Collin County Outer Loop
From US 75 to SH 121
Collin County, Texas

July 2010

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1.0 INTRODUCTION

The Collin County Toll Road Authority (CCTRA) has undertaken the preparation of this environmental document for Segment 1 of the proposed Collin County Outer Loop. This document presents the potential social, economic, and environmental effects for this new 4.6-mile section of the Collin County Outer Loop located between United States (US) Highway 75 and State Highway (SH) 121 in Collin County, Texas (see Figure 1). This document analyses the first phase of development of Segment 1, which includes the purchase of right-of-way for the ultimate facility and the construction of a two-lane frontage road.

The Collin County Outer Loop is included in the *Collin County Thoroughfare Plan, 2007 Update* and the *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment* (*Mobility 2030 - 2009 Amendment*). The Collin County Outer Loop is a planned roadway facility that would provide a necessary east-west link in the county and is expected to help relieve congestion on other roadways. The loop would provide access to the future extension of Dallas North Tollway, SH 121, US 75, US 380, and enhance access to Rockwall County. Though planned as a part of a larger facility in Collin County, Segment 1 has independent utility because the project would function as a usable roadway, does not require the implementation of other projects to operate, and would not restrict the consideration of other foreseeable transportation improvements.

The purpose of this document is to provide the public and decision makers with adequate and appropriate information regarding the need and purpose of this project; alternatives considered; and the social, economic, and environmental effects. The final approval of the project would be made by CCTRA after the environmental impacts are evaluated and comments on this document, including those from the public hearing, have been evaluated.

2.0 NEED FOR PROPOSED ACTION

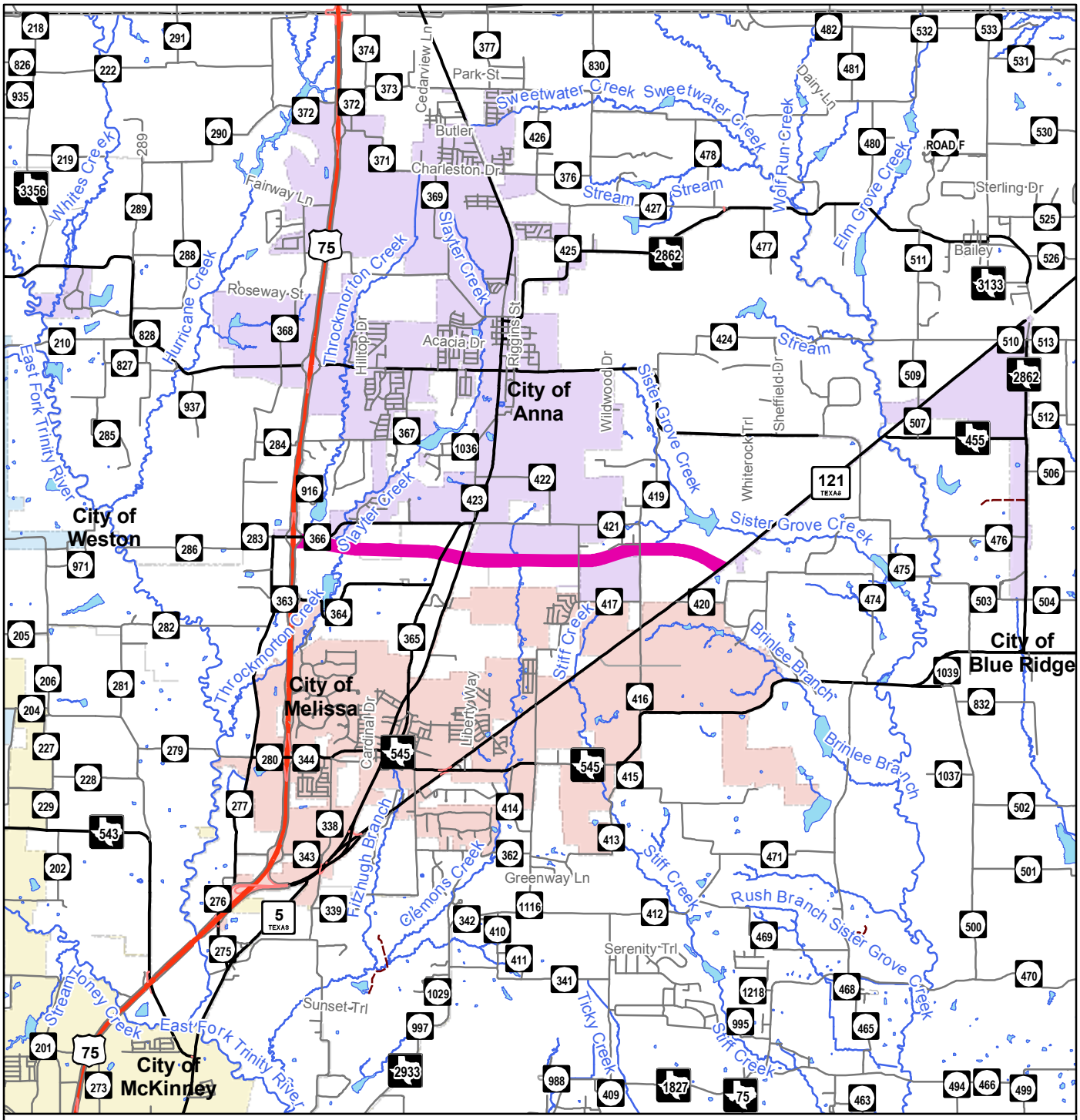
The need for a new roadway from US 75 to SH 121 is to help address regional population and employment growth and travel demand.

2.1 REGIONAL GROWTH

Historically, Texas has been one of the 10 fastest growing states in the nation. According to the US Census Bureau, Texas added 3.9 million persons between 1990 and 2000, a 22.8 percent increase in population. By comparison, the US population grew by 32.7 million persons between 1990 and 2000, an increase of 13.2 percent. During this same time period, the Dallas-Fort Worth urban area grew to 5,067,400 persons, a 29.3 percent increase in population since the 1990 Census. The urban area includes 10-counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties).

Population estimates from the US Census Bureau released in March 2009 showed the Dallas-Fort Worth-Arlington urbanized area had a population of 6.3 million and added more people from July 2007 to July 2008 than any other metropolitan area in the nation. Based on this estimate, the Dallas-Fort Worth urban area is the fourth most populous in the nation. The Dallas-Fort Worth region has sustained a long period of economic growth because of three primary factors: a favorable business climate, attractive tax policies, and an abundance of available land. The current economic downturn is expected to slow the rate of growth over the near term, but is expected to return to previous levels of growth as the economy recovers. Historically, this has been the case with other downturns in the economy.

Collin County ranks as one of the top growth areas both in the state and the nation and is the fastest growing county in the region. Between 1990 and 2000, Collin County has experienced



Collin County Outer Loop Segment 1
Local Environmental Document

Project Location Map

US 75 to SH 121

Figure 1

North Central Texas Council of Governments

Transportation Department

Source: TPWD, 1984

almost three times the population growth as the Dallas-Fort Worth urban area with an 86 percent increase. Table 1 shows the US Census data from 1970 through 2000 for populations and the North Central Texas Council of Governments (NCTCOG) regional projections for 2030. These projections are developed independent of the transportation system planning process.

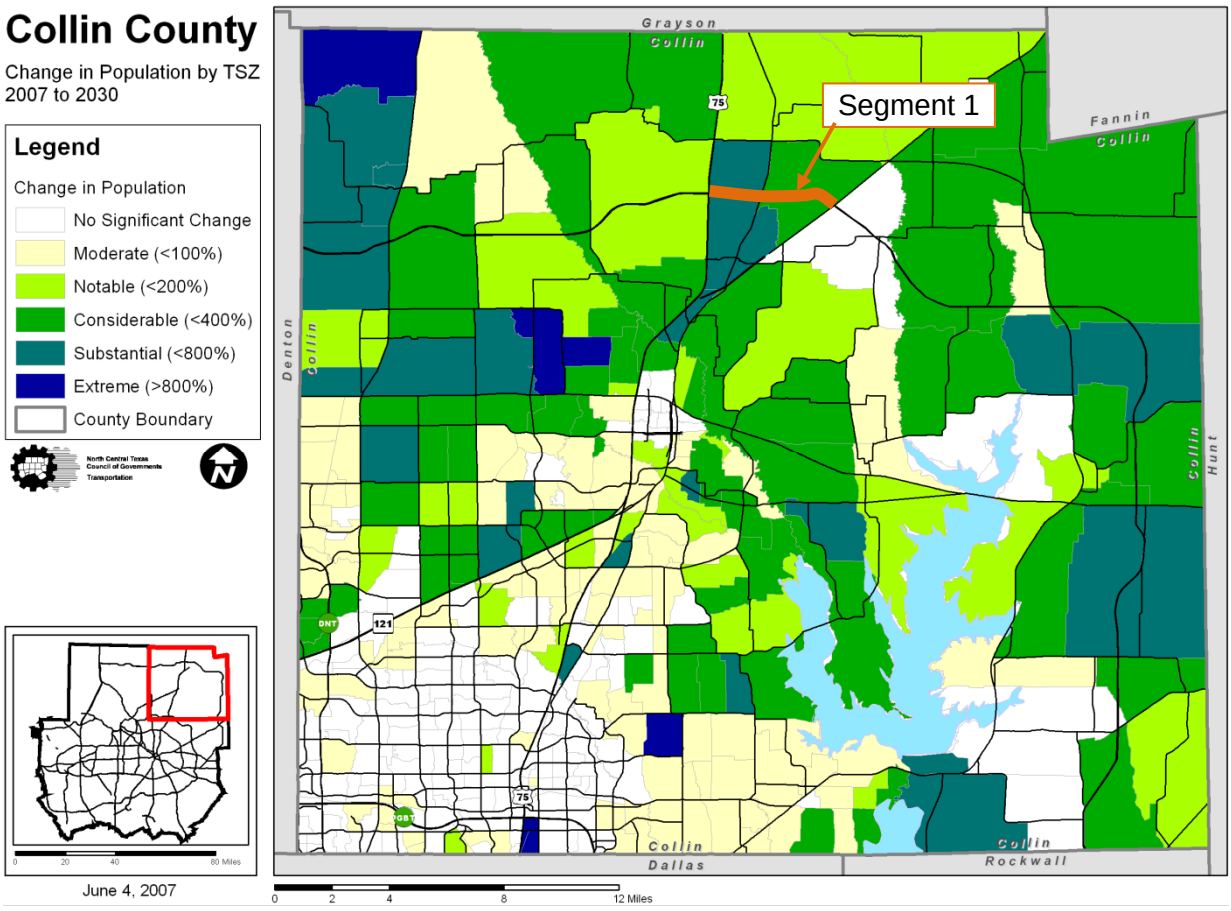
Table 1. Population Growth

	1970[1]	1980[1]	1990[1]	2000[1]	Projected 2030[2]
Dallas-Fort Worth Urban Area	2,371,611	2,957,091	3,920,094	5,067,400	9,107,900
Change		585,480	963,003	1,147,306	4,040,500
% Change		25%	32%	29%	80%
Collin County	66,920	144,576	264,036	491,675	1,166,645
Change		77,656	119,460	227,639	674,400
% Change		116%	83%	86%	137%

Source: (1) US Census Bureau, (2) NCTCOG Demographic Forecast Information (January 24, 2007)

Because of the lower costs and availability of land, the northeast quadrant of Collin County is expected to see significant population growth. Figure 2 shows the projected population changes from 2007 to 2030 in northeast Collin County. The project passes through areas that are projected to experience considerable (between 201 and 400 percent) and substantial (between 401 and 800 percent) increase in population.

Figure 2. Change in Population from 2007 to 2030



Source: NCTCOG, June 2007

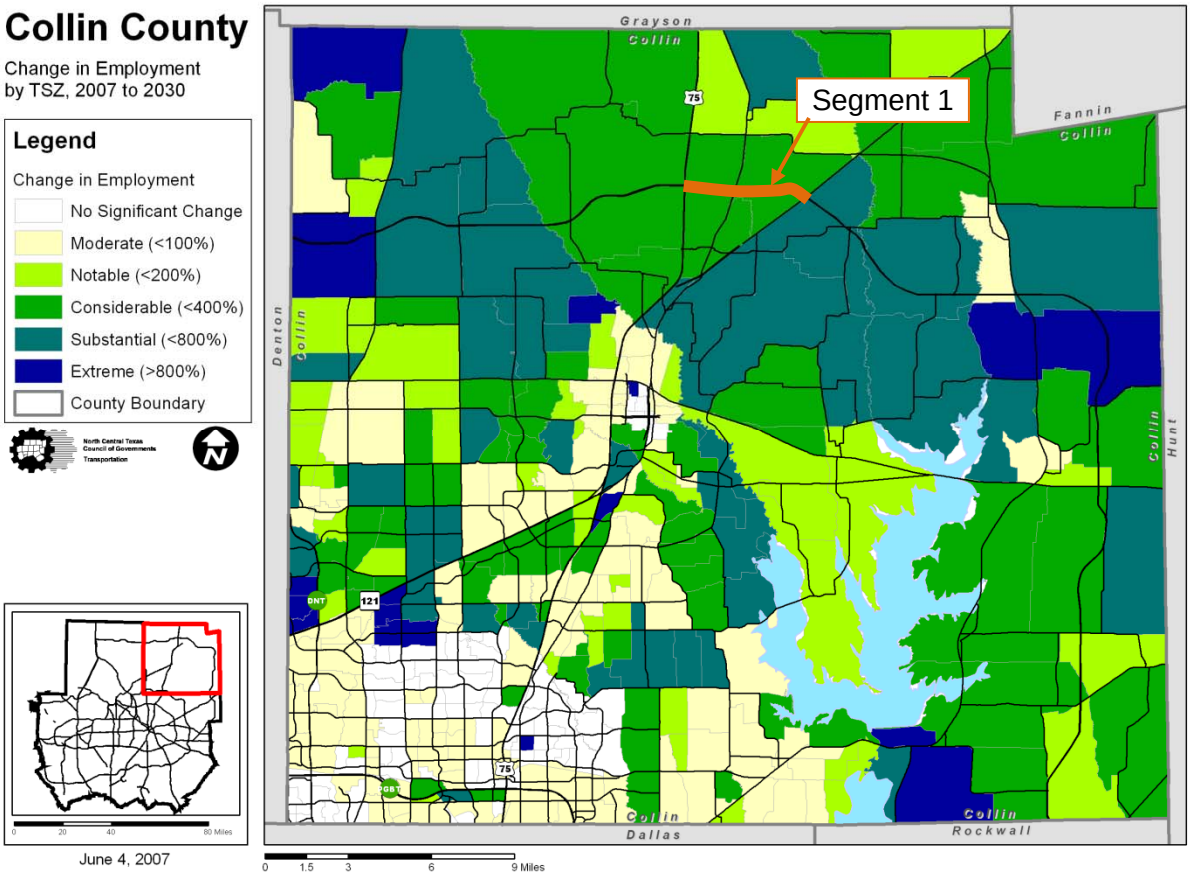
As population increases, employment levels are expected to increase accordingly. Table 2 shows the 2000 and forecasted 2030 employment for the Dallas-Fort Worth urban area and Collin County. It is projected that employment in Collin County will increase by 154 percent between 2000 and 2030 compared to 72 percent for the region. Much of this growth can be attributed to the region being a leader in the creation of new jobs, corporate relocations, and growth in the technology and service-based industries. Figure 3 shows the projected change in employment from 2007 to 2030 in northeast Collin County. The project passes through an area that is projected to experience considerable (between 201 and 400 percent increase) in employment.

Table 2. 2000 and 2030 Employment

Location	Employment		% Employment Increase 2000 to 2030
	2000 (1)	Forecasted 2030 (2)	
Dallas-Fort Worth Urban Area	3,158,200	5,416,700	72%
Collin County	204,100	517,300	154%

Source: (1) US Census Bureau, (2) NCTCOG Demographic Forecast Information (January 24, 2007)

Figure 3. Change in Employment from 2007 to 2030



Source: NCTCOG, June 2007

The county continues to attract new industry and businesses. The associated increases in population and employment will create a strain on existing transportation systems. Trends derived through analysis of previous demographic growth include increased automobile ownership, more single-occupant travel, increased suburbanization, and increased vehicle miles of travel in the region (regional travel).

2.2 TRAVEL DEMAND

Not only have population and travel increased, but the nature of travel has changed in ways that contribute to greater traffic congestion. The changes in land use associated with suburbanization have an effect on the characteristics of travel. Industrial and commercial developments have now expanded beyond the central cities and into the suburban communities, causing a dramatic change in travel patterns for these areas. Increasing development of the industrial and commercial facilities has positively affected the growth of the economy for these communities as well as generated rapidly increasing population growth. Rather than the suburb-to-central city commute of the past, today's commuting patterns are more widely diffused, as inter- and intra-suburban travel has increased. Due to the rapid pace at which growth has occurred, and is projected to continue, limited funding seriously constrains the region's ability to solve ground transportation issues in the region.

Mobility 2030 - 2009 Amendment is the current fiscally constrained Metropolitan Transportation Plan (MTP) for the Dallas-Fort Worth area. It presents a system of transportation improvements needed to maintain mobility in the Dallas-Fort Worth metropolitan area over the next 20 plus years and serves as a guide for the expenditure of state and federal funds for the region. Its development was coordinated among the public, local governments, transit authorities, the Texas Department of Transportation (TxDOT), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA). Regional transportation projects selected through the process of forecasting future travel demand, evaluating system alternatives, and selecting those options which best meet the mobility needs of the region are included in the plan. It also serves as a guide for the phased implementation of multi-modal transportation improvements, policies, and programs through the year 2030.

The improvements recommended in *Mobility 2030 - 2009 Amendment* include regional congestion management strategies, bicycle and pedestrian facilities, managed High Occupancy Vehicle lanes, light/commuter rail and bus transit improvements, intelligent transportation system (ITS) technology, freeway and toll road lanes, and improvements to the regional arterial and local thoroughfare system such as intersection improvements and signal timing. As shown in Table 3, *Mobility 2030 - 2009 Amendment* projects the implementation of planned transportation improvements would keep the increase in congestion delay to about 2.5 percent compared to 2007 mobility levels in the Dallas-Fort Worth area. This illustrates a more functional and efficient transportation system despite a 45 percent increase in population and 43 percent increase in employment.

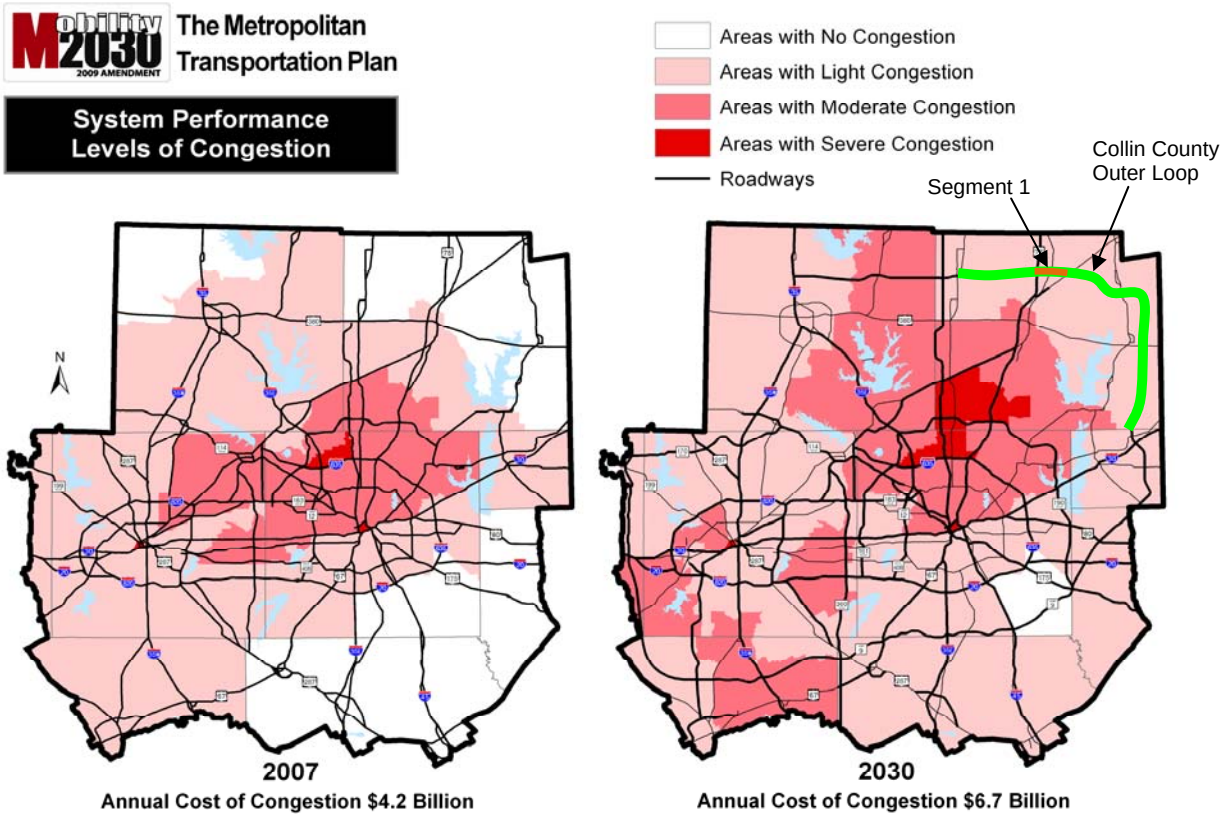
Table 3. *Mobility 2030 - 2009 Amendment* Regional Performance Measures

Performance Measure	2007	*Mobility 2030 - 2009 Amendment*
Population	5,856,432	8,503,146
Employment	3,664,954	5,256,667
VMT	151,392,421	241,219,970
Hourly Capacity (miles)	30,283,116	43,780,351
Vehicle Miles Spent in Delay (daily)	1,026,960	1,697,274
Percent Increase in Travel Time due to Congestion	34.32%	36.87%
Annual Cost of Congestion	$4.17 Billion	$6.62 Billion

Source: NCTCOG, April 2009
Note: The annual cost of congestion presented is conservative, as it does not include annual freight cost of congestion. Congestion impacts to goods movement, while only a fraction of the general traffic stream, are estimated to be between three to five times higher than passenger congestion costs.

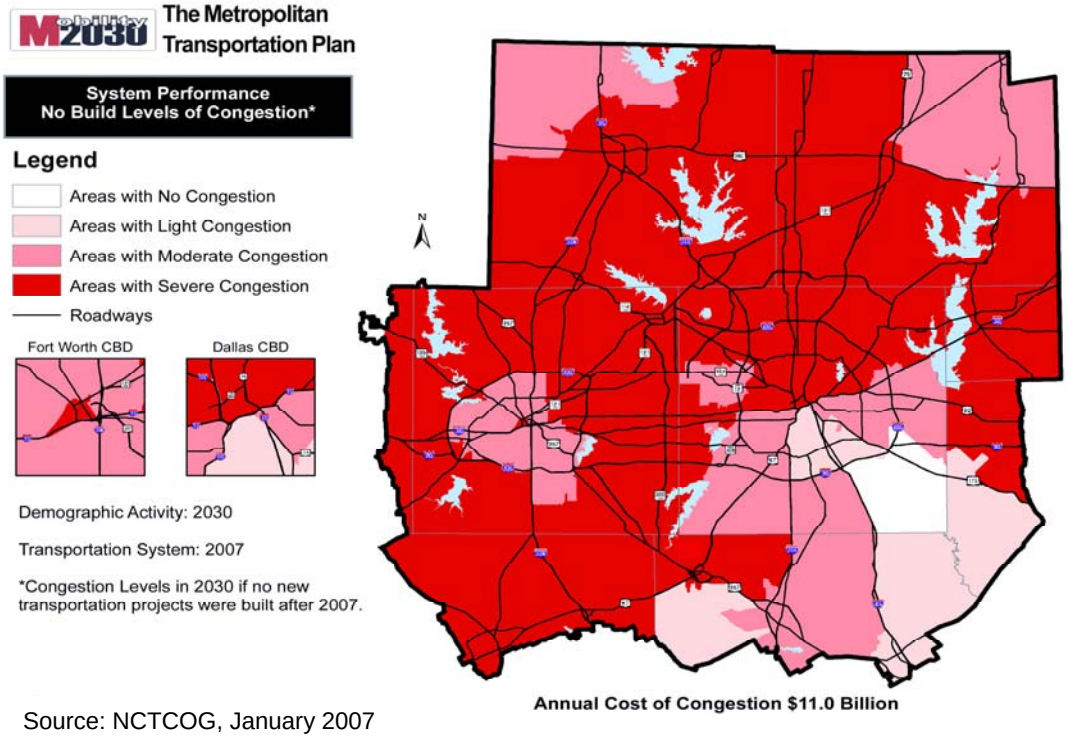
Figure 4 illustrates the congestion levels during the peak hour under 2007 and projected 2030 conditions based on the improvements recommended in *Mobility 2030 - 2009 Amendment*. These recommendations include the construction of the Collin County Outer Loop. Figure 5 shows the congestion levels during peak hour in the Dallas-Fort Worth area under the no build scenario where no transportation improvements are built beyond the programmed commitments in the *2008-2011 Transportation Improvement Program* (TIP). The congestion cost almost doubles compared to the *Mobility 2030 - 2009 Amendment* improvements. Under this scenario, the majority of Collin County would experience severe congestion in 2030.

Figure 4. Dallas-Fort Worth *Mobility 2030, 2009 Amendment* MTP System Performance 2007 and 2030 Level of Congestion



Source: NCTCOG, February 2009

Figure 5. Dallas-Fort Worth No Build Levels of Congestion in 2030



Source: NCTCOG, January 2007

2.3 TRANSPORTATION SYSTEM LINKAGES

Within northeast Collin County, there are very few major transportation facilities (see Figure 1). Today, travel choices are limited to one controlled-access facility (US 75) and numerous smaller, rural roadways which provide limited mobility and access choices.

- US 75 runs generally north-south on the western edge of the study corridor. Currently, US 75 is a four-lane controlled-access facility with two, two-lane, two-way frontage roads on either side of the mainlanes. In the future, US 75 will be widened to six mainlanes.
- Generally, SH 5 runs north-south and is approximately 1.5 miles east of US 75. SH 5 is a two-lane roadway within the study corridor. Engineering to widen SH 5 between SH 121 and FM 455 to a four-lane divided roadway is currently being performed. The construction is currently not funded.
- On the eastern end of the study corridor, SH 121 is a two-lane roadway that travels northeast. This roadway (from SH 5 to FM 455) is scheduled to be widened to a four-lane divided roadway with construction starting in October 2010. The section from US 75 to SH 5 will be widened to six lanes and is scheduled to begin construction in early 2011.
- The nearest major east-west roadway is US 380, which is approximately seven miles to the south. It is a four/six-lane facility lane. There are no plans to widen this facility.
- FM 455 is an east-west, two-lane rural roadway. West of Anna, the roadway has three severe 90-degree turns. From US 75 to SH 5, this roadway is planned to be widened to four lanes.
- The study corridor is also served by several county roads (CR); however, none are continuous between US 75 and SH 121.

As mentioned in Section 2.1, the study corridor is seeing significant population growth, but improvements to the roadway infrastructure have not kept pace and are constrained by limited availability of funding for transportation projects. As mentioned previously, the Collin County Outer Loop is included in the *Collin County Thoroughfare Plan, 2007 Update* and the *Mobility 2030 - 2009 Amendment*. It is also included in the *2006 City of Anna Land Use Thoroughfare Plan* and the *City of Melissa Comprehensive Plan*, 2006. The Collin County Outer Loop is a planned roadway facility that would provide a necessary east-west link in the county and is expected to help relieve congestion on other roadways. The loop would provide access to the future extension of Dallas North Tollway, SH 121, US 75, US 380, and enhance access to Rockwall County. The freeway and tollway system evaluation in *Mobility 2030 - 2009 Amendment* recommends an outer loop around the Dallas-Fort Worth Metroplex. This project may contribute to the development of an outer loop (circumferential) roadway system and help increase mobility and accessibility around the northeast quadrant of the region.

3.0 PURPOSE OF THE PROPOSED ACTION

The Collin County Outer Loop is an essential element of the *Collin County Thoroughfare Plan, 2007 Update* that would aid in addressing transportation issues in the county. The purpose of the Segment 1 project is to:

- Help establish a transportation corridor to manage travel demand from rapid population and employment growth and development
- Provide roadway capacity, mobility, and accessibility for developing areas by providing more direct links to existing major radial highways
- Serve population areas that currently lack major limited-access facilities for inter-suburban travel
- Provide the basic transportation infrastructure necessary to allow for expansion that accommodates varied travel demands or modes as warranted

4.0 ALTERNATIVES

As previously mentioned Collin County ranks as one of the top growth areas in the state and the nation and is the fastest growing county in the region. To accommodate the expected future population and employment growth and mitigate regional congestion, Collin County Commissioners approved the preparation of study of the Collin County Outer Loop. This section describes the planning process, alternative development, selection of a preferred alignment, and the alternatives studied in this document.

4.1 PLANNING AND ALTERNATIVE DEVELOPMENT PROCESS

The Collin County Outer Loop was first identified in the 2002 update to the *Collin County Mobility Plan* as "Multimodal Transportation Corridor Preservation." The 53-mile loop was divided into five segments based on priorities to preserve right-of-way and construct the facility. The segments are:

Segment 1: From US 75 to SH 121
Segment 2: From FM 6 to Rockwall County Line
Segment 3: From the Dallas North Tollway to US 75
Segment 4: From US 380 to FM 6
Segment 5: From SH 121 to US 380

In October 2004, Collin County initiated a study to identify a preferred corridor and alignment for the Collin County Outer Loop between US 75 and the Rockwall County Line, a distance of approximately 39 miles (Segments 1, 2, 4, and 5). The study first concentrated on developing alignment alternatives between US 75 and SH 121 through the Cities of Melissa and Anna. It

was considered important to establish an alignment in this short section to preserve right-of-way because of high growth and rapidly encroaching development. The two cities were consistently among the Dallas-Fort Worth region's top 10 fastest growing jurisdictions by percentage during the early 2000s.

The process of identifying a preferred alignment from US 75 to SH 121 involved data collection and review, developing and evaluating alignment alternatives, developing and evaluating alignment alternatives, and recommendation of a preferred alignment. Public involvement was a key component (see Section 4.3). The initial data collection effort within the study area helped identify the possible existence and location of constraints that could influence the location of alignment alternatives. This effort included meetings with the Cities of Anna and Melissa and affected agencies. Also, additional constraint sites were field verified based on information provided at public meetings or from city and/or county officials.

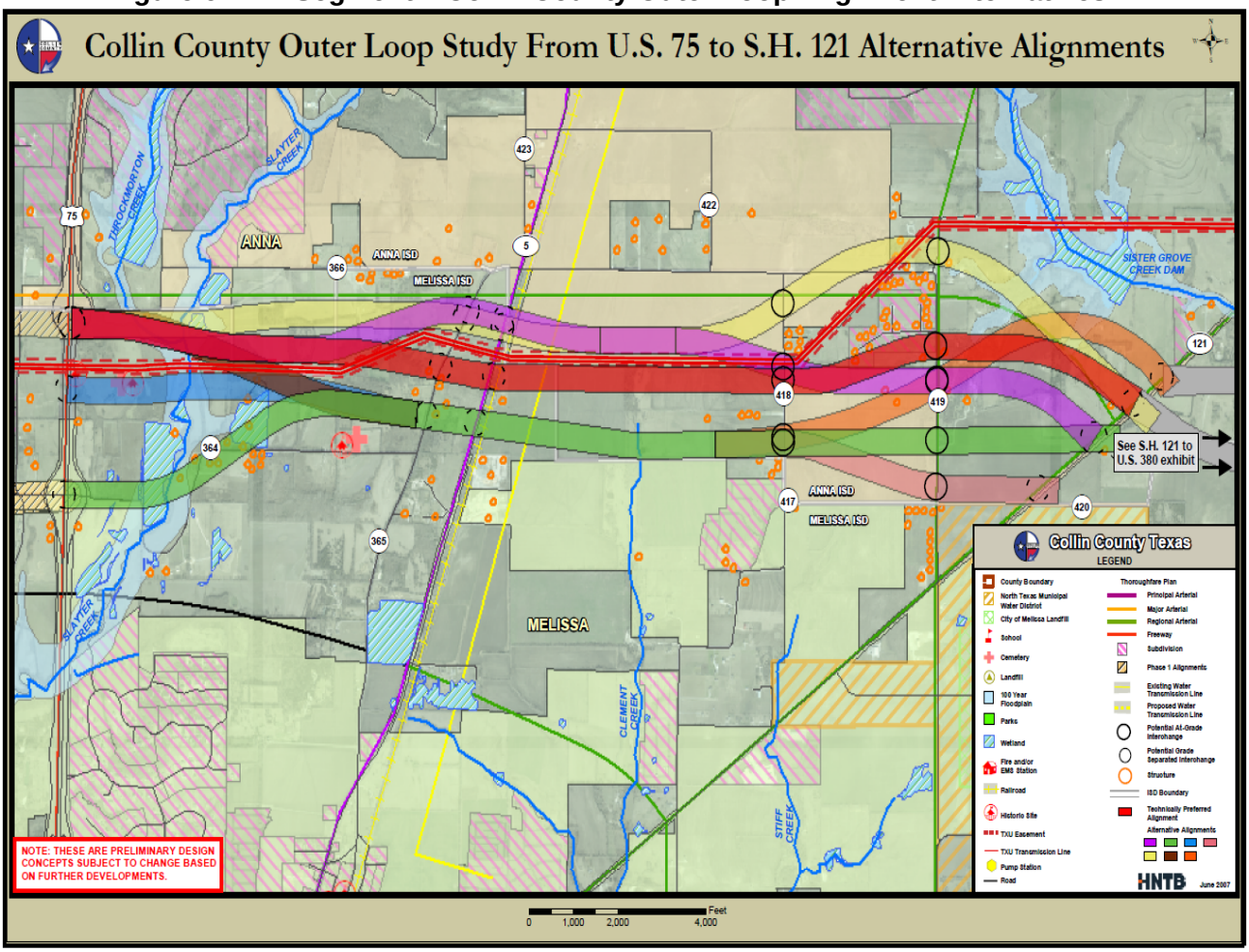
A technical methodology plan based on the project goals (enhanced mobility and safety, cost effectiveness, engineering feasibility, and minimal environmental impacts) was developed to minimize, to the extent practicable, any bias in the evaluation process. A qualitative rating system was used to compare the advantages and disadvantages of the alternatives and provided a decision-making framework for choosing the preferred corridor. The methodology used a five-level rating system:

++ Significant Positive Effects
+ Some Positive Effects
O No Effect, Neutral
- Some Negative Effects
-- Significant Negative Effects

Some of the major constraints included existing and proposed developments, creeks and floodplains, a Texas Utilities (TXU) power line easement, cemeteries, and historical sites. The tie-in point along US 75 at CR 366 had previously been established in the study from the Dallas North Tollway to US 75. Based on this initial research, it was determined that due to the rapid development in the Cities of Anna and Melissa, only one corridor located between CR 366 and CR 364 was available without substantial impacts to existing or proposed developments. Four alternative alignments were developed in and around the corridor between CR 366 and CR 364; all were on new location. The four alternative alignments (see Figure 6) were:

- CR 366/North of TXU Line (Yellow)
- CR 366/Along North Side of TXU Line (Purple)
- CR 364 (Green)
- CR 366/Along South Side of TXU Line (Red)

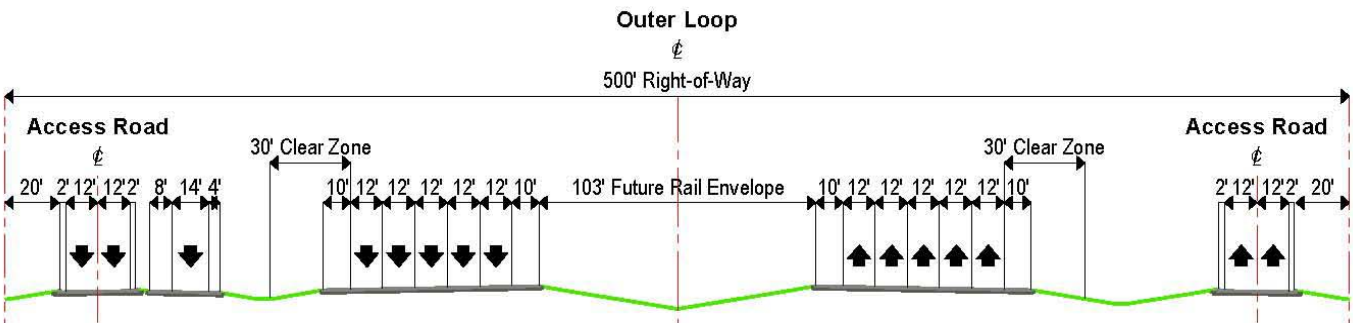
Figure 6. Segment 1 Collin County Outer Loop Alignment Alternatives



Source: *Collin County Outer Loop Route Study from US 75 to the Rockwall County Line, June 2007*

An ultimate right-of-way width of 500 feet was established based on a 70-mile per hour, 10-lane urban controlled-access roadway with access ramps and two, two-lane access roads (see Figure 7). To allow for a potential multi-modal corridor, if needed, the typical section also included a wide median to allow for future passenger or freight rail. The right-of-way could be wider at intersections, ramps, and where cuts or fills result in increased widths of side slopes. This typical section was established to allow future flexibility in the design and mode.

Figure 7. Collin County Outer Loop Ultimate Typical Section



Source: Collin County, Segment 2 Alignment

Each alternative alignment was evaluated using the established five-level rating system. Table 4 shows the results of this evaluation. In terms of accessibility, construction costs, right-of-way acquisition, socio-economic and neighborhood impacts, noise impacts, natural impacts, cultural impacts, and hazardous materials, all four alternatives rated the same. The final alternatives differed in terms of safety, utilities, and infrastructure impacts, compatibility with other projects, and public support.

Table 4. Alignment Evaluation

Category	Criteria	Alternatives			
		CR 366/North of TXU Line (Yellow)	CR 366/Along North Side of TXU Line (Purple)	CR 364 (Green)	CR 366/Along South Side of TXU Line (Red)
Enhanced Mobility and Safety	Accessibility	++	++	++	++
	Safety	++	++	+	++
Cost Effectiveness	Construction Cost	-	-	-	-
	Right-of-Way Acquisition	-	-	-	-
	Utilities and Infrastructure	-	--	-	-
Engineering Feasibility	Compatibility with Other Projects	-	-	--	++
Minimal Environmental Impacts	Public Input	+	+	--	+
	Socio-Economic and Neighborhood Impacts	-	-	-	-
	Noise Impacts	-	-	-	-
	Natural Impacts	-	-	-	-
	Cultural Impacts	O	O	O	O
	Hazardous Materials	O	O	O	O

Source: Collin County Outer Loop Route Study from US 75 to the Rockwall County Line, June 2007

- The CR 364 (Green) alignment was ranked lower than the other alignments in the category of safety (design standards and intersection skew) because the proposed intersection with SH 121 was not perpendicular. Skewed intersections are not preferred because of potential safety issues, such as inadequate sight distance.
- In the category of utilities and infrastructure, the CR 366/Along North Side of TXU Line (Purple) alignment was rated lower than the other alignments because of the need to relocate a substantial number of additional large TxU/Oncor transmission towers.
- Under compatibility with other projects, the alignments were evaluated in relationship to two other major projects in the area: western extension of the Collin County Outer Loop from the Dallas North Tollway to US 75 and the proposed residential developments west of CR 418 (north of the TXU/Oncor easement and east of CR 418 south of the TXU/Oncor easement). These residential developments had identified an alignment for the Outer Loop through their parcels as part of their preliminary site plan. The CR 364 (Green) alignment was ranked the lowest because it was not compatible with Segment 3 of the Collin County Outer Loop or the proposed developments. The CR 366/North of TXU Line (Yellow) and CR 366/Along North Side of TXU line (Purple) alignments are compatible with Segment 3, but were not compatible with the proposed developments near CR 418.

- Public input was obtained through public meetings and meetings with cities and agencies. Although both positive and negative comments were received for all alternatives, the majority of the comments regarding the CR 366/North of TXU Line (Yellow), CR 366/Along North Side of TXU Line (Purple), and CR 366/Along South Side of TXU Line (Red) alignments were positive. In addition, these alignments are located adjacent to the TXU easement, which is preferred by the City of Anna. The CR 364 (Green) alignment received more negative comments than positive comments, and is not located adjacent to the TXU easement, as preferred by the City of Anna; therefore, it was ranked lower than the other alternatives in the category of public input.

Based on this alignment evaluation, the alignment CR 366/Along South Side of TXU Line (Red) was recommended as the preferred alignment (see Figure 6). This new location alignment was approved by the Collin County Commissioners Court on November 22, 2005, and selected as the locally preferred alternative. It was noted that further refinements to the approved alignment were permissible, based on continued project development. Further documentation of this process can be found in the *Collin County Outer Loop Route Study from US 75 to the Rockwall County Line, June 2007*.

The approved Collin County Outer Loop locally preferred alignment was also formally incorporated into the *Collin County Mobility Study-2007 Update* thoroughfare plan recommendations and the document was officially adopted by the Collin County Commissioners Court in December 2007. The Collin County Outer Loop locally preferred alignment was classified in the thoroughfare plan recommendations as a tollway with the recognition that local revenues alone would be insufficient to complete final engineering, obtain environmental approval, acquire right-of-way, and construct the ultimate facility prior to the year 2030.

4.2 DESCRIPTION OF ALTERNATIVES EVALUATED IN THIS DOCUMENT

Based on the results of previous studies and input from agencies and the public, a locally preferred alternative was developed to minimize, to the extent possible, the potential for impact to the social, economic, and natural environment. This locally preferred alternative is the basis for the Build Alternative evaluated in this document. Additionally, the No Build Alternative is being studied in this document as a point of comparison.

4.2.1 No Build Alternative

The No Build Alternative assumes Segment 1 of the Collin County Outer Loop is not constructed. The No Build Alternative is considered the baseline alternative for comparison to the Build Alternative. The No Build Alternative does include other transportation improvements as programmed in *Mobility 2030 - 2009 Amendment,* capital improvement plans for the cities and counties, and the *2008-2011 TIP.* The No Build Alternative includes improvements to several other roadways that traverse or run along the study corridor. Table 5 lists the projects currently planned in or near the study corridor. Additionally, the No Build Alternative is a range of Congestion Management Process projects aimed at improving air quality as a result of nonattainment status by the US Environmental Protection Agency (EPA). These include travel demand management, transportation systems management, intelligent transportation systems/advanced transportation management, transit, and bicycle and pedestrian improvements. While improvements in these categories are aimed to improve travel demands, none are currently located in the immediate study corridor.

Table 5. Planned Transportation Improvement

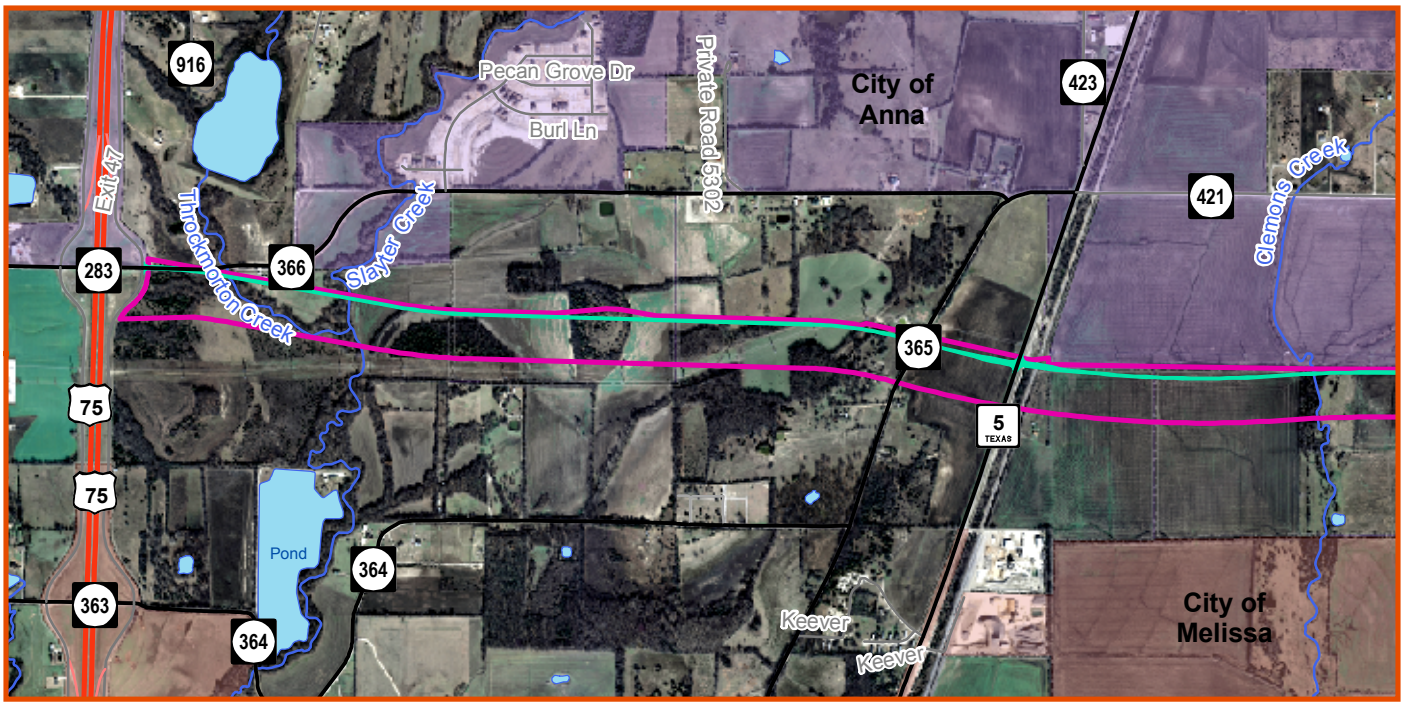
Project IDs	Street/Limits	Type of Project	Estimated Date of Construction	Total Project Costs (in Millions)
20176 0549-03-018	SH 121 from SH 5 to FM 455	Widen to 4-lane divided	6/2012	$53.50 (unfunded)
20076 0549-03-021	SH 121 from FM 455 to Fannin County Line	Widen to 4-lane divided	1/2020	$18.17 (funded)
20198 0047-14-917	US 75 from Melissa Road to Outer Loop (CR 366)	Reconstruct and widen to 8 mainlanes and 3-lane frontage roads	5/2013	$71.35 (unfunded)
20078 0047-14-916	US 75 North from Telephone Road (CR 275) to Outer Loop (CR 366)	Reconstruct and widen to 6 mainlanes with 3-lane frontage roads	5/2011	$95.85
20078 0047-14-902	US 75 from Outer Loop (CR 366) to Grayson County Line	Reconstruct to 6 mainlanes with 2-lane frontage roads	6/11	$6.25 (funded)
20085 0549-03-018	SH 5 from SH 121 to FM 455	Widen to 4-lane divided	6/12	$42.94 (funded)
52559 2845-01-014	FM 455 from SH 5 to West of Wild Rose Lane	Widen to 6-lane ultimate	3/15	$19.66
2845-01-015	FM 455 From West of Wild Rose Lane to SH 121	6-lane urban (new alignment)	3/2012	$4.49 (unfunded)
0816-04-044	FM 455 From US 75 northbound frontage road to SH 5	Widen to 4 lanes divided (ultimate 6 lanes)	12/2010	$10.36 (funded)
	Ferguson Parkway from FM 455 to Foster Crossing Road (CR 366)	Engineering/Right-of-Way		$0.59
	Throckmorton Road from US 75 to East of SH 5	2-lane (ultimate 4-lane) (new alignment)		$7.33

Source: *2008-2011 TIP*; TxDOT, October 2009; Collin County Projects web site http://public1.co.collin.tx.us/sites/ccpm/default.aspx

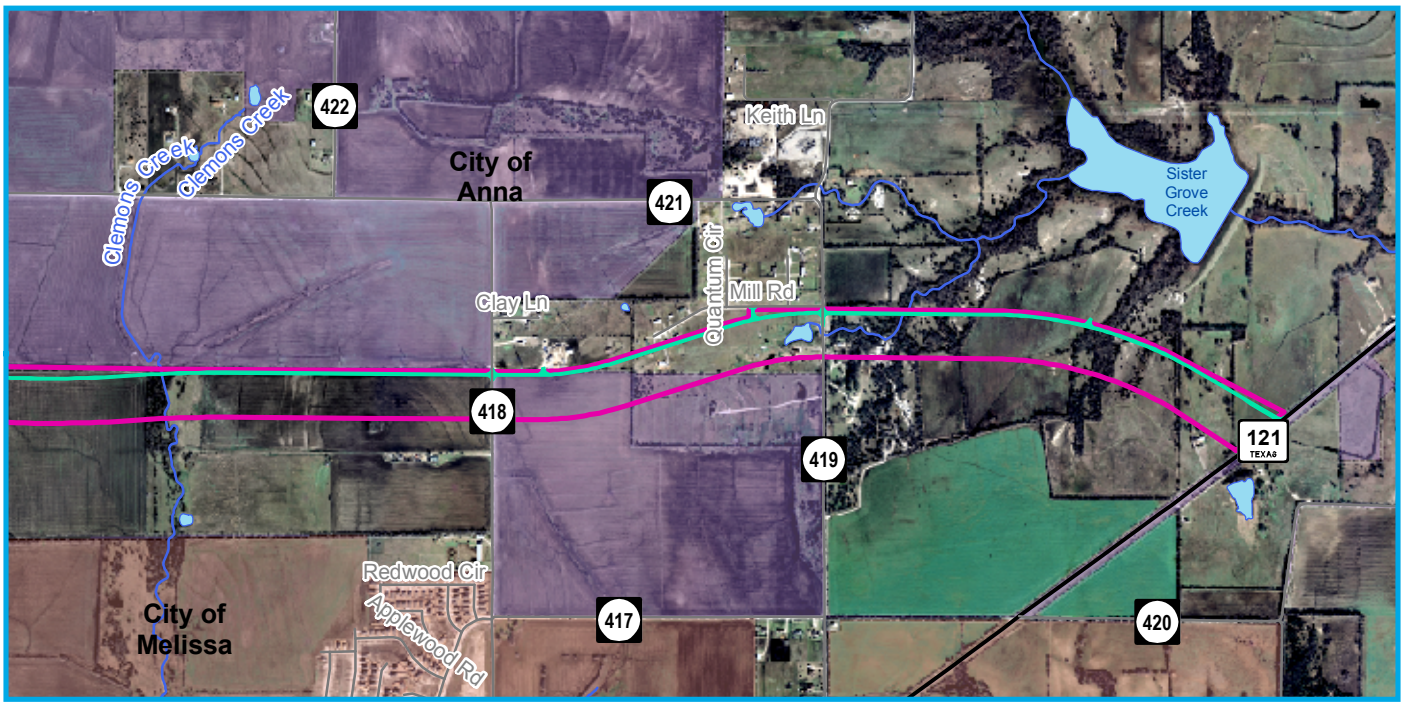
4.2.2 Build Alternative

As discussed in Section 4.1, CR 366/Along South Side of TXU Line (Red) was selected as the locally preferred alternative. As shown in Figure 7, the ultimate typical section includes access roads, tolled mainlanes, and ramps. However, the Collin County Outer Loop is being planned and developed as a staged facility because the ultimate section would not be needed immediately. Staging or phasing the facility allows the roadway to be developed as needed and as funding is available. Though the facility would be staged, the ultimate right-of-way needed would be purchased to preserve the corridor and allow for appropriate land use planning adjacent to the facility.

The initial construction planned for Segment 1 is the construction of the ultimate two-lane westbound access road from US 75 to SH 121 (sees Figure 8 and Figure 9). This roadway would operate as a non-tolled, two-way roadway until the eastbound access road and/or the mainlanes are built. Therefore, for the purpose of this environmental study, the Build Alternative is defined as the purchase of the ultimate right-of-way (500 feet wide) and the construction of the westbound access road.



↑ US 75 to Clemons Creek ↓ Clemons Creek to SH 121

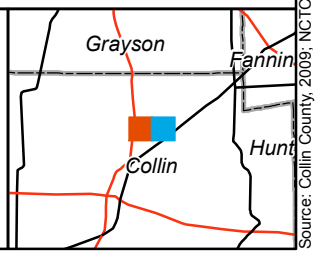


Proposed Facility Pavement Extent
Proposed Right-of-Way
Primary Highway
Major Arterial
Minor Arterial
Other Roadway
Stream
Lake
City / Town Limits

0 1,000 2,000
Feet

N

Key Map



Source: Collin County, 2009; NCTCOG, 2007

COLLIN COUNTY

Collin County Outer Loop Segment 1
Local Environmental Document

Build Alternative

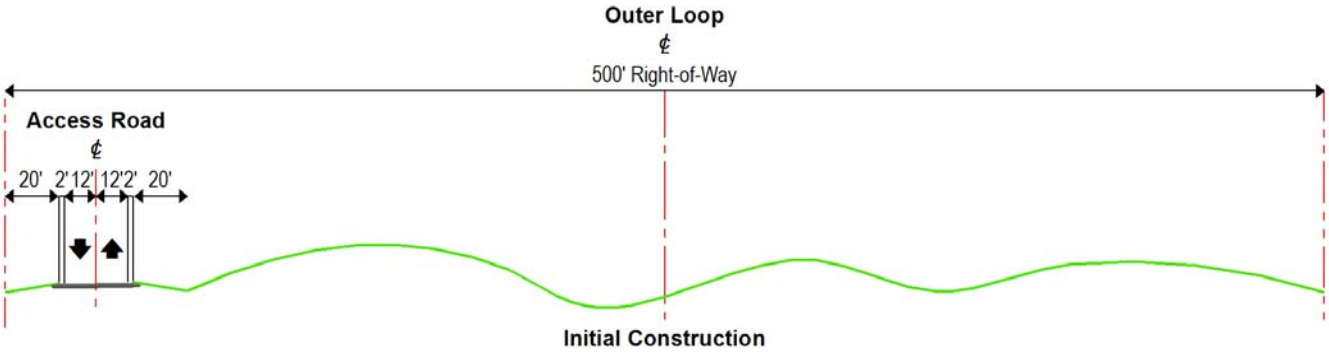
US 75 to SH 121

Figure 8

North Central Texas Council of Governments

Transportation Department

Figure 9. Segment 1 Typical Section



Source: Segment 1 60 Percent Construction Plans, December 2009

The estimated right-of-way cost for the ultimate 500-foot wide right-of-way is $10.5 million. The estimated construction costs for the westbound frontage road is $12.4 million (in 2010 dollars). The project is being funded through a combination of Collin County bonds and Regional Toll Revenue funds generated by a partnership to finance SH 121.

4.3 PUBLIC AND AGENCY COORDINATION

The study for the Collin County Outer Loop has been conducted in an open, proactive, participatory process to allow the public and agencies to gain knowledge and provide input throughout the study. This section summarizes the public and agency involvement and coordination efforts. As mentioned in Section 4.1, Collin County conducted a study from US 75 to the Rockwall County Line (Segments 1, 2, 4, 5). The public involvement efforts associated with the study were also conducted for the 39-mile length.

4.3.1 Public Involvement

Public involvement was an important component in the study of the Collin County Outer Loop. Throughout the study, several communication tools were used to keep the interested persons informed about upcoming public meetings and the project status. To date, seven public meetings and two public hearings have been held.

All of the public meetings included an open house beginning at 6:30 p.m. followed by a public presentation at 7:00 p.m. During each open house, interested persons were provided an opportunity to write their comments directly on the alternative corridor and alignment maps. After each public meeting, the presentation and alternative corridor and alignment were posted on the Collin County Web site and a public meeting summary prepared to document comments. The following sections summarize the public meetings and comments received. Comments received were reviewed to determine which comments were specifically related to Segment 1 and general comments for the entire project.

Bilingual postcards announcing public meetings were mailed to individuals on the mailing list, and display advertisements announcing upcoming public meetings were placed in local newspapers. News releases and letters to elected officials were prepared and distributed prior to each public meeting. Information about the project was also posted on the web site at www.co.collin.tx.us/commissioners_court/mobility_projects/outerloop.jsp. Meeting reports, including sign-in sheet, copies of the handouts and presentations, comments and transcripts are available for review at the Collin County Engineering Office.

4.3.1.1 February 24, 2005, Open House/Public Meeting

An open house/public meeting was held for the Collin County Outer Loop (from US 75 to the Rockwall County Line) at Melissa High School on Thursday, February 24, 2005. Display advertisements were prepared in both English and Spanish and placed in the *Dallas Morning News*-Collin County edition (February 18 and 22, 2005) and *Al Dia* (February 21 and 23, 2005). The objective of this meeting was to present project background information, study process, and schedule as well as to provide attendees the opportunity to offer input into the proposed study area corridor and alignment alternatives. Exhibits consisted of a project study area map, environmental constraints map, study timetable, public involvement process, contact information, and preliminary alternative alignments.

One hundred sixty-six people attended the open house and meeting. During the open house, persons wrote comments on the alignment alternatives regarding potential alignments routes and known constraints (e.g., wetlands, cemeteries). Nine verbal comments were made during the public meeting and 12 written comments were submitted. On the preliminary alternative alignment exhibits, there were several suggestions for alternative alignment locations and many participated cited an alignment preference. Written comments were regarding the need to plan ahead of growth, need for mass transit, property impacts, proposed right-of-way width, other modes and tools to manage congestion, prioritization of open spaces and green belts, safety, reduced air quality, increased noise levels, the location of cemeteries near US 75, consider/evaluate existing roadways, and reduce the proposed right-of-way width. The verbal comments regarded the need for the project, evaluate using existing roadways, include open spaces and green belts, tools to manage congestion, and coordination with the Trans-Texas Corridor (TTC).

4.3.1.2 May 19, 2005, Open House/Public Meeting

An open house/public meeting was held for the Collin County Outer Loop (from US 75 to the Rockwall County Line) at Farmersville High School on Thursday, May 19, 2005. Display advertisements were prepared in both English and Spanish and placed in the *Dallas Morning News*-Collin County edition and *Al Dia.* The objective of this meeting was to present project background information, including project need, schedule, study process, and to provide interested persons the opportunity to offer their input into the proposed corridor and alignment alternatives. Exhibits included a project study area map, environmental constraints map, study timetable, public involvement process, contact information, and alternative alignments maps.

Seventy-one interested persons and four elected/public officials attended. Attendees were given an agenda, a copy of the presentation, a comment form, a questionnaire, and a project newsletter. The newsletter was printed in English and Spanish. During the open house, persons wrote comments on the alignment alternatives regarding potential alignments routes and a residential subdivision. Three written comments and seven completed questionnaires were submitted at the public meeting. In general, these written comments related to support for moving forward with the project, widening SH 78, and support of a particular alignment. One written comment received after the public meeting indicated interest in donating right-of-way for the project, depending on the route chosen. Verbal comments related to the process to select an alignment, right-of-way acquisition, property values, improvements to other roadways, location of the TTC, costs, and project schedule.

4.3.1.3 August 18, 2005, Open House/Public Meeting

An open house/public meeting was held for the Collin County Outer Loop (from US 75 to the Rockwall County Line) at the McClendon Elementary School, in Nevada, Texas, on Thursday, August 18, 2005. Display advertisements were prepared in both English and Spanish and ads placed in the *Dallas Morning News*-Collin County edition (August 14 and 15, 2005), *Al Dia*

(August 13 and 15, 2005), *The Farmersville Times* (August 18, 2005), *The Wylie News* (August 17, 2005), and *The Princeton Herald*, *The Sachse News*, and *The Murphy Monitor* (August 18, 2005). The objective of the meeting was to solicit input and comment on the proposed corridor and alignment alternatives. Exhibits consisted of a project study area map, environmental constraints map, study timetable, public involvement process, contact information, and alternative alignments/corridor maps.

One-hundred seventy-two interested persons and four elected/public officials attended. Fourteen comment forms and 18 questionnaires were returned the night of the meeting. Three comment forms were received after the meeting. Written comments related to how the community is notified of the project and meetings, the need for the project, support for the project, and opposition to the project. During the public meeting, verbal comments related to the TTC, need for public transportation, the right-of-way acquisition process, how the community is notified of the project and meetings, and would the loop be a hazardous material route.

4.3.1.4 October/November 2005 Open Houses/Public Meetings

An open house/public meeting was held for the Collin County Outer Loop (from US 75 to the Rockwall County Line) at the McClendon Elementary School, in Nevada, Texas, on Tuesday, October 25, 2005. A second open house/public meeting was held November 1, 2005, at Farmersville High School. Display advertisements for both meetings were prepared in both English and Spanish and placed in the *Dallas Morning News*-Collin County edition (October 22 and 25, 2005), *Wylie News* (October 19 and 26, 2005), *Farmersville Times* (October 20, 2005), and *Al Dia* (October 21 and 25, 2005). The same information was presented at both meetings. The objective of the meetings was to provide an opportunity for input and comment on the proposed corridor and alignment alternatives. Exhibits consisted of a project study area map, environmental constraints map, study timetable, public involvement process, contact information, and alternative alignments/corridor maps.

At the October 25, 2005, meeting, 47 interested persons and four elected/public officials attended. Three written comments and eight questionnaires were returned the night of the public meeting. Written comments related to the donation of right-of-way and TTC not providing local service. Verbal comments were related to the process to select a preferred alternative, notice to property owners, use of eminent domain, project schedule, typical section, project financing, and alignment location.

At the November 1, 2005, meeting, 81 interested persons and two elected/public officials attended. Eight written comments and six questionnaires were returned the night of the public meeting and four comment forms and two questionnaires were returned after the meeting. Written comments were related to support of the project, request to notify property owners of the final decision, and the need for the project. Verbal comments related to location of the TTC, costs, community impacts, funding, and right-of-way acquisition.

4.3.1.5 November 22, 2005, Public Hearing

A public hearing was held on the project to obtain approval from the Collin County Commissioners Court at the Collin County Courthouse on Tuesday, November 22, 2005. The technically preferred alignment from US 75 to SH 121 was presented. The Commissioners Court approved the alignment, which was then incorporated into the *Collin County Thoroughfare Plan*.

4.3.1.6 March 23, 2006, Open Houses/Public Meetings

An open house/public meeting for the Collin County Outer Loop (from US 75 to the Rockwall County Line) was held at the Farmersville High School on Thursday, March 23, 2006. Display

advertisements were prepared in both English and Spanish and placed in the *Dallas Morning News*-Collin County edition (March 19 and 22, 2006), *Wylie News* (March 22, 2006), *Farmersville Times* (March 23, 2006), and *Al Dia* (March 18, 2006). The objective of this meeting was to provide an update on the project status and provide interested persons an opportunity to provide their input into project development. Exhibits consisted of a project study area map, environmental constraints map, study timetable, public involvement process, contact information, and alternative alignments/corridor maps.

Over 190 interested persons and three elected/public officials attended. Nine written comments and 15 questionnaires were returned the night of the public meeting. Two additional written comments were received after the meeting. Written comments were related to the alignment location, impacts to a specific property, donation of right-of-way, and use of existing roadways. Verbal comments were regarding funding, property owner notification, property value, project schedule, community and natural environment impacts, need for the project, process to select a preferred alternative, right-of-way requirements, and regional rail.

4.3.1.7 September 19, 2006, Open House/Public Meeting

An open house/public meeting was held for the Collin County Outer Loop (from US 75 to the Rockwall County Line) at the McClendon Elementary School, in Nevada, Texas, on Tuesday, September 19, 2006. Display advertisements were prepared in both English and Spanish and placed in the *Dallas Morning News*-Collin County edition (September 16 and 18, 2006) *and Al Dia* (September 16 and 18, 2006). The objective of the meeting was to solicit input and comment on the proposed corridor and alignment alternatives. Exhibits consisted of a project study area map, environmental constraints map, study timetable, public involvement process, contact information, and alternative alignments/corridor maps.

Two-hundred nineteen interested persons and four elected/public officials attended. Nine written comment forms and 10 questionnaires were returned the night of the meeting. Two additional written comments were received after the meeting. Written comments were related to not building the TTC or the loop. Verbal comments were related to the Collin County Outer Loop becoming part of the TTC, information used to evaluate alternatives, need for the project, need to improve other roadways, funding, project schedule, and support for not building the Collin County Outer Loop.

4.3.1.8 December 12, 2006, Public Hearing

An open house/public hearing was held for the Collin County Outer Loop (from the Dallas North Tollway to the Rockwall County Line) at the Central Jury Room of the Collin County Government Center-Annex B, on Tuesday, December 12, 2006. Display advertisements were prepared in English and Spanish and placed in the *Dallas Morning News*-Collin County edition and *Al Dia* (November 14, 21, and 28, 2006, and December 5, 2006). The objective of the meeting was to allow input and comment on the technically preferred alignment for the proposed Collin County Outer Loop (from the Dallas North Tollway to the Rockwall County Line). Exhibits consisted of an environmental constraints map (US 75 to Rockwall County), technically preferred alignment from Dallas North Tollway to US 75, and technically preferred alignment from US 75 to Rockwall County.

Two hundred and eighty three interested persons and five elected/public officials attended. During the hearing, 21 people spoke and thirty-one written comments were received. Written comments were opposition to the project, support for using existing facilities, water quality, concerns that the Collin County Outer Loop would become part of the TTC, support for the project, impacts to the natural environment, property access, division of property, meeting notification, and right-of-way acquisition process.

4.3.2 Agency Involvement

From the onset of the study, development of the project has been coordinated with the local agencies to confirm existing constraints identified during the data collection, identify future constraints, and to obtain public perception. The project has been also been coordinated with Dallas Area Rapid Transit (DART), TxDOT, North Texas Municipal Water District (NTMWD), TXU, and the Texas Historical Commission (THC).

5.0 ENVIRONMENTAL RESOURCES, EFFECTS, AND MITIGATION

This section presents the environmental resources, effects, and potential mitigation associated with the Build Alternative (purchase of ultimate right-of-way and construction of a two-lane access road) as described in Section 4.2.2. Issues evaluated include: land use, right-of-way, relocations, community cohesion, economic, public facilities and services, utilities, visual, demographics, farmland, vegetation, threatened and endangered species, wildlife, migratory birds, water quality, floodplains, wetlands, waters of the US, regulated/hazardous materials, air quality, noise, cultural resources, parkland, open spaces, and indirect and cumulative impacts. The effects of the Build Alternative are compared to the No Build Alternative (see Section 4.2.1).

In the following section, the terms proposed right-of-way and study corridor are used. The proposed right-of-way is defined as the land needed (500 feet wide) for the ultimate typical section as discussed in Section 4.1 and shown in Figure 6. In general, the study corridor has been defined as the proposed right-of-way needed and the properties adjacent to the right-of-way. For some subject matters such as community cohesion, demographics, cultural resources, indirect impacts, and cumulative effects, different study areas of potential effects were used and are defined under the resource methodology.

5.1 SOCIAL AND ECONOMIC

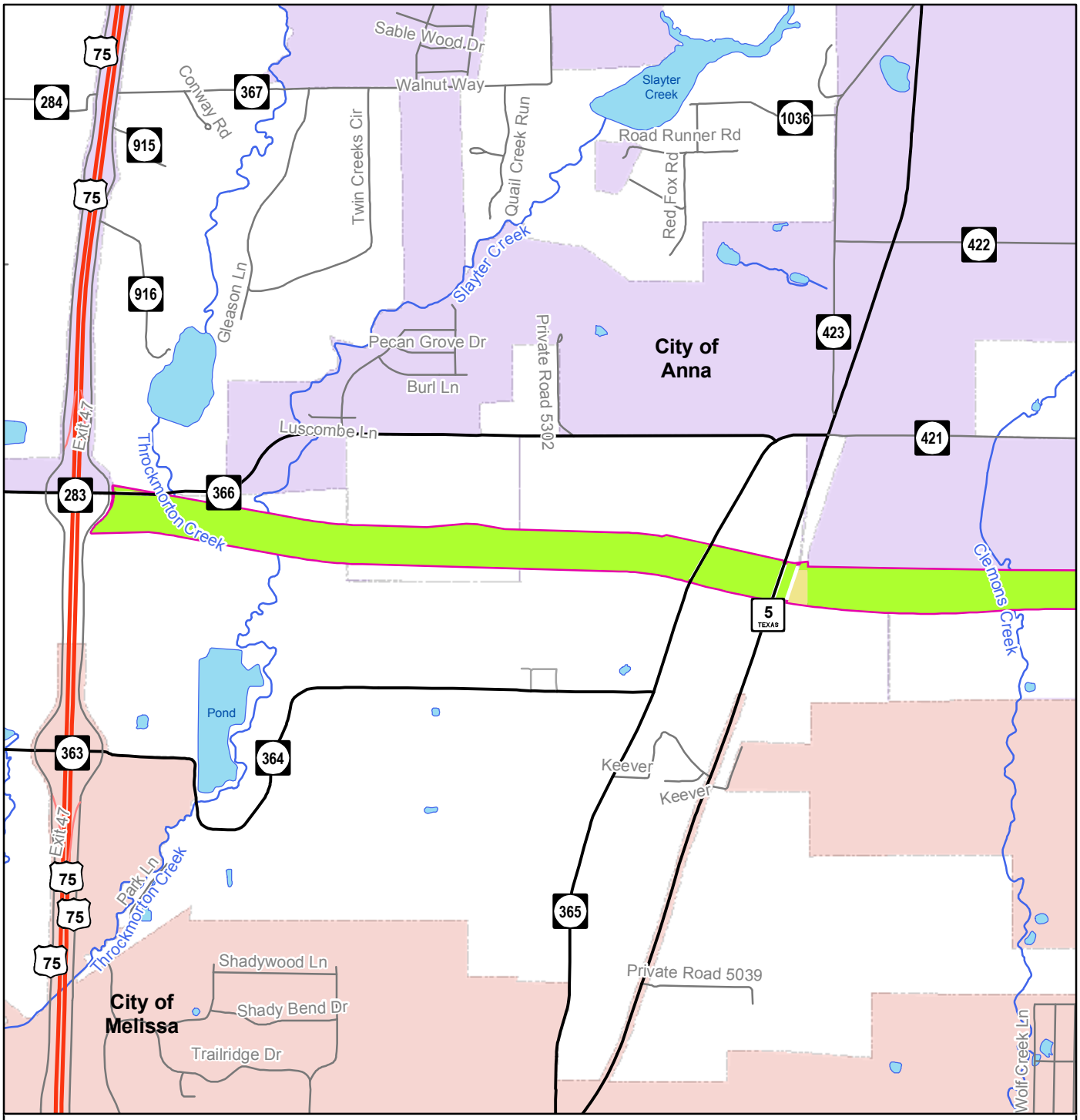
This section describes the social and economic setting of the study corridor that could potentially be affected by the Build Alternative. The No Build Alternative is brought forward in the analysis as a baseline for comparison purposes.

5.1.1 Land Use

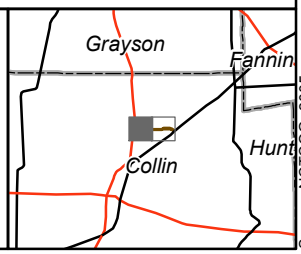
Based on field observations of land use conducted in December 2009, NCTCOG 2005 land use data, and review of 2007 aerial photographs, the existing land use within the proposed right-of-way is approximately 93 percent vacant, six percent single-family residential, and less than one percent each of mobile homes and water (see Figures 10 and 11). Of the land classified as vacant, about 44 percent is currently cropland, 21 percent is open grassland or pasture, and the remainder is lightly forested. Almost the entire study corridor passes through unincorporated areas that are under county jurisdiction and are not zoned. Two parcels located between CR 418 and CR 419 are under the jurisdiction of the City of Anna. These parcels are both zoned for single-family residential use.

The No Build Alternative would not impact the land use within the study corridor.

Under the Build Alternative, 285.7 acres of land would be converted to transportation use. The first phase of the project includes the purchase of ultimate right-of-way and construction of a two-lane roadway adjacent to the northern boundary of the proposed right-of-way. The Build Alternative would impact about 20 percent of the proposed ultimate right-of-way. Current land uses could be maintained in the remainder of the right-of-way until the full facility is constructed. Once the proposed improvement is constructed, the entire right-of-way would be dedicated to transportation use.



Key Map



Source: NCTCOG, 2005

COLLIN COUNTY

Collin County Outer Loop Segment 1
Local Environmental Document

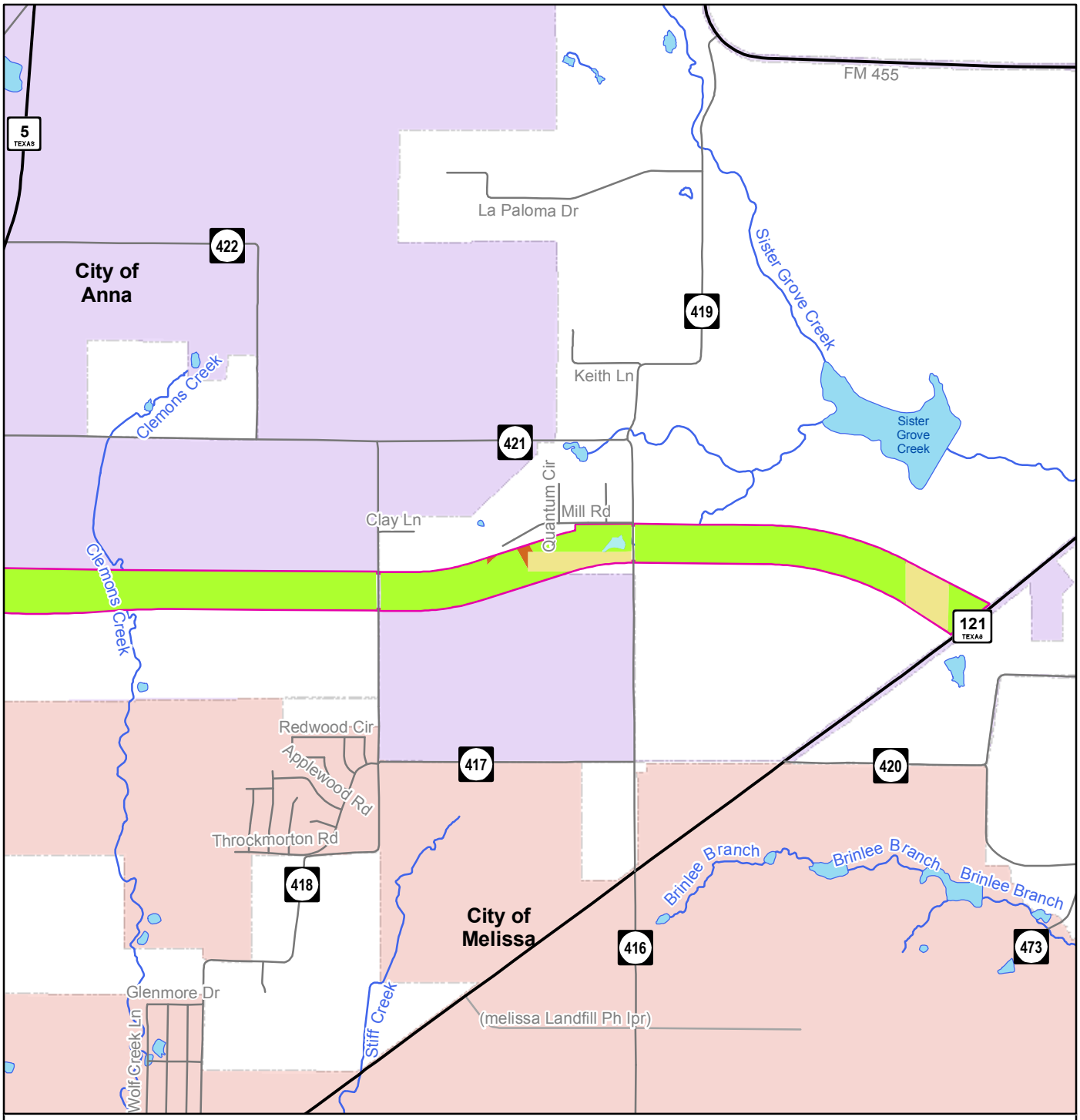
Land Use

US 75 to Clemons Creek

Figure 10

North Central Texas Council of Governments

Transportation Department



Collin County Outer Loop Segment 1
Local Environmental Document

Land Use

Clemons Creek to SH 121

Figure 11

North Central Texas Council of Governments

Transportation Department

5.1.2 Right-of-Way and Relocations

The ultimate Collin County Outer Loop would require a typical right-of-way width of 500 feet (see Figure 6). However, the right-of-way may be wider at intersections, ramps, and where cuts or fills result in increased widths of side slopes.

The No Build Alternative would not impact any properties or require the acquisition of right-of-way, leaving the current properties and structures intact.

For the Build Alternative, approximately 285.7 acres of right-of-way from 32 parcels would be acquired to accommodate the ultimate facility. Figures 10 and 11 illustrate the proposed right-of-way for the Build Alternative. Potential displacements caused by the Build Alternative were minimized during the planning process by avoiding impacts to existing structures where possible and using available vacant or open land where practicable for the preliminary alignments. Constraints were mapped and used in the planning process to avoid important resources such as cemeteries, places of worship, public facilities, and other various resources.

Displacements include 11 structures: three single-family homes, one mobile home, three barns, and four sheds or other outbuildings. Five of these structures (one single-family home, one mobile home, two barns, and one shed) would be impacted by the first phase of construction, while the remaining structures would be displaced when the ultimate facility is fully implemented. These structures are shown on Figures 12 and 13.

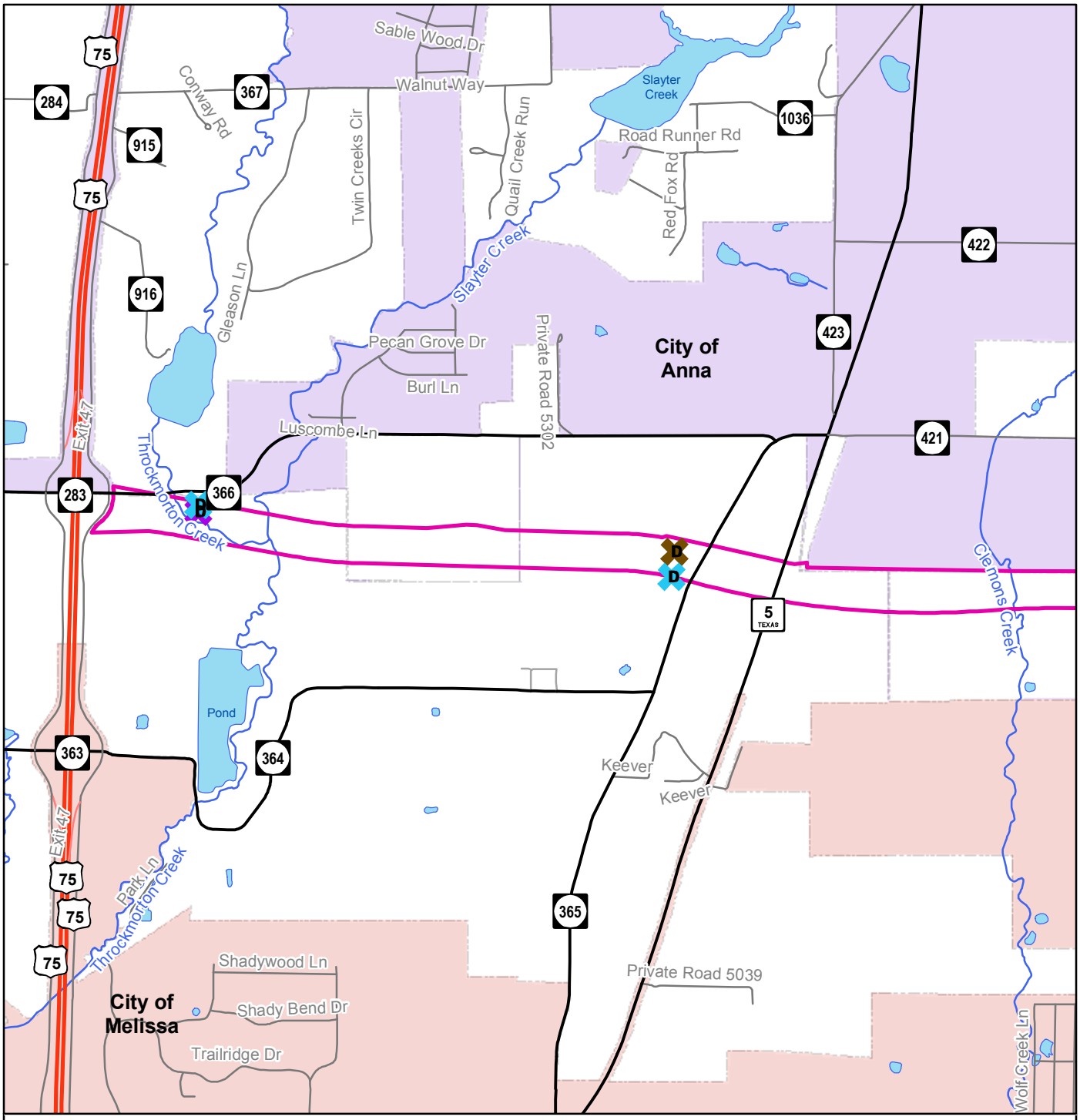
Of the 32 parcels, 21 parcels have been acquired by the CCTRA as of December 2009. The county began acquiring properties following approval of the locally preferred alternative by the Collin County Commissioners Court to preserve the corridor. The right-of-way acquisition program has been conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources have been made available to all property owners without discrimination.

5.1.3 Community Cohesion

Based on field observations conducted in December 2009, NCTCOG 2005 land use data, and review of 2007 aerial photographs, the area near the study corridor is predominantly rural. There are isolated residences surrounded by farmland, pastures, open grasslands, and lightly forested areas. A mobile home community lies north of the study corridor and west of CR 419. Another rural neighborhood is located north of the study corridor and east of CR 418. Pecan Groves in the City of Anna and North Creek in the City of Melissa are the only residential subdivisions located within 0.5 miles of the study corridor. The only community facilities within one-mile of the proposed facility are White Rock Church, which is south and east of the eastern limit of the study corridor, and three cemeteries: Brinlee Cemetery, Coffman Cemetery, and Highland Cemetery.

The No Build Alternative would not negatively impact community cohesion, but it would not improve access to other community resources.

During the development of alternatives, the alignment for the Build Alternative was designed to avoid negative impacts to community cohesion. Most of the residences within the proposed right-of-way that would be displaced are isolated homesteads. The only functional neighborhood that intersects the right-of-way is the mobile home community along Old Mill Road. The residents that the transportation facility displaces have already been relocated to previously vacant lots within the same mobile home community. Therefore, the Build Alternative would not sever or displace any functioning neighborhoods, nor would it displace any existing



Single-Family Residence
Mobile Home
Barn
Shed or Other Outbuilding

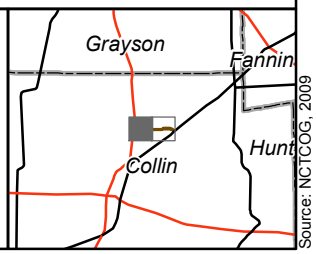
Proposed Right-of-Way
Primary Highway
Major Arterial
Minor Arterial
Other Roadway

Stream
Lake
City/Town Limits

0 1,000 2,000
Feet

N

Key Map

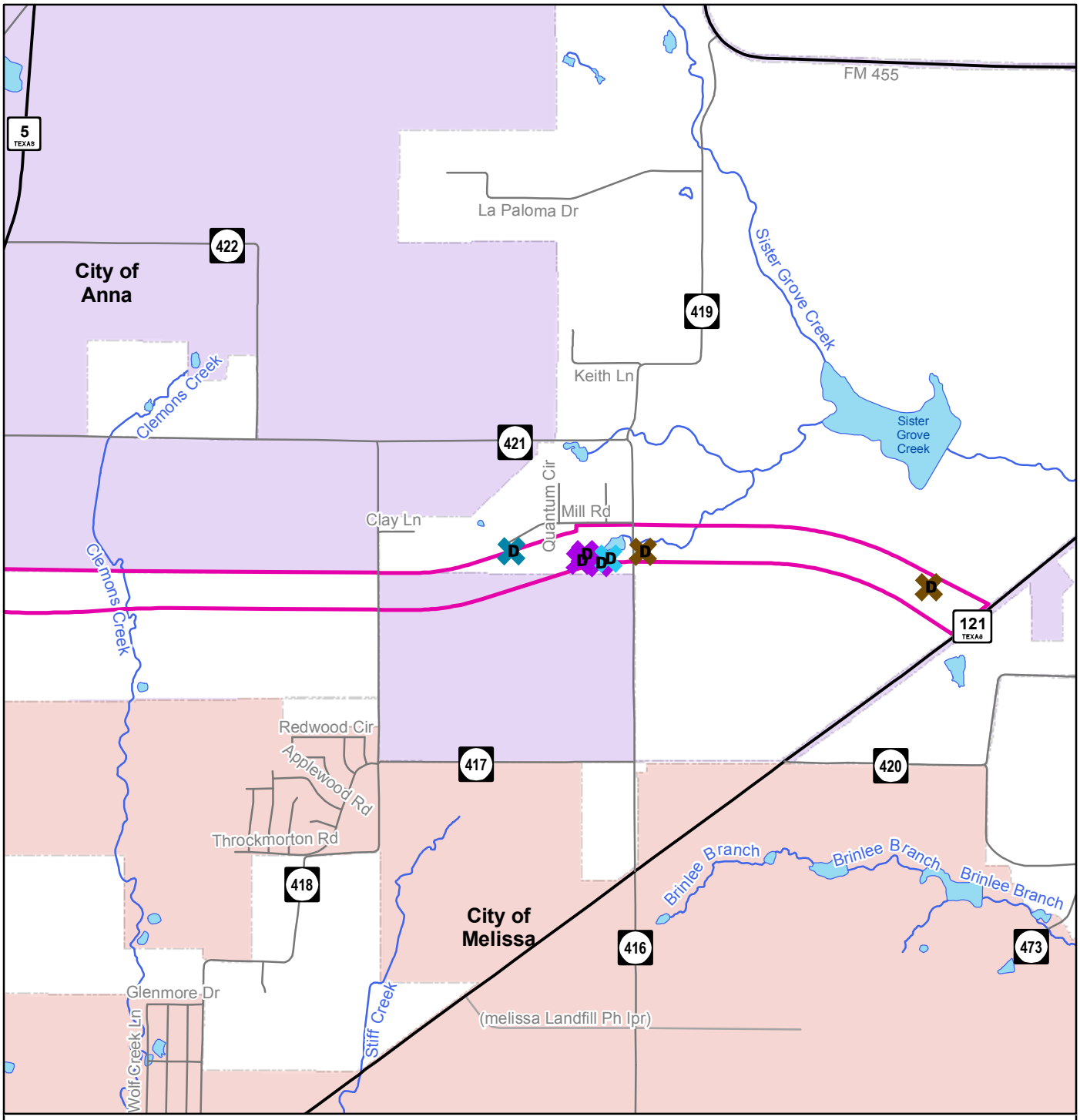


Source: NCTCOG, 2009

Collin County Outer Loop Segment 1
Local Environmental Document
Right-of-Way Impacts and Displacements
US 75 to Clemons Creek
Figure 12

COLLIN COUNTY

North Central Texas Council of Governments
Transportation Department



Collin County Outer Loop Segment 1
Local Environmental Document

Right-of-Way Impacts and Displacements

Clemons Creek to SH 121

Figure 13

North Central Texas Council of Governments
Transportation Department

points of assembly. By improving connection between existing roadway facilities such as US 75, SH 5 and SH 121, access to community facilities for residents near and along the Build Alternative would be improved.

5.1.4 Economic

A review of the economic conditions in the study corridor was completed based on field observations conducted in December 2009, NCTCOG 2005 land use data, NCTCOG major employer data, and NCTCOG activity center data. Much of the economic activity in the area is agricultural, with croplands, pastures, and farm animals occupying most of the land in and around the study corridor. The Farris Concrete Company, located 0.25 miles south of the study corridor on SH 5, is the only major employer near the proposed facility.

Under the No Build Alternative, no properties or structures would be impacted; thus, there would be no economic impacts to adjacent property owners.

Four residences and associated structures within the proposed right-of-way would require relocation for the Build Alternative. Some agricultural lands would be converted to transportation uses in the Build Alternative. The exact economic impact is difficult to quantify and could vary widely between properties. During construction, there would be short-term economic gain to the area due to new job opportunities and a temporary boost to the local economy. It is anticipated that road users would receive long-term economic benefits resulting from lower vehicle operating costs and improved safety.

5.1.5 Public Facilities and Services

A review of the public facilities and services in the study corridor was completed based on field observations conducted in December 2009, NCTCOG 2005 and use data, and NCTCOG feature datasets. There are no public facilities within one-mile of the study corridor. The nearest public facilities are the municipal buildings and schools in the Cities of Anna and Melissa.

An existing railroad line crosses the proposed facility just east of SH 5. This rail line is operated by Dallas, Garland, and Northeastern Railroad (DGNO) and offers limited freight rail service that connects customers in the City of McKinney to freight rail lines farther to the north. The rail right-of-way has been owned by DART since the late 1980s when DART acquired it from Union Pacific Railroad. Current light rail transit service on the line terminates in the City of Plano. NCTCOG is conducting a McKinney Corridor Conceptual Engineering and Funding Study to explore extending passenger rail service north from Plano to McKinney. If the Cities of Anna and Melissa continue to grow, passenger rail service may be considered within the proposed Collin County Outer Loop Segment 1 right-of-way.

Under the No Build Alternative, no properties or structures would be impacted; thus, there would be no impacts to public facilities and services.

No public facilities or services would be impacted by the Build Alternative; however, an agreement to cross the DART-owned railroad would be required. The Build Alternative would provide increased accessibility for this portion of Collin County to various religious, educational, medical, and recreational facilities. Emergency public services would have a more efficient facility to use.

5.1.6 Utilities

Based on field observations conducted in December 2009, a review of 2007 aerial photographs, and data provided by Collin County, there are several existing utility lines within the study corridor. An Oncor electric transmission line runs parallel to the study corridor from east of CR 418 to west of CR 365, where it crosses the study corridor and moves away from the study corridor. The Greater Texoma Utility Authority has a water line serving the water storage tank north of the Oncor transmission line and east of SH 5 that crosses the study corridor. AT&T, the Grayson-Collin Electric Company, and the North Collin Water Supply Corporation have utility lines that cross the study corridor near SH 5, SH 121, CR 365, CR 366, CR 418, and/or CR 419. A sanitary sewer line crosses the study corridor near Slayter Creek.

Under the No Build Alternative, no new right-of-way would be acquired; thus it would not be necessary to relocate any utilities.

Under the Build Alternative, minor utility adjustments would be required. Utility companies with affected utilities in the area would be contacted prior to construction to coordinate relocation or adjustments where necessary. The adjustment and relocation of any utilities would be handled so that no substantial interruptions would take place while these adjustments are being made.

5.1.7 Visual

Visual and aesthetic resources within the study corridor were identified through review of aerial photographs and field study. Photographs of the study corridor are included in Appendix A. Generally, substantial visual and aesthetic resources within the study corridor consist of undeveloped open space/natural areas. In addition, potential sensitive visual receptors (i.e., areas or users affected by changes in the visual and aesthetic character of the study corridor) have been identified. Sensitive visual receptors of primary concern are residential areas facing and immediately adjacent to the Build Alternative. The primary viewers impacted by the proposed facility are single-family residents, motorists, and farm workers. Generally, the existing visual quality of the area ranges from moderate to high with visual and aesthetic resources including farmland, open pastures, forested land, and residential housing.

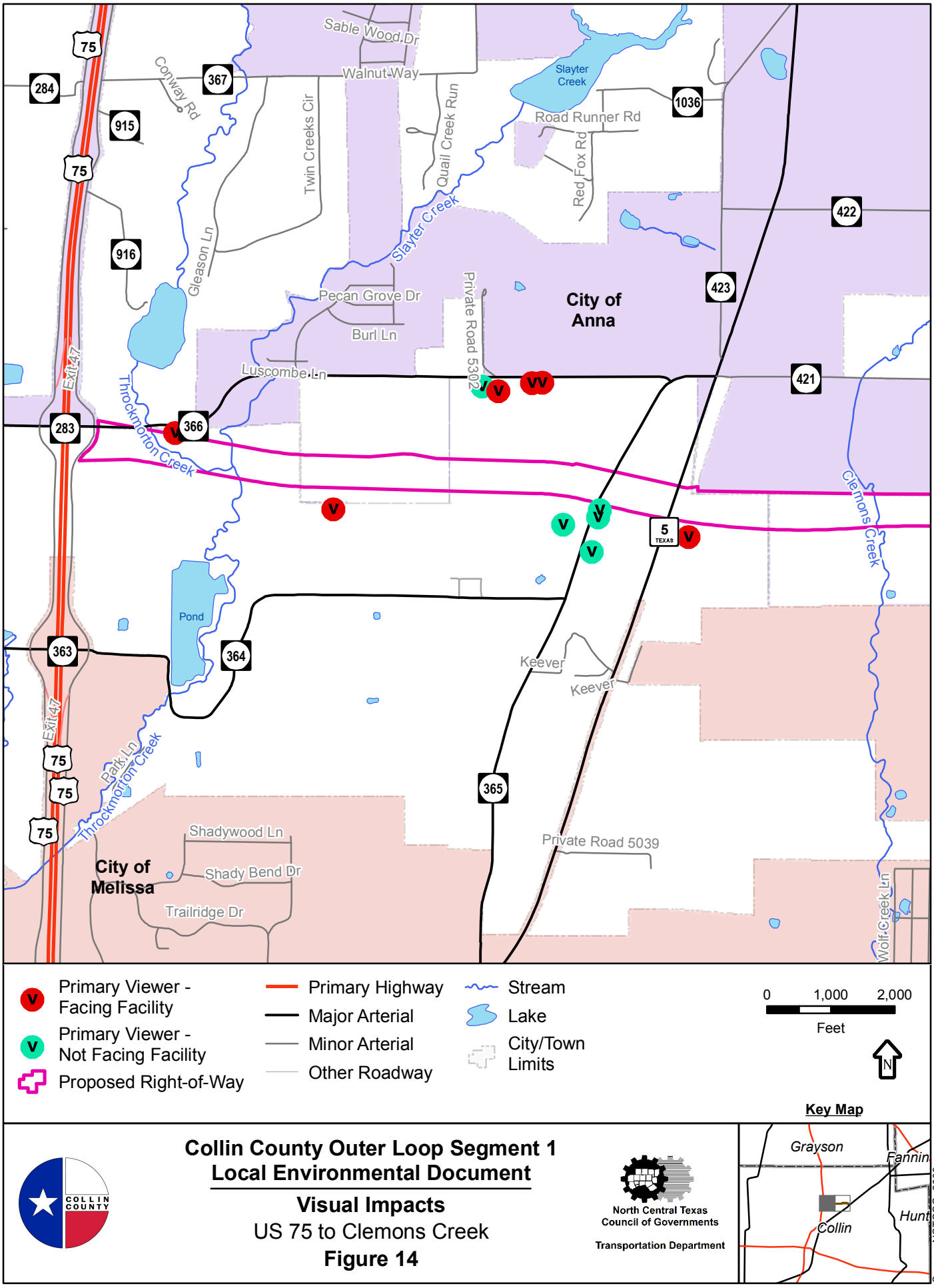
The No Build Alternative would leave the existing visual setting unchanged; there would be no adverse visual effects.

A field evaluation was performed to determine the potential visual impacts resulting from the Build Alternative. The Build Alternative would introduce a new element into the study corridor. It would create a new transportation corridor in a predominantly rural area. The roadway would substantially change the visual character of the residents of the four homes within 100 feet of the right-of-way and the seven additional residences that are within 500 feet of and facing the proposed right-of-way (see Figures 14 and 15 and Table 6). The affected homes are generally located along Mill Road, with isolated homes also located on SH 5, CR 366, and CR 418.

Table 6. Visual Impacts

Distance from Proposed Right-of-Way	Residences Facing Facility	Residences Not Facing Facility	Total Residences
0.0 to 100.0 feet	3	1	4
100.1 to 500.0 feet	7	17	24
500.1 feet to 0.25 miles	15	10	25
TOTAL	25	28	53

Source: NCTCOG Aerial Orthophotos. 2007, NCTCOG Research and Information Services.



Collin County Outer Loop Segment 1
Local Environmental Document

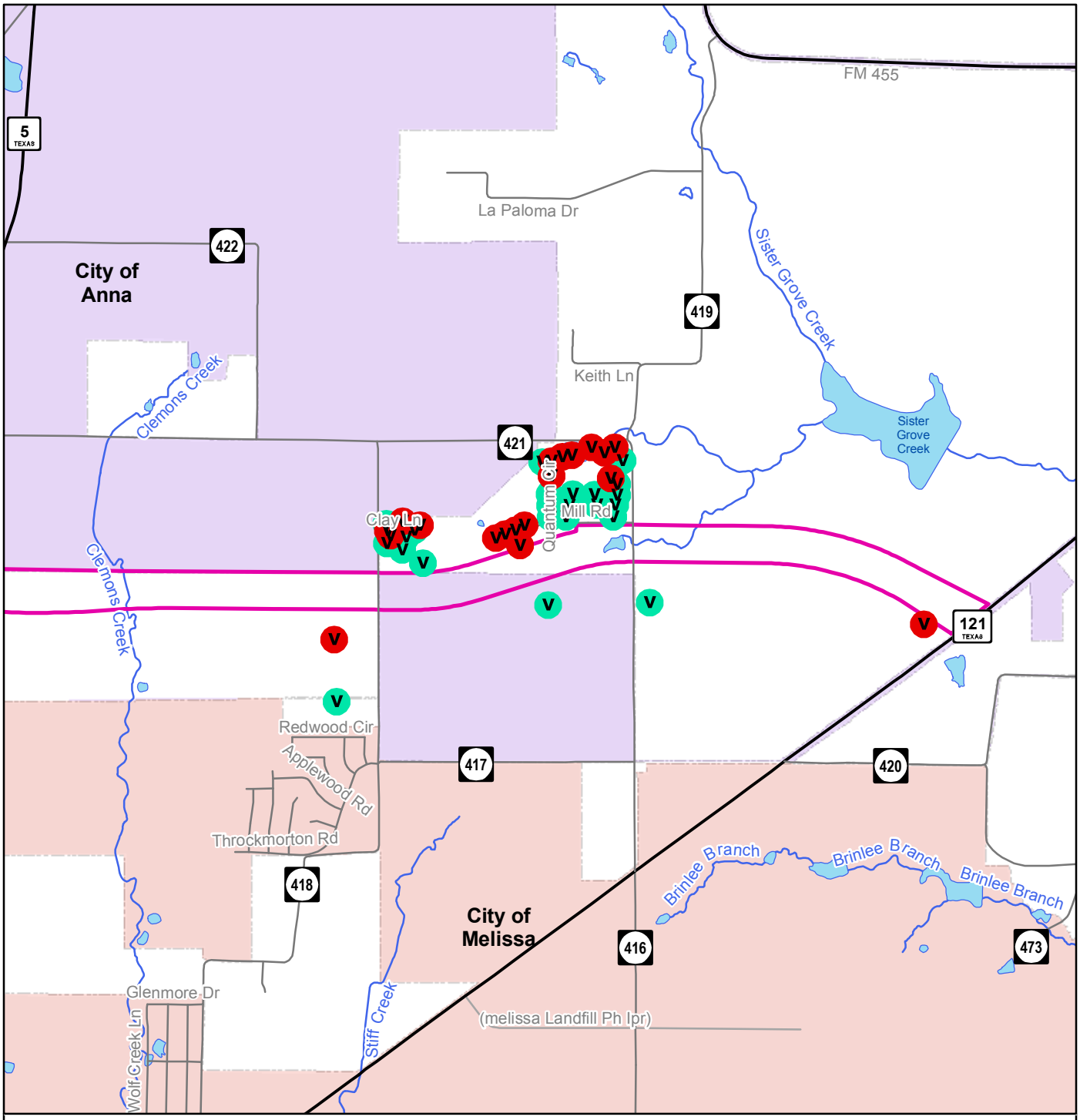
Visual Impacts

US 75 to Clemons Creek

Figure 14

North Central Texas Council of Governments
Transportation Department

Source: NCTCOG, 2009



Collin County Outer Loop Segment 1
Local Environmental Document

Visual Impacts

Clemons Creek to SH 121

Figure 15

North Central Texas Council of Governments

Transportation Department

The initial construction planned for Segment 1 is the construction of the ultimate two-lane westbound access road. This project would include seeding and placement of sod within the construction site. The ultimate design of the facility could include landscaping treatments and aesthetic elements to help integrate the roadway with adjacent communities. These elements would be developed during final design. The implementation of some aesthetic elements would require local government participation and cost sharing to fund the improvements.

5.1.8 Demographics

In 2000, the Dallas-Fort Worth urban area grew to 5,067,400 persons, a 29.3 percent increase in population since the 1990 Census. The urban area includes 10-counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties). Table 7 demonstrates substantial growth in population through 2000. The Dallas-Fort Worth urban area has experienced considerable and consistent population growth over the last 30 years. By 2030, the Dallas-Fort Worth urban area population is expected to be approximately 9.1 million persons, an increase of 80 percent over 2000. On average, the region is anticipated to add population at a rate of approximately 140,000 persons per year.

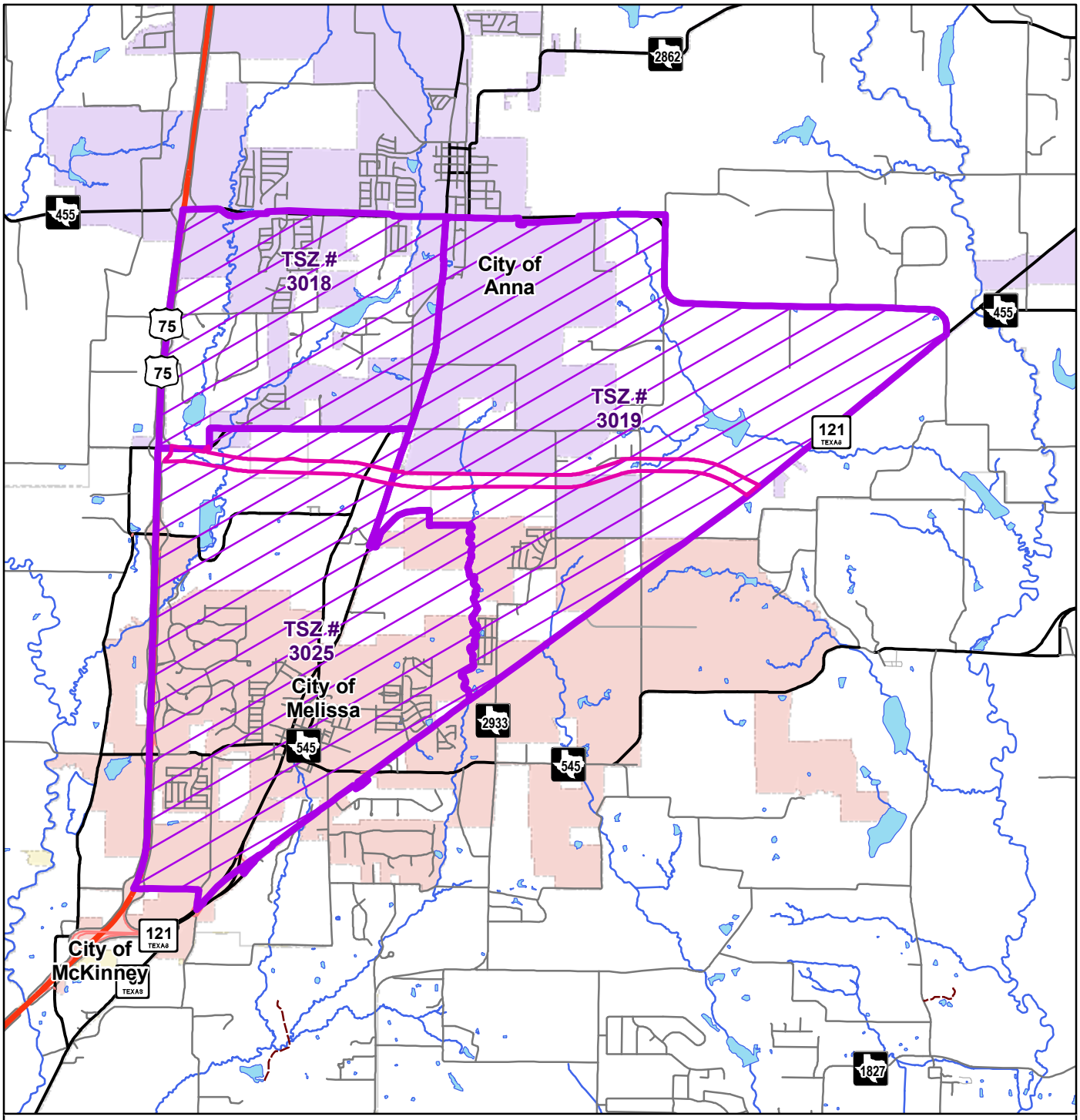
The population in north central Collin County has grown steadily during the last few decades. The City of Anna, the only municipality within the proposed right-of-way and the nearby City of Melissa have both grown considerably since 1990. The Collin County Outer Loop project is needed to accommodate this population increase and the expected increase in population for both north central Collin County and the Dallas-Fort Worth urban area. The historical and projected population within the three NCTCOG transportation survey zones (TSZs) that encompass the proposed right-of-way and within nearby cities is included in Table 7. TSZs are generally aggregations of census block groups used in for NCTCOG demographic and transportation models. The locations of the TSZs are shown in Figure 16.

Table 7. Population Growth around the Study Corridor

Location	Historical			Projected		
	1970	1980	1990	2000	2010	2030
TSZ # 3018	N/A	N/A	N/A	507*	648	1,746
TSZ # 3019	N/A	N/A	N/A	509*	548	2,146
TSZ # 3025	N/A	N/A	N/A	1,355*	2,003	10,572
Study Corridor TSZs	N/A	N/A	N/A	2,371*	3,199	14,464
City of Anna	736	855	904	1,225	1,175	**
City of Melissa	N/A	604	557	1,350	1,740	5,375
Collin County	66,920	144,576	264,036	491,675	749,343	1,166,645
Dallas-Fort Worth Urban Area	2,371,611	2,957,091	3,920,094	5,067,400	7,646,600	9,107,900

Sources: North Central Texas – Population by Decade, 1960-2000. March 2001, NCTCOG Research and Information Services; NCTCOG 2030 Demographic Forecast. March 2003, NCTCOG Research and Information Services.

Notes: * TSZ Populations for 2000 are taken from the NCTCOG 2030 Demographic Forecast.
** Not available



Collin County Outer Loop
Local Environmental Document

Transportation Survey Zones

US 75 to SH 121

Figure 16

North Central Texas Council of Governments

Transportation Department

The employment growth in the Dallas-Fort Worth urban area and near the study corridor is expected to continue. Table 8 shows the employment estimates from the three TSZs that encompass the proposed Build Alternative, nearby cities, Collin County, and the Dallas-Fort Worth urban area. The number of jobs in the TSZs that encompass the study corridor is expected to grow by an average of approximately five percent per year between 2000 and 2030. The total number of jobs is projected to be 352 percent higher in 2030 than in 2000 for the study corridor TSZs.

Table 8. Employment Growth around the Study Corridor

Location	2000	2010	2030	Percent Change (2000 to 2030)
TSZ # 3018	99	138	384	287.9%
TSZ # 3019	123	222	837	580.5%
TSZ # 3025	349	489	1,360	289.7%
Study Corridor TSZs	571	849	2,581	352.0%
City of Anna	35	49	141	302.9%
City of Melissa	147	240	840	471.4%
Collin County	204,057	292,533	517,264	153.5%
Dallas-Fort Worth Urban Area	3,158,200	3,897,000	5,416,700	71.5%

Source: NCTCOG 2030 Demographic Forecast. March 2003, NCTCOG Research and Information Services.

Because future demographics are established independent of the transportation planning process, the population and employment growth in the area surrounding the study corridor is expected to be the same in the Build and No Build Alternatives. For a discussion of potential indirect impacts on the distribution of population and employment that could result from the Build Alternative see Section 5.8.

5.1.8.1 Environmental Justice

Environmental justice refers to an equitable distribution of both burdens and benefits to groups such as racial minorities or residents of economically disadvantaged areas. Environmental injustice occurs when minority or low-income communities and individuals are burdened with more than their share of environmental risks, while enjoying fewer of the benefits of environmental regulation than non-minority or non-low-income. Census data from 2000 for census block groups that encompass or are located along the study corridor (census tract 0302.00, block groups 1 and 3) were analyzed to determine minority (minority includes both race and ethnicity) and income characteristics in the study corridor. A total of 4,269 persons were recorded in the two census block groups. In accordance with Title VI of the Civil Rights Restoration Act of 1987, data on the presence of and effects to minority and low-income populations were analyzed to ensure that the proposed action does not subject these populations to a "disproportionately high and adverse effect."

Using the 2000 Census data, the inclusive blocks were analyzed for percent minorities. In addition, these blocks were compared to a larger reference area (block groups) for minority populations to determine if any meaningful greater populations of minorities were present. For purposes of this document, the definition of minority populations was based on the Council on Environmental Quality (CEQ) guidance document *Environmental Justice Guidance under the National Environmental Policy Act*. Based on this guidance, minority populations are identified as either:

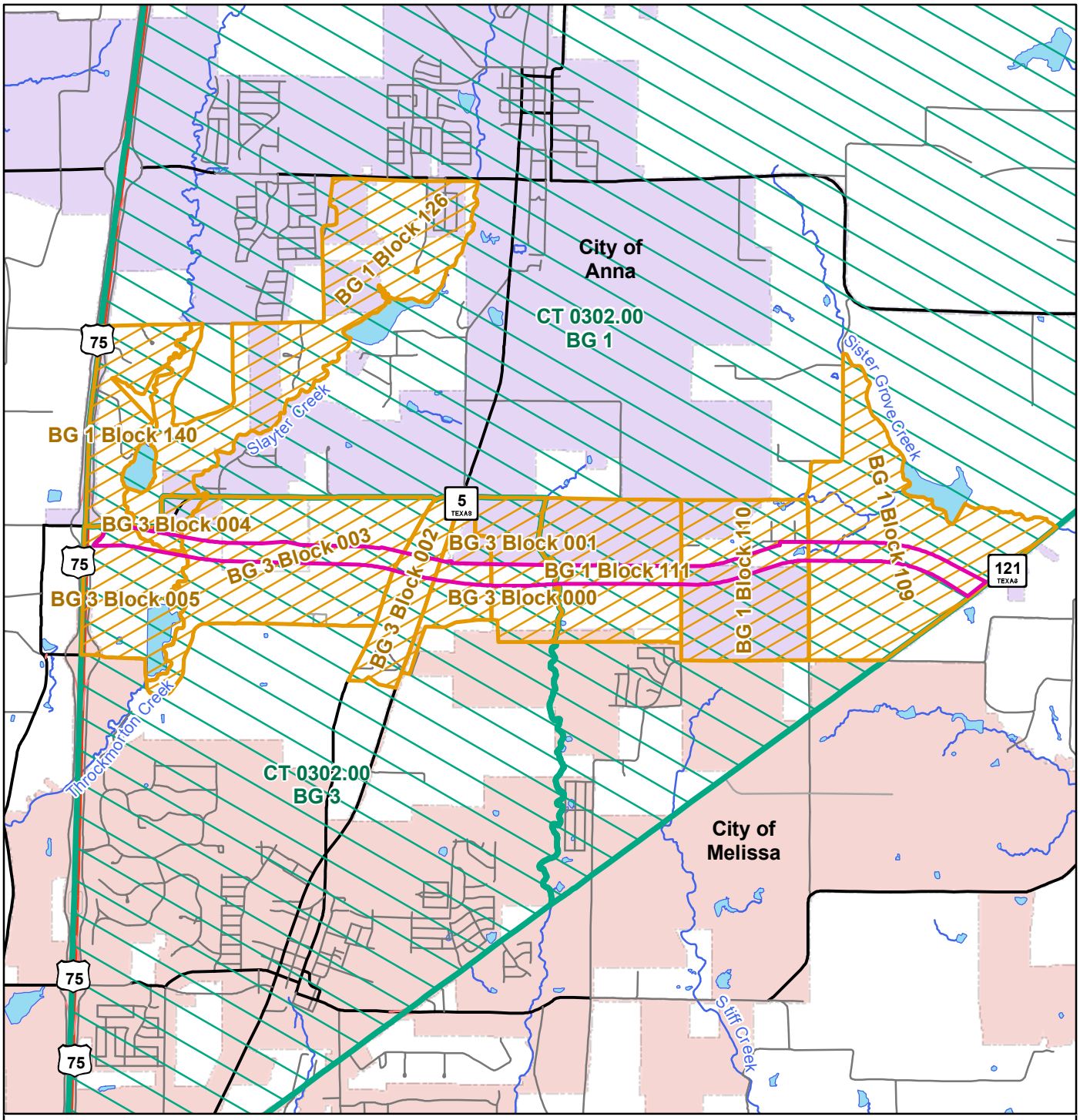
- The minority population of the affected area exceeds 50 percent or
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis and who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic

The race distribution within the two census block groups and the 11 census blocks that intersect the study area is presented in Table 9. The locations of the blocks and block groups are shown on Figure 17.

Table 9. 2000 Census Racial Distribution Characteristics of Study Corridor

Location	Total Population (1)	Population/Percentage						
		White	Black	Hispanic or Latino (2)	American Indian, Eskimo, or Aleut	Asian	Pacific Islander	Other (3)
Census Tract 0302.00 Block Group 1	2,913	2,458 84.4%	5 0.2%	520 17.9%	83 2.8%	26 0.9%	0 0.0%	187 6.4%
Block 109	7	7 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Block 110	17	16 94.1%	0 0.0%	1 5.9%	0 0.0%	0 0.0%	0 0.0%	1 5.9%
Block 111	8	8 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Block 126	164	139 84.8%	1 0.6%	1 0.6%	1 0.6%	0 0.0%	0 0.0%	0 0.0%
Block 140	80	80 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Census Tract 0302.00 Block Group 3	1,356	1,175 86.7%	16 1.2%	183 13.5%	6 0.4%	6 0.4%	0 0.0%	123 9.1%
Block 000	1	1 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Block 001	0	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Block 002	63	54 85.7%	2 3.2%	3 4.8%	0 0.0%	0 0.0%	0 0.0%	3 4.8%
Block 003	26	26 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Block 004	3	3 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Block 005	7	7 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Block Group Total	4,269	3,633 85.1%	21 0.5%	703 16.5%	89 2.1%	32 0.7%	0 0.0%	310 7.3%
Block Total	376	341 90.7%	3 0.8%	5 1.3%	1 0.3%	0 0.0%	0 0.0%	4 1.1%

Source: 2000 US Census. American Fact Finder.
Notes: (1) Total population is the summation of all race categories reported from the US Census Bureau consisting of White, Black, American Indian and Alaska native, Asian, native Hawaiian and other Pacific islander, some other race, and two or more races.
(2) Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any other race.
(3) Other is defined as "some other race" category defined by the US Census Bureau.



COLLIN COUNTY

Collin County Outer Loop Segment 1
Local Environmental Document

2000 US Census Divisions

US 75 to SH 121

Figure 17

North Central Texas Council of Governments

Transportation Department

As shown in Table 9, no block groups or blocks encompassing the study corridor have a minority population above 50 percent. No blocks in the study corridor were identified to have meaningfully greater percent minority populations than the immediate general area (block groups). Because the smallest unit for demographic data is the block-level, the impacts (e.g., displacements and/or right-of-way impacts, noise impacts) to these affected units are assumed to be proportional to the entire demographic profile of the affected block.

Table 10 provides the 2000 Census median incomes for households and families at the census block group and census tract level for the area that includes the study area. Collin County had a poverty level at 4.9 percent in 1999 based on the 2000 Census. The City of Anna had 9.1 percent of the population below the poverty level, which is lower than the 10.8 percent poverty level for the Dallas-Fort Worth urban area.

Table 10. 2000 Census Median Income Characteristics of Study Corridor

Location	Median Income in 1999 Dollars		Total Per Capita Income in 1999 Dollars	Percent Below Poverty
	Households	Families		
Census Tract 0302.00 Block Group 1	$48,095	$54,167	$19,429	5.8%
Census Tract 0302.00 Block Group 3	$60,455	$66,250	$27,054	5.3%
Census Tract 0302.00	$53,911	$60,482	$23,883	6.0%
City of Anna	$45,938	$51,250	$15,920	9.1%
Collin County	$70,835	$81,856	$33,345	4.9%

Source: 2000 US Census. American Fact Finder.

Based on FHWA Order 6640.23, a low-income population was defined as any population that has a median household income below the US Department of Health and Human Services (HHS) defined poverty guideline for a family of four. The 2010 HHS poverty guideline for a family of four ($22,050) was compared to the block groups located within the study corridor to determine if low-income populations were present.

As shown in Table 10, the median household incomes for the census block groups within the study corridor are $48,095 and $60,455. These are higher than the median household income for the City of Anna ($45,938), but lower than the Collin County median household income ($70,835). The median household income for census tract 0302.00 ($53,911) is between the median incomes for the census block groups. The median household income for each of the block groups within the study corridor was higher than the 2010 HHS poverty guideline of $22,050; therefore, no low-income populations were identified in the study corridor.

There are four residences displaced by the planned facility; two in census tract 0302.00 block group 1 block 110, one in census tract 0302.00 block group 3 block 003, and one in census tract 0302.00 block group 3 block 004. Because the 2000 Census identified no minority or low-income populations in these geographies or anywhere within the study area, neither the No Build Alternative nor Build Alternative would adversely impact minority and low-income populations. The impacts on those populations would not be disproportionately high and adverse compared to the general population.

5.1.8.2 Limited English Proficiency

Information regarding English language proficiency within the study corridor is based on the 2000 Census information from the block groups that intersect it. These block groups are shown in Figure 17. The languages spoken by limited English proficiency (LEP) populations are as follows: 95.6 percent speak Spanish, 1.0 percent speak Indo-European, and 3.4 percent speak Asian or Pacific Island. These numbers represent a person's primary language, but do not necessarily preclude them from speaking English. Table 11 shows the LEP population by census block group, study corridor and for the City of Anna and Collin County that speak English "not well" or "not at all." No indications of an LEP population were present during the field investigations, including street or commercial signs in a foreign language.

Table 11. 2000 Census Limited English Proficiency

Location	Total Population*	Speak English "not well" or "not at all"	Percent Speak English "not well" or "not at all"
Census Tract 0302.00 Block Group 1	2,713	188	6.9%
Census Tract 0302.00 Block Group 3	1,253	16	1.3%
Study Corridor Block Groups	3,966	204	5.1%
City of Anna	1,084	143	13.2%
Collin County	449,510	15,647	3.5%

Source: 2000 US Census. American Fact Finder.
*Only includes population older than five years old per the US Census Bureau

Neither the No Build Alternative nor the Build Alternative would adversely impact or discriminate against LEP populations. As mentioned in Section 5.1.2, neither alternative would bisect any communities and would not sever or alter the social interaction of the communities along the corridor. The No Build would not improve access to other community resources. The Build Alternative would improve accessibility in the area.

Reasonable steps have been, and would continue to be taken, to ensure LEP populations have meaningful access to programs, services, and information Collin County provides. As mentioned in Section 4.3, public meeting notices regarding this project were published in English and Spanish and mailed to persons on the mailing lists. Spanish meeting notices were also published in the Spanish newspaper. Both notices stated that the meeting would be conducted in English and gave a contact number to request special communication accommodations. No one requested Spanish translation prior to or during the meetings.

5.2 NATURAL RESOURCES

This section describes the natural resources of the study corridor that could potentially be affected by the Build Alternative (see Section 4.2.2). The No Build Alternative (see Section 4.2.1) is brought forward in the analysis as a baseline for comparison purposes.

5.2.1 Farmland

As mentioned in Section 5.1.1, of the over 93 percent of land within the proposed right-of-way is classified as vacant, about 44 percent is currently cropland and 21 percent is open grassland or pasture.

The No Build Alternative would not impact farmland or ranchland.

The Build Alternative would convert existing farmland into transportation use. Of the 286 acres of right-of-way to be acquired, 178 acres are considered prime farmland as defined by the Natural Resource Conservation Service, which would permanently be changed to transportation use. In addition to the loss of prime farmland soils, one farmland/ranchland would be divided as a result of the Build Alternative. This land occurs on the east side of CR 365 between CR 366 and CR 364.

Avoidance and minimization of impacts to farmlands occurred during the planning and feasibility phase of the study for the Collin County Outer Loop (see Section 4.1). Impacts to farmlands were one of the environmental items considered during this process. To the extent possible, the alignment utilized the edges and boundaries of farms and properties to prevent bisection. Continued avoidance and minimization could occur during the design phase of the project by minimizing division of existing farmlands and hindrance of farmland access.

The Build Alternative could increase access to some farmland or ranchland. Access would be restored to all affected properties, but in some instances, travel across a formerly undivided parcel may be hampered, or remaining property may be uneconomical for farming or grazing purposes. In some of these cases, farm businesses may be eligible for compensation through the right-of-way acquisition process. Mitigation measures could also include the construction of crossings under the roadway for farming or grazing purposes. Mitigation of potential impacts to adjacent remaining farmland could include soil erosion control and invasive plant species control to preserve the remaining farming property.

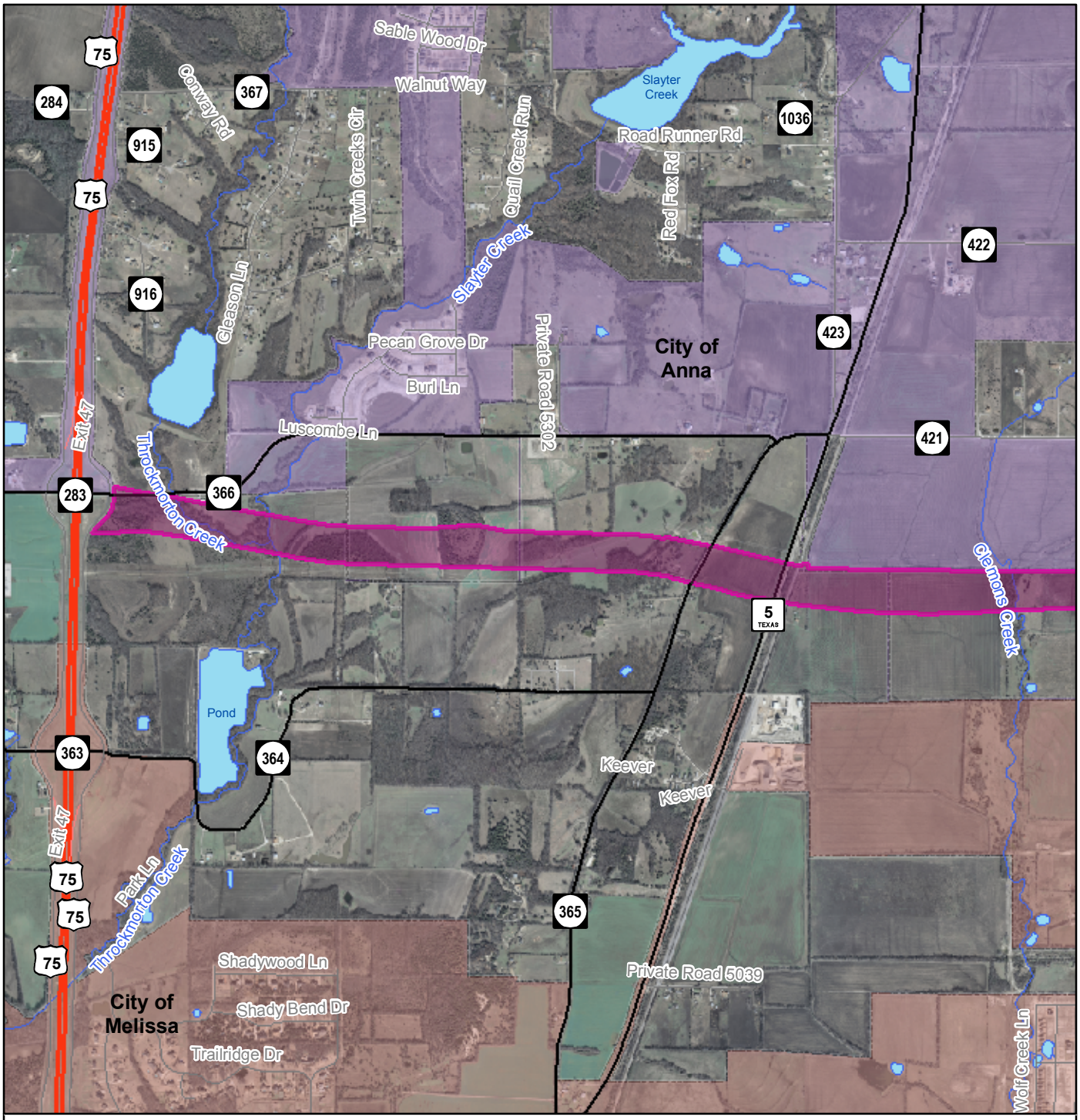
5.2.2 Vegetation

According to *Vegetation Types of Texas*, the study corridor is classified as "Crops." Crops are identified as "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." Field observations conducted in December 2009 confirmed the area consisted of farming operations. Figures 18 and 19 show the vegetation types in the study corridor. The dominate vegetation is agricultural crops of corn (*Zea mays*) with 38 percent of the study corridor associated with this vegetation. Table 12 lists the vegetation types identified in the study corridor.

Table 12. Vegetation Types

Type	Percent Coverage
Row Crops	38.28%
Herbaceous (Agriculture)	32.51%
Upland Woodland	15.35%
Riparian Woodland	6.45%
Impervious	3.31%
Fencerow	2.05%
Herbaceous (Residential)	1.76%
Pond	0.29%
Total	**100.00%**

Source: Environmental Baseline Report, November 2009

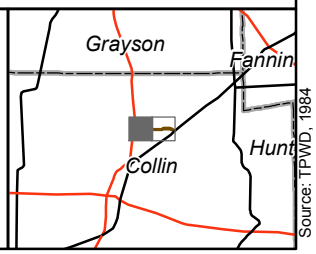


Crops
Proposed Right-of-Way
Primary Highway
Major Arterial
Minor Arterial
Other Roadway
Stream
Lake
City / Town Limits

0 1,000 2,000
Feet

N

Key Map



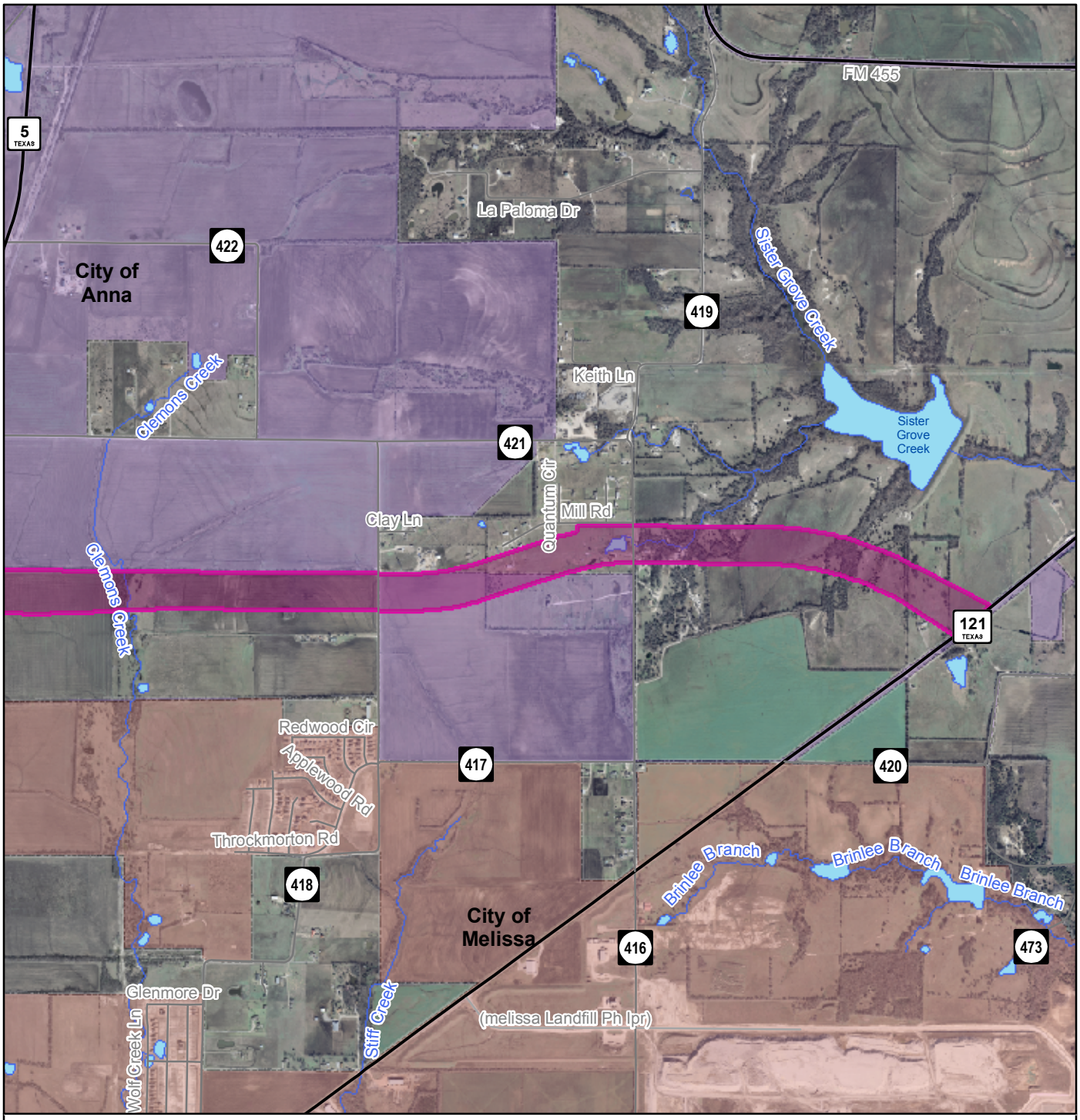
Source: TPWD, 1984

COLLIN COUNTY

Collin County Outer Loop Segment 1
Local Environmental Document

Vegetation Types
US 75 to Clemons Creek
Figure 18

North Central Texas Council of Governments
Transportation Department

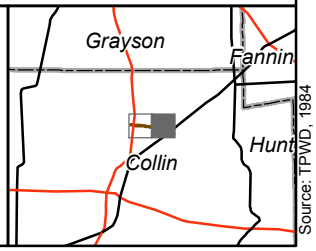


Crops
Proposed Right-of-Way
Primary Highway
Major Arterial
Minor Arterial
Other Roadway
Stream
Lake
City / Town Limits

0 1,000 2,000
Feet

N

Key Map



Source: TPWD, 1984

COLLIN COUNTY

Collin County Outer Loop Segment 1
Local Environmental Document

Vegetation Types

Clemons Creek to SH 121

Figure 19

North Central Texas Council of Governments

Transportation Department

Dominant herbaceous vegetation identified included Johnson grass (*Sorgum halepense*), Bermuda grass (*Cynodon dactylon*), sunflower (*Helianthus sp.*), giant ragweed (*Ambrosia trifida*), snow-on-the-prairie (*Euphorbia bicolor*), silver bluestem (*Bothriochloa saccharoides*), tall fescue (*Schedonorus phoenix*), little bluestem (*Schizachyrium scoparium*), western ragweed (*Ambrosia psilostachya*), and poison ivy (*Toxicodendron radicans*). Dominant woody species included sugarberry (*Celtis laevigata*), eastern red cedar (*Juniperus virginiana*), bois d'arc (*Maclura pomifera*), honey locust (*Gelditsia triacanthos*), cedar elm (*Ulmus crassifolia*) pecan (*Carya illinoensis*), American elm (*Ulmus americana*), black willow (*Salix nigra*), chinaberry (*Melia azerdarach*), and boxelder (*Acer negundo*), greenbriar (*Smilax sp.*), American beautyberry (*Callicarpa americana*), Japanese honeysuckle (*Lonicera japonica*), mistletoe (*Phoradendron tomentosum*), chinkapin oak (*Quercus muhlenbergii*), and shumard oak (*Quercus shumardii*).

Large trees, those defined as over 12 inches diameter at breast height (dbh), were noted along the streams and fence lines throughout the proposed right-of-way. In addition, a few scattered large trees were present in the pastureland and open spaces. No trees of significant larger size than the surrounding woody vegetation were noted within the proposed right-of-way. The City of Anna has a tree ordinance with required mitigation for removal of trees of specific sizes and species. However, all transportation projects are exempt from this ordinance.

The No Build Alternative would not impact vegetation.

The Build Alternative would permanently convert these vegetation communities to transportation use, either a conversion to pavement (18 acres) or a conversion to a maintained roadway right-of-way (268 acres). Approximately 59 acres of woody vegetation could be removed by the Build Alternative. These woody areas include small and large woody species, with approximately 37 acres (63 percent) riparian woody vegetation.

The primary impact to vegetation resulting from right-of-way preparation and construction of the Build Alternative would be the removal of existing vegetation within the proposed right-of-way. Existing vegetation would be preserved wherever possible. Vegetation communities would be directly impacted by heavy machinery such as bulldozers. Adjacent vegetation can be affected by dust, erosion, and/or sedimentation. Impacts to vegetation communities adjacent to the proposed right-of-way would be minimized through an efficient construction phasing and the implementation of best management practices (BMP) such as silt fencing during construction. Vegetation areas that would not be re-vegetated would re-vegetate naturally.

5.2.3 Threatened and Endangered Species

The Endangered Species Act of 1973, as amended, protects federal threatened and endangered species and their habitat. The Bald and Golden Eagle Protection Act [16 US Code (UCS) 668-668d] of 1940, as amended, gives protection to Bald and Golden Eagles (*Haliaeetus leucocephalus* and *Aquila chrysaetos*) similar to the endangered species act. Somewhat similar legislation [i.e., Section 65.171-176 and 69.01-69.9 of the Texas Administrative Code (TAC)] has been passed by the State of Texas. The Texas Parks and Wildlife Department (TPWD) has the responsibility of listing threatened and endangered species within the state. In addition, the TPWD Code, Chapters 68 and 88, contains 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.

Two federally listed species and 14 state listed species were identified for Collin County. Table 13 list the state and federal listed species in Collin County, their status, habitat, and species effect. Federal species effects are classified as no affect, may affect but not likely to adversely effect, may affect but likely to adversely affect, and would affect. State listed species are listed as no impact, may impact, or would impact.

Table 13. Threatened and Endangered Species in Collin County

Species	Federal Status	State Status	Description of Habitat	Habitat Present	Species Effect
Birds					
American Peregrine falcon (*Falco peregrinus anatum*)	*	T	Resident of Trans-Pecos region and migratory on the Texas coast. Prefers open areas, meadows, mudflats, beaches, marshes, and lakes	No	No Impact
Bald Eagle (*Haliaeetus leucocephalus*)	DM	T	Nest and winters near rivers, lakes, and along coasts; nest in tall trees or cliffs near large bodies of water	No	No Affect
Interior Least Tern (*Sterna antillarum athalassos*)	**	E	Nest along sand and gravel bars within braided streams and rivers; also known to nest on man-made structures	No	No Affect
Piping Plover (*Charadrius melodus*)	**	T	Wintering migrant along Gulf Coast beaches. Prefers sandy beaches and lakeshores	No	No Affect
White-Faced Ibis (*Plegais chihi*)	*	T	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nest in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	No	No Impact
Whooping Crane (*Grus americana*)	E	E	Estuaries, prairie marshes, savannah grasslands, and cropland/pastures. Winter resident at Aransas Natural Wildlife Refuge, Aransas, and Matagorda	No	No Affect
Wood Stork (*Mycteria americana*)	*	T	Forges in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater; usually roost communally in tall snags, mudflats, and other wetlands	No	No Impact
Mammals					
Red Wolf (*Canis rufus*)	**	E	Extripated; formerly throughout eastern half of Texas in brushy forest edges as well as coastal prairies	No	No Impact
Reptiles					
Alligator Snapping turtle (*Macrochelys temminckii*)	*	T	Perennial water bodies, deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; usually in water with mud bottom and abundant aquatic vegetation	No	No Impact
Texas Horned Lizard (*Phrynosoma cornutum*)	*	T	Open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; sandy to rocky soil	No	No Impact
Timber/Canebrake Rattlesnake (*Crotalus horridus*)	*	T	Swamps, floodplains, upland woodlands, riparian zones, abandoned farmland; prefers dense ground cover	Yes	May Impact

Table 13. Threatened and Endangered Species in Collin County (continued)

Species	Federal Status	State Status	Description of Habitat	Habitat Present	Species Effect
Mollusks					
Louisiana Pigtoe (*Pleurobema riddellii*)	*	T	Streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins.	No	No Impact
Sandbank Pocketbook (*Lampsilis satura*)	*	T	Small to large rivers with moderate flows and swift current on gravel, sand-gravel, and sand bottoms. East Texas, Sulfur south through San Jacinto River basins and Neches River.	No	No Impact
Texas Heelspliter (*Potamilus amphichaenus*)	*	T	Quiet waters in mud or sand and in reservoirs along Sabine, Neches, and Trinity River basins	No	No Impact

Source: USFWS and TPWD, February 2010
Notes: E – Endangered
T – Threatened
DM – Delisted Taxon, Recovered, Being Monitored First Five Years
* – Not listed by US Fish and Wildlife Service
** – A listed species by the US Fish and Wildlife Service, but not occurring in Collin County

During a December 2009 field visit, no additional species or habitats were identified in the study corridor. A Natural Diversity Database (NDD) search was conducted in January 2009. The results located four protected plant series within a 10-mile radius of the study corridor. These series included three little bluestem-Indian grass series and one American elm-chinkapin oak-hackberry series. No series were identified in substantial amounts in the study corridor. One series was identified within less than one-mile from the study corridor, a bluestem-Indian grass series. While both little bluestem and Indian grass (*Sorghastrum nutans*) were identified in the study corridor, Indian grass was not identified in large quantities nor was little bluestem and Indian grass found in significant combinations together. No effect is expected to the bluestem-Indian grass series because it is outside the study corridor. Any additional remnant of this series in the study corridor has been removed due to the heavy amount of agricultural and ranching activities.

The No Build Alternative would have no effect to threatened and endangered species.

All federal and state listed species identified were found to have no effect or no impact by the Build Alternative with the exception of one state listed species. The state threatened timber/canebrake rattlesnake (*Crotalus horridus*) was found to have suitable habitat in the study corridor riparian areas. The Build Alternative may impact the timber/canebrake rattlesnake. Because the species is mobile, it may move outside the proposed right-of-way once construction starts. Suitable habitat exists for the snake outside the proposed right-of-way. Only injured or young would have the greatest chance of being impacted by the Build Alternative.

During construction, efforts would be made to avoid impacts to threatened or endangered species. If a threatened or endangered species is identified, construction would cease until further investigation is conducted to avoid potential impacts.

5.2.4 Wildlife and Migratory Birds

Several laws and regulations govern impacts to wildlife resources, most notably the Migratory Bird Treaty Act (MBTA) of 1918 and the Endangered Species Act of 1973. The MBTA affords protection to virtually all migratory birds, including their parts, nests, or eggs. The MBTA affords protection to over 800 species in total.

Several wildlife species were observed during the field investigations in December 2009. The species observed were American Kestrel (*Falco sparverius*), Killdeer (*Charadrius vociferus*), Red-tailed Hawk (*Buteo jamaicensis*), Greater Roadrunner (*Geococcyx californianus*), House Sparrow (*Passer domesticus*), Turkey Vulture (*Cathartes aura*), and Fox Squirrel (*Sciurus niger*). Several other species of wildlife could be present in the study corridor given the existing habitat. These could include deer, small rodents such as rabbit and field mice, a variety of herps, and numerous insects and other small animals.

The No Build Alternative would not impact wildlife or migratory birds.

Potential impacts under the Build Alternative would be similar to threatened and endangered species. Most species are mobile and would move to similar habitat outside the proposed right-of-way. Only injured and young would be susceptible to impacts from the Build Alternative. While no nest or young were observed in the study corridor, a potential for nesting migratory birds and/or their young could be present in the study corridor. The removal of large trees, particularly along the streams in the corridor, could impact nesting birds and other wildlife that utilize these areas as habitat. In addition, ground nesting birds prevalent in farmland and prairie areas, would suffer similar impacts to their removal of habitat for nesting and foraging.

Habitat fragmentation can result from the partitioning of existing habitats by land conversion from human activities or geological processes to make the existing habitat discontinuous. Human induced habitat fragmentation was observed throughout the study corridor, identified with aerial photography, and confirmed through field observations. Areas of relatively undisturbed habitat are sparse and broken up by numerous human land use activities tied to crops, pasturelands, and developed areas.

In addition to habitat destruction during construction, roads and traffic result in noise and air pollution, spread of invasive species, and habitat fragmentation. The effects of habitat fragmentation as a result of road and other linear projects have been well documented. It reduces the value of adjacent habitats in several ways, primarily by creating multiple smaller habitats that are bisected by a dangerous or impassable obstacle. The result is a decrease in carrying capacity of adjacent habitats. Several bridges or culverts would be required for the Build Alternative including structures at the major stream crossings, including Throckmorton Creek, Slayter Creek, and Clemons Creek. Various wildlife species are known to use bridge-spanned riparian corridors and culverts to travel under roads. While the bridges and culverts would not be specifically designed for wildlife movement, larger culverts would likely facilitate wildlife movement. The bridges used to span the larger water bodies would allow greater wildlife movement of larger species. While habitat fragmentation is expected from the Build Alternative, the area was observed to exhibit habitat fragmentation from area roads and land use practices from agriculture. Vehicular collisions with wildlife would also result from the increasing habitat fragmentation. Mortality due to vehicles (i.e., road kill) affects virtually all types of wildlife, but particularly impacts terrestrial species who are crossing from one habitat patch to another.

The MBTA affords protection (from killing or capture) to the vast majority of bird species that could occur along the study corridor, including their nests and eggs. Because adult birds are for the most part mobile, the largest potential for impacts to MBTA-listed species would occur during the nesting season (generally spring through summer). Migrational patterns would not be affected by the Build Alternative. In the event that migratory birds are encountered on-site during project construction, contractors would avoid "taking" protected birds, active nest, eggs, and/or young. The contractor would remove old migratory bird nests from September 1 through the end of February from any structure where work would be done. In addition, the contractor would be prepared to prevent migratory birds from building nests between March 1 and August 31. If project construction is to begin between March 1 and August 31, it is recommended that a qualified biologist conduct a survey of the study corridor to determine the presence or absence of migratory bird species in advance of any construction.

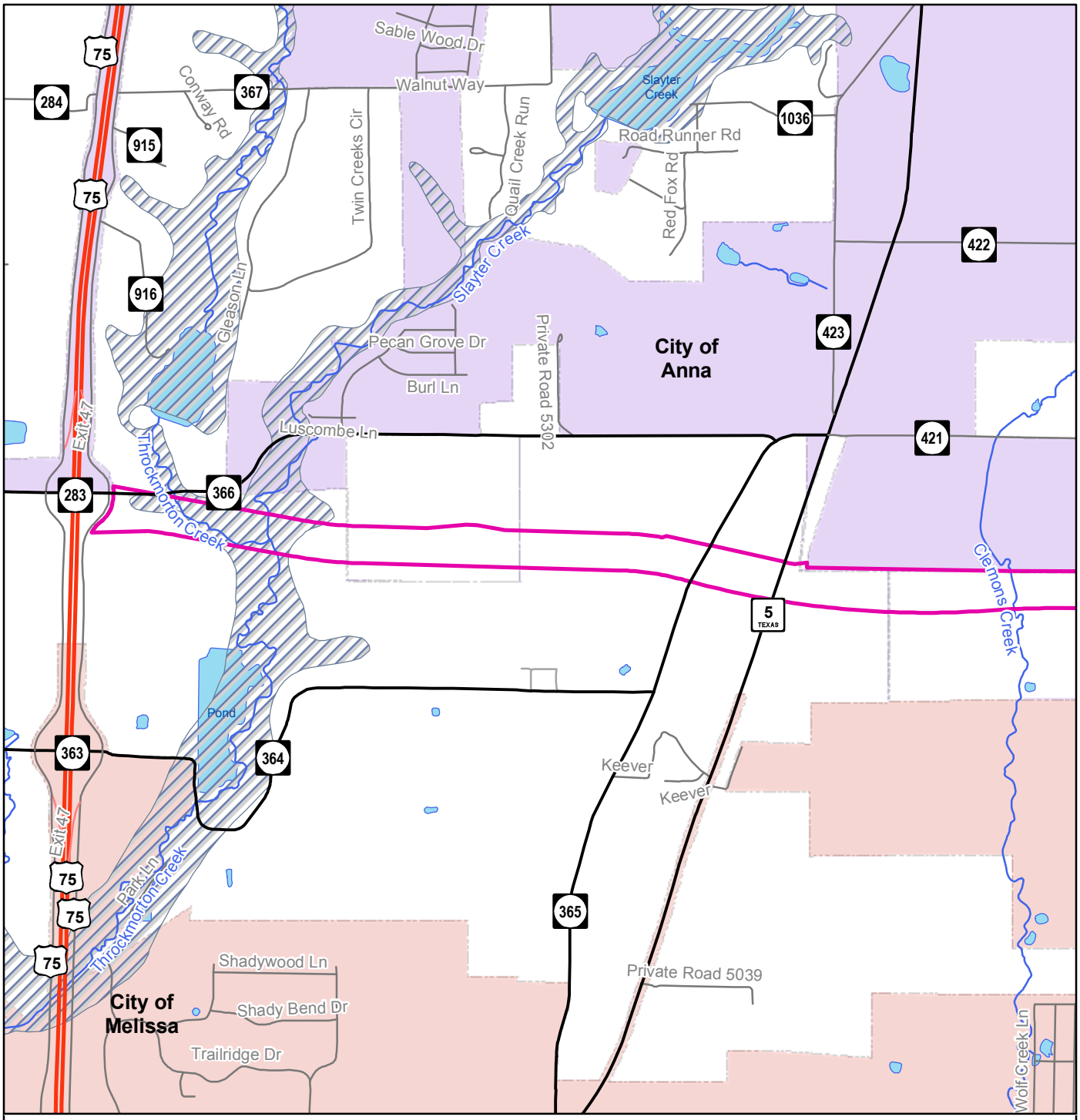
5.2.5 Water Quality

Various water bodies cross the study corridor. Three larger streams were identified with one minor unnamed tributary crossing the study corridor. These streams were identified as Throckmorton Creek, Slayter Creek, and Clemons Creek. The water from these streams and other various water systems flow into two streams identified by Texas Commission on Environmental Quality (TCEQ) 2008 Water Inventory List. This document describes the quality status of Texas' natural waters based on historical data and identifies water bodies that are not meeting standards set for their use.

These two water bodies are Sister Grove Creek, Segment ID 0821B, which is located to the east of the study corridor, and Lake Lavon, Segment ID 0821, located south of the study corridor. No identified impaired waters listed on the 2008 Clean Water Acts Section 303(d) list are located within the study corridor. In addition, no impaired waters were identified five miles upstream of the proposed project. The creeks are shown for the study corridor on Figures 20 and to 21.

The No Build Alternative would not impact water quality. The No Build Alternative would involve no additional construction activities and would not require a Texas Pollutant Discharge Elimination System (TPDES).

As previously stated, the Build Alternative would disturb 286 acres of land by construction. Compliance with the TPDES General Permit for Construction Activity in accordance with Section 402(b) of the Clean Water Act (CWA) (Public Law 95-217) and Section 405(p) of the Water Quality Act of 1987 (Public Law 100-4) would be required because construction activities would disturb more than one acre. Additionally, Collin County has a TPDES small Municipal Separate Storm Sewer Systems (MS4s) permit. The TPDES permit would also require the preparation of a Notice of Intent (NOI) and a storm water pollution prevention plan (SW3P) prior to the initiation of grading activities. The SW3P would be based on BMP and include techniques to reduce the amount of total suspended solids from entering streams. Proposed construction activities for the Build Alternative would disturb more the five acres; therefore, Collin County would be required to submit a NOI to the TCEQ.

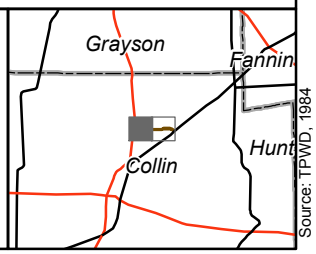


FEMA 100-Year Floodplain
Proposed Right-of-Way
Primary Highway
Major Arterial
Minor Arterial
Other Roadway
Stream
Lake
City / Town Limits

0 1,000 2,000
Feet

N

Key Map



Source: TPWD, 1984

COLLIN COUNTY

Collin County Outer Loop Segment 1
Local Environmental Document

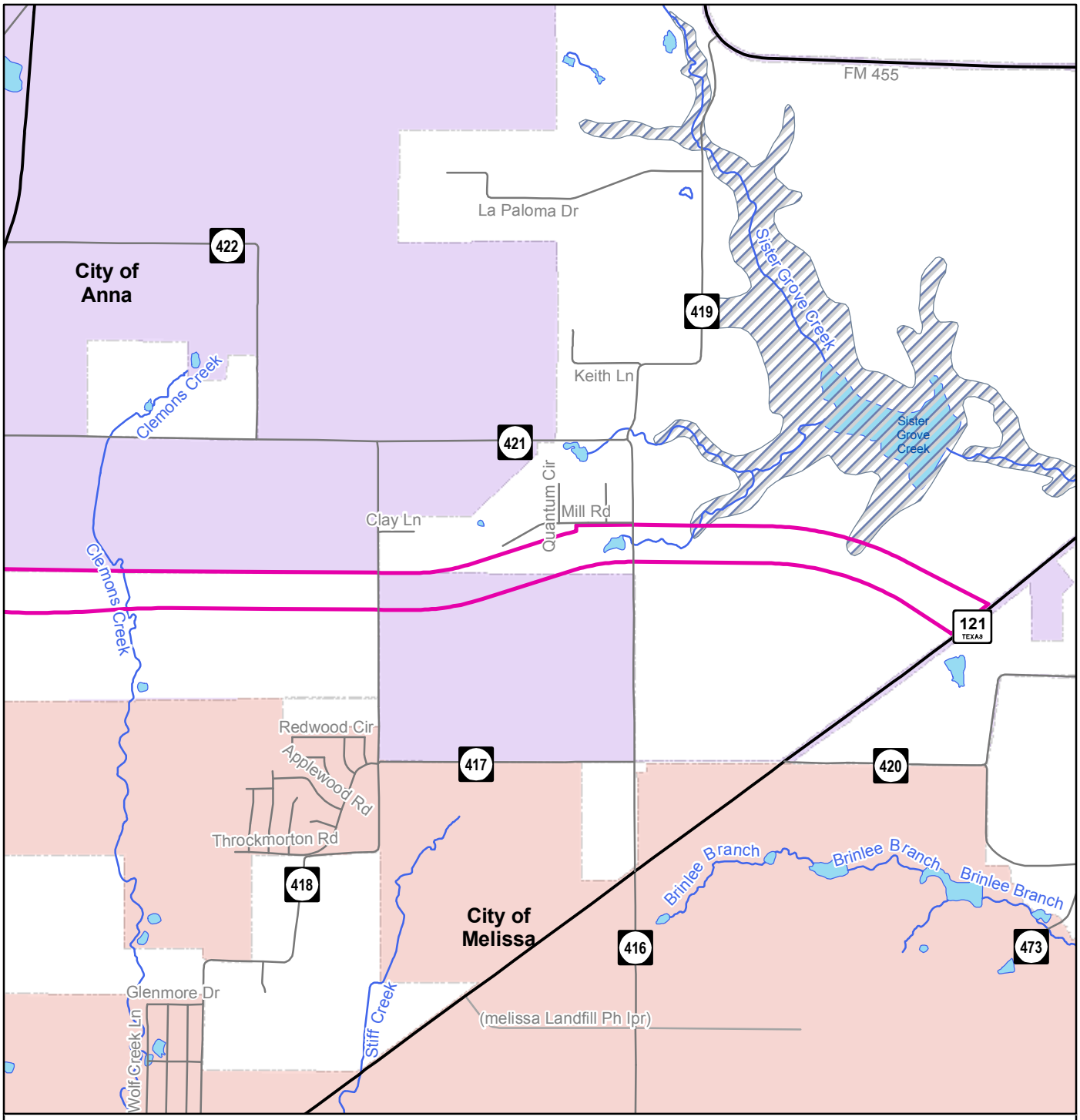
Water Bodies

US 75 to Clemons Creek

Figure 20

North Central Texas Council of Governments

Transportation Department



Collin County Outer Loop Segment 1
Local Environmental Document

Water Bodies

Clemons Creek to SH 121

Figure 21

North Central Texas Council of Governments

Transportation Department

5.2.6 Floodplains

According to the Federal Emergency Management Agency (FEMA), portions of the study corridor are located in the Regulatory Floodway Zone of the 100-year floodplain. Approximately 22 acres of the proposed right-of-way is mapped as Zone A (base flood elevations have not been determined). These floodplains are associated with Slayter Creek, Throckmorton Creek, and an unnamed tributary to Sister Grove Creek. The floodplain associated with the study corridor is graphically shown in Figures 20 and 21.

The No Build Alternative would leave the floodplains untouched; therefore, there would be no impacts to floodplains under this alternative.

The Build Alternative would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Two hydraulic reports have been produced for the Build Alternative design. The reports covered detailed hydraulic studies for Throckmorton Creek and Slayter Creek. Both of these creeks are located near the western terminus of the study area. The results recommended two bridge class culverts for the crossings of Throckmorton Creek and Slayter Creek. Eighteen additional culverts were recommended at other water crossings. In total, 20 culverts would be required for the Build Alternative.

Informal coordination with the local floodplain administrator would be required for the Build Alternative. Collin County and the City of Anna are participants in the National Flood Insurance Program. In cooperation with FEMA, Collin County would conform to the standard for temporary and permanent fill set by Flood Insurance Rate Maps (FIRM). The study corridor falls into two FEMA FIRM maps - 48085C0155J and 48085C0160J. Both FIRMS had active dates on June 1, 2009.

5.2.7 Wetlands/Waters of the US

A detailed wetlands and waters investigation was conducted in November 2009. Six potential jurisdictional waters of the US were identified in the proposed right-of-way; no wetlands were identified. A total of 1.14 acres of waters of the US were identified (see Table 14). These water features are shown in relation to the study corridor in Figures 20 and 21.

Table 14. Potential Waters of the US

Feature	Feature Name	Acres in Proposed right-of-way	Potential Impacts (Acres)	Anticipated USACE Permit
Water 1	Throckmorton Creek and tributary	0.50	0.09	NWP 14
Water 2	Slayter Creek	0.21	None (bridged)	None
Water 3	Clemons Creek	0.09	0.04	NWP 14
Water 4	Tributary to Sister Grove Creek	0.21	0.07	NWP 14
Water 5	Tributary to Sister Grove Creek	0.02	None (south of construction limits)	None
Water 6	Tributary to Sister Grove Creek	0.11	0.02	NWP 14
Totals		1.14	0.22	

Source: Environmental Baseline Report, November 2009

The No Build Alternative would not impact any waters of the US.

The Build Alternative would impact an estimated 0.22 acres of potential waters of the US during construction activities. The placement of temporary or permanent dredge or fill material into waters of the US, including wetlands is regulated by Section 404 of the CWA. The US Army Corp of Engineers (USACE) has regulatory power over impacts to Section 404 waters. Under the USACE Nationwide Permit (NWP) program, all impacts would be authorized under a NWP 14 without a preconstruction notification. Any impacts that would exceed the NWP 14 threshold of 0.10 acres or if impacts would include any wetlands, a preconstruction notification would be required. Any temporary fill would be returned to their pre-existing conditions. The contractor would be responsible for complying with the General Conditions of the NWP 14 during construction.

As a result of impacts to waters of the US associated with the construction of the Build Alternative, erosion control, sedimentation control, and post construction Total Suspended Solids (TSS) control devices from the TCEQ Section 401 Tier 1 Water Quality BMP List would be required. At least one device from each category would be utilized. Erosion control devices would be implemented and maintained until construction is complete. Sedimentation control devices would be maintained and remain in place until completion of the Build Alternative. Post-construction TSS control devices would be implemented upon completion of the Build Alternative.

The Build Alternative would not cross any navigable waters, therefore no permits under Section 9, 10, and 14 (33 USC 408) under the Rivers and Harbors Act of 1899 through the US Coast Guard would be required.

5.3 REGULATED/HAZARDOUS MATERIALS

The hazardous materials investigation consisted of a visual survey of the study corridor and a regulatory records review. The visual survey was conducted on June 11 and August 18, 2009. The survey included a visual observation of properties located along and immediately outside the proposed right-of-way to identify the release of or threatened release of petroleum products or other hazardous substances. The results of the visual survey located one potential hazardous materials site. The site comprised a trash pile adjacent to an historic-age ranch house on the western limits of the study corridor next to Throckmorton Creek. This trash pile would be removed during construction of the Build Alternative and could contain some hazardous materials. No other sites were observed during field investigations.

A review of the regulatory database was conducted on August 31, 2009. A review of the results identified one site in the half-mile radius search of the Build Alternative. This site is listed as a Tier II Chemical Reporting Program (storage of chemicals). The site is located 0.35 miles south of the study corridor on SH 5. A visual inspection of this site in the field visit in December 2009 verified the site as a construction supply site. Because of the type of site and the distance from the study corridor, this site is not likely to pose a contamination problem to the Build Alternative.

Neither the No Build Alternative nor Build Alternative would impact any regulated/hazardous material sites.

It is not anticipated that any hazardous materials would be encountered during construction. However, any unanticipated hazardous materials encountered during construction would be handled according to applicable federal, state, and local regulations. The construction contractor should take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area(s). The use of construction equipment

within sensitive areas should be minimized or eliminated entirely. All construction materials used for the project should be removed as soon as work schedules permit.

5.4 AIR QUALITY

The 1970 Clean Air Act granted the EPA authority to establish National Ambient Air Quality Standards (NAAQS) for criteria air pollutants that may reasonably be anticipated to endanger public health or welfare. EPA has promulgated NAAQS for six criteria pollutants: ozone, carbon monoxide, particulate matter, nitrogen dioxide, sulfur dioxide, and lead. The NAAQS represent maximum allowable concentrations for the criteria pollutants, which are requisite to protect the public health and welfare with an adequate margin of safety. The EPA has identified standards for these six criteria pollutants based on specific time criteria.

The 1990 Clean Air Act Amendments (CAAA) established specific requirements which must be met for each area that does not achieve the NAAQS (non-attainment areas). The requirements are based on the severity of the air pollution problem. Transportation conformity is a CAAA requirement that calls for the EPA, US Department of Transportation (US DOT), and various regional, state, and local government agencies to integrate air quality and transportation planning development processes. Transportation conformity supports the development of transportation plans, programs, and projects that enable areas to meet and maintain NAAQS for ozone, carbon monoxide, and particulate matter. Through the State Implementation Plan (SIP), the air quality planning process ties transportation planning to the conformity provisions of the CAAA because each regionally significant transportation project is required to conform to the EPA approved SIP. This ensures that transportation projects are consistent with state and local air quality objectives. The NCTCOG is responsible for the conformity analysis in the Dallas-Fort Worth area.

The Build Alternative is located in Collin County, which is part of the EPA designated nine-county non-attainment area for the eight-hour standard for the pollutant ozone; therefore, the transportation conformity rule applies. The Build Alternative is consistent with the financially constrained long-range *Mobility 2030 - 2009 Amendment* and the *2008-2011 TIP*, page VII-70 project number 20089, as proposed by the NCTCOG. The US DOT (FHWA/FTA) found the MTP to conform to the SIP on August 31, 2009, and *2008-2011 TIP* to conform on August 31, 2009. Energy, environment, air quality, cost and mobility considerations are addressed in the programming of the TIP.

The primary pollutants from motor vehicles are volatile organic compounds, carbon monoxide, and nitrogen oxides. Volatile organic compounds and nitrogen oxides can combine under the right conditions in a series of photochemical reactions to form ozone. Because these reactions take place over a period of several hours, maximum concentrations of ozone are often found far downwind of the precursor sources. Thus, ozone is a regional problem and not a localized condition. The modeling procedures of ozone require long-term meteorological data and detailed area wide emission rates for all potential sources (industry, business, and transportation) and are normally too complex to be performed within the scope of an environmental analysis for a highway project. For the purpose of comparing the results of the NAAQS, ozone concentrations are modeled by the regional air quality planning agency for the SIP. However, concentrations for carbon monoxide are readily modeled for highway projects and are required by federal regulations.

Using guidelines for a Traffic Air Quality Analysis established by TxDOT, any facility having traffic less than 140,000 average daily traffic (ADT) in the design year (2030 for the Build Alternative) would not exceed the carbon monoxide threshold for the NAAQS. Based on this

testing standard, the Build Alternative would only have 20,900 ADT in 2030 and would therefore be under the 140,000 ADT required for an air quality analysis.

An examination of the study corridor and areas within 328 and 1,640 feet from the study corridor did not reveal any air quality sensitive receivers such as schools, hospitals, assisted-living facilities, and licensed daycare facilities. Dispersion studies have shown that the roadway air toxics decrease at approximately 328 feet (100 meters). By 1,640 feet (500 meters), most studies found it very difficult to distinguish the roadway from the background mobile source air toxic (MSATs) concentrations in any given area.

5.5 NOISE

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels [Traffic Noise Model (TNM) 2.5]. The model primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Sound from highway traffic is generated primarily from a vehicle tires, engine, and exhaust. It is commonly measured in decibels and is expressed as "dB." Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dBA." In addition, because traffic sound levels are never constant due to the changing number, type, and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis used for this study included the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Prediction of future noise contours.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

Noise contours were used versus a specific receiver based analysis due to the availability of data. Without a detailed traffic analysis and report, specific traffic numbers for ingress/egress movements, K-factor, and other noise related traffic components were unknown. The noise contours would provide a base for future development while maintaining the ability to assess potentially impacted noise receivers. Noise contours were modeled as a worst case scenario. Traffic data utilized were results from the Regional Outer Loop study that is currently on-going. This data represented the most current and available traffic numbers. This would represent the “worst case” scenario, and if traffic would be less, noise impacts would be reduced.

Established Noise Abatement Criteria (NAC) for various land use activity areas are used as one of two means to determine when a traffic noise impact would occur (Table 15).

Table 15. FHWA Noise Abatement Criteria

Activity Category	dBA Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, properties, or activities not included in categories A or B above.
D	--	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: FHWA
NOTE: Primary consideration is given to exterior areas (Category A, B or C) where frequent human activity occurs. However, interior areas (Category E) are used if exterior areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.

An absolute criterion impact for noise would occur when the predicted noise level at a receiver approaches, equals, or exceeds the NAC. "Approach" is defined as one dBA below the NAC. For example, a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above. When a traffic noise impact occurs, noise abatement measures should be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

The No Build Alternative would have a no effect on existing or future noise levels.

The results of the noise analysis for the Build Alternative are shown in Table 16. Noise contours were determined at a location along the corridor with the greatest potential for noise impacts. This place occurred at the intersection of SH 5 and the Build Alternative where traffic control devices would cause vehicle acceleration, which causes greater noise impacts than vehicles at constant speeds. In addition, the contours were assessed along the north side of the proposed right-of-way, where the proposed roadway would be constructed. The results concluded only receivers on the north side of the proposed right-of-way would receive noise impacts.

Table 16. Noise Contour Table

Activity Category	dBA Leq Critera	dBA Leq Absolute Criterion	Noise Contour (feet from north side of right-of-way)
A	57 (exterior)	56 (exterior)	390
B	67 (exterior)	66 (exterior)	80
C	72 (exterior)	71 (exterior)	30
D	None	None	N/A
E	52 (interior)	51 (interior)	30

Source: NCTCOG, 2010

One impact noise receiver was identified within the noise impact contours. The residence is a category B receiver and is located at the western terminus of the study corridor on CR 366 north of Throckmorton Creek. No potential noise mitigation is proposed for this receiver. Using

reasonable and feasible criteria established by TxDOT, mitigation for one receiver, regardless of the method used, is not reasonable or feasible. The cost of constructing a noise barrier (wall or berm) would not be cost effective for one receiver benefit. Mitigation through vegetation is not feasible. Vegetation requirements to a noise reduction that is readily perceptible by the human ear (at least five dBA) would require dense vegetation (no visual penetration in the understory, mid-story, and upper story) that is at least 100 feet in depth to the impacted receiver. The impacted receiver from the Build Alternative is too close to have a vegetation noise barrier. Because of the cost and limitations associated with only one benefited receiver, noise mitigation is not proposed for the Build Alternative.

A comprehensive traffic noise analysis would be performed in all subsequent environmental documents for the Collin County Outer Loop. On the date of approval of this document and any subsequent documents by the implementing agency (Date of Public Knowledge), the implementing agency(s) is(are) are no longer responsible for providing traffic noise abatement measures for new development adjacent to the facility if the land use is incompatible with projected noise contours.

5.6 CULTURAL RESOURCES

The Antiquities Code of Texas (ACT) states that it is public policy and in the public interest to locate, protect, and preserve all sites, objects, buildings, pre-twentieth century shipwrecks, and locations of historical, archeological, educational, or scientific interest. In 1995, the THC was made the legal custodian of the ACT and therefore, all cultural resources, historic and prehistoric, within the public domain of the State of Texas. Such diverse resources may be designated as State Archeological Landmarks (SALs) by the THC.

A cultural resource survey was conducted in June 2009 (under Texas Antiquities Permit Number 5205). The Area of Potential Effects (APE) used for this survey was defined as 500 feet (proposed right-of-way) and historic-age resources were based on structures that would be 50 years of age or older from the performed study; this date was identified as 1959. Four previously identified sites were identified through archival research located within 0.6 miles from the APE. These sites were reviewed during field visits to ascertain if cultural resources were located in the APE from these sites. No cultural resources from these sites were within the APE. However, the result of the pedestrian cultural resources survey identified four historic-age archeological resources (three sites and one locality) within the APE that had previously not been identified. Based on coordination with the THC, none of these sites were determined to be eligible for listing in the National Register of Historic Properties (NRHP) or SAL. Therefore, neither the No Build Alternative nor the Build Alternative would impact cultural resources.

5.7 PARKLANDS AND OPEN SPACE

TPWD Code, Title 3, Chapter 26 contains regulations 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 within responsibility for it determines there is no feasible and prudent alternative and that the project/program includes all reasonable planning to minimize harm to the land.

Using GIS, parks were identified in the Collin County area. No parklands or protected open spaces were identified in the study corridor or near the study corridor. Therefore, neither the No Build Alternative nor Build Alternative would impact any parklands or open spaces.

5.8 INDIRECT IMPACTS

According to the CEQ definition, indirect effects are those "caused by an action and occur later in time or farther removed in distance, but are still reasonably foreseeable." Indirect effects "may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

Indirect impacts are assessed by indentifying all reasonably foreseeable actions. A reasonably foreseeable action is an action that is sufficiently likely to occur such that a person of ordinary prudence would take it into account in making a decision. Factors that would indicate that a project or action is reasonably foreseeable include funding approvals for an anticipated project, formal approval or action on a project, or whether there is evidence of active preparation to make a decision on alternatives to a project.

Indirect effects were assessed based on guidance described in the TxDOT *Revised Guidance on Preparing Indirect and Cumulative Impact Analysis* and the Transportation Research Board (TRB) National Cooperative Highway Research Program (NCHRP) Report 466: *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*. Based on the TxDOT guidance, a seven-step approach was used to identify and evaluate potential indirect impacts of the proposed project. Table 17 details the seven steps.

Table 17. Seven-Step Approach to Estimate Indirect Impacts

Step	Description
Step 1 – Scoping	The basic approach, effort required, and geographical boundaries of the study are determined.
Step 2 – Identify the Study Area's Goals and Trends	Information regarding the study area is compiled with the goal of defining the context for assessment.
Step 3 – Inventory the Study Area's Notable Features	Additional data on environmental features are gathered and synthesized with a goal of identifying specific environmental issues by which to assess the project.
Step 4 – Identify Impact-Causing Activities of Proposed Action and Alternatives	Fully describe the component activities of each project alternative.
Step 5 – Identify Potentially Significant Indirect Effects for Analysis	Indirect effects associated with project activities and alternatives are cataloged, and potentially significant effects meriting further analysis are identified.
Step 6 – Analyze Indirect Effects and Evaluate Results	Qualitative and quantitative techniques are employed to estimate the magnitude of the potentially significant effects identified in Step 5 and describe future conditions with and without the proposed transportation improvement.
Step 7 – Assess Consequences and Develop Mitigation (as appropriate)	The consequences of indirect effects are evaluated in the context of the full range of project effects. Strategies to avoid or lessen any effects found to be unacceptable are developed. Effects are re-evaluated in the context of those mitigation strategies.

Source: TxDOT, *Guidance on Preparing Indirect and Cumulative Impact Analyses*, June 2009

Resources such as zoning maps, Census 2000 data, land use/comprehensive plans, *Mobility 2030 - 2009 Amendment*, and discussions with local officials were used to establish the qualitative assumptions which underlie the findings discussed in the following sections. Given the unpredictable nature of indirect impacts, qualitative assumptions were predominately relied upon during analysis, including anticipated residential and commercial development.

5.8.1 Step 1 – Scoping

The scoping step for assessing indirect impacts includes examining the attributes of the project and the surrounding area to focus the analytical approach and identifying the appropriate boundaries of the study area for indirect effects.

5.8.1.1 Project Attributes

The project design and right-of-way needs are described in Sections 4.2.2 and 5.1.2 of this document, respectively.

5.8.1.2 Approach and Effort Required

The process described in TRB NCHRP Report 466 was used to determine the general study approach and required level of effort for the indirect effects analysis. Table 18 summarizes the results.

Table 18. Level of Effort Required for Indirect Impacts Analysis

Project Variables		Assessment Methodology
Project Type	New location	Qualitative
Project Scale	4.6 miles in length 285.7 acres of right-of-way needed	Qualitative
Project Scope	Local	Qualitative
Stage of Study	Development of construction plans. The right-of-way has been purchased.	Qualitative
Project Setting	The area is primarily cropland, open grassland or pasture, and lightly forested with some residential land uses.	Qualitative
Design Features	Construction of the ultimate two-lane westbound access road from US 75 to SH 121	Qualitative
Project Purpose	• Help establish a transportation corridor to manage travel demand from rapid population and employment growth and development • Provide roadway capacity, mobility, and accessibility for developing areas by providing more direct links to existing major radial highways • Serve population areas that currently lack major limited-access facilities for inter-suburban travel • Provide the basic transportation infrastructure necessary to allow for expansion that accommodates varied travel demands or modes as warranted	Qualitative/ Quantitative
Data Availability	• Zoning maps • Census 2000 data • Land use/comprehensive plans • MTP • Discussions with the Cities of Anna, McKinney, and Melissa and Collin County	Qualitative/ Quantitative

5.8.1.3 Boundaries of the Indirect Effects Study Area

The TRB NCHRP Report 466 states that "development effects are most often found up to one-mile around a freeway interchange, up to two to five miles along major feeder roadways to the interchange." The TRB NCHRP Report 466 continues to state there are certain general circumstances which may influence the likelihood of induced development shifts. Thus, the two to five-mile boundary serves as a guideline and individual projects must be analyzed case-by-case.

Based on the project study team knowledge of local social, economic, environmental, and transportation network conditions and an analysis of whether any induced development-shifting circumstances were present, a three-mile radius around the US 75 project was established as the area of influence (AOI) for potential indirect effects (see Figure 22). A three-mile area was used because of other existing roadways (FM 455 and FM 545) that run parallel to the proposed Collin County Outer Loop. Also, the Collin County Outer Loop Segment 1 would connect to US 75 and SH 5, which are major existing north-south roadways. These existing roadways would also influence the social, economic, and natural environmental conditions. Therefore, the effects on development induced by the proposed improvements would be expected to diminish beyond a reasonable distance. The AOI encompasses approximately 36,370 acres and includes portions of Collin County and the Cities of Anna, McKinney, Melissa, and Weston.

The temporal component of the AOI is the timeframe in which impacts to resources are expected to occur, which is 2010 to 2030. Extending the timeframe forward to 2030 for indirect effects matches *Mobility 2030 - 2009 Amendment*, the MTP for the region.

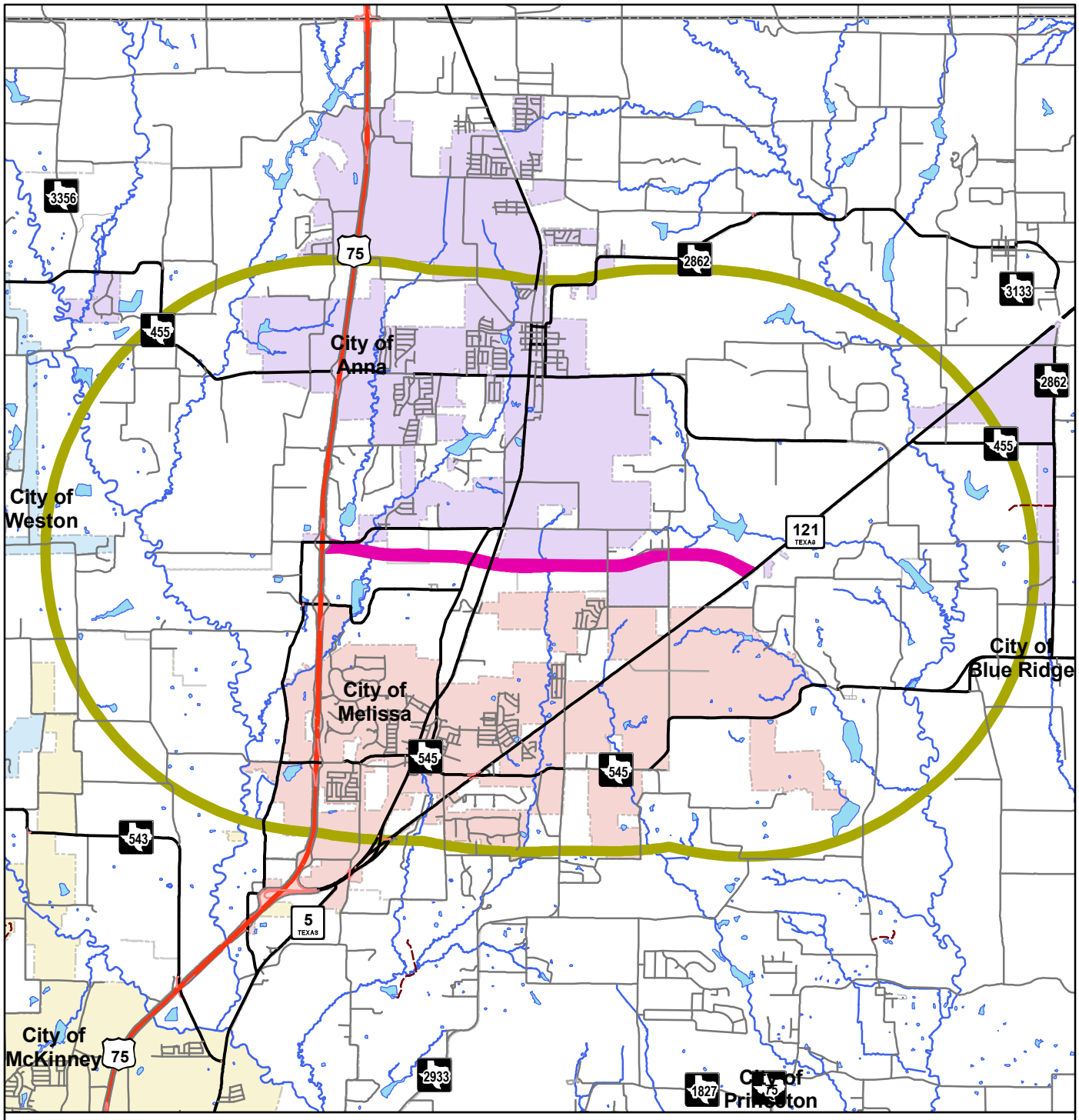
5.8.2 Step 2 – Identify the Study Area's Goals and Trends

Goals were drawn from *Mobility 2030 - 2009 Amendment,* future land use plans of the municipalities within the AOI, and communication with planning staff for the local governments. Trends were determined through analysis of US Census data, the NCTCOG 2030 Demographic Forecast, historical land use data, and Texas Education Agency (TEA) data. The indirect impacts of the proposed facility are among the many factors that will affect the rate at which these goals are met or whether the identified trends continue.

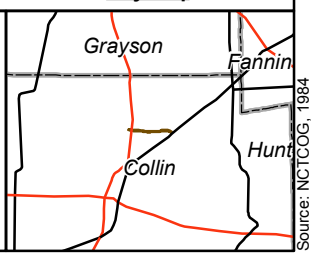
5.8.2.1 Goals

Regional transportation goals have been established to guide the development of the current MTP, *Mobility 2030 - 2009 Amendment.* The MTP is federally mandated. It identifies transportation needs; guides federal, state, and local transportation expenditures; and is the basis for project specific studies. The three categories of goals are transportation, quality of life, and financing (see Table 19). The goals adopted as part of MTP represent the Dallas-Fort Worth regional commitment to a comprehensive, cooperative, and continuous transportation planning process for a balanced transportation system by recognizing the evolving transportation and air quality needs of the region.

Mobility 2030 - 2009 Amendment includes the Collin County Outer Loop (Corridor 4). The MTP also proposes an 18-mile extension of the existing DART Red Line light rail line. This corridor passes through the Cities of Allen, McKinney, and Plano and Town of Fairview along a former freight railroad now owned by DART.



Key Map



Source: NCTCOG, 1984

Collin County Outer Loop Segment 1
Local Environmental Document

Area of Influence

US 75 to SH 121

Figure 22

North Central Texas Council of Governments

Transportation Department

Table 19 *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 the Safety of the Transportation System • 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 • 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 Sources for the Funding of Transportation Improvements • Develop Cost-Effective Transportation Projects, Programs, and Policies Aimed at Reducing the Capital and Operating Costs of the Transportation System • Prioritize Transportation Funds to Ensure the Maintenance of the Current and Future Transportation Systems • Preserve Rights-of-Way for Transportation Investments in Advance of Economic Development

Source: *Mobility 2030: The Metropolitan Transportation Plan, 2009 Amendment*, April 2009

A variety of plans and policies exist in the AOI to promote, guide, and monitor various development activities ranging from regional transportation infrastructure to land development. Municipalities use planning documents to plan and manage land use, growth, and public services and infrastructure in their jurisdiction.

- City of Anna - Anna adopted a future land use map in 2006 and is currently updating its comprehensive plan. The draft comprehensive plan identifies eight general goals.
  - Land Use and Growth: Encourage sustainable growth that preserves and enhances the character of Anna and ensures compatibility of land uses in the community.
  - Transportation: Provide a balanced transportation system that is integrated locally and regionally, supports alternative modes of transportation, and is pedestrian friendly.
  - Public Facilities and Services: Provide efficient and progressive public facilities and services that accommodate future growth and meet the community's changing needs.
  - Housing: Achieve a thriving Anna housing market that offers appealing neighborhoods with diverse housing choices.
  - Economic Development: Promote a healthy and diversified economy that fosters a competitive business environment and offers opportunities for employment and entrepreneurship.

  - Urban Design: Promote an attractive and aesthetically pleasing public realm that preserves and enhances the city's history and built environment.
  - Downtown: Establish a dynamic environment that is integrated into the social and economic fabric of the city, promotes broad awareness, and sustains the downtown as a regional destination.
  - Education: Enhance Anna as "y(our) home town" with opportunities that support people of all ages to compete successfully in a global economy.
- City of McKinney – The City of McKinney Comprehensive Plan was originally adopted in March 2004. It has been amended several times with the most recent revision in January 2010. The plan includes 14 goals, each with numerous objectives. These goals serve as the vision for the community.
  - Economic development vitality for a sustainable and affordable community
  - Preservation of historic McKinney
  - Attractive hometown that promotes McKinney's character
  - Leisure and recreational opportunities
  - Financially sound city government
  - Utility and infrastructure systems (water supply, wastewater treatment, storm drainage, etc.) adequately serving existing and future residents, businesses, and visitors
  - A multi-modal transportation network that is clean, safe, and efficient
  - Attractive urban design elements (gateways, corridor treatments, edges, and view sheds)
  - Public safety services consistent with community values
  - A managed traffic flow and thoroughfare system
  - Land use compatibility and mix
  - Protect environmental resources of McKinney
  - Affordable services that enhance the quality of life
  - Well planned future
- City of Melissa – The City of Melissa *Comprehensive Plan 2006* is the long-range planning tool to be used by city staff, decision-makers, and residents to guide the growth and physical development of the community. The plan includes various elements: land use, transportation, parks and trails, public services and facilities, and the city center concept plan. Each element includes specific goals, objectives, and policies.
- City of Weston – The City of Weston does not have a comprehensive or thoroughfare plan that establishes community goals.

5.8.2.2 Trends

Changes in population from previous years can help indicate future growth patterns. Table 20 shows the historical population trends for cities within the AOI based on data from the US Census Bureau and NCTCOG. The cities within the AOI experienced substantial growth from 1990 to 2000 with population increases ranging from 35.5 to 155.5 percent. During this same time, the county grew by 86.2 percent. Between 2000 and 2010, the trend continued with the cities growing between 124.1 percent and 561.2 percent. The total growth within the cities over the 20-year period was about 24.5 percent per year for a total of over 490.7 percent.

Table 20. Historical Population Trends within the AOI

Area	1990 Population[1]	2000 Population[1]	2010 Population[2]	Percent Change (1990-2000)	Percent Change (2000-2010)	Percent Change (1990-2010)
Anna	904	1,225	8,100	35.5%	561.2%	796.0%
McKinney	21,283	54,369	121,850	155.5%	124.1%	472.5%
Melissa	557	1,350	4,400	142.4%	225.9%	689.9%
Weston	362	635	N/A	75.4%	N/A	N/A
Collin County	264,036	491,675	786,250	86.2%	59.9%	197.8%

Source: 1 US Census, 2010; 2 NCTCOG, 2010

Table 21 shows the current demographic forecast for the cities within the AOI and Collin County. According to the NCTCOG data, the rate of employment and population growth in the AOI based on the NCTCOG 2030 Demographic Forecast grid is projected to be higher than the county.

Table 21. Population and Employment Projections within the AOI

Area	2000		2030		% Change 2000-2030	
	Population	Employment	Population	Employment	Population	Employment
Anna	1,169	35	1,247	141	6.7%	302.9%
McKinney	53,725	26,293	225,933	74,750	320.5%	184.3%
Melissa	1,349	147	5,375	840	298.4%	471.4%
Weston	N/A	N/A	N/A	N/A	N/A	N/A
Collin County	492,276	204,057	1,166,645	517,264	137.0%	153.5%

Source: NCTCOG 2030 Demographic Forecast, 2003

The AOI population is expected to grow at a rate of 357 percent compared to the Collin County rate of 137 percent. The projected rate of employment growth is higher, at 510 percent compared to the countywide rate of 154 percent. The population projections for the City of Anna do not reflect the actual population growth within the city between 2000 and 2010 shown in Table 21. The predicted growth is underestimating the actual growth that is occurring, which further exemplifies the fast rate of growth. Melissa and McKinney are projected to grow at a faster rate than the remained of the county. All three employment projections indicate that the cities in the AOI are expected to add jobs at a faster rate than Collin County as a whole. Based on the comprehensive plans of each municipality, the estimated build out population and year are shown in Table 22.

Table 22. Build Out Populations

Municipality	Estimated Build Out Population	Estimated Build Out Year
Anna	100,000	not available
McKinney	375,000 to 400,000	not available
Melissa	95,700	2045

Source: Draft *City of Anna Comprehensive Plan 2010-2030*, *City of McKinney Comprehensive Plan, and* City of Melissa *Comprehensive Plan 2006*

The AOI contains 36,370 acres of land. According to the 2005 NCTCOG land use dataset, approximately 12 percent is currently developed for residential, commercial, or industrial uses and 80 percent of the land in the AOI is vacant. The remaining acreage percent is designated as water and other land use types such as infrastructure, park, and floodplains. Table 23 shows the land use types for the indirect affects area for 1995, 2000, and 2005. Between 1995 and 2005, almost 15 percent of the land within the AOI was converted from vacant or undeveloped land to other types of use.

Table 23. Land Use Trends within the AOI

Land Use	1995	2000	2005
Vacant or undeveloped	94.1%	87.5%	79.5%
Residential	3.3%	6.9%	10.7%
Commercial or Industrial	0.2%	0.4%	1.4%
Other	2.4%	5.1%	8.4%

Source: NCTCOG Land Use 1995, 2000, and 2005

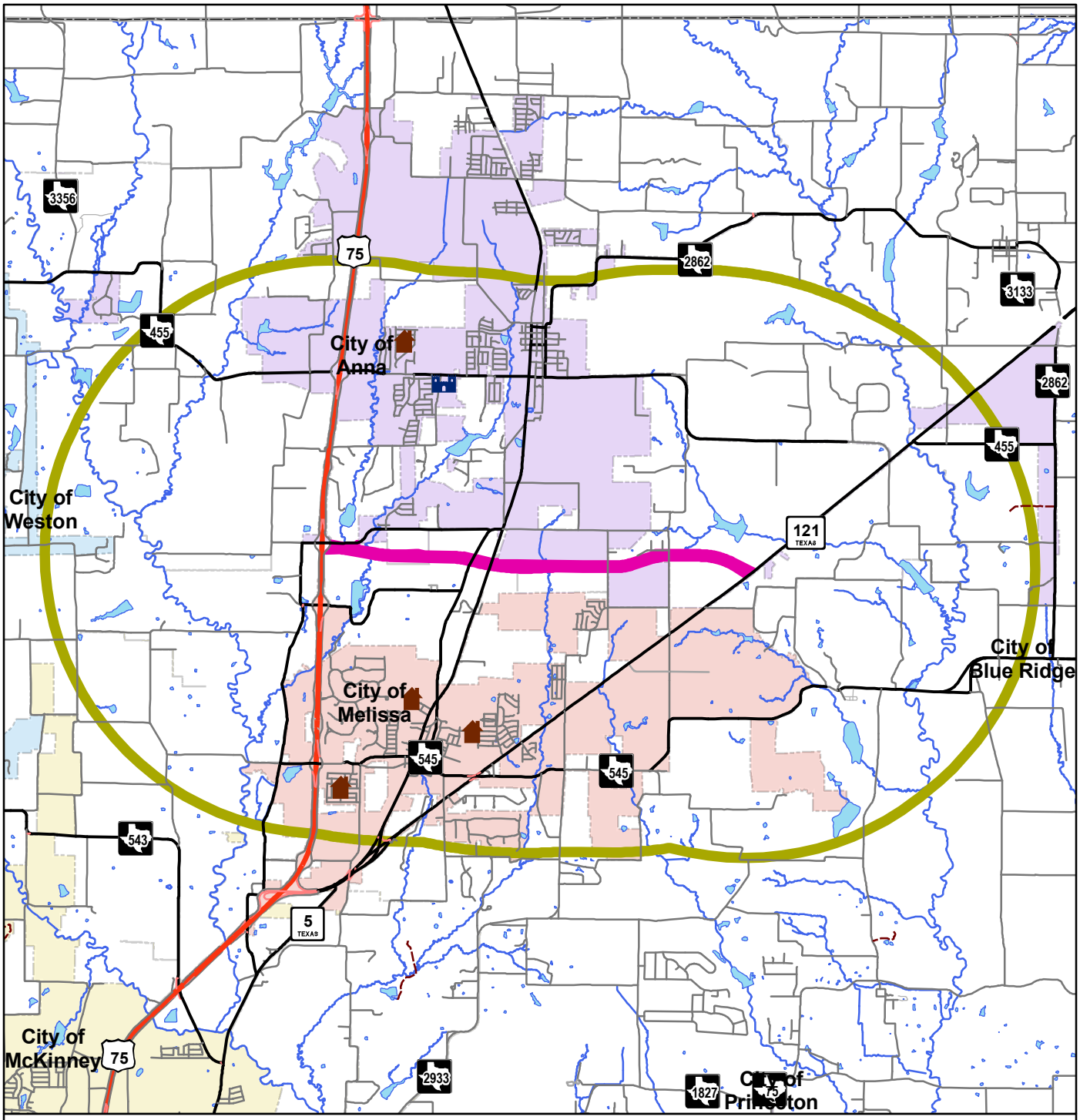
The unincorporated land outside of an extraterritorial jurisdiction (ETJ) is solely under the jurisdiction of Collin County. The small portion of the AOI south of CR 413 and east of CR 412 falls into this category. According to Collin County staff, no developments are planned in this area. No planned developments have been identified within the city limits or ETJ of the Cities of McKinney or Weston. The NCTCOG maintains a development monitoring database that tracks major developments that are either existing, under construction, announced, or in the conceptual stages within the NCTCOG region. Major developments are defined as having over 80,000 square feet and/or 80 employees. As shown in Table 24 and Figure 23, the City of Melissa has three residential developments and the City of Anna has one retail and one residential development that are either planned or under construction.

Table 24. Major Developments within the AOI

City	Number of Developments	Development Types
Anna	2	Retail, Single-Family
McKinney	0	none
Melissa	3	Single-Family
Weston	0	none

Source: NCTCOG Development Monitoring, 2009

The future land use plans of the Cities of Anna, McKinney, and Melissa extend to their ETJ boundaries. There are no published land use plans for the City of Weston. While only about 30 percent of the land within the AOI is currently within the city limits of any of these municipalities, the three future land use plans cover more than 90 percent of the area under study. The portion of the AOI outside of city limits but within the ETJ is not under any zoning ordinances, but development within the area must comply with the subdivision regulations of one of the three cities. As development continues in the area, all three cities are expected to expand their city limits to encompass the majority of land within their ETJs. The predominant land uses within the AOI for each city are shown in Table 25.



COLLIN COUNTY

Collin County Outer Loop Segment 1
Local Environmental Document

Major Developments

US 75 to SH 121

Figure 23

North Central Texas Council of Governments

Transportation Department

Table 25. Predominant Land Use Patterns within the AOI

City	Type	Extent
Anna	Industrial	Along US 75 and SH 121
	Commercial	Along US 75, SH 5, SH 121, and at intersections along FM 455 and the proposed facility
	High Density Residential and Mixed-Use	Along SH 5 and the proposed facility
	Low to Medium Density Residential	Most of the remainder of the AOI within the city ETJ
McKinney	Community Village	Near the intersection of County Road 206 and Melissa Road
	Residential	Most of the remainder of the AOI within the city ETJ
Melissa	Industrial	Along SH 5, SH 121, and FM 545
	Commercial, Retail, or High Density Residential	Along SH 5 and SH 121
	Mixed-Use	Along US 75 and the planned facility
	Low to Medium Density Residential	Most of the remainder of the AOI within the city ETJ

Source: Draft *City of Anna Comprehensive Plan 2010-2030*, *City of McKinney Comprehensive Plan, and* City of Melissa *Comprehensive Plan 2006*

According to the TEA, there are four school districts located in the indirect effects study area. These school districts exhibit moderate growth over the past four years as show in Table 26.

Table 26. School District Enrollment Trends within the AOI

District Name	2005-2006 Enrollment	2008-2009 Enrollment	Four-Year Change	Percent Change
Anna ISD	1,533	2,148	615	40.1%
Blue Ridge ISD	655	632	-23	-3.5%
McKinney ISD	19,743	23,401	3,658	18.5%
Melissa ISD	804	1,256	452	56.2%

Source: Enrollment Reports 2005-2006 and 2008-2009; TEA, 2010 http://ritter.tea.state.tx.us/peims/

5.8.3 Step 3 – Inventory the Study Area's Notable Features

Notable features that could potentially be indirectly impacted within the AOI include sensitive species and habitats; valued environmental components; relative uniqueness, recovery time, and unusual landscape features; and vulnerable elements of the population. The notable features in the AOI consist of the following:

5.8.3.1 Sensitive Species and Habitats

Sensitive species and habitats are those ecologically valuable species and habitats and/or those that are vulnerable to impacts. Two federally listed species and 14 state listed species were identified for Collin County (see Table 13). Additionally, the NDD records identified four protected plant series within AOI. These series included three little bluestem-Indian grass series and one American elm-chinkapin oak-hackberry series.

Three larger streams (Throckmorton Creek, Slayter Creek, and Clemons Creek) were identified within the AOI with one minor unnamed tributary. These streams and the 100-year floodplain are shown on Figures 20 and 21. There are approximately 324,548 linear feet (approximately

61.5 miles) of stream, 405 acres of lakes and ponds, and 342 acres of potential wetlands within the AOI. Approximately 5,241 acres of floodplains are associated with these water bodies in the AOI.

5.8.3.2 Valued Environmental Components

Valued environmental components are those characteristics or attributes of the environment that society seeks to use, protect, or enhance. There are 11 state historical markers with the AOI but no public parks or recreational areas.

5.8.3.3 Relative Uniqueness, Recovery Time, and Unusual Landscape Features

Relative uniqueness refers to how many comparable examples of the element exist at different levels of scale. Recovery time refers to how long it would take to replace the landscape element if it were disturbed or destroyed. Unusual landscape features are those that occur once, or only a few times, across a landscape. The vegetation and water body features previously discussed under sensitive species and habitats features are also included because these features are relatively unique to the AOI, would require a long recovery time, and only occur a few times across the landscape.

5.8.3.4 Vulnerable Elements of the Population

Vulnerable elements of the population may include the elderly, children, persons with disabilities, minority groups, and low-income groups. Vulnerable elements of the population exist in the AOI. There are eight public schools (four elementary, two middle/junior high, and two high schools), one assisted-living facility, and two licensed daycare facilities within the AOI.

The AOI is includes portions of two census tracts (0301.00 and 0302.00) with the vast majority of the AOI within tract 302.00. As shown in Tables 9 and 10 in Section 5.1.8.1, minority populations exist within these census tracts; however, there are no low-income populations within the AOI.

5.8.4 Step 4 – Identify Impact-Causing Activities of the Proposed Action and Alternatives

Indirect effects are commonly related to land use changes. Generally, it would be reasonable to expect that projects on new locations or larger scale projects (e.g., upgrading an existing facility arterial to a controlled-access freeway) would have more potential to cause indirect effects than smaller scale projects or projects being constructed in already developed areas. To help understand the range of impacts, the direct project-related impacts are listed and discussed in Table 27.

Table 27. Potential Impact-Causing Activities

Type of Activity	Project Specific Activity	Relevant Details
Modification of Regime	Alteration of habitat and ground cover	Over 93 percent of land within the proposed right-of-way is classified as vacant, about 44 percent is currently cropland and 21 percent is open grassland or pasture. The dominate vegetation is agricultural crops of corn (38 percent of the study corridor). The total amount of area that would potentially be disturbed by the proposed project would be approximately 268 acres with approximately 59 acres of this amount being woody vegetation. The proposed project would cross Throckmorton Creek, Slayter Creek, Clemons Creek, and other water crossings. The design includes 20 culverts to maintain hydraulic conditions. The proposed project would not create substantial ecological encroachment-alteration effects to these streams.
Land Transformation and Construction	Construct new transportation facility	The project involves the initial construction of the ultimate two-lane westbound access road from US 75 to SH 121 and the purchase of the ultimate right-of-way (500 feet wide). See Section 4.2.2 for more information.
Processing	Storage of construction material	No construction easements would be required. The project involves the initial construction of the ultimate two-lane westbound access road from US 75 to SH 121 and the purchase of the ultimate right-of-way (500 feet wide). See Section 4.2.2 for more information.
Land Alteration	Construct new transportation facility	As mentioned in Section 5.1.1, the existing land use within the proposed right-of-way is approximately 93 percent vacant, six percent single-family residential, and less than one percent each of mobile homes and water. Of the land classified as vacant, about 44 percent is currently cropland, 21 percent is open grassland or pasture, and the remainder is lightly forested. The project would convert this land to roadway use.
Resource Renewal	Revegatation	The proposed project would permanently convert these vegetation communities to transportation use, either a conversion to pavement (18 acres) or a conversion to a maintained roadway right-of-way (268 acres). Approximately 59 acres of woody vegetation could be removed. These woody areas include small and large woody species, with approximately 37 acres (63 percent) riparian woody vegetation. The primary impact to vegetation resulting from right-of-way preparation and construction of the Build Alternative would be the removal of existing vegetation within the proposed right-of-way. Existing vegetation would be preserved wherever possible. Vegetation communities would be directly impacted by heavy machinery such as bulldozers. Impacts to vegetation communities adjacent to the proposed right-of-way would be minimized through an efficient construction phasing and the implementation of BMPs such as silt fencing during construction. Vegetation areas that would not be re-vegetated would re-vegetate naturally.
Changes in Traffic	Changes to travel patterns	The project would establish a new east-west transportation corridor. This proposed project would provide accessibility for developing areas by providing more direct links to existing major radial highways.

Table 27. Potential Impact-Causing Activities (continued)

Type	Project Specific Activity	Relevant Details
Waste Emplacement and Treatment	Construction	Soil excavated from the project area would likely be used for this project or sold for other uses, depending on the results of soil testing. The contractor, when selected, may chose to provide portable sanitary facilities for employees at the field office. No other sanitary waste discharge is anticipated.
Chemical Treatment	Revegatation	Fertilizer would be used during re-vegetation. Periodic applications of herbicide may occur during the maintenance phase of the proposed project.
Access Alteration	Changes in access and circulation patterns	The project would establish a new east-west transportation corridor. This proposed project would provide accessibility for developing areas by providing more direct links to existing major radial highways.

5.8.5 Step 5 – Identify Potentially Substantial Indirect Effects for Analysis

Based upon the information provided in the previous steps, this step identifies which indirect effects may be substantial. Impacts identified as substantial may require further analysis. Types of indirect effects include:

- Encroachment-Alteration - Those effects that alter the behavior and functioning of the physical environment. These effects are related to project design features, but are separated from the project by time and/or distance.
- Induced Growth Effects - Changes in traffic, access, and mobility can result in changes in land use. Roadway projects may promote development or influence an increase in the rate of development.
- Induced Growth-Related Effects - Those effects that are attributable to the induced growth itself.

Because the project would create a new transportation corridor, the project has the potential to cause all three types of indirect effects to the social, economic, and natural environment. To help identify potential substantial indirect effects, discussions with the cities in the AOI and Collin County were conducted to determine how the Collin County Outer Loop Segment 1 may affect their growth and development. The following sections provide a context for identifying the potential type of indirect effect by summarizing the discussions with local officials and reviewing the resources in the AOI.

5.8.5.1 Contact with Local Officials

The study team conducted meetings with officials from the local jurisdictions through which Segment 1 of the Collin County Outer Loop would be constructed. These officials have jurisdiction over land uses through a combination of zoning, local government plans (i.e., comprehensive plans), and policies. Specifically, the local officials were asked how development would occur if the project were constructed compared to how it would occur if Segment 1 of the Collin County Outer Loop were not constructed. The following summarizes these discussions.

<u>City of Anna</u>

The population of Anna has quadrupled since 2000 and is projected to continue to increase in the coming years. City staff stated that the Build Alternative for Segment 1 of the Collin County Outer Loop is expected to support additional residential and commercial development within

Anna. By improving access to US 75 for the southern part of the city, the project could make existing residential developments, such as Anna Ranch and Pecan Grove, more attractive and spur the additional development indicated in the future land use plan for the city. According to city staff, the facility could also spur mixed use and commercial development along SH 5 within Anna.

Indirect transportation impacts of the Build Alternative are anticipated by Anna. The Build Alternative is included in the city thoroughfare plan. By providing an additional connection between SH 121 and US 75 the facility would relieve congestion along FM 455 in Anna.

City of Melissa

The population of Melissa has tripled since 1990 and is projected to increase in the coming years. City staff stated that the Build Alternative is expected to support additional residential and commercial development within Melissa. By improving access to US 75 for the northern part of the city the project could make existing residential developments, such as North Creek, more attractive and spur the additional development indicated in the future land use plan for the city. According to city staff, the facility could also spur commercial development along US 75 within Melissa by increasing daily traffic along the frontage roads. Indirect transportation impacts of the Build Alternative are anticipated by Melissa.

The Build Alternative is included in the city thoroughfare plan. By providing an additional connection between SH 121 and US 75 the facility would relieve congestion along SH 121 in Melissa and at the US 75 and SH 121 interchange. Heavy vehicles that currently travel along SH 121, including the truck traffic generated by the North Texas Municipal Water District facility, would use the facility to bypass the residential neighborhoods along that route.

City of McKinney

The city land use and transportation plans include the proposed Collin County Outer Loop facility. City staff indicated indirect transportation and development impacts of either the Build or No Build Alternative would be minor. Some land within the ETJ of McKinney, west of the East Fork Trinity River and south of CR 281, is located within the AOI. The planned private development within this area, the Trinity Falls Master-Planned Community, is expected to proceed under both the Build and No Build Alternatives.

City of Weston

The recent deannexation of a sizeable portion of Weston makes the future of the city uncertain. Most of the elected leadership of the city no longer reside within the city limits and, therefore, are no longer eligible for office. Existing development and transportation plans for the city will need to be reevaluated because of these changes and cannot be included in this analysis.

5.8.5.2 Assessment of Resources

Land Use

Community plans have been made based on the construction of Collin County Outer Loop Segment 1. Examples of development contingent on the proposed facility project include: single-family, retail, office, mixed-use, and industrial development in the City of Anna and the City of Melissa along the proposed facility and near where it intersects US 75. Overall, the Build Alternative would be expected to induce more development along the proposed facility than the No Build Alternative, especially around the major intersections, including US 75, SH 5, and SH 121. This development represents the potential indirect impacts of Collin County Outer Loop Segment 1.

The local planners anticipate no induced development-shifting circumstances (i.e., development shifting from one community to another) would occur under either the Build or No Build Alternatives. This is because land development depends on several other key factors being present. For instance, the construction of Collin County Outer Loop Segment 1 would not be the sole factor contributing to the potential redistribution of development from some other geographic area. Other necessary factors include the extent and maturity of existing infrastructure, land availability, price, state of the local and regional economy, area vacancy rates, location attractiveness, local political and regulatory conditions, and land use controls. Consideration of these potential future circumstances is considered too speculative and cannot be meaningfully evaluated within the scope of this study.

Community Cohesion

It is unlikely that additional development in the area would result in a reduction of community cohesion. However, groupings of rural homesteads within the AOI may be considered communities even though they are physically dispersed. In sparsely settled rural environments, cohesive connections between "neighbors," who may be several miles distant, can be as important as the sense of identity shared by residents of dense urban neighborhoods. The relative success of these and other small enclaves in retaining a measure of identity and cohesiveness in the face of spreading suburban growth depends on a number of factors, including the pace of new development and the commitment of residents to retain important elements, such as institutional practices, public facilities, cultural events, architectural styles, and economic patterns, in the face of change.

The projected development under the Build and No Build Alternatives would not cause a decrease in community cohesion or isolate any neighborhoods within these communities. Growth of each forecasted development would occur in open areas and serve the local neighborhoods and communities with more residential development, or support these communities by providing commercial resources. These developments would not cause any disruption or isolate public services or facilities from other neighborhoods or communities in the AOI.

Economic

The construction of Collin County Outer Loop Segment 1 would have direct and indirect impacts on regional employment and tax impacts. The anticipated indirect economic impacts for the Build Alternative would be the additional customers for local business from construction workers. These indirect impacts are not directly quantifiable. The No Build Alternative would not cause any indirect economic impacts because of construction.

Public Facilities and Services

Municipalities within the AOI would likely be required to provide additional public services and facilities under either the Build or No Build Alternatives. The need for additional public services, particularly emergency services, is based on response times. A decrease in time needed for responders to reach persons and facilities in their service areas is preferred. Improved roadways, including tollroads, usually facilitate quicker response times and expedite access. It is incumbent upon community leaders and public service entities to be apprised of areas under development and to evaluate needs for additional fire stations, police stations, and emergency response services. The potential for adverse indirect impacts to the public facilities located within the AOI is unlikely as transportation improvements typically improve congestion, mobility, and access.

Air Quality

The project is located in Collin County, which is part of the EPA designated eight-hour, nine-county nonattainment area for the pollutant ozone. The proposed improvements involve a new location roadway that would redistribute traffic. This could reduce pollutions from idling and accelerating vehicles for VOCs, CO, and NOx. The roadway would cause some traffic to move closer to residents and human activity and may cause a slight increase in some air pollutants at specific locations as direct effects.

Farmland

Within the AOI there are approximately 17,467 acres of prime farmland. Because no specific developments have been identified as being induced by the Build Alternative, this project is not expected to have significant indirect impacts on farmlands. Some of the prime farmland could be affected by development under both the Build and the No Build Alternatives.

Biological

The threatened or endangered species discussed in Section 5.2.3 could be indirectly impacted by the proposed facility. Although none of these species are found within the project area, it is possible that a species could migrate through the area, using available vegetation and streams. Common rural and urban wildlife also use the natural habitat present in the area. As undeveloped and agricultural land is rezoned for residential and commercial use, large areas of herbaceous and woody vegetation and various stream systems could be impacted by the infrastructure associated with suburban growth. The vegetation and streams within the corridor are connected to other vegetated areas both north and south of the roadway, creating open corridors that can be used by roaming aerial and terrestrial animals. Development along the corridor would divide existing vegetation into small, distinct segments surrounded by man-made structures instead of the existing continuous corridors, effectively removing travel corridors for any roaming animals.

Water Quality, Wetlands, and Waters of the US

Development under both the Build and No Build Alternatives would result in some adverse impacts to water resources through water quality degradation. Development impacts that contribute to water quality degradation include increased impermeable surface and increased non-point source pollution (e.g., from fertilizers, pesticides, sediments, and vehicle residues). The indirect impacts of this development can include increased storm water runoff velocities and pollutant loads leading to water quality impacts. The network of future roadways and subdivision streets associated with forecasted development could contribute both direct and indirect effects previously described. However, the density and composition of future development within the area would determine the amount and type of the runoff. Within the AOI, no water bodies were listed on the 2008 Texas State Water Quality Inventory Section 303(d) list.

Under both the Build and No Build Alternatives, some degradation of waters of the US, including wetlands, may occur from forecasted development within the AOI. Potential effects to waters of the US from development include placement of fill and degradation of functions through encroachment and as a result of increased runoff. Within the AOI, there are approximately 324,548 linear feet (approximately 61.5 miles) of stream, 405 acres of lakes and ponds and 342 acres of potential wetlands. Because no specific developments have been identified under either the Build or No Build Alternatives, the potential indirect impacts to streams and wetlands cannot be quantified.

These quantifications represent an estimated maximum potential effect from forecasted development through 2030. Data sources for quantifications included the NCTCOG streams

and lakes datasets for estimating linear feet and miles of streams and acres of lakes and ponds. This dataset includes many features which may not be determined to be jurisdictional after field verification. For example, the streams quantified in the AOI likely include water courses upstream of the jurisdictional limits of waters of the US. Acres of wetlands within the AOI were estimated using the 2001 National Land Cover Dataset. It is likely that many of these features mapped as wetlands are actually stock ponds that are non-jurisdictional. For this reason, it is unlikely that all water features within the AOI would be considered jurisdictional by the USACE and, therefore, subject to protection under Section 404 of the CWA. In addition, it is unlikely all waters of the US within the AOI would be impacted.

5.8.5.3 Summary

Based on the information in the previous sections, the construction of Segment 1 of the Collin County Outer has the potential to create all three types of indirect effects. Table 28 lists the type of effect by resource.

Table 28. Type of Potential Indirect Effect by Resource

Resource	Encroachment-Alteration	Access-Alteration Effects	Induced Growth-Related Effects
Social and Economic			
Land Use	Yes	Yes	Yes
Community Cohesion	Yes	Yes	Yes
Economic	Yes	Yes	Yes
Public Facilities and Services	Yes	Yes	Yes
Natural Resources			
Farmland	Yes	No	Yes
Biological	Yes	No	Yes
Water Quality, Wetlands, and Waters of the US	Yes	No	Yes

5.8.6 Steps 6 and 7 – Analyze Indirect Effects, Evaluate Results, Assess Consequences, and Consider/Develop Mitigation

The following section analyses the potential indirect effects of proposed Collin County Outer Loop Segment 1 on community cohesion, economic conditions, and public services and facilities and any potential mitigation.

5.8.6.1 Land Use

Based on the contacts with local planners, the expectation is their jurisdictions would experience similar commercial development with the Collin County Outer Loop Segment 1 than without it. Under the No Build, development would likely continue and land use changes would occur in AOI with economics the driving force for development. As a result, these areas would experience similar levels of income, employment, and earning opportunities, and additional tax revenues under either the Build or No Build Alternative.

The construction of Collin County Outer Loop Segment 1 would not increase the rate of the development within the entire AOI. Based on the discussions with the local planners, substantial development is already underway and would occur both with and without the proposed facility. Construction of the proposed facility could speed up the timeline of some of this development, but the location and speed of development would also be dependent on the communities within the AOI upgrading infrastructure, such as water, wastewater, and adjoining transportation facilities to support this new development.

The future land use plans that guide development are consistent with the Collin County Outer Loop Segment 1. The municipalities within the AOI have a variety of tools at their disposal to manage growth within their jurisdictions. Zoning, subdivision ordinances, and other land development requirements can be applied by municipal governments to ensure the orderly growth of their respective communities.

5.8.6.2 Community Cohesion

Changes to land use would not cause any disruption or isolate public services or facilities from other neighborhoods or communities in the AOI. The additional residential and commercial developments may cause an increase in community cohesion. New developments would increase the base population of these communities and potentially may function as a bridge between isolated neighborhoods (i.e., residential development) or create additional gathering places in the form of commercial development (i.e., supermarkets). Therefore, it is unlikely that Collin County Outer Loop Segment 1 would contribute to substantial adverse indirect community cohesion impacts.

5.8.6.3 Economic Conditions

Long-term employment and economic benefits would be favorable as a result of the Collin County Outer Loop Segment 1 project. Current development opportunities are transitioning this area from semi-rural communities to a more suburbanized area. This transition will result in the area cities serving as residential and service-providing supporting communities whose futures are more fully integrated into the economic dynamics of the Dallas area. Although tax revenues would increase, the increase in the rate of development within the AOI would also increase the demand for consumer services, including, but not limited to retail, banking, medical, and recreational.

5.8.6.4 Public Services and Facilities

The Build and No Build Alternatives would require additional public services to support the projected growth in the AOI. Based on standard urban and land use economics (e.g., *The Development of Urban Economics in the United States*, Harvey S. Perloff and *Histories of Cities and City Planning*, Cliff Ellis), tax revenue from commercial development is normally greater than the tax revenue needed to support it, and would not create revenue problems for the jurisdictions within the AOI. However, residential development uses more tax revenue than it generates creating the need for additional tax revenues. Potential negative indirect impacts to the public facilities located within the AOI are not anticipated.

5.8.6.5 Farmland

Farmland operations could be affected by development under the Build and No Build Alternatives. Under both alternatives, forecasted development could result in the acquisition of a farm or ranch from a willing seller. As a result, farming operations on that land would no longer occur. It is not possible to determine the extent of future effects to farm operations that could result under either of the Build or No Build Alternatives; however, the effect on farm operations is considered secondary to the effect of loss of the prime farmland from development and this effect is not considered substantial.

5.8.6.6 Biological

New induced development and associated roadway construction could result in the clearing of prairies and grassland, as well as the fragmentation of habitat. The proposed project would indirectly affect undeveloped land or potential wildlife habitat through permanent conversion of these habitats into homes and commercial sites. Any vegetation associated with a federal threatened or endangered species habitat would be protected under the Endangered Species Act (ESA) and would require mitigation if impacted. Additionally, each indirect development

could incorporate parks, green space, and tree coverage into their developments to offset the impacts to vegetation and wildlife habitat that was incurred.

5.8.6.7 Water Quality, Waters of the US and Wetlands

Section 401 of the CWA Water Quality Certification of Federal Actions, such as permits for work in jurisdictional waters, requires BMPs be used to control erosion, sedimentation, and post-construction total suspended solids. In addition, water quality effects from development would be minimized by implementing a SW3P in compliance with TPDES requirements and MS4 in conjunction with city improvements. For projects disturbing more than five acres under the TPDES, a NOI is required to be submitted to the TCEQ prior to construction. In addition to the federal and state regulations in place, many local government ordinances include provisions that provide some level of water pollution prevention. This includes varying levels of water quality protection measures through processes such as site plan approval and construction site inspections to verify implementation of SW3Ps. Substantial differences in effects to water quality are not anticipated between the Build and No Build Alternatives.

Changes in land use and related effects on wetlands and waters of the US are currently occurring and are expected to continue. New induced development and corresponding excavation or increases in stormwater flow could encroach upon and/or affect aquatic resources by changing vegetation/wildlife habitat or hydrology and therefore, potentially the size, functions, or value of the resources.

Regardless of whether the forecasted developments would be public or private, these developments would have to comply with Section 401 and 404 of the CWA. The USACE administers Section 404 of the CWA and operates under a "no net loss" policy for protected wetlands, requiring avoidance and minimization of impacts, and compensatory mitigation for unavoidable impacts. Because of the USACE regulations, any potential loss of waters of the US from the indirect developments would be mitigated for to compensate the loss.

5.9 CUMULATIVE IMPACTS

Cumulative impacts are defined in 40 CFR 1508.7 as impacts "on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Cumulative impacts tend to be less defined than indirect impacts and are therefore more difficult to quantify.

Because this is a transportation project, the majority of the guidance and methodology was based on the *Revised* G*uidance on Preparing Indirect and Cumulative Impacts Analysis* developed by TxDOT dated June 2009. The document includes an eight-step approach to identify and evaluate potential cumulative impacts of the proposed project in combination with other past, present, and reasonably foreseeable actions. The following list the eight-step process utilized in this cumulative impact analysis:

1. Identify the resources to consider in the analysis.
2. Define the study area for each affected resource.
3. Describe the current health and historical context for each resource.
4. Identify direct and indirect impacts that may contribute to the cumulative impact.
5. Indentify other reasonably foreseeable actions that may affect resources.
6. Assess potential cumulative impacts to each resource.
7. Report the results.
8. Assess and discuss mitigation issues for all adverse impacts.

For a cumulative effects analysis to be worthwhile it must be limited through scoping to the effects that can be evaluated meaningfully. A significant cumulative effect on the environment means a significant, or potentially significant, adverse or beneficial change in any of the physical conditions within the area affected by the project that results from the compounded or incremental individual environmental effects. Of particular importance is the assumption concerning compliance with relevant environmental laws designed to ensure the sustainability of resources. Over the past several decades federal, state, and local lawmaking bodies have enacted statutes, regulations, and ordinances designed to preserve and enhance the abundance and quality of natural resources by requiring project sponsors to avoid, minimize, and mitigate the environmental impacts of their projects or actions. Therefore, cumulative impact analyses focus on the "net effects" on each resource that remain after full compliance with the regulatory requirements at all levels.

5.9.1 Step 1 – Identify the Resources to Consider in the Analysis

Resources that are substantially impacted by the project and/or resources that are currently in poor or declining health or a risk should be evaluated during the cumulative impact analysis. Based on the analysis in Sections 5.1 through 5.7, the proposed project would not have substantial direct or indirect impacts to resources. However, even though the direct and indirect impacts may be relatively minor, this analysis of cumulative effects focuses on resources that are affected by the proposed project and considered to be at risk. The resources identified include farmland, socio-economic, and waters of the US.

5.9.2 Step 2 – Define the Study Area for Each Affected Resource

For the purpose of assessing cumulative impacts, Step 2 identifies the geographical extent of the resource study area (RSA) and the temporal RSA considered in this cumulative impacts section. The geographical RSAs were identified for each resource:

- Farmland – The RSA for farmland includes the soils associated with the Blackland Prairie region.
- Socio-Economic – The RSA for this resource was identified as the cities within the AOI in the indirect impacts section. These cities would be the Cities of Anna, McKinney, Melissa, and Weston.
- Waters of the US – The RSA for this resource is the Trinity River Basin, which drains all the water within the Dallas-Fort Worth region.

Temporal resource study was defined as a temporal span from 1990 to 2030. This time frame was chosen because it evenly divides past and future actions. Available information for past growth and patterns were readily accessible from 1990 and later. The upper limit was chosen because future forecast for demographics and roadways are based on the MTP, which based future growth for 2030.

5.9.3 Step 3 – Describe the Current Health and Historical Context for Each Resource

Patterns or activities that have contributed to the current condition of the resources/issues considered in this cumulative impact analysis would not differ greatly with the proposed project because growth and development is taking place independently, and to varying degrees, are currently occurring and expected to continue. The health of each resource considered in this analysis is summarized in Table 29.

Table 29. Resource Health and History

Resource	Current Health and Historical Context
Farmland	Declining – According to the USDA National Agriculture Statistics Service, between 2002 and 2007 the average farm size in Collin County has decreased by 12 percent and the number of acres in each farm decreased by seven percent. As discussed in previous sections, the area has experienced rapid growth in the past, which resulted in conversions of rural land to developed lands, resulting in a loss of farmland.
Socio-Economic	Changing – As growth occurs in the RSA, changes to the social and economic health is fluctuating. Past rapid growth, as discussed in previous sections, caused a shift in the social environment as the demographics on the populations changed. In addition, the influx of people will cause an increase of community resources such as libraries, places of worship, etc. The induced growth could cause an increase in commercial growth, increasing the economics of the RSA.
Waters of the US	Stable – Although loss of waters of the US and a degradation of water quality has occurred in the past due to construction, urbanization, and industrialization, modern changes to aggressive mitigation for loss of waters of the U.S through the USACE and water quality impacts has stabilized the impacts of growth and industry to the RSA.

Source: NCTCOG, 2010

5.9.4 Step 4 – Identify Direct and Indirect Impacts that may Contribute to a Cumulative Impact

The direct and indirect impacts for the proposed project have been discussed throughout the document. Direct impacts were identified in Sections 5.1 through 5.7. The indirect impacts were addressed in the indirect impacts portion of Section 5.8.

5.9.5 Step 5 – Identify Other Reasonably Foreseeable Actions that May Affect Resources

Reasonably foreseeable actions are those that are likely to occur, or are probable, rather than those that are merely possible. Reasonably foreseeable actions in the project area and AOI include major transportations projects (such as roadway widening and new location facilities), the identifiable land use changes from the future land use plans produced by the municipalities in the AOI and any additional information supplied by the county and municipalities through conversations with the city planners. Reasonable foreseeable actions through land use and the cities have been documented previously in this section.

Transportation improvements included those facilities recognized through the NCTCOG Transportation Improvement Program Information System (TIPINS) and through the MTP. Table 30 details all the known transportation projects occurring in the AOI.

Table 30. Future Transportation Projects

Project	Type	Limits
Airport Drive	New Roadway	Industrial Boulevard to US 380
Craig Ranch – Henneman Way	New Roadway	TPC Drive to Hewitt Drive
Craig Ranch – Hogan Way	New Roadway	TPC Drive to Weiskopf Avenue
Craig Ranch – TPC Drive	New Roadway	SH 121 to Collin-McKinney
Craig Ranch – Weiskopf Avenue	New Roadway	Collin-McKinney to SH 121
DART Red Line Extension	Rail Transit	Parker Road Station to McKinney
FM 2478 (Custer Road)	Addition of Lanes	US 380 to Stonebridge
FM 455	Addition of Lanes	US 75 NB frontage road to SH 121
FM 546	New Roadway	SH 5 to 0.192 mi east of CR 317
FM 720	Addition of Lanes	FM 2478 (Custer Road) to US 75
FM 720	Addition of Lanes	Hardin Boulevard to Ridge Road
Hardin Boulevard	Addition of Lanes	Eldorado Parkway to 700 feet north of Eldorado Parkway
Hardin Boulevard	New Roadway	FM 720 to SH 121
Hardin Boulevard	New Roadway	US 380 to Wilmeth Road
Hardin Boulevard	New Roadway	Virginia Parkway to Provine Road
Lake Forest Drive	Addition of Lanes	FM 720 to SH 121
Lake Forest Drive	New Roadway	US 380 to Virginia Parkway
Melissa Drive	Addition of Lanes	US 75 to SH 5
SH 121	Addition of Lanes	SH 5 to Fannin County Line
SH 5	Addition of Lanes	SH 121 to FM 455
US 380	Addition of Lanes	At FM 2478 (Custer Road)
US 75	Addition of Lanes	SH 121 south to Grayson County Line
Wilmeth Road	Addition of Lanes	Hardin Boulevard to High Pointe Boulevard

Source: NCTCOG GIS: TIPINS, 2009; *2030 Mobility - 2009 Amendment*

5.9.6 Steps 6, 7, and 8 – Assess Potential Cumulative Impacts, Report the Results, and Assess Mitigation for Adverse Impacts

5.9.6.1 Farmland

Impacts to farmland soils would occur through the projected growth discussed previously. As the present actions, direct impacts and indirect impacts from land use changes and roadway construction combine for cumulative impacts, a large portion of the AOI would see a conversion loss of farmland soils as the land is replaced with an urbanized area (homes, commercial, industrial, and transportation uses). Although the AOI would see a large portion converted, the RSA of the Blackland Prairie is a swath extending from Oklahoma to south Texas, and similar types of soils are found throughout the prairie, which consists of approximately 12.6 million acres. The total impact to the RSA would be small as significant portions of the Blackland Prairie are still intact for farming uses.

Farmland/ranching operations could experience a cumulative impact; however, this is very difficult to quantify. Linear transportation projects have the highest potential to impact agricultural operations by segmentation of farms, reducing the size of fields, or cutting-off or restricting access to fields. As show in Table 30, 23 separate roadway projects are planned for the cities in the AOI. These types of projects typically acquire only the extent of a land parcel necessary for the facility right-of-way, leaving the remainder of the parcel or farm. Other private development would likely acquire the entire farm from a willing seller, thus leaving no farm

operations to affect. It is not possible to determine the extent of future impacts to farm operations that could result under either the Build or No Build Alternatives. However, the impact on farm operations is considered secondary to the primary adverse impact resulting from the loss of important farmland. In addition, the majority of the proposed roadway improvements would occur in areas that have been previously developed, minimizing the impact to new farmland operations. The impact to farmland operations is not considered substantial.

There is no mechanism for mitigation for loss of farmlands or farmland soils. Minimization of loss of farmland and farmland soils could occur through control of invasive species on developed lands adjacent to farmland operations and erosion control measures on developed lands adjacent to farmland and prime farmland soils to prevent further erosion on farmland and farmland soils. Potential future loss of farmland could be limited by the implementation of more stringent local, state, and/or federal restrictions on the conversion of the farmland resource.

5.9.6.2 Socio-Economic

Specific data on past, present, and reasonably foreseeable future projects are not available such as, the amount of new right-of-way needed, the specific number of relocations that may occur, the neighborhoods or communities that may be affected by visual or noise impacts, community/public resources affected, and the potential economic impacts. Therefore, the potential cumulative impacts are not able to be quantified. However, given the trend of the past 20 years and expectations for the next 20 years, it appears that the potential cumulative socioeconomic impacts would generally be consistent with the previous impact on the trend that has resulted from population growth and land development in the RSA.

As described in Section 5.8, development within the city limits and ETJ of the Cities of McKinney, Melissa, and Anna would continue the growth trend in the northern portion of the Dallas metropolitan area. Local and regional governments have also prepared for and encouraged growth in these cities. Right-of-way acquisition and relocations have been required for many past and present transportation projects. Projects attempt to minimize the number of relocations and moving assistance and mitigation is typically required.

The cumulative effect of relocation and right-of-way acquisition is consistent with the general growth trend in the socioeconomic RSA. Required right-of-way acquisition and relocations due to forecasted future development are not expected to adversely affect the overall quality of life in the RSA. Any development that does occur within the RSA could have a greater effect on existing residents than what would occur in more developed areas. Existing and future land development is expected to continue to accommodate the present and future residents of the area. The improvement would occur as commercial land use moves into the study area. These commercial land uses would lead to increase in infrastructure as utilities and roadways are built and improved to accommodate the increase in these land use types. In addition, the roadways would provide more accessible routes through the RSA that would increase community cohesion and allow easier access to work and commercial businesses as well as benefit emergency vehicle access.

The results of this predicted growth could cause a decrease in the quality of life for some residences. Those residences preferring a rural setting for their residence would experience an impact from the associated indirect growth from commercial and residential areas.

Economic growth would continue in the RSA once the roadway is completed and additional development occurs. With the addition of a new transportation facility, development would be consistent with local regulations. Changes in the local economy of the rural portion of the RSA from agriculture to a regionally based economy are likely to occur. The anticipated growth and

associated increases in economic and employment conditions are considered beneficial cumulative impacts. Because the majority of these impacts are beneficial and would offset any potential negative effects, no mitigation is proposed.

5.9.6.3 Waters of the US

There are direct and indirect impacts to surface waters and water quality associated with land conversion, which affects the impact to these resources through increased urban areas and impervious surfaces. Anticipated impacts to water quality could include the increase in pollutant loading into the existing receiving waters associated with the increased runoff from the additional impervious surfaces that transport pollutants generated by vehicles using the Collin County Outer Loop Segment 1 and increased sedimentation transport to water bodies during construction in the AOI. As previously stated, BMPs would be employed during construction to minimize the adverse impacts of erosion and sedimentation on surface water resources. Land conversion from vacant, undeveloped land to urbanized areas increases the amount of impervious surfaces, which contributes to water resource impacts. Channelization, displacement, and segmentation of hydric features combined with storm water runoff could result in water quality impacts and the potential for increased runoff velocities and channel erosion may occur as a result of reduced flood storage capacity.

The estimated cumulative impact is predicted for year 2030 and would include impacts associated with development not related to the project, as well as project impacts. This cumulative impact would occur over time as conversion of land drives impacts to water resources in the AOI. It is likely the potential indirect and cumulative impacts to streams are an overestimate, as the quantifications are based on a total impact of the resources within the AOI. However, existing regulations (e.g., Section 404 of the CWA) govern impacts to streams, which would minimize potential impacts. The additional land use changes in the AOI would cause a loss of waters of the US. The cumulative result from the present, direct, and indirect impacts would decrease available waters in the RSA of the Trinity River Basin. Although some loss would occur, current regulations would preserve and cause no net loss of waters of the US. The potential cumulative impact is not anticipated to affect the resource trend and, therefore, is not considered to be substantial.

In addition to project-specific mitigation measures, there are existing programs that would help to reduce the potential cumulative impacts of the proposed project and other future projects on water quality in the Trinity River Basin. For instance, the Texas Clean Rivers Act, as enacted with Senate Bill 818 by the 72nd Texas Legislature in 1991, requires the TCEQ to ensure the performance of regional assessments of water quality on a watershed basis through the Clean Rivers Program (CRP). The CRP is a statewide program to collect and assess water quality data throughout the river basins. The CRP program addresses both basin and state monitoring objectives through collaboration and coordination with the TCEQ State Water Quality Monitoring (SWQM) program, other governmental agencies, and the private and public sectors. The CRP conducts routine, periodic, and targeted monitoring activity comparable to the SWQM program. The compatibility of monitoring efforts facilitates collaboration between these programs to assess, manage, and disseminate water quality data used in developing basin-specific monitoring plans. The Trinity River Authority implements the CRP program for the Trinity River Basin.

The NCTCOG also has regional water quality responsibilities and has been working with local governments to coordinate a regional storm water monitoring program. Both regional entities conduct their water quality activities primarily at the watershed level. The objectives of the CRP are to use the watershed management approach to identify and evaluate water quality issues, to establish priorities for corrective action, and to implement those actions. The Trinity River Basin

CRP is committed to developing a comprehensive water quality monitoring network throughout the basin. Due to the heavy urbanization and development of the upper basin and importance of the lower basin as a source of water for the City of Houston, there exist numerous entities within the basin with existing, extensive water quality monitoring programs.

Regulations are in place to assist in the minimization of impacts to wetlands and waters of the US and stress on the resource. Developments (both public and private) would avoid or minimize these impacts in compliance with existing federal statutes. Through CWA Section 404 permitting, the USACE mandates reducing or avoiding substantial adverse impacts to protected resources on an individual as well as cumulative project basis.

In 1991, Texas adopted state goals for "no net loss" of acreage or aquatic function of wetlands. These goals reflect the regulatory program in the CWA legislation that prohibits discharge into waters of the US unless authorized by a permit issued under CWA Section 404. The USACE has authority over such actions and may require the permittee to restore, create, enhance, or preserve nearby aquatic features as compensation to offset unavoidable adverse impacts to the aquatic environment. Future trends in the regulation of waters of the US, including wetlands, are likely to focus on compensatory mitigation requirements. Regulatory agencies are expected to develop procedures to track the success and completion of mitigation efforts as the focus moves toward replacement of specific aquatic functions, rather than replacement of total area. Consequently, regulatory controls are expected to continue the trend of stabilizing the amount of existing waters of the US, including wetlands, through vigorous application of mitigation requirements under the CWA. In addition, the new USACE regulations for compensatory mitigation for loss of aquatic resources, effective June 9, 2008, focuses on the preferential use of mitigation banks. This new guidance shifts mitigation for loss of aquatic resources to high quality, unfragmented, water resources, improving the mitigation of losses of waters of the US. Because of the strong regulatory rules and laws in place, impacts to waters of the US and their water quality there would be no cumulative negative impacts to this resource.

6.0 CONCLUSION

The engineering, social, economic, and environmental investigations conducted thus far indicate that the construction of the Build Alternative would result in no significant impacts on the quality of human health or the environment. Therefore, the project is recommended for advancement through the design and construction phase.

Appendix A

Project Photographs

#1 Western terminus of proposed project

#2 Throckmorton Creek

#3 Potential residential displacement on CR 365

#4 DART owned railroad adjacent to SH 5

#5 American Kestrel observed in project vicinity

#6 Farmland in the study area

#7 Oncor electrical transmission line adjacent to the study area

#8 Mobile homes adjacent to project area on Mills Road

#9 Potential residential displacement on CR 419

#10 Unnamed tributary to Sister Grove Creek

11# Livestock observed near study area

12# Eastern terminus of the proposed project

Appendix B - Bibliography

1970 Clean Air Act, Title 42 US Code Chapter 85.

1990 Clean Air Act Amendments, S. 1630

City of Anna. *2006 Land Use Plans*

City of Melissa. *2006 Comprehensive Plan*

Collin County. *Collin County Outer Loop Route Study from US 75 to the Rockwall County Line,* June 2007

Collin County. *Environmental Baseline Report*, November 2009, Collin County Outer Loop Segment 1

Collin County. *Cultural Resources Survey of a Portion of the Proposed Collin County Outer Loop from US 75 to SH 121, Collin County, Texas*, July 2009

Collin County. *Collin County Mobility Plan – 2002 Update*

Collin County. *Collin County Mobility Study – 2007 Update* thoroughfare plan

Collin County. Revised Public Meeting #1 Summary, Collin County Outer Loop Study, US 75 to Rockwall County. February 24, 2005.

Collin County. Revised Public Meeting #2 Summary, Collin County Outer Loop Study US 75 to Rockwall County. May 19, 2005.

Collin County. Revised Public Meeting #3 Summary, Collin County Outer Loop Study, US 75 to Rockwall County. August 18, 2005.

Collin County. Revised Public Meeting #3 Summary, Collin County Outer Loop Study, US 75 to Rockwall County. August 18, 2005.

Collin County. Public Meeting #5 Summary, Collin County Outer Loop Study, US 75 to Rockwall County. November 1, 2005.

Collin County. Public Meeting #6 Summary, Collin County Outer Loop Study, US 75 to Rockwall County. March 23, 2006.

Collin County. Public Meeting #7 Summary, Collin County Outer Loop Study, US 75 to Rockwall County. September 19, 2006

Collin County. Public Hearing Summary, Collin County Outer Loop Technically Preferred Alignment. December 12, 2006.

Collin County. website http://public1.co.collin.tx.us/sites/ccpm/default.aspx

Council on Environmental Quality. *Environmental Justice Guidance under the National Environmental Policy Act*. December 1997.

GeoMarine. *Cultural Resources Survey of a Portion of the Proposed Collin County Outer Loop From US 75 to SH 121, Collin County, Texas.* July 2009.

McMahan, C.A.; R.G. Frye; and K.L. Brown. 1984. *The Vegetation Types of Texas, Including Cropland* (An Illustrated Synopsis to Accompany the Map). Texas Parks and Wildlife Department (TPWD). Austin, Texas.

Natural Resources Conservation Service (NRCS). 2007. Soil Data Mart, Collin County "Prime and Other Important Farmlands," http://soildatamart.nrcs.usda.gov/ (Accessed February 2009).

North Central Texas Council of Governments (NCTCOG). April 2009. *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment.*

NCTCOG and TxDOT, *2008-2011 Statewide Transportation Improvement Program/Transportation Improvement Program, Amended April 2009*

NCTCOG, 2008, Geographic Information System (GIS), NCTCOG Region, Features

NCTCOG, 2008, GIS, NCTCOG, Region, Lakes

NCTCOG, 2008, GIS, NCTCOG Region, Parks.

NCTCOG, 2008, GIS, NCTCOG Region, Streams

NCTCOG, 2005, GIS, NCTCOG Region, 2005 Land Use.

NCTCOG, 2000 and 2030, North Central Texas 2030 Demographic Forecast http://www.nctcog.org/ris/demographics/forecast.asp, (Accessed December 2009).

NCTCOG, 1969, GIS, Collin County Soils.

NCTCOG. Importance of Establishing County-Wide Transportation Needs Assessments. Presentation. June 7, 2007.

Texas Department of Family and Protective Services (TDFPS), 2009, State of Texas, Licensed Child-Care Home, http://www.dfps.state.tx.us/, (Accessed March 2009).

TDFPS, 2009, State of Texas, Licensed Child-Care Center, http://www.dfps.state.tx.us/, (Accessed March 2009).

Texas Education Agency, 2008, GIS, State of Texas, Schools 2008, http://ritter.tea.state.tx.us/SDL/sdldownload.html (Accessed February 2009)

TxDOT. Environmental Affairs Division, *TxDOT Air Quality Guidelines*, 2006.

TxDOT. *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses*. June 2009

TPWD, 1984, GIS, State of Texas, Vegetation Types of Texas, http://www.tpwd.state.tx.us/landwater/land/maps/gis/data_downloads/, (Accessed February 2009).

TPWD. 2009. GIS, Natural Diversity Database – Collin County Outer Loop USGS Quads.

US Census Bureau, 2000, Census 2000 Summary File 1 (SF1) and 3 (SF3), http://www.census.gov/Press-Release/www/2002/sumfile3.html, (Accessed January 2009).