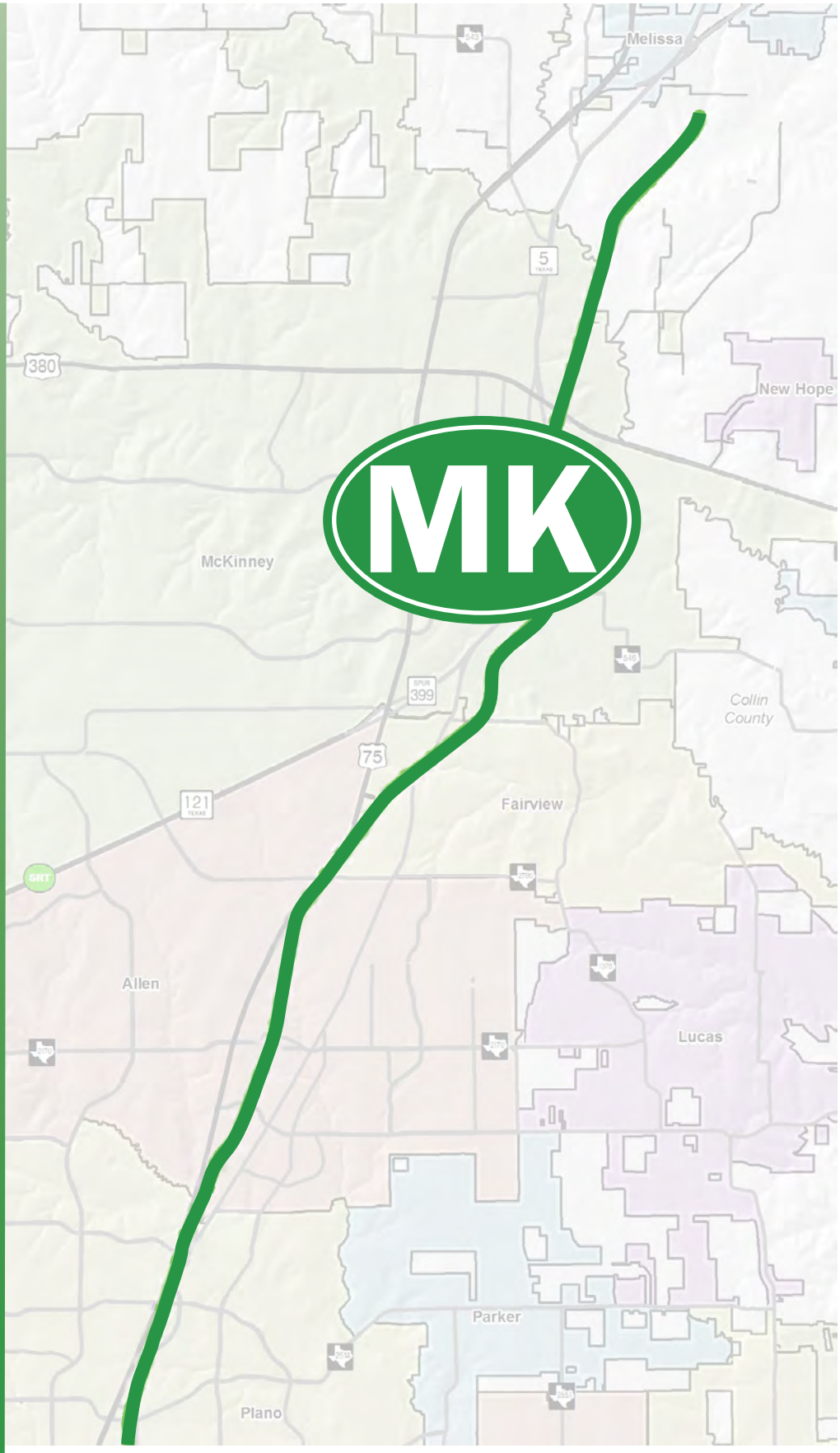
McKinney Corridor



Conceptual Engineering and Funding Study

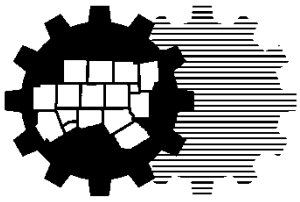
North Central Texas
Council of Governments

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).

North Central Texas Council of Governments
P. O. Box 5888
Arlington, Texas 76005-5888
(817) 640-3300

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.

"The contents of this report reflect the views of the authors who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the views or policies of the Federal Highway Administration, the Federal Transit Administration, or the Texas Department of Transportation."

McKinney Corridor

Conceptual Engineering and Funding Study

July 2010

North Central Texas
Council of Governments

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Technical Committee
Ruben Delgado
Director of Engineering, Collin County

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

The McKinney Corridor is part of a long-term multimodal vision for the rapidly growing Dallas-Fort Worth (DFW) region. The McKinney 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 McKinney Corridor is intended to connect population and employment in the fast growing central Collin County area with the existing and proposed passenger rail network in the DFW region.

The McKinney Corridor is a proposed north-south passenger rail corridor connecting Collin and Dallas Counties in North Central Texas. The corridor extends approximately 17.7 miles through four municipalities along Dallas Area Rapid Transit (DART) owned freight rail right-of-way. The connected municipalities include Allen, Fairview, McKinney, and Plano.

The study area boundary extends one mile from the current rail centerline along each side of the proposed rail alignment from the existing DART Red Line station at Parker Road in Plano to a northern terminus in McKinney approximately one mile south of State Highway (SH) 121 North. Based on 2000 United Stated (US) Census data, the study area population is approximately 144,000 persons with major employers including Benecorp Business Services, the City of Allen, the City of McKinney, Encore Wire Corporation, Experian, Lattimore Materials Company, Medical Center of McKinney, Raytheon Company, and Timber Blind Manufacturing. Figure 1-1 depicts the McKinney Corridor location within the DFW region.

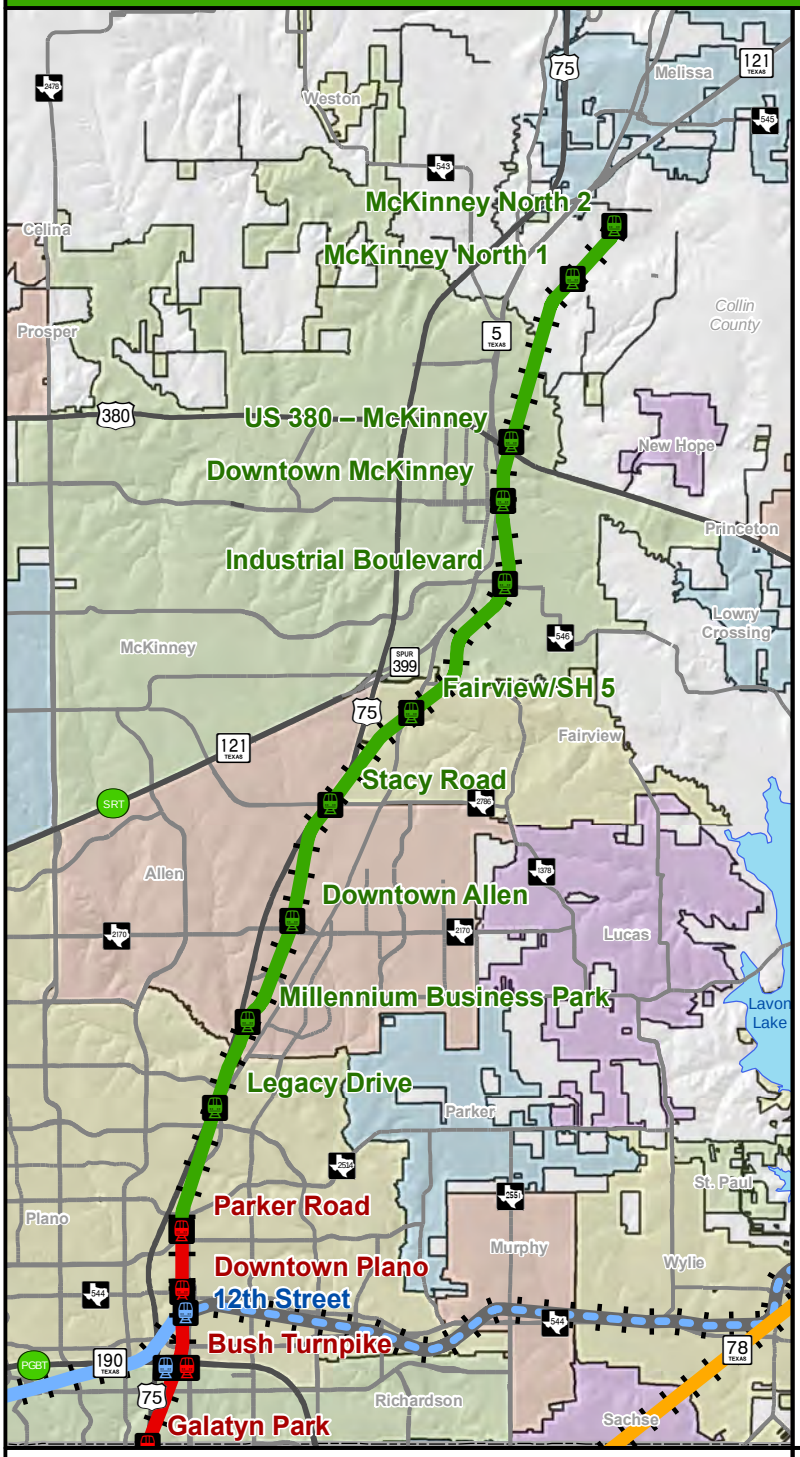
1.1 STUDY PURPOSE

NCTCOG, the Metropolitan Planning Organization (MPO) for the DFW region, initiated the McKinney 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. In brief, the McKinney Corridor CE & FS is structured as follows:

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

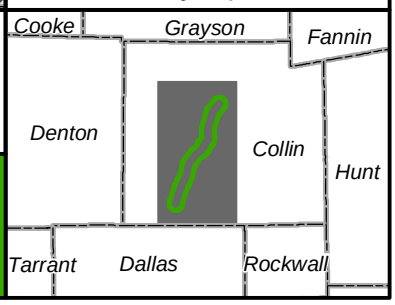
Figure 1-1 — McKinney Corridor Location Map
PGBT to FM 545



Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

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.

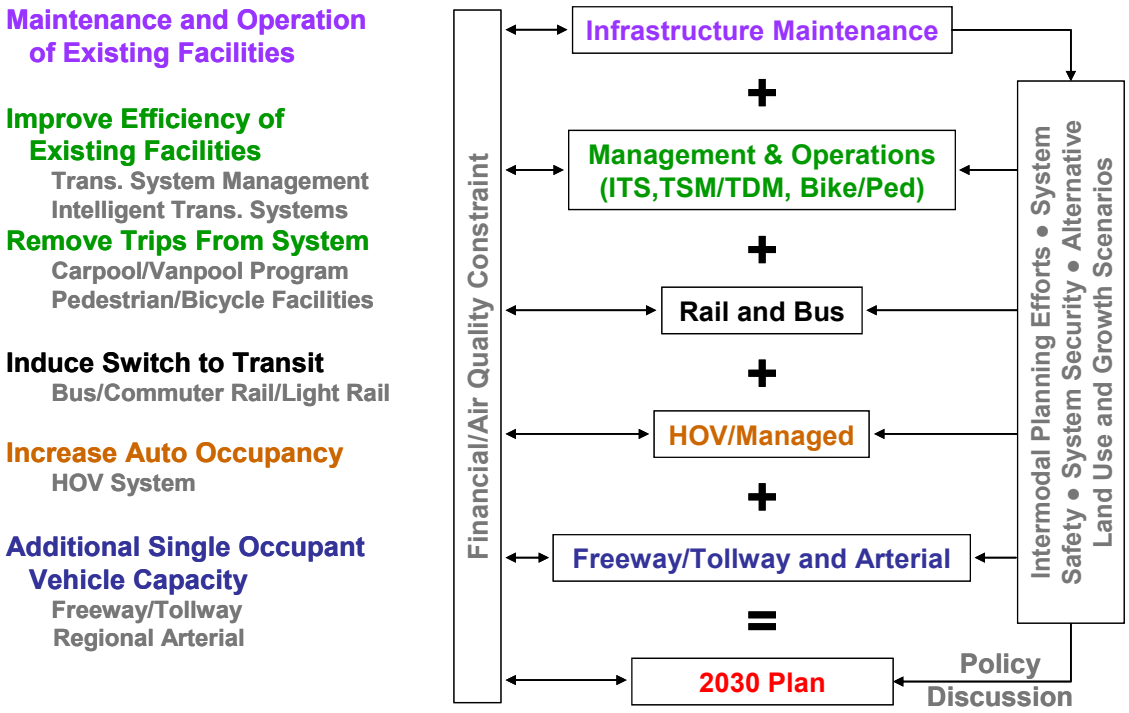
In addition to first investing in low cost, high yield projects, efforts are underway to induce travelers to modify their travel behavior by switching to transit, bicycle and pedestrian facilities, or increasing auto occupancy levels. Encouraging behavior modifications could reduce the number of vehicles 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 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: *Mobility 2030 - 2009 Amendment*, April 2009

Figure 1-2 Metropolitan Transportation Plan Process



Source: *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.

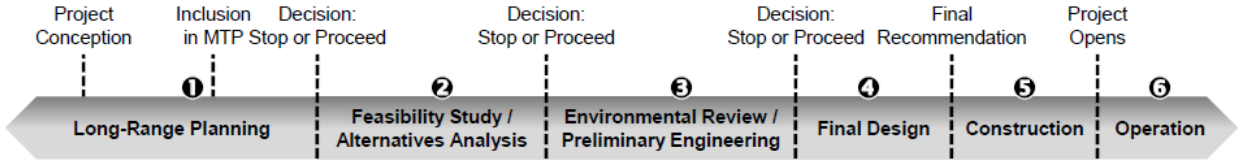
Table 1-2 Identified Funding Needs for the DFW Region through 2030

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[1]	$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[2]	**$145.5 (60%)**	**$98.0 (40%)**
	$243.5 Billion	

Source: NCTCOG, April 2009
Notes:
1. Includes funding from local transit initiatives
2. 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 McKinney 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 McKinney 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 McKinney 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 McKinney 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 McKinney Corridor has high ridership potential and warrants further study.

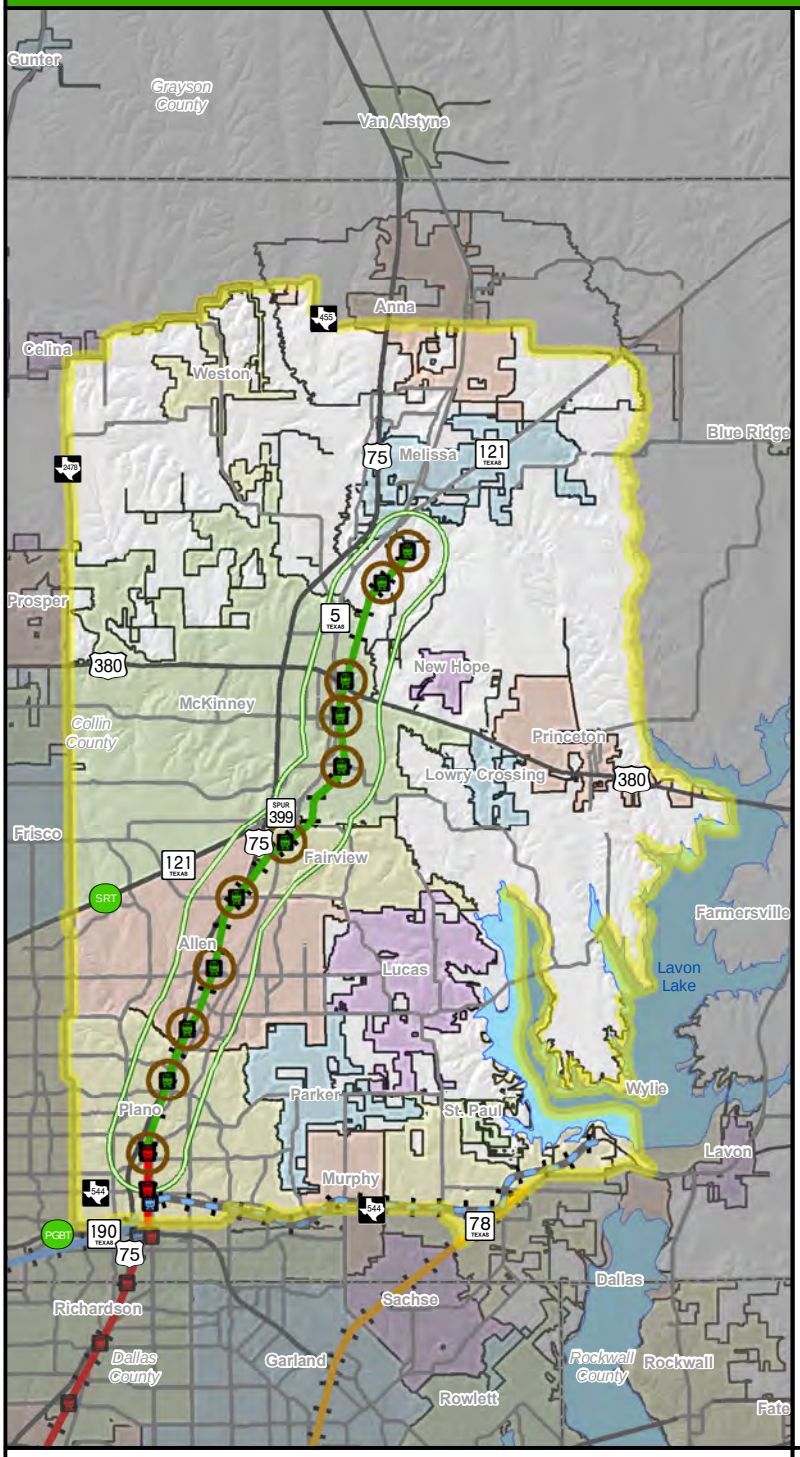
While this corridor is not included in the DART *2030 Transit System Plan*, DART recognizes the potential for future passenger rail on the McKinney Corridor. The portion of this corridor north of Plano is currently outside the DART service area boundary. DART has evaluated the potential for rail service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

1.4 STUDY AREA

The McKinney Corridor study area is a one-mile radius from the proposed rail alignment, which extends approximately 17.7 miles, from the existing DART Red Line station at Parker Road in Plano to a northern terminus in McKinney approximately one-mile south of SH 121 North. The study area includes many employment centers, diverse neighborhoods, and activity centers. The study area includes portions of five municipalities including, Allen, Fairview, McKinney, Melissa and Plano; all within Collin County. The McKinney Corridor connection to the DART Red Line light rail transit (LRT) service and potential connection with the proposed Cotton Belt regional rail service would 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 most of central Collin County and is generally bound by Farm-to-Market Road (FM) 455 on the north, Plano Parkway to the south, Custer Road to the west, and Lavon Lake and Sister Grove Creek to the east. Figure 1-4 illustrates the corridor study and planning areas for the McKinney Corridor within the DFW region.

Figure 1-4 — McKinney Corridor Study and Planning Area
PGBT to Grayson County Line



Legend

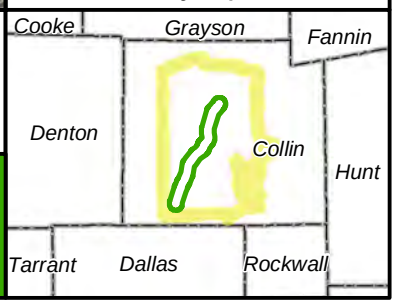
Analysis Areas

- Planning Area
- Study Area
- Station Analysis Area

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Future Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

1.4.1 Corridor Description

The existing McKinney Corridor generally parallels the US 75 and SH 5 corridors. The right-of-way is owned by DART from south of the Parker Road Station to Sherman, Texas. It is anticipated the corridor would interface with two other major passenger rail lines:

- DART Red Line LRT service to downtown Dallas (existing)
- Cotton Belt Corridor service from Dallas/Fort Worth International Airport (DFWIA) to Richardson/Plano (proposed)

The southern section from the Parker Road Station in Plano to approximately 1,000 feet south of Industrial Boulevard (FM 546) in McKinney is not in active rail service. In several locations the track has been removed for the construction of new or upgraded arterial roadways. There are ten at-grade, one grade separated, and three removed rail crossings. No portions are currently double tracked and the rail corridor has a continuous 100-foot wide right-of-way. The existing track condition is rated as poor.

The northern portion of the corridor, from Industrial Boulevard in McKinney to the northern terminus in the McKinney extraterritorial jurisdiction (ETJ), is in active freight rail service. The existing corridor is single tracked except for the siding between Virginia Street and Broad Street. There are 11 at-grade and two grade separated rail crossings within the active freight service area. The track condition is poor to fair, with freight trains operating at low speeds and other rail yard rules.

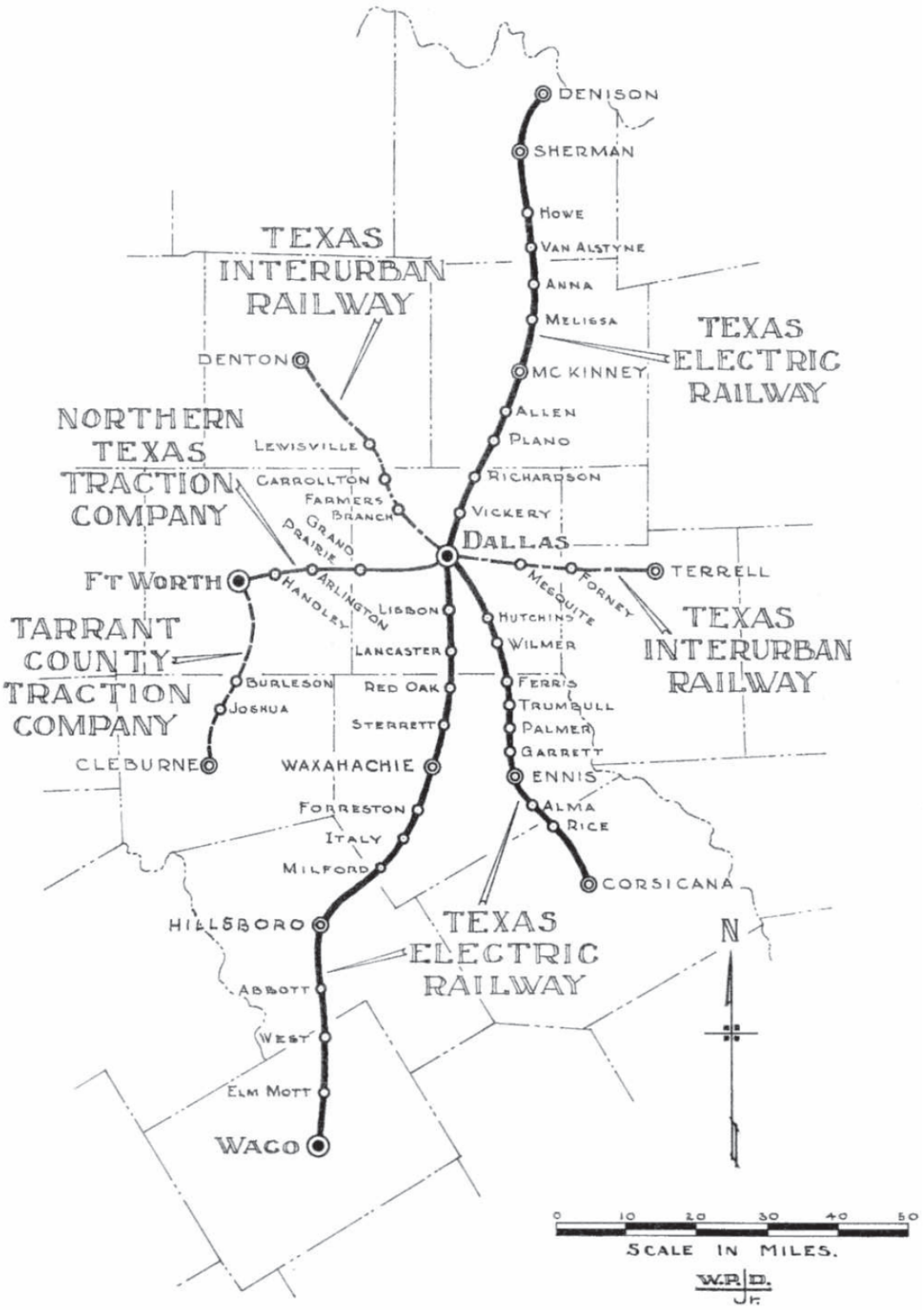
1.4.2 Historical Passenger Rail Operations

The McKinney Corridor rail line was built by the Texas Traction Company to connect the electric interurban rail line in Sherman/Denison that opened in 1901 and the Dallas/Fort Worth line that opened in 1902. Service between Dallas and Sherman began operation in 1908, extending to Denison by 1911. The Texas Electric Railway, formed in 1917 as a merger between the Texas Traction Company and Southern Traction Company, provided passenger service connecting Denison, Dallas, and Waco. Within the McKinney Corridor study area, stations in Plano, Allen, and McKinney were served by about 30 trains per day on the Dallas-Denison 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.

1.4.3 Existing Freight Rail Operations

The Dallas, Garland, and Northeastern Railroad Company (DGNO) possess trackage rights north of Stacy Road (FM 2786) and operate one or two trains on an average weekday. There is an active east-west spur connecting the main line to customers between Industrial Boulevard and Elm Street in McKinney. Passenger and freight rail operation within the same corridor introduces additional challenges. Chapters 3 and 4 address this topic in greater detail.

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



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

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

1.4.4 Major Employment and Activity Centers

Twenty-two major employers are located within the McKinney Corridor study area including, Benecorp Business Services, the City of Allen, the City of McKinney, Encore Wire Corporation, Experian, Lattimore Materials Company, Medical Center of McKinney, Raytheon Company, and Timber Blind Manufacturing. The 185 activity centers along the corridor include major employers Allen Premium Outlets and the Allen Event Center. The Allen Event Center is home to the Allen Americans ice hockey team, a Central Hockey League affiliate of the Dallas Stars National Hockey League team. The study area also includes 86 community facilities which include, but are not limited to places of worship, recreational facilities, medical facilities, and educational facilities. Chapter 4 and Appendix B address these facilities in greater detail.

1.5 PREVIOUS WORK EFFORTS

Passenger rail service within the McKinney Corridor has been studied for several years. The McKinney 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 McKinney Corridor. Allen, Fairview, McKinney, and Plano each reference the potential for passenger rail service along the McKinney Corridor within their approved local government comprehensive plans.

1.5.1 Regional Rail Corridor Study

NCTCOG published the *RRCS* in July 2005. Within the report, the McKinney Corridor was referred to as Corridor E-3. The report recommended passenger rail service be implemented using a Federal Railroad Administration (FRA) non-compliant, yet LRT-compatible vehicle operating from northern McKinney to downtown Dallas. The recommended service would provide new service along the existing freight rail corridor from the existing DART Parker Road Station to the proposed McKinney North 2 Station.

1.5.2 Rail North Texas

The Regional Transportation Council (RTC), the independent transportation policy body of the MPO, initiated RNT in 2008 to 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 McKinney Corridor overview was created identifying projected ridership, preliminary station locations, potential cost, social statistics, and land use. This study used the same project limits as the *RRCS*.

1.5.3 Transit Agency Studies

In the DART *2030 Transit System Plan* the potential to expand DART service into Allen, Fairview, and McKinney through a LRT Red Line extension was identified as an expansion opportunity. The plan noted any DART light rail system expansion along the McKinney Corridor would be predicated upon the municipalities along the rail line electing to join DART. DART tested the McKinney Corridor as an LRT extension with supporting feeder bus service and found it to have high ridership potential.

1.5.4 Local Government Comprehensive Plans

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

1.5.4.1 City of Plano

The *City of Plano Comprehensive Plan* (2004) identifies plans for TOD near the two existing DART Red Line stations (Parker Road Station and Downtown Plano Station). In addition, the 2004 *City of Plano Comprehensive Plan* identifies the need to determine the feasibility of a station at Spring Creek Parkway to preserve land required for a station and to explore the possibility of grade separating the rail line intersection with Parker Road.

1.5.4.2 City of Allen

The Allen *2002-2022 Comprehensive Plan* identifies the potential for expanding DART passenger rail service north of Plano. The plan notes the potential transportation benefits of extending light rail transit along the corridor, but makes no specific recommendations.

1.5.4.3 Town of Fairview

The *2005 Fairview Comprehensive Plan* identifies a potential transit station at the intersection of the McKinney Corridor and SH 5. The plan recommends TOD land uses within one-quarter mile of the preferred station location.

1.5.4.4 City of McKinney

The 2004 McKinney Comprehensive Plan includes expanding passenger rail service to McKinney. The plan recognizes the incompatibility between current local sales tax allocations and becoming a DART member city. The plan provides for transit center land uses surrounding preferred station locations. As an extension of the 2004 McKinney Comprehensive Plan, the Town Center Study is a planning initiative focused on addressing the specific needs of the McKinney historic Town Center area. Now in its implementation phase, the Town Center Study Phase 1 Report and associated illustrative plan was approved by the McKinney City Council in 2008 and envisions an urban, mixed-use transit village in anticipation of a future rail transit station within walking distance of the historic downtown.

1.5.5 System Planning Efforts

A comprehensive regional passenger rail study to identify preferred regional passenger rail corridors and implementation phasing has not been completed.

1.6 STAKEHOLDER AND AGENCY OUTREACH

The McKinney 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 McKinney 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 discusses the need and purpose for transportation improvements within the McKinney Corridor. This chapter also provides information on the established mission statement, goals, and objectives for the project used to guide the development of this document, as well as subsequent phases of project development and implementation.

2.1 TRANSPORTION NEED

The need for the McKinney Corridor project is based on population and employment growth, increased transportation demand, sustainable development initiatives, system linkages, and intermodal connections from the study area to the Dallas-Fort Worth (DFW) region. The McKinney 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, DFW is the fourth most populous urbanized area 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, benefited from an unprecedented period of growth. Regional growth 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.

The DFW region population is anticipated to increase by almost three million people over the next 20 years. Table 2-1 shows the 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. Approximately 70 percent of the regional population increase between 2000 and 2010 is expected to occur in the four core counties: Collin, Dallas, Denton, and Tarrant.

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 *2030 Demographic Forecast* (April, 2003) and US Census Bureau

Table 2-2 shows the projected populations and employment for municipalities along the McKinney Corridor. A total population increase of approximately 93 percent and a 168 percent increase in employment are projected within the study area between 2000 and 2030. These population and employment forecasts come from the NCTCOG 2030 demographic forecast completed in 2003. Recent 2010 population estimates indicate the current population of study area municipalities is 489,800, an increase of over 50 percent since 2000.

Table 2-2 Base Year and Projected Population and Employment

	Population			Employment		
Location	2000	2030	% Change	2000	2030	% Change
Allen	43,622	99,331	127.7%	9,059	45,144	398.3%
Fairview	2,625	18,100	589.5%	218	11,670	5253.2%
McKinney	53,725	225,933	320.5%	26,293	74,750	184.3%
Melissa	1,349	5,375	298.4%	147	840	471.4%
Plano	222,498	257,061	15.5%	115,048	184,205	60.1%
Total	**323,819**	**605,800**	**87.1%**	**150,765**	**316,609**	**110.0%**
Study Area	99,547	191,764	92.6%	49,844	133,632	168.1%

Source: NCTCOG *2030 Demographic Forecast* Equation: (2030 # - 2000 #)/2000 #

Five employers with 700 or more employees are located within the study area. The largest concentration of these large employers is in McKinney with three. With approximately 1,200 employees, the Medical Center of McKinney has the largest number of employees. Other major employers with more than 700 employees in the study area include Benecorp Business Services, Encore Wire Corporation, Lattimore Materials Company, and Raytheon Company (Plano Campus).

Access to these major employers and activity centers is primarily by personal motor vehicle. Job growth in areas outside traditional downtowns will continue to change journey to work patterns. Also shown in Table 2-2, all communities except McKinney are projected to have a greater percentage increase in employment than residential population from 2000 to 2030. The municipalities in the McKinney Corridor study area are generally characterized as having higher residential population than employment. Plano is the only city within the study area expected to add more jobs than residents between 2000 and 2030. The projected population increase 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 the political balkanization and employment decentralization in a metro area caused by a large

number of municipalities competing for major employers. *Job Sprawl Revisited: The Changing Geography of Metropolitan Employment* notes a steady employment decentralization 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. Projected in population and employment increases, the formation and relocation of businesses in areas further from the urban core, and the already congested roadway network are anticipated to create severe mobility challenges and the need for additional transportation capacity in the McKinney Corridor.

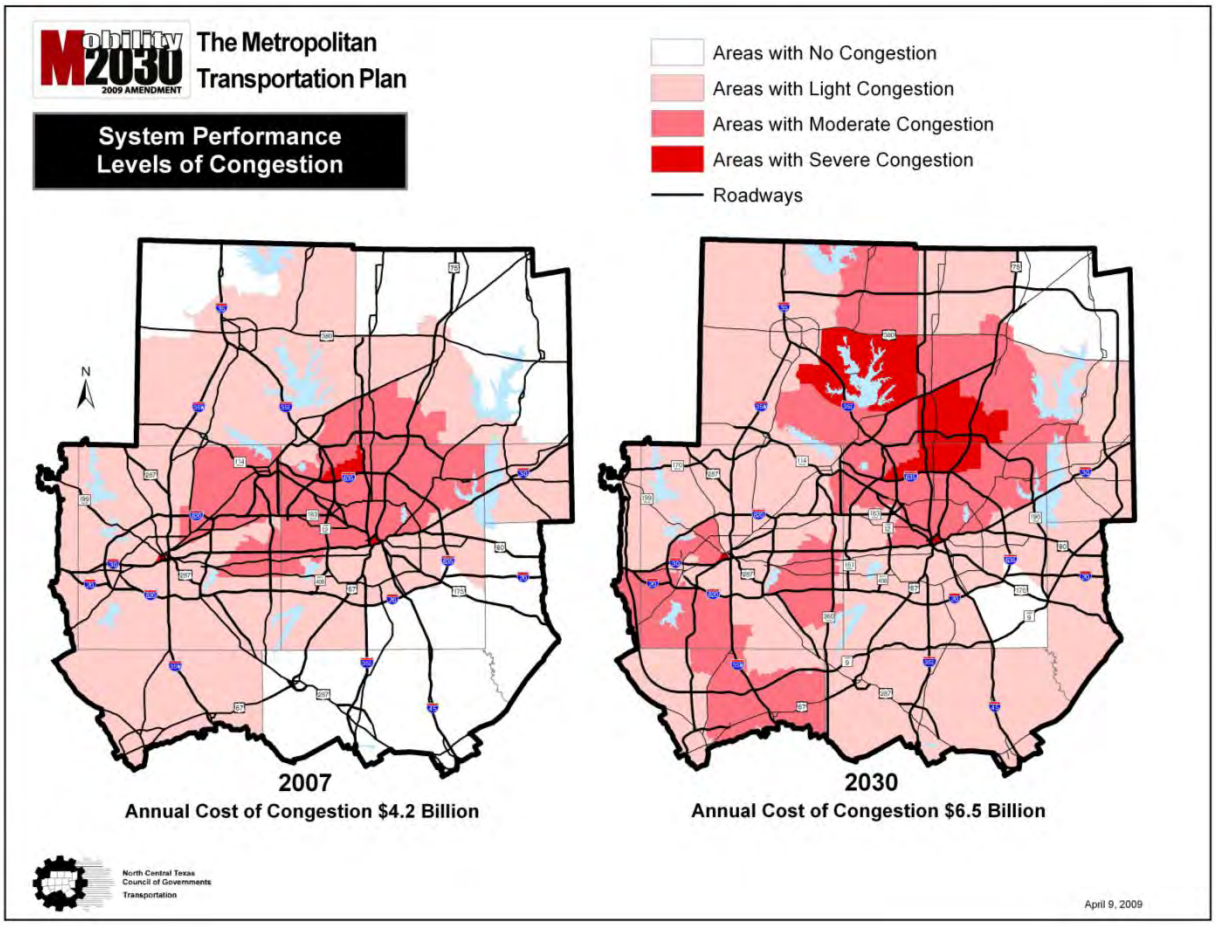
2.1.2 Increased Transportation Demand

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. Changes in land use associated with suburbanization have altered travel characteristics. Rather than the suburb-to-central city commute of the past, current commuting patterns are more widely scattered, as inter- and intra-suburban travel and reverse commute trip patterns have increased.

Despite the rapid pace at which growth has occurred, and is projected to continue, limited funding for transportation improvements has constrained the ability to solve ground transportation issues. As discussed in Chapter 1, Section 1.2, *Mobility 2030 - 2009 Amendment* is the current fiscally constrained MTP. It presents a system of transportation improvements needed to maintain mobility in the DFW metropolitan area over the next 20 years. *Mobility 2030 - 2009 Amendment* 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 a high transportation system investment level, congestion is projected to increase by 2030 when projections indicate roadway capacity will be insufficient to accommodate projected travel demand. Roadway upgrades and expansion have not kept pace with changing residential and commercial development patterns, leading to increasing congestion and delay. Figure 2-1 illustrates congestion levels during the peak hours under 2007 and 2030 conditions. The 2030 conditions represent anticipated congestion levels with all *Mobility 2030 - 2009 Amendment* projects completed. The increase in congestion is directly attributed to the projected 93 percent population increase and 168 percent employment increase in the study area from 2000 to 2030. To lessen the resulting congestion impact, a number of roadway improvements are proposed in the McKinney Corridor study area.

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



Source: NCTCOG, April 2009

The roadway system in the McKinney Corridor planning area includes several major highways, toll roads, and regional arterials (see Chapter 1, Figure 1-4). The major north-south corridors traversing the planning area include US 75, State Highway (SH) 5, SH 121, Farm-to-Market (FM) 2478 (Custer Road), FM 1378, and Shiloh Road. The Sam Rayburn Tollway (SRT) and Spur 399 run generally northeast to southwest. The major east-west roadways in the corridor planning area are US 380, Eldorado Parkway, FM 546 (Industrial Boulevard), Stacy Road, Spring Creek Parkway, FM 544 (15th Street and 14th Street), and SH 78. The Collin County Outer Loop is a planned east-west toll road through the northern portion of the planning area.

- US 75 is the major north-south corridor within the planning area. The roadway currently has four to eight main lanes and four to six frontage road lanes. There is also a two-lane high occupancy vehicle (HOV) facility south of Exchange Parkway in Allen. NCTCOG *Mobility 2030 - 2009 Amendment Corridor Fact Sheets Summary* indicates this roadway will have six to ten general purpose lanes and four to six frontage road lanes by 2030. The two-lane HOV facility is planned to extend to Virginia Parkway in McKinney and may be converted into managed lanes. In 2007, this facility carried up to 270,000 vehicles per day (VPD) and is projected to carry up to 330,000 VPD by 2030.

- SH 5/McDonald Street/Greenville Drive/Greenville Avenue/K Avenue is a north-south arterial roadway generally parallel to US 75 to the east. It varies from two to six lanes within the planning area. There are plans to expand the two-lane segment north of McKinney to a four-lane facility by 2030. In 2007 the roadway carried up to 44,000 VPD and is projected to carry up to 64,000 VPD by 2030.
- SH 121 is a two- to four-lane rural arterial with up to 18,000 VPD in 2007. By 2030 the entire facility is planned to be four-lane and is projected to carry up to 42,000 VPD.
- The SRT is currently under construction. The six frontage road lanes have been completed throughout the facility. With the exception of the interchange with US 75, the six general purpose toll lanes are open to traffic. The frontage road lanes carried up to 43,000 VPD in 2007 and the entire facility is expected to carry up to 130,000 VPD by 2030.
- Spur 399 is a connecting facility extending the SRT from US 75 to SH 5. It is currently a four-lane facility and is planned to be expanded to six lanes by 2030. The facility carried approximately 35,000 VPD in 2007 and is projected to carry 45,000 VPD by 2030.
- FM 2478 (Custer Road) is a major north-south arterial forming the planning area western boundary. While it is currently a two-lane road north of Stonebridge Drive, the majority of this facility is a divided four- to six-lane arterial. The two-lane section between Stonebridge Drive and US 380 is under construction and will be six lanes by 2012. The roadway currently carries up to 45,000 VPD and the projected 2030 volumes are up to 60,000 VPD.
- FM 1378 runs from SH 5 near the Fairview/McKinney border to Plano Parkway in Wylie. It is currently a two-lane rural road, but is planned to be a six-lane divided arterial by 2030. The facility carries up to 18,000 VPD and is projected to carry up to 50,000 VPD by 2030.
- Shiloh Road is an arterial extending from Parker Road south toward the President George Bush Turnpike (PGBT). It is currently two lanes between Park Boulevard and six lanes farther south. The two-lane segment is planned to expand to four lanes by 2030. The roadway carried up to 22,000 VPD in 2007 and is projected to carry up to 40,000 VPD in 2030.
- US 380 is an east-west corridor connecting Denton, McKinney, Farmersville, and Greenville. It is currently a four- to six-lane arterial with no future expansions planned within the McKinney Corridor planning area. The 2007 volumes on the facility were up to 33,000 VPD with projected volumes in 2030 of up to 57,000 VPD.
- Eldorado Parkway is a two- to four-lane roadway from SH 5 to the west. There are plans to expand the roadway to a four- to six-lane facility. The 2007 traffic volumes were up to 23,000 VPD, with future projections of up to 55,000 VPD in 2030.
- Existing FM 546 (Industrial Boulevard) is a continuation of Eldorado Parkway east of SH 5. This two- to four-lane roadway provides access to Collin County Regional Airport (CCRA) and rural areas northwest of Lavon Lake. The 2007 traffic volumes were up to 17,000 VPD.
- A FM 546 realignment called for in the *McKinney Master Thoroughfare Plan* would create a six-lane major arterial near the current location of Old Mill Road. This roadway would carry regional traffic around the CCRA and eastward to intersect with US 380. Future traffic volume projections are up to 38,000 VPD in 2030.

- Stacy Road is currently a four- to six-lane east-west arterial. *Mobility 2030 - 2009 Amendment* calls for the facility to be extended east, then north to form a loop around McKinney. The roadway carried up to 20,000 VPD in 2007 and is projected to be up to 54,000 VPD in 2030. The Town of Fairview is opposed to this McKinney Loop connector along Stacy Road and identifies Stacy Road east of FM 1378 as a two-lane, undivided roadway in the locally adopted *Master Thoroughfare Plan*. The *McKinney Master Thoroughfare Plan* shows the planned north-south portion of the loop as a major arterial connecting Telephone Road to County Road 317.
- Spring Creek Parkway is a four- to six-lane facility with no plans for future extension or expansion. It carried between 11,000 and 45,000 VPD in 2007 and is projected to carry between 30,000 and 60,000 VPD in 2030.
- FM 544 follows 15th Street west of Avenue G and along 14th street to the east of Avenue G in Plano. There are four- and six-lane sections accommodating up to 45,000 VPD in 2007. There are no plans to expand the facility. It is projected to carry up to 68,000 VPD by 2030.
- SH 78 is a two- to four-lane facility following a northeast-southwest path from Wylie to the PGBT toward downtown Dallas. The 2007 volumes within the planning area were up to 25,000 VPD. By 2030 the facility is planned to be a six-lane roadway and is projected to carry up to 45,000 VPD.
- The Collin County Outer Loop is a planned toll facility that could have as many as ten tolled lanes and four frontage road lanes by 2030. The county-adopted alignment is north of FM 545 and south of FM 455 within the planning area.

As indicated in Figure 2-1, the existing roadway system within the McKinney Corridor planning area is currently experiencing light to moderate congestion. Level-of-service (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. The Dallas-Fort Worth Regional Travel Model (DFWRTM) was used to generate 2007 and 2030 performance measures for the planning area roadway network. The 2030 transportation network includes all roadway and transit projects recommended by the MTP, including the McKinney Corridor.

As shown in Table 2-3, in 2007 almost 12 percent of the existing roadway sections in the planning area were at LOS D or E and about 13 percent were at LOS F. Even with the addition of the over 1,000 roadway lane miles recommended in the MTP, about 12 percent of planning area total lane miles are projected to be at LOS D and E and over 21 percent at LOS F in 2030. The overall percentage of roadways experiencing LOS D and E conditions remains virtually the same between 2007 and 2030, but the percentage of roadways experiencing LOS F increases by almost two-thirds. As population increase and congestion worsens, drivers will increasingly use arterials and local streets to avoid anticipated traffic delays on freeways and toll roads. In 2030, the planning area is expected to experience an increase in vehicle miles traveled (VMT), vehicle hours of travel (VHT), and vehicle hours of congestion delay.

Table 2-3 Planning Area Transportation Performance Measures

Performance Measures	2007	2030	% Change
Vehicle Miles of Travel Per Day	6,851,083	13,449,109	96.3%
Vehicle Hours of Travel Per Day	178,546	361,201	102.3%
Vehicle Hours of Congestion Delay Per Day	27,036	67,844	150.9%
Lane Miles in Planning Area	1,702	2,762	62.2%
Percent Lane Miles at LOS D, E	**2007**	**2030**	**% Change**
Freeway/Tollway	26.8%	12.5%	-53.5%
Principal Arterial	8.2%	18.8%	129.4%
Minor Arterial	11.1%	11.1%	0.1%
Collector	6.5%	7.7%	19.3%
Freeway/Tollway Ramps	8.1%	13.1%	61.6%
Frontage Roads	17.4%	6.3%	-63.8%
HOV	10.1%	10.4%	2.3%
Total Roadway Network	11.5%	11.9%	3.0%
Percent Lane Miles at LOS F	**2007**	**2030**	**% Change**
Freeway/Tollway	29.6%	20.5%	-30.8%
Principal Arterial	4.9%	27.0%	454.1%
Minor Arterial	12.4%	21.1%	70.4%
Collector	10.1%	16.7%	64.6%
Freeway/Tollway Ramps	11.0%	10.3%	-6.3%
Frontage Roads	16.9%	13.6%	-19.5%
HOV	5.6%	43.6%	678.1%
Total Roadway Network	12.9%	21.1%	63.7%

Source: NCTCOG, 2009

Dallas Area Rapid Transit (DART) currently operates most transit service provided within the planning area. DART operates numerous bus routes, as well as the DART Red Line Light Rail Transit (LRT) passenger rail service. Collin County Area Regional Transit (CCART) operates three bus routes within the McKinney Urbanized Area, supplemented by Americans with Disabilities Act (ADA) paratransit service to locations within three-fourths of a mile of the fixed routes. CCART also provides demand responsive public transportation services throughout Collin County. The current bus network for both agencies generally operates in mixed traffic, leading to unreliable service.

The need for additional transportation facilities has been documented in *Mobility 2030 - 2009 Amendment* based on regionally approved demographic projections. *Mobility 2030 - 2009 Amendment* recommends the implementation of LRT-compatible regional rail service along the existing DART owned rail line from the Parker Road Station to north McKinney. Travel forecasts were performed 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, improving the efficiencies of existing facilities, reducing single-occupant vehicle trips, increasing transit trips, and increasing 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 an 80 percent increase in population and a 72 percent increase in employment from 2000 to 2030. In contrast, the population and employment densities in the McKinney Corridor study area are expected to increase 93 percent and 168 percent, respectively. While the densities of some urban areas within the region will increase, the region continues to suburbanize. A driving factor in the continued suburbanization is the availability of more affordable housing options outside the four core counties, as well as the employment decentralization noted in Section 2.1.1.

Previous demographic growth trends analyses indicate increased automobile ownership, more single-occupant vehicle 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 through 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 and 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 DFW region issue. The US Environmental Protection Agency (EPA) has designated the DFW region as a nonattainment area for the eight-hour ozone standard. The Clean Air Act Amendments (CAAA) of 1990 require transportation plans for all nonattainment areas to be in air quality conformity with the State Implementation Plan (SIP) and demonstrate projects in the MTP meet air quality goals. Encouraging developments throughout the region to adapt to these characteristics 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; however, regional control totals for population and employment remained constant. In each of the following scenarios, population and employment growth occurring between 2010 and 2030 were redistributed throughout the region, 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 total for each individual county was also 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 2-4 reveals travel demand and air quality effects based on each scenario. Results indicate both the passenger rail and VNT scenarios reduce the greatest amounts of ozone emissions, VMT, and hours of congestion delay in the region.

Table 2-4 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
Nitrogen Oxides Emissions	-4.1%	-3.9%	-1.2%	-8.47%	-2.4%
Volatile Organic Compounds 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 do not possess the 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, land use planning initiatives 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 development
- Improve access management

These strategies 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 McKinney Corridor supports these policies.

2.1.4 System Linkage and Intermodal Connections

Passenger rail is an integral part of the DFW region MTP intended to provide a more 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 McKinney Corridor has an opportunity to link residents with several other transportation facilities throughout the region.

The DFW region currently has over 48 miles of LRT and 35 miles of commuter rail in operation. Several additional passenger rail transit projects are currently in construction or planning phases. These projects include new regional rail services and LRT expansions with a regional, line-haul focus. The McKinney Corridor has the potential to directly interface with:

- The DART Red Line is currently in operation from the Westmoreland Station in southwest Dallas to the Parker Road Station in Plano. The line travels over 28 miles, passing through Oak Cliff and downtown Dallas and paralleling US 75 through Dallas, Richardson, and Plano. The DART Red Line carries more than 30,000 passengers on an average weekday and operates at headways of 10 minutes or less during peak periods and 20 to 30 minutes during off-peak periods.
- The planned Cotton Belt Corridor would connect the eastern terminus of the Fort Worth Transportation Authority (The T) Southwest-to-Northeast (SW2NE) Commuter Rail Corridor to the DART Red Line. The corridor extends from Dallas/Fort Worth International Airport (DFWIA) to a new or existing station on the DART Red Line in Richardson or Plano. Originally planned to begin operations between 2025 and 2030, local and regional leaders are exploring possible project delivery methods to accelerate Cotton Belt Corridor implementation to match the planned opening of the SW2NE Commuter Rail Corridor in 2013.

2.2 PURPOSE

The primary McKinney Corridor purpose is to provide a passenger rail connection to improve mobility, accessibility, and system linkages to major employment, population, and activity centers. Passenger rail service implementation within the McKinney Corridor would provide an alternative to roadway traffic congestion in the planning area. A key McKinney Corridor component is the regional connectivity offered by connecting with the DART Red Line. The McKinney Corridor also offers opportunities to connect with the proposed Cotton Belt Corridor linking DFWIA, Carrollton, Addison, and Richardson/Plano.

Because of forecasted population and employment growth, regional travel demand 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, 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 McKinney 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 Dallas County to Collin 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 McKinney Corridor. The goals and objectives respond to the underlying transportation needs determined in this chapter. This study identified the following purposes for transportation improvements in the McKinney Corridor:

Goal: Enhance corridor mobility and accessibility

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

Goal: Encourage economic development

Objectives:
- Encourage employment opportunities
- Encourage economic development opportunities
- Ensure consistency with regional and local transportation and comprehensive plans
- Encourage strategies for land use development and 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

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3.0 DEVELOPMENT OF ALTERNATIVES

Chapter 3 discusses the alternatives developed for the McKinney 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 McKinney 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 acceptable for McKinney 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. Three vehicle technologies were initially considered for the McKinney Corridor: Light Rail Transit (LRT), Light Rail New Technology (LRNT), and Commuter Rail Transit (CRT). These technologies are defined in the following sections. 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 McKinney Corridor are: LRT and LRNT.

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, ten 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 one alignment 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 DART-owned 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.

3.2.2 Grade Separations

Within the McKinney Corridor, three of the 27 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. For this study, a preliminary grade separation analysis was conducted to determine if existing at-grade crossings are warranted for grade separation. The analysis deemed a roadway warranted for grade separation if one of the following criteria is satisfied:

- Traffic volumes greater than 40,000 daily vehicles
- Roadway is a six-lane facility
- Roadway is a four-lane divided facility

This 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. Table 3-2 provides a list of current or proposed roadways in the McKinney Corridor meeting one or more of these criteria based on year 2030 model results identified in *Mobility 2030 - 2009 Amendment*. More analysis 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
6-Lane Major Arterial *[Future]*		X	
US 380	X	X	
Existing FM 546 (Industrial Boulevard)		X	
FM 546 Realignment *[Future]*		X	
Stacy Road	X		X
Exchange Parkway		X	
McDermott Drive			X
Bethany Drive		X	
Legacy Drive	X		X
Spring Creek Parkway	X	X	
Parker Road	X	X	

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

3.2.3 Termini

A terminus located at a transit rail hub allows passengers to transfer between multiple passenger rail lines. Within the McKinney Corridor the potential transit rail hub is the Parker Road Station. At this station riders could connect to the DART Red Line LRT to reach downtown Dallas or other destinations along the line. The Cotton Belt Corridor could also connect with the DART Red Line at various locations including the existing DART Red Line Bush Turnpike Station or a new 12th Street Station near the DART Red Line/Cotton Belt intersection. Technical and regulatory obstacles make a northward extension of the Cotton Belt within the existing DART Red Line alignment unfeasible. However, if technical issues can be resolved, the Cotton Belt Corridor could pass through Downtown Plano Station and Parker Road Stations and terminate at the McKinney North 2 Station.

The northern terminus would be an end of the line station for this corridor. The McKinney North 2 Station or the US 380–McKinney Station could be designed to serve local residents and park-and-ride users. If the population north of the proposed terminus continues to expand, a northward extension of passenger rail service to Melissa or Anna could be considered.

3.2.4 Right-of-Way

The existing McKinney Corridor right-of-way extends from Parker Road in Plano to McKinney, a distance of approximately 17.7 route miles. DART owns the right-of-way from the Parker Road Station to a junction with a Burlington Northern Santa Fe (BNSF) freight rail line near Sherman, Texas. 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

Within the McKinney Corridor right-of-way, the Dallas, Garland, and Northeastern Railroad Company (DGNO) serves the freight rail customers. DART operates and dispatches the LRT service within the corridor. DART LRT vehicles are often parked on the tracks immediately north of the Parker Road Station when not in use. Figure 3-1 also shows the operating rights for the McKinney Corridor and connecting facilities.

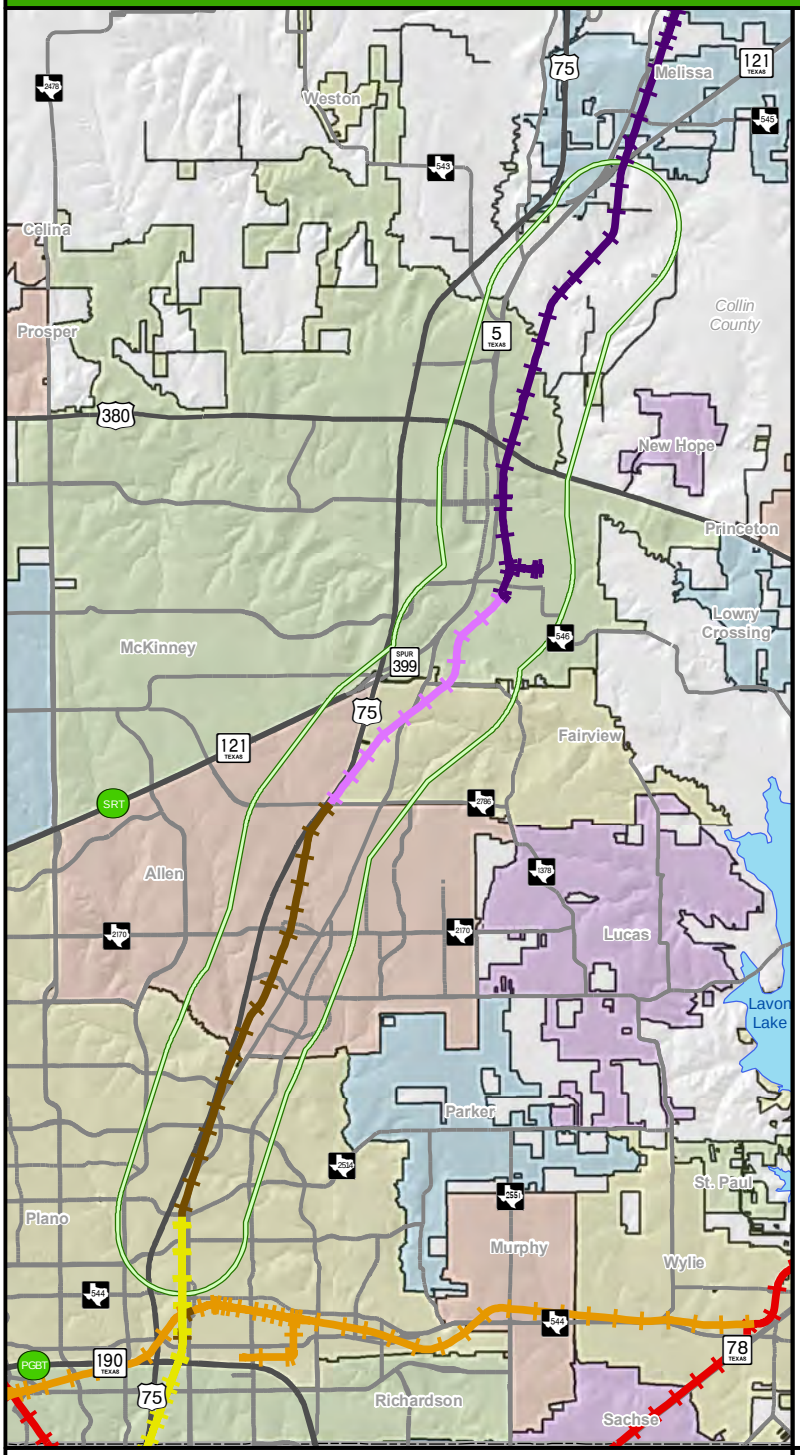
3.3 DESCRIPTION OF ALTERNATIVES

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 provides LRT service along the DART Red Line from Dallas to Parker Road Station in Plano and operates five bus routes in the study area within Plano. DART offers on-call service to supplement the fixed route service within the DART service area.

Figure 3-1 — Rail Line Ownership and Operation
PGBT to FM 545



Legend

Operation (Ownership)

- DART LRT Service (DART Right-of-Way)
- DART Inactive (DART Right-of-Way)
- DGNO Freight Service (DART Right-of-Way)
- DGNO Inactive (DART Right-of-Way)
- KCS Freight Service (DART Right-of-Way)
- KCS Freight Service (KCS Right-of-Way)

Other Items

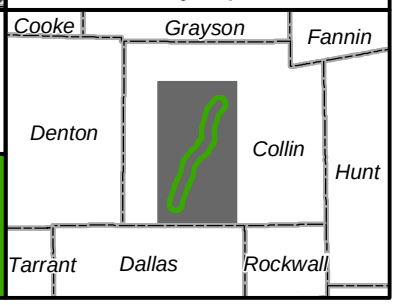
- Highway
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

0 1 2 3 6

Miles

N

Key Map



Map Date: July 2010 Source(s): NCTCOG

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Collin County Area Regional Transit (CCART) operates three bus routes within the McKinney Urbanized Area, supplemented by Americans with Disabilities Act (ADA) paratransit service to locations within three-fourths of a mile of the fixed routes. CCART also provides demand responsive public transportation services throughout Collin County.

The No-Build Alternative will include all planned improvements to the regional roadway system and transit services, except for the McKinney 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 Build Alternatives

The build alternatives are based upon the corridor alignment recommended in the NCTCOG *RRCS* completed in 2005. In addition, the alternatives are based on input from various technical staff representing the cities along the corridor, previous study efforts, and corridor stakeholders. All six build alternatives are proposed to operate within the existing DART owned right-of-way. The alternatives tested variations in vehicle technology and potential station locations. Alternatives 1, 2, and 6 include interlined service within the existing DART Red Line LRT service area. This interlined service would share the tracks with the existing DART Red Line service, effectively doubling the frequency of service at stations served by both lines. Alternatives 4 and 5 test the implementation of the McKinney Corridor as a continuation of the proposed Cotton Belt Corridor and the existing DART Red Line, respectively.

3.3.2.1 Alternative 1

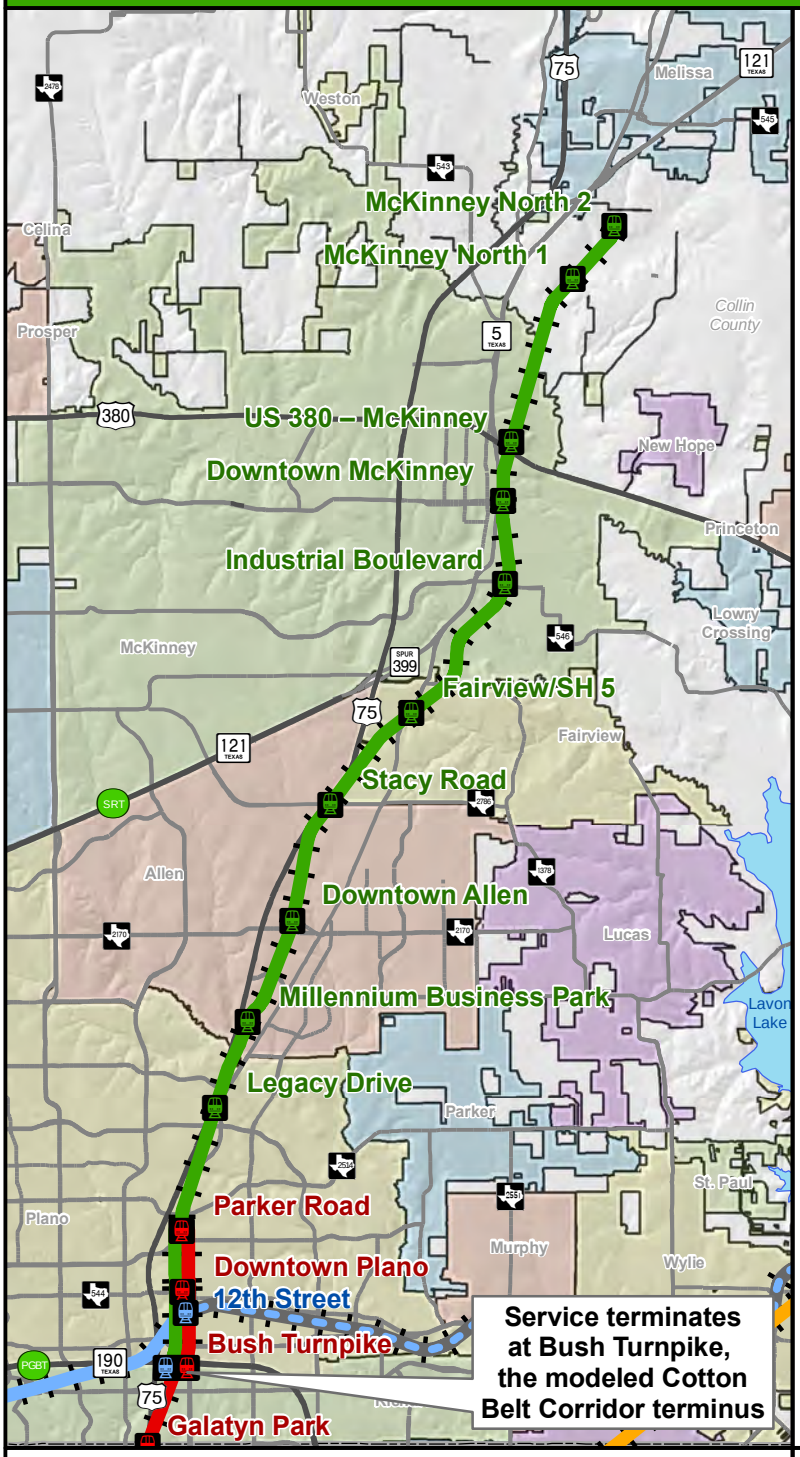
In Alternative 1, a new LRT service throughout the McKinney Corridor and interlining with the DART Red Line between Parker Road Station and Bush Turnpike Station is examined. This service would require riders with destinations south of Bush Turnpike Station to transfer to the DART Red Line at one of the three stations served by both routes, but would allow for direct transfers to the proposed Cotton Belt Corridor eastern terminus at the Bush Turnpike Station or a possible station near 12th Street in Plano. Every potential station location was included in this alternative. Figure 3-2 shows the alignment and stations modeled in Alternative 1.

As described in Section 3.1.1, LRT service cannot share tracks with the existing freight rail service in McKinney. In addition to the tracks required for LRT vehicles, dedicated freight rail tracks would need to be constructed within the existing right-of-way if freight rail service is to continue.

3.3.2.2 Alternative 2

The passenger rail service modeled in Alternative 2 operates under the same conditions as Alternative 1. The only difference between the alternatives is a reduction in the number of stations built. Millennium Business Park Station, Industrial Boulevard Station, and McKinney North 1 Station were not included in the regional travel demand model for this alternative. Figure 3-3 shows the alignment and stations modeled in Alternative 2. As with Alternative 1, dedicated freight rail tracks would need to be constructed within the existing right-of-way in McKinney if freight rail service is to continue.

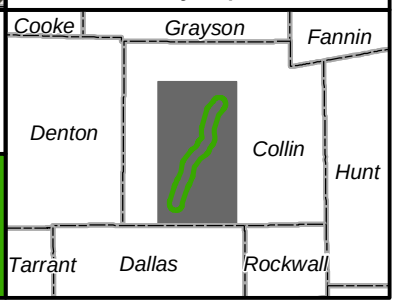
Figure 3-2 — Alternative 1
PGBT to FM 545



Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor LRT Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

Key Map



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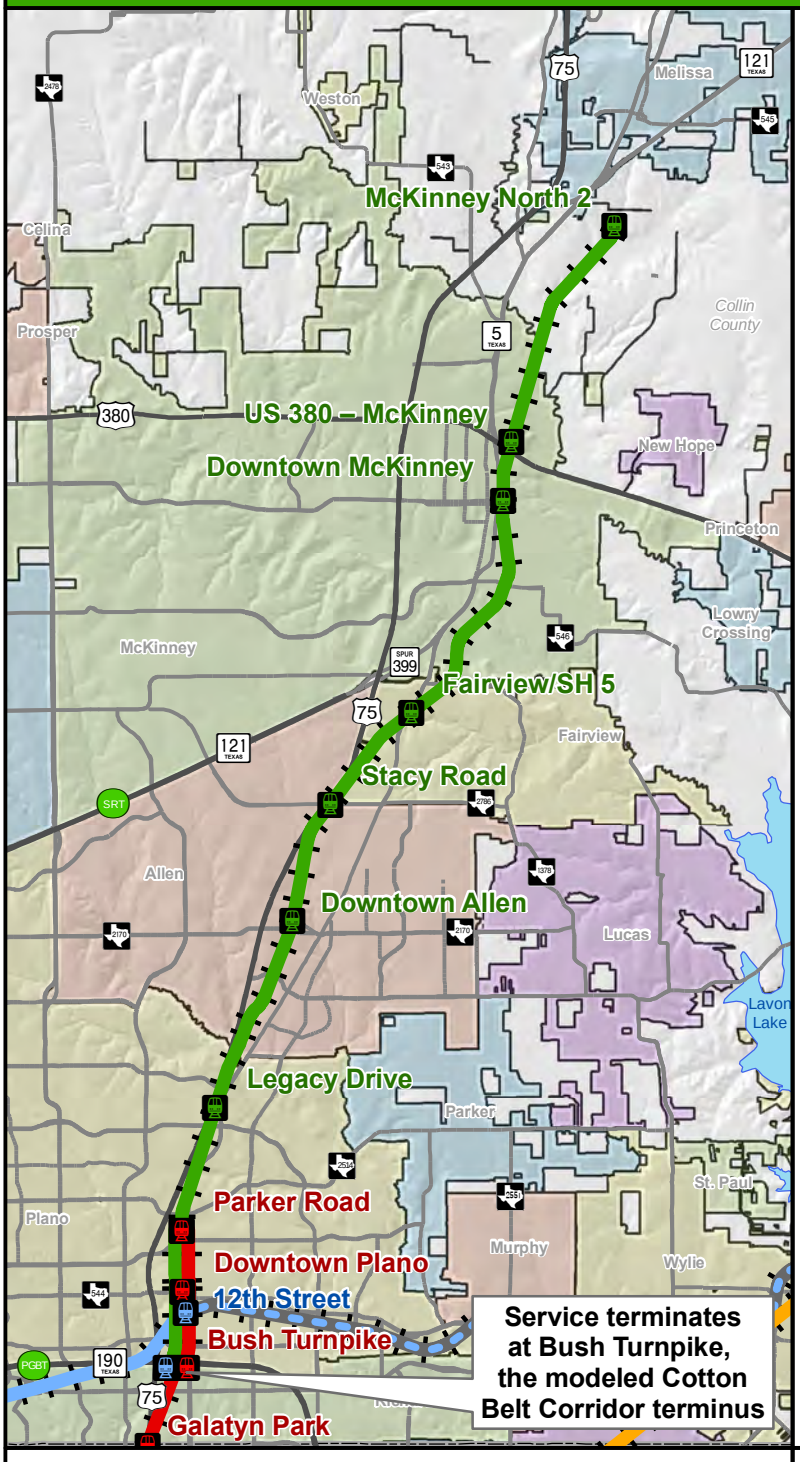
Map Date: July 2010 Source(s): NCTCOG

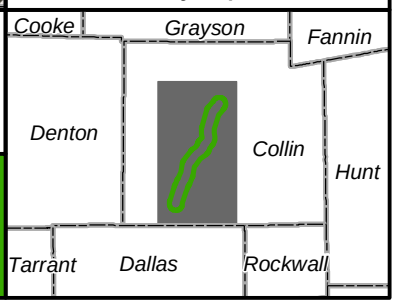
Figure 3-3 — Alternative 2
PGBT to FM 545



Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor LRT Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

Key Map



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McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

3.3.2.3 Alternative 3

The LRNT service modeled in Alternative 3 offers the most limited service of the six alternatives. The service begins at the Parker Road Station and continues north to McKinney North 2 Station, serving the same stations as Alternative 2. McKinney Corridor users in this alternative are required to transfer to, or from, the DART Red Line at Parker Road Station if their origin or destination are not both within the McKinney Corridor service area. Passengers traveling to destinations along the proposed Cotton Belt Corridor would be required to transfer two times, once at Parker Road Station and again at the eastern terminus station (Bush Turnpike Station in Richardson or a possible new station near 12th Street in Plano). Figure 3-4 shows the alignment and stations modeled in Alternative 3.

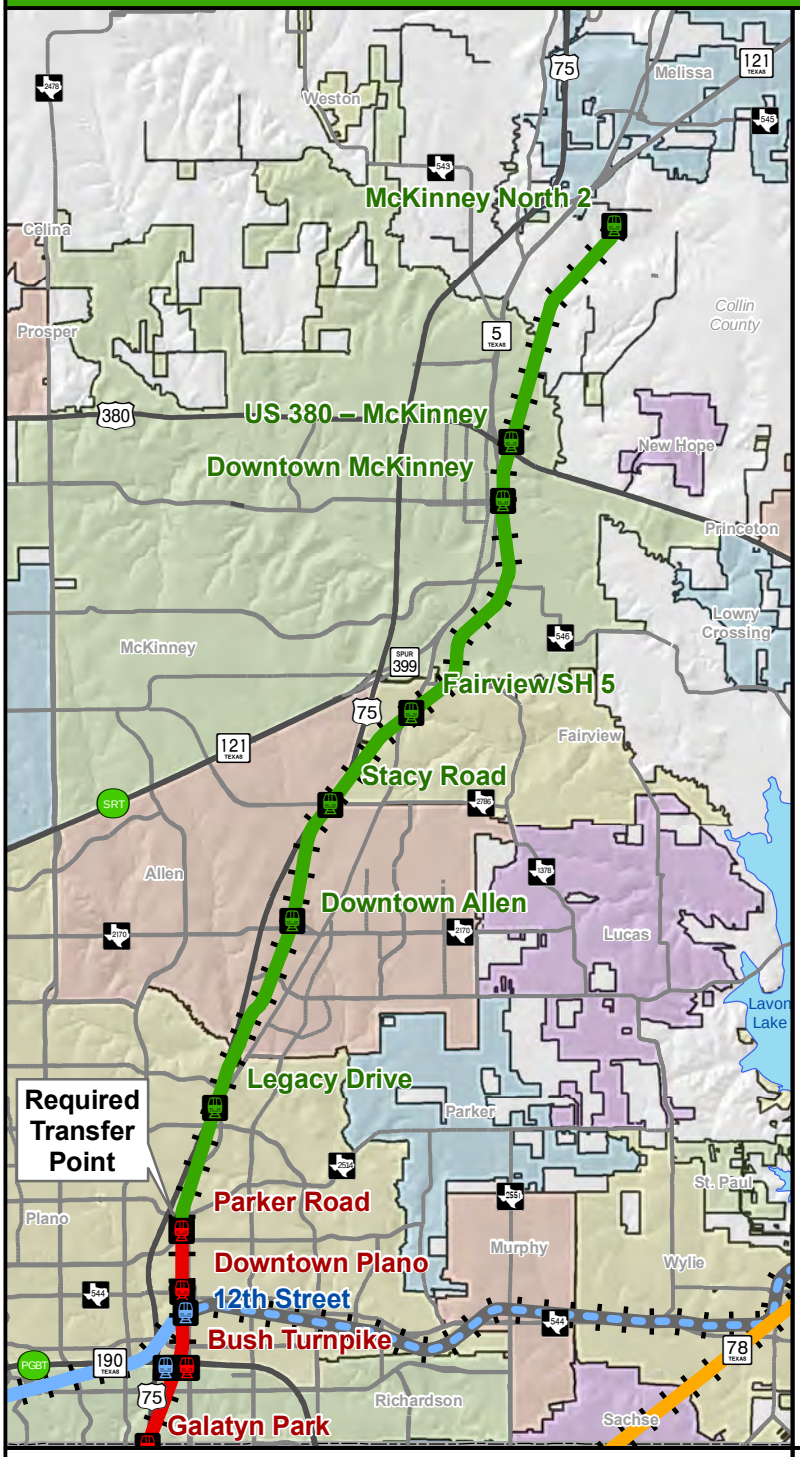
The existing freight rail service in McKinney would be compatible with LRNT service if FRA compliant vehicles are used. The tracks required for these vehicles could continue to serve freight rail vehicles. The low level of daily freight rail traffic within the corridor could be integrated with passenger rail service through appropriate dispatching.

3.3.2.4 Alternative 4

The LRNT service modeled in Alternative 4 offers service to the same stations as Alternative 3. In addition, the service in the McKinney Corridor and the proposed Cotton Belt Corridor are combined in this alternative to allow users to continue southwest toward Addison, Carrollton, or Dallas/Fort Worth International Airport (DFWIA) without transferring. For passengers within the McKinney Corridor with destinations toward downtown Dallas, transfers to the DART Red Line could be accommodated at the Parker Road or Downtown Plano Stations. Figure 3-5 shows the alignment and stations modeled in Alternative 4.

As in Alternative 3, the existing freight rail service in McKinney is compatible with LRNT service if FRA compliant vehicles are used. Interlining the Cotton Belt and McKinney Corridors creates additional logistical and engineering issues to be addressed. The ability to operate LRNT vehicles along the same tracks as LRT vehicles could be limited if FRA compliant vehicles are used. Vehicle technology and FRA policy changes would be needed before this alternative could be implemented. If the vehicles can safely be operated on the same tracks, the stations would need to be modified to meet ADA accessibility requirements for both vehicle types. The dispatching requirements for this alternative are more complicated than for any other modeled alternative. If separate tracks are needed to accommodate LRNT vehicles through the existing LRT service area, additional right-of-way or lengthy elevated sections would be needed.

Figure 3-4 — Alternative 3
PGBT to FM 545



Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor LRNT Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

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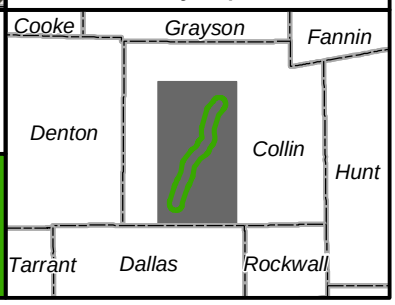
Miles

N

Key Map



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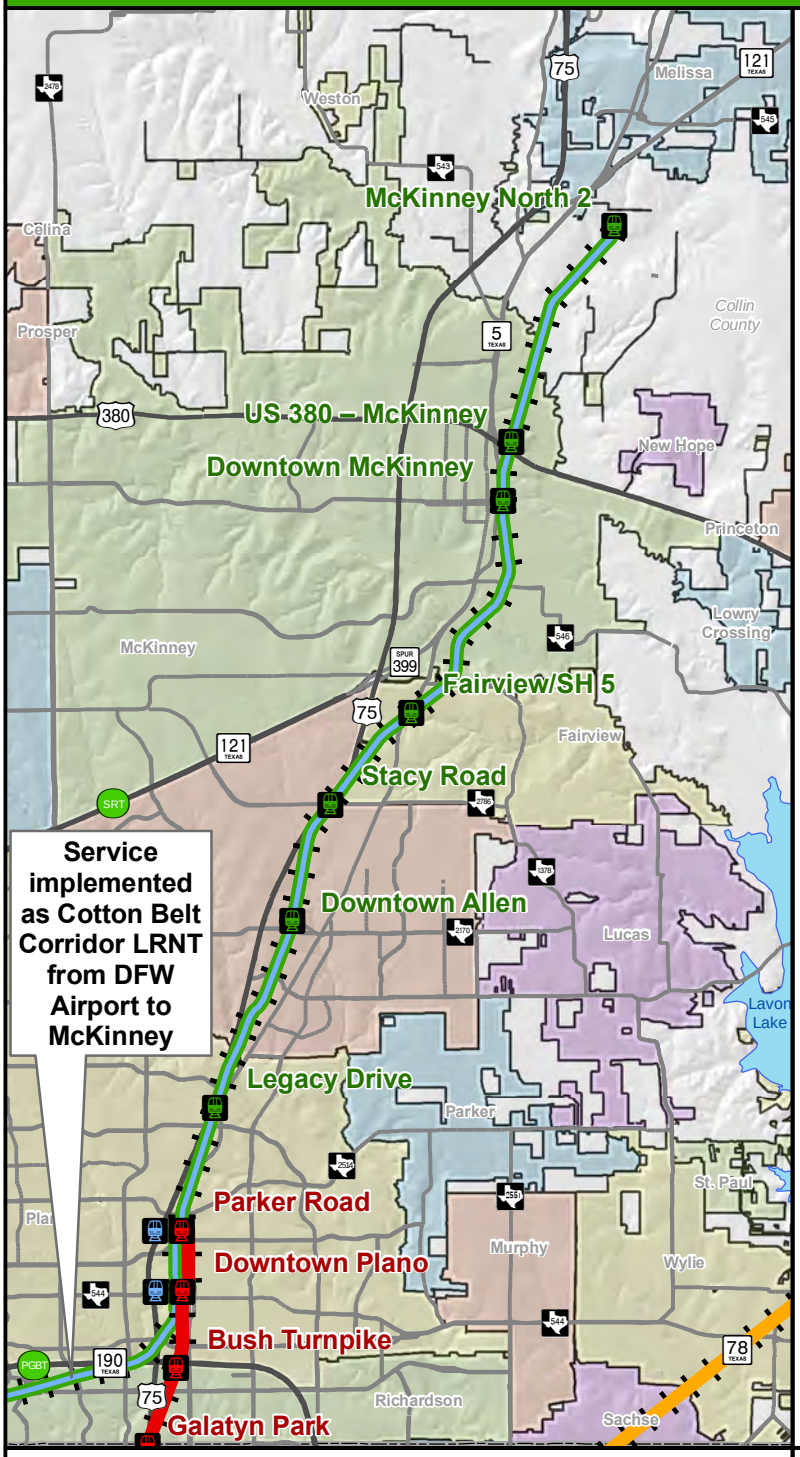
Map Date: July 2010 Source(s): NCTCOG

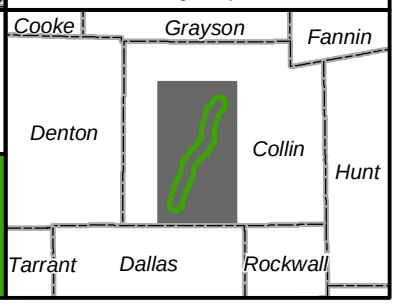
Figure 3-5 — Alternative 4
PGBT to FM 545



Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Possible Transfer Station
- Proposed McKinney/ Cotton Belt Corridor LRNT Alignment
- Existing DART Red Line
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

Key Map



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Map Date: July 2010 Source(s): NCTCOG

3.3.2.5 Alternative 5

In Alternative 5, a combination of DART Red Line LRT service with the McKinney Corridor is modeled. This service allows for one-seat rides (i.e., no transfers) from stations in the McKinney Corridor to all destinations along the DART Red Line. Direct transfers to the proposed Cotton Belt Corridor would occur at the eastern terminus at Bush Turnpike Station or a possible station near 12th Street in Plano. With LRT service the minimum distance between stations is shorter; therefore each potential station location was included in this alternative. Figure 3-6 shows the alignment and stations modeled in Alternative 5. As with the other LRT alternatives, dedicated freight rail tracks would need to be constructed within the existing right-of-way in McKinney if freight rail service is to continue.

3.3.2.6 Alternative 6

In Alternative 6, a new LRT service throughout the McKinney Corridor interlined with the DART Red Line between Parker Road Station and Mockingbird Station is modeled. This service allows for one-seat rides from stations in the McKinney Corridor to destinations along the DART Red Line from Mockingbird Station north. Users with destinations farther south or along the DART Blue Line could transfer to another transit service at this station. Direct transfers to the proposed Cotton Belt Corridor would occur at the eastern terminus at Bush Turnpike Station or a possible station near 12th Street in Plano. Eleven potential stations location were included in this alternative. Figure 3-7 shows the alignment and stations modeled in Alternative 6. As with the other LRT alternatives, dedicated freight rail tracks would need to be constructed within the existing right-of-way in McKinney if freight rail service is to continue.

3.3.2.7 Summary of Build Alternatives

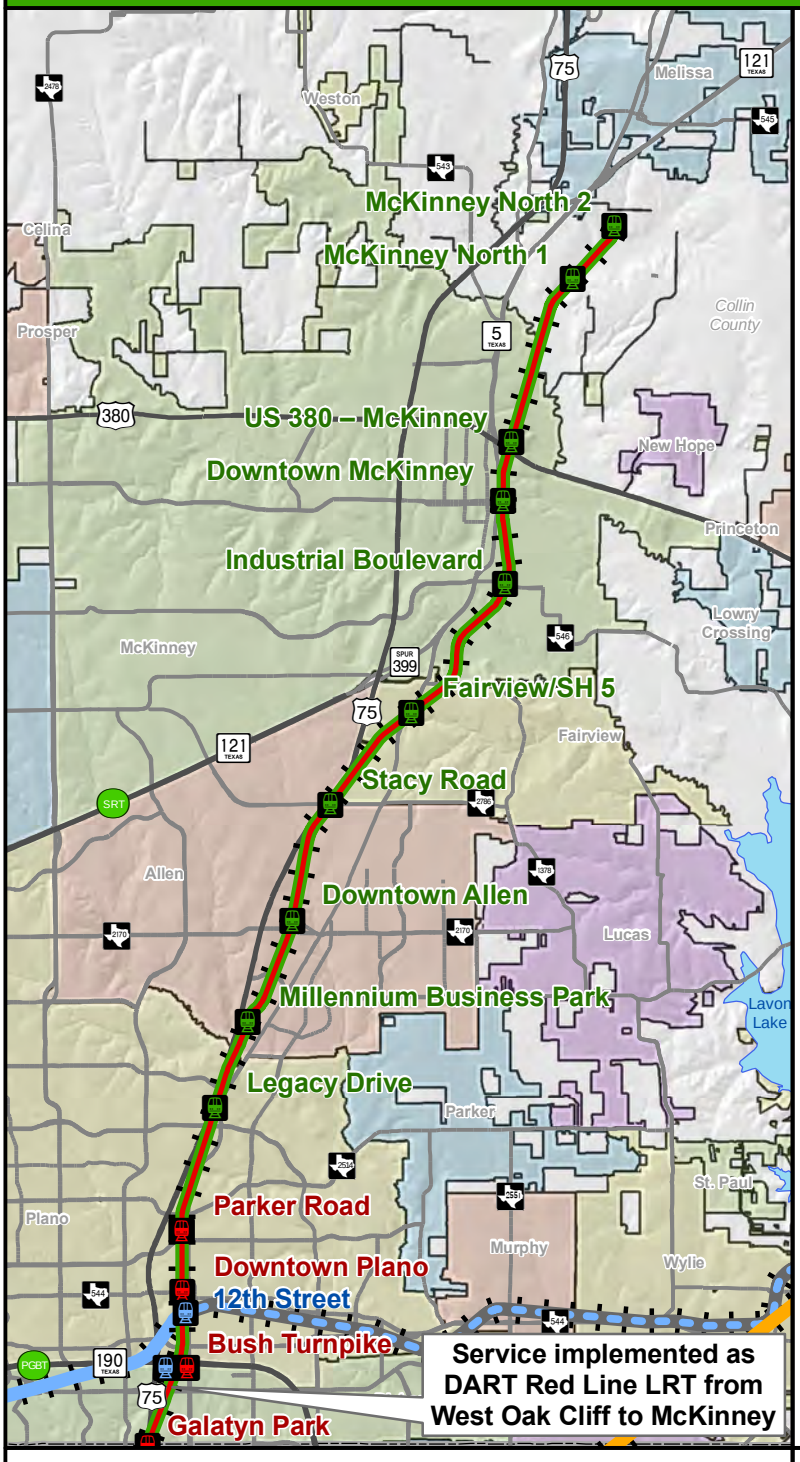
Table 3-3 provides a matrix showing the technology and service alternatives considered. All six alternatives include McKinney North 2 Station as the northern terminus.

Table 3-3 Build Alternatives Summary

Alternative	Primary Mode	Interlined Service	Combined Service	Southern Terminus	McKinney Corridor Stations
1	LRT	DART Red Line	None	Bush Turnpike	11
2	LRT	DART Red Line	None	Bush Turnpike	8
3	LRNT	None	None	Parker Road	8
4	LRNT	None	Cotton Belt	DFW Airport	8
5	LRT	None	DART Red Line	West Oak Cliff	11
6	LRT	DART Red Line	None	Mockingbird	11

Source: NCTCOG, September 2009

Figure 3-6 — Alternative 5
PGBT to FM 545



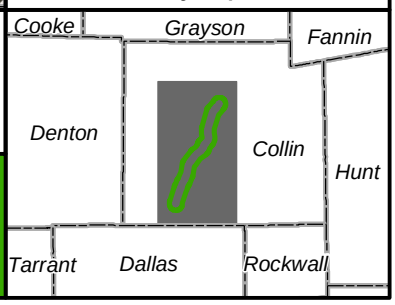
Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor/Red Line LRT Alignment
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

0 1 2 3 6
Miles

N

Key Map

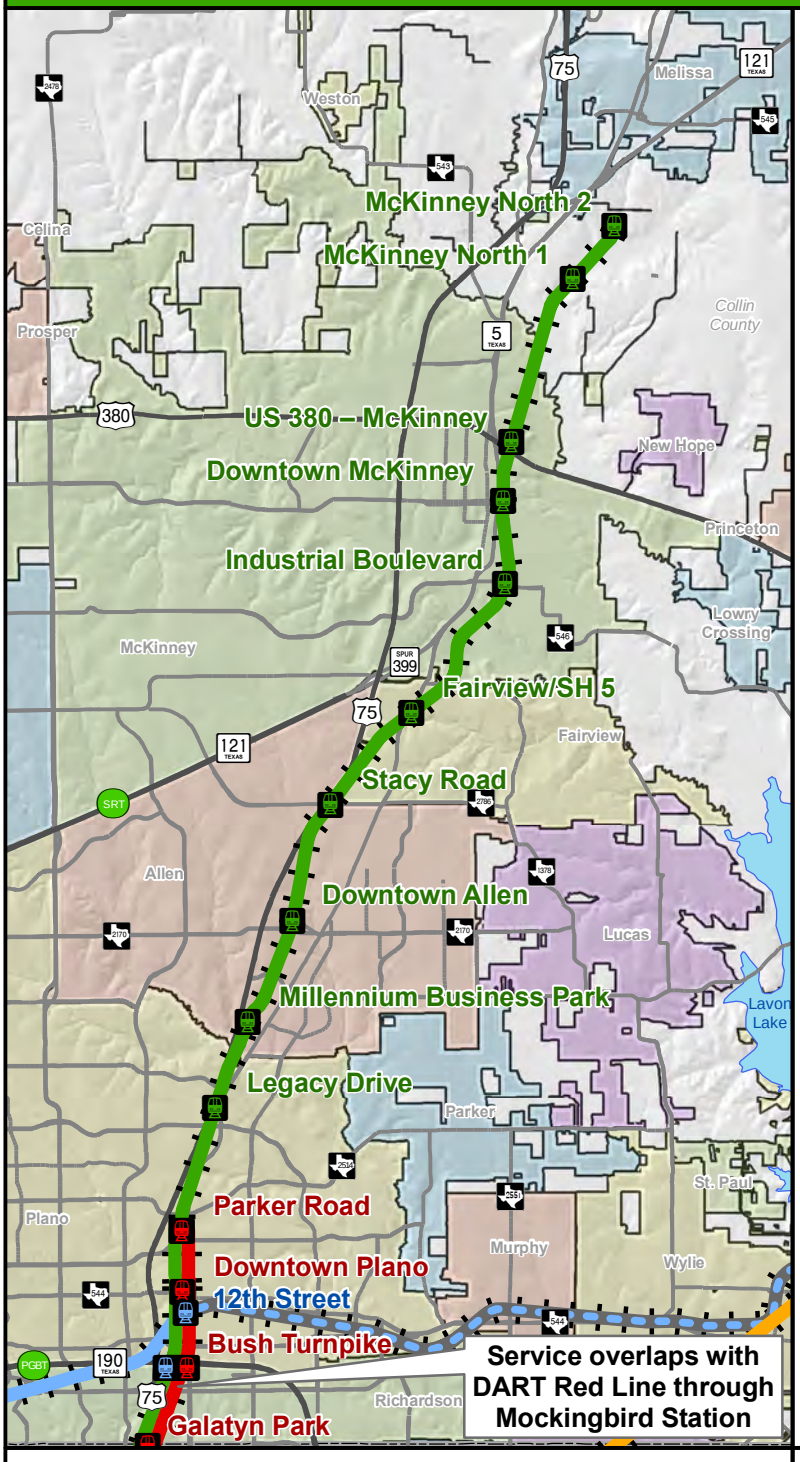


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

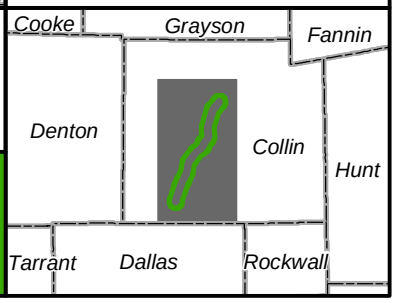
Figure 3-7 — Alternative 6
PGBT to FM 545



Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor LRT Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

Key Map



Map Date: July 2010 Source(s): NCTCOG

North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

3.4 STATIONS

The proposed passenger rail service would provide up to 10 new stations depending on the vehicle technology and build alternative selected for this corridor. Station platforms would be approximately 300 to 500 feet in length and can be described as one of the following:

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

Some McKinney Corridor alignment alternatives include service to stations outside the McKinney Corridor study area. While the increased service or connectivity could have a marginal impact on land use and development trends near these stations, any changes induced solely by the McKinney Corridor are considered unlikely. The primary driver of any changes in transportation infrastructure or land use would be the existing DART Red Line or the proposed Cotton Belt Corridor. The specific locations of any proposed stations along these passenger rail services are not addressed in this study.

3.4.1 Parker Road Station

Located within one-half mile of US 75, access to this existing DART Red Line station is provided by the local street network. Major arterials near the station include, Parker Road, Park Boulevard, and K Avenue. Bicycle and pedestrian access through the Regional Veloweb is planned on the Lavon Link Trail. Plano has plans for designated on-street bicycle lanes along Central Parkway and Archerwood Street, and several off-street facilities along Spring Creek Parkway about one-half mile south of the station. The local street network currently provides direct pedestrian and bicycle access to the facility. DART local transit feeder bus service is in place for this station. This location could serve as a connection between the DART Red Line, the proposed Cotton Belt Corridor, and the McKinney Corridor for rail transit users, depending on the alternatives selected. Figure 3-8 shows the transportation facilities near this station.

3.4.2 Legacy Drive Station

The proposed Legacy Drive Station would be located along the McKinney Corridor approximately half-way between Spring Creek Parkway and Legacy Drive. Both Raytheon Company and Texas Instruments have offices within one-half mile of the proposed station. Roadway access to this station would be accommodated on US 75, K Avenue, and Legacy Drive. Bicycle and pedestrian access would be accommodated on the planned Plano Central Link Trail, as well as local streets and sidewalks. Future land uses for Plano indicate mixed commercial development near the future station. Additional local feeder bus service to supplement existing DART bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-8 shows the transportation facilities near this station.

3.4.3 Millennium Business Park Station

The Millennium Business Park Station would provide transit access to several major employers, including Experian and Jack Henry & Associates. The Allen future land use maps indicate additional office and industrial development in this area. Roadway access to this station would be accommodated on US 75, Greenville Avenue, and Ridgemont Drive. Bicycle and pedestrian access would be accommodated on the planned Cotton Belt Lavon Trail, as well as local streets and sidewalks. Local feeder bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-8 shows the transportation facilities near this station.

3.4.4 Downtown Allen Station

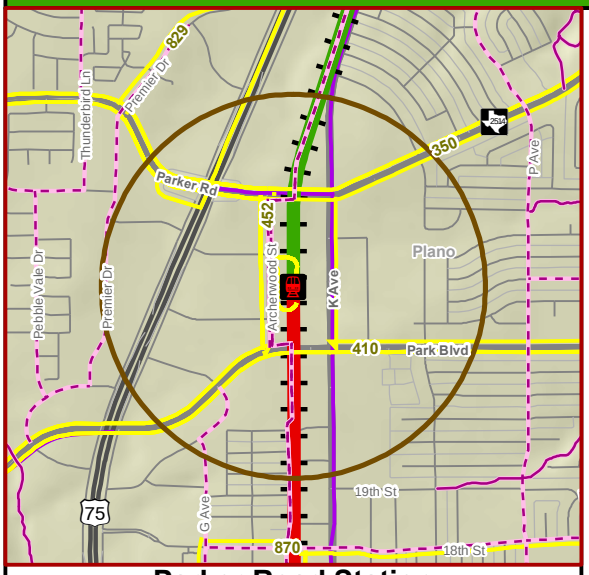
The proposed Downtown Allen Station would be located north of Main Street in downtown Allen. The historic Allen Train Depot is located just south of Main Street in downtown Allen. The largest employer near this station is the City of Allen. The primary roadway access to this station would be accommodated on McDermott Boulevard and Main Street, while US 75 and Greenville Avenue are located within one-half mile of the proposed station location. Bicycle and pedestrian access would be accommodated on the planned Cotton Belt Lavon Trail, as well as local streets and sidewalks. The Allen Station Park bicycle and pedestrian trail system connects to St. Mary Drive and Cedar Drive less than one-half mile north of the proposed station. A local feeder bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-8 shows the transportation facilities near this station.

3.4.5 Stacy Road Station

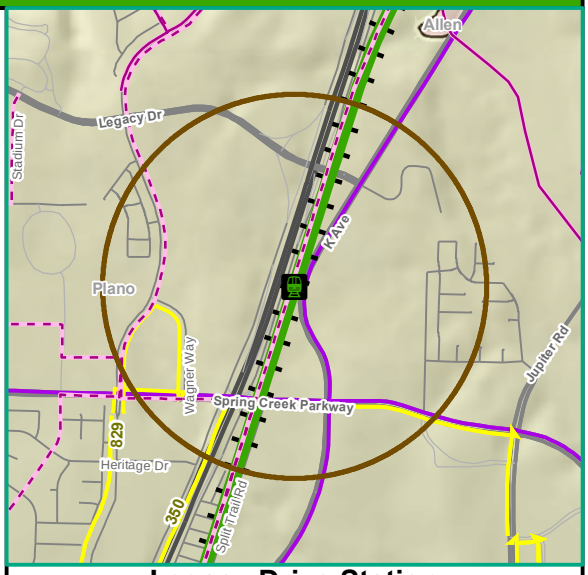
The proposed Stacy Road Station would be located within The Village at Allen or The Village at Fairview developments. This station would be located near the intersection of US 75 and Stacy Road. These developments have a mixture of residential and commercial properties. The Allen Event Center and the Allen Premium Outlets are also located within one-half mile of the proposed station. Bicycle and pedestrian access would be accommodated on the existing and planned Stacy Road bicycle lanes, the planned Cotton Belt Lavon Trail, and other local streets and sidewalks. A local feeder bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-9 shows the transportation facilities near this station.

Figure 3-8 — Stations - Parker Road to Downtown Allen

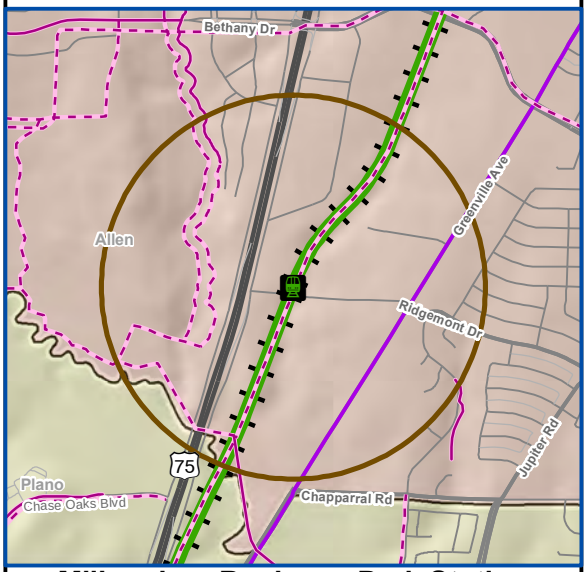
City of Plano to City of Allen (Downtown)



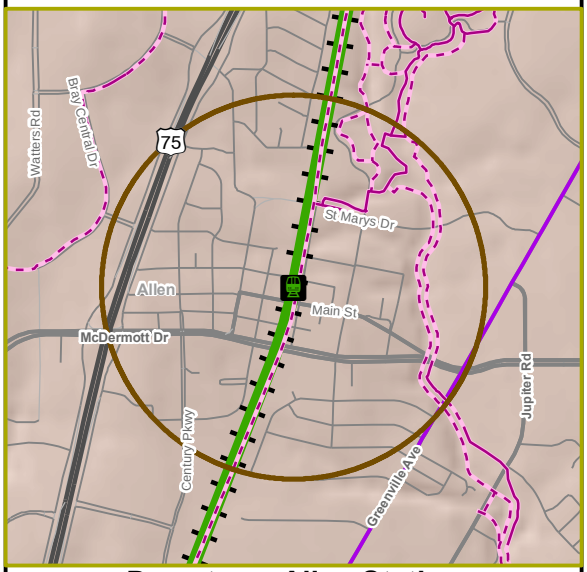
Parker Road Station



Legacy Drive Station



Millennium Business Park Station

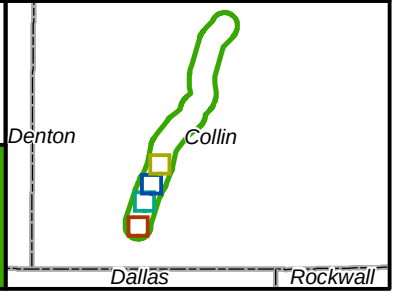


Downtown Allen Station

Legend

- Potential Station
- DART LRT Station
- McKinney Corridor
- DART Red Line
- DART Bus Route
- CCART Bus Route
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Other Major Arterial
- Minor Arterial
- Other Roadway
- Existing Bicycle/Pedestrian Route
- Planned Bicycle/Pedestrian Route
- Station Analysis Area
- City / Town Limits
- County Limits

Key Map



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Map Date: July 2010 Source(s): NCTCOG

3.4.6 Fairview/SH 5 Station

The Fairview/SH 5 Station would be located near the intersection of SH 5 with the McKinney Corridor. The planned Fairview Center mixed-use development includes land reserved for a future rail station. The primary roadway access to this station would be accommodated on SH 5. Bicycle and pedestrian access would be accommodated on the planned Bluebonnet East and Sloan Creek Trails, as well as local streets and sidewalks. A local feeder bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-9 shows the transportation facilities near this station.

3.4.7 Industrial Boulevard Station

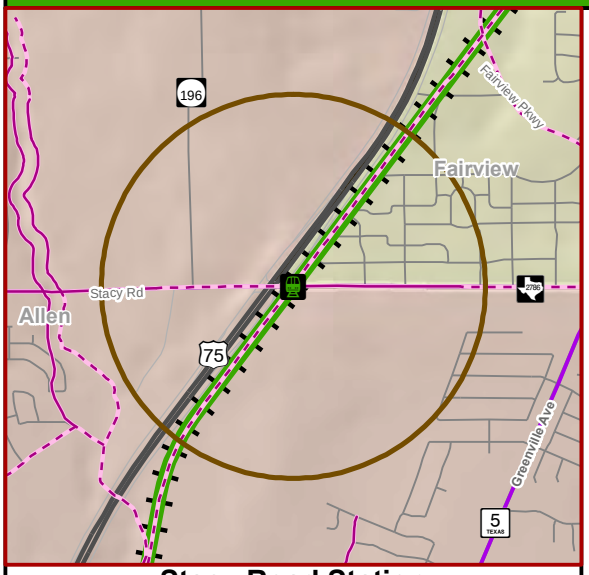
The Industrial Boulevard Station would be located near the McKinney Corridor intersection with Industrial Boulevard. The current land use in the area is mostly industrial, with Encore Wire Corporation located within one-fourth mile of the proposed station and Timber Blind Manufacturing located within one-half mile of the proposed station. The historic Pecan Grove Cemetery is located at the southeast corner of Industrial Boulevard and SH 5. Collin County Regional Airport is located approximately one-mile east of the proposed station. The McKinney future land use plan calls for development of a transit village near this proposed station. The primary roadway access to this station would be accommodated by Industrial Boulevard, Eldorado Parkway, and SH 5. Bicycle and pedestrian access would be accommodated on the planned Bluebonnet East Regional Veloweb Trail, as well as local streets and sidewalks. Additional local feeder bus service would be considered to supplement existing CCART bus service in the area. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-9 shows the transportation facilities near this station.

3.4.8 Downtown McKinney Station

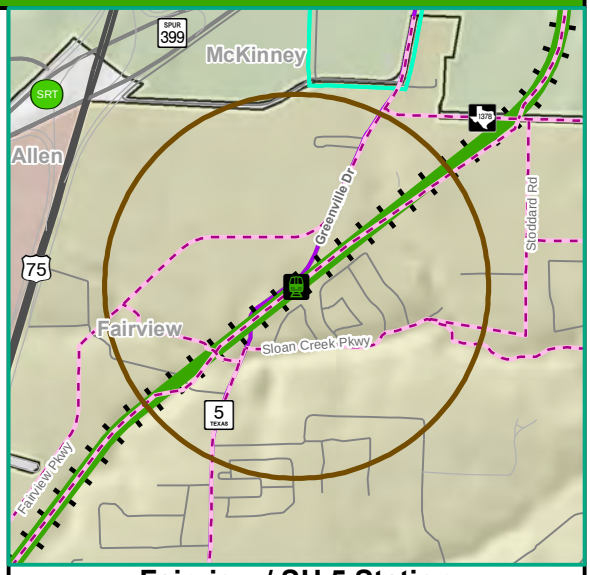
The proposed Downtown McKinney Station would be located near downtown McKinney immediately north of Virginia Street or immediately south of Louisiana Street. Current land use near the station is a mixture of residential, office, retail, and industrial. The *McKinney Town Center Study* envisions this station as part of an urban transit village, not as a park-and-ride location. The City of McKinney is a major employer near this potential station. Major arterials near the station include SH 5 (McDonald Street), Louisiana Street, Virginia Street, and Tennessee Street. Bicycle and pedestrian access would be served by the local street and sidewalk networks and by the planned Bluebonnet East Regional Veloweb Trail. Additional local feeder bus service to supplement existing CCART bus service would be considered for this proposed station. The Downtown McKinney Station is proposed to be an urban station with limited or no vehicle parking. Figure 3-9 shows the transportation facilities near this station.

Figure 3-9 — Stations - Stacy Road to Downtown McKinney

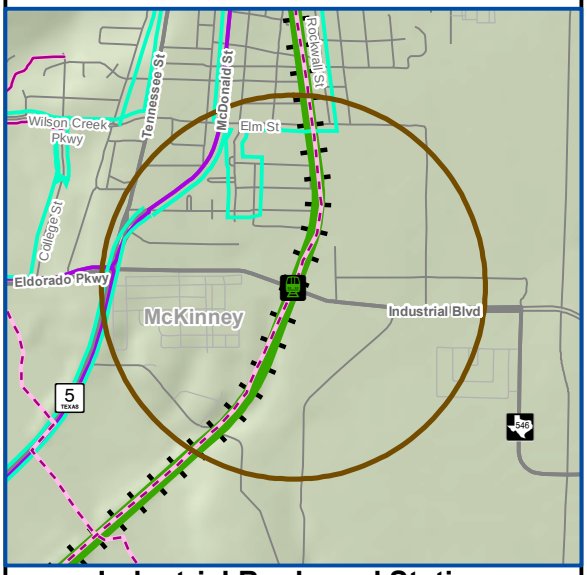
City of Allen (Stacy Road) to City of McKinney (Downtown)



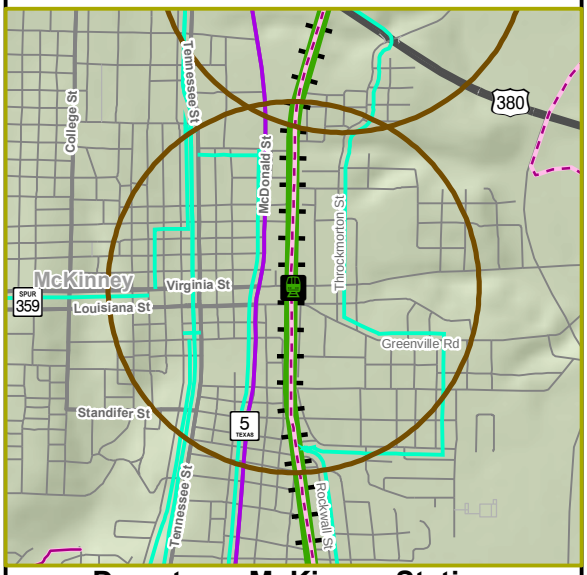
Stacy Road Station



Fairview / SH 5 Station



Industrial Boulevard Station



Downtown McKinney Station

Legend

- Potential Station
- DART LRT Station
- McKinney Corridor
- DART Red Line
- DART Bus Route
- CCART Bus Route
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Other Major Arterial
- Minor Arterial
- Other Roadway
- Existing Bicycle/Pedestrian Route
- Planned Bicycle/Pedestrian Route
- Station Analysis Area
- City / Town Limits
- County Limits

Key Map

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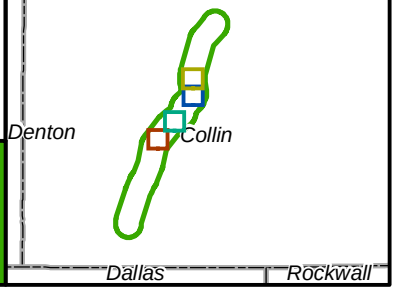

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Map Date: July 2010 Source(s): NCTCOG

3.4.9 US 380–McKinney Station

The US 380-McKinney Station would be located north of US 380 near the intersection with the McKinney Corridor. Roadway access to this station would be accommodated by US 380 and SH 5, making this station ideal for park-and-ride commuters throughout north-central Collin County. Bicycle and pedestrian access would be accommodated on local streets and sidewalks. The Bluebonnet East Regional Veloweb Trail is also planned to terminate in the area south of this station. Additional local feeder bus service to supplement existing CCART bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-10 shows the transportation facilities near this station.

3.4.10 McKinney North 1 Station

The proposed McKinney North 1 Station would be located at a transit village included on McKinney future land use map. Presently located in a relatively rural location, access to this station is currently limited to County Road 388 and private roads. Based on McKinney's future transportation plan, a planned six lane major arterial roadway would provide station access. There is a planned bicycle and pedestrian trail system along Clemons Creek and within the existing rail right-of-way in proximity to the proposed station. Local feeder bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-10 shows the transportation facilities near this station.

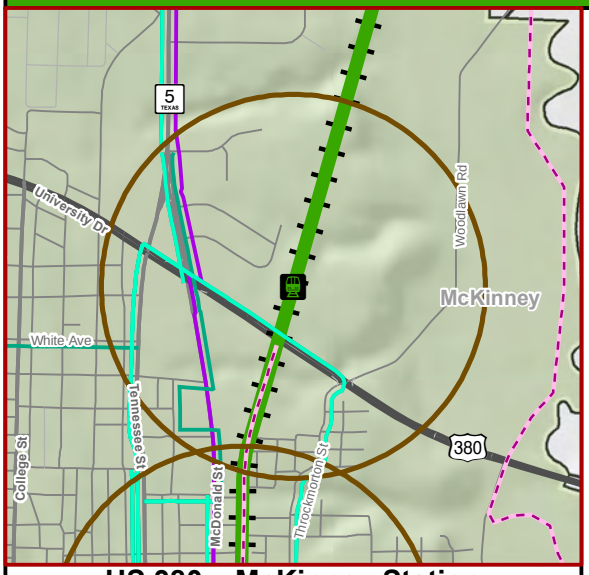
3.4.11 McKinney North 2 Station

The proposed McKinney North 2 Station would be located at a transit village included on the City of McKinney future land use map. As with the proposed McKinney North 1 Station, this station is currently located in a mostly undeveloped area. Access to this station is currently limited to Berry Road and private roads. Based on the future transportation plan, McKinney will expand the arterial roadway network to provide access to the station. There are planned bicycle and pedestrian trails within the existing rail right-of-way and along Fitzhugh Branch in Melissa that would provide access to the proposed station. A local feeder bus service would be considered for this proposed station. A parking analysis would need to be conducted in subsequent project development phases to identify appropriate parking requirements. Figure 3-10 shows the transportation facilities near this station.

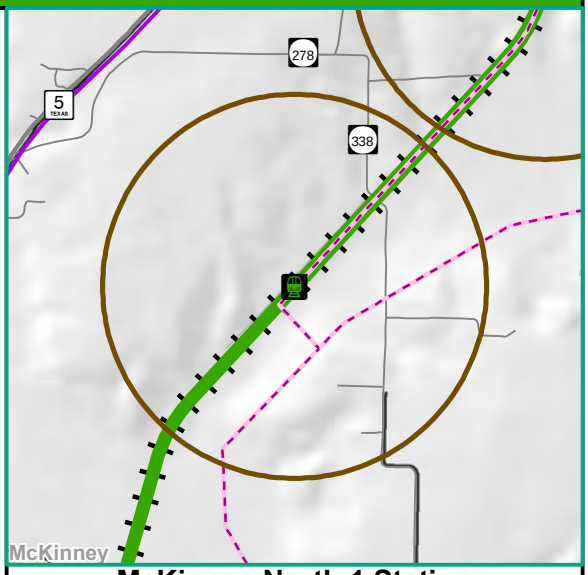
3.4.12 Station Summary

Table 3-4 shows the approximate spacing between each potential station. Table 3-5 provides a matrix showing the potential stations for each alternative. The stations are listed from south to north. All six build alternatives provide service starting at Parker Road Station and terminating at McKinney North 2 Station. The eventual McKinney Corridor could include any combination of potential stations and should not be limited to only the station combinations examined in this study. 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.

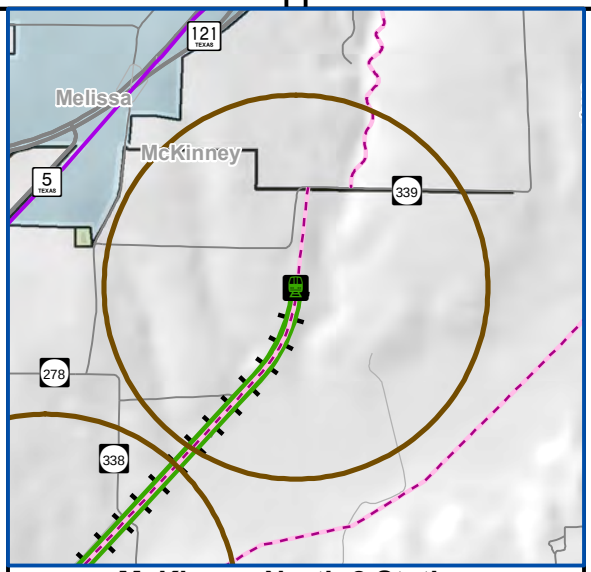
Figure 3-10 — Stations - US 380—McKinney to McKinney North 2
City of McKinney (US 380 to County Road 339)



US 380 – McKinney Station



McKinney North 1 Station

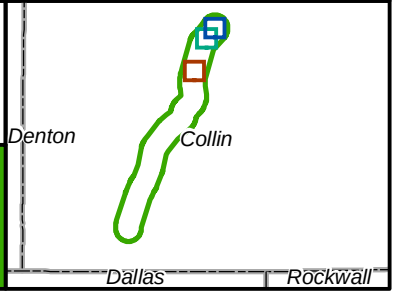


McKinney North 2 Station

Legend

- Potential Station
- DART LRT Station
- McKinney Corridor
- DART Red Line
- DART Bus Route
- CCART Bus Route
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Other Major Arterial
- Minor Arterial
- Other Roadway
- Existing Bicycle/Pedestrian Route
- Planned Bicycle/Pedestrian Route
- Station Analysis Area
- City / Town Limits
- County Limits

Key Map



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Map Date: July 2010 Source(s): NCTCOG

Table 3-4 Station Spacing

To Station / From Station	Parker Road	Legacy Drive	Millennium Business Park	Downtown Allen	Stacy Road	Fairview/SH 5	Industrial Boulevard	Downtown McKinney	US 380–McKinney	McKinney North 1	McKinney North 2
From Station	**Distance (miles)**										
Parker Road (Existing)	--	2.0	3.4	5.2	7.1	9.0	11.6	13.0	13.9	16.7	17.7
Legacy Drive		--	1.4	3.2	5.1	7.0	9.6	11.0	11.9	14.7	15.7
Millennium Business Park			--	1.7	3.7	5.6	8.2	9.5	10.5	13.2	14.3
Downtown Allen				--	2.0	3.9	6.5	7.8	8.7	11.5	12.6
Stacy Road					--	1.9	4.5	5.8	6.8	9.5	10.6
Fairview/SH 5						--	2.6	3.9	4.9	7.6	8.7
Industrial Boulevard							--	1.3	2.3	5.0	6.1
Downtown McKinney								--	0.9	3.7	4.8
US 380–McKinney									--	2.8	3.8
McKinney North 1										--	1.1
McKinney North 2											--

Source: NCTCOG, 2010

Table 3-5 Build Alternatives Station List

Station / Alternative	1	2	3	4	5	6
DART Red Line Stations south of Mockingbird					X	
DART Red Line Stations from Mockingbird to Eastern Cotton Belt Terminus					X	X
Cotton Belt Stations from DFW Airport to UTD/Synergy Park				X		
Eastern Cotton Belt Terminus and Downtown Plano	X	X		X	X	X
Parker Road	X	X	X	X	X	X
Legacy Drive	X	X	X	X	X	X
Millennium Business Park	X				X	X
Downtown Allen	X	X	X	X	X	X
Stacy Road	X	X	X	X	X	X
Fairview/SH 5	X	X	X	X	X	X
Industrial Boulevard	X				X	X
Downtown McKinney	X	X	X	X	X	X
US 380–McKinney	X	X	X	X	X	X
McKinney North 1	X				X	X
McKinney North 2	X	X	X	X	X	X

Source: NCTCOG, September 2009

3.5 PROJECTED RIDERSHIP

Using standard transit ridership forecasting techniques, estimated riders in the McKinney 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 3-6. 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. "DART Transfer Trips" reflect the total number of transfers from McKinney Corridor service to modeled DART bus or LRT service. "Parker Road (Red Line)" activity is included to show how transfer options could impact existing DART LRT service. The "McKinney Station Total" is the activity in stations within the McKinney Corridor. In each alternative except Alternative 3, some passengers board or alight at stations outside the McKinney Corridor. The "McKinney 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 3-6 Estimated 2030 Daily Passenger Volumes

Project Measure	Alternative						
	No Build	1	2	3	4	5	6
Primary Mode	N/A	LRT	LRT	LRNT	LRNT	LRT	LRT
Length (miles)[1]	N/A	19.9	19.9	17.7	44.6	49.0	32.3
Travel Time (minutes)	N/A	29.7	28.1	23.9	61.8	78.7	49.7
Headway[2] (peak/off-peak)	N/A	10/20	10/20	20/60	20/60	10/20	10/20
Regional Transit Trips	293,041	297,710	297,776	295,313	298,478	298,657	300,454
DART Transfer Trips		2,800	2,730	1,680	1,020	4,050	3,510
Modeled Ridership							
Parker Road (Red Line)	2,400	1,680	1,670	3,120	2,250	2,000	1,360
Parker Road		590	590	1,780	570	360	350
Legacy Drive		400	450	220	40	420	350
Millennium Business Park		150				170	130
Downtown Allen		780	870	500	450	1,140	950
Stacy Road		650	660	360	830	640	580
Fairview/SH 5		680	690	440	600	860	800
Industrial Boulevard		30				20	20
Downtown McKinney		770	790	440	490	930	870
US 380–McKinney		680	770	450	710	740	690
McKinney North 1		150				150	140
McKinney North 2		130	180	110	140	130	120
McKinney Station Total		5,010	5,000	4,300	3,830	5,560	5,000
Interlined Ridership[3]		2,360[4]	2,280[4]				3,230[5]
Combined Ridership[3]					1,910[6]	3,760[7]	
McKinney Line Total		7,370	7,280	4,300	5,740	9,320	8,230

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 McKinney Corridor
4. Interlined Ridership includes one-seat rides through the DART Red Line Bush Turnpike Station
5. Interlined Ridership includes one-seat rides through the DART Red Line Mockingbird Station
6. Combined Ridership includes one-seat rides through the planned Cotton Belt DFW Airport Station
7. Combined Ridership includes one-seat rides through the DART Red Line West Oak Cliff Station

3.6 RAIL OPERATIONS

The frequency of service and hours of operation for passenger rail would vary by technology. Figure 3-11 shows the rail operations modeled for the build alternatives.

3.6.1 Light Rail Transit Operations

Proposed McKinney Corridor operations for LRT alternatives will be similar to current DART Red Line rail service operations. Rail service would be provided between 5:00 a.m. and 12:30 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 ten-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 20-minute headways. These headways would vary slightly

in areas where McKinney Corridor service shares track with other LRT services. An expansion of existing DART LRT maintenance facilities to accommodate McKinney Corridor vehicles is assumed for these alternatives.

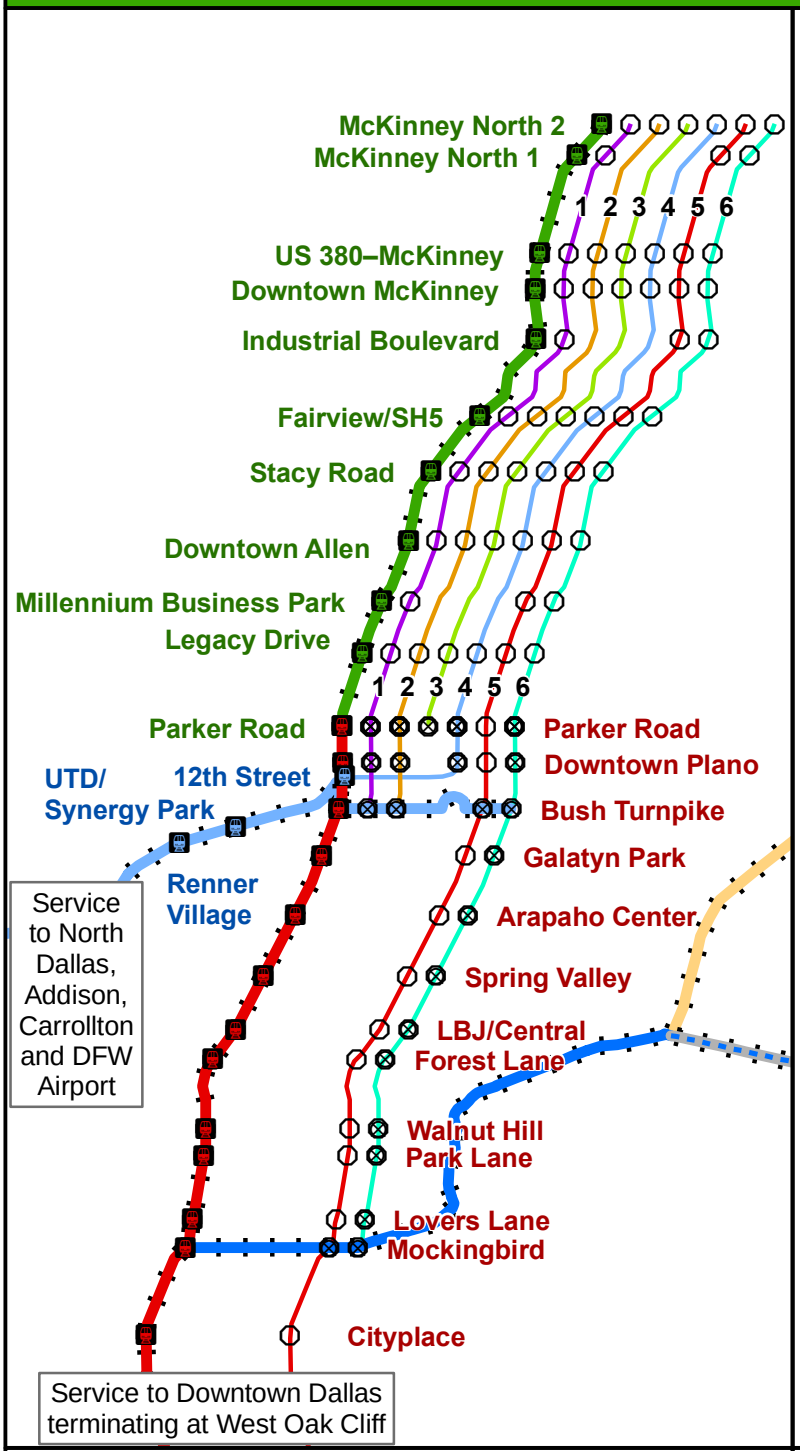
A detailed operational impact analysis to existing transit services is outside the scope of this study. Several general issues will need to be addressed for any McKinney Corridor alternative, especially those implemented using LRT vehicles. Peak period capacity along the DART Red Line is constrained by two main factors: vehicle headways and downtown Dallas corridor capacity. Current vehicle headways during peak periods range from four to seven minutes. Reducing these headways to provide more frequent service could lead to reduced reliability of service, especially south of Mockingbird Station where the track is shared by the DART Blue Line. With the opening of the DART Green Line and planned DART Orange Line, the additional capacity constraints through downtown Dallas limit the minimum headways for all DART LRT services. A planned second downtown Dallas alignment (D2) would address the conflict of short headways and the overlapping demands of multiple lines using shared tracks. Unless the D2 alignment was already in place, the construction of the McKinney Corridor could overload the LRT system through Dallas.

3.6.2 Light Rail New Technology Operations

Proposed McKinney Corridor operations for LRNT alternatives 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 20-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.

In the LRNT alternatives, freight service operations would coexist with passenger service within McKinney, with one track with sidings shared by 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. Vehicle access to an LRNT maintenance facility shared with the TRE or DCTA would be routed to the Cotton Belt line through the existing DART Red Line service area or, if that is not technically feasible, through the BNSF line that connects to the McKinney Corridor line near Sherman, Texas.

Figure 3-11 — Modeled Rail Operations



Legend

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Station
- Modeled Stop with Potential Transfers
- Modeled Stop with no Transfer Options
- Alternative 1 (LRT)
- Alternative 2 (LRT)
- Alternative 3 (LRNT)
- Alternative 4 (LRNT)
- Alternative 5 (LRT)
- Alternative 6 (LRT)
- Proposed McKinney Corridor Alignment
- Existing DART Red Line (LRT)
- Existing DART Blue Line (LRT)
- Proposed Cotton Belt Corridor (LRNT)
- Planned DART Blue Line Extension
- Potential Lavon Lake Corridor

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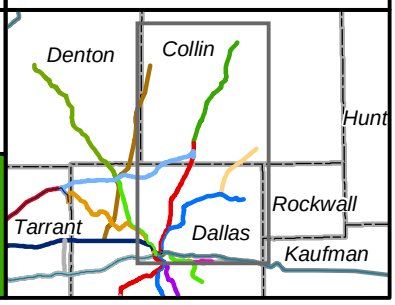


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

3.7 BUS OPERATIONS

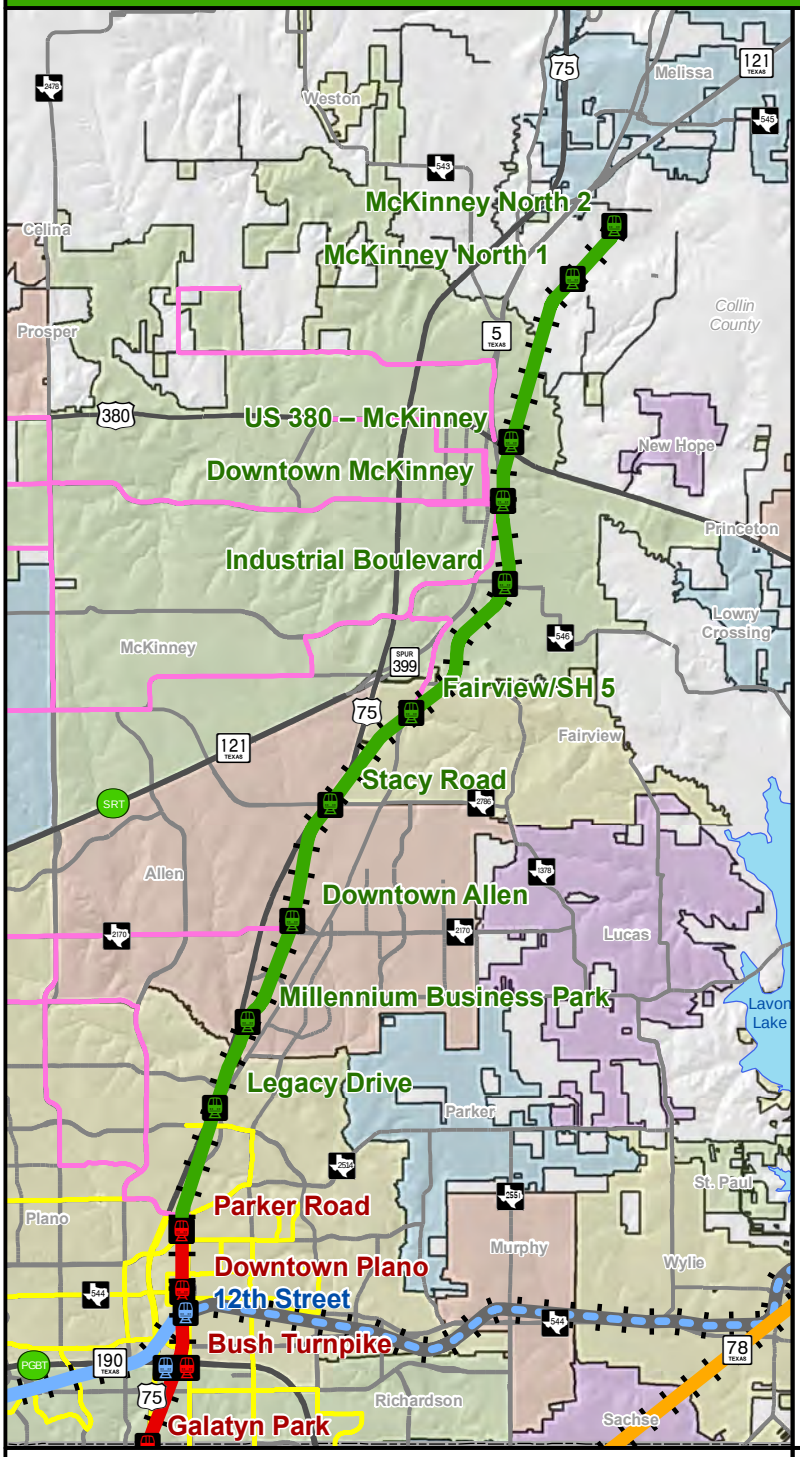
Currently, eight bus routes provide service within the corridor. Current bus services are limited to McKinney and Plano. Some existing bus routes could serve a feeder bus role. Bus route headways would be adjusted to match needs associated with the rail service schedule. Expanded bus transit operations 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 3-12 shows the bus network modeled for the build alternatives.

3.8 COSTS

Conceptual capital costs were estimated for the six 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, existing improvements
- Vehicles
- Professional services
- Unallocated contingency

Figure 3-12 — Modeled Bus Routes
PGBT to FM 545



Legend

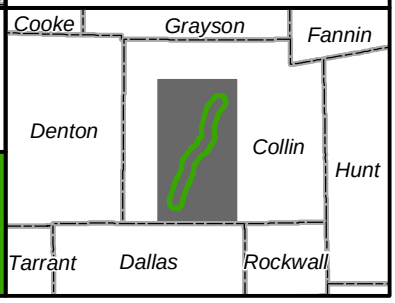
Modeled Routes
- DART Feeder Bus
- Regional Rail Feeder Bus

Other Items
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Possible Cotton Belt Corridor Station
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- City / Town Limits
- County Limits
- Lake

0 1 2 3 6
Miles

N

Key Map



Map Date: July 2010 Source(s): NCTCOG

North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

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 2009 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 ten 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.
- As recommended by *DART Capital Cost Methodology*, right-of-way is estimated to be approximately four percent of the estimated construction costs for LRNT or 15 percent for LRT. This does not include the right-of-way presently owned by DART and generally represents land typically needed for stations and station access.
- 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 McKinney 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 3-7 shows a summary of capital cost estimates for each alternative.

Table 3-7 Rail Capital Costs Summary

Cost Category	Alternative					
	1	2	3	4	5	6
	Cost (millions of 2009 dollars)					
Guideway and Track Elements	$127	$127	$93	$219	$127	$127
Passenger Stations and Parking	$50	$35	$35	$81	$50	$50
Maintenance and Layover Facilities	$7	$7	$4	$4	$7	$7
Sitework & Special Conditions	$67	$67	$7	$16	$67	$67
Electrification, Signaling and Communications Systems	$196	$196	$29	$74	$196	$196
Allowances	$384	$371	$144	$338	$384	$384
Right-of-Way Acquisition	$87	$84	$9	$20	$87	$87
Vehicles	$153	$153	$77	$165	$153	$282
Unallocated Contingency[1]	$0	$0	$0	$50	$0	$0
Capital Cost Total	**$1,071**	**$1,040**	**$398**	**$967**	**$1,071**	**$1,200**
Approximate Capital Cost Total[2]	**$1,075**	**$1,050**	**$400**	**$975**	**$1,075**	**$1,200**
Total Length (miles)	17.7	17.7	17.7	44.6	17.7	17.7
Approximate Cost Per Mile	**$61**	**$59**	**$23**	**$22**	**$61**	**$68**
Annualized Capital Cost[3]	$75.25	$73.50	$28.00	$68.25	$75.25	$84.00
2030 Annual Ridership (millions)[4]	2.06	2.04	1.20	3.39	2.61	2.33
Annualized Capital Cost Per Rider (in 2009 dollars/rider)	**$37**	**$36**	**$23**	**$20**	**$29**	**$36**

1. Alternative 4: Unallocated Contingency includes trench alignments proposed in the Cities of Dallas and Coppell, as well as an environmental contingency along the Cotton Belt Corridor
2. Approximate Capital Cost Total rounded to the nearest $25 million
3. Annualized Cost = 0.07 × Present Value (assumes 50-year project life and 6.75 percent annual inflation)
4. 2030 Annual Ridership = Daily Ridership estimate × 280 days (to account for holidays and weekends)

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4.0 AFFECTED ENVIRONMENT

Chapter 4 summarizes the social, economic, and natural environmental resources within the McKinney 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 McKinney 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 McKinney 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 Appendix B, Table B-1 are the regionally significant arterials passing through the McKinney Corridor study area.

Appendix B, Figures B-1 and B-2, identify the major highways, toll roads, and regionally significant arterials within the study area. The US 75 and State Highway (SH) 5 corridors both run parallel to the McKinney Corridor. Appendix B, Figures B-3 and B-4, 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. The NCTCOG Dallas-Fort Worth Regional Travel Model (DFWRTM) indicated approximately 75 percent of study area roads were operating at a LOS A, B, or C in 2007; 12 percent were operating at a LOS D or E; and 13 percent were operating at a LOS F.

There are several roadway improvement projects planned within the study area. These projects are included in Appendix B, Tables B-2 and B-3. 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. Appendix B, Figure B-5, shows the locations of planned projects on highways, toll roads, and regionally significant arterials.

Appendix B, Figures B-6 and B-7, 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 Appendix B, Figure B-8, the McKinney Corridor passes through areas currently experiencing moderate to severe congestion. Estimates indicate congestion levels will be more severe by 2030, even if all planned projects, including the McKinney Corridor passenger rail line, are constructed.

4.1.2 Transit System

The McKinney Corridor study area falls within the service area of two transit providers, DART and Collin County Area Regional Transit (CCART). Data describing the existing and near-term expansion of transit routes and ridership was provided by DART and CCART. NCTCOG provided information regarding the long-range regional planning for bus transit and passenger rail projects.

Currently, DART operates most transit service provided within the study area. DART operates several bus routes and one light rail transit (LRT) line, the Red Line, terminating within the study area. Appendix B, Table B-4, lists the five DART bus routes passing through some portion of the study area including one suburban route, two crosstown routes, and two special or shuttle routes. DART also offers on-call service to areas within Plano. Appendix B, Figure B-9, identifies the transit services currently provided within the study area. The DART Red Line Parker Road Station is the only park-and-ride facility within the study area.

CCART also provides transit service in the study area. CCART operates three bus routes within the McKinney Urbanized Area, listed in Appendix B, Table B-4. Appendix B, Figure B-10, shows these routes. The fixed service routes are supplemented by Americans with Disabilities Act (ADA) paratransit service to locations within three-fourths of a mile of the fixed routes. CCART also provides demand responsive public transportation services throughout Collin County.

In addition to existing LRT service provided by DART, the planned Cotton Belt Corridor could connect, depending on the vehicle technology and other considerations, with the DART Red Line. The connection could be made at a number of locations including the existing DART Red Line Bush Turnpike Station, Downtown Plano Station, Parker Road Station, or potentially a new station on the DART Red Line. Appendix B, Figure B-9, shows the location of the Cotton Belt Corridor.

4.1.3 Bicycle and Pedestrian

Dedicated bicycle and pedestrian facilities exist at several locations within the study area. Municipalities with existing facilities include Allen, McKinney, and Plano. All of the municipalities in the study area have planned bicycle and pedestrian facilities. The primary bicycle and pedestrian data sources include NCTCOG and the most recent comprehensive plans and/or trail plans of Allen, Fairview, McKinney, Melissa, and Plano. 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. Appendix B, Figures B-11 and B-12, show the locations of existing and planned bicycle and pedestrian facility improvements in the study area. There are many portions of the Regional Veloweb planned for inclusion into existing freight rail corridors including the Lavon Link, Plano Central Link, Cotton Belt Lavon, and Bluebonnet East trails, which follow almost the entire alignment of the McKinney Corridor rail line. Appendix B, Tables B-5, B-6, and B-7 list the existing and planned bicycle and pedestrian facilities within the study area.

Approximately 17 miles of bicycle and pedestrian facilities are currently operational within the study area. Facilities in Allen account for about ten miles (60 percent) of the bicycle and pedestrian system within the study area.

All municipalities within the study area have planned expansions to their local bicycle and pedestrian trail systems, totaling approximately 75 miles. Allen and Plano each plan to add over 20 miles of trails. McKinney and Fairview plan to add approximately 18 and 13 miles of improvements, respectively.

4.1.4 Freight

The existing roadway system accommodates most freight movement within the study area. North of Industrial Boulevard in McKinney, one or two freight trains operate within the McKinney Corridor on an average weekday. 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). Appendix B, Figures B-13 and B-14, illustrate the locations of freight rail facilities within the study area.

Several locations within the study area have concentrations of freight intensive facilities including one distribution center, 20 manufacturing centers, and four warehouses. These facilities are concentrated mainly in three areas - the Millennium Business Park in Allen, near Industrial Boulevard in McKinney, and near US 380 in McKinney. Access to freight rail service was an important location factor for many McKinney facilities. There are no identified FODs in the McKinney Corridor 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. The only FTZ within three miles of the study area is the Fossil Partners subzone in Richardson (FTZ #39-E), instituted as a subzone of the Dallas/Fort Worth International Airport (DFWIA) FTZ (FTZ #39).

Owned by DART, the McKinney Corridor rail line provides active freight rail service in McKinney. While no freight rail lines intersect the McKinney Corridor within the study area, the Cotton Belt rail line crosses under the DART Red Line approximately one-third mile south

of the study area. There are 19.7 miles of main line DART-owned tracks and 2.4 miles of railroad spurs within the study area.

NCTCOG identified the US 75 corridor for potential long-term intercity truck lane restrictions. If implemented, the proposed expanded truck lane restrictions along these facilities would 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. There has been no timeframe identified for the implementation of additional truck lane restrictions for the US 75 corridor and no other changes to the goods movement system are planned.

4.1.5 Aviation

Two primary commercial service airports serve DFW region passengers, 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.

As identified in Appendix B, Figure B-14, there is one public use airport within the study area, Collin County Regional Airport (CCRA) at McKinney. Owned by the City of McKinney, managed by McKinney Airport Development Corporation, this airport primarily serves general aviation users. There are plans to construct a new airport traffic control tower and a new 7,000-foot long runway. Construction of these projects is scheduled to begin in 2010.

4.1.6 Travel Patterns

Commuting patterns within the study area and throughout the region were reviewed for potential interactions with the McKinney 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, 58.1 percent of study area residents are employed within their county of residence, but only 30.9 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 22.4 percent of study area residents worked in one of these five primary cities. The 2000 Census reported 93.0 percent of commuters used a car, truck, or van; with 80.3 percent of the commutes consisting of drive alone trips; and the other 12.8 percent in two or more person carpools. The other methods reported by at least 1,000 workers for accessing employment were working from home and walking to work with overall share of commutes at 3.6 percent and 1.6 percent, respectively.

Travel time to work for study area residents was similar to the travel times for the entire DFW MSA. Approximately 22.8 percent of study area residents had a commute of less than 15 minutes when compared to 21.7 percent of DFW MSA residents. A slightly lower proportion of study area residents (31.5 percent) had a commute of 15 to 29 minutes when compared to the rest of the DFW MSA (34.8 percent). Appendix B, Tables B-8 through B-10, 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 slightly between 1990 and 2000. The percentage of workers employed within their county of residence increased by 3.3 percent and the proportion of workers who commuted to a central

city decreased by 0.6 percent. The mode choice of study area commuters did not change drastically between 1990 and 2000, with the proportion working from home increasing and those driving alone decreasing slightly. 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 Collin County, the municipalities of Allen, Fairview, McKinney, Melissa, and Plano. Table 4-1 identifies various land use types within the study area. Over 56.0 percent of the study area is classified undeveloped land with residential areas accounting for the majority of developed land. Appendix B, Figures B-15 and B-16, graphically illustrate land use in the McKinney Corridor study area.

Table 4-1 2005 Land Use within Study Area

Land Use Type	Percentage
Residential	19.8%
Dedicated	6.9%
Commercial	6.7%
Government/Educational	5.0%
Industrial	4.4%
Water	0.6%
Infrastructure	0.4%
Airports	0.1%
Undeveloped	56.3%

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 McKinney Corridor including race, ethnicity, age, environmental justice populations, and limited English proficiency (LEP) populations.

4.2.2.1 Ethnicity

Table 4-2 shows the population, race, and ethnicity for Collin County and the census tracts intersecting the study area. The 24 census tracts identified in the McKinney Corridor are shown in Appendix B, Figures B-17 and B-18. The study area has approximately 28.8 percent minority population, which includes Hispanic persons; compared to approximately 22.5 percent minority for Collin County. The study area ethnic composition is approximately 78.5 percent White, 16.5 percent Hispanic (or Latino), 5.9 percent Black/African-American, 4.1 percent Asian, 0.6 percent American Indian/Alaska Native, and 0.015 percent Native Hawaiian or other Pacific Islander. The study area exhibits a higher percentage of all ethnic minorities, except Asian, than Collin County as a whole. Although the general study area is

not classified minority, census tracts 309.00 and 319.00 were identified as having majority minority populations. Appendix B, Table B-17, shows population, race, and ethnicity by census tract.

Table 4-2 2000 Population and Ethnicity

Characteristic	Collin County		Study Area	
	Population	Percent	Population	Percent
White	400,181	81.4%	112,973	78.5%
Black	23,561	4.8%	8,543	5.9%
Asian	34,047	6.9%	5,835	4.1%
American Indian	2,323	0.5%	813	0.6%
Native Hawaiian	230	0.0%	21	<0.1%
Other race	20,957	4.3%	12,026	8.4%
Two or more	10,376	2.1%	3,744	2.6%
Hispanic[1]	50,510	10.3%	23,743	16.5%
Total	**491,675**	**100%**	**143,955**	**100%**

Source: US Census, 2000

1. Hispanic persons are not considered a separate race and may belong to any race.

4.2.2.2 Age

The average median age in study area census tracts is 32 years old, slightly lower than the median age in Collin County of 33 years old. Approximately 35 percent of study area residents are under 18 or older than 64 years. This corresponds to Collin County with 34 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. Appendix B, Table B-18, details this information.

4.2.2.3 Poverty Levels

The median household income for the census tracts in the study area ranged from $30,653 to $102,367. Fifteen of the 24 census tracts had median incomes below $70,835, the median Collin County household income. Using 2000 Census data and the Department of Housing and Urban Development (HUD) definition of low-income household, nine census tracts out of 24 were determined to have low-income residents. Appendix B, Table B-20, shows median household income and poverty levels for each census tract in the study area.

4.2.2.4 Language

Census tract data for “Ability to Speak English for the Population Five Years and Over” indicates an average of 6.0 percent of the residents in the study area speak English “Not Well” or “Not At All.” The average for Collin County is 3.5 percent. Of those persons who did not speak English well, Spanish was the preferred language. Appendix B, Tables B-20 and B-21, show data from the 2000 Census including languages spoken by the LEP population over five years of age from the 24 census tracts in the study area.

4.2.3 Community Resources

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

4.2.3.1 Major Activity Centers and Developments

Major activity centers and developments in the McKinney 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 185 major activity centers and developments including:

- Six cultural facilities
- 17 educational facilities
- Seven government quarters
- Eight hotels/motels
- 33 industrial facilities
- Six institutional facilities
- 45 multi-family developments
- Two mixed-use developments
- 26 office complexes
- One recreational facility
- 29 retail centers
- Five single-family developments

Notable major activity centers in the study area include the Allen Event Center, Allen Premium Outlets, Encore Wire Corporation, Lattimore Materials Company, the Medical Center of McKinney, and the Raytheon Company Spring Creek site. Each facility is a regional destination point. Appendix B, Table B-22, lists the number of existing major activity centers and developments in the study area by type and municipality.

4.2.3.2 Employment

Major employment centers in the McKinney Corridor are defined as 250 employees or more at a single location. There were 22 major employers identified within the study area. Appendix B, Table B-23, lists the major employers in the study area. Allen and McKinney each had eight, and Plano had six. No other cities had major employers. There are five major employers with over 700 employees in the McKinney Corridor study area with three in McKinney and two in Plano.

4.2.3.3 Community Facilities

There were 86 community facilities identified within the study area, categorized into ten distinct types:

- 11 assisted living facilities
- Six cemeteries
- Five cultural facilities
- 19 educational facilities
- Nine emergency services
- Ten governmental facilities
- Seven medical facilities
- Two places of worship
- 14 recreational facilities
- Three transportation facilities

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

4.2.4 Cultural Resources

Identified in the study area are 112 known cultural resources. Appendix B, Tables B-25 through B-29 and Figures B-19 and B-20, depict the locations that include:

- Three nationally registered historic districts
- 53 nationally registered historic properties
- 50 historical markers
- Six cemeteries

Specific archeological data were not obtained for the study area; however, there were 33 previous archeological surveys conducted in the corridor for other projects. Appendix B, Table B-30, lists the date, agency, and type of each investigation performed.

4.2.5 Parks and Recreation

Fifty-six parks and recreational areas were identified within the study area. The data search returned seven different types of facilities in three study area municipalities. Appendix B, Table B-31, lists the name, type, and location of each facility.

4.2.6 Regulated Materials

The potential regulated or hazardous material sites in the study area consist of four landfill sites and 14 miles of pipeline; no mining, radioactive, or Superfund sites were identified. Three of the four 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 other identified landfill, the City of McKinney Landfill, is an active, authorized landfill with a registered permit with the Texas Commission on Environmental Quality (TCEQ) for waste disposal.

Pipelines crossing the project area carried two separate commodities, natural gas and natural gas liquids. Appendix B, Figures B-21 and B-22, show the locations of potential regulated materials sites in the McKinney 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 is within a designated moderate nonattainment area for the eight-hour ozone standard by the US Environmental Protection Agency (EPA). Appendix B, Table B-32, 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).

Appendix B, Table B-33, lists the four highest daily maximum eight-hour ozone concentrations recorded annually from 2000 to 2009 at the Frisco Continuous Air Monitoring Station (CAMS) 31/CAMS 680. 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 McKinney Corridor rail line. The land use adjacent to the rail right-of-way includes 18,925 linear feet (10.1 percent) of residential land use, 5,777 linear feet (3.1 percent) of park or recreational land use, and 1,274 linear feet (0.7 percent) of institutional land use. This totals 25,976 linear feet (13.9 percent) of noise sensitive land use. In addition, the existing McKinney Corridor rail line has freight activity. While this freight activity is light to moderate and is currently confined to McKinney, existing land use areas have adapted to the light to 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 McKinney Corridor rail line. In the study area, no Category 1 land uses were identified. Category 2 land uses totaled 18,925 linear feet (10.1 percent) which included residential, hotels, and motels. Category 3 land uses totaled 7,050 linear feet (3.7 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. Appendix B, Figures B-15 and B-16, identify the land use for the study area, which includes vibration sensitive areas.

4.3.4 Water Resources

A total of 3,716 acres of 100-year floodplain were located in the study area. In addition, 282 acres of 500-year floodplain land were identified. These floodplains are located around the numerous streams crossing the project study area as shown in Appendix B, Figures B-27 and B-28. The largest floodplain area occurred along the East Fork Trinity River and Clemons Creek, which parallels the McKinney Corridor study area north of US 380.

Numerous streams cross the McKinney Corridor study area. Over 230,000 linear feet of stream were identified, including named and unnamed rivers, streams, and aqueducts. Larger streams include Bowman Branch, Brown Branch, Clemons Creek, Comegy Creek, Cottonwood Creek, East Fork Trinity River, Fitzhugh Branch, Honey Creek, Jeans Creek, Rowlett Creek, Russell Branch Rowlett Creek, Shawnee Park Pond, Sloan Creek, Spring Creek, and Wilson Creek. No stream segments within the study area are on the TCEQ 2008 303(d) list for impaired water body segments.

All municipalities within the study area are members of the North Texas Municipal Water District and have Municipal Separate Storm Sewer Systems (MS4) permits. Plano has a medium or large MS4 permits (Phase 1). Allen, Fairview, McKinney, Melissa, and Collin County have small MS4 permits (Phase 2). Appendix B, Section B.3.4.1, 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 entirely in one ecological area: the Northern Blackland Prairie subarea of the Texas Blackland Prairies. Additionally, identified in the study area are two vegetation types from the *Vegetation Types of Texas*. The majority of the study area falls into the “crops” category with approximately 23,024 acres while “urban areas” account for approximately 1,665 acres. Appendix B, Table B-37, also describes the vegetation type, typical species found in each vegetation type, and where the distribution of the vegetation type occurs. Appendix B, Figure B-29, 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 no occurrences of threatened or endangered species in the study area.

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 longest stretch of stream and the only river crossed by the McKinney Corridor is the East Fork Trinity River, which runs for over 30,000 linear feet (almost six miles) within the study area. Over 200,000 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 Clemons Creek, Cottonwood Creek, Rowlett Creek, Sloan Creek, and Wilson 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. Appendix B, Table B-38, lists the linear footage by stream.

There are also approximately 427 acres of wetlands and lakes in the study area. Lakes accounted for less than 0.3 percent of the study area, with the majority located in golf courses. There were very few wetlands identified in the study area. Most wetland areas were located in proximity to the East Fork Trinity River, Clemons Creek, and Wilson Creek. Appendix B, Tables B-39 and B-40, shows acreage of lakes and wetlands in the study area and the percent of the entire study area they encompass. Appendix B, Figure B-30, 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 and terrace deposits. Two aquifers occur in the study area, the Trinity Aquifer and the Woodbine Aquifer. Appendix B, Figure B-31, 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 24 unique map unit types. These map units are condensed into 11 separate soil series and one non-series soils. Appendix B, Table B-41, details the study area soils. Appendix B, Figures B-32 and B-33, 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 McKinney Corridor, as detailed in Chapter 1, Section 1.4, is being studied from the DART Red Line Parker Road Station in Plano to the proposed McKinney North 2 Station in McKinney. The portion of the study area in Plano is within the DART service area. The portion of the study area in McKinney is within the service area of the Collin County Area Regional Transit (CCART). Figure 5-1 illustrates the McKinney Corridor study area within existing transit service areas.

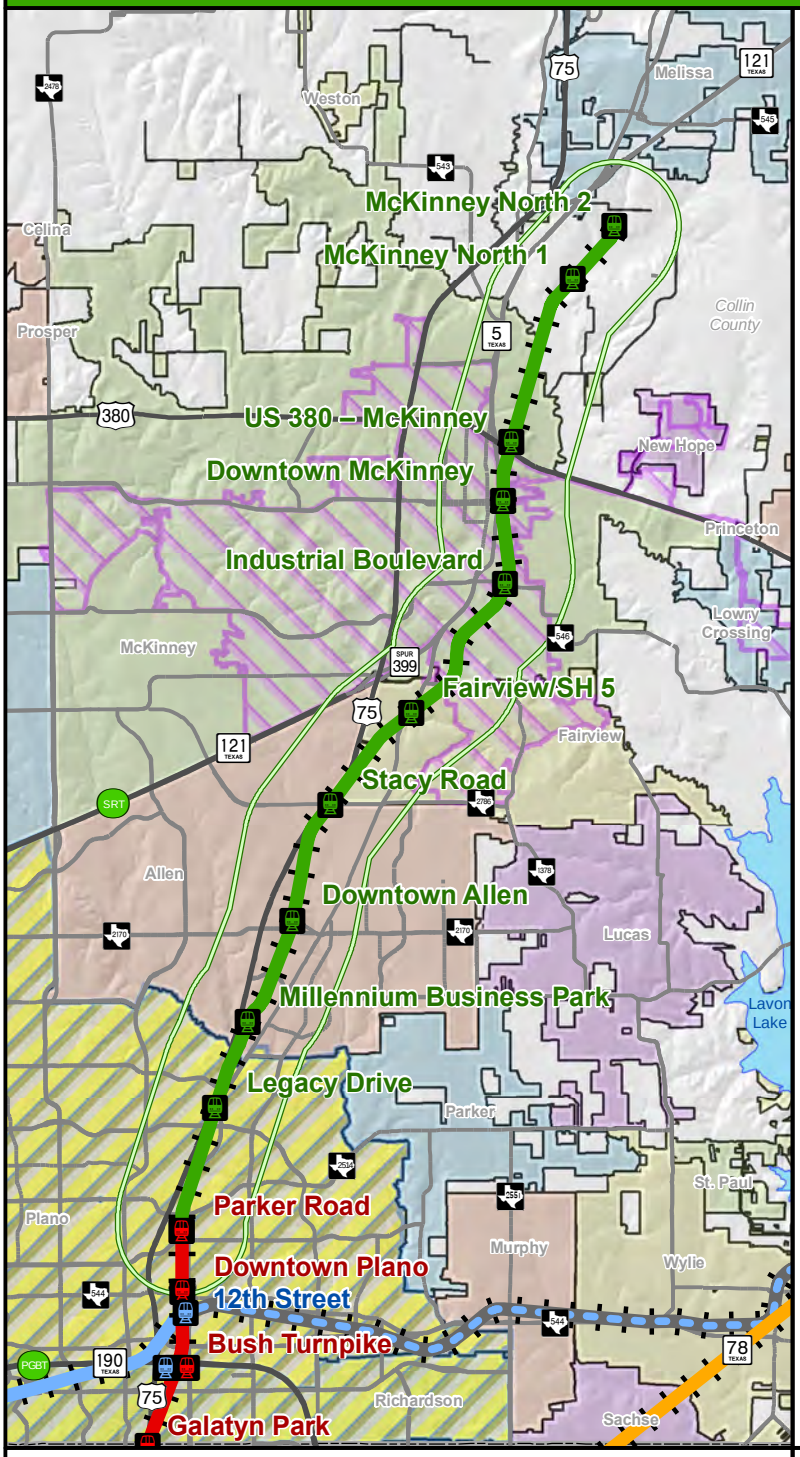
DART local funding is derived from a 1.0 cent sales tax levied in 13 member cities. The Fort Worth Transportation Authority (The T) levies a 0.50 cent sales tax as their local funding source from the Cities of Blue Mound, Fort Worth, and Richland Hills. Grapevine is also a The T member city under a special 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
PGBT to FM 545



Legend

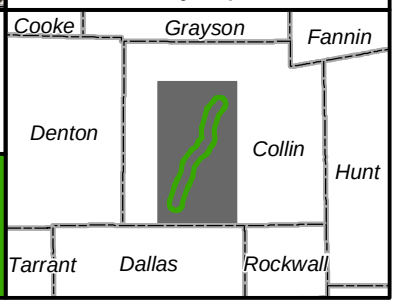
Transit Agency Service Area

- CCART Urban Service
- DART Service Area

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

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. 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 Fare Box 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 McKinney 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 Funding 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 McKinney 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 McKinney 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 McKinney Corridor Meetings

Date	Meeting	Location	Type of Meeting
1/20/2009	Advancing Rail in North Texas Strategy Meeting - McKinney Corridor	NCTCOG Transportation Council Room	Corridor Strategy Team
3/13/2009	Advancing Rail in North Texas Strategy Meeting - McKinney Corridor	Downtown Plano Station Conference Room	Corridor Strategy Team
5/7/2009	Collin County Meeting	Collin County Offices	Stakeholder
5/7/2009	City of Plano Meeting	City of Plano Offices	Stakeholder
5/21/2009	Town of Fairview Meeting	Fairview Town Hall	Stakeholder
5/21/2009	City of Allen Meeting	Allen City Hall	Stakeholder
5/21/2009	DART Meeting	NCTCOG Mustang Conference Room	Agency
5/28/2009	City of McKinney Meeting	McKinney Development Services Building	Stakeholder
6/1/2009	Advancing Rail in North Texas Strategy Meeting - McKinney Corridor	Allen Municipal Court/Parks and Recreation Building	Corridor Strategy Team
9/25/2009	City of Plano Meeting	City of Plano Offices	Stakeholder

Table 6-1 McKinney Corridor Meetings (continued)

Date	Meeting	Location	Type of Meeting
9/30/2009	Collin County Meeting	Collin County Offices	Stakeholder
10/29/2009	City of Allen Meeting	Allen City Hall	Stakeholder
11/2/2009	City of McKinney Meeting	McKinney Development Services Building	Stakeholder
11/13/2009	Advancing Rail in North Texas Strategy Meeting - McKinney Corridor	Allen Municipal Court / Parks and Recreation Building	Corridor Strategy Team
04/09/2010	City of McKinney Meeting	McKinney Development Services Building	Stakeholder
04/12/2010	City of Plano Meeting	City of Plano Offices	Stakeholder
04/13/2010	City of Allen Meeting	Allen City Hall	Stakeholder
04/13/2010	Collin County Meeting	Collin County Offices	Stakeholder
04/16/2010	Advancing Rail in North Texas Strategy Meeting - McKinney Corridor	Allen Municipal Court / Parks and Recreation Building	Corridor Strategy Team

Source: NCTCOG, April 2010

6.1.1 Stakeholder/Agency Meetings

Throughout the project there were three rounds of Stakeholder/Agency Meetings, totaling 14 individual meetings.

6.1.1.1 Round One – May 2009

May 7, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to the Collin County Engineering Director and a member of the Collin County Planning Board. 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. County staff was briefed on the current project status. County representatives deferred to the individual cities for judgment regarding station locations, but suggested access to the Collin County Regional Airport (CCRA) be considered. NCTCOG staff noted the McKinney Corridor begins at the DART Red Line northern terminus, the corridor could be implemented as either light rail new technology (LRNT) or light rail transit (LRT).

May 7, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to the Plano Assistant City Manager and City Engineer. 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 Plano City Council priorities among the three potential passenger rail corridors traveling through Plano are: Cotton Belt Corridor, Frisco Corridor, and McKinney Corridor. City staff discussed capacity constraints along the DART Red Line, noting corridor trains are almost completely full during peak periods. NCTCOG staff noted previous studies had shown two potential stations in Plano, Spring Creek Parkway, and Legacy Drive. City staff suggested if only one station is feasible, the preference is the Legacy Drive location.

May 21, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to the Fairview Town Manager and other 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 stakeholder concerns. Town staff noted previous studies had shown stations at Stacy Road near the Fairview/Allen border and at Farm-to-Market Road (FM) 1378 (Country Club Road). It was indicated the Stacy Road station is the preferred station, but the other station should be shifted south to the intersection of the rail line with State Highway (SH) 5 (Greenville Drive). Town staff noted the planned Fairview Center development has included a potential rail station in their plans at this location.

May 21, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to the Allen City Manager and other city 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 any stakeholder concerns regarding this corridor. City staff indicated there are two potential station locations in their comprehensive plan, downtown Allen and Stacy Road. Concerns were raised regarding the limited additional capacity along the DART Red Line south of Plano and the potential for a forced transfer from the McKinney Corridor to the DART Red Line. The need for grade separations to reduce potential rail service impacts on roadway system performance was also discussed.

May 21, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to DART staff and 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 LRNT vehicle under development by DART. They also indicated preferred station spacing for LRNT service of three to five miles.

May 28, 2009

NCTCOG staff provided a brief regional passenger rail initiative description to the McKinney City Manager and other city 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. City staff discussed the five potential station locations included in the 2006 *McKinney Comprehensive Plan*: Industrial Boulevard, downtown McKinney, US 380, and two transit oriented development (TOD) locations north of US 380. Due to station spacing criteria, NCTCOG staff noted that a LRNT technology would not allow for all five stations. City staff indicated downtown McKinney, US 380, and one of the TOD stations should be included in all McKinney Corridor alternatives. The need to maintain the active freight rail service along the corridor within the City of McKinney was also discussed.

6.1.1.2 Round Two – September to November 2009

September 25, 2009

NCTCOG staff met with Plano staff to update city representatives on progress to date and seek input regarding data collection efforts. City staff was briefed on the preliminary modeling results for the McKinney Corridor. Downstream impacts of riders from the McKinney Corridor on the DART Red Line were also discussed. When the station criteria were presented to the city staff, it was suggested that different types of stations should have different criteria. For example, end of the line stations should be focused on ease of access and sufficient land for parking lots while mid-section stations should focus more on development opportunities, demographics, and local preferences. It was also suggested the criteria be focused on impacts around the potential stations.

September 30, 2009

NCTCOG staff met with Collin County staff to discuss the corridor/station level criteria. County staff questioned the demographics used for the evaluation. *Mobility 2030: The Metropolitan Transportation Plan for the Dallas – Fort Worth Area – 2009 Amendment (Mobility 2030 - 2009 Amendment)* approved demographics were used for the evaluation. Updated demographics are projected to be available in early 2010; however, this CE & FS will not utilize the new demographic set. Ridership estimates from the Dallas-Fort Worth Regional Travel Model (DFWRTM) were also discussed.

October 29, 2009

NCTCOG staff met with Allen staff to discuss the upcoming Corridor Strategy Team Meeting, station criteria, and ridership estimates. City staff indicated the preliminary DFWRTM results underscore the city's preference for LRT service along the McKinney Corridor. Discussion focused on options for funding rail service through some combination of local, countywide, regional, state, and federal sources.

November 2, 2009

NCTCOG staff met with McKinney 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 DFWRTM version and the 2030 demographic forecast used in *Mobility 2030 - 2009 Amendment.* Discussion then focused on options for funding rail service through some combination of local, countywide, regional, state, and federal sources.

6.1.1.3 Round Three – April 2010

April 9, 2010

NCTCOG staff met with McKinney 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 the status of cost estimates for the McKinney Corridor.

April 12, 2010

NCTCOG staff met with Plano 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 McKinney Corridor. City staff stressed the importance of grade separating Parker Road and other roadways.

April 13, 2010

NCTCOG staff met with Allen 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 McKinney Corridor. City staff noted the importance of future coordination between municipalities to the implementation of the McKinney Corridor. A grant of Job Access/Reverse Commute (JA/RC) funds will allow the city to start a bus route to connect major employment and population centers in Allen to the existing DART transit network.

April 13, 2010

NCTCOG staff met with Collin County staff to update county representatives on progress to date and seek feedback regarding data collection efforts. County staff was briefed on the preliminary assessment of social and environmental effects and on the status of cost estimates for the McKinney 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 January 2009

The primary purpose of the initial McKinney 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 McKinney 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 Red Line. 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 metropolitan transportation plan (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 prepare detailed ridership estimates. Ridership estimates indicated on the RNT fact sheets represent average weekday ridership. Ridership estimates could change based on different station locations, station spacing, and/or train frequency which could be the case when this corridor is further studied in this study effort.

The station locations in the RNT McKinney Fact Sheet were developed looking at traditional regional rail standard spacing and working with cities and their land use plans. This study will further investigate station locations. The station spacing between Legacy Drive and Spring Creek Parkway was determined to be too short. Studying an additional station near CCRA was also suggested.

Based on DFWRTM forecasts and the current *Mobility 2030 - 2009 Amendment* demographics, the McKinney Corridor is only warranted between Plano and McKinney by 2030, although new demographic data may show a need for northward expansion sooner. Northward expansion to Melissa, Anna, or even farther to Sherman could eventually be warranted.

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, and TOD and sustainable development issues.

Participant comments focused on a number of issues. It was important to ensure the data underlying the study is as current as possible. Because one project goal is to improve regional mobility, all alternatives should be considered including extending passenger rail service north of McKinney. Some participant concerns regarding funding and equity between residents of DART member and non-member cities were also raised. The choice of vehicle technology for the corridor should consider the LRNT vehicle development timeframe.

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. Some of the comments and concerns regarding the study included:

- Constructing passenger rail infrastructure all or part of the way to Sherman to get ahead of construction cost inflation.
- Connecting this corridor to either the DART Red Line or the proposed Cotton Belt Corridor for more “one-seat ride” destinations.
- 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. Both LRT and LRNT vehicles would face logistical issues if implemented within the corridor.

6.1.2.4 November 2009

This meeting provided information on NCTCOG’s 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 LRT system is estimated to cost between $65 and $80 million per mile and 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.

6.1.2.5 April 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, 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.

A brief discussion regarding the recent JA/RC grants awarded to the Allen and McKinney focused on using the programs to demonstrate the viability of transit service throughout the McKinney Corridor. City of Allen staff suggested moving the Downtown Allen Station to a location north of Main Street. During a summary of forecasted ridership of the McKinney Corridor alternatives it was suggested that downstream impacts to existing DART Red Line LRT service be studied, especially through the downtown Dallas 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.

6.2 WEBSITE

Information regarding the McKinney Corridor CE & FS is provided through a Web site (www.nctcog.org/trans/spd/transitrail/redline) launched 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 McKinney 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 McKinney 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 McKinney 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**	**6**
Length (miles)	0	19.9	19.9	17.7	44.6	49.0	32.3
Primary Mode	N/A	LRT	LRT	LRNT	LRNT	LRT	LRT
Interlined Service	N/A	DART Red Line	DART Red Line	None	None	None	DART Red Line
Combined Service	N/A	None	None	None	Cotton Belt	DART Red Line	None
Southern Terminus	N/A	Bush Turnpike	Bush Turnpike	Parker Road	DFW Airport	West Oak Cliff	Mocking-bird
Number of Stations	0	11	8	8	8	11	11
Transit							
Estimated Daily Ridership	0	7,370	7,280	4,300	5,740	9,320	8,230
Linked Regional Transit Trips	293,041	297,710	297,776	295,313	298,478	298,657	300,454
Corridor Travel Time (minutes)	N/A	29.7	28.1	23.9	61.8	78.7	49.7
Daily DART service transfer trips	N/A	2,800	2,730	1,680	1,020	4,050	3,510
Property Acquisition (ROW Needed for Alignment)	None	None	None	None	None	None	None
Project Costs							
Total Cost (millions, 2009 dollars)	N/A	$1,075	$1,050	$400	$975	$1,075	$1,200
Cost Per Mile (millions, 2009 dollars)	N/A	$61	$59	$23	$22	$61	$68
Annualized Cost Per Rider	N/A	$37	$36	$23	$20	$29	$36
Land Use							
Compatibility with Local Plans	Low	High	Medium	Medium	Medium	High	High
Major Employers	1	11	6	6	6	11	11
Activity Centers	15	65	49	49	49	65	65
Community Facilities	1	15	14	14	14	15	15
Historic and Archeological Resources							
Existing Historical Sites	0	39	36	36	36	39	39
Archeological Investigations	4	22	17	17	17	22	22
Potential Historical Structures	11	709	630	630	630	709	709
Parks, Trails and Recreational Facilities							
Facilities adjacent to Rail Corridor	0	2	2	2	2	2	2
Facilities near Stations	4	43	31	31	31	43	43
Hazardous/Regulated Materials							
Sites adjacent to Rail Corridor	0	5	5	5	5	5	5
Sites near Stations	0	6	2	2	2	6	6
Air Quality Impact	None	Positive	Positive	Positive	Positive	Positive	Positive
Noise (linear feet)							
Potential Sensitive Land Uses	0	25,976	25,976	25,976	25,976	25,976	25,976
Vibration (linear feet)							
Potential Sensitive Land Uses							
Category 1	0	0	0	0	0	0	0
Category 2	0	18,925	18,925	18,925	18,925	18,925	18,925
Category 3	0	7,050	7,050	7,050	7,050	7,050	7,050
Water Resources							
Floodplain Crossings (in linear feet)	0	14,252	14,252	14,252	14,252	14,252	14,252
Stream Crossings	0	8	8	8	8	8	8
Ecosystems	0	0	0	0	0	0	0
Prime Farmlands (acres)	27	1,444	1,125	1,125	1,125	1,444	1,444
Constructability Difficulty[2]	N/A	Medium	Medium	Low	High	Low	Medium

Source: NCTCOG, January 2010

1. Data reflect conditions for alignments from Parker Road Station to the potential McKinney North 2 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
Parker Road Station (Existing)	
• Connects to DART Red Line • Located within DART service area • Opportunities for redevelopment and densification • Existing park-and-ride facility access from major roadways including: US 75, Avenue K, Parker Road, and Park Boulevard • Local street and sidewalk network provides bicycle and pedestrian access • Major employers and activity centers within one-half mile	• Need to elevate rail line over Parker Road • Potential need to redesign existing station and parking depending on vehicle selected
Legacy Drive Station	
• Compatible with City of Plano plans • Located within DART service area • Opportunities for redevelopment and densification • Access to major roadways including: US 75, Avenue K, Legacy Drive, and Spring Creek Parkway • Local street and sidewalk network provides bicycle and pedestrian access • Major employers and activity centers within one-half mile	• Close proximity to potential Millennium Business Park Station depending on vehicle selected • Limited sites for station development and parking • Undeveloped land within identified floodplains
Millennium Business Park Station	
• Opportunities for redevelopment and densification • Park-and-ride access through US 75 and Greenville Avenue • Local street and sidewalk network provides bicycle and pedestrian access • Major employers and activity centers within one-half mile	• Close proximity to potential Downtown Allen Station and Legacy Drive Station depending on vehicle selected • Undeveloped land within identified floodplains • Not currently in a primary transit agency service area

Table 7-2 Summary of Station Findings (continued)

Benefits	Challenges
Downtown Allen Station	
• Compatible with City of Allen plans • Opportunities for redevelopment and densification • Access to major roadways including: US 75, Greenville Avenue, and McDermott Drive/Main Street • Local street and sidewalk network provides bicycle and pedestrian access • Major employers, special events, and activity centers within one-half mile	• Close proximity to potential Millennium Business Park Station depending on vehicle selected • Limited sites for station parking • Not currently in a primary transit agency service area
Stacy Road Station	
• Compatible with City of Allen and Town of Fairview plans • Opportunities for new TOD • Included in The Village at Allen • Park-and-ride access through US 75 and FM 2786 (Stacy Road) • Local street and sidewalk network provides bicycle and pedestrian access • Major employers, special events, and activity centers within one-half mile	• Potential need to elevate station • Limited sites for station parking • Shared parking agreement may be required • Not currently in a primary transit agency service area
Fairview/SH 5 Station	
• Compatible with Town of Fairview plans • Opportunities for new TOD • Included in Fairview Center development • Access to SH 5 (Greenville Drive) • McKinney Medical Center within three-fourths of a mile	• Minimal existing development near station • Potential hazardous/regulated material sites within one-half mile • Not currently in a primary transit agency service area
Industrial Boulevard Station	
• Compatible with City of McKinney plans • Access to major arterial roadways including: SH 5 (McDonald Street), Industrial Boulevard, and Eldorado Parkway • Local street and sidewalk network provides bicycle and pedestrian access • Major employers and activity centers within one-half mile • Collin County Regional Airport within one mile	• Close proximity to potential Downtown McKinney Station depending on vehicle selected • Limited sites for station development and parking • Numerous identified and/or potentially historical resources within one-half mile • Potential hazardous/regulated material sites within one-half mile • Pecan Grove Cemetery within one-half mile • Not currently in a primary transit agency service area

Table 7-2 Summary of Station Findings (continued)

Benefits	Challenges
Downtown McKinney Station	
• Compatible with City of McKinney plans • Opportunities for redevelopment and densification and opportunities for new TOD • Access to major arterial roadways including: SH 5 (McDonald Street), Virginia Street, and Louisiana Street • Local street and sidewalk network provides bicycle and pedestrian access • Major employers, special events, and activity centers within one-half mile	• Close proximity to potential US 380–McKinney Station and Industrial Boulevard Station depending on vehicle selected • Limited sites for station parking • Numerous identified and/or potential historical resources within one-half mile • Not currently in a primary transit agency service area
US 380–McKinney Station	
• Compatible with City of McKinney plans • Park-and-ride access through US 380 and SH 5 (McDonald Street) • Major employers and activity centers within one-half mile	• Close proximity to potential McKinney North 1 Station and Downtown McKinney Station depending on vehicle selected • Potential hazardous/regulated material sites within one-half mile • Not currently in a primary transit agency service area
McKinney North 1 Station	
• Compatible with City of McKinney plans • Opportunities for new TOD	• Located outside of current city limits • No existing transportation infrastructure to support station • Minimal existing development near station • Close proximity to potential McKinney North 2 Station and US 380–McKinney Station depending on vehicle selected • Undeveloped land within identified floodplains • Potential hazardous/regulated material sites within one-half mile • Not currently in a primary transit agency service area
McKinney North 2 Station	
• Compatible with City of McKinney plans • Opportunities for new transit oriented development (TOD) • Park-and-ride access through SH 5 and SH 121	• Located outside of current city limits • No existing transportation infrastructure to support station • Minimal existing development near station • Close proximity to potential McKinney North 1 Station depending on vehicle selected • Not currently in a primary transit agency service area

Source: NCTCOG February, 2010

7.4 NEXT STEPS

The McKinney 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

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 the DART right-of-way
  - Joint agreement for usage rights depending on implementing entity
  - Determine best track ownership scenario depending on implementing entity
  - Identify, define, and overcome challenges
  - Freight/commuter train modeling in McKinney

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
- Investigate interlined or continuous service opportunities with other passenger rail services
  - Cotton Belt
  - DART Red Line
- Identify and secure appropriate funding sources
- Achieve environmental documentation approval from reviewing agencies

APPENDIX A
COST ESTIMATES

TABLE OF CONTENTS

A.1 ALTERNATIVE 1

Corridor: McKinney Corridor (Alternative 1)
Corridor Limits: LRT from Bush Turnpike Station to McKinney North 2 Station (All Stations Included)
Total Length (Miles): 17.7
Total Length (Feet): 93,500
Number of Stations: 10
Number of Vehicles: 17
Number of Support Busses: 20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Double Track, 136# CWR (Ties, rail, ballast)	93,500	FT	$620	$57,970,000
10.02	New Siding Track, 136# CWR	32,200	FT	$310	$9,982,000
10.03	New Station Siding Track, 136# CWR	0	FT	$310	$0
10.04	New Turnout #20, 136# Rail	6	EA	$485,000	$2,910,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	0	EA	$485,000	$0
10.06	New Railroad Diamond Crossing, 136# Rail	2	EA	$400,000	$800,000
10.07	Highway/Railroad Grade Separation (RR over Roadway)	6	EA	$7,000,000	$42,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete	2,070	TF	$3,280	$6,789,600
10.10	New Bridge - US 380, Concrete	470	TF	$3,710	$1,743,700
10.11	Retaining Wall (0 FT - 10 FT High), one side	0	LF	$575	$0
10.12	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.13	Fencing	187,000	LF	$25	$4,675,000
	SUBTOTAL				**$126,870,300**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	30	AC	$100,500	$3,015,000
20.02	Utilities Allowance	10	Station	$325,000	$3,250,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$2,200,000	$2,200,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	9	EA	$3,200,000	$28,800,000
20.05	Parking Spaces, Surface Lot	3,000	EA	$4,000	$12,000,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	13,500	SY	$60	$810,000
20.08	Reconstruct Roadway for Station Access	6,500	SY	$30	$195,000
	SUBTOTAL				**$50,270,000**

		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	$500	$2,640,000
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	$5,000	$3,000,000
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	7,100	SY	$15	$106,500
30.09	Fencing	2,300	LF	$25	$57,500
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$6,984,000**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	17.7	MI	$1,500,000	$26,550,000
40.02	Utilities Allowance (Alignment)	17.7	MI	$1,848,000	$32,709,600
40.03	New Railbed - Mainline	17.7	MI	$286,000	$5,062,200
40.04	New Railbed - Station Sidings	0	MI	$286,000	$0
40.05	New Railbed - Passing Sidings	6.1	MI	$286,000	$1,744,600
40.06	Betterments (10% of total project length)	1.77	MI	$528,000	$934,560
	SUBTOTAL				**$67,000,960**
50	**ELECTRIFICATION, SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	93,500	LF	$225	$21,037,500
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	0	EA	$100,000	$0
50.03	Traction Electrification	93,500	LF	$700	$65,450,000
50.04	PTC - Wayside (control points, switches, intermediate signals)	0	EA	$25,000	$0
50.05	PTC - Office	0	EA	$25,000	$0
50.06	PTC - Communications	0	EA	$1,700	$0
50.07	PTC - System Engineering	0	EA	$24,500	$0
50.08	PTC - Program Management	0	EA	$11,500	$0
50.09	CTC System (at Control Points)	93,500	LF	$900	$84,150,000
50.10	Minor Street At-grade (New/Modify Gates & Devices)	9	EA	$345,000	$3,105,000
50.11	Major Street At-grade (New Gates & Warning Devices)	6	EA	$515,000	$3,090,000
50.12	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.13	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.14	Special Conditions Contingency	17.7	MI	$1,000,000	$17,700,000
	SUBTOTAL				**$196,012,500**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$447,137,760**
DART Allowances					
Design Contingency (30%)			%	0.30	$134,141,328
					$581,279,088
Construction Contingency (10%)			%	0.10	$58,127,909
DART Add-on Allowance (32%)			%	0.32	$186,009,308
					$825,416,305
Environmental Allowance (1%)			%	0.01	$5,812,791
	SUBTOTAL				**$831,229,096**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (15% of Subtotal of Design Contingency)		%	0.15	$87,191,863
	SUBTOTAL				**$87,191,863**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail Transit	17	EA	$8,100,000	$137,700,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$152,700,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
90.02	Cost Allocation for Increased Passenger Services	0	LS	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$1,071,120,959**
	COST PER MILE				**$60,515,308**

A.2 ALTERNATIVE 2

Corridor: McKinney Corridor (Alternative 2)
Corridor Limits: LRT from Bush Turnpike Station to McKinney North 2 Station (No Millenium Bus. Park/Industrial Blvd./McKinney North 1 Stn.)
Total Length (Miles): 17.7
Total Length (Feet): 93,500
Number of Stations: 10
Number of Vehicles: 17
Number of Support Busses: 20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Double Track, 136# CWR (Ties, rail, ballast)	93,500	FT	$620	$57,970,000
10.02	New Siding Track, 136# CWR	32,200	FT	$310	$9,982,000
10.03	New Station Siding Track, 136# CWR	0	FT	$310	$0
10.04	New Turnout #20, 136# Rail	6	EA	$485,000	$2,910,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	0	EA	$485,000	$0
10.06	New Railroad Diamond Crossing, 136# Rail	2	EA	$400,000	$800,000
10.07	Highway/Railroad Grade Separation (RR over Roadway)	6	EA	$7,000,000	$42,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete	2,070	TF	$3,280	$6,789,600
10.10	New Bridge - US 380, Concrete	470	TF	$3,710	$1,743,700
10.11	Retaining Wall (0 FT - 10 FT High), one side	0	LF	$575	$0
10.12	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.13	Fencing	187,000	LF	$25	$4,675,000
	SUBTOTAL				**$126,870,300**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	21	AC	$100,500	$2,110,500
20.02	Utilities Allowance	7	Station	$325,000	$2,275,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$2,200,000	$2,200,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	6	EA	$3,200,000	$19,200,000
20.05	Parking Spaces, Surface Lot	2,100	EA	$4,000	$8,400,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	9,450	SY	$60	$567,000
20.08	Reconstruct Roadway for Station Access	4,550	SY	$30	$136,500
	SUBTOTAL				**$34,889,000**

		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	$500	$2,640,000
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	$5,000	$3,000,000
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	$106,500
30.09	Fencing	2,300	LF	$25	$57,500
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$6,984,000**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	17.7	MI	$1,500,000	$26,550,000
40.02	Utilities Allowance (Alignment)	17.7	MI	$1,848,000	$32,709,600
40.03	New Railbed - Mainline	17.7	MI	$286,000	$5,062,200
40.04	New Railbed - Station Sidings	0	MI	$286,000	$0
40.05	New Railbed - Passing Sidings	6.1	MI	$286,000	$1,744,600
40.06	Betterments (10% of total project length)	1.77	MI	$528,000	$934,560
	SUBTOTAL				**$67,000,960**
50	**ELECTRIFICATION, SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	93,500	LF	$225	$21,037,500
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	0	EA	$100,000	$0
50.03	Traction Electrification	93,500	LF	$700	$65,450,000
50.04	PTC - Wayside (control points, switches, intermediate signals)	0	EA	$25,000	$0
50.05	PTC - Office	0	EA	$25,000	$0
50.06	PTC - Communications	0	EA	$1,700	$0
50.07	PTC - System Engineering	0	EA	$24,500	$0
50.08	PTC - Program Management	0	EA	$11,500	$0
50.09	CTC System (at Control Points)	93,500	LF	$900	$84,150,000
50.10	Minor Street At-grade (New/Modify Gates & Devices)	9	EA	$345,000	$3,105,000
50.11	Major Street At-grade (New Gates & Warning Devices)	6	EA	$515,000	$3,090,000
50.12	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.13	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.14	Special Conditions Contingency	17.7	MI	$1,000,000	$17,700,000
	SUBTOTAL				**$196,012,500**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$431,756,760**
DART Allowances					
Design Contingency (30%)			%	0.30	$129,527,028
					$561,283,788
Construction Contingency (10%)			%	0.10	$56,128,379
DART Add-on Allowance (32%)			%	0.32	$179,610,812
					$797,022,979
Environmental Allowance (1%)			%	0.01	$5,612,838
	SUBTOTAL				**$802,635,817**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (15% of Subtotal of Design Contingency)		%	0.15	$84,192,568
	SUBTOTAL				**$84,192,568**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail Transit	17	EA	$8,100,000	$137,700,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$152,700,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
90.02	Cost Allocation for Increased Passenger Services	0	LS	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$1,039,528,385**
	COST PER MILE				**$58,730,417**

A.3 ALTERNATIVE 3

Corridor: McKinney Corridor (Alternative 3)
Corridor Limits: LRNT from Parker Road Station to McKinney North 2 Station (No Millenium Bus. Park/Industrial Blvd./McKinney North 1 Stn.)
Total Length (Miles): 17.7
Total Length (Feet): 93,500
Number of Stations: 7
Number of Vehicles: 7
Number of Support Busses: 20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	93,500	FT	$310	$28,985,000
10.02	New Siding / Double Track, 136# CWR	3,000	FT	$310	$930,000
10.03	New Station Siding Track, 136# CWR	13,200	FT	$310	$4,092,000
10.04	New Turnout #20, 136# Rail	6	EA	$485,000	$2,910,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	14	EA	$485,000	$6,790,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	6	EA	$7,000,000	$42,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete	2,070	TF	$1,200	$2,484,000
10.10	New Bridge - US 380, Concrete	470	TF	$1,200	$564,000
10.11	Retaining Wall (0 FT - 10 FT High), one side	0	LF	$575	$0
10.12	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.13	Fencing	187,000	LF	$25	$4,675,000
	SUBTOTAL				**$93,430,000**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	21	AC	$100,500	$2,110,500
20.02	Utilities Allowance	7	Station	$325,000	$2,275,000
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.)	7	EA	$2,831,000	$19,817,000
20.05	Parking Spaces, Surface Lot	2,100	EA	$4,000	$8,400,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	9,450	SY	$60	$567,000
20.08	Reconstruct Roadway for Station Access	4,550	SY	$30	$136,500
	SUBTOTAL				**$35,006,000**

		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	$500	$2,640,000
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	7,100	SY	$15	$106,500
30.09	Fencing	2,300	LF	$25	$57,500
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$4,134,000**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	17.7	MI	$12,000	$212,400
40.02	Utilities Allowance (Alignment)	17.7	MI	$20,000	$354,000
40.03	New Railbed - Mainline	17.7	MI	$286,000	$5,062,200
40.04	New Railbed - Station Sidings	2.5	MI	$286,000	$715,000
40.05	New Railbed - Passing Sidings	0.6	MI	$286,000	$171,600
	SUBTOTAL				**$6,515,200**
50	**ELECTRIFICATION, 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	Traction Electrification	0	LF	$700	$0
50.04	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.05	PTC - Office	1	EA	$25,000	$25,000
50.06	PTC - Communications	1	EA	$1,700	$1,700
50.07	PTC - System Engineering	1	EA	$24,500	$24,500
50.08	PTC - Program Management	1	EA	$11,500	$11,500
50.09	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.10	Minor Street At-grade (New/Modify Gates & Devices)	9	EA	$345,000	$3,105,000
50.11	Major Street At-grade (New Gates & Warning Devices)	6	EA	$515,000	$3,090,000
50.12	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.13	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.14	Special Conditions Contingency	17.7	MI	$1,000,000	$17,700,000
	SUBTOTAL				**$29,012,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$168,097,900**
DART Allowances					
Design Contingency (30%)			%	0.30	$50,429,370
					$218,527,270
Construction Contingency (10%)			%	0.10	$21,852,727
DART Add-on Allowance (32%)			%	0.32	$69,928,726
					$310,308,723
Environmental Allowance (1%)			%	0.01	$2,185,273
	SUBTOTAL				**$312,493,996**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$8,741,091
	SUBTOTAL				**$8,741,091**
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
90.02	Cost Allocation for Increased Passenger Services	0	LS	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$397,835,087**
	COST PER MILE				**$22,476,559**

A.4 ALTERNATIVE 4

Corridor: Combined McKinney Corridor/Cotton Belt Corridor (Alternative 4)
Corridor Limits: LRNT from DFW Airport Station to McKinney North 2 Station (No Millenium Bus. Park/Industrial Blvd./McKinney North 1 Stn)
Total Length (Miles): 44.6
Total Length (Feet): 235,500
Number of Stations: 17
Number of Vehicles: 17
Number of Support Busses: 20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Main Track, 136# CWR (Ties, rail, ballast)	235,500	FT	$310	$73,005,000
10.02	New Siding / Double Track, 136# CWR	9,000	FT	$310	$2,790,000
10.03	New Station Siding Track, 136# CWR	22,400	FT	$310	$6,944,000
10.04	New Turnout #20, 136# Rail	18	EA	$485,000	$8,730,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	30	EA	$485,000	$14,550,000
10.06	New Railroad Diamond Crossing, 136# Rail	0	EA	$400,000	$0
10.07	Highway/Railroad Grade Separation (RR over Roadway)	14	EA	$7,000,000	$98,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete	2,070	TF	$1,200	$2,484,000
10.10	New Bridge - US 380, Concrete	470	TF	$1,200	$564,000
10.11	Retaining Wall (0 FT - 10 FT High), one side	0	LF	$575	$0
10.12	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.13	Fencing	471,000	LF	$25	$11,775,000
	SUBTOTAL				**$218,842,000**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	51	AC	$100,500	$5,125,500
20.02	Utilities Allowance	17	Station	$325,000	$5,525,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	0	EA	$1,700,000	$0
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	17	EA	$2,831,000	$48,127,000
20.05	Parking Spaces, Surface Lot	5,100	EA	$4,000	$20,400,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	22,950	SY	$60	$1,377,000
20.08	Reconstruct Roadway for Station Access	11,050	SY	$30	$331,500
	SUBTOTAL				**$80,886,000**

		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	$500	$2,640,000
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	7,100	SY	$15	$106,500
30.09	Fencing	2,300	LF	$25	$57,500
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$4,134,000**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	44.6	MI	$12,000	$535,200
40.02	Utilities Allowance (Alignment)	44.6	MI	$20,000	$892,000
40.03	New Railbed - Mainline	44.6	MI	$286,000	$12,755,600
40.04	New Railbed - Station Sidings	4.25	MI	$286,000	$1,215,500
40.05	New Railbed - Passing Sidings	1.7	MI	$286,000	$486,200
	SUBTOTAL				**$15,884,500**
50	**ELECTRIFICATION, 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	Traction Electrification	0	LF	$700	$0
50.04	PTC - Wayside (control points, switches, intermediate signals)	1	EA	$25,000	$25,000
50.05	PTC - Office	1	EA	$25,000	$25,000
50.06	PTC - Communications	1	EA	$1,700	$1,700
50.07	PTC - System Engineering	1	EA	$24,500	$24,500
50.08	PTC - Program Management	1	EA	$11,500	$11,500
50.09	CTC System (at Control Points)	1	EA	$750,000	$750,000
50.10	Minor Street At-grade (New/Modify Gates & Devices)	22	EA	$345,000	$7,590,000
50.11	Major Street At-grade (New Gates & Warning Devices)	33	EA	$515,000	$16,995,000
50.12	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.13	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.14	Special Conditions Contingency	44.6	MI	$1,000,000	$44.600,000
	SUBTOTAL				**$74,302,700**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$394,049,200**
DART Allowances					
Design Contingency (30%)			%	0.30	$118,214,760
					$512,263,960
Construction Contingency (10%)			%	0.10	$51,226,396
DART Add-on Allowance (32%)			%	0.32	$163,924,467
					$727,414,823
Environmental Allowance (1%)			%	0.01	$5,122,640
	SUBTOTAL				**$732,537,463**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (4% of Subtotal of Design Contingency)		%	0.04	$20,490,558
	SUBTOTAL				**$20,490,558**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail Transit	17	EA	$8,800,000	$149,600,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$164,600,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	1	EA	$50,000,000	$50,000,000
90.02	Cost Allocation for Increased Passenger Services	0	LS	$0	$0
	SUBTOTAL				**$50,000,000**
	TOTAL PROJECT COST				**$967,628,021**
	COST PER MILE				**$21,695,696**

A.5 ALTERNATIVE 5

Corridor: Combined McKinney Corridor/DART Red Line (Alternative 5)
Corridor Limits: LRT from West Oak Cliff to McKinney North 2 Station (All Stations)
Total Length (Miles): 17.7
Total Length (Feet): 93,500
Number of Stations: 10
Number of Vehicles: 17
Number of Support Busses: 20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Double Track, 136# CWR (Ties, rail, ballast)	93,500	FT	$620	$57,970,000
10.02	New Siding Track, 136# CWR	32,200	FT	$310	$9,982,000
10.03	New Station Siding Track, 136# CWR	0	FT	$310	$0
10.04	New Turnout #20, 136# Rail	6	EA	$485,000	$2,910,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	0	EA	$485,000	$0
10.06	New Railroad Diamond Crossing, 136# Rail	2	EA	$400,000	$800,000
10.07	Highway/Railroad Grade Separation (RR over Roadway)	6	EA	$7,000,000	$42,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete	2,070	TF	$3,280	$6,789,600
10.10	New Bridge - US 380, Concrete	470	TF	$3,710	$1,743,700
10.11	Retaining Wall (0 FT - 10 FT High), one side	0	LF	$575	$0
10.12	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.13	Fencing	187,000	LF	$25	$4,675,000
	SUBTOTAL				**$126,870,300**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	30	AC	$100,500	$3,015,000
20.02	Utilities Allowance	10	Station	$325,000	$3,250,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$2,200,000	$2,200,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	9	EA	$3,200,000	$28,800,000
20.05	Parking Spaces, Surface Lot	3,000	EA	$4,000	$12,000,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	13,500	SY	$60	$810,000
20.08	Reconstruct Roadway for Station Access	6,500	SY	$30	$195,000
	SUBTOTAL				**$50,270,000**

		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	$500	$2,640,000
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	$5,000	$3,000,000
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	7,100	SY	$15	$106,500
30.09	Fencing	2,300	LF	$25	$57,500
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$6,984,000**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	17.7	MI	$1,500,000	$26,550,000
40.02	Utilities Allowance (Alignment)	17.7	MI	$1,848,000	$32,709,600
40.03	New Railbed - Mainline	17.7	MI	$286,000	$5,062,200
40.04	New Railbed - Station Sidings	0	MI	$286,000	$0
40.05	New Railbed - Passing Sidings	6.1	MI	$286,000	$1,744,600
40.06	Betterments (10% of total project length)	1.77	MI	$528,000	$934,560
	SUBTOTAL				**$67,000,960**
50	**ELECTRIFICATION, SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	93,500	LF	$225	$21,037,500
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	0	EA	$100,000	$0
50.03	Traction Electrification	93,500	LF	$700	$65,450,000
50.04	PTC - Wayside (control points, switches, intermediate signals)	0	EA	$25,000	$0
50.05	PTC - Office	0	EA	$25,000	$0
50.06	PTC - Communications	0	EA	$1,700	$0
50.07	PTC - System Engineering	0	EA	$24,500	$0
50.08	PTC - Program Management	0	EA	$11,500	$0
50.09	CTC System (at Control Points)	93,500	LF	$900	$84,150,000
50.10	Minor Street At-grade (New/Modify Gates & Devices)	9	EA	$345,000	$3,105,000
50.11	Major Street At-grade (New Gates & Warning Devices)	6	EA	$515,000	$3,090,000
50.12	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.13	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.14	Special Conditions Contingency	17.7	MI	$1,000,000	$17,700,000
	SUBTOTAL				**$196,012,500**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$447,137,760**
DART Allowances					
Design Contingency (30%)			%	0.30	$134,141,328
					$581,279,088
Construction Contingency (10%)			%	0.10	$58,127,909
DART Add-on Allowance (32%)			%	0.32	$186,009,308
					$825,416,305
Environmental Allowance (1%)			%	0.01	$5,812,791
	SUBTOTAL				**$831,229,096**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (15% of Subtotal of Design Contingency)		%	0.15	$87,191,863
	SUBTOTAL				**$87,191,863**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail Transit	17	EA	$8,100,000	$137,700,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$152,700,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
90.02	Cost Allocation for Increased Passenger Services	0	LS	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$1,071,120,959**
	COST PER MILE				**$60,515,308**

A.6 ALTERNATIVE 6

Corridor: McKinney Corridor (Alternative 6)
Corridor Limits: LRT from Mockingbird Station to McKinney North 2 Station (All Stations)
Total Length (Miles): 17.7
Total Length (Feet): 93,500
Number of Stations: 10
Number of Vehicles: 33
Number of Support Busses: 20

		Quantity	Unit	Unit Price	Cost
10	**GUIDEWAY & TRACK ELEMENTS**				
10.01	New Double Track, 136# CWR (Ties, rail, ballast)	93,500	FT	$620	$57,970,000
10.02	New Siding Track, 136# CWR	32,200	FT	$310	$9,982,000
10.03	New Station Siding Track, 136# CWR	0	FT	$310	$0
10.04	New Turnout #20, 136# Rail	6	EA	$485,000	$2,910,000
10.05	New Turnout #20, 136# Rail, Station Siding / Double Track	0	EA	$485,000	$0
10.06	New Railroad Diamond Crossing, 136# Rail	2	EA	$400,000	$800,000
10.07	Highway/Railroad Grade Separation (RR over Roadway)	6	EA	$7,000,000	$42,000,000
10.08	Railroad/Railroad Grade Separation (Railroad over RR)	0	TF	$6,500	$0
10.09	New Bridge, Concrete	2,070	TF	$3,280	$6,789,600
10.10	New Bridge - US 380, Concrete	470	TF	$3,710	$1,743,700
10.11	Retaining Wall (0 FT - 10 FT High), one side	0	LF	$575	$0
10.12	Retaining Wall (10 FT - 20 FT High), one side	0	LF	$1,200	$0
10.13	Fencing	187,000	LF	$25	$4,675,000
	SUBTOTAL				**$126,870,300**
20	**PASSENGER STATIONS & PARKING**				
20.01	Earthwork, General Clearing and Grading	30	AC	$100,500	$3,015,000
20.02	Utilities Allowance	10	Station	$325,000	$3,250,000
20.03	Station, At-Grade, Center Platform (Canopy, Fare Equip, Security, etc.)	1	EA	$2,200,000	$2,200,000
20.04	Station, At-Grade, 2 Side Platforms (Canopy, Fare Equip, Security, etc.)	9	EA	$3,200,000	$28,800,000
20.05	Parking Spaces, Surface Lot	3,000	EA	$4,000	$12,000,000
20.06	Pedestrian Overcrossing	0	EA	$1,000,000	$0
20.07	New Roadway for Station Access	13,500	SY	$60	$810,000
20.08	Reconstruct Roadway for Station Access	6,500	SY	$30	$195,000
	SUBTOTAL				**$50,270,000**

		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	$500	$2,640,000
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	$5,000	$3,000,000
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	7,100	SY	$15	$106,500
30.09	Fencing	2,300	LF	$25	$57,500
30.10	Utilities Allowance	1	LS	$200,000	$200,000
	SUBTOTAL				**$6,984,000**
40	**SITEWORK & SPECIAL CONDITIONS**				
40.01	Earthwork, General Clearing and Grading	17.7	MI	$1,500,000	$26,550,000
40.02	Utilities Allowance (Alignment)	17.7	MI	$1,848,000	$32,709,600
40.03	New Railbed - Mainline	17.7	MI	$286,000	$5,062,200
40.04	New Railbed - Station Sidings	0	MI	$286,000	$0
40.05	New Railbed - Passing Sidings	6.1	MI	$286,000	$1,744,600
40.06	Betterments (10% of total project length)	1.77	MI	$528,000	$934,560
	SUBTOTAL				**$67,000,960**
50	**ELECTRIFICATION, SIGNALING & COMMUNICATIONS SYSTEMS**				
50.01	Communications System (Trains, Stations, Yards, etc.)	93,500	LF	$225	$21,037,500
50.02	Positive Train Control (PTC) - Locomotives & Cab Cars	0	EA	$100,000	$0
50.03	Traction Electrification	93,500	LF	$700	$65,450,000
50.04	PTC - Wayside (control points, switches, intermediate signals)	0	EA	$25,000	$0
50.05	PTC - Office	0	EA	$25,000	$0
50.06	PTC - Communications	0	EA	$1,700	$0
50.07	PTC - System Engineering	0	EA	$24,500	$0
50.08	PTC - Program Management	0	EA	$11,500	$0
50.09	CTC System (at Control Points)	93,500	LF	$900	$84,150,000
50.10	Minor Street At-grade (New/Modify Gates & Devices)	9	EA	$345,000	$3,105,000
50.11	Major Street At-grade (New Gates & Warning Devices)	6	EA	$515,000	$3,090,000
50.12	At-Grade Crossing Surface, Concrete Panels	800	LF	$600	$480,000
50.13	Rail Safety Measures (including flagging)	1	LS	$1,000,000	$1,000,000
50.14	Special Conditions Contingency	17.7	MI	$1,000,000	$17,700,000
	SUBTOTAL				**$196,012,500**

		Quantity	Unit	Unit Price	Cost
BASIC CIVIL/SYSTEMS COST					**$447,137,760**
DART Allowances					
Design Contingency (30%)			%	0.30	$134,141,328
					$581,279,088
Construction Contingency (10%)			%	0.10	$58,127,909
DART Add-on Allowance (32%)			%	0.32	$186,009,308
					$825,416,305
Environmental Allowance (1%)			%	0.01	$5,812,791
	SUBTOTAL				**$831,229,096**
60	**RIGHT-OF-WAY ACQUISITION**				
60.01	Right-of-Way Allowance (Alignment) (15% of Subtotal of Design Contingency)		%	0.15	$87,191,863
	SUBTOTAL				**$87,191,863**
70	**VEHICLES**				
70.01	Rail Vehicles, Light Rail Transit	33	EA	$8,100,000	$267,300,000
70.02	Buses for Feeder Bus Service	20	EA	$750,000	$15,000,000
	SUBTOTAL				**$282,300,000**
90	**UNALLOCATED CONTINGENCY**				
90.01	Environmental Mitigation	0	EA	$0	$0
90.02	Cost Allocation for Increased Passenger Services	0	LS	$0	$0
	SUBTOTAL				**$0**
	TOTAL PROJECT COST				**$1,200,720,959**
	COST PER MILE				**$67,837,342**

A.7 SUMMARY

Table A-1 Rail Capital Costs Summary

Cost Category	Alternative					
	1	2	3	4	5	6
	Cost (millions of 2009 dollars)					
Guideway and Track Elements	$127	$127	$93	$219	$127	$127
Passenger Stations and Parking	$50	$35	$35	$81	$50	$50
Maintenance and Layover Facilities	$7	$7	$4	$4	$7	$7
Sitework & Special Conditions	$67	$67	$7	$16	$67	$67
Electrification, Signaling and Communications Systems	$196	$196	$29	$74	$196	$196
Allowances	$384	$371	$144	$338	$384	$384
Right-of-Way Acquisition	$87	$84	$9	$20	$87	$87
Vehicles	$153	$153	$77	$165	$153	$282
Unallocated Contingency[1]	$0	$0	$0	$50	$0	$0
Capital Cost Total	**$1,071**	**$1,040**	**$398**	**$967**	**$1,071**	**$1,200**
Approximate Capital Cost Total[2]	**$1,075**	**$1,050**	**$400**	**$975**	**$1,075**	**$1,200**

1. Alternative 4: Unallocated Contingency includes trench alignments proposed in the Cities of Dallas and Coppell, as well as an environmental contingency along the Cotton Belt Corridor
2. Approximate Capital Cost Total rounded to the nearest $25 million

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APPENDIX B
AFFECTED ENVIRONMENT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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B. AFFECTED ENVIRONMENT

Appendix B includes researched information for the McKinney Corridor regarding the affected environment and existing conditions. The study area used for this study represents a one-mile area surrounding the proposed McKinney Corridor as defined in Chapter 1, Section 1.4. The one-mile area best represents the potential resources possibly affected by the proposed project.

B.1 TRANSPORTATION SYSTEM

This section documents the existing and planned conditions of the transportation system within and near the study area. The proposed McKinney Corridor would provide regional rail service between Plano and McKinney along the Dallas Area Rapid Transit (DART) 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 McKinney Corridor 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), the Metropolitan Planning Organization (MPO) for the Dallas-Fort Worth (DFW) region, Texas Department of Transportation (TxDOT), and 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 DFW 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 McKinney Corridor study area. The local roadway system around each potential station in the study area is discussed in Chapter 3, Section 3.4.

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.

Current System

The most important transportation 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. US 75 and SH 5

are major roadway facilities that parallel the McKinney Corridor. Facilities that run generally perpendicular to the corridor are the Sam Rayburn Tollway (SRT) and US 380.

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 taken by TxDOT in 2004. DFWRTM forecasts indicate that in the study area, approximately 75 percent of the roads were operating at a LOS of A, B, or C in 2007; 13 percent of the roads were operating at a LOS of F; and the rest of the roads were at LOS D or E in the study area. Table B-1 shows the roadway segments that make up the RSA system within the study area, most of these RSAs serve east-west 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.

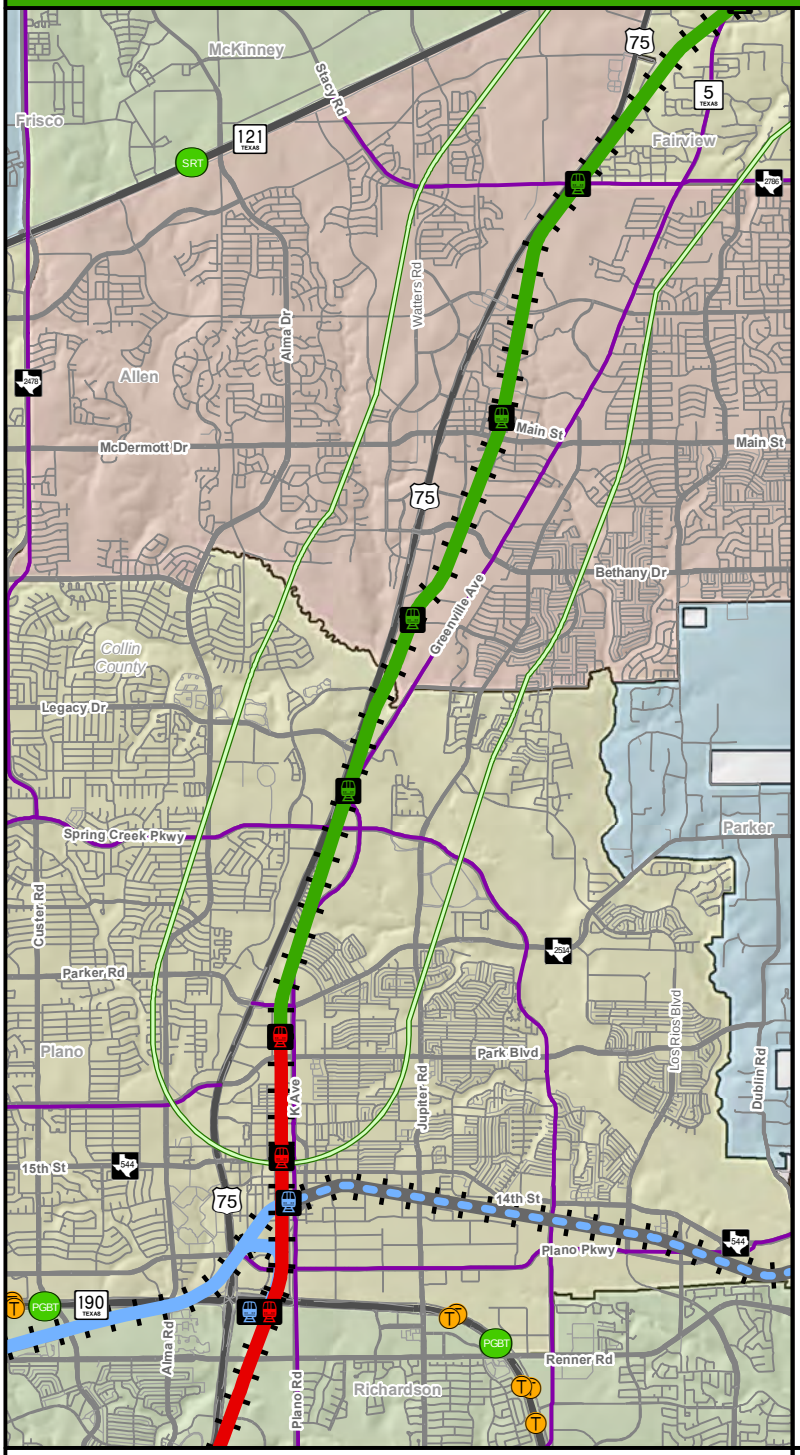
Table B-1 Regionally Significant Arterials

Street	RSA Segment ID	Limit A[1]	Limit B	Current Lanes	Direction	Length[2]
Eldorado Parkway	223.4	SH 5	US 75 frontage road	4	East-West	2.05
FM 546 Realignment	223.5	SH 5	Future arterial	0	East-West	1.30
FM 2786/ Stacy Road	207.1	US 75	FM 1378	2	East-West	1.39
FM 544/ Park Boulevard	222	Midway Road	US 75	6	East-West	1.32
Parker Road	232	US 75	SH 5/K Avenue	6	East-West	0.46
SH 121	209	Fannin County line	FM 2933	2	East-West	0.44
SH 5	211	Grayson County line	SH 121	2	North-South	0.40
SH 5/Greenville Avenue/K Avenue	210.20	Exchange Parkway	Renner Road	6	North-South	0.27
SH 5/ Greenville Avenue	210	Spur 399	Stacy Road	2	North-South	7.42
SH 5/ McDonald Street	208	SH 121	Tennessee Street	2	North-South	4.01
SH 5/ McDonald Street	208.1	Tennessee Street	Spur 399	4	North-South	4.28
Spring Creek Parkway	218	US 75	Parker Road	6	East-West	3.70
Spring Creek Parkway	219	Dallas North Tollway frontage northbound	US 75	6	East-West	1.09
Future Arterial	206	US 380	SH 5	0	North-South	1.03
Stacy Road	207	SH 121 frontage northbound	US 75 frontage southbound	6	East-West	3.63

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
PGBT to SRT



Legend

Existing Roadway Features

- Toll Plaza
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Minor Arterial
- Other Roadway

Other Items

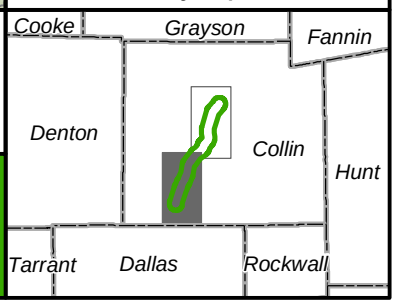
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map

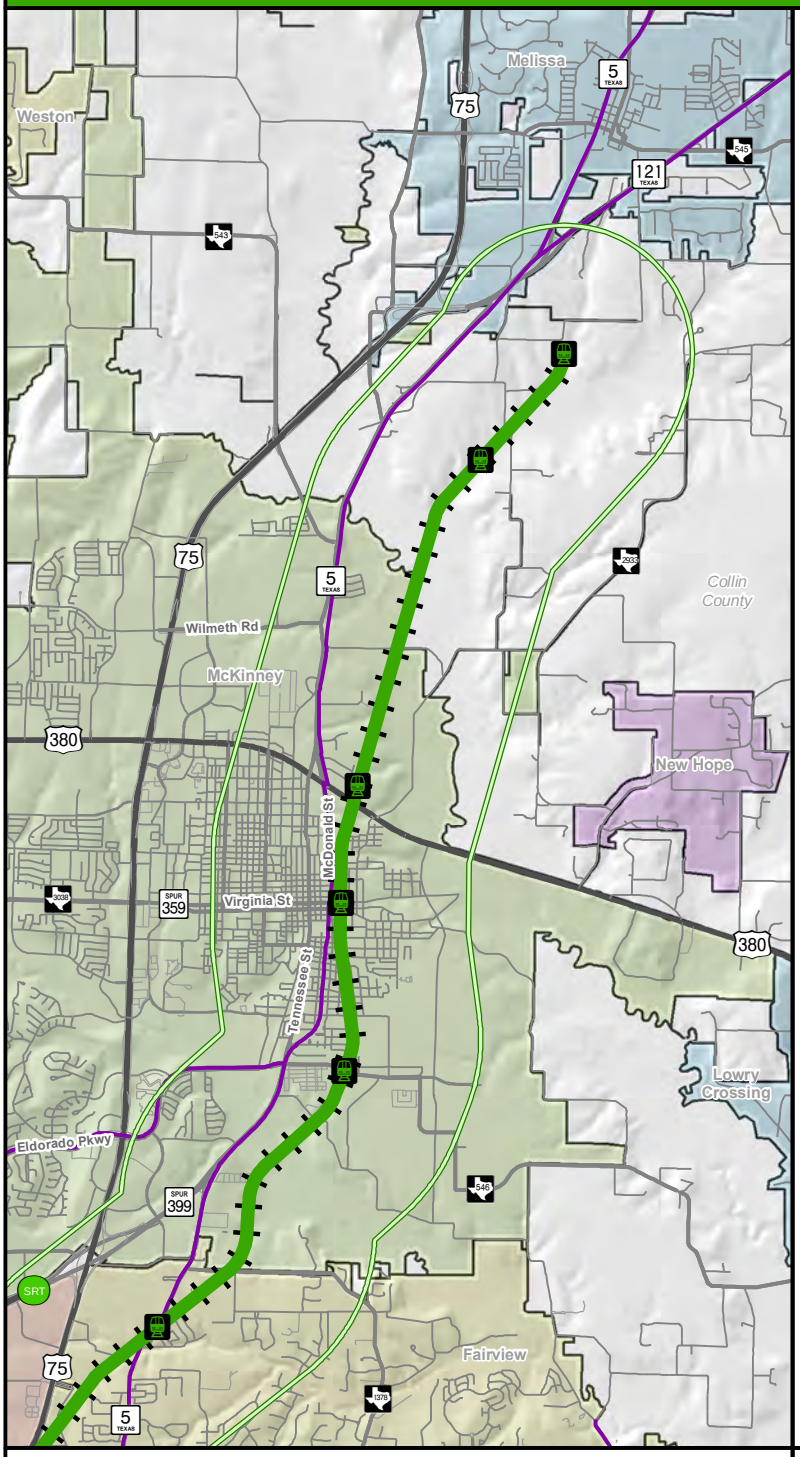


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; TxDOT

Figure B-2 — Existing Roadway System
SRT to FM 545



Legend

Existing Roadway Features

- Toll Plaza
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Minor Arterial
- Other Roadway

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
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- Study Area
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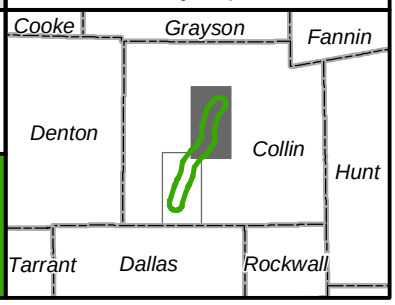
0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map

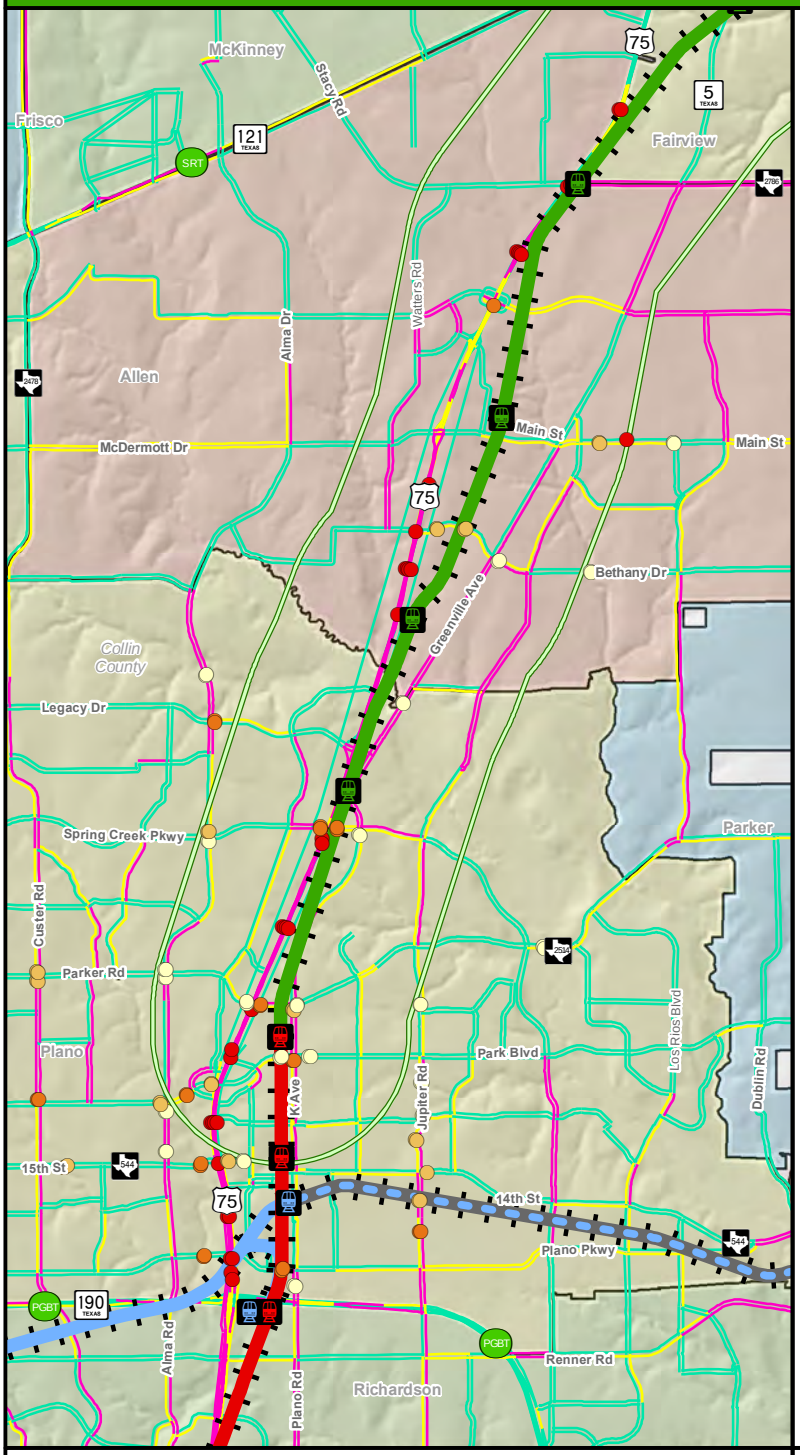


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

Figure B-3 — 2007 Level of Service and 2004 Traffic Counts
PGBT to SRT



Legend

Traffic and LOS Data

- 20,000-24,999 VPD
- 25,000-29,999 VPD
- 30,000-59,999 VPD
- 60,000+ VPD
- Level of Service A, B, C
- Level of Service D, E
- Level of Service F

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
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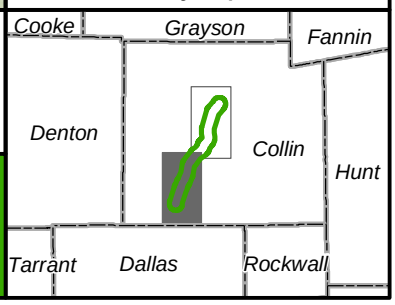
0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map

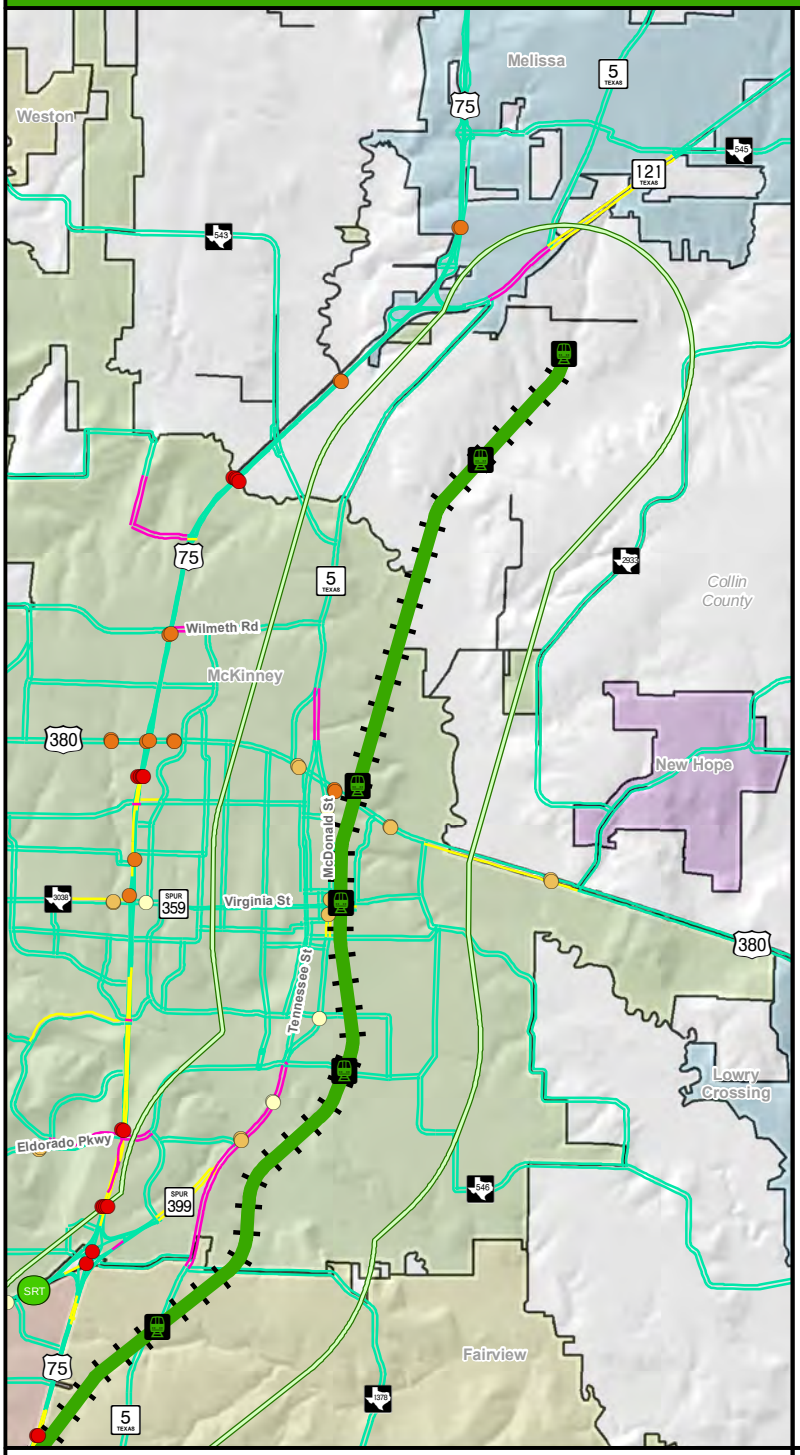


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; TxDOT

Figure B-4 — 2007 Level of Service and 2004 Traffic Counts
SRT to FM 545



Legend

Traffic and LOS Data

- 20,000-24,999 VPD
- 25,000-29,999 VPD
- 30,000-59,999 VPD
- 60,000+ VPD
- Level of Service A, B, C
- Level of Service D, E
- Level of Service F

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Study Area
- City / Town Limits
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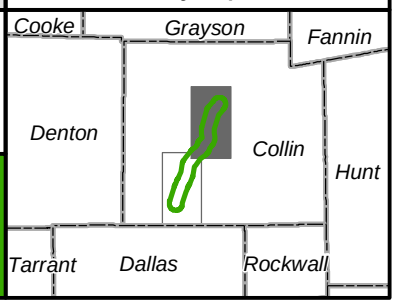
Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; TxDOT

Planned System Improvements

There are three highway or toll road improvement projects included in *Mobility 2030 - 2009 Amendment* that fall within the study area. Table B-2 lists the three highway and toll road improvements in the study area. Most of the improvements call for 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 Number	Limit A	Limit B	Current Lanes	Planned Lanes	Year Operational
SRT	39.1	US 75	Hillcrest Road	6 (Toll)	8 (Toll)	2010 – 2019
US 75	53.4	PGBT	Park Boulevard	8+2(HOV)	10+2(Managed)	2010 – 2019
	53.3	Park Boulevard	Legacy Drive	8+2(HOV)	8+2(Managed)	2007
	53.2	Legacy Drive	Exchange Parkway	6	8+2(Managed)	2010 – 2019
	53.1	Exchange Parkway	SH 121 South	6	8+2(Managed)	2010 – 2019
US 75	52.4	SH 121 South	US 380	4	8+2(Managed)	2010 – 2019
	52.3	US 380	SH 121 North	4	8	2010 – 2019
	52.2	SH 121 North	Regional Outer Loop	4	6	2010 – 2019
SH 121	52.5	FM 545	US 75	2/4 Arterial	4 Arterial	2010 – 2019

Source: NCTCOG, 2009

The RSAs within the study area pass through developed areas, constraining the possibility of expanding these facilities to carry more traffic. Through the year 2030, five of the 15 identified roadway segments anticipate having added lane capacity while two 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 seven segments is 12.6 miles (40 percent) of the projected total of 32.8 miles of RSAs within the study area in 2030. The additional roadways will increase the total lane miles of RSAs within the study area to 155.5 miles, an increase of 41 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

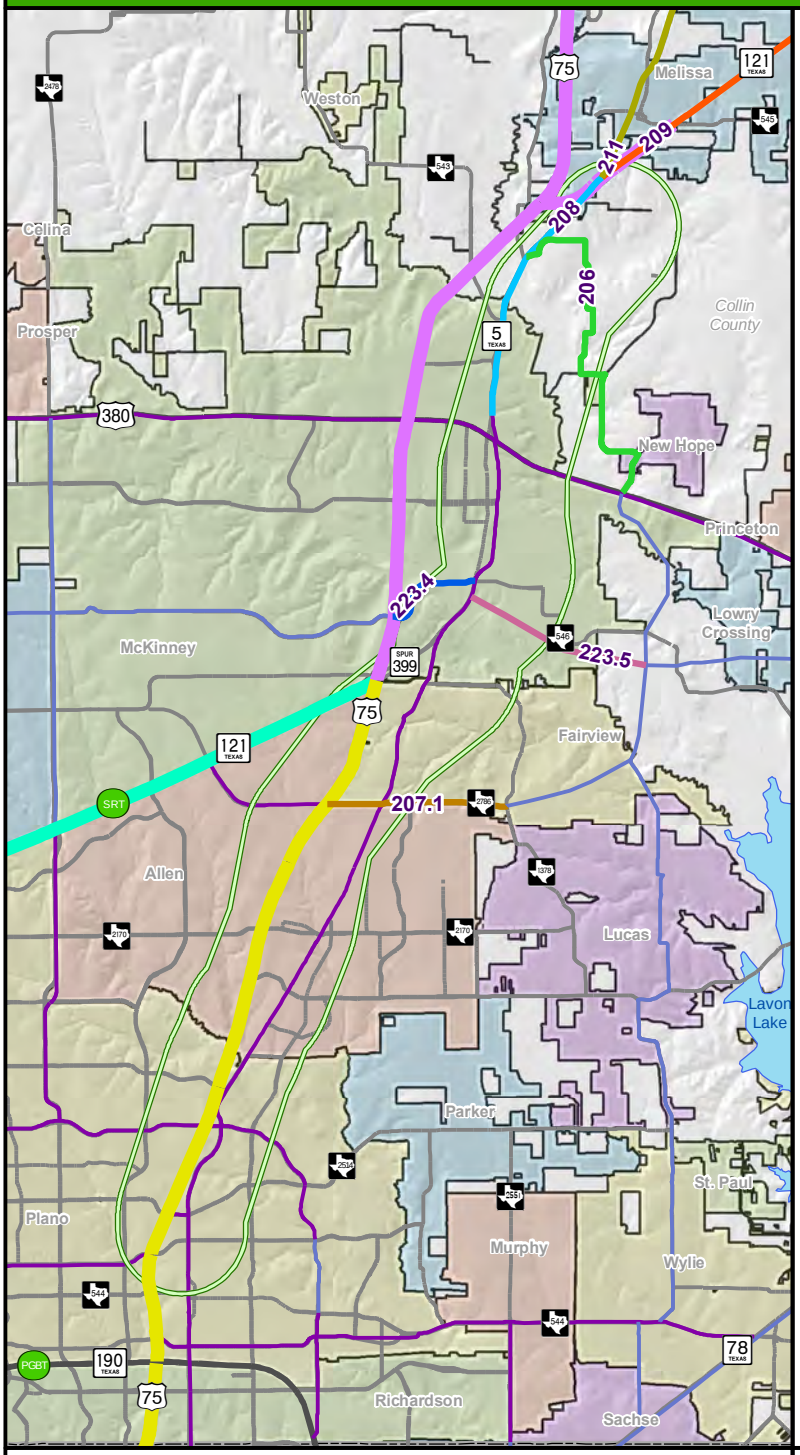
Street	RSA Segment ID[1]	Limit A	Limit B	Current Lanes	Planned 2030 Lanes	Length
FM 2786/Stacy Road	207.1	US 75	FM 1378	2	4	1.32
FM 546 Realignment	223.5	SH 5	Future arterial	0	6	1.39
Eldorado Parkway	223.4	SH 5	US 75 frontage road	4	6	1.30
SH 5/McDonald Street	208	SH 121	Tennessee Street	2	4	4.28
Future Arterial	206	US 380	SH 5	0	6	3.63
SH 121	209	Fannin County line	FM 2933	2	4	0.40
SH 5	211	Grayson County line	SH 121	2	4	0.27

Source: NCTCOG, 2009

1. RSA Segment ID corresponds to roadway designations in *Mobility 2030 - 2009 Amendment*

Even if all planned improvements, including the McKinney Corridor rail line, 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-5 — Planned Roadway Improvements
PGBT to FM 545



Legend

Planned Improvement

- Corridor 39
- Corridor 52
- Corridor 53
- RSA Segment 206
- RSA Segment 207.1
- RSA Segment 208
- RSA Segment 209
- RSA Segment 211
- RSA Segment 223.4
- RSA Segment 223.5
- RSA Improvements Outside Study Area

Other Items

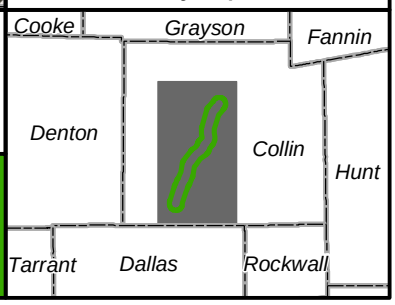
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

0 1 2 3 6

Miles

N

Key Map



Map Date: July 2010 Source(s): NCTCOG

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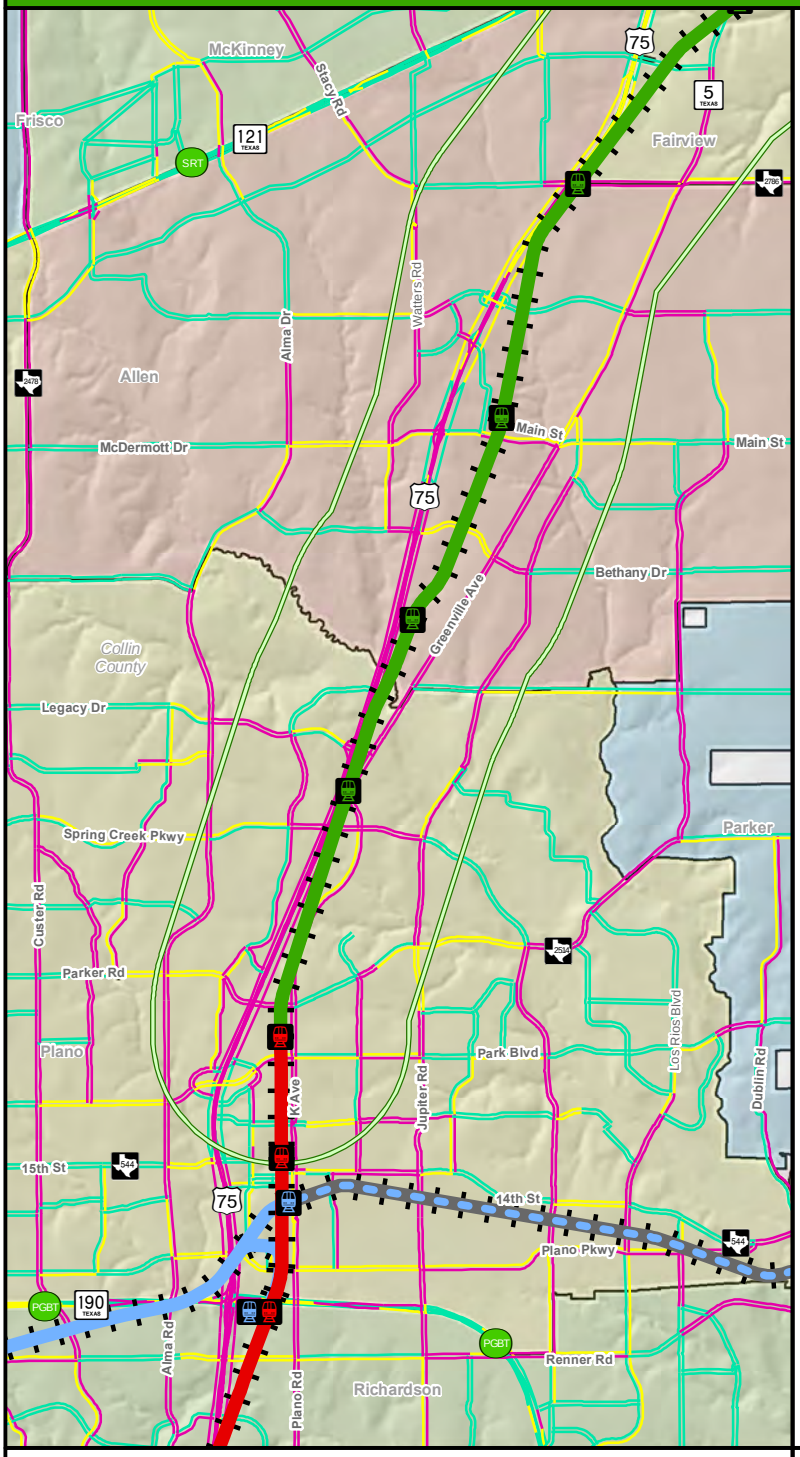
Figure B-6 — 2030 Level of Service
PGBT to SRT



Legend

Projected Level of Service

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

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3

Miles

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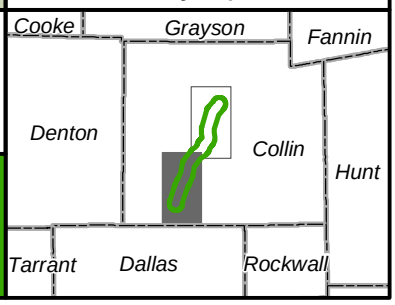
Key Map



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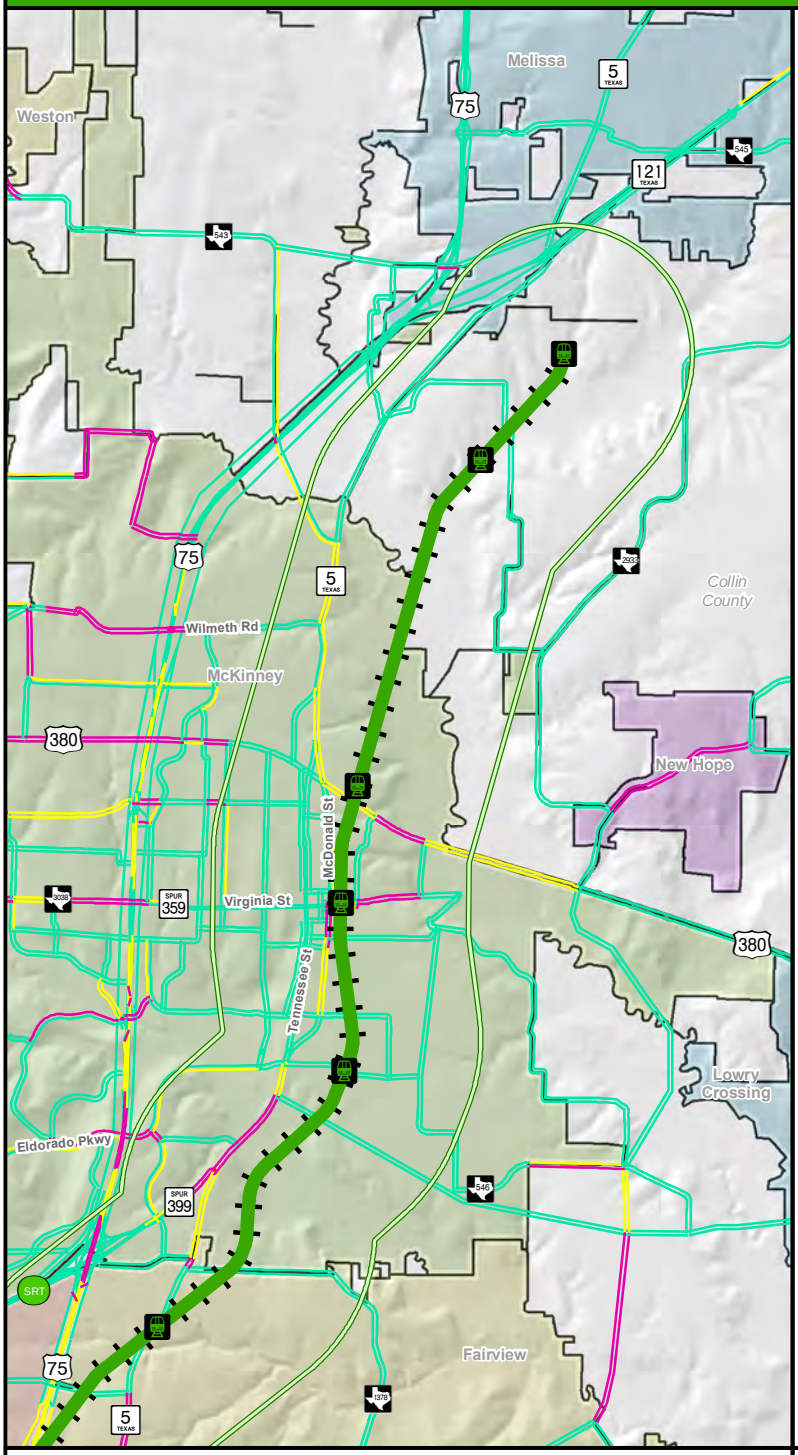
Map Date: July 2010 Source(s): NCTCOG

Figure B-7 — 2030 Level of Service
SRT to FM 545



Legend

Projected Level of Service

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

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Study Area
- City / Town Limits
- County Limits

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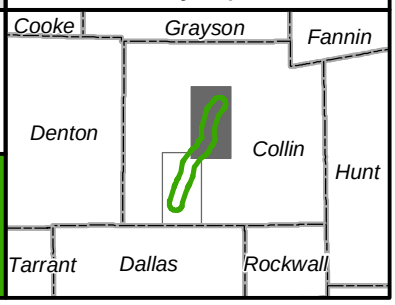
Miles

N

Key Map



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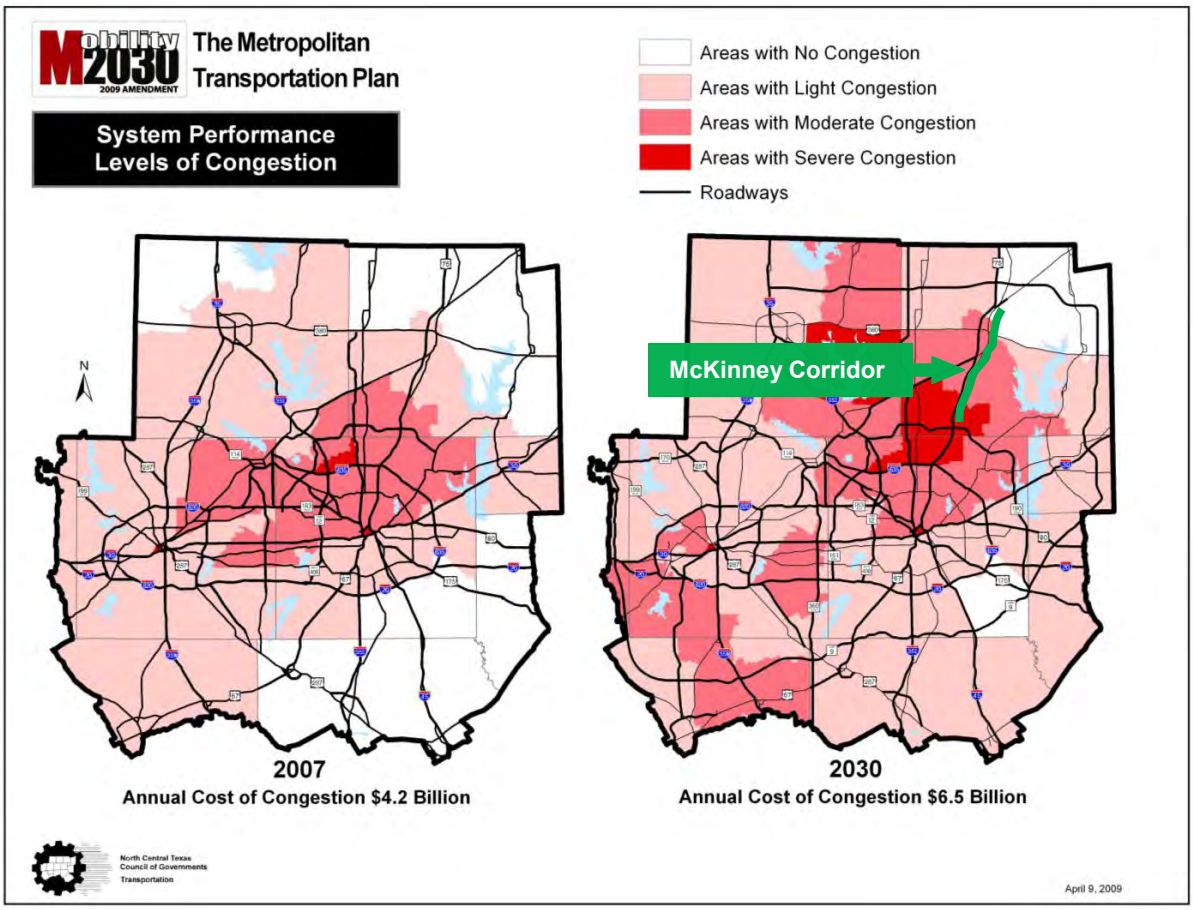
McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

Figure B-8, the McKinney Corridor travels through areas currently experiencing moderate to severe congestion. As demonstrated by comparing projected congestion levels in 2030 to those shown for 2007, in the previous 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 McKinney Corridor study area falls within the service area of the two transit providers, DART and Collin County Area Regional Transit (CCART). This section will detail 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 three sources, CCART, DART, and NCTCOG. CCART provided data regarding their service area and fixed route service. 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.

Current System

Figures B-9 and B-10 illustrate the existing and committed transit system. The DART Red Line currently provides light rail transit (LRT) service to the Parker Road Station. DART also operates five bus routes within the study area and offers on-call service, all within Plano. CCART operates three bus routes within the McKinney Urbanized Area, supplemented by Americans with Disabilities Act (ADA) paratransit service to locations within three-fourths of a mile of the fixed routes. CCART also provides demand responsive public transportation services throughout Collin County. The eight bus routes that pass through some portion of the study area are listed in Table B-4. The Parker Road Station is the only park-and-ride facility within the study area. It accommodates parking for about 2,000 vehicles and serves as a hub for local and express bus routes and the DART Red Line. There is no other transit service offered within the study area.

Table B-4 Existing Bus Routes

Agency	Route	Route Type
CCART	100	Commercial Center
CCART	200	Suburban Route
CCART	300	Suburban Route
DART	350	Suburban Route
DART	410	Crosstown Route
DART	452	Crosstown Route
DART	829	Special/Shuttle
DART	870	Special/Shuttle

Source: CCART, 2009 and DART, 2009

Planned System Improvements

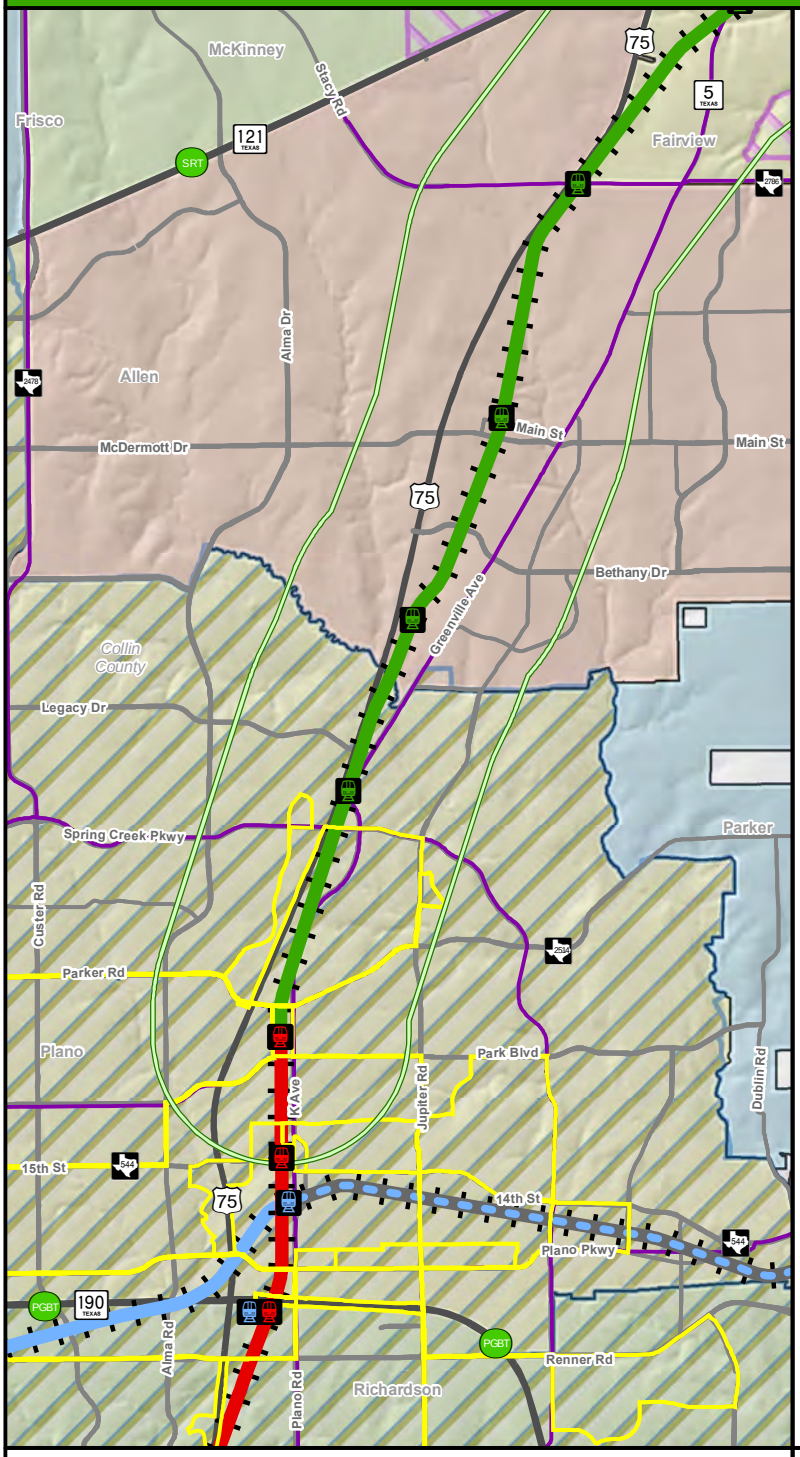
In addition to existing LRT service provided by the DART Red Line, there are plans to build and operate commuter rail service along the Cotton Belt Corridor as shown in Figure B-9. Depending on the vehicle technology and other considerations, the location of the connection between the Cotton Belt Corridor and the Red Line could be at the existing Bush Turnpike, Downtown Plano, or Parker Road stations, or at a new location such as 12th Street in Plano. DART and CCART regularly evaluate their bus routes and implements changes to the systems as circumstances warrant.

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 Allen, McKinney, and Plano. All of the municipalities within the study area have planned bicycle and 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 Dallas-Fort Worth Metroplex. NCTCOG maintains the data describing the existing and

Figure B-9 — Existing and Commited Transit System
PGBT to SRT



Legend

Transit Features

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- CCART Bus Route
- DART Bus Route
- CCART Urban Service
- DART Service Area

Other items

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

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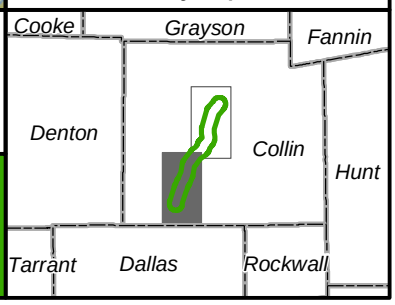
Miles

N

Key Map

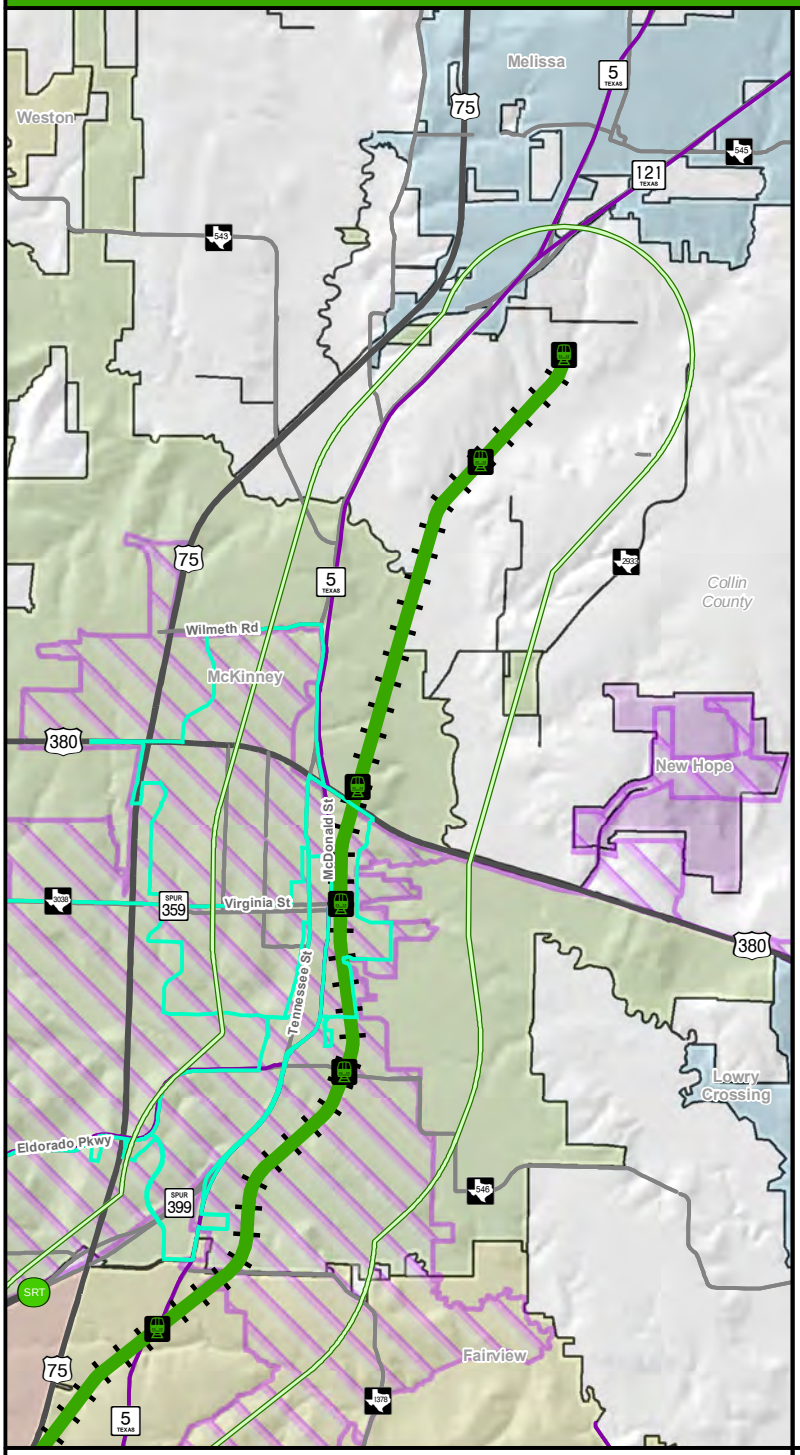


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; DART; CCART

Figure B-10 — Existing and Commited Transit System
SRT to FM 545



Legend

Transit Features

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- CCART Bus Route
- DART Bus Route
- CCART Urban Service
- DART Service Area

Other items

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

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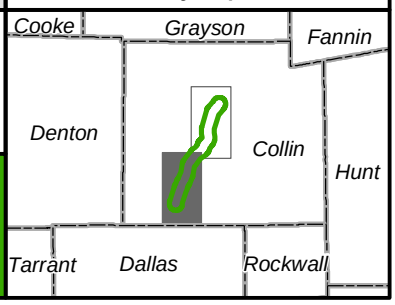
Miles

N

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; DART; CCART

planned facilities associated with the Regional Veloweb, a 644-mile, designated off-street trail network planned to provide bicycle and pedestrian connections in the Dallas-Fort Worth Metroplex.

Current System

There are currently about 17 miles of bicycle and pedestrian facilities within the study area. Allen has approximately 10 miles of trails and Plano has almost six miles of trails. As illustrated in Figures B-11 and B-12, most of the existing bicycle and pedestrian facilities are located in the southern half of the study area. Table B-5 provides a complete list of the existing bicycle and pedestrian facilities in the study area.

Table B-5 Existing Bicycle and Pedestrian Facilities

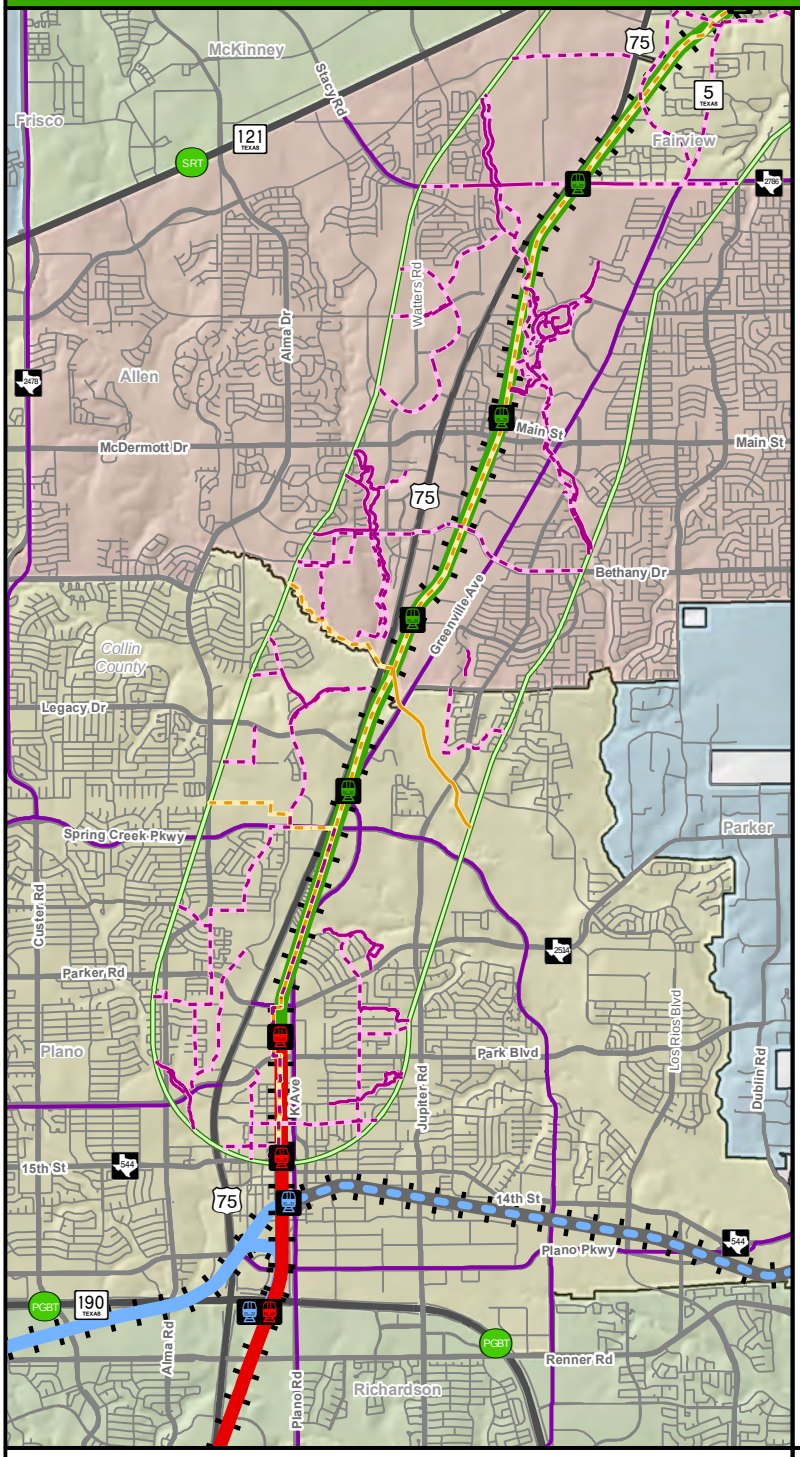
City	Data Source	Trail Name	Facility	Length (miles)
Allen	Allen Trail Development Plan	Allen Station Trails	Off-Street	2.92
Allen	Allen Trail Development Plan	Bel Air Drive	On-Street	0.11
Allen	Allen Trail Development Plan	Bethany Drive	On-Street	0.49
Allen	Allen Trail Development Plan	Bray Central Drive	On-Street	0.07
Allen	Allen Trail Development Plan	Cottonwood Creek Trails	Off-Street	2.77
Allen	Allen Trail Development Plan	Exchange Parkway	On-Street	0.22
Allen	Allen Trail Development Plan	Raintree Circle	On-Street	0.06
Allen	Allen Trail Development Plan	St Mary's Drive	On-Street	0.13
Allen	Allen Trail Development Plan	Stacy Road	On-Street	1.00
Allen	Allen Trail Development Plan	Unknown	Off-Street	0.22
Allen	Allen Trail Development Plan	Watters Branch Trails	Off-Street	2.11
McKinney	McKinney Bike Trails	Unknown	Off-Street	0.46
McKinney	McKinney Bike Trails	Wilson Creek Parkway	On-Street	0.29
Plano	Plano Bike Plan	Chisholm Trail	Off-Street	0.92
Plano	Plano Bike Plan	Haggard Park	Off-Street	0.41
Plano	Plano Bike Plan	Park Connector	Off-Street	0.91
Plano	Plano Bike Plan	Santa Fe Trail	Off-Street	0.49
Plano	Plano Bike Plan	Shawnee Park Trail	Off-Street	0.79
Plano	Plano Bike Plan	Willow Creek Park Trail	Off-Street	0.95
Plano	NCTCOG	Preston Ridge	Regional Veloweb	1.45

Source: NCTCOG, 2010

Planned System Improvements

All of the municipalities within the study area have planned expansions to their local bicycle and pedestrian trail systems, totaling approximately 75 miles. Allen and Plano each plan to add approximately 20 miles of additional bicycle and pedestrian facilities. Fairview and McKinney plan to add approximately 13 and 18 additional miles of improvements, respectively. Melissa also plans to add almost a mile of bicycle and pedestrian trails within the study area. Of the planned facilities, 29.3 miles (39 percent) are on-street facilities, 27.4 miles (38 percent) are local off-street trails, and 17.3 miles (23 percent) are planned Regional Veloweb facilities. Shown in Figures B-11 and B-12 and listed in Table B-6 are the planned bicycle and pedestrian facilities.

Figure B-11 — Existing and Planned Bicycle and Pedestrian Facilities
PGBT to SRT



Legend

Bicycle/Pedestrian Facility

- Existing Municipal Trail
- Existing Regional Veloweb Trail
- Planned Municipal Trail
- Planned Regional Veloweb Trail

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Minor Arterial
- Study Area
- City / Town Limits
- County Limits

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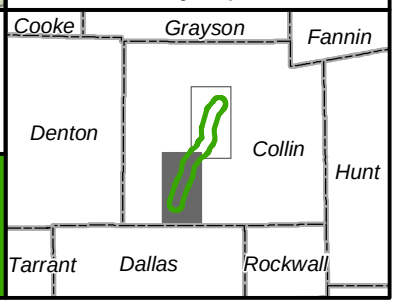
Miles

N

Key Map

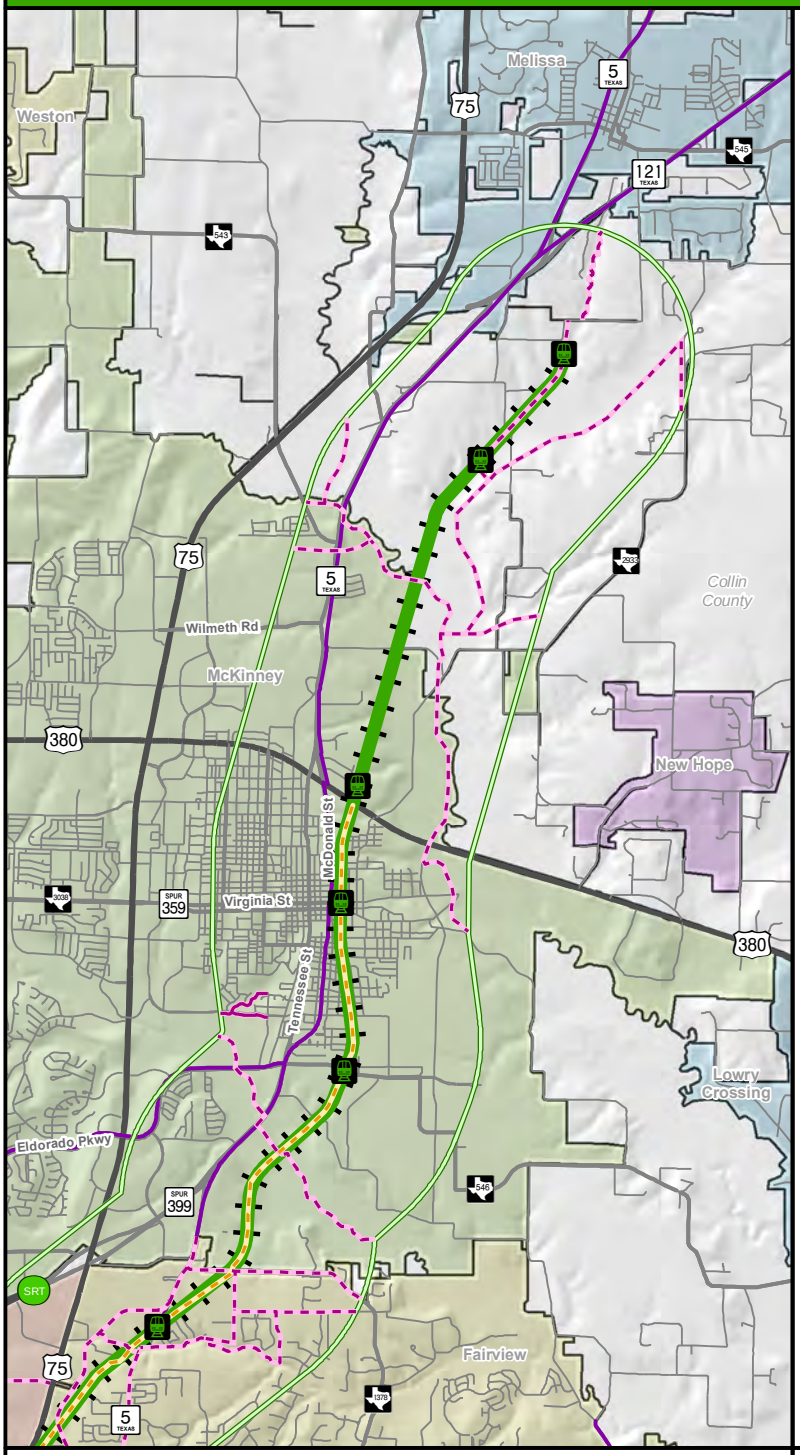


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; Allen; Fairview; McKinney; Melissa; Plano

Figure B-12 — Existing and Planned Bicycle and Pedestrian Facilities
SRT to FM 545



Legend

Bicycle/Pedestrian Facility

- Existing Municipal Trail
- Existing Regional Veloweb Trail
- Planned Municipal Trail
- Planned Regional Veloweb Trail

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Minor Arterial
- Study Area
- City / Town Limits
- County Limits

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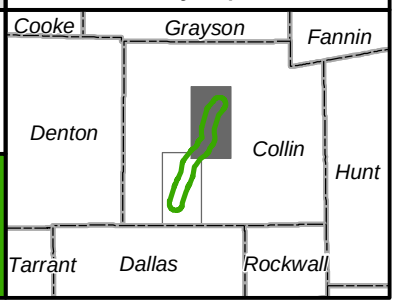
Miles

N

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; Allen; Fairview; McKinney; Melissa; Plano

Table B-6 Planned Municipal Bicycle and Pedestrian Facilities

Municipality	Data Source	Trail Name	Facility Type	Length (miles)
Melissa	Melissa Comprehensive Plan	Fitzhugh Branch	Off-Street	0.80
McKinney	McKinney Comprehensive Plan	Rail Conversion	Off-Street	1.55
McKinney	McKinney Comprehensive Plan	Clemons Creek Trails	Off-Street	4.06
McKinney	McKinney Comprehensive Plan	East Fork Trails	Off-Street	5.14
McKinney	McKinney Comprehensive Plan	Unknown	Off-Street	1.21
McKinney	McKinney Comprehensive Plan	Wilson Creek Trails	Off-Street	2.32
Fairview	Fairview Comprehensive Plan	Country Club Road	On-Street	1.44
Fairview	Fairview Comprehensive Plan	Fairview Parkway	On-Street	2.24
Fairview	Fairview Comprehensive Plan	Hart Rd	On-Street	0.96
Fairview	Fairview Comprehensive Plan	SH 5 (North)	On-Street	0.55
Fairview	Fairview Comprehensive Plan	SH 5 (South)	On-Street	1.33
Fairview	Fairview Comprehensive Plan	Sloan Creek	Off-Street	1.99
Fairview	Fairview Comprehensive Plan	Stacy Road	On-Street	0.82
Fairview	Fairview Comprehensive Plan	Stoddard Road	On-Street	0.83
Allen	Allen Trail Development Plan	Allen Station Trail	Off-Street	1.84
Allen	Allen Trail Development Plan	Bray Central Drive	On-Street	0.87
Allen	Allen Trail Development Plan	Cottonwood Creek Trails	Off-Street	3.97
Allen	Allen Trail Development Plan	Exchange Parkway	On-Street	0.60
Allen	Allen Trail Development Plan	Old Bethany Drive	On-Street	0.67
Allen	Allen Trail Development Plan	Raintree Circle	On-Street	0.98
Allen	Allen Trail Development Plan	Ridgeview Drive	On-Street	0.95
Allen	Allen Trail Development Plan	Stacy Road	On-Street	0.66
Allen	Allen Trail Development Plan	Stockton Drive	On-Street	0.71
Allen	Allen Trail Development Plan	Unknown	Off-Street	0.49
Allen	Allen Trail Development Plan	Unknown	On-Street	1.50
Allen	Allen Trail Development Plan	Watters Branch Trail	Off-Street	2.07
Allen	NCTCOG	Unknown	On-Street	1.13
Plano	Plano Bike Plan	15th Street Station	Greenway	0.53
Plano	Plano Bike Plan	Hoblitzelle Park Trail	Off-Street	0.28
Plano	Plano Bike Plan	Parker Road Station	Greenway	0.49
Plano	Plano Bike Plan	Route 71	On-Street	2.55
Plano	Plano Bike Plan	Route 73	On-Street	2.61
Plano	Plano Bike Plan	Route 75	On-Street	0.75
Plano	Plano Bike Plan	Route 85	On-Street	1.67
Plano	Plano Bike Plan	Route 408	On-Street	0.98
Plano	Plano Bike Plan	Route 416	On-Street	0.42
Plano	Plano Bike Plan	Route 436	On-Street	0.32
Plano	Plano Bike Plan	Route 444	On-Street	0.53
Plano	Plano Bike Plan	Route 454	On-Street	1.10
Plano	Plano Bike Plan	Route 458	On-Street	0.65
Plano	Plano Bike Plan	System Improvements	On-Street	1.51
Plano	Plano Bike Plan	Rail to Trail Conversion	Off-Street	1.68

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 17.3 miles of Regional Veloweb facilities are planned in the study area. 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)
Allen	NCTCOG	Bluebonnet East	Regional Veloweb	1.20
Allen	NCTCOG	Cottonbelt Lavon	Regional Veloweb	4.12
Fairview	NCTCOG	Bluebonnet East	Regional Veloweb	1.99
Fairview	NCTCOG	Cottonbelt Lavon	Regional Veloweb	0.69
McKinney	NCTCOG	Bluebonnet East	Regional Veloweb	3.98
Plano	NCTCOG	Bluebonnet West	Regional Veloweb	1.18
Plano	NCTCOG	Lavon Link	Regional Veloweb	2.58
Plano	NCTCOG	Plano Central Link	Regional Veloweb	1.58

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).

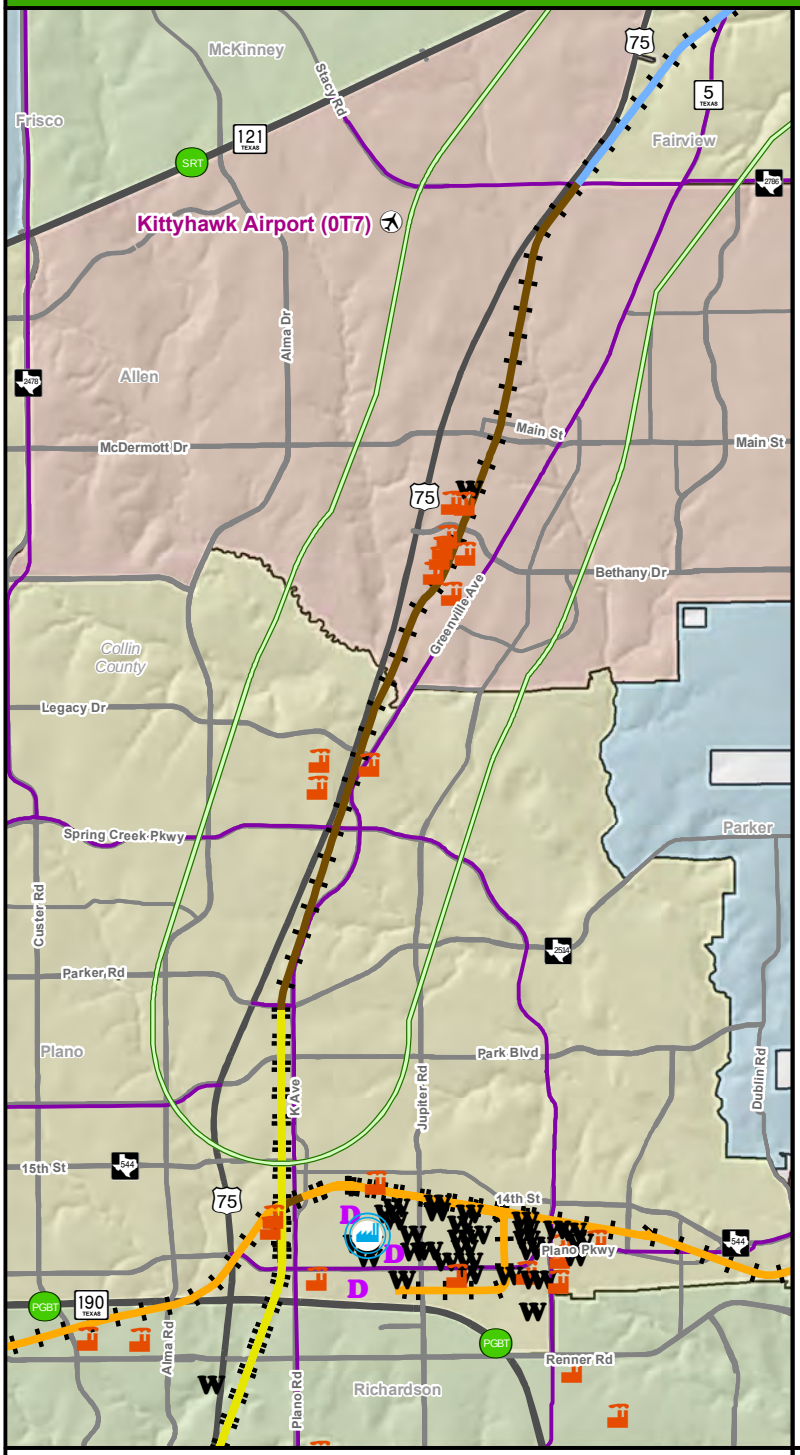
The existing roadway system serves most freight movement within the study area. One or two freight trains operate within the McKinney Corridor on an average weekday. There are also several freight intensive facilities, such as distribution centers and warehouses within the study area.

Current System

Several locations within the study area have concentrations of freight intensive facilities including four warehouses, one distribution center, and 20 manufacturing centers. These facilities are concentrated mainly in three areas - the Millennium Business Park in Allen, near Industrial Boulevard in McKinney, and along US 380 in McKinney. Access to freight rail service was an important factor in the choice of location for many of these facilities in McKinney. 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. The Fossil Partners subzone in Richardson (FTZ #39-E) is the nearest FTZ to the study area, located about three miles away. This FTZ was instituted as a subzone of the Dallas/Fort Worth International Airport (DFWIA) FTZ (FTZ #39).

Figure B-13 — Goods Movement and Aviation Facilities
PGBT to SRT



Legend

Freight/Aviation Facilities

- D — Distribution Center
- General Aviation
- Industrial Park
- Manufacturing
- W — Warehouse
- DART LRT Service (DART Right-of-Way)
- DART Inactive (DART Right-of-Way)
- DGNO Freight Service (DART Right-of-Way)
- DGNO Inactive (DART Right-of-Way)
- KCS Freight Service (DART Right-of-Way)
- Airport
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial

Other Items

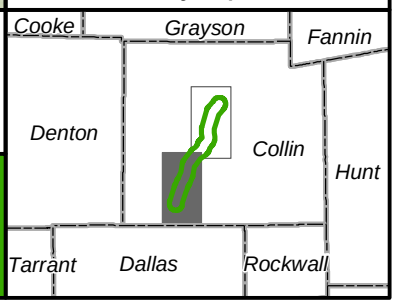
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map

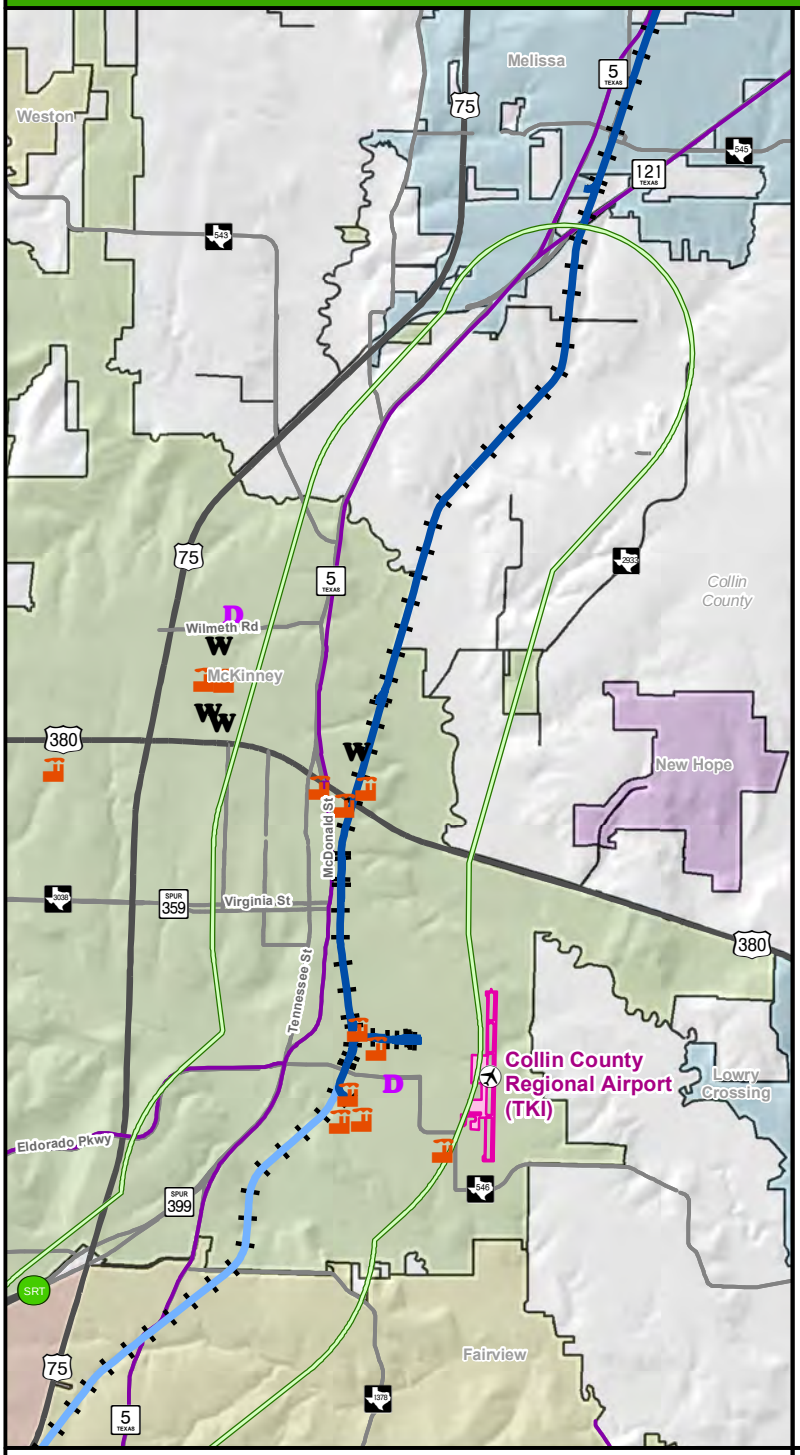


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

Figure B-14 — Goods Movement and Aviation Facilities
SRT to FM 545



Legend

Freight/Aviation Facilities

- Distribution Center
- General Aviation
- Industrial Park
- Manufacturing
- Warehouse
- DART LRT Service (DART Right-of-Way)
- DART Inactive (DART Right-of-Way)
- DGNO Freight Service (DART Right-of-Way)
- DGNO Inactive (DART Right-of-Way)
- KCS Freight Service (DART Right-of-Way)
- Airport
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial

Other Items

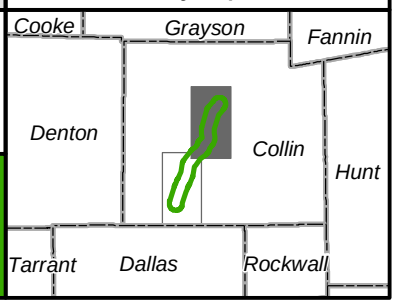
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

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, the nearest one is the Northgate Business Park in Dallas and Garland, over seven miles south of the study area.

Owned by DART, the McKinney Corridor rail line provides active freight rail service throughout McKinney. While there are no freight rail lines that intersect the McKinney Corridor within the study area, the Cotton Belt rail line crosses under the DART Red Line approximately one-third mile south of the study area. There are 19.7 miles of main line DART tracks and 2.4 miles of railroad spurs within the study area. Figures B-13 and B-14 illustrate the locations of freight rail facilities within the study area.

Planned System Improvements

Few planned changes in the freight system are publicly available as private companies serve most freight movements. In the study area, the only planned change in the goods movement system is along the US 75 corridor, identified by NCTCOG for potential long-term intercity truck lane restrictions. If implemented, the proposed expanded truck lane restrictions along this facility would 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. There has been no timeframe identified for the implementation of additional truck lane restrictions for this 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

Collin County Regional Airport (CCRA) at McKinney is the one public use airport within the study area. Figure B-14 shows the location of this facility. Owned by the City of McKinney, managed by McKinney Airport Development Corporation, this airport serves general aviation.

Planned System Improvements

There are plans to construct a new airport traffic control tower and a new 7,000-foot long runway at CCRA. Construction of these projects is scheduled to begin in 2010.

B.1.6 Travel Patterns

This section discusses the general travel patterns in the study area. Commuting patterns 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. 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). The entire study area is located outside of these five central cities. According to the 2000 Census, 58.1 percent of employees in the study area work within their county of residence, only 30.9 percent work within their municipality of residence and 96.6 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 Census Commuting Patterns

2000 Census Category	Study Area		DFW MSA		Difference
	Number	Percent	Number	Percent	
Place of Work By State					
Worked in state of residence:	74,239	99.3%	2,510,207	99.3%	0.0%
In county of residence	43,469	58.1%	1,806,134	71.5%	-13.4%
Outside county of residence	30,770	41.1%	704,073	27.9%	13.2%
Worked outside of state	560	0.7%	17,441	0.7%	0.0%
Place of Work By Place (City or Town)					
Living in a place:	70,147	93.8%	2,337,394	92.5%	1.3%
Worked in place	23,111	30.9%	920,327	36.4%	-5.5%
Worked outside place	47,036	62.9%	1,417,067	56.1%	6.8%
Not in identified place	4,652	6.2%	190,254	7.5%	-1.3%
Place of Work By MSA					
Living in an MSA:	74,799	100.0%	2,527,648	100.0%	0.0%
Worked in MSA of residence:	72,260	96.6%	2,244,568	88.8%	7.8%
Central city	16,733	22.4%	1,232,272	48.8%	-26.4%
Remainder	55,527	74.2%	1,012,296	40.0%	34.2%
Worked in a different MSA:	2,207	3.0%	262,622	10.4%	-7.4%
Central city	1,389	1.9%	167,198	6.6%	-4.7%
Remainder	818	1.1%	95,424	3.8%	-2.7%
Worked outside any MSA	332	0.4%	20,458	0.8%	-0.4%

Source: 2000 US Census

Respondents to the 2000 Census reported that 93.0 percent of workers who reside in the study area commute using a car, truck, or van, with 80.3 percent driving alone trips and 12.8 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 working from home at 3.6 percent and walking to work at 1.6 percent. Table B-9 provides journey to work information organized by mode of travel and geographic area. The 0.9 percent difference in work trips on public transportation between the study area and the DFW MSA reflects the limited public transportation options within the study area.

Table B-9 2000 Census Mode of Travel to Work

	Study Area		DFW MSA		
Mode of Travel to Work	**Number**	**Percent**	**Number**	**Percent**	**Difference**
Car, truck, or van:	69,578	93.0%	2,343,257	92.7%	0.3%
Drive alone	60,034	80.3%	1,990,617	78.8%	1.5%
Carpool	9,544	12.8%	352,640	14.0%	-1.2%
Public Transportation:	670	0.9%	45,765	1.8%	-0.9%
Bus or trolley bus	617	0.8%	40,094	1.6%	-0.8%
Motorcycle	58	0.1%	2,565	0.1%	0.0%
Bicycle	139	0.2%	3,435	0.1%	0.1%
Walked	1,200	1.6%	37,331	1.5%	0.1%
Other means	495	0.6%	19,895	0.8%	-0.2%
Worked at home	2,659	3.6%	75,400	3.0%	0.6%

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 slightly higher proportion of study area residents (22.8 percent) had a commute of less than 15 minutes when compared to the rest of the DFW MSA (21.7 percent). A slightly lower proportion of study area residents (31.5 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 2000 Census Commuting Travel Times

	Study Area		DFW MSA		
Travel Time	**Number**	**Percent**	**Number**	**Percent**	**Difference**
Did not work at home:	72,140	96.4%	2,452,248	97.0%	-0.6%
0 to 14 minutes	17,071	22.8%	549,594	21.7%	1.1%
15 to 29 minutes	23,547	31.5%	879,813	34.8%	-3.3%
30 to 44 minutes	16,907	22.6%	589,026	23.3%	-0.7%
45 to 59 minutes	8,248	11.0%	242,588	9.6%	1.4%
60 to 89 minutes	5,032	6.7%	134,079	5.3%	1.4%
90 or more minutes	1,335	1.8%	57,148	2.3%	-0.5%
Worked at home	2,659	3.6%	75,400	3.0%	0.6%

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 increased by 3.3 percent. The proportion of workers employed within their city or town of residence decreased by 1.1 percent. Between 1990 and 2000, the proportion of workers who commuted to 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:	55,938	99.3%	74,239	99.3%	18,301	0.0%
In county of residence	30,862	54.8%	43,469	58.1%	12,607	3.3%
Outside county of residence	25,076	44.5%	30,770	41.1%	5,694	-3.4%
Worked outside of state	377	0.7%	560	0.7%	183	0.0%
Place of Work By Place (City or Town)						
Living in a place:	51,385	91.2%	70,147	93.8%	18,762	2.6%
Worked in place	18,010	32.0%	23,111	30.9%	5,101	-1.1%
Worked outside place	33,375	59.3%	47,036	62.9%	13,661	3.6%
Not in identified place	4,930	8.8%	4,652	6.2%	-278	-2.6%
Place of Work By MSA						
Living in an MSA:	56,315	100.0%	74,799	100.0%	18,484	0.0%
Worked in MSA of residence:	54,179	96.2%	72,260	96.6%	18,081	0.4%
Central city	12,950	23.0%	16,733	22.4%	3,783	-0.6%
Remainder	41,229	73.2%	55,527	74.2%	14,298	1.0%
Worked in a different MSA:	1,897	3.4%	2,207	3.0%	310	-0.4%
Central city	1,180	2.1%	1,389	1.9%	209	-0.2%
Remainder	717	1.3%	818	1.1%	101	-0.2%
Worked outside any MSA	239	0.4%	332	0.4%	93	0.0%

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 working from home, which went from 2.5 percent to 3.6 percent of the total working population between 1990 and 2000. The greatest percentage reduction among the reported mode choices was driving alone which accounted for 0.8 percent fewer trips in 2000 than in 1990. The total number of workers in the study area increased in those ten years, leading to a corresponding increase in total number of people choosing each mode except motorcycles.

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:	52,939	94.0%	69,578	93.0%	16,639	-1.0%
Drive alone	45,661	81.1%	60,034	80.3%	14,373	-0.8%
Carpool	7,278	12.9%	9,544	12.8%	2,266	-0.1%
Public Transportation:	496	0.9%	670	0.9%	174	0.0%
Bus or trolley bus	454	0.8%	617	0.8%	163	0.0%
Motorcycle	127	0.2%	58	0.1%	-69	-0.1%
Bicycle	34	0.1%	139	0.2%	105	0.1%
Walked	936	1.7%	1,200	1.6%	264	-0.1%
Other means	363	0.6%	495	0.6%	132	0.0%
Worked at home	1,420	2.5%	2,659	3.6%	1,239	1.1%

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 30 minutes decreased and the proportion of workers with commute times within each interval over 30 minutes increased. Overall, the proportion of workers with commutes less than 15, 30, and 45 minutes decreased by 3.2 percent, 6.3 percent, and 4.3 percent, respectively.

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:	54,895	97.5%	72,140	96.4%	17,245	-1.1%
0 to 14 minutes	14,668	26.0%	17,071	22.8%	2,403	-3.2%
15 to 29 minutes	19,479	34.6%	23,547	31.5%	4,068	-3.1%
30 to 44 minutes	11,580	20.6%	16,907	22.6%	5,327	2.0%
45 to 59 minutes	5,219	9.3%	8,248	11.0%	3,029	1.7%
60 to 89 minutes	2,999	5.3%	5,032	6.7%	2,033	1.4%
90 or more minutes	950	1.7%	1,335	1.8%	385	0.1%
Worked at home	1,420	2.5%	2,659	3.6%	1,239	1.1%

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 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.

B.2.1.3 Existing Conditions and Future Projections/Plans

This section discusses the land use around the McKinney Corridor. The project study area encompasses portions of Collin County and the municipalities of Allen, Fairview, McKinney, Melissa, and Plano. 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	19.8%
Dedicated	6.9%
Commercial	6.7%
Government/Educational	5.0%
Industrial	4.4%
Water	0.6%
Infrastructure	0.4%
Airports	0.1%
Undeveloped	56.3%

Source: NCTCOG GIS Land Use, 2005

Undeveloped land accounts for approximately 56.3 percent of the identified land use within the study area. Residential land use accounts for 19.8 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 McKinney 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
Parker Road	82.4	4.1	230.2	12.2	13.8	--	--	36.0
	21.8%	1.1%	60.8%	3.2%	3.6%	--	--	9.5%
Legacy Drive	30.7	22.6	105.7	77.8	8.7	0.4	--	150.6
	7.7%	5.7%	26.7%	19.6%	2.2%	0.1%	--	38.0%
Millennium Business Park	25.5	--	55.7	50.9	--	25.9	4.8	272.3
	5.9%	--	12.8%	11.7%	--	5.9%	1.1%	62.6%
Downtown Allen	133.1	47.3	70.7	21.0	0.6	38.3	--	72.7
	34.7%	12.3%	18.4%	5.5%	0.1%	10.0%	--	18.9%
Stacy Road	6.7	--	46.4	--	--	--	1.0	378.5
	1.5%	--	10.7%	--	--	--	0.2%	87.5%
Fairview/SH 5	43.4	6.5	0.2	--	--	--	2.3	414.9
	9.3%	1.4%	<0.1%	--	--	--	0.5%	88.8%
Industrial Boulevard	45.4	6.0	18.3	209.2	1.2	58.5	--	71.9
	11.0%	1.5%	4.5%	51.0%	0.3%	14.3%	--	17.5%
Downtown McKinney	138.6	42.1	53.1	49.5	1.3	21.0	--	61.4
	37.8%	11.5%	14.5%	13.5%	0.3%	5.7%	--	16.7%
US 380 - McKinney	52.7	2.3	45.7	86.9	--	0.4	0.6	237.4
	12.4%	0.5%	10.7%	20.4%	--	0.1%	0.1%	55.7%
McKinney North 1	110.4	--	--	--	--	--	0.3	373.8
	22.8%	--	--	--	--	--	0.1%	77.2%
McKinney North 2	70.8	--	--	--	--	--	2.7	408.2
	14.7%	--	--	--	--	--	0.6%	84.7%

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

Parker Road Station

The existing DART Red Line Parker Road Station is located between Park Boulevard and Parker Road (FM 2514) in Plano. The station is the northern terminus of the DART Red Line and primarily serves park-and-ride users. Within the station analysis area, the land use is commercial (60.8 percent), residential (21.8 percent), undeveloped (9.5 percent), infrastructure (3.6 percent), industrial (3.2 percent) and government/educational (1.1 percent). The Parker Road Station contains numerous large retail businesses including Best Buy, Kohl's, Target, and numerous strip centers. Residential subdivisions are located east of the station with some multi-family units. Plano future land use plans indicate general commercial, freeway commercial, and some residential development for this area. The land use near Parker Road Station is shown in Figure B-15.

Legacy Drive Station

The proposed Legacy Drive Station would be located along the McKinney Corridor approximately half-way between Spring Creek Parkway and Legacy Drive. Within the station analysis area, the land use is undeveloped (38.0 percent), commercial (26.7 percent), industrial (19.6 percent), residential (7.7 percent), government/educational (5.7 percent), infrastructure (2.2 percent), and dedicated (0.1 percent). The undeveloped land is mostly within the floodplain of Rowlett Creek. Several industrial parks and warehouse are located both east and west of US 75. Other places of interest include several retail centers and one place of worship. The future land use plans for Plano identify this station at Spring Creek Parkway, south of Legacy Drive. Future land use near the station is proposed as freeway commercial, community commercial, general commercial, and residential. The land use near this station is shown in Figure B-15.

Millennium Business Park Station

The proposed Millennium Business Park Station would be located near the McKinney rail line crossing of Ridgemont Drive. Within the station analysis area, the land use is undeveloped (62.6 percent), commercial (12.8 percent), industrial (11.7 percent), residential (5.9 percent), dedicated (5.9 percent), and water (1.1 percent). The undeveloped land is vacant and lies within the floodplain of an unnamed tributary to Rowlett Creek. Commercial land use is focused in a few areas, mostly surrounding US 75, with the Experian office and numerous additional multi-tenant office buildings. A few residential homes are located along Greenville Avenue to the southeast of the proposed transit station. Allen does not show this station in future land use plans. Proposed land use near the transit station primarily consists of industrial use with a small portion devoted to office space. The land use near this station is shown in Figure B-15.

Downtown Allen Station

The proposed Downtown Allen Station would be located north of Main Street in downtown Allen. The historic Allen train depot is located just south of Main Street in downtown Allen. Within the station analysis area, the land use is residential (34.7 percent), undeveloped (18.9 percent), commercial (18.4 percent), government/educational (12.3 percent), dedicated (10.0 percent), industrial (5.5 percent), and infrastructure (0.1 percent). Vacant lands surround the outskirts of the one-half mile area around the proposed transit station. Near the proposed station, dense single-family homes surround the downtown area. Other areas of note include a mixed-use development, a library, a police station, a fire station, and the Allen Civic Auditorium. Small commercial and retail establishments are scattered throughout the one-half mile area. Allen does not show this transit station in their future land use plans. Future land use for the central business district is predominately office/retail, institutional/office, residential/retail, commercial/retail, office, and institutional. The land use near this station is shown in Figure B-15.

Stacy Road Station

The proposed Stacy Road Station would be located within The Village at Allen or The Village at Fairview development. Within the station analysis area, the land use is undeveloped (87.5 percent), commercial (10.7 percent), residential (1.5 percent), and water (0.2 percent). Since 2005, The Village at Allen and The Village at Fairview developments have converted much of the undeveloped land into a mixture commercial and residential use. The Allen Outlet Mall, JC Penney, Super Target, Whole Foods, and two strip centers are located in this area. Neither Allen nor Fairview show this station in their future land use or thoroughfare plans. The Fairview future land use plan identifies the area around this station for mixed commercial development. Allen has designated the land for commercial/retail development. The land use near this station is shown in Figure B-15.

Fairview/SH 5 Station

The proposed Fairview/SH 5 Station would be located near the intersection of SH 5 and the McKinney Corridor. Within the station analysis area, the land use is undeveloped (88.8 percent), residential (9.3 percent), government/educational (1.4 percent), water (0.5 percent), and commercial (less than 0.1 percent). Currently, the area within one-half mile of the proposed station is mostly undeveloped floodplain associated with Sloan Creek and farmland. A few rural residential areas occupy the remaining land. The undeveloped land on the west side of the McKinney Corridor is included in the proposed Fairview Center development. The development plans include a rail station. Fairview has included this station in their future land use planning. The proposed future land use around the station is institutional, mixed use, residential mix, and residential suburban. The land use near this station is shown in Figure B-16.

Industrial Boulevard Station

The proposed Industrial Boulevard Station would be located near the intersection of the McKinney Corridor and Industrial Boulevard. Within the station analysis area, the land use is industrial (51.0 percent), undeveloped (17.5 percent), dedicated (14.3 percent), residential (11.0 percent), commercial (4.5 percent), government/educational (1.5 percent), and infrastructure (0.3 percent). Recent aerial photography confirms the large industrial use in the area, which includes Encore Wire, Montgomery Kone, Roper Pump Company, and Timber Blind & Shutter. The remaining areas are undeveloped land. The area around this station is identified on the McKinney future land use plans as a transit village. The Collin County Regional Airport (CCRA) is located one mile east of the proposed station location. The land use near this station is shown in Figure B-16.

Downtown McKinney Station

The proposed Downtown McKinney Station would be located near downtown McKinney. Within the station analysis area, the land use is residential (37.8 percent), undeveloped (16.7 percent), commercial (14.5 percent), industrial (13.5 percent), government/institutional (11.5 percent), dedicated (5.7 percent), and infrastructure (0.3 percent). NCTCOG feature data and aerial photography exhibit the area directly around this proposed station as the central downtown area of McKinney. Important features include the Commercial Historic District, McKinney City Hall, McKinney Performing Arts Center, Roy and Helen Hall Memorial Library, Texas Highway Patrol, and the Wysong Central Fire Station. The area outside downtown is

occupied by single-family residential dwellings. The area around this station is identified on the McKinney future land use plans as a transit village. The land use near this station is shown in Figure B-16.

US 380–McKinney Station

The proposed US 380-McKinney Station would be located north of US 380 near where it crosses the McKinney Corridor. Within the station analysis area, the land use is undeveloped (55.7 percent), industrial (20.4 percent), residential (12.4 percent), commercial (10.7 percent), government/educational (0.5 percent), water (0.1 percent), and dedicated (0.1 percent). Places of employment in the one-half mile area around the proposed station include the industrial facilities of Fisher Controls, Southern Foods Group, and Watson & Chalin Manufacturing. East of the proposed station is mostly farmland and vacant land. The area west of the proposed station is predominantly industrial facilities with some residential homes. The area around this station is identified on the McKinney future land use plans as a transit village. The land use near this station is shown in Figure B-16.

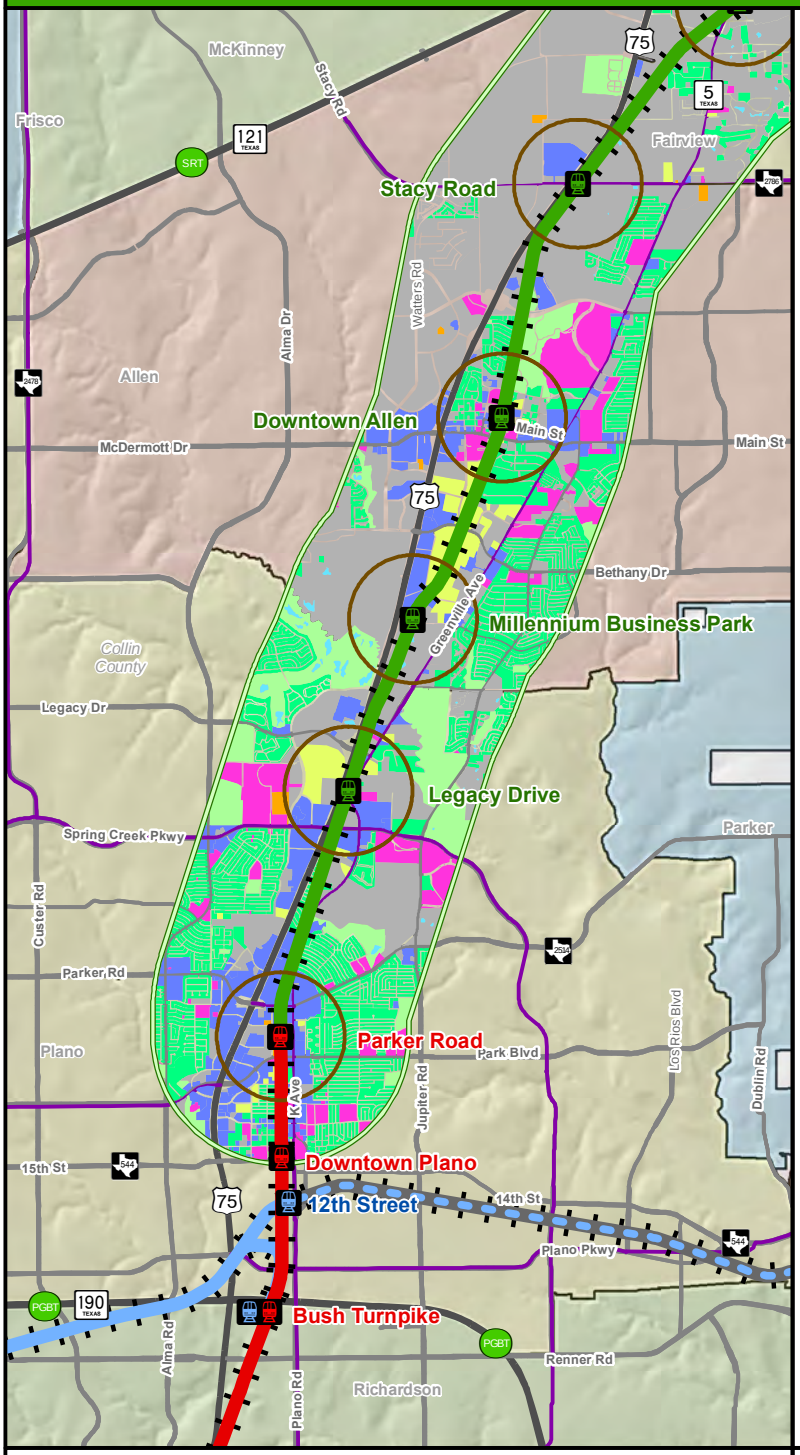
McKinney North 1 Station

The proposed McKinney North 1 station would be located at the crossing of the railroad and County Road (CR) 338. Within the station analysis area, the land use is undeveloped (77.2 percent), residential (22.8 percent), and water (0.1 percent). No special features were noted in the station analysis area. The majority of the undeveloped land is floodplains attributed to Clemons Creek or farmlands. Scattered rural residential homes occupy the remaining acreage. The area around this station is identified on the McKinney future land use plans as a transit village. This station location is outside of the McKinney city limits, but is within the extraterritorial jurisdiction (ETJ) of the city. The land use near this station is shown in Figure B-16.

McKinney North 2 Station

The proposed McKinney North 2 Station is located south of the intersection of Berry Street and the existing rail line. Within the station analysis area, the land use is undeveloped (84.7 percent), residential (14.7 percent), and water (0.6 percent). No special features were noted in the station analysis area. The majority of the undeveloped land is floodplains attributed to Fitzhugh Branch or farmlands. Scattered and sparse rural residential homes occupy the remainder of the area. The area around this station is identified on the McKinney future land use plans as a transit village. This station location is outside of the McKinney city limits, but is within the ETJ of the city. The land use near this station is shown in Figure B-16.

Figure B-15 — 2005 Land Use
PGBT to SRT



Legend

Land Use

- Residential
- Government/Educational
- Commercial
- Industrial
- Infrastructure
- Airports
- Dedicated
- Water
- Undeveloped

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Study Area
- Station Analysis Area
- City / Town Limits
- County Limits

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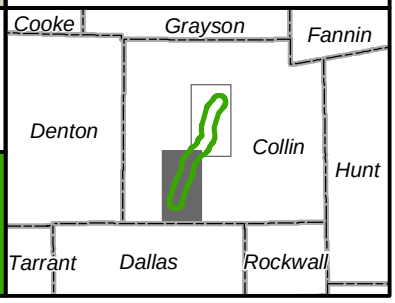
Miles

N

Key Map

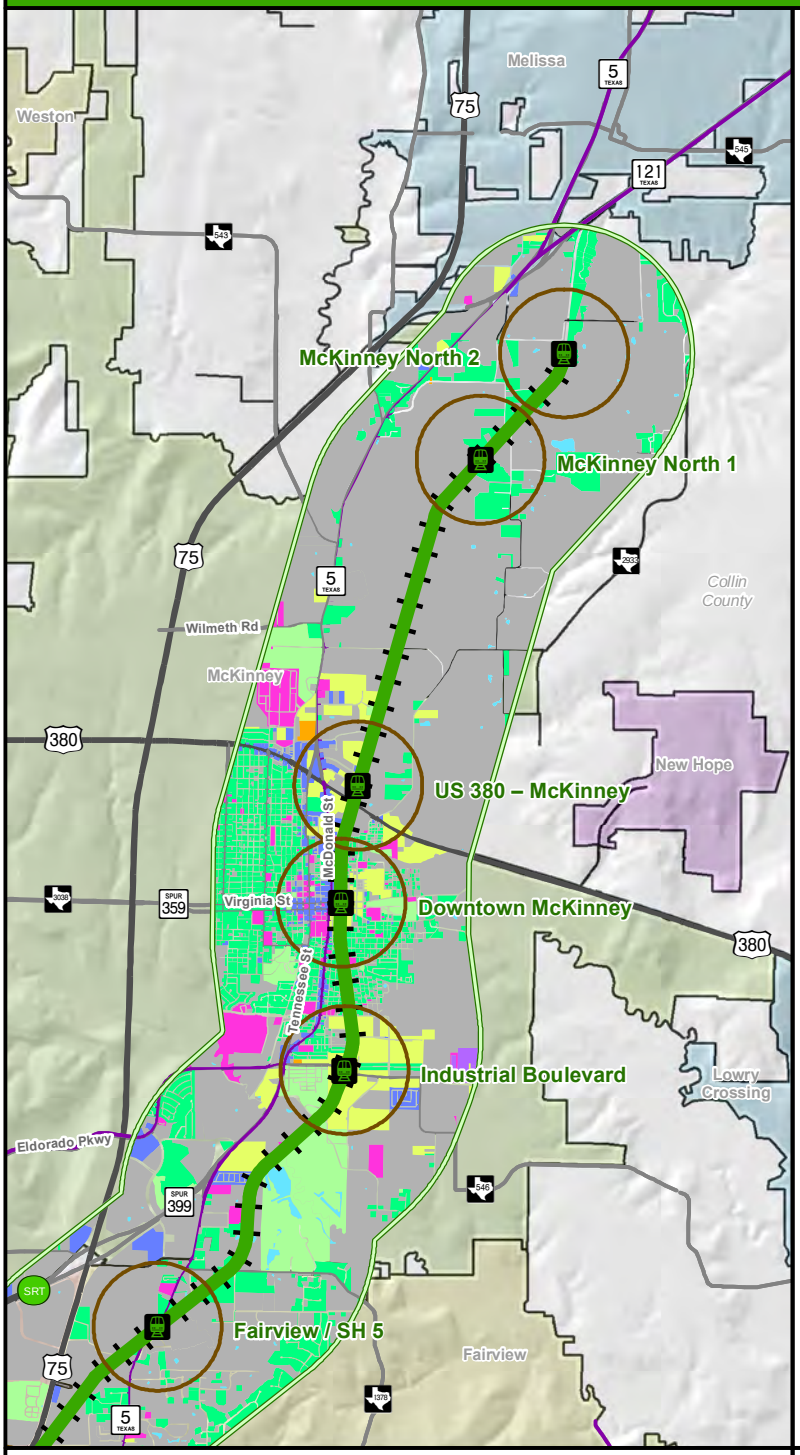


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

Figure B-16 — 2005 Land Use
SRT to FM 545



Legend

Land Use

- Residential
- Government/Educational
- Commercial
- Industrial
- Infrastructure
- Airports
- Dedicated
- Water
- Undeveloped

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
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Miles

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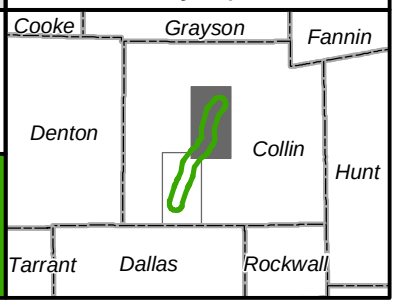
Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

B.2.2 Socio-Economic

This section addresses the existing conditions for socio-economics in the McKinney Corridor study area. Items 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.

Title VI of the Civil Rights Act of 1964, 42 USC 2000d et seq. provides that no person in the US shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity that receives federal financial assistance. The Supreme Court, in Lau v. Nichols, 414 US 563 (1974), interpreted Title VI regulations promulgated by the former Department of Health, Education, and Welfare to hold that Title VI prohibits conduct that has a disproportionate effect on LEP persons because such conduct constitutes 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

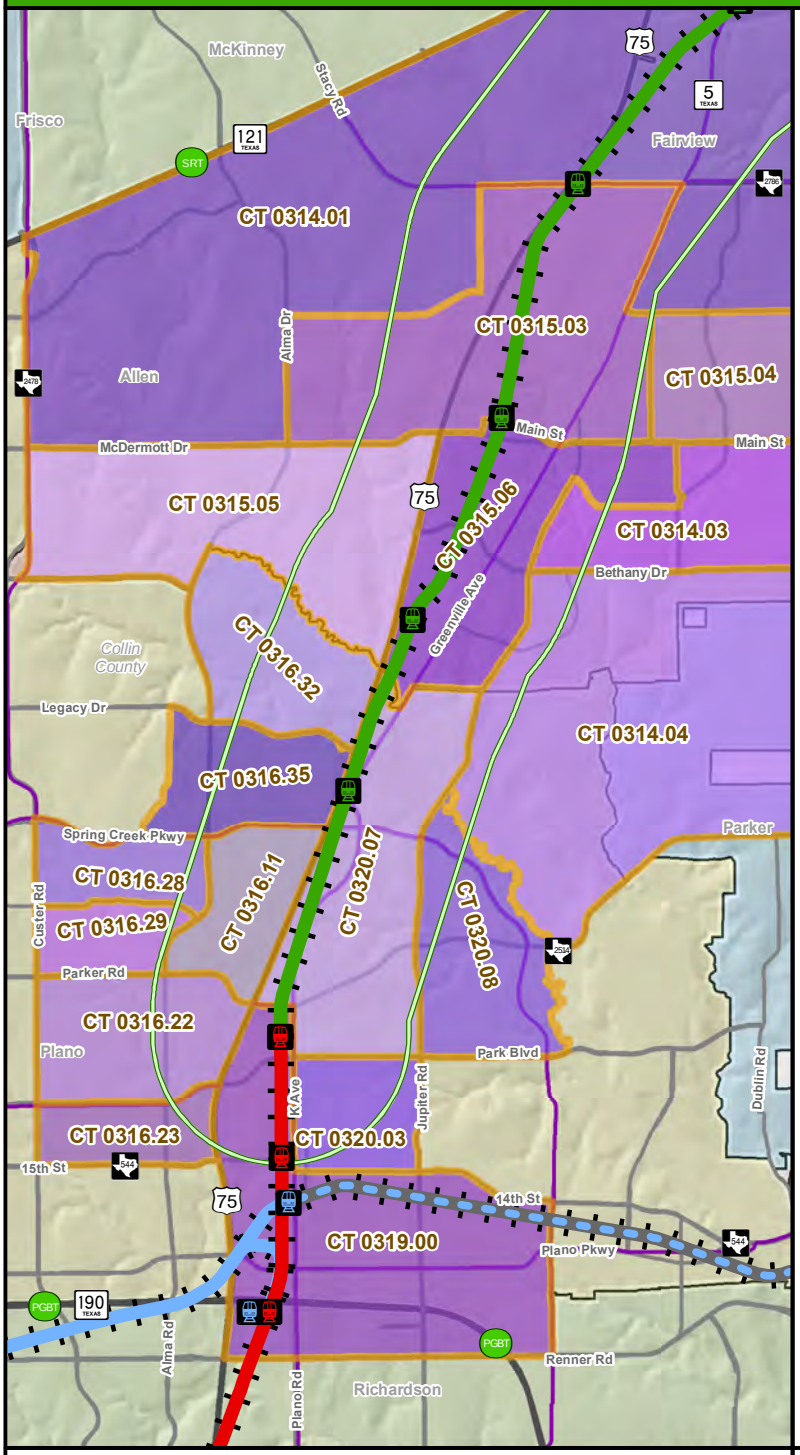
Demographics of Collin County and the study area were analyzed for environmental justice impacts. The 2000 Census data has been used to identify minority, low-income, and LEP communities in the study area. Social and demographic data for the census tracts comprising the study area were analyzed to determine 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 Collin County.

B.2.2.3 Existing Conditions and Future Projections

General populations 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 McKinney Corridor, shown in Chapter 2, Table 2-2, indicate an increase in population and employment between 2000 and 2030 of 92.6 percent and 168.1 percent, respectively.

Twenty-four census tracts were identified in the study area for the McKinney Corridor and are shown in Figures B-17 and B-18. The study area has approximately 38.0 percent minority population, which includes Hispanic persons, compared to approximately 28.9 percent minority for all of Collin County. The ethnic composition of the study area is approximately 78.5 percent White, 5.9 percent Black/African-American, 0.6 percent American Indian/Alaska Native, 4.1 percent Asian, less than 0.1 percent Native Hawaiian or other Pacific Islander and 16.5 percent Hispanic (or Latino). The study area exhibits a higher percentage of all

Figure B-17 — 2000 US Census Tracts
PGBT to SRT



Legend

US Census Boundaries (2000)

- Census Tract (CT)

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
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- County Limits

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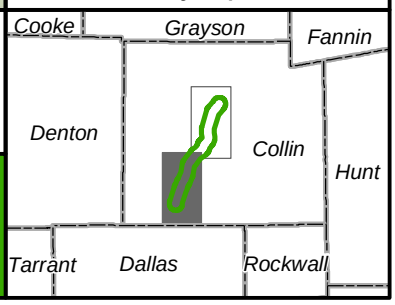
Miles

N

Key Map

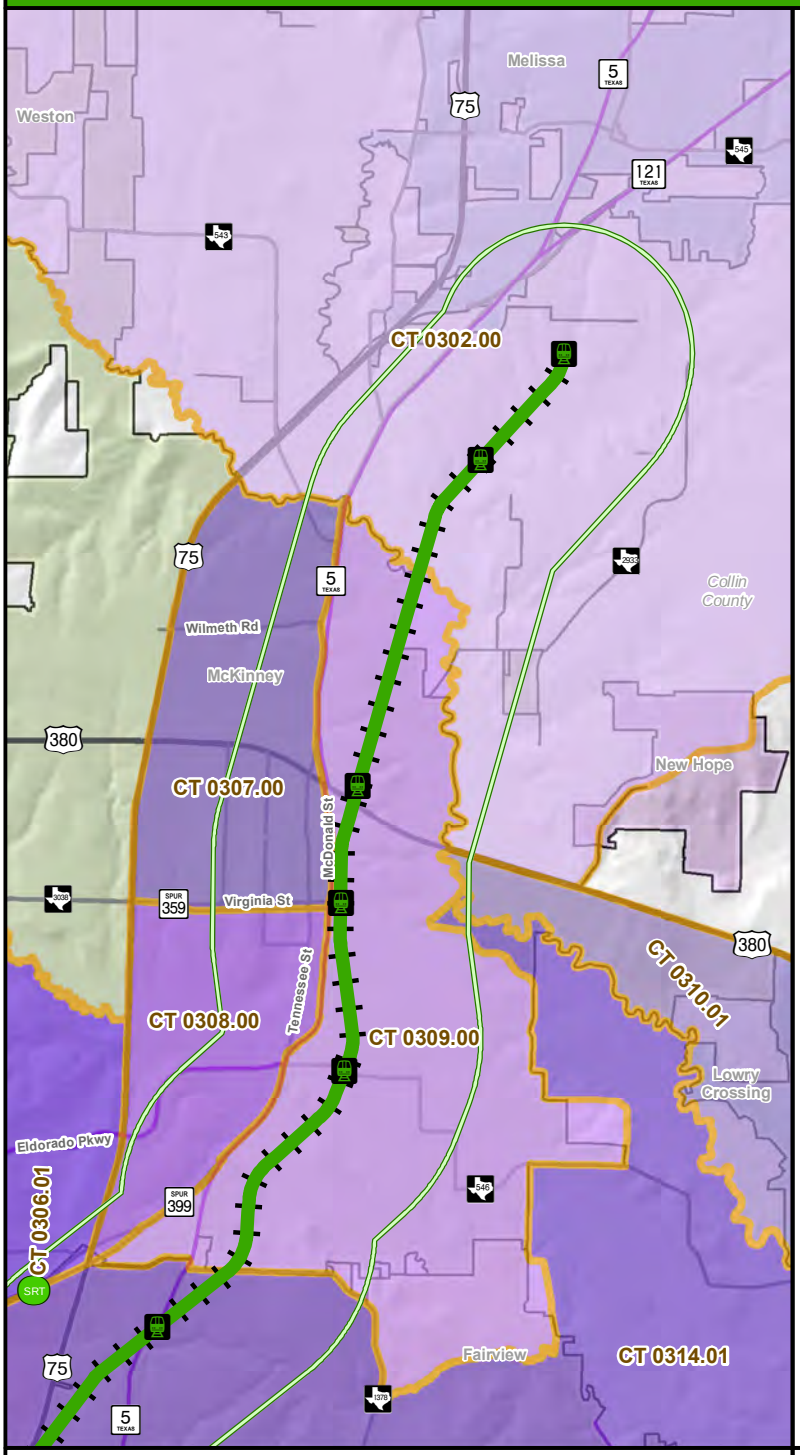


North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; US Census Bureau

Figure B-18 — 2000 US Census Tracts
SRT to FM 545



Legend

US Census Boundaries (2000)

- Census Tract (CT)

Other Items

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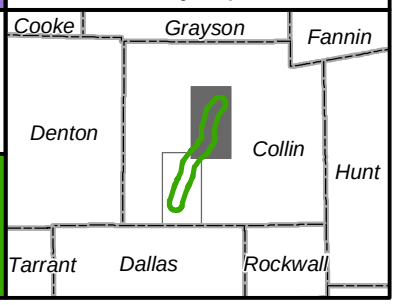
Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; US Census Bureau

ethnic minorities, except Asian, than Collin County as a whole. Table B-16 shows the population, race, and ethnicity for Collin County and the study area.

Table B-16 2000 Population and Ethnicity Composition

Characteristic	Collin County		Study Area	
	Population	Percent	Population	Percent
White	400,181	81.4%	112,973	78.5%
Black	23,561	4.8%	8,543	5.9%
American Indian	2,323	0.5%	813	0.6%
Asian	34,047	6.9%	5,835	4.1%
Native Hawaiian	230	0.0%	21	<0.1%
Other race	20,957	4.3%	12,026	8.4%
Two or more	10,376	2.1%	3,744	2.6%
Hispanic[1]	50,510	10.3%	23,743	16.5%

Source: US Census, 2000

1. Hispanic persons are not considered a separate race and may belong to any race

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. Although the study area is not minority, two census tracts were identified to contain minority populations with at least 50 percent: census tract 309.00 (50.1 percent Hispanic population) and census tract 319.00 (64.6 percent Hispanic population). 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]
302.00	8,354	7,461	47	162	53	0	396	235	961
	100%	*89.3%*	*0.6%*	*1.9%*	*0.6%*	*0.0%*	*4.7%*	*2.8%*	*11.5%*
306.01	7,258	6,772	141	22	168	0	44	111	278
	100%	*93.3%*	*1.9%*	*0.3%*	*2.3%*	*0.0%*	*0.6%*	*1.5%*	*3.8%*
307.00	8,136	5,667	776	42	62	0	1,362	227	2,262
	100%	*69.7%*	*9.5%*	*0.5%*	*0.8%*	*0.0%*	*16.7%*	*2.8%*	*27.8%*
308.00	7,254	5,080	514	61	0	0	1,375	224	2,171
	100%	*70.0%*	*7.1%*	*0.8%*	*0.0%*	*0.0%*	*19.0%*	*3.1%*	*29.9%*
309.00	6,510	2,752	1,408	5	12	0	2,210	123	3,263
	100%	*42.3%*	*21.6%*	*0.1%*	*0.2%*	*0.0%*	*33.9%*	*1.9%*	*50.1%*

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]
310.01	4,965	4,436	63	46	31	0	296	93	625
	100%	*89.3%*	*1.3%*	*0.9%*	*0.6%*	*0.0%*	*6.0%*	*1.9%*	*12.6%*
314.01	10,292	9,469	150	24	362	4	183	100	470
	100%	*92.0%*	*1.5%*	*0.2%*	*3.5%*	*0.0%*	*1.8%*	*1.0%*	*4.6%*
314.03	8,154	7,129	410	6	344	0	179	86	448
	100%	*87.4%*	*5.0%*	*0.1%*	*4.2%*	*0.0%*	*2.2%*	*1.1%*	*5.5%*
314.04	9,431	7,712	599	25	589	0	213	293	622
	100%	*81.8%*	*6.4%*	*0.3%*	*6.2%*	*0.0%*	*2.3%*	*3.1%*	*6.6%*
315.03	4,659	4,215	124	31	91	0	138	60	235
	100%	*90.5%*	*2.7%*	*0.7%*	*2.0%*	*0.0%*	*3.0%*	*1.3%*	*5.0%*
315.04	6,403	5,890	227	50	81	0	123	32	308
	100%	*92.0%*	*3.5%*	*0.8%*	*1.3%*	*0.0%*	*1.9%*	*0.5%*	*4.8%*
315.05	4,914	4,146	225	12	431	0	63	37	206
	100%	*84.4%*	*4.6%*	*0.2%*	*8.8%*	*0.0%*	*1.3%*	*0.8%*	*4.2%*
315.06	7,212	6,182	385	45	51	0	336	213	996
	100%	*85.7%*	*5.3%*	*0.6%*	*0.7%*	*0.0%*	*4.7%*	*3.0%*	*13.8%*
316.11	3,696	2,612	386	43	439	0	117	99	365
	100%	*70.7%*	*10.4%*	*1.2%*	*11.9%*	*0.0%*	*3.2%*	*2.7%*	*9.9%*
316.22	5,841	4,573	217	9	711	0	159	172	269
	100%	*78.3%*	*3.7%*	*0.2%*	*12.2%*	*0.0%*	*2.7%*	*2.9%*	*4.6%*
316.23	3,187	1,853	39	6	478	0	679	132	866
	100%	*58.1%*	*1.2%*	*0.2%*	*15.0%*	*0.0%*	*21.3%*	*4.1%*	*27.2%*
316.28	3,823	3,343	106	7	161	0	86	120	346
	100%	*87.4%*	*2.8%*	*0.2%*	*4.2%*	*0.0%*	*2.2%*	*3.1%*	*9.1%*
316.29	3,452	2,879	190	33	167	0	116	67	450
	100%	*83.4%*	*5.5%*	*1.0%*	*4.8%*	*0.0%*	*3.4%*	*1.9%*	*13.0%*
316.32	5,062	3,823	298	6	556	0	151	228	296
	100%	*75.5%*	*5.9%*	*0.1%*	*11.0%*	*0.0%*	*3.0%*	*4.5%*	*5.8%*
316.35	3,928	2,748	347	0	399	0	270	164	456
	100%	*70.0%*	*8.8%*	*0.0%*	*10.2%*	*0.0%*	*6.9%*	*4.2%*	*11.6%*
319.00	4,099	2,167	499	44	24	0	1,177	188	2,647
	100%	*52.9%*	*12.2%*	*1.1%*	*0.6%*	*0.0%*	*28.7%*	*4.6%*	*64.6%*
320.03	5,234	3,464	422	63	29	0	1,176	80	2,228
	100%	*66.2%*	*8.1%*	*1.2%*	*0.6%*	*0.0%*	*22.5%*	*1.5%*	*42.6%*
320.07	7,721	4,989	741	7	410	0	1,024	550	2,534
	100%	*64.6%*	*9.6%*	*0.1%*	*5.3%*	*0.0%*	*13.3%*	*7.1%*	*32.8%*
320.08	4,370	3,611	229	64	186	17	153	110	441
	100%	*82.6%*	*5.2%*	*1.5%*	*4.3%*	*0.4%*	*3.5%*	*2.5%*	*10.1%*

Source: US Census Bureau, 2000

1. Percentages do not include Hispanic percents; 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 Collin County and the study area. The median age of residents within the study area is 32 years, while the median age in Collin County is 33 years. Residents of the study area younger than 18 years account for 30.0 percent of the population and 5.4 percent are older than 64 years. In Collin County, 28.7 percent of residents are younger than 18 years and 5.3 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 Collin County of households that do not have an automobile available.

Table B-18 Population Characteristics

Characteristic	Collin County		Study Area	
	Population	Percent	Population	Percent
Poverty	23,784	4.9%	10,655	7.5%
Under 18	141,307	28.7%	43,181	30.0%
Over 64	25,852	5.3%	7,774	5.4%
Households with No Vehicle	4,690	2.6%	1,802	3.6%
Median Household Income	$70,835		$64,902[1]	
Median Age	33		32[1]	

Source: US Census Bureau, 2000

1. 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 and Collin County is to "drive alone." Alternative forms of transportation are more prevalent in the study area (16.8 percent) than in Collin County as a whole (12.1 percent). Almost four percent more workers in the study area carpool than in Collin County. Workers in the study area were also more likely to walk or bicycle to work than other Collin County residents.

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

Work Trip Mode[1]	Collin County		Study Area	
	Workers	Percent	Workers	Percent
Drive Alone	220,103	83.5%	60,034	83.2%
Carpool	25,152	9.5%	9,544	13.2%
Public Transportation[2]	2,189	0.8%	670	0.9%
Walk/Bicycle	2,945	1.1%	1,339	1.9%
Other Means	1,573	0.6%	553	0.8%
Alternative Transportation[3]	31,823	12.1%	12,106	16.8%

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 $30,653 and $102,367 for census tracts within the study area. The median income for Collin County was $70,835, higher than 14 of the 24 study area census tracts.

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"
302.00	6.0%	$53,911	3.0%
306.01	2.1%	$102,367	0.6%
307.00	16.9%	$38,217	10.9%
308.00	11.0%	$39,946	13.5%
309.00	26.5%	$30,653	21.2%
310.01	7.6%	$52,027	2.9%
314.01	2.8%	$98,974	1.3%
314.03	2.2%	$84,431	1.3%
314.04	1.7%	$83,138	1.0%
315.03	2.8%	$82,358	0.5%
315.04	1.4%	$77,648	0.3%
315.05	1.8%	$96,515	2.2%
315.06	8.0%	$47,866	1.8%
316.11	4.2%	$69,837	3.5%
316.22	3.5%	$74,255	2.5%
316.23	13.4%	$66,319	5.3%
316.28	2.9%	$71,875	2.5%
316.29	2.0%	$59,757	3.2%
316.32	4.4%	$76,240	2.9%
316.35	5.6%	$56,906	3.5%
319.00	26.1%	$36,349	35.3%
320.03	17.5%	$37,436	19.3%
320.07	11.2%	$50,244	9.9%
320.08	2.1%	$70,368	2.2%
Collin County	4.8%	$70,835	3.5%

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 Collin County is $56,668. Based on the analysis of median income levels, nine of the 24 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 12 of the 24 study area census tracts was higher than the poverty rate for Collin County.

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 24 census tracts in the study area.

Table B-21 Languages Spoken by LEP Populations

Language	Number of LEP speakers
Spanish	6,876
Other Indo-European	347
Asian and Pacific Island	548
Other	56

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

There are no specific legal or regulatory contexts for the analysis of community resources.

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, emergency services, etc. 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 McKinney 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 in the study area include the Allen Event Center, Allen Premium Outlets, the Commercial Historic District in McKinney, Encore Wire

Corporation in McKinney, the Medical Center of McKinney, and the Raytheon Spring Creek site. Each of these facilities is a regional destination point. Table B-22 shows the distribution of existing activity centers and developments in the study area. There were no activity centers or developments identified within the study area in Melissa or unincorporated areas.

Table B-22 Existing Activity Centers and Developments

Activity Center Type	Allen	Fairview	McKinney	Plano
Cultural	2		1	3
Education	5	1	5	6
Government Quarters	1		4	2
Hotel/Motel	5			3
Industrial	11		18	4
Institutional	2		2	2
Multi-Family	15	1	11	18
Mixed-Use			1	1
Office	17		3	6
Recreational	1			
Retail	10	1	1	17
Single-Family			4	1
Total	**69**	**3**	**50**	**63**

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 22 major employers identified in the study area. Table B-23 lists the major employers in the McKinney Corridor study area.

Table B-23 Major Employers

Company	Location	Employees
Medical Center of McKinney	McKinney	1,200
Lattimore Materials Company	McKinney	1,100
Encore Wire Corporation	McKinney	753
Benecorp Business Services	Plano	719
Raytheon Company	Plano	700
City of McKinney	McKinney	607
Experian	Allen	600
Timber Blind Manufacturing	McKinney	550
City of Allen	Allen	510
Wal-Mart Supercenter	Plano	420
City of Plano - City Hall	Plano	400
Watson & Chalin Manufacturing Incorporated	McKinney	374
Jack Henry & Associates Incorporated	Allen	363
Sanmina-Sci Corporation	Allen	350
Allen High School	Allen	333
Collin County	McKinney	308
State Farm	Allen	300

Table B-23 Major Employers (continued)

Company	Location	Employees
City of Plano Fire Department	Plano	300
Bristol Hotel Tenant Company	Plano	300
Mykrolis	Allen	259
North Texas Job Corps Center	McKinney	251
Super Target	Allen	250

Source: NCTCOG GIS – Major Employers, January 2010

Of the 22 major employers in the study area, Allen and McKinney each had eight, and Plano had six. No other cities had major employers. There are nine major employers with over 500 employees, five within McKinney (the City of McKinney, Encore Wire Corp, Lattimore Materials Company, Medical Center of McKinney and Timber Blind Manufacturing), two in Plano (Benecorp Business Services and Raytheon Company), and two in Allen (the City of Allen and Experian).

Community Facilities

There were 86 community facilities identified within the McKinney Corridor study area. These facilities were categorized into ten 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]
Allen	1	2	1	6	2	2	4		3	
Fairview				1	2	1			1	
McKinney	8	3	2	6	2	3	3	1	6	1
Melissa					1	1				
Plano	2	1	2	6	2	3		1	4	2
Total	**11**	**6**	**5**	**19**	**9**	**10**	**7**	**2**	**14**	**3**

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 recreational facilities; the least common were transportation facilities and places of worship. McKinney recorded the most community facilities with a total of 35, accounting for 41 percent

of all community facilities in the study area. Fairview and Melissa contained the fewest community facilities in the study area with five and two facilities, respectively.

B.2.4 Cultural Resources

B.2.4.1 Legal/Regulatory Context

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.

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 undertaking's effects 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 (DAP) 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 are 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 1.0. 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 Collin 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 1,532 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 ten-year increments starting in 1926.

Table B-25 Year of Construction in Parcels

Year Built	Number of Parcels
Before 1926	3
1926-1935	5
1936-1945	16
1946-1955	77
1956-1965	302
1966-1975	1,129
Total	**1,532**

Source: Collin County Parcel Data, 2008

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

Table B-26 NHRP Historical Districts

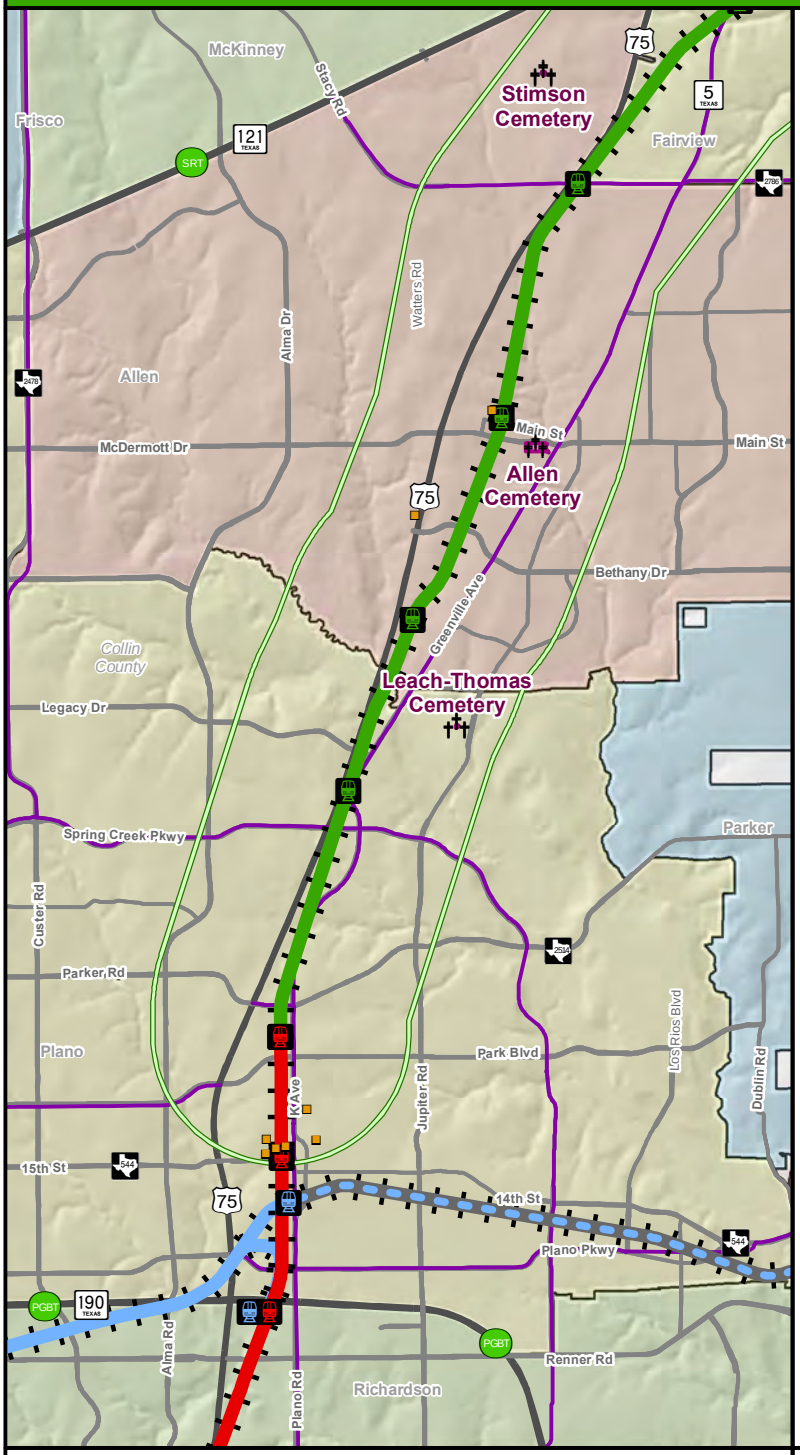
District Name	District Boundaries
McKinney Commercial Historic District	Roughly bounded by Herndon Street, Wood Street, Cloyd Street, Davis Street, Louisiana Street, McDonald Street and Virginia Street in the City of McKinney
McKinney Cotton Mill Historic District	Roughly bounded by Elm Street, RR tracks, Burrus Street, Fowler Street and Amscott Street in the City of McKinney
McKinney Residential Historic District	Roughly bounded by Lamar Street, Benge Street, Louisiana Street and Oak Street in the City of McKinney

Source: THC, 2009

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 53 NRHP-listed properties currently listed. Table B-27 lists the NRHP-listed properties. All of the listed properties are within the City of McKinney. Figures B-19 and B-20 show the locations of these historical resources.

There are 50 historical markers in the study area, located within three municipalities. Table B-28 lists the historical markers and the municipality they are located in. The locations of these historical resources are shown previously in Figures B-19 and B-20. Within the study area, McKinney has 42 (84 percent) of the historical markers, Plano has six (12 percent), and Allen has two (4 percent).

Figure B-19 — Historical Resources
PGBT to SRT



Legend

Historical Features

- National Register Historical Property
- State Historical Marker
- Cemetery
- National Register Historical District

Other Items

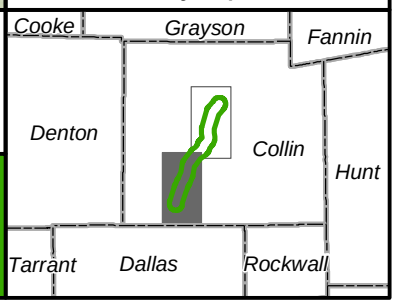
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map



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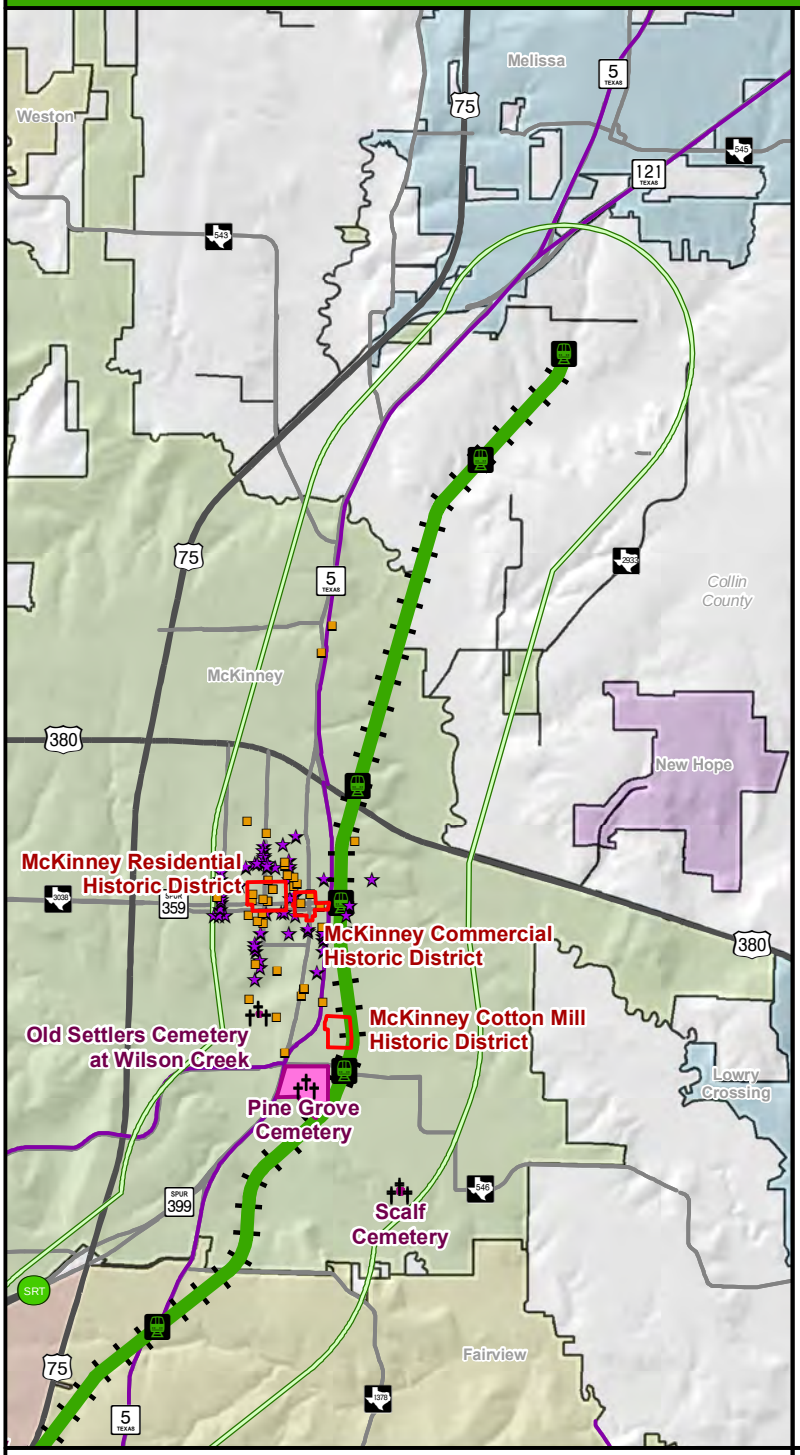
McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; THC

Figure B-20 — Historical Resources
SRT to FM 545



Legend

Historical Features

- National Register Historical Property
- State Historical Marker
- Cemetery
- National Register Historical District

Other Items

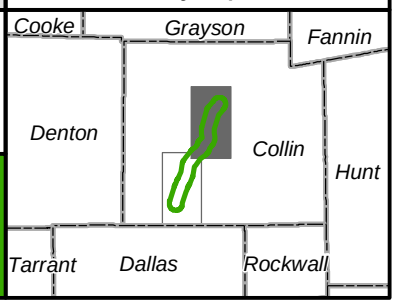
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; THC

Table B-27 NRHP-Listed Properties

NRHP Reference Number	Property Name	Address	Listed Date
87001661	Beverly--Harris House	604 Parker Street	10/08/1987
87001662	Bingham, John H., House	800 S. Chestnut Street	06/27/1988
87001663	Board--Everett House	507 N. Bradley Street	10/08/1987
87001666	Brown, John R., House	509 N. Church Street	10/08/1987
87001671	Burrus--Finch House	405 N. Waddill Street	06/27/1988
87001679	Clardy, U. P., House	315 Oak Street	10/08/1987
87001681	Cline--Bass House	804 Tucker Street	06/27/1988
87001682	Coggins, J. R., House	805 Howell Street	10/08/1987
87001685	Collin County Mill and Elevator Company	407 E. Louisiana Street	10/08/1987
87001688	Goodner, Jim B., House	302 S. Tennessee Street	10/08/1987
87001691	Crouch--Perkins House	205 N. Church Street	10/08/1987
87001695	Davis, H. L., House	705 N. College Street	10/08/1987
87001697	Davis--Hill House	710 N. Church Street	10/08/1987
87001699	Dowell, J. S., House	608 Parker Street	10/08/1987
87001702	Dulaney, Joseph Field, House	315 S. Chestnut Street	10/08/1987
87001704	Dulaney, Joe E., House	311 S. Chestnut Street	10/08/1987
87001705	Faires, F. C., House	505 S. Chestnut Street	10/08/1987
87001706	Faires--Bell House	South side of Chestnut Square	10/08/1987
87001707	Ferguson, John H., House	607 N. Church Street	10/08/1987
87001708	Foote--Crouch House	401 N. Benge Street	06/27/1988
87001709	Fox, S. H., House	808 Tucker Street	10/08/1987
87001710	Gouch--Hughston House	1206 W. Louisiana Street	06/27/1988
87001711	Heard--Craig House	205 W. Hunt Street	10/08/1987
87001712	Hill, Ben, House	509 Tucker Street	10/08/1987
87001713	Hill, John B., House	605 N. College Street	10/08/1987
87001714	Hill, Moran, House	203 N. Waddill Street	10/08/1987
87001715	Hill, W. R., House	601 N. College Street	10/08/1987
87001716	Hill--Webb Grain Elevator	400 E. Louisiana Street	10/08/1987
87001717	House at 1303 W. Louisiana	1303 W. Louisiana Street	10/08/1987
87001719	House at 301 E. Lamar	301 E. Lamar Street	10/08/1987
87001720	House at 610 Tucker	610 Tucker Street	10/08/1987
87001721	House at 704 Parker	704 Parker Street	10/08/1987
87001722	Houses at 406 and 408 Heard	406 & 408 Heard Street	10/08/1987
87001723	Johnson, John, House	302 Anthony Street	10/08/1987
87001724	Johnson, Thomas, House	312 S. Tennessee Street	10/08/1987
87001737	King, Mrs. J. C., House	405 W. Louisiana Street	10/13/1988
87001738	Kirkpatrick, E. W., House and Barn	903 Parker Street	10/08/1987
87001739	McKinney Cotton Compress Plant	300 blk. Throckmorton Street	06/27/1988
87001743	McKinney Hospital, Old	700--800 S. College Street	10/08/1987
87001745	Neathery, Sam, House	215 N. Waddill Street	06/27/1988
87001746	Nenney, J. P., House	601 N. Church Street	06/27/1988
87001747	Newsome, R. F., House	609 Tucker Street	10/08/1987
87001748	Newsome--King House	401 W. Louisiana Street	10/08/1987
87001749	Rhea, John C., House	801 N. College Street	06/27/1988
87001750	Scott, A. M., House	1109 W. Louisiana Street	10/08/1987
87001751	Scott, L. A., House	513 W. Louisiana Street	06/27/1988
87001752	Smith, W. D., House	703 N. College Street	10/08/1987

Table B-27 NRHP-Listed Properties (continued)

NRHP Reference Number	Property Name	Address	Listed Date
87001753	Taylor, J. H., House	211 N. Waddill Street	10/08/1987
87001754	Thompson House	1207 W. Louisiana Street	10/08/1987
87001755	Waddill, R. L., House	302 W. Lamar Street	10/08/1987
87001756	Wiley, Thomas W., House	105 S. Church Street	10/08/1987
87001757	Wilson, A. G., House	417 N. Waddill Street	10/08/1987
95001365	Estes House	903 N. College Street	11/29/1995

Source: THC, 2009

Table B-28 Historical Markers

District Name	Location
Allen Station of the Texas Electric Railway	Allen
Aron-Harris House	McKinney
Barnes-Largent House	McKinney
Beverly-Harris House	McKinney
Bradley Cemetery	McKinney
Burton House	McKinney
Collin County	McKinney
Collin County Courthouse, Old	McKinney
Collin County Prison	McKinney
Crouch-Perkins House	McKinney
Davis House	McKinney
Davis House	McKinney
Dulaney Cottage	McKinney
Dulaney House	McKinney
Elm Saloon, Site of	McKinney
Faires, John, House	McKinney
Fanny Finch Elementary School	McKinney
First Baptist Church of McKinney	McKinney
First Baptist Church of Plano	Plano
First Christian Church of Plano	Plano
First Methodist Church of Plano	Plano
First National Bank Building	McKinney
First United Methodist Church of McKinney	McKinney
Fox-Caldwell House	McKinney
Gough-Hughston House	McKinney
Heard, Charles P. and Sallie G., House	McKinney
Heard, John S. and Rachel W., House	McKinney
Heard-Craig House	McKinney
Hoard, Dr. William Taylor, House	McKinney
Howell House	McKinney
Johnson, Rebekah Baines, Birthplace of	McKinney
Kirkpatrick House	McKinney
Largent, William B., House	McKinney
Martin, John, House	McKinney
McKinney	McKinney
McKinney, Collin, Home	McKinney
Muncey Massacre	Allen
Pecan Grove Memorial Park	McKinney
Plano High School and Gymnasium	Plano
Plano National Bank/I.O.O.F. Lodge Building	Plano
Rhea, James Calvin, House	McKinney
Saint Mark Baptist Church	McKinney
Scott, L.A., Home	McKinney
Stiff, J.D., Home	McKinney
Taylor House	McKinney
Texas Electric Railway Station	Plano
Thompson, William Clinton and Anna Belle, House	McKinney
Throckmorton, James W., Law Office	McKinney
Waddill-Morris Homesite	McKinney
Wilmeth-McKinney Homestead, Site of	McKinney

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, six 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
COL-C004	Old Settlers Cemetery at Wilson Creek	McKinney
COL-C010	Leach-Thomas	Plano
COL-C044	Stimson	Allen
COL-C056	Pine Grove	McKinney
COL-C057	Scalf	McKinney
N/A	Allen Cemetery	Allen

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 no museums located within the study area.

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-30 shows the previous archeological investigations that have been performed in the study area for other projects. A total of 33 archeological investigations have been conducted in the study corridor by other entities, including investigations in all five municipalities and the unincorporated portions of the study area.

Table B-30 Archeological Investigations

Date Conducted	Implementing Agency	Project Type
12/74	Soil Conservation Service (SCS)	Survey
04/78	US Environmental Protection Agency (EPA)	Survey
02/79	EPA	Survey
01/82	EPA	Survey
04/82	TxDOT	Survey
01/83	EPA	Survey
11/85	Federal Highway Administration (FHWA)	Survey
05/86	US National Park Service	Survey
03/87	FHWA	Survey
08/87	Farmers Home Administration (FmHA)	Survey
11/87	FHWA	Survey
03/88	TxDOT	Survey
06/89	TxDOT	Survey

Table B-30 Archeological Investigations (continued)

Date Conducted	Implementing Agency	Project Type
10/90	TxDOT	Unknown
05/92	EPA	Survey
02/96	FHWA	Survey
04/96	DART	Survey
12/96	City of Allen	Survey
12/96	City of Allen	Survey
02/98	Texas Parks and Wildlife Department (TPWD)	Survey
02/99	TPWD	Survey
02/99	City of Irving	Survey
02/01	TxDOT	Survey
02/02	City of Allen	Testing
02/02	City of Allen	Testing
02/02	City of Allen	Testing
02/02	City of Allen	Testing
12/03	TxDOT	Assessment and Survey
12/03	TxDOT	Assessment and Survey
02/05	TxDOT/FHWA	Recon Survey
02/05	City of McKinney	Survey
07/06	Federal Aviation Administration (FAA)	Survey
04/07	US Army Corps of Engineers (USACE)	Survey

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 taking 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 56 parks and recreational areas were identified. Three greenbelts, one preserve, and one nature area have been designated by the municipalities. The features database returned seven different types of facilities in three study area municipalities. Table B-31 lists the name, type, and location of each facility.

Table B-31 Parks and Recreational Facilities

Name	Type	Location
Boys & Girls Club of Collin County	Recreational or Community Center	McKinney
Central Park	School Park	McKinney
Cottonwood Park	Community Park	McKinney
Finch Park	School Park	McKinney
Fitzhugh Park	School Park	McKinney
Heard Natural Science Museum and Wildlife Sanctuary	Recreational or Community Center	McKinney
McKinney Boys & Girls Club	Recreational or Community Center	McKinney
McKinney Country Club	Golf Course	McKinney
Mitchell Park	School Park	McKinney
Mouzon Ball Fields	Community Park	McKinney
Murphy Park	School Park	McKinney
North Park	Community Park	McKinney
Oak Hollow Golf Course	Golf Course	McKinney
Old Settler's Park	Community Park	McKinney
Senior Citizen Center	Community Park	McKinney
The Golf Club at McKinney	Golf Course	McKinney
Wattley Park	School Park	McKinney
Wilson Creek Softball/Baseball Complex	Community Park	McKinney
Swings Unlimited Practice Center	Golf Course	Fairview
Allen Dog Park	Special Use Park	Allen
Allen Heritage Center	Recreational or Community Center	Allen
Allen Senior Center	Recreational or Community Center	Allen
Allen Station Park	Community Park	Allen
Allen Youth Park Edge	Sports Complex	Allen
Allenwood Property	Park	Allen
Chase Oaks Golf Course	Sports Complex	Allen
City Hall Plaza	Park	Allen
Collin Square	Park	Allen
Cottonwood Bend Park	Park	Allen

Table B-31 Parks and Recreational Facilities (continued)

Name	Type	Location
Don Rodenbaugh Natatorium	Sports Complex	Allen
Ford Park West	Sports Complex	Allen
Ford Pool	Park	Allen
Greenville Heights	Park	Allen
Jupiter Park	Sports Complex	Allen
Park & Recreation Operations Office	Park	Allen
Quail Run Park	Park	Allen
Rolling Hills Park	Park	Allen
Spring Meadow Park	Park	Allen
Boys & Girls Club of Collin County	Recreational or Community Center	Plano
Chase Oaks Golf Club	Golf Course	Plano
Chisholm Trail Greenbelt	Park	Plano
Chisholm Trail Greenbelt (South)	Park	Plano
Clearview Park	Park	Plano
Enfield Park	Park	Plano
Haggard Park	Park	Plano
Harrington Park	Park	Plano
High Point Athletic Fields	Park	Plano
High Point Tennis Center	Park	Plano
Oak Point Center	Park	Plano
Oak Point Park & Nature Preserve	Park	Plano
Oak Point Park & Nature Preserve North	Park	Plano
Santa Fe Trail	Park	Plano
Schell Park	Park	Plano
Sergeant Mike McCreary Sports Fields	Sports Complex	Plano
Shawnee Park	Park	Plano
Willowcreek Park	Park	Plano

Source: NCTCOG GIS – Features and Parks, 2009

B.2.6 Regulated Materials

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) 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.

B.2.6.2 Existing Conditions and Future Projections

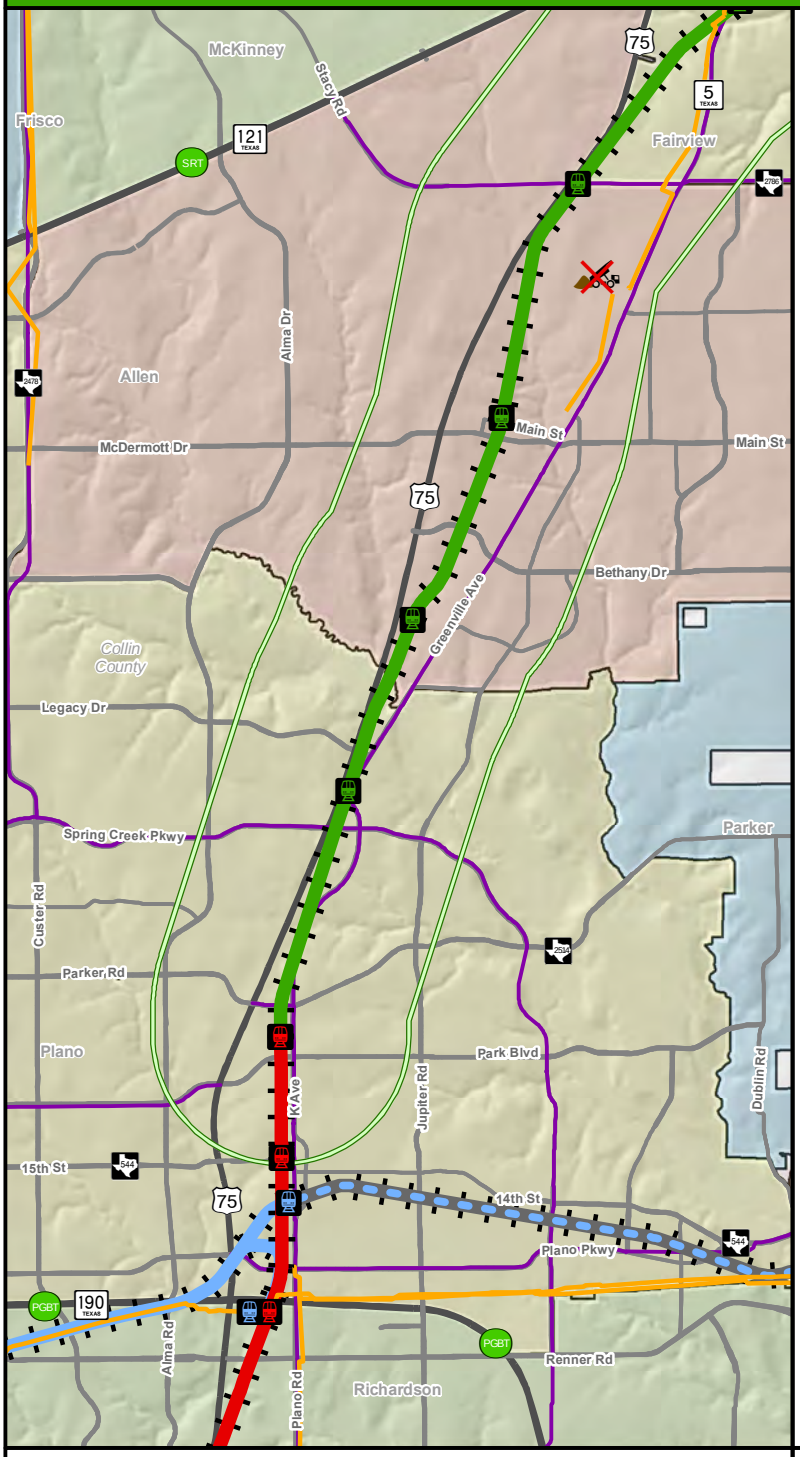
Data was obtained from TCEQ, NCTCOG, and the Railroad Commission of Texas for potential hazardous materials sites. Although this data identified potential areas, actual contamination of soil and/or ground water would not be determined until field investigations would occur during the next project development phase.

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 McKinney 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.

Four landfill sites and 14 miles of pipeline were identified in the McKinney Corridor study area; no radioactive, Superfund or mining sites were identified. Three of the four 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 other identified landfill, the City of McKinney Landfill, is an active, authorized landfill with a registered permit with TCEQ for waste disposal.

The 14 miles of pipeline traversing the study area carried two types of product: natural gas and natural gas liquids. Natural gas accounted for the majority of the piped commodities with 11.5 miles of pipeline (82 percent). The natural gas liquids pipeline traversing the study area near the McKinney North 1 Station accounts for the remainder of the pipelines within the McKinney Corridor study area. Figures B-21 and B-22 show the location of the potential regulated materials sites within the study area.

Figure B-21 — Regulated Materials
PGBT to SRT



Legend

Potential Sites

- Active Landfill
- Closed Landfill
- Oil/Natural Gas Pipeline

Other Items

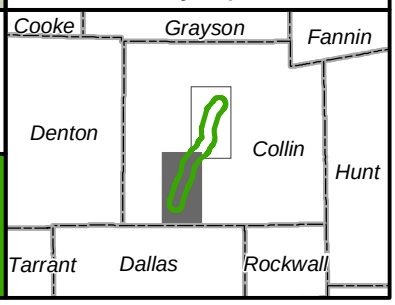
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3

Miles

N

Key Map



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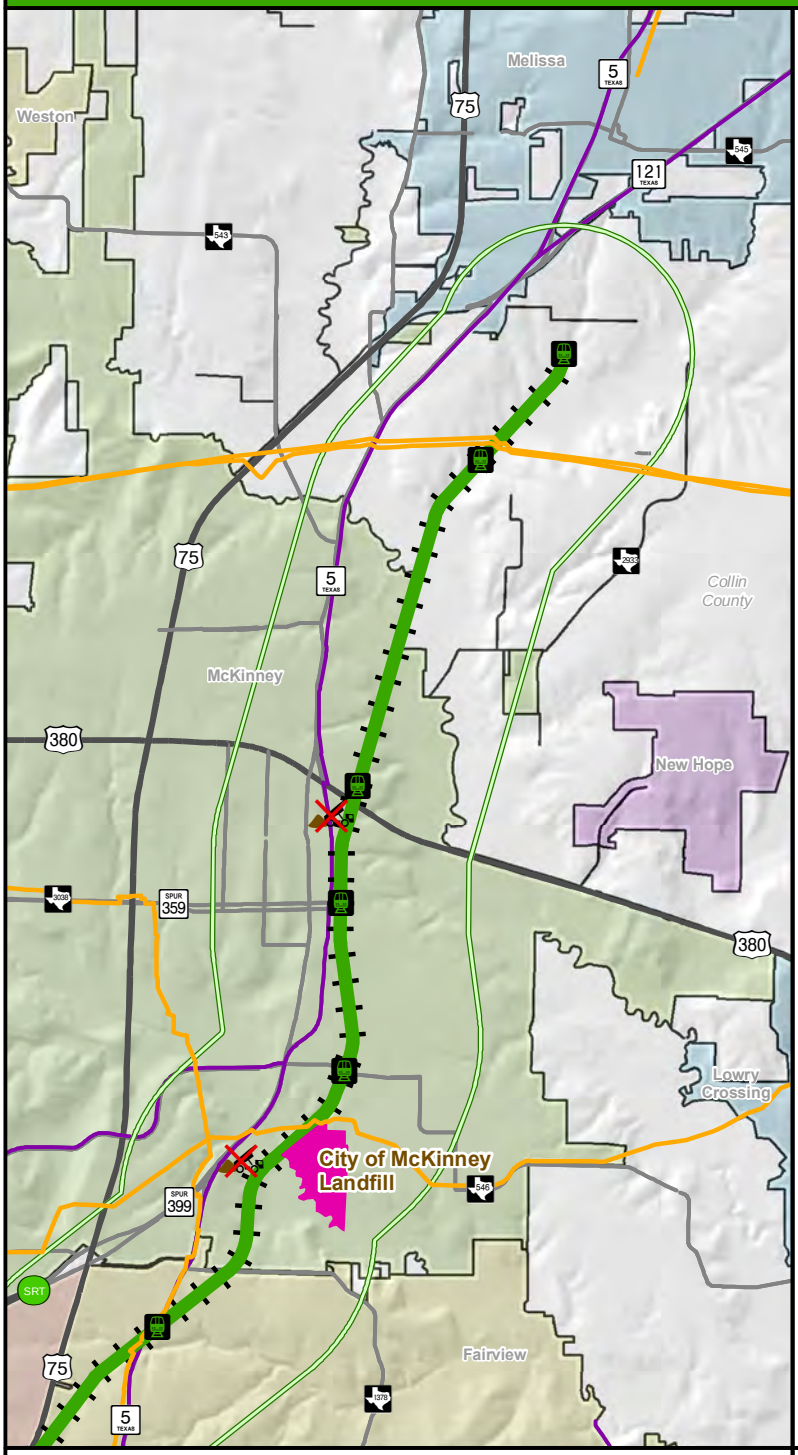
Map Date: July 2010 Source(s): NCTCOG

Figure B-22 — Regulated Materials
SRT to FM 545



Legend

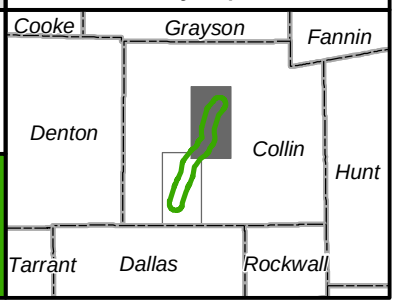
Potential Sites
- Active Landfill
- Closed Landfill
- Oil/Natural Gas Pipeline

Other Items
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

0 0.5 1 1.5 2 2.5 3
Miles

N

Key Map



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McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

B.3 ENVIRONMENTAL CONDITIONS

The following sections discuss the regulatory guidance, methodology, existing conditions, and future projections for environmental resources. Although the McKinney 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-32 lists the NAAQS for these six pollutants.

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.

Table B-32 Air Pollution Concentrations Required to Exceed the NAAQS

Pollutant	Averaging Period	Standard	Primary NAAQS[1]	Secondary NAAQS[2]
Ozone	8-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	1-hour	Not to be at or above this level more than once per calendar year.	35.5 ppm	35.5 ppm
	8-hour	Not to be at or above this level more than once per calendar year.	9.5 ppm	9.5 ppm
Sulfur Dioxide	3-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

Table B-32 Air Pollution Concentrations Required to Exceed the NAAQS (continued)

Pollutant	Averaging Period	Standard	Primary NAAQS[1]	Secondary NAAQS[2]
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-hr	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.

B.3.1.2 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. Between 2000 and 2020, FHWA projects that 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.

B.3.1.3 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.

B.3.1.4 Conformity

The study area is located in Collin County, which has 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.3.1.5 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.3.1.6 Existing Conditions and Future Projections

Air quality is a regional problem, not a localized condition. The study area is located in Collin County, which has 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, Hunt, and Wise Counties have been proposed to be added as nonattainment for eight-hour ozone standards. These additional counties are 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.

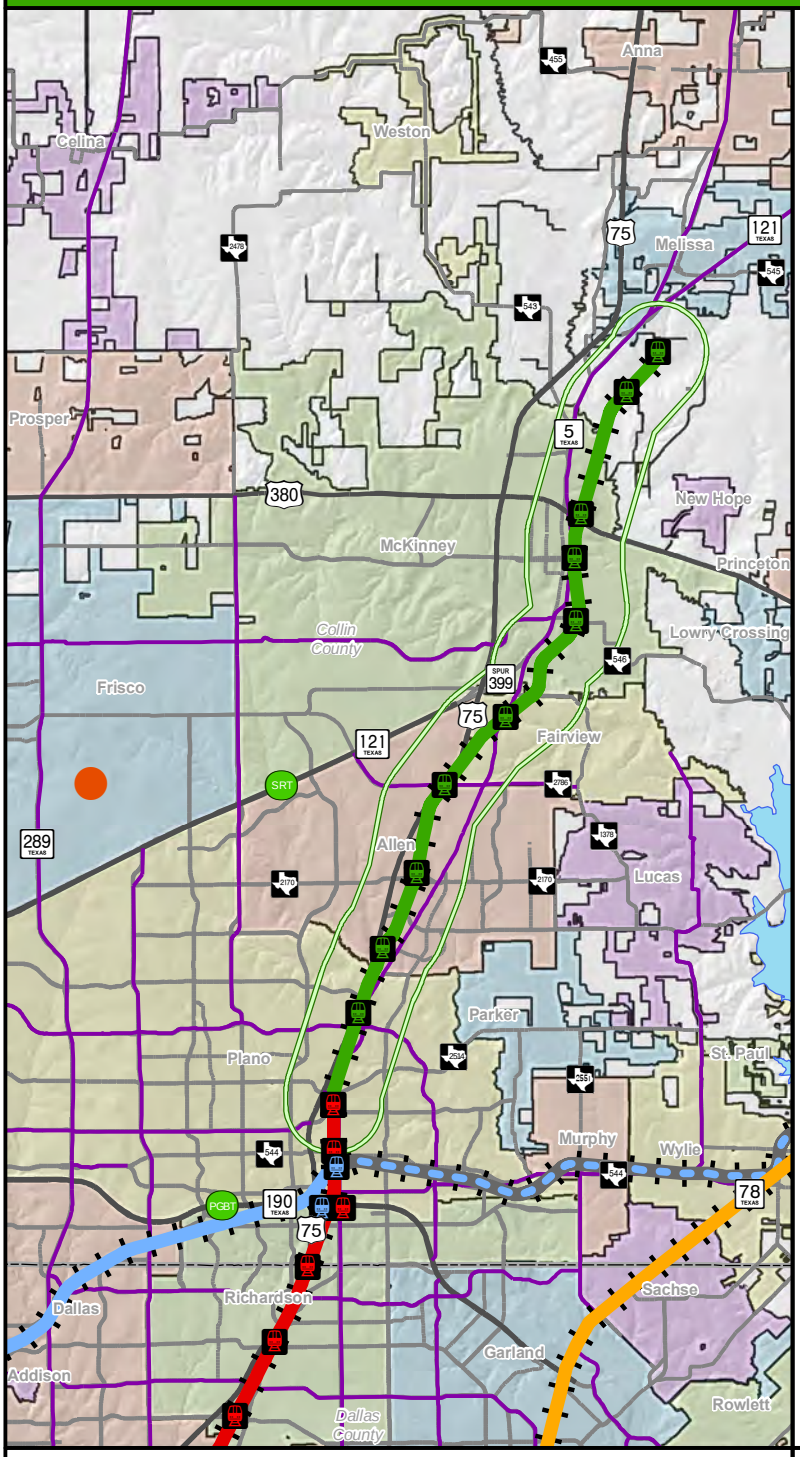
The modeling procedures for ozone require long-term meteorological data, detailed area-wide emission rates, and activity levels for all emission sources (on-road, non-road, point, and area). Accordingly, concentrations of ozone are modeled by the regional air quality planning agency for the SIP. The 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-33 lists the four highest daily maximum eight-hour ozone concentrations recorded annually from 2000 to 2009 at the Frisco Continuous Air Monitoring Station (CAMS) 31/CAMS 680. This CAMS is the closest active monitoring station to the study area.

Table B-33 Four Highest Eight-Hour Ozone Concentrations

Year	Highest		Second Highest		Third Highest		Fourth Highest	
	Date	Level[1]	Date	Level[1]	Date	Level[1]	Date	Level[1]
CAMS 31 / CAMS 680 Frisco								
2000	07/14/00	130	08/02/00	124	08/22/00	124	07/06/00 08/24/00	119
2001	06/20/01	115	08/19/01	114	07/13/01	113	07/23/01	109
2002	09/14/02	113	09/13/02	112	09/27/02	105	07/09/02	99
2003	08/07/03	118	07/18/03	109	05/18/03	102	06/01/03	101
2004	07/15/04	113	07/20/04	113	08/02/04	112	07/21/04	110
2005	09/28/05	117	05/22/05	108	06/23/05	108	08/23/05	101
2006	07/21/06	114	08/31/06	111	06/30/06	110	05/13/06	100
2007	09/21/07	118	08/10/07	96	06/05/07	94	07/23/07 07/25/07	94
2008	07/01/08	110	08/14/08	102	08/21/08	97	07/02/08	94
2009	08/25/09	109	07/02/09	95	06/27/09	94	07/13/09	92

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

Figure B-23 — Air Quality Monitoring Stations



Legend

Air Quality Features

- Frisco CAMS 31/680

Other Items

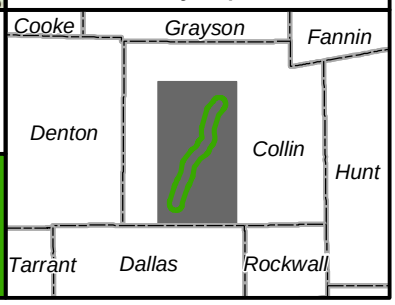
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

0 1 2 4 6 8

Miles

N

Key Map



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McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

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.
- 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 is required as part of the National Environmental Protection Act (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.

B.3.2.2 Human Perception Levels

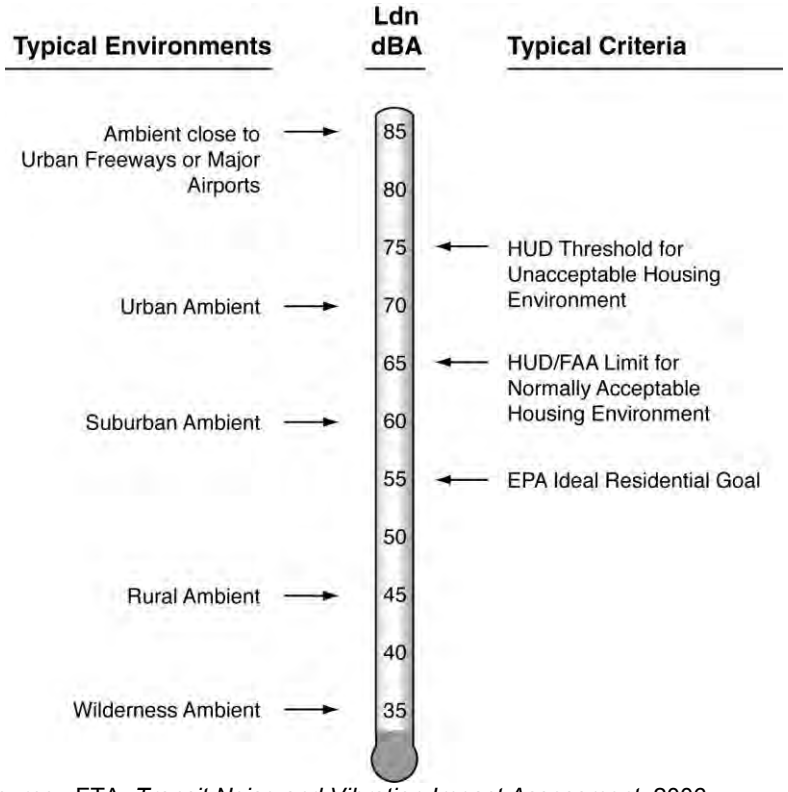
Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human subjective response are intensity or level, frequency content, and variation 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-34.

Table B-34 Land Use Categories and Metrics for Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)$[1]	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 $L_{eq}(h)$[1]	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.

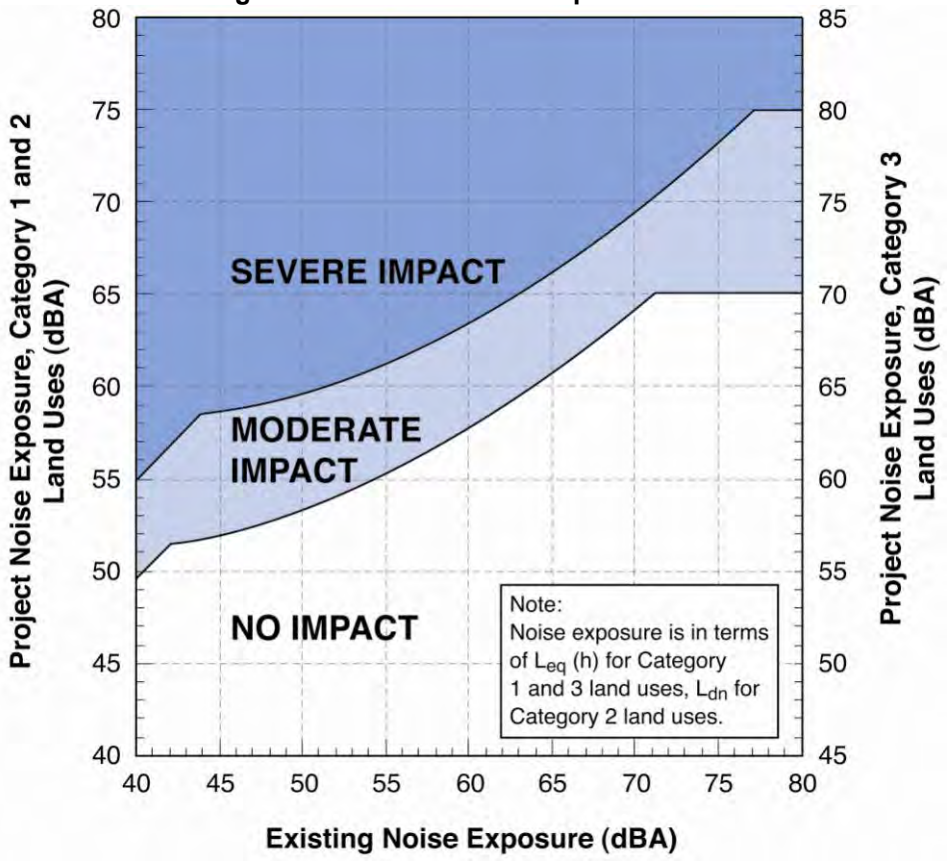
Source: FTA, *Transit Noise and Vibration Impact Assessment*. 2006
1. L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity

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. Since 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-34 identifies sensitive land use as defined by the FTA.

B.3.2.5 Existing Conditions and Future Projections

GIS data for 2005 land use was used to determine the linear feet of noise sensitive land uses adjacent to the existing McKinney Corridor rail line. Of the land use adjacent to the rail right-of-way, there were 18,925 linear feet (10.1 percent) of residential land use, 5,777 linear feet (3.1 percent) of park or recreational land use, and 1,274 linear feet (0.7 percent) of institutional land use. This totals 25,976 linear feet (13.9 percent) of noise sensitive land use. These land uses could contain specific noise sensitive receivers.

In addition, the existing McKinney Corridor rail line has freight activity. This freight activity is moderate and limited to the areas north of Industrial Boulevard in McKinney. 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

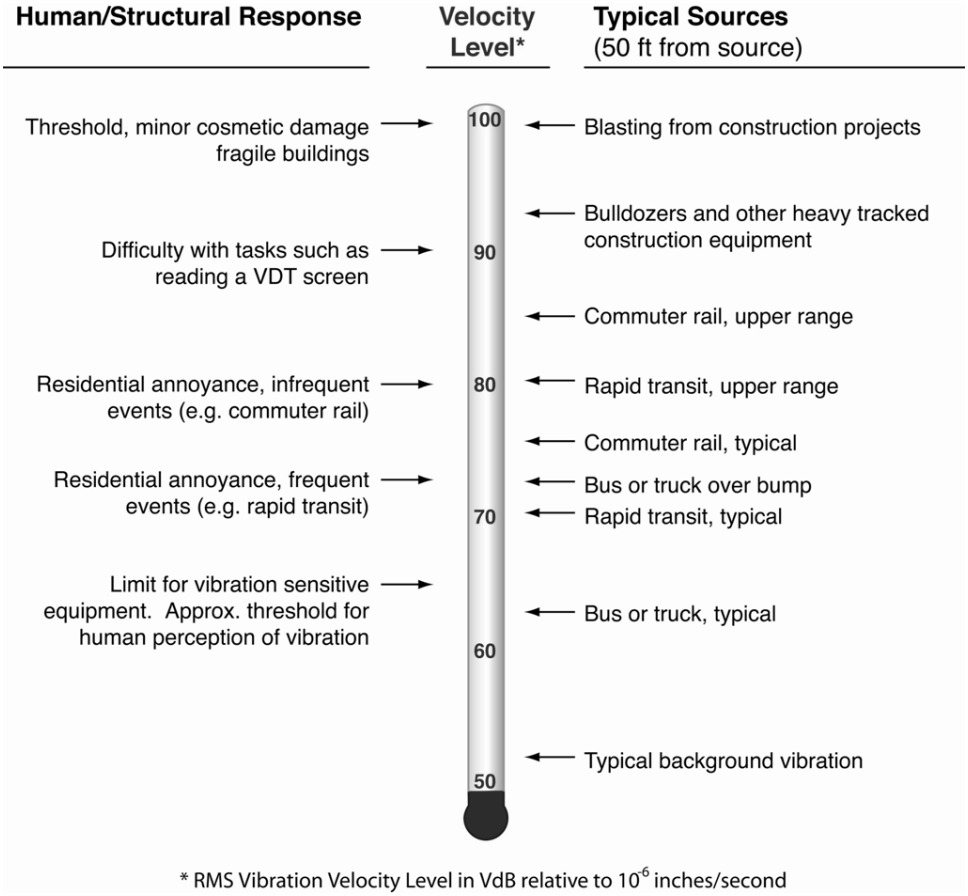
Ground-borne vibration is the shaking motion of the ground due to a source such as a train, bus, or truck passing by. Vibration waves are generated at the source, pass through the ground and into nearby buildings.

B.3.3.1 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, since 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.3.3.2 Vibration Criteria

The FTA criteria for vibration impact are based on land use and vehicle frequency, as shown in Table B-35. 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-35 Ground-Borne Vibration and Noise Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch /sec)			Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)		
	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.3.3.3 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 McKinney Corridor rail line. In the study area, no Category 1 land uses were identified. Category 2 land uses totaled 18,925 linear feet (10.1 percent) which included residential, hotels, and motels. Finally, 7,050 linear feet (3.7 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 McKinney Corridor rail line has freight activity detailed in Chapter 1, Section 1.4.3. 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, and 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

Floodplains

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.

Water Quality

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 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

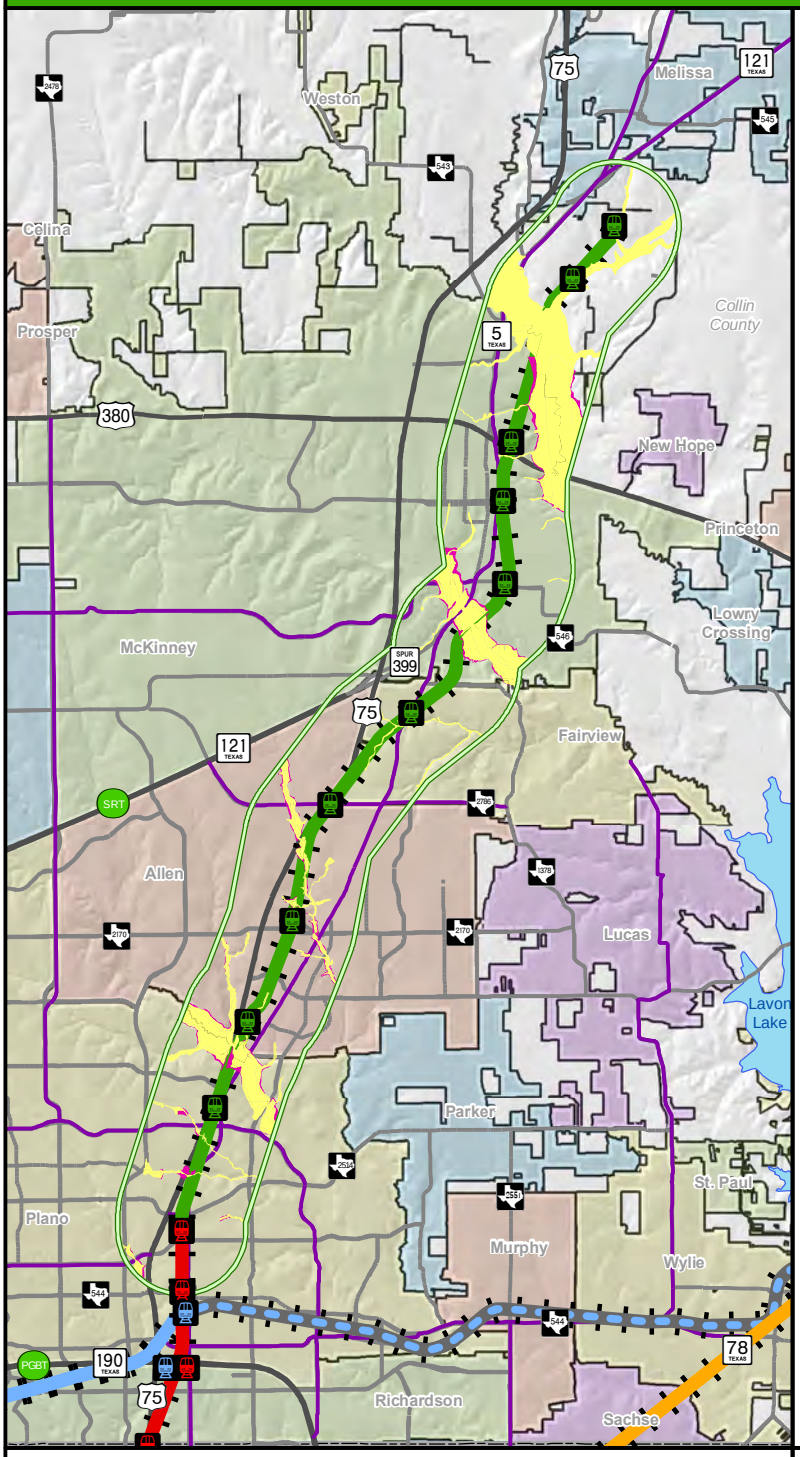
Using NCTCOG data floodplains, streams and lakes, and impaired streams and lakes were mapped and a determination per each resource was summarized if it occurs within the study area. Figures B-27 through B-28 show all water quality related resources in the study area: floodplains, streams and lakes.

B.3.4.3 Existing Conditions and Future Projections

A total of 3,716 acres of 100-year floodplain were located in the study area. In addition, 282 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 Figure B-27. The largest area of floodplain occurred along the East Fork Trinity River and Clemons Creek, which run parallel to the McKinney Corridor study area north of US 380.

Numerous streams cross the project area. Over 230,000 linear feet of stream were identified in the project study area. These streams included unnamed tributaries and aqueducts. Larger streams include Bowman Branch, Brown Branch, Clemons Creek, Comegy Creek, Cottonwood Creek, East Fork Trinity River, Fitzhugh Branch, Honey Creek, Jeans Creek, Rowlett Creek, Russell Branch Rowlett Creek, Shawnee Park Pond, Sloan Creek, Spring Creek, and Wilson Creek. No stream segments within the study area are listed on the 2008 TCEQ Section 303(d) list for impaired water body segments. A more detailed discussion of streams is in Section B.3.6.

Figure B-27 — Floodplains
PGBT to FM 545



Legend

Identified Floodplains

- 100-Year Floodplain
- 500-year Floodplain

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

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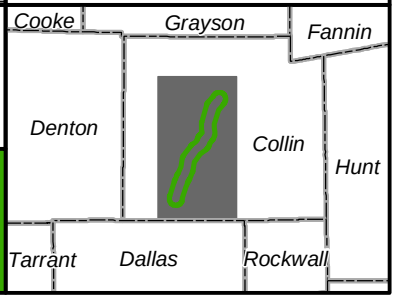
Miles

N

Key Map



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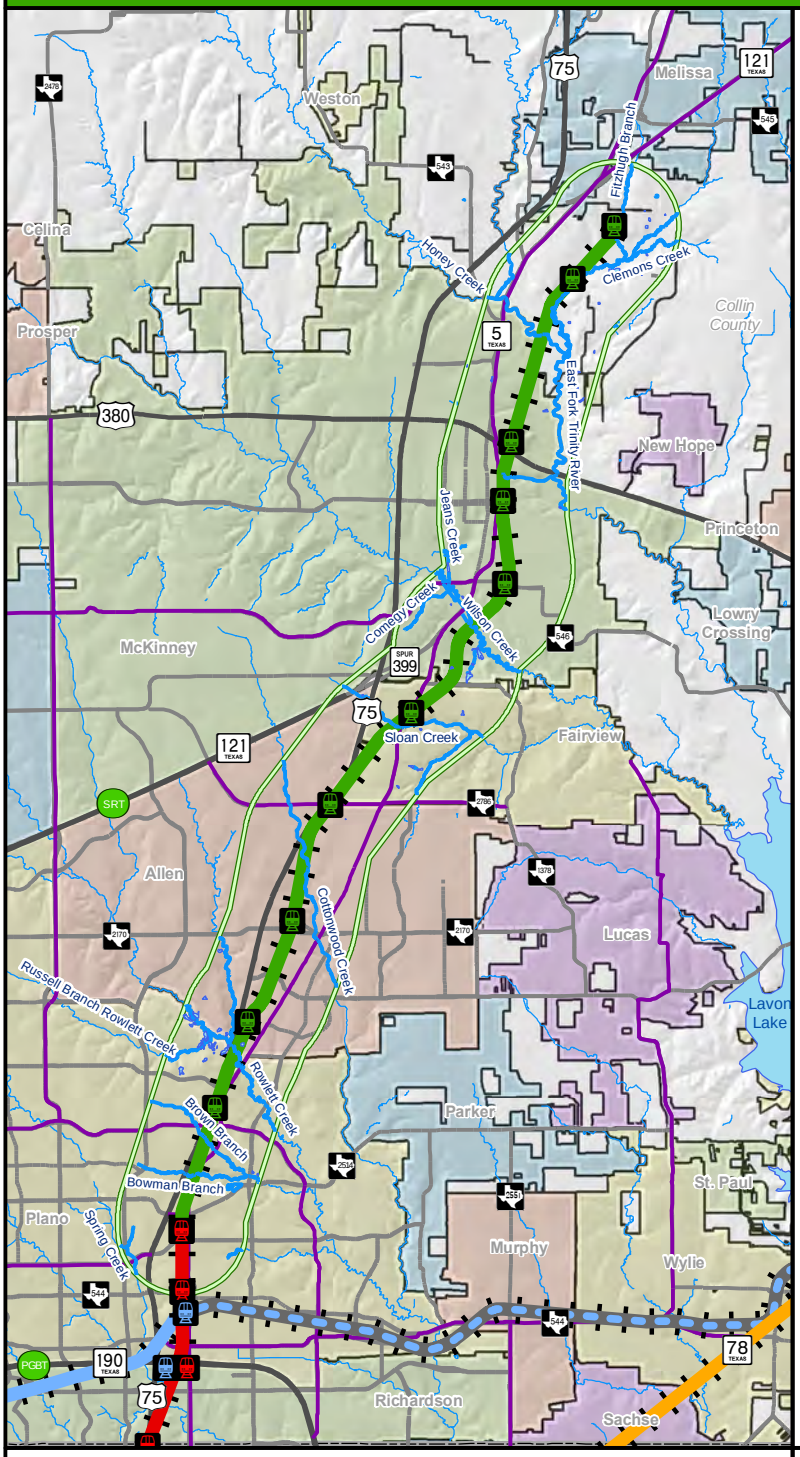
Map Date: July 2010 Source(s): NCTCOG; FEMA (q3)

Figure B-28 — Water Resources
PGBT to FM 545



Legend

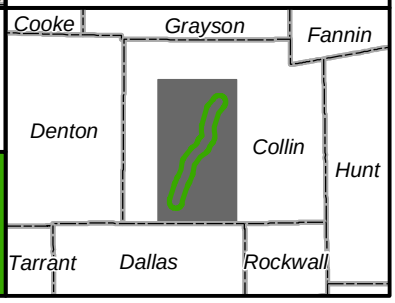
Water Resources

- River/Stream
- Lake/Pond

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

Key Map



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McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG

All municipalities within the study area are members of the North Texas Municipal Water District and have Municipal Separate Storm Sewer Systems (MS4) permits. Plano has a medium or large MS4 permits (Phase 1). The remaining municipalities of Allen, Fairview, McKinney, and Melissa and Collin County 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. But, with the enforcement of the regulations cited above and use of water quality preventive measures such as BMPs during construction and a SWPPP, post-construction, it is anticipated adverse impacts would be mitigated.

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

Vegetation

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.

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 11 taxa listed by federal and/or state government agencies in Collin County are shown in Table B-36.

Table B-36 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
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
Reptiles			
Alligator Snapping Turtle	*Macrochelys temminckii*	--	T
Texas Horned Lizard	*Phrynosoma cornutum*	--	T
Timber/Canebrake Rattlesnake	*Crotalus horridus*	--	T

Source: USFWS, June 2009; TPWD, June 2009.
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 May 22, 2009 (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 derived from the land use section, 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 Praries major ecological area. The study area is all within the Northern Blackland Prairie portion 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.

Two vegetation types from the *Vegetation Types of Texas* were identified in the study area. Table B-37 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 23,024 acres (93 percent), urban areas accounted for approximately 1,665 acres (seven percent).

Table B-37 Vegetation Types

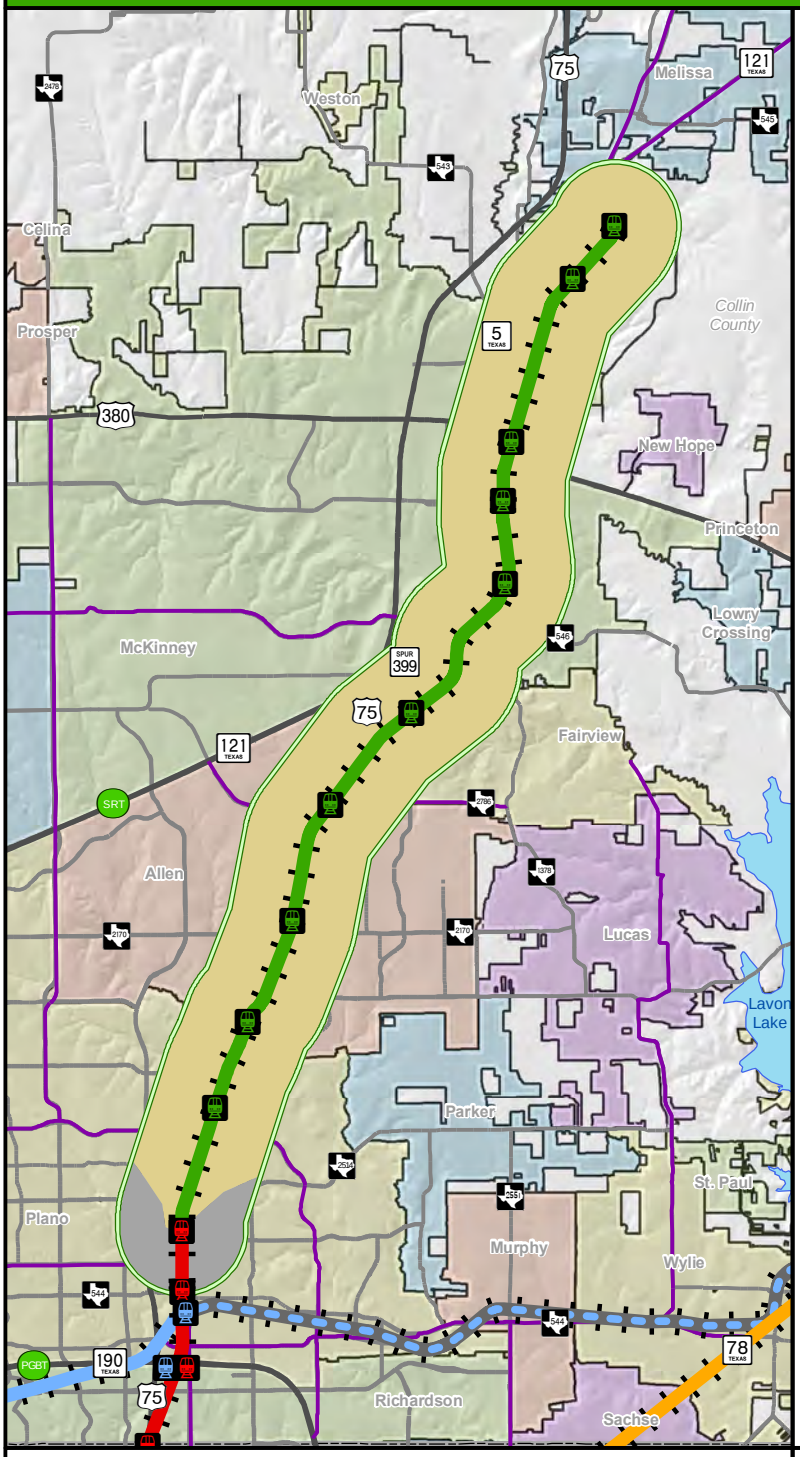
Vegetation Type	TPWD Vegetation Code Number	Commonly Associated Plants	Distribution	Area (Acres)	Percent of Study Area
Crops	44	Cultivated cover crops or row crops providing food and/or fiber for either man or domestic animals. This type may also portray grassland associated with crop rotations.	Statewide	23,024	93.3%
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	1,665	6.7%

Source: TPWD GIS: *Vegetation Types of Texas*, February 2009

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. There were no occurrences of threatened or endangered species or wildlife management areas listed within the study area.

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.

Figure B-29 — Vegetation Types of Texas
PGBT to FM 545



Legend

Vegetation Type

- Crops
- Urban

Other Items

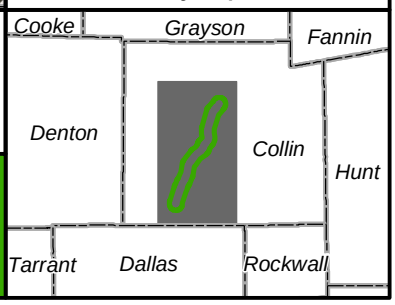
- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

0 1 2 3 6

Miles

N

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; TPWD

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 longest stretch of stream was the only river crossed by the McKinney Corridor, the East Fork Trinity River, which runs for over 30,000 linear feet (almost six miles) within the study area. Over 200,000 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 Clemons Creek, Cottonwood Creek, Rowlett Creek, Sloan Creek, and Wilson 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-38 shows the amount of linear feet of streams in the McKinney Corridor study area. Water resources, including streams and rivers, were shown previously in Figure B-28.

Table B-38 Linear Feet of Streams

Stream Name	Linear Feet	Stream Name	Linear Feet
Bowman Branch	10,770	Jeans Creek	2,263
Brown Branch	13,690	Rowlett Creek	20,953
Clemons Creek	25,176	Russell Branch Rowlett Creek	6,396
Comegy Creek	6,948	Shawnee Park Pond	1,392
Cottonwood Creek	21,780	Sloan Creek	22,445
East Fork Trinity River	30,718	Spring Creek	3,267
Fitzhugh Branch	9,929	Wilson Creek	19,095
Honey Creek	3,344	Unnamed stream segments	32,392

Source: NCTCOG GIS: Streams, 2009

Table B-39 lists the lakes and ponds within the McKinney Corridor study area. The only named ponds are on two golf courses within the study area. Lakes and ponds account for less than one percent of the area under study.

Table B-39 Waters of the US

Name	Area (Acres)	Percent of Study Area
Chase Oak Golf Course Ponds	26.7	0.1%
Oak Hollow Golf Course Ponds	1.2	<0.1%
Smaller unnamed lakes or ponds	48.5	0.2%
Total lakes and ponds	**76.4**	**0.3%**

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-40, wetlands comprised only 1.4 percent of the study area. The largest identified wetlands areas were along Clemons Creek, East Fork Trinity River, and Wilson Creek. 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.

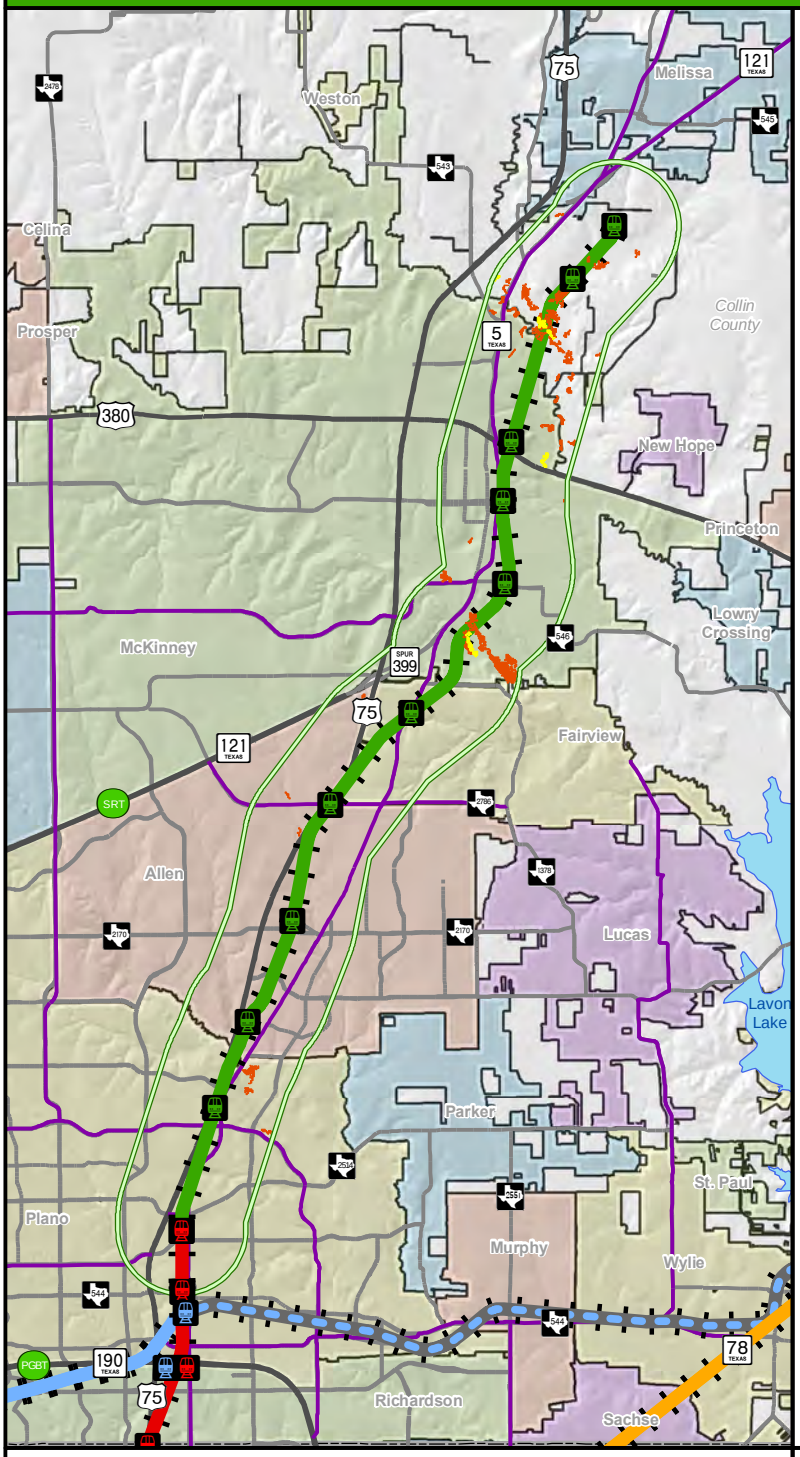
Table B-40 Wetlands

Name	Area (Acres)	Percent of Study Area
Woody Wetlands	314.9	1.3%
Emergent Herbaceous Wetlands	35.8	0.1%
Total Wetlands	**350.7**	**1.4%**

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.

Figure B-30 — NLCD Wetlands
PGBT to FM 545



Legend

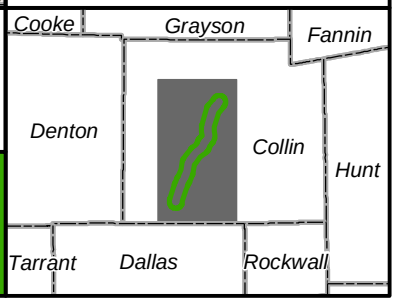
NLCD Wetlands

- Emergent Herbaceous Wetlands
- Woody Wetlands

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

Key Map



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Map Date: July 2010 Source(s): NCTCOG; US EPA NLCD 2001

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

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.

Except for prime and unique farmlands, soils and geology are not associated with laws or regulations in this region.

B.3.7.2 Methodology/Research

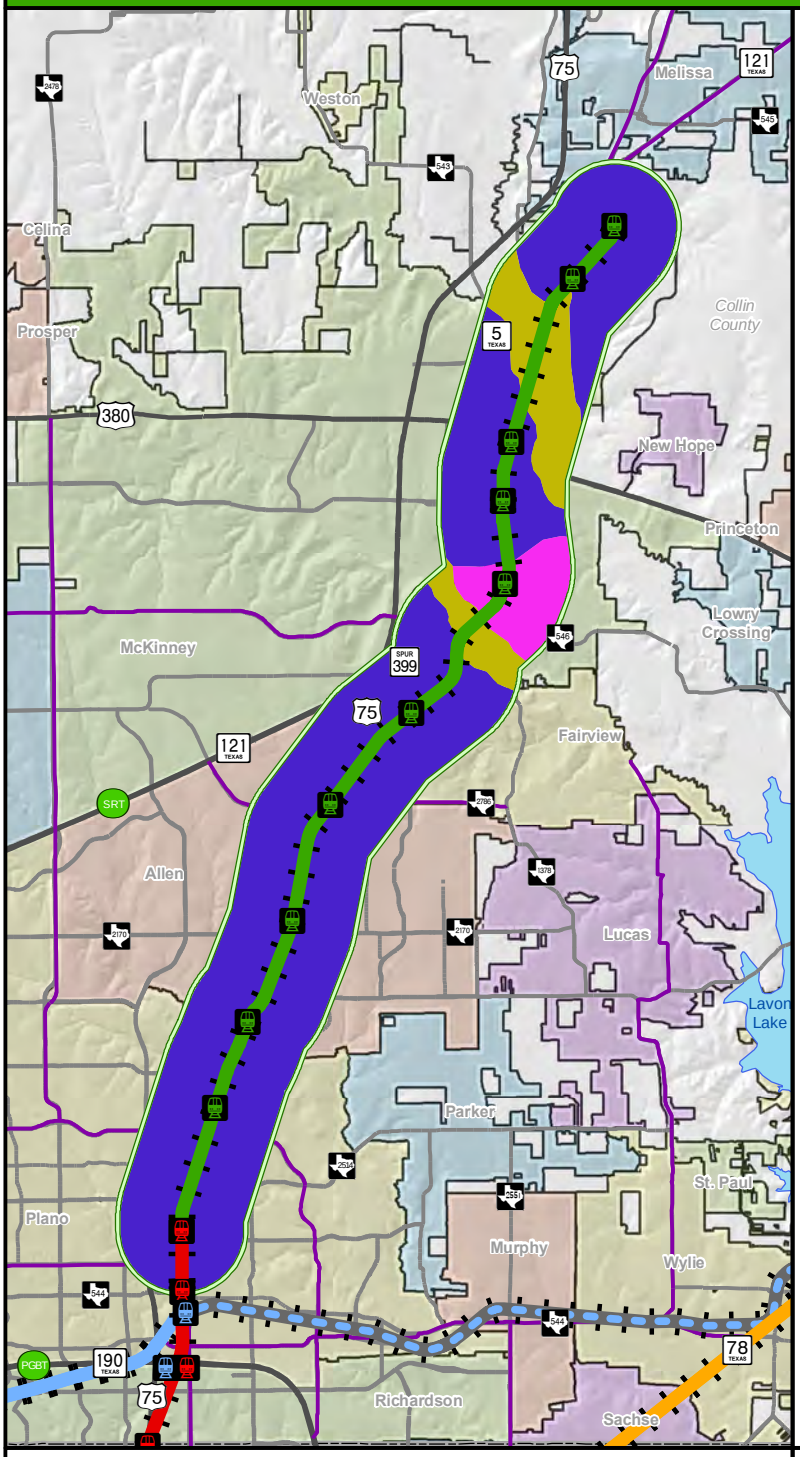
GIS data was used to identify the geological components, including aquifers and soils, within the McKinney Corridor study area. Data for the geological formations was obtained from the USGS which included GIS data and descriptions of the geological formations. Aquifer data was obtained from the Texas 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

<u>Geological</u>

The study area lies atop the Austin Chalk major geological formation. Other minor geological units included in the McKinney Corridor study area are alluvium 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.

Figure B-31 — Geological Features
PGBT to FM 545



Legend

Geological Formation

- Alluvium
- Austin Chalk
- Terrace Deposits

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Potential Lavon Lake Corridor
- Highway/Tollway
- Regionally Significant Arterial
- Major Arterial
- Study Area
- City / Town Limits
- County Limits
- Lake

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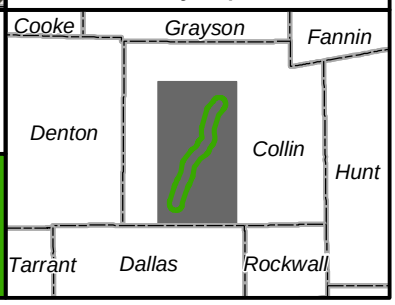
Miles

N

Key Map



North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; USGS

- 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 20,794 acres (84.2 percent) of the study area. The portions of the study area covered by this formation include: all areas within Allen, Melissa, and Plano; almost all of Fairview; and approximately two thirds of McKinney. 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 2,522 acres (10.2 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 East Fork Trinity River and Wilson 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 1,373 acres (5.6 percent) of the area. The location of this geological area is between the alluvium geological areas from the Elm Fork Trinity River and Wilson Creek.

<u>Aquifers</u>

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 24 unique map unit types. These map units are condensed into 11 separate soil series and one non-series soil. Table B-41 details the soils in the study area. Figures B-32 and B-33 graphically display the soil series in the study area.

Table B-41 Soil Series

Name	Description	Percent of Study Area
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.	5.2%
Austin Series[1]	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.	18.9%
Burleson Series[1]	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.	0.4%
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.	1.0%
Frio Series[1]	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%
Houston Black Series[1]	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.	55.9%
Leson Series	The Leson series consists of very deep, moderately well drained, very slowly permeable soils that formed in alkaline shales and clays. These soils are on nearly level or gently sloping uplands. Slopes range from zero to five percent.	0.1%

Table B-41 Soil Series (continued)

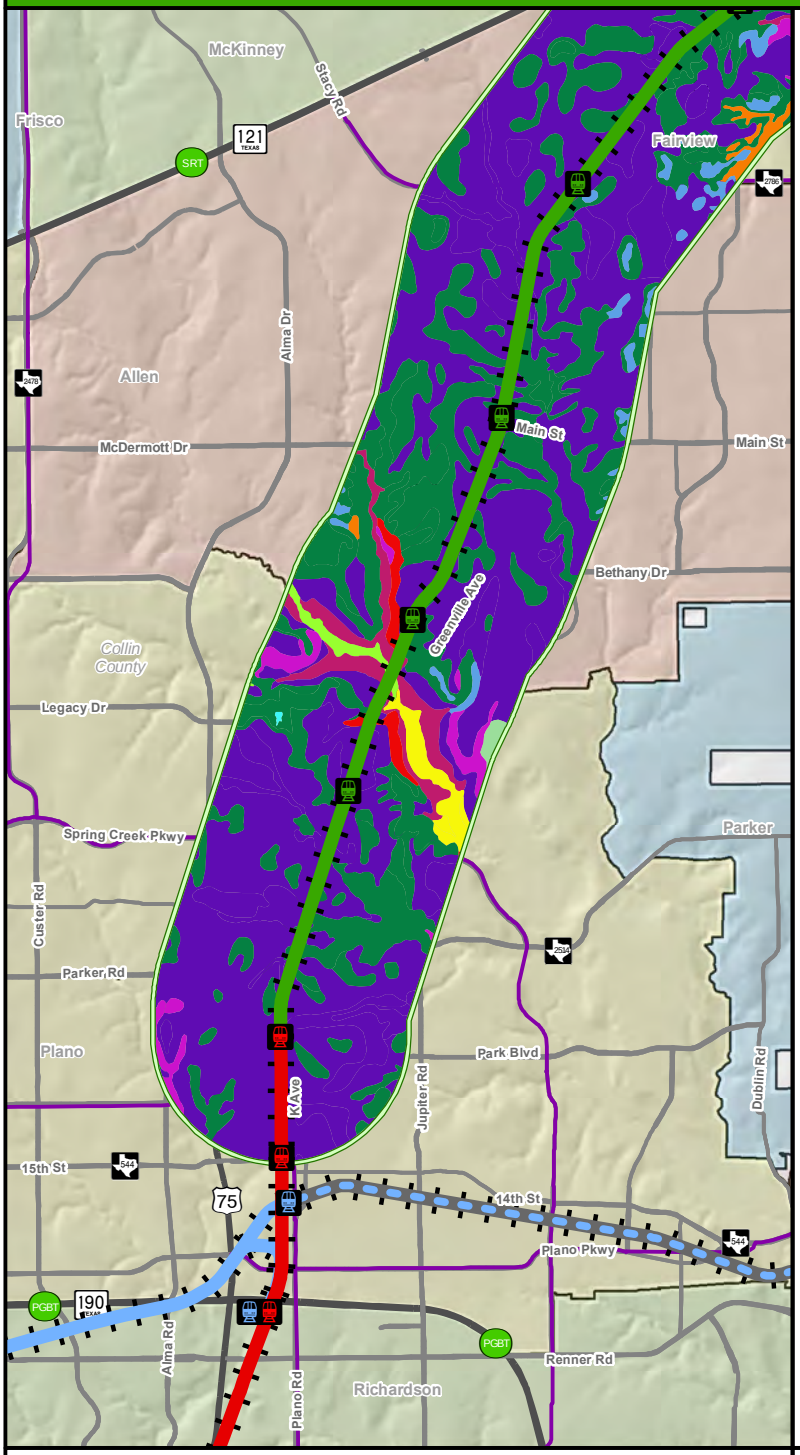
Name	Description	Percent of Study Area
Lewisville Series[1]	The Lewisville series consists of very deep, well drained, moderately permeable soils that formed in ancient loamy and calcareous sediments. These upland soils have slopes of zero to 10 percent.	6.5%
Stephen Series	The Stephen series consists 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.	7.3%
Tinn Series	The Tinn series consists of very deep, moderately well drained, very slowly permeable soils that formed in calcareous clayey alluvium. These soils are on floodplains of streams that drain the Blackland Prairies. Slopes are dominantly less than one percent but range from zero to two percent.	0.8%
Trinity Series[1]	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.	9.9%
Water[2]	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.	1.0%

Source: NRCS Soils GIS & Taxonomy, 2009

1. Some or all soils in this series have been identified as prime farmland soils by NRCS and USDA.
2. This soil type is not a soil series because of the absences of soil layers and horizons, but represents a general classification.

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.

Figure B-32 — Soils
PGBT to SRT



Legend

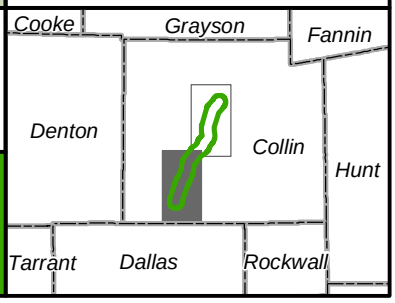
Soil Series

- Altoga
- Austin
- Burleson
- Eddy
- Frio
- Houston Black
- Leson
- Lewisville
- Stephen
- Tinn
- Trinity
- Water

Other Items

- Potential McKinney Corridor Station
- Existing DART Red Line Station
- Potential Cotton Belt Corridor Terminus
- Proposed McKinney Corridor Alignment
- Existing DART Red Line
- Proposed Cotton Belt Corridor
- Potential Cotton Belt Corridor Extension
- Highway/Tollway
- Regionally Significant Arterial (RSA)
- Major Arterial
- Study Area
- City / Town Limits
- County Limits

Key Map



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North Central Texas Council of Governments

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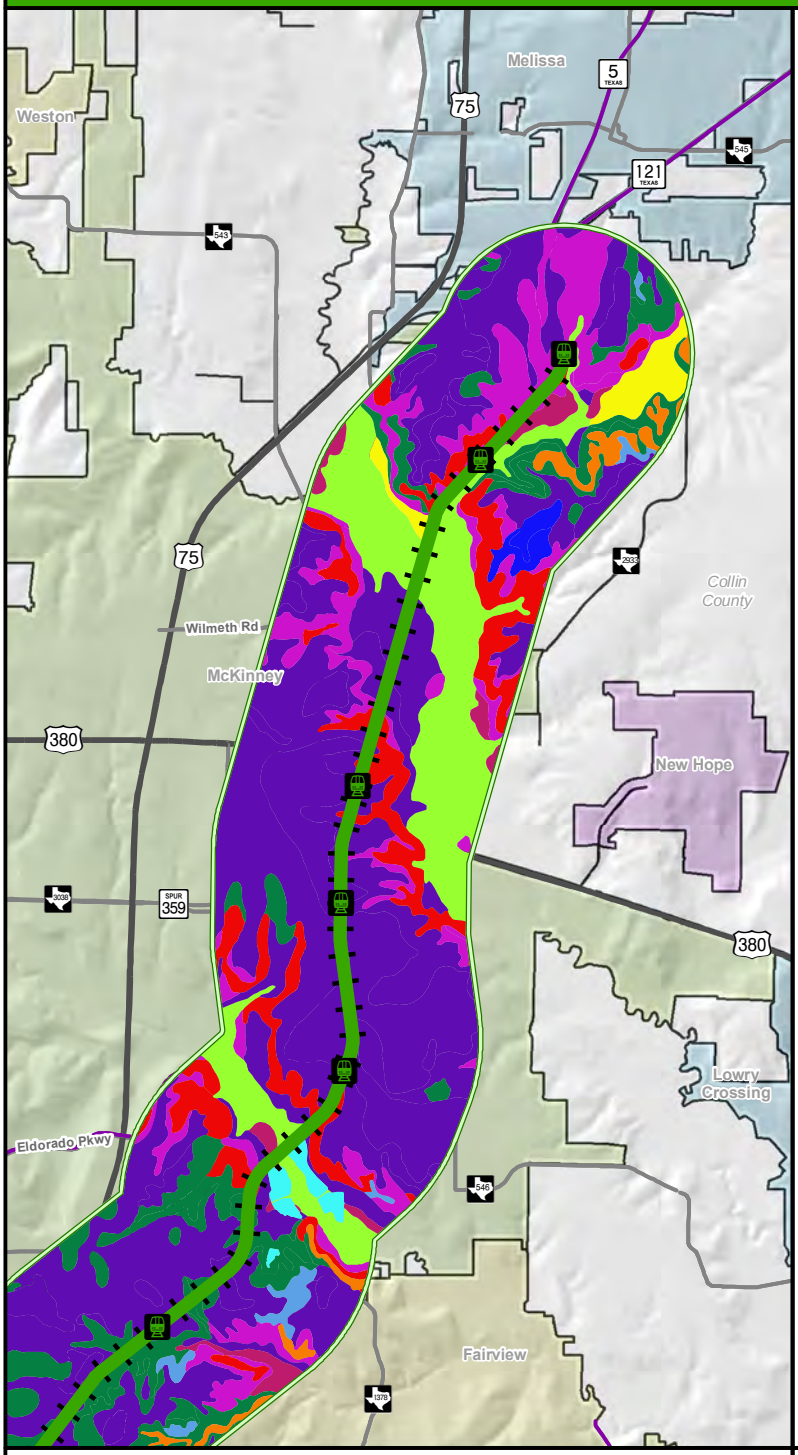
Map Date: July 2010 Source(s): NCTCOG; NRCS Soils

Figure B-33 — Soils
SRT to FM 545



Legend

Soil Series

- Altoga
- Austin
- Burleson
- Eddy
- Frio
- Houston Black
- Leson
- Lewisville
- Stephen
- Tinn
- Trinity
- Water

Other Items

- Potential McKinney Corridor Station
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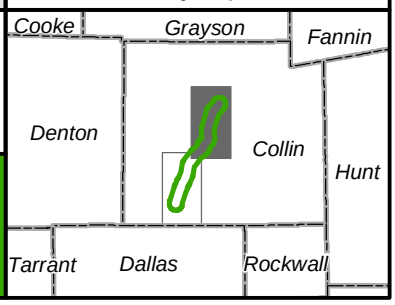
Key Map



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Miles

N

North Central Texas Council of Governments

McKinney Corridor Conceptual Engineering and Funding Study

Map Date: July 2010 Source(s): NCTCOG; NRCS Soils

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.

APPENDIX C
MEETING SUMMARIES

TABLE OF CONTENTS

C.1 JANUARY 20, 2009

Advancing Rail in North Texas Strategy Meeting
McKinney Corridor (DART Red Line Extension)

Tuesday, January 20, 2009

Attendance

There were 29 attendees signed-in including representatives from Allen, Dallas Area Rapid Transit (DART), Denton County Transit Authority (DCTA), Dallas-Fort Worth (DFW) International Airport, Fairview, Fort Worth, Hurst, Irving, Plano, Richardson, North Central Texas Council of Governments (NCTCOG) staff, and Regional Transportation Council (RTC) members.

Purpose

The primary purpose was to increase communication for the interested parties along the McKinney Corridor to expedite project implementation. A secondary purpose was to gain consensus for the support of NCTCOG staff to pursue this effort and to determine stakeholder issues regarding the study process.

Corridor Overview and Status Report

Michael Morris, Transportation Director, NCTCOG began by briefly discussing the Rail North Texas initiative. Mr. Morris emphasized the RTC vision for this corridor, the significance of the corridor, and highlighted information on three other corridors. This corridor is closest to meeting minimum daily ridership warrants for light rail transit (LRT) of 4,400 passengers.

Mr. Morris shared information regarding a few regional items, including the McKinney corridor relative to its interface with the Cotton Belt corridor (under study) and how vehicle technology can play an important role in connecting this corridor to additional corridors.

The City of Plano proposed the concept of electronic payment at the parking lot connected to the Parker Road Station. Mr. Turner inquired if the RTC had an interest in partnering with the city, North Texas Tollway Authority (NTTA) and DART to create a test project where a TollTag-type device would be used to collect parking fees, pay tolls, and transit fees. A successful test would be useful in development of rail lines across the region.

Mr. Morris shared with the participants that the Streamline Project Delivery team will focus on expediting projects through environmental clearance to get projects to implementation faster.

Bill Whitfield, Mayor, City of McKinney asked why are we ready to see progress made on bringing rail to McKinney and why are we looking at it now if, according to the map, the start of service is 16 years out? Mr. Morris explained that the goal of this process is to speed up the time for the start of service to begin.

Work Program

Tom Shelton, Senior Program Manager, NCTCOG, indicated NCTCOG would prepare a draft work program and described the work program as a feasibility study. The goal for this meeting is to gather input on what items, issues and concerns the participants would like addressed in the work program whose purpose is to expedite the project. Mr. Shelton shared information regarding the Rail North Texas initiative that will go to the state

legislature. Mr. Shelton indicated the goal of the RTC is to begin a feasibility study as soon as possible with the intent to fast track the planning process in anticipation of a favorable decision in Austin. Mr. Shelton indicated the McKinney Corridor is included in *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area* (*Mobility 2030*). Mr. Shelton also provided details regarding other corridors in *Mobility 2030* and the subset of corridors considered as part of the Rail North Texas legislative initiative, including the DART Red Line extension to McKinney.

Chad Edwards, Program Manager, NCTCOG, described the forecasted passenger levels required to warrant rail service. Mr. Edwards stated the current ridership model forecasts indicate this corridor warrants light rail service.

Numa Bulot, railroad liaison, DART and Trinity Railway Express (TRE), stated DART-owned right-of-way width in the corridor is generally 100 feet. Steve Salin, Vice President Commuter Rail, DART, informed the group that the northern terminus is within DART right-of-way. On the north, DART right-of-way ends south of Sherman at the Sherman Junction with the BNSF railroad right-of-way.

Mr. Morris noted the identified station locations were assumed, based upon professional judgment and model input. Additional analysis will be conducted, and input from cities and planners will be used to evaluate the appropriate station locations in the next project efforts.

Bill Whitfield indicated the City of McKinney supports the proposed rail line. The Mayor indicated projects in Collin County will continue to grow to the North. There is a desperate need for a rail line to McKinney and the citizens support the need for mass transit.

Frank Turner, Executive Director of the Business Development Center, City of Plano, stated the city remains a constant rail line supporter for extending the DART Red Line north from the Parker Road station. Mr. Turner also noted careful consideration should be given to the prioritization of the proposed rail lines in the area (Cotton Belt is Mr. Turner's first priority). The DART Red Line extension may raise questions about technology, capacity, grade crossings, and station locations. Regarding station locations, assessment should be given to whether both the proposed Spring Creek and Legacy stations are needed.

Mr. Morris shared with the group that DART has a warrant process for grade separation and asked DART staff to provide the City of Plano with that information. Mr. Morris noted, that in his opinion, the Spring Creek station would be a more viable location than Legacy Drive.

Mr. Morris stated NCTCOG staff will analyze whether the Spring Creek Station or Legacy Station is the best one to serve the northern portion of Plano. Also, NCTCOG staff will analyze whether the DART Red Line extension should be tied to the current Red Line alignment or the proposed Cotton Belt alignment westward toward the DFW Airport.

Mr. Turner indicated approximately 50 percent of the current ridership accessing the DART system at the Parker Road Station originates from points to the north. Another item of concern to the City of Plano is the issue of equity, in the context of a true regional funding mechanism.

Mr. Morris said cost and revenue are not equally balanced and agreed equity issues need to be addressed. This may put more burden on the DART system; more trains – frequency,

capacity, congestion. Depending on the chosen technology, diesel trains in the tunnel south of Mockingbird Station will also pose an issue.

John Baumgartner, Director Engineering and Traffic, City of Allen, told the group the City of Allen supports the DART Red Line extension. The City of Allen Strategic Plan identifies plans for the city to be served by passenger rail service. The City of Allen understands the value of public transportation. However, there are issues regarding funding equity and technology that need to be resolved.

Dave Carter, Director of Traffic and Transportation, City of Richardson, told the group the City of Richardson is also interested in seeing the rail line move forward sooner then the proposed 2025 date. Mr. Carter informed the group the city has received comments from major employer representatives regarding the difficulty employees experience traveling from points to the North into Richardson (primarily due to traffic congestion on North Central Expressway). He said that with the projected regional population growth and a projected 50 percent increase of employment in Richardson, it will be essential to provide rail transit as a commuting option further to the north. Parking is an issue in Plano, as well as at the George Bush LRT Station, because of the patronage demand from the north. One concern is to look at where grade crossings will be taking place. Mr. Carter suggested NCTCOG staff research the origin of the Parker Road Station passengers to access how many new patrons would be boarding in McKinney and Allen versus the existing patronage. Several other issues that need to be resolved pertaining to vehicles include; station design, width and height of train doors and door locations. Vehicle type is very important to station and platform design.

Lee Dunlap, City Council Member, City of Plano, provided the perspective of the City of Plano. Mr. Dunlap commented that city staff and elected officials want to be a good community partners. Citizen concerns include the number of times motorists would have to stop because of rail traffic from extending the DART Red Line. The Cotton Belt line is seen as an added benefit to the taxpayers. Considering the current economy and tight budgets, why would city residents want to add to their tax burden for rail, if they are already paying for DART services.

When the proposed system details are determined, the City of Plano hopes a decision on whether the proposed Cotton Belt line will continue east, turn to the north, or terminate at the existing Bush Turnpike Station. This decision has huge impacts for the City of Plano.

Mr. Morris stated that the Rail North Texas initiative recognizes Plano and other DART cities and these will not be double taxed in this process without a fair share.

Bill Whitfield asked for the Town of Fairview standpoint regarding advancing this corridor study.

Ray Dunlap, Community Development Manager, Town of Fairview, indicated the Town of Fairview is very interested, and hopes to get an increase in the 4A/4B tax to give a local option to support passenger rail service.

Peter Vargas, City Manager, City of Allen, stated Collin County has historically been in favor of passenger rail service. With a changeover in the Collin County Commissioners Court, it is important to ask the Commissioners to clarify their stance on the matter.

Frank Turner indicated he has heard favorable comments from Collin County Commissioners regarding the proposed DART Red Line extension. Regarding the Rail North Texas initiative, the issue of funding equity is how to determine the cost for riders that reside outside the DART service area. Mr. Morris stated funds from one county fund trips starting from that county. Mr. Morris requested staff forward a copy of the current legislation to Frank Turner by the end of the week.

Vehicles
Tom Shelton indicated to the group that DART is working toward Federal Railroad Administration (FRA) approval of a rail vehicle that will be in compliance with FRA regulations. The new "hybrid" vehicle will be designed to operate passenger service on the same tracks as freight rail vehicles.

Steve Salin added the vehicle approval by the FRA is approximately five years away. The concept vehicle currently used in Austin does not fit within the constraints of the DART light rail system. If passenger rail is warranted, separate tracks may be required to allow passenger and freight rail service in the same corridor. The goal is to have one vehicle that can be used throughout the region operating on both freight and light rail corridor tracks. Mr. Morris stated the DCTA is also interested in a FRA compliant light rail vehicle for their proposed "A Train" line.

Lee Dunlap believes the ideal situation would be to use one vehicle for continuous operation. Designing a new hybrid vehicle capable of operation in various corridors would be less expensive than building infrastructure to accommodate many types of vehicles. Mr. Morris followed up that statement by adding a study is needed to identify where 80 percent of forecast passengers travel to and from, which may set the alignment.

Preliminary Stations for Evaluation
- Spring Creek Parkway in Plano (compare merits with Legacy Drive Station)
- Legacy Drive in Plano (compare merits with Legacy Drive Station)
- Main Street in Allen is good
- Stacy Road in Allen is good
- FM 1378 in Fairview is good
- Downtown in McKinney is good
- Consider airport location for additional station in McKinney

Rich Morgan, Regional Transportation Council, stated transit oriented development (TOD) is important in this process, in particular there are developers turning their backs on the rail line and/or station. This may be due to a lack of knowledge that a rail line is slated to be built near their development.

Next Steps
Meeting Minutes and Draft Work Plan to be shared with participants within the next seven to ten days.

Next Meeting (Tentative):
Date: Friday March 13, 2009 at 10:00 am.
Location: TBD

C.2 MARCH 13, 2009

Advancing Rail in North Texas Strategy Meeting
Plano to McKinney Rail Corridor

Friday, March 13, 2009

Attendance
Twenty-nine attendees signed-in, including representatives from the City of Allen, Collin County, DART, Town of Fairview, Fort Worth Transportation Authority (The T), Huitt-Zollars, Jacobs, City of Melissa, City of McKinney, City of Plano, City of Richardson, and NCTCOG.

The meeting was held in a conference room at the DART Red Line Station in Downtown Plano. Handouts included: an agenda, copy of the presentation, McKinney Corridor Fact Sheet, draft McKinney Corridor Conceptual Engineering and Funding Study (CE & FS), and January 20, 2009, meeting minutes.

No comments or amendments to the January 20, 2009, minutes.

Meeting Purpose and Committee Structure
There are four rail corridors the Streamlined Project Delivery team is currently focusing on. There is no prioritization of the corridors:

- BNSF Line
- Cotton Belt Line
- McKinney Corridor
- Waxahachie Line

The goal of the rail corridor strategy meetings is to move projects forward, beginning with conceptual engineering and feasibility studies that will ease preparation for the eventual environmental analysis. Staff will need time to collaborate with the partners on the work program and within two to three months some of the technical information should be available to share with the group. DART has completed a lot of analysis on the McKinney Corridor.

For Rail North Texas, a regional rail corridor study was completed in 2005 and incorporated into *Mobility 2030*. This regional rail corridor plan will continue in *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment* (*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.

The outcome of the Texas Local Option Transportation Act (TLOTA) will have an impact on further studies and implementation of the regional passenger rail network. NCTCOG is optimistic about the bill and the strategy is to remain proactive. If TLOTA is passed by the legislature this session, the next steps as currently proposed are:

- Becomes effective January 1, 2010.
- Counties assemble a list of priority projects and the plan to be presented to voters.
- Elections sometime mid- to late-2010.

Corridor Overview and Status Report
Corridor Fact Sheet
The data from the McKinney Corridor Fact sheet are the results of a study conducted for the Rail North Texas initiative in 2005. The corridor fact sheet summarizes the regional rail corridor information, demographics, and estimated costs utilizing the McKinney Corridor from the Parker Road Station to the McKinney North Station with proposed rail stations at Parker Road, Spring Creek Parkway, Legacy Drive, FM 2170 (Main Street), Stacy Road, Fairview/FM 1378, McKinney Central, and McKinney North.

Please contact Mr. Chad Edwards at cedwards@nctcog.org or Mr. Kevin Feldt at kfeldt@nctcog.org regarding any modifications to the Corridor Fact Sheet.

NCTCOG staff is currently working on demographics for 2035, but these figures are not anticipated to be approved by the RTC until late fall. To maintain consistency with *Mobility 2030 – 2009 Amendment*, the studies that currently exist, and to be able to progress on the rail corridor studies the demographic forecasts that were utilized for *Mobility 2030 – 2009 Amendment* will be used throughout the four rail corridor studies.

Questions/Comments:

Comment: Is the rail corridor study going to continue to the Collin County line and beyond?
Response (NCTCOG): The preliminary corridor presented is the corridor encompassed in Mobility 2030; there has been no analysis beyond the McKinney North station.

Comment: The population statistics are grossly underestimated.
Response (NCTCOG): The population statistics on the corridor fact sheet represent only the one mile buffer zone from the center line of the track (illustrated in green). The regional travel demand model accounts for the total population of each city and county.

Question: What is the forecasted ridership based on; daily ridership, weekly ridership, or something different?
Response (NCTCOG): Daily ridership.

Concerns:
- Demographic information is based on Census 2000; nine year old data.

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.

Questions/Comments:

Question: Will the corridor be light rail or commuter rail?
Response (NCTCOG): The type of rail vehicle used will ultimately depend on the estimated ridership and that will be confirmed through further study. In Mobility 2030, the planned technology for the corridor is similar to commuter rail, and it is anticipated to be non-electrified.

Question: Will existing right-of-way and infrastructure be utilized? Cost is presented at $17 million per mile; will costs be broke out between construction cost and equipment cost
Response (NCTCOG): Staff will break down these costs for the corridor. Current cost for light rail, including vehicles, is $65 to $70 million per mile. Since there is existing infrastructure, in this corridor the cost has been estimated at $17 million per mile. This is based on a non-electrified commuter rail concept with less frequent headways than LRT and thus, fewer stations and potentially limited areas of double-track.

Comment: Right-of-way is secure to Sherman, Texas. Due to the high cost of building rail, planning should extend further north to Sherman. This line is already owned by DART, so it would be ideal to include the entire line in the cost estimates. Getting these cars off the road should have a major air quality impact?
Response (NCTCOG): Planning the rail corridor to Sherman presents more of a challenge, but staff will study the option.

Question: What are the plans for parking at the individual stations?
Response (NCTCOG): Parking will be determined by ridership demand. The type of station constructed, suburban or urban will be ascertained through input with the communities.

Concerns:

- Passengers outside the DART service area filling the parking areas and rail cars before the train reaches the DART member city customers who are paying for the services through local option taxes.
- Study all transportation alternatives; the goal is to increase overall mobility.
- Right-of-way is secure to Sherman, Texas. This line is already owned by DART; and due to the high cost of building rail, ideally planning cost estimates should extend north to Sherman.
- One station at Spring Creek is more viable.
- Possible transfer points between commuter rail and light rail.

Draft Work Program for CE & FS
The copy of work program is the general outline for all four rail corridors under study and has not been personalized to the McKinney 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. 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 the community needs and desires. The scope of the project is anticipated to take approximately one year to complete, with recommendations available in early 2010.

One of the strategies for the rail corridor study is to expedite the environmental analysis and possibly a National Environmental Policy Act (NEPA) document:

- Required to receive any funding from the federal government.
- It is possible at the end of the study that federal funding will not be necessary.
- The feasibility study is not the NEPA document, but the study will be encompassed in the NEPA document if needed.
- The idea is to capture the broader issues within the corridor, so that if and when studies proceed, most of the underlying work is completed.

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

Questions/Comments:

Question: How accurate are the revenue projections expected to be?
Response (NCTCOG): Investment grade analysis is not anticipated at this level of study. National and regional trends will be incorporated. All funding opportunities and challenges will be reviewed.

Question: If the TLOTA is passed and the voters approve the local option, how will this funding be incorporated into the current DART financial structure?
Response (DART):

- Nothing is final.
- No co-mingling of funds between counties.
  - Separate accounts.
  - The level of service will be based on the funding raised in each county.

Question: If the regional rail system is built, how will DART accommodate the additional capacity physically and financially?
Response (DART): Nothing is finalized and discussions continue at this point. It is anticipated that the planning for capital and operating costs for each county's corridor will need to include compensation to DART for the service impacts on the DART system. The DART system was designed to expand over time, but the growth being planned for the regional rail network is being accelerated at a pace that DART is not well positioned to accommodate easily. DART has a checklist of approximately 25 impacts on the DART system that will need to be considered in the costs analysis.

Comment/Question: Will there need to be two separate accounts. One set of funds are those that are collected and spent in each county for rail service and the other set of funds will be impact fees to DART?
Response (DART): Yes. These issues will become more defined as the TLOTA bill is written.

Question: Does DART own right-of-way for future expansion?
Response (DART): Yes. It has always been anticipated that future rail corridors would be aligned with the DART system, but not all areas may choose to become DART member cities.

Concerns:

- Current DART member cities are concerned about the financial equity and it is important the level of service remains consistent in the member cities.
- Trains are full before they reach the DART member cities.
- The accelerated growth rate of regional rail planning and the ability to accommodate all the contingencies.
- Currently, DART downtown alignment is limited to 24 trains in each direction during peak periods.
- If the counties are going to be expected to cover the cost for service impacts to DART this should be included in the TLOTA.
- DART was built with federal funds. This may have significant impacts on planning and building the regional rail corridors that will be financed with local funds through TLOTA.
- The fares for non-DART member cities will not be subsidized by DART member cities. Through some method, full fare recovery is expected from these riders.
- DART 2030 plans only represent member cities.
- Operating costs will only continue to increase. These costs do not go away.

Vehicles
DART has taken a national, leadership role in the design and manufacture of a new, hybrid vehicle for the urban market. The challenges to advancements in a hybrid vehicle are the legal and regulatory concerns for each type of rail line. The ideal is for the vehicle to operate passenger service on the same tracks as freight rail vehicles. In corridors where there may be an overlap with freight rail, these new vehicles would have to be FRA compliant.

Concerns:

- Address the Cotton Belt connections to this rail line in discussions.
- Still in very early planning stages.
- Could be five years before a suitable hybrid vehicle could be approved and manufacturing begun.
- In some corridors, double tracks may be necessary between freight and light rail.
- Concept vehicle being tested in Austin is not compatible to DART.

Transit Oriented Development/Lessons Learned and Grade Crossing Banking Program
The 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 Ms. Rebekah Karasko, Senior Transportation Planner, Goods Movement, (817) 695-9258 or rkarasko@nctcog.org.

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 Ms. Karla Weaver, Senior Transportation Planner, Sustainable Development, (817) 608-2376 or kweaver@nctcog.org.

Action Items:

- Meeting summary from the March 13, 2009, will be distributed, please send any comments or suggestions to Mr. Kevin Feldt at kfeldt@nctcog.org.
- Define station site locations.
- Break out the costs between construction and equipment.
- Review work program, provide suggestions or comments.

C.3 JUNE 1, 2009

Advancing Rail in North Texas Strategy Meeting
Plano to McKinney Rail Corridor

Monday, June 1, 2009

Attendance
There were 23 participants signed-in, with representatives from Allen, Collin County, Fairview, McKinney, Richardson, Plano, DART, DCTA, Texas Department of Transportation (TxDOT) Collin County, NCTCOG staff, and consultants from Blaydes Consulting, Kimley-Horn, and Huitt-Zollars.

The meeting was held at the Allen Municipal Court/Parks and Recreation Building in Allen, Texas. Handouts included: an agenda, a copy of the presentation, the draft Chapter 1: Sections 1 thru 5 (draft) of the CE & FS.

TLOTA Update
There was a brief update on the still unknown status of the Senate Bill (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 Plano to McKinney rail corridor. Staff will proceed with the study goals and objectives.

Comments/Concerns:
- Regardless of the outcome of SB 300 in the legislature all possible funding opportunities should continue to remain open for discussion and study
- The corridor is considered a viable project
- Increased public education on the costs and goals of the corridor is necessary

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 Mr. Kevin Feldt at 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.

CE & FS (draft)
There was a brief overview of the draft Chapter 1: Sections 1 thru 5 of the CE & FS. The study purpose 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 being to streamline the process as much as possible and narrow the options to one viable build alternative. For the project to be successful, please review Chapter 1 and forward amendments or comments to Mr. Kevin Feldt at kfeldt@nctcog.org.

Station locations identified by the Rail North Texas initiative are for regional rail technology. Additional stations may be included if light rail transit is the preferred rail technology.

Corridor Alignment and Station Alternatives
NCTCOG staff met with individual cities and other agencies to discuss rail stations and other concerns within each corridor jurisdiction. Results of each meeting were highlighted in the presentation and additional comments requested from the participating city or agency.

- **Collin County; no additional comments**
- **Plano; additional comments:**
  - Grade separations are preferred at three stations; these are desired regardless of the rail technology used.
  - There are varying reasons why these stops would require grade separations, but above or below grade isn't a big concern - above grade would be preferred
  - Cost is a very important component of the project - vehicle technology used with the Cotton Belt corridor may influence the chosen vehicle technology
- **Allen; additional comments:**
  - Prefers LRT; if there is a forced transfer at Parker Road, riders will be more likely to drive down to that station rather than board in Allen
  - Transfers are the primary issue to address
  - Desire for elevated station at Stacy Road primarily due to safety concerns
- **Fairview; additional comments:**
  - Open to all ideas concerning Stacy Road
  - Fairview Center developer will cooperate with the town on a station location.
  - Development planning approved, but not active at this time
- **McKinney; additional comments:**
  - McKinney North stations 1 and 2 are undeveloped and currently in the extraterritorial jurisdiction (ETJ) of the city and provide future possibilities for Greenfield TOD
  - Based on vehicle technology, a station at Industrial Boulevard may or may not be warranted – the City of McKinney would prefer a station at Industrial Boulevard if possible.
  - Must maintain current freight rail access for Encore Wire Company, which travels from the north into McKinney
  - No preference on the technology selected
  - The City of McKinney's top priority is implementing service to McKinney as quickly as possible.

Comments/Concerns:

- With no specific design in hand, the approximate cost of LRT for at-grade, in an existing rail corridor is $60 million per mile and upwards of $70 million per mile if constructing an at-grade system in a non-existing corridor - a need for elevated structures would increase this amount to approximately $80 million per mile
- Issues regarding cities outside the DART member service areas are complex
- DART owns the right of way to Sherman
- Rail bridge crossing at SH 5 in Fairview needs consideration; this is under the jurisdiction of TxDOT.
- Coordination alternatives with the Cotton Belt corridor are an important consideration because decisions on the Cotton Belt have implications for this corridor
- Transfers are an important concern
- Planning for the corridor to extend to Sherman strenuously stressed as the cost of building rail only continues to increase dramatically - the long range MTP is a consideration here
- Keep all options on the table and make an effort to study all alternatives and opportunities to build this corridor at a cost less than $80 million a mile
- Look at options to build the project in stages instead of all at once
- NCTCOG staff should work more closely with DART on viable cost saving opportunities
- If the decision is to use new vehicle technology that cannot be transferred to DART tracks the northern sectors will have to also keep in mind maintenance and service facilities for the vehicles
- Consider the possibility of this corridor being an extension of the Cotton Belt Line rather than the DART Red Line
- The Cotton Belt will have some level of freight rail activity, so the vehicles will need to be Federal Railroad Administration compliant.

There was a brief overview of the pros of the two alignment alternatives.

Next Meeting
Six to eight weeks

Action Items:

- Review the draft Chapter 1; Sections 1 thru 5 of the CE & FS; please send any comments or suggestions to Mr. Kevin Feldt at kfeldt@nctcog.org.
- Review the mission statement, project goals and objectives; please send any comments to Mr. Kevin Feldt at kfeldt@nctcog.org
- Meeting summary from the June 1, 2009 will be distributed, please send any comments or suggestions to Mr. Kevin Feldt at kfeldt@nctcog.org
- NCTCOG staff will begin the analytical analysis and evaluation of the corridor; including ridership forecasting, vehicle technology appropriate for the corridor, confirm station locations, and estimating capital and operational costs
- At the next meeting DART will give a presentation on vehicle technology.
- NCTCOG staff to provide a more detailed worksheet that compares the pros and cons of various systems, technologies, etc.

C.4 NOVEMBER 13, 2009

Advancing Rail in North Texas Strategy Meeting
Plano to McKinney Rail Corridor

Friday, November 13, 2009

Attendance
There were 26 participants signed-in, with representatives from Allen, Collin County, Fairview, McKinney, Richardson, Plano, DART, DCTA, and consultants from Freese & Nichols, Galatyn Park Corporation, HDR Engineering, Jacobs, Kimley-Horn, and Huitt-Zollars.

The meeting was held at the Allen Municipal Court/Parks and Recreation Building in Allen, Texas. Handouts included: an agenda, a copy of the presentation, and a draft map of potential modeled station locations and final meeting minutes from June 1, 2009.

There was one minor change to the meeting summary.

One of the purposes of the rail corridor strategy meetings is to provide an open forum to encourage discussion of all ideas. Any remarks made during the meeting are for these purposes only and no comments should be taken as any individual or entity's final position or policy.

Introduction and Overview
There was a brief comment on the TLOTA failure to reach the floor at the last legislative session which has somewhat shifted the focus of the CE & FS for the Plano to McKinney Corridor. A secondary focus of the CE & FS is to be a resource to help expedite the next phase of project implementation, environmental documentation.

Currently, the Plano to McKinney Corridor is not in the *DART 2030 Transit Plan* and due to the absence of the potential funding options of TLOTA, funding strategies is at the forefront for this corridor.

Comments/Concerns:
- As a group, consensus on how to move the corridor forward is necessary.
- Funding is a primary concern.
- The focus for the CE & FS study needs defined.

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 and the progress to-date. The presentation is available on the Web site at: www.nctcog.org/trans/spd/transitrail/McKinney.

Comments/Concerns:

- Accurate ridership projections are critical; these are currently being worked on in cooperation with NCTCOG staff.
- There are technology limitations that come in play with this corridor.
- Discussions with other transit agencies regarding opportunities to purchase rail vehicles collectively are occurring and are positive.
- Different types of vehicles require more or less operators, which has the potential to increase operational costs.
- Potential seating capacity limits must be considered.
- LRT:
  - An expanded rail network throughout the region, powered on a LRT system is likely cost prohibitive.
  - It is assumed at this point in time, and into the foreseeable future, the FRA compliant vehicle will not be able to travel on LRT; this is a challenging component for this particular corridor.
  - If a LRT option is beyond any financial resource capability for the near- to far-term for the Plano to McKinney Corridor, the forced transfer option may be necessary until future resources become available.
- Plano to McKinney rail corridor to be part of the regional rail network:
  - Realized cost savings from economies of scale with the rest of the region, how is that going to be accomplished logistically?
  - Access to the regional facilities network; how are the rail cars from this corridor, in a cost effective manner, going to travel to the maintenance facilities within the current rail track options?
  - Currently, most of the rail corridor under discussion for regional rail is DART owned, except for one route across a BNSF owned section southwest of Sherman, Texas that would potentially be used to access the regional maintenance facilities. To operate within the regional rail network, there are two preliminary issues that must be discerned:
    - A possible trackage rights agreement with BNSF along this corridor.
    - The thought that DART could purchase rights to this corridor (likely cost prohibitive).
- Maintenance facilities:
  - All rail systems are mandated by the FRA to have a viable maintenance facility and establish a schedule to provide adequate access to that system. Also, there must be a facility for storing the rail cars, preferably near the origins of rush hour traffic.
  - The option of delivering the rail cars to a regional maintenance facility from the Plano to McKinney rail corridor during some form of “off-hours” period across a freight or commuter line has been briefly discussed, but this is an option that would need additional research.
- Plano to McKinney corridor planned as commuter rail and is a self-contained system:
  - This option would require its own maintenance facilities, etc.
  - Would likely result in increased costs.

Stakeholder Meetings, Station and Corridor Variables, Corridor Alignment and Station Alternatives Ridership Alternatives

There was a brief update on the recently held individual stakeholders meetings with the various partners in the Plano to McKinney Corridor. Results of each meeting were highlighted in the presentation.

Six varying alignment and station alternatives were each briefly highlighted. Alternatives are expected to be modified as newer modeling results become available. Four of the alternatives were modeled considering LRT technology and two were modeled with possible commuter rail (CRT) technology options.

Comments/Concerns:

- Modeled alternatives:
  - The points of measurement for all trip alternatives are the same, between Parker Road and McKinney.
  - Line total equals daily boarding. Boarding is considered one person.
  - Trip times are included in the modeling. It is also included in the modeling that as the number of stations increase, thereby increasing trip times, ridership will decrease.
  - New riders, distinguished from those who currently park-and-ride, are undeterminable in the present modeling.
  - There are dramatic differences in the line totals shown between Alternatives 3 and 4; even though the numbers of proposed stations for these two alternatives are equal. Specifically, the ridership projections shown for Legacy Drive.
    - This is likely a typo, NCTCOG staff will review. Any revisions will be updated in the presentation on the Web site.
  - There are also dramatic differences between riders at Parker Road in Alternatives 3 and 4.
    - Alternative 4 modeling considers continuous service on the Cotton Belt rail corridor to DFW Airport, whereas Alternative 3 is a forced transfer at Parker Road.
  - The reasoning behind a potential Mockingbird Station transfer would be to decrease the stress on the DART Red and Blue lines. This requires more detailed analysis as the study process moves further along.
- Right-of-way:
  - It is very important to confirm station locations and alternatives and begin acquiring right-of-way and zoning for the corridor so that further down the road when funding opportunity becomes available the right-of-way has already been secured and zoned.
  - There have been no studies done by DART or NCTCOG regarding possible track expansion alternatives for the Plano to McKinney rail corridor to be able travel through the Downtown Plano Station. There is not adequate right-of-way space to do so.
  - Right of way for two light-rail tracks is typically 50 feet; stations of course require more area.
  - Although perhaps not a popular idea, there is an option to build an elevated commuter train through downtown Plano. Irving currently has a nice example of an elevated structure under construction.

- Station locations:
  - Technology concerns may impact station locations.
  - Feasible walking distances for transit riders is an important consideration.
  - Preferred station separations: LRT is one to three miles; CRT is three to five miles.
  - Approximately 60 percent of the park-and-ride customers of DART services at the Parker Road Station are considered residents of non-DART member cities.

Funding Strategies and General Discussion
There was a brainstorming session on possible funding options.

Comments/Concerns:
- The Plano to McKinney Corridor is a viable corridor, particularly in relation to the constrained US 75 footprint and this corridor has an existing alignment.
- Funding considerations:
  - Moving to any environmental documentation would be premature before viable funding sources are determined.
  - A variety of funding options will need to work in concert.
  - It is recognized by all cities and counties that each has a responsibility to pick up a fair share of costs.
  - Determining recurring funding sources for operations and maintenance are a critical consideration.
  - The 13 DART member cities cannot sustain operational and maintenance funding for a regional system.
  - Although all options are on the table, it must be recognized that DART member cities have a 20-year advantage to non-DART member cities.
  - Rather than focus on the member cities that are at the “head of the line” by 20-years, focus on the scenario that by beginning to contribute into the regional rail system now, will result in the new, participating cities being in the front of the line later.
  - The subsidized fare structure is a complex issue that will need to be addressed.
  - Begin considering an effective marketing strategy for the Plano to McKinney Corridor.
  - Some DART member cities are close to being “built out” to capacity, so increasing sales tax revenues from these sources is becoming limited.
- Possible funding options:
  - Although probably not considered viable by all, one source for operational funds for the non-DART member cities is to make the 4A/4B sales tax funding option available for rail transit.
  - The 4A/4B sales tax funding is considered vital for encouraging economic development in many areas.
  - Tax-increment financing (TIF) may be an option for areas around potential stations.
  - It is likely a TIF zones alone will not be sufficient to generate the needed funds necessary to construct a rail corridor let alone sustain maintenance and operational costs.
  - Some DART member cities are close to being “built out” to capacity, so increasing sales tax revenues from these sources is becoming limited.

- Legislative:
  - NCTCOG is continuing efforts for some form of the TLOTA bill being presented at the next legislative session.
  - Concerns of increasing sales tax caps that would hinder businesses being attracted to the State is a real concern for the legislature and most likely not a viable option.
- Other:
  - Keep all options of the table.
  - Broaden the horizons on how to get the corridor built.
  - Creating another transit authority or partnering with the DCTA on the corridor may be more viable.
  - The CE & FS study should consider all options, including the possibility of building this corridor outside of the DART system.
  - Be wary of putting the cart before the horse, conflicts over who will administer the system before the it has been determined what the system will be is premature.

Next Meeting
To be determined.

Action Items:
- Determine next steps for the Plano to McKinney Corridor.
- Begin researching all possible funding options.
- Move forward on defining station locations and initiate possible right-of-way acquisition needs in the corridor.
- Define and complete sections 1 through 4 of the CE & FS and distribute to appropriate individuals for review.
- Meeting summary from the November 13, 2009, will be distributed, please send any comments or suggestions to Mr. Kevin Feldt at kfeldt@nctcog.org.

C.5 APRIL 16, 2010

Advancing Rail in North Texas Strategy Meeting
Plano to McKinney Rail Corridor

Friday, April 16, 2010

Attendance
There were 22 participants signed-in, with representatives from Allen, Collin County, Fairview, McKinney, Plano, Richardson, DART, DART Citizens Advisory Committee, TxDOT, and consultants from Freese & Nichols, Jacobs, and Kiewit.

The meeting was held at the Allen Municipal Court/Parks and Recreation Building in Allen, TX. Handouts included: an agenda, a copy of the presentation, a draft Summary of Potential Corridor Impacts table, a draft map of potential modeled station locations and a meeting summary from November 13, 2010.

No comments or amendments to the November 13, 2009, meeting summary were noted.

Welcome and Introductions
Mr. Tom Shelton, NCTCOG, welcomed the attendees and gave a brief overview of the agenda topics. The draft CE & FS for the McKinney Corridor is near completion. NCTCOG staff is completing review of and incorporating relevant comments to the CE & FS by DART. Efforts will continue to finalize the CE & FS. It is anticipated this meeting will be the last of the McKinney Corridor Strategy Team focusing on the CE & FS.

In the next few weeks, the Draft CE & FS will be distributed to key stakeholders for a comment and review period of approximately two weeks. Please carefully review the study and contact Mr. Kevin Feldt, Program Manager, to arrange a meeting for review of comments and concerns at kfeldt@nctcog.org or (817) 704-2529.

Update on Investigations on Potential Regional Rail Vehicle Technology – Tom Shelton, Senior Program Manager, NCTCOG
Mr. Shelton gave a brief update on DART efforts regarding new passenger rail vehicle technology for regional rail implementation. Current activities and next steps can be found in the presentation on the Web site at: www.nctcog.org/trans/spd.

Highlights:

- Over the past 15 months, NCTCOG Streamlined Project Delivery team has focused on four rail corridors highlighted in the Rail North Texas initiative: The Cotton Belt Corridor, Frisco (BNSF) Corridor, McKinney Corridor and the Waxahachie Corridor.
- The McKinney Corridor is the only rail corridor where possible LRT alternatives were studied. These are reflected in Alternatives 1, 2, 5, 6.
- The alternatives studied for the CE & FS in the Cotton Belt, Frisco (BNSF), and Waxahachie Corridors and in Alternatives 3 and 4 in the McKinney Corridor utilized the ongoing efforts by DART for a light rail new technology (LRNT) vehicle.
- A detailed presentation on the ongoing efforts for the LRNT vehicle was given to the McKinney Corridor Strategy Team meeting on November 13, 2009, by Mr. Wayne Friesner, Vice President, Commuter Rail, DART. This presentation is available on the Web site at: www.nctcog.org/trans/spd/transitrail.

Comments/Concerns:

- Has the DCTA ordered their rail cars?
  - No. DCTA has ordered the "second generation" Stadler urban commuter rail vehicles that resemble the vehicles currently utilized on the Capital Metro in Austin.
  - These vehicles, along with the vehicles used in Austin, are non-compliant for FRA crash worthiness regulations.
  - DCTA is going to negotiate with the FRA for a waiver to allow these non-compliant vehicles to travel on the same tracks as freight rail using freight and passenger service time separation.
  - The LRNT vehicles would be fully FRA compliant and would not require a waiver.
- The LRNT vehicles would not be able to travel on LRT tracks. In the McKinney Corridor, this would essentially be the LRT between the DART Red Line Parker Road Station and any potential Cotton Belt connection to the DART Red Line.
- LRNT vehicles will have a higher cost than LRT vehicles and likely a higher cost than the Stadler vehicles DCTA ordered.
- It is anticipated the LRNT vehicles, although higher in cost, will be more aesthetically pleasing and more environmentally friendly for the anticipated increase in demand for rail corridors that can travel into and near suburban neighborhoods.

CE & FS Stakeholder Meetings – Kevin Feldt, Program Manager, NCTCOG

Mr. Feldt presented an overview of the objectives and coordination efforts of the CE & FS. There was a brief update on the recently held individual stakeholders meetings. Summary results of the meetings were highlighted in the presentation. There was a brief summary of the CE & FS findings and stakeholder comments and potential station locations. These are listed in the presentation located on the Web site at: www.nctcog.org/trans/spd/transitrail.

Highlights:

- The comments from DART on the Draft CE & FS continue to be reviewed and incorporated into the document as applicable.
- When complete (the end of April or early May) the Draft CE & FS will be forwarded via email to key stakeholders for an approximate two week review and comment period.
- After comments are received, reviewed, and incorporated into the report as applicable; targeted distribution of the Final CE & FS is anticipated near the end of May.
- The CE & FS is not intended to draw conclusions or develop recommendations. The CE & FS effort is to provide reliable information to stakeholders for future decision making purposes.
- Another purpose of the CE & FS is to help expedite any future environmental documentation.
- Station locations are not final.

Comments/Concerns:

- The City of Allen has applied for a Job Access Reverse Commute (JARC) Grant for initial bus services.
- The City of McKinney has applied for a JARC Grant for initial bus services.
- The City of Plano would like to see the 12th Street station option included and shown on mapping.

- Consensus is for McKinney Corridor CE & FS purposes, station locations seem to be fairly accurate, but may be subject to some shifting in future studies.
- The US 380 and McKinney Central Station seem a little close.
  - Station locations will be further defined when a vehicle technology is known.
- The Main Street Station in Allen needs to be moved north of Main Street a bit.
- It is important to define and secure station locations and gain consensus regarding the direction the corridor is moving by all participants.
- Are the grade separations formula driven?
  - Generally, in the CE & FS two criteria where used for the grade separations: if 40,000 vehicles cross the intersection daily or if it is a six lane divided facility. Grade separations will be further defined in the CE & FS.
  - Grade separations are very complex and will be studied further in later analyses.

Summary of Findings – Jacob Asplund, Transportation Planner II, NCTCOG
Mr. Asplund gave an update on the six varying alignment and station alternatives and each was briefly highlighted along with the Summary of Potential Corridor Impacts table. The modeling assumptions, Alternatives 1 through 6, a summary of findings and draft capital cost summaries can be found in the presentation at: www.nctcog.org/trans/spd/transitrail.

Highlights:
- Alternatives are expected to be modified as newer modeling results become available in future studies.
- Four of the alternatives were modeled considering LRT technology and two were modeled with possible LRNT technology.
- Approved 2030 demographics for the metropolitan transportation plan, *Mobility 2030 - 2009 Amendment* were used for this CE & FS. As studies continue in this corridor, new modeling assumptions with updated demographics will need to be run.
- Alternatives 5 and 6 are considered more for comparison purposes. These alternatives, suggesting a continuation of the DART Red Line north, would be more complex and require partnerships and DART membership for all municipalities in the corridor.
- Capital cost estimates do not take into account any possible attributable costs to the current system. An example, in Alternative 1 it estimates 17 vehicles would be necessary; this cost does not include adding a train on the Red Line to accommodate increased passengers in the corridor. There is potential for capital costs estimates to increase.
- Note the potential decrease in capital cost outlays with a LRNT vehicle.

Comments/Concerns:
- Very important to keep realistic funding options in the forefront of the discussion.
- There were no studies done for a parallel track at Parker Road Station that would connect to the Cotton Belt Corridor. This is considered unfeasible at this time.
- The regional travel demand model assumes most transit trips will be to employment centers rather than trips to the Dallas Fort Worth International Airport (DFWIA) for airline flights, but modeling does include trips of employees to DFWIA.
- Crucial to consider that the employment centers and potential developments along the corridor are the source of most ridership and plan accordingly.
- Except for Alternatives 5 and 6 all tracks north of Parker Road Station would be single track.

- If the estimated heavy passenger load on the DART Red Line occurs during rush hour, are there potential detrimental impacts to increasing the frequency or the size of the trains destined for downtown Dallas?
  - Increasing the frequency of trains in downtown Dallas isn't feasible. The sizes, but not necessarily the length of the vehicles has more potential as a solution.
- Maintenance and storage facilities issues are complex and need further study.
- May be possible partnership opportunities with DCTA on maintenance and storage facilities in their area if needed.

General Discussion – Tom Shelton, Senior Program Manager, NCTCOG

Tom briefly highlighted next steps and encouraged participants to consider where to go from here, how to maintain the momentum for the corridor, and continue discussions on funding opportunities for regional rail in the McKinney Corridor and North Central Texas.

Comments/Concerns:

- Is there any value to reporting ridership numbers on the no-build option, particularly for the Parker Road and Bush Turnpike Stations?
  - If ridership numbers for the no build are desired, it can be done.
  - May give more clarity to ridership demand at the noted stations if the Cotton Belt Corridor is built.
- There is bus feeder services modeled for Allen and McKinney.
- Define clearly in the CE & FS that ridership numbers reflect a snapshot in time, the horizon year 2030.
- Very important that cities pay attention to the accuracy of their demographics, they are vital to accurate modeling and planning efforts.
- As discussions move forward with the public and communities in the McKinney Corridor the CE & FS will be a valuable source of information, as well as participation by NCTCOG staff in discussions.

Action Items:

- Distribute the Draft CE & FS at the end of April/early May 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 Mr. 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 McKinney Corridor.
- Review and incorporate all applicable comments by stakeholders, complete and distribute Final CE & FS.

APPENDIX D
EVALUATION ESTIMATES

TABLE OF CONTENTS

LIST OF TABLES

D. EVALUATION ESTIMATES

This section describes socio-economic, cultural, and natural features in close proximity to the McKinney 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 3.5.

- 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.
- Daily Dallas Area Rapid Transit (DART) Service Transfer Trips - The estimated number of trips where riders transfer between the McKinney Corridor and DART Light Rail Transit (LRT) or bus service.

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
Parker Road	Existing Station	DART
Legacy Drive	Proposed Station	Plano Comprehensive Plan
Millennium Business Park	Potential Station	None
Downtown Allen	Proposed Reservation	Allen Comprehensive Plan
Stacy Road	Proposed Reservation	Fairview and Allen - TOD
Fairview/State Highway (SH) 5	Proposed Reservation	Private Developer
Industrial Boulevard	Transit Village Site	McKinney Comprehensive Plan
Downtown McKinney	Transit Village Site	McKinney Comprehensive Plan
US 380 – McKinney	Transit Village Site	McKinney Comprehensive Plan
McKinney North 1	Transit Village Site	McKinney Comprehensive Plan
McKinney North 2	Transit Village Site	McKinney Comprehensive 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
Parker Road Station Total	**1**
Benecorp Business Services	Plano
Legacy Drive Station Total	**1**
Raytheon Company	Plano
Millennium Business Park Station Total	**3**
Experian	Allen
Jack Henry & Associates Incorporated	Allen
Mykrolis Corporation	Allen
Downtown Allen Station Total	**1**
City of Allen	Allen
Stacy Road Station Total	**1**
SuperTarget	Allen
Fairview/SH 5 Station Total	**0**
Industrial Boulevard Station Total	**2**
Encore Wire Corporation	McKinney
Timber Blind Manufacturing	McKinney
Downtown McKinney Station Total	**1**
City of McKinney	McKinney
US 380 – McKinney Station Total	**1**
Watson & Chalin Manufacturing Incorporated	McKinney
McKinney North 1 Station Total	**0**
McKinney North 2 Station Total	**0**

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
Parker Road Station Total	**15**
2201 Avenue K	Office
720 East Park Boulevard	Office
Ashley Park Townhomes	Multi-Family
Bank of America Plano Tower	Office
Burlington Coat Factory Shopping Center	Retail
Crest Cadillac Incorporated	Retail
GTE Southwest Incorporated	Industrial
Kohls Department Stores Incorporated	Retail
La Jolla on Park	Multi-Family
Parker Central Plaza	Retail
Parker Crossing Shopping Center	Retail
Parker Town Centre	Retail
Pleasant Park Apartments	Multi-Family
Republic Place	Office
Target	Retail
Legacy Drive Station Total	**10**
Chase Oaks Village	Multi-Family
Fellowship Church	Cultural
Oakpoint Estates	Multi-Family
Plano Market Square	Retail
Raytheon	Industrial
Sam's Club	Retail
Spring Creek Crossing	Retail
Spring Creek Plaza	Retail
Telstrat International (TSI)	Industrial
Texas Instruments	Industrial
Millennium Business Park Station Total	**9**
BSM Financial Center	Office
Cornerstone Development Phase II	Office
Enterprise Office II	Office
Experian	Office
Jack Henry & Associates, Enterprise Office I	Office
Mykrolis	Industrial
Parkview in Allen	Multi-Family
Quest Medical Incorporated	Industrial
Watters Creek at Montgomery Farm (Phase 1)	Office

Table D-3 Activity Centers (continued)

Name of Activity Center	Type
Downtown Allen Station Total	**7**
Albertson's Shopping Center	Retail
Allen City Hall	Institutional
Allen Civic Auditorium	Cultural
Allen Public Library	Cultural
Allen Towne Square	Mixed Use
Cottonwood Creek Shopping Center	Retail
Whisenant Estates	Multi-Family
Stacy Road Station Total	**6**
Allen Event Center	Recreational
Allen Premium Outlets	Retail
Courtyard by Marriott	Hotel/Motel
Hampton Inn & Suites	Hotel/Motel
Village at Allen, The	Retail
Village at Fairview, The	Retail
Fairview/SH 5 Station Total	**0**
Industrial Boulevard Station Total	**7**
1710-1720 Couch Drive (Formerly Simpson Strong Tie)	Industrial
2060 Couch Drive	Industrial
Encore Wire Corporation	Industrial
Encore Wire Limited	Industrial
Montgomery Kone	Industrial
Roper Pump Company	Industrial
Timber Blind Manufacturing	Industrial
Downtown McKinney Station Total	**6**
Commercial Historic District	Mixed Use
Gilberts McKinney Mobile Home Park	Multi-Family
McKinney City Hall	Institutional
McKinney Performing Arts Center	Cultural
Producers Compress Incorporated	Industrial
Webb, J. W. Elementary	Education
US 380 – McKinney Station Total	**5**
500 Metro Park Drive	Industrial
901 N McDonald Street	Industrial
Fisher Controls International	Industrial
Southern Foods Group LP	Industrial
Watson & Chalin Manufacturing	Industrial
McKinney North 1 Station Total	**0**
McKinney North 2 Station Total	**0**

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
Parker Road Station Total	**1**
Parker Road Station	Transportation
Legacy Drive Station Total	**1**
Fellowship Church	Cultural
Millennium Business Park Station Total	**0**
Downtown Allen Station Total	**6**
Allen City Hall	Government
Allen Civic Auditorium	Cultural
Allen Fire Station 1	Emergency Services
Allen Main Post Office	Government
Allen Police Dept	Emergency Services
Allen Public Library	Recreational
Stacy Road Station Total	**1**
Allen Event Center	Recreational
Fairview/SH 5 Station Total	**0**
Industrial Boulevard Station Total	**1**
Pecan Grove Cemetery	Cemetery
Downtown McKinney Station Total	**5**
McKinney City Hall	Government
McKinney Fire Station 1	Emergency Services
McKinney Performing Arts Center	Cultural
McKinney Public Library	Recreational
Municipal Court	Government
Webb, J. W. Elementary	Educational
US 380 – McKinney Station Total	**0**
McKinney North 1 Station Total	**0**
McKinney North 2 Station Total	**0**

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
Parker Road Station Total	**0**
Legacy Drive Station Total	**0**
Millennium Business Park Station Total	**0**
Downtown Allen Station Total	**2**
Allen Station of the Texas Electric Railway	Marker
Allen Cemetery	Cemetery
Stacy Road Station Total	**0**
Fairview/SH 5 Station Total	**0**
Industrial Boulevard Station Total	**3**
Pecan Grove Cemetery	Cemetery
Pecan Grove Memorial Park	Marker
McKinney Cotton Mill Historic District	District
Downtown McKinney Station Total	**33**
Brown, John R., House	Property
Collin County	Marker
Collin County Courthouse, Old	Marker
Collin County Mill and Elevator Company	Property
Collin County Prison	Marker
Crouch-Perkins House	Marker
Crouch--Perkins House	Property
Dulaney Cottage	Marker
Dulaney, Joe E., House	Property
Dulaney, Joseph Field, House	Property
Faires, F. C., House	Property
Faires--Bell House	Property
First Baptist Church of McKinney	Marker
First National Bank Building	Marker
First United Methodist Church of McKinney	Marker
Foote--Crouch House	Property
Goodner, Jim B., House	Property
Heard-Craig House	Marker
Heard--Craig House	Property
Hill--Webb Grain Elevator	Property
House at 301 E. Lamar	Property
Johnson, John, House	Property
Johnson, Rebekah Baines, Birthplace of	Marker
Johnson, Thomas, House	Property

Table D-5 Historical Features (continued)

Name of Historical Feature	Feature Type
Downtown McKinney Station (continued)	
King, Mrs. J. C., House	Property
McKinney Commercial Historic District	District
McKinney Cotton Compress Plant	Property
McKinney Residential Historic District	District
Nenney, J. P., House	Property
Newsome--King House	Property
Throckmorton, James W., Law Office	Marker
Waddill, R. L., House	Property
Wiley, Thomas W., House	Property
US 380 – McKinney Station Total	**1**
First Baptist Church of McKinney	Marker
McKinney North 1 Station Total	**0**
McKinney North 2 Station Total	**0**

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
Parker Road Station Total		**4**
Texas Department of Transportation (TxDOT)	Survey	April 1982
Federal Highway Administration (FHWA)	Survey	November 1985
TxDOT	Survey	March 1988
DART	Survey	April 1996
Legacy Drive Station Total		**3**
TxDOT	Survey	April 1982
Farmers Home Administration (FmHA)	Survey	August 1987
TxDOT	Survey	March 1988
Millennium Business Park Station Total		**4**
FmHA	Survey	August 1987
TxDOT	Survey	June 1989
US Environmental Protection Agency (EPA)	Survey	May 1992
TxDOT	Survey	February 2001
Downtown Allen Station Total		**5**
EPA	Survey	April 1978
FmHA	Survey	August 1987
FHWA	Survey	November 1987
EPA	Survey	May 1992
City of Allen	Survey	December 1996

Table D-6 Archeological Investigations (continued)

Investigating Agency	Type	Date
Stacy Road Station Total		**1**
FmHA	Survey	August 1987
Fairview/SH 5 Station Total		**0**
Industrial Boulevard Station Total		**0**
Downtown McKinney Station Total		**0**
US 380 – McKinney Station Total		**1**
FHWA	Survey	March 1987
McKinney North 1 Station Total		**1**
City of Irving	Survey	February 1999
McKinney North 2 Station Total		**3**
Soil Conservation Service (SCS)	Survey	December 1974
EPA	Survey	January 1982
EPA	Survey	January 1983

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 McKinney 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
Parker Road Station Total	**11**
Before 1961	1
1961-1975	10
Legacy Drive Station Total	**16**
Before 1961	5
1961-1975	11
Millennium Business Park Station Total	**5**
Before 1961	0
1961-1975	5
Downtown Allen Station Total	**99**
Before 1961	14
1961-1975	85
Stacy Road Station Total	**0**
Fairview/SH 5 Station Total	**14**
Before 1961	5
1961-1975	9

Table D-7 Year of Construction on Parcels (continued)

Year Built	Number of Parcels
Industrial Boulevard Station Total	**74**
Before 1961	11
1961-1975	63
Downtown McKinney Station Total	**423**
Before 1961	60
1961-1975	363
US 380 – McKinney Station Total	**63**
Before 1961	11
1961-1975	52
McKinney North 1 Station Total	**0**
McKinney North 2 Station Total	**4**
Before 1961	1
1961-1975	3

Source: Collin County 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 McKinney Corridor was determined to be adjacent to three parks or recreational facilities. The following facilities could fall under the state or federal protections outlined in Appendix B, Section B.2.5.1: Allen Station Park in Allen; the Preston Ridge Trail in Plano; and the Heard Natural Science Museum & Wildlife Sanctuary in McKinney. In addition, Table D-8 lists the off-street bicycle and pedestrian trails, parks and recreational facilities within one-half mile of McKinney Corridor stations.

Table D-8 Parks, Trails and Recreation Facilities

Name of Facility	Facility Type
Parker Road Station Total	**4**
15th Street Station	Planned Trail
Lavon Link	Planned Regional Veloweb Trail
Parker Road Station	Planned Trail
Rail to Trail Conversion	Planned Trail
Legacy Drive Station Total	**3**
Plano Central Link	Planned Trail
Chase Oaks Golf Course	Recreational Facility
Oak Point Park and Nature Preserve	Existing Park
Millennium Business Park Station Total	**8**
Bluebonnet East	Planned Regional Veloweb Trail
Collin Square Trail	Existing Trail
Cotton Belt Lavon	Planned Regional Veloweb Trail

Table D-8 Parks, Trails and Recreation Facilities (continued)

Name of Facility	Facility Type
Millennium Business Park Station (continued)	
Plano Central Link	Planned Regional Veloweb Trail
Preston Ridge	Existing Trail
Watters Branch Trail	Existing Trail
Chase Oaks Golf Course	Recreational Facility
Collin Square	Existing Park
Downtown Allen Station Total	**11**
Allen Station Trails	Existing Trail
Cotton Belt Lavon	Planned Regional Veloweb Trail
Cottonwood Creek Trails	Existing Trails
Allen Heritage Center	Recreational Facility
Allen Heritage Village	Recreational Facility
Allen Senior Center	Recreational Facility
Allen Station Park	Existing Park
Allen Youth Park Edge	Existing Park
Allenwood Property	Planned Park
City Hall Plaza	Existing Park
Park & Recreation Operations Office	Recreational Facility
Stacy Road Station Total	**1**
Cotton Belt Lavon	Planned Trail
Fairview/SH 5 Station Total	**2**
Bluebonnet East	Planned Regional Veloweb Trail
Sloan Creek	Planned Trail
Industrial Boulevard Station Total	**2**
Bluebonnet East	Planned Regional Veloweb Trail
Cottonwood Park	Existing Park
Downtown McKinney Station Total	**6**
Bluebonnet East	Planned Regional Veloweb Trail
Central Park	Existing Park
Fitzhugh Park	Existing Park
Mitchell Park	Existing Park
Mouzon Ball Fields	Existing Park
Old Settler's Park	Existing Park
US 380 – McKinney Station Total	**2**
Bluebonnet East	Planned Regional Veloweb Trail
Wattley Park	Existing Park
McKinney North 1 Station Total	**2**
Bluebonnet North Trail	Planned Trail
Clemons Creek Trail	Planned Trail
McKinney North 2 Station Total	**2**
Bluebonnet North Trail	Planned Trail
Fitzhugh Branch	Planned Trail

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 McKinney Corridor was determined to be adjacent to one landfill site, the City of McKinney Landfill. The two unauthorized, abandoned landfills within one-eighth mile of the rail line do not have well-defined boundaries and could extend into the rail right-of-way. These sites are located west of the rail line near the intersection of SH 5 and Spur 399 and near the intersection of McDonald Street and Erwin Avenue. Four natural gas pipelines cross the rail line within the McKinney Corridor: Atmos Energy pipeline D9-2-1-2 in Fairview, Atmos Energy pipeline D17-9 in McKinney, ONEOK Sterling Pipeline System north of McKinney, and Energy Transfer Company Merit-Collin pipeline north of McKinney. 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)
Parker Road Station	0	0
Legacy Drive	0	0
Millennium Business Park	0	0
Downtown Allen	0	0
Stacy Road	0	0
Fairview/SH 5	0	1.06 miles (Atmos Energy)
Industrial Boulevard	1 (Active)	0.49 miles (Atmos Energy)
Downtown McKinney	0	0
US 380 – McKinney	1 (Closed)	0
McKinney North 1	0	1.02 miles (Entergy Transfer Company) 1.01 miles (ONEOK)
McKinney North 2	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 McKinney Corridor is identified. As shown in Table D-10, the land use directly adjacent to the rail line right-of-way includes 18,925 linear feet (10.1 percent) of residential land use, 5,777 linear feet (3.1 percent) of park or recreational land use, and 1,274 linear feet (0.7 percent) of institutional land use. This totals 25,976 linear feet (13.9 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
Parker Road to Legacy Drive	2,171	0	0
Legacy Drive to Millennium Business Park	583	153	0
Millennium Business Park to Downtown Allen	1,966	0	0
Downtown Allen to Stacy Road	2,235	0	4,225
Stacy Road to Fairview / SH 5	789	0	0
Fairview/SH 5 to Industrial Boulevard	3,782	638	1,197
Industrial Boulevard to Downtown McKinney	3,704	263	0
Downtown McKinney to US 380 – McKinney	729	220	0
US 380 – McKinney to McKinney North 1	0	0	355
McKinney North 1 to McKinney North 2	2,966	0	0

Source: NCTCOG, 2009

D.14 VIBRATION

Based on the data discussed in Appendix B, Section B.3.3, vibration sensitive land use near the McKinney 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 18,925 linear feet (10.1 percent) which includes residential land use, hotels, and motels. Approximately 7,050 linear feet (3.7 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
Parker Road to Legacy Drive	0	2,171	0
Legacy Drive to Millennium Business Park	0	583	153
Millennium Business Park to Downtown Allen	0	1,966	0
Downtown Allen to Stacy Road	0	2,235	4,225
Stacy Road to Fairview / SH 5	0	789	0
Fairview / SH 5 to Industrial Boulevard	0	3,782	1,835
Industrial Boulevard to Downtown McKinney	0	3,704	263
Downtown McKinney to US 380 – McKinney	0	729	220
US 380 – McKinney to McKinney North 1	0	0	355
McKinney North 1 to McKinney North 2	0	2,966	0

Source: NCTCOG, 2009

D.15 WATER RESOURCES

Based on the data discussed in Appendix B, Section B.3.4, floodplains along the McKinney Corridor rail line are identified. The linear feet of floodplain crossings by the McKinney 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 17.7 miles (93,619 linear feet) includes 11,591

linear feet (12.4 percent) of 100-year floodplain crossings and 2,660 linear feet (2.8 percent) of 500-year floodplain crossings. This totals 14,252 linear feet (15.2 percent) of identified floodplain crossings for the McKinney Corridor.

Table D-12 Rail Centerline Floodplain Crossings

Station Segment	Linear Feet of Floodplain		Stream Crossings
	100-Year	500-Year	
Parker Road to Legacy Drive	516	323	2
Legacy Drive to Millennium Business Park	932	1,100	1
Millennium Business Park to Downtown Allen	0	0	0
Downtown Allen to Stacy Road	1,417	257	1
Stacy Road to Fairview/SH 5	271	0	1
Fairview/SH 5 to Industrial Boulevard	413	0	1
Industrial Boulevard to Downtown McKinney	0	0	0
Downtown McKinney to US 380 – McKinney	110	0	1
US 380 – McKinney to McKinney North 1	6,930	980	1
McKinney North 1 to McKinney North 2	1,011	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 McKinney Corridor was determined to have eight stream crossings. The corridor crosses the following streams, Bowman Branch, Brown Branch, Cottonwood Creek, East Fork Trinity River, Rowlett Creek, Sloan Creek, Wilson Creek and an unnamed tributary of East Fork Trinity River that starts near the intersection of the rail line and Broad Street. 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, there are no occurrences of threatened or endangered species or wildlife management areas 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, eight types of soil within the station analysis areas are classified as prime farmlands: Austin silty clay (1 to 3 percent slopes), Frio clay loam (occasionally flooded), Houston Black clay (0 to 1 percent slopes), Houston Black 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), and Trinity clay (occasionally flooded). 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
Parker Road Station	26.8
Legacy Drive	85.8
Millennium Business Park	121.3
Downtown Allen	55.6
Stacy Road	372.9
Fairview/SH 5	223.5
Industrial Boulevard	65.1
Downtown McKinney	40.9
US 380 – McKinney	125.6
McKinney North 1	132.5
McKinney North 2	194.1

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).