6.1 percent) of residential land use, 7,540 linear feet (2.3 percent) of park or recreational land use, and 8,200 linear feet (2.5 percent) of institutional land use. This totals 35,480 linear feet (10.9 percent) of noise sensitive land use. These land uses could contain specific noise sensitive receivers.

Table D-10 Noise Sensitive Land Use

Station Segment	Linear Feet of Land Use Type		
	Residential	Park or Recreational	Institutional
Waxahachie CBD to US 287	4,946	0	4,175
US 287 to North Waxahachie	0	0	0
North Waxahachie to South Red Oak	247	0	0
South Red Oak to Downtown Red Oak	666	0	563
Downtown Red Oak to North Red Oak	1,164	0	783
North Red Oak to Lancaster CBD	2,678	2,555	516
Lancaster CBD to Cedar Valley College	2,142	0	0
Cedar Valley College to Southport	1,613	0	0
Southport to Simpson Stuart	3,794	0	0
Simpson Stuart to Loop 12	0	0	25
Loop 12 to Ledbetter	0	0	0
Ledbetter to Illinois	1,980	0	1,155
Illinois to MLK	514	4,980	0
MLK to Corinth	0	0	0
Corinth to Union	0	0	984

Source: NCTCOG, 2010

D.14 VIBRATION

Based on the data discussed in Appendix B, Section B.3.3, vibration sensitive land use near the Waxahachie Corridor is identified. As shown in Table D-11, the land use directly adjacent to the rail line right-of-way includes no Category 1 land uses. Category 2 land uses totaled 19,740 linear feet (6.1 percent) which includes residential land use, hotels, and motels. Approximately 15,740 linear feet (4.8 percent) of Category 3 land uses are identified; these land uses included institutional buildings (such as government buildings) and park and recreational facilities. Each of these land use types identified could contain specific vibration sensitive receivers.

Table D-11 Vibration Sensitive Land Use

Station Segment	Linear Feet of Land Use Type		
	Category 1	Category 2	Category 3
Waxahachie CBD to US 287	0	4,946	4,175
US 287 to North Waxahachie	0	0	0
North Waxahachie to South Red Oak	0	247	0
South Red Oak to Downtown Red Oak	0	666	3,071
Downtown Red Oak to North Red Oak	0	1,164	783
North Red Oak to Lancaster CBD	0	2,678	516
Lancaster CBD to Cedar Valley College	0	2,142	0
Cedar Valley College to Southport	0	1,613	0
Southport to Simpson Stuart	0	3,794	0
Simpson Stuart to Loop 12	0	0	25
Loop 12 to Ledbetter	0	0	0
Ledbetter to Illinois	0	1,980	1,155
Illinois to MLK	0	514	4,980
MLK to Corinth	0	0	0
Corinth to Union	0	0	984

Source: NCTCOG, 2010

D.15 WATER RESOURCES

Based on the data discussed in Appendix B, Section B.3.4, floodplains along the Waxahachie Corridor rail line are identified. The linear feet of floodplain crossings by the Waxahachie Corridor rail line was calculated using the centerline length along the rail line that intersects identified Federal Emergency Management Agency (FEMA) Q3 floodplains. As shown in Table D-12, the total rail centerline length of 30.9 miles (162,917 linear feet) includes 31,166 linear feet (19.1 percent) of 100-year floodplain crossings and 6,219 linear feet (3.8 percent) of 500-year floodplain crossings. This totals 37,385 linear feet (22.9 percent) of identified floodplain crossings for the Waxahachie Corridor.

Table D-12 Rail Centerline Floodplain Crossings

Station Segment	Linear Feet of Floodplain		Stream Crossings
	100-Year	500-Year	
Waxahachie CBD to US 287	590	733	0
US 287 to North Waxahachie	1,213	602	1
North Waxahachie to South Red Oak	3,743	783	3
South Red Oak to Downtown Red Oak	0	0	0
Downtown Red Oak to North Red Oak	0	0	1
North Red Oak to Lancaster CBD	738	1,017	2
Lancaster CBD to Cedar Valley College	1,407	36	1
Cedar Valley College to Southport	0	0	1
Southport to Simpson Stuart	4,568	0	2
Simpson Stuart to Loop 12	5,728	0	1
Loop 12 to Ledbetter	0	0	0
Ledbetter to Illinois	319	0	1
Illinois to MLK	10,291	3,048	1
MLK to Corinth	2,569	0	0
Corinth to Union	0	0	0

Source: NCTCOG, 2009

Based on a review of the data discussed in Appendix B, Section B.3.6, and 2007 aerial photography, the Waxahachie Corridor was determined to have 14 stream crossings. The corridor crosses the following streams, Bear Creek, Bushy Creek, Five Mile Creek, Floyd Branch, Honey Springs Branch, Keller Creek, North Grove Creek, Red Oak Creek, South Grove Creek, Ten Mile Creek, Trinity River, Whites Creek, and an unnamed tributary of Red Oak Creek that starts near Highland Road. Additional unnamed, ephemeral streams may cross the rail corridor within the study area.

D.16 ECOSYSTEM

The Natural Diversity Database (NDD) from Texas Parks and Wildlife Department provides actual recorded occurrences of protected species and vegetation series throughout the State of Texas. Areas near reported occurrences can be investigated further to confirm the presence of the documented species or vegetation series and avoid them whenever possible. A search through the NDD was conducted for the study area for potential threatened and endangered species, species of concern, protected species and vegetation series. As noted in Appendix B, Section B.3.5, one occurrence of a rookery was listed within the study area.

D.17 PRIME FARMLANDS

The soils within the study area are discussed in Appendix B, Section B.3.7. Any prime farmlands within one-half mile of a passenger rail station could be subject to additional development pressure. Based on United States Department of Agriculture soil type definitions, 12 types of soil within the station analysis areas are classified as prime farmlands: Austin silty clay (1 to 3 percent slopes), Austin silty clay (3 to 5 percent slopes), Brastsil fine sandy loam (0 to 3 percent slopes), Branyon clay (0 to 1 percent slopes), Branyon clay, terrace (1 to 3 percent slopes), Frio silty clay (occasionally flooded), Heiden clay (1 to 3 percent slopes), Houston Black clay (0 to 1 percent slopes), Houston Black clay

(1 to 3 percent slopes), Lewisville silty clay (1 to 3 percent slopes), Lewisville silty clay (3 to 5 percent slopes), and Sunev clay loam (1 to 3 percent slopes). Table D-13 lists the acreage of vacant areas based on 2005 land use data with prime farmland soils near each station.

Table D-13 Prime Farmlands

Station	Acres of Prime Farmland
Waxahachie CBD	56.2
US 287	120.1
North Waxahachie	310.0
South Red Oak	179.3
Downtown Red Oak	198.6
North Red Oak	388.9
Lancaster CBD	118.0
Cedar Valley College	306.3
Southport	34.3
Simpson Stuart	241.6
Loop 12	0
Ledbetter	0
Illinois	0
MLK	0
Corinth	0
Union Station	0

Source: NCTCOG, 2009

D.18 CONSTRUCTABILITY DIFFICULTY

Constructability is a qualitative measure to gauge the level of construction difficulty for each alternative. The measure is based on the level of several factors including estimated additional right of way needed for construction, perceived obstacles (e.g., permits, public acceptance), and additional structures needed. The evaluation for this qualitative measure was stated using “low” (easily built), “medium” (requires more effort to build), and “high” (has obstacles to overcome to build).

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