STATE ENVIRONMENTAL ASSESSMENT

FM 720

FROM: ELDORADO PARKWAY (FM 720)
TO: US 380

DENTON COUNTY

CSJ: 1567-01-025

TEXAS DEPARTMENT OF TRANSPORTATION

JUNE 2011

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DESCRIPTION OF THE PROPOSED ACTION

Introduction

The proposed project consists of expanding the existing Farm-to-Market (FM) 720 roadway for 4.7 miles from Eldorado Parkway (formerly Garza Lane) to U.S. Highway (US) 380 in Denton County, Texas. **Figure 1** identifies the project location; **Figure 2** shows the project and surrounding area on the Little Elm, Texas quadrangle of the U.S. Geological Survey map; and, **Figure 3** presents an aerial photograph of the project limits and surrounding area.

Design plans can be inspected at the Texas Department of Transportation (TxDOT) Dallas District Office and the TxDOT Denton County Area Office located at:

4777 E. Highway 80 Mesquite, Texas 75150	2624 W. Prairie Denton, Texas 76201

Need and Purpose

The project is needed because the current transportation network in the project area is insufficient to accommodate future traffic demands projected by the TxDOT Transportation Planning and Programming Division (TPP). The purpose of the proposed project is to provide additional capacity to the existing FM 720 facility, reduce traffic congestion, and improve design deficiencies.

The alternatives evaluated in this document would be considered in terms of how well they serve the following purposes while meeting the underlying need for the proposed project.

Increase Capacity

High traffic volumes exceeding capacity are the result of major population growth in the project study area that in turn results in traffic congestion during the peak periods. Level of Service (LOS) for a roadway is designated A through F (A being the best and F the worst) and it covers the entire range of traffic operations that may occur. The definitions of LOS A through F are presented in **Table 1**.

Table 1: Level of Service

A	Highest quality of service. Free traffic flow, low volume, and densities. Little or no restriction on maneuverability or speed. 55+ miles per hour (mph). No delay.
B	Stable traffic flow, speed becoming slightly restricted. Low restriction on maneuverability. 50 mph. No delay.
C	Stable traffic flow, but less freedom to select speed, change lanes or pass. Density increasing. 45 mph. Minimal delay.
D	Speeds tolerable, but subject to sudden and considerable variation. 40 mph. Minimal delay.
E	Unstable traffic flows with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability, and low driver comfort. 35 mph. Considerable delay.
F	Forced traffic flow. Speed and flow may drop to zero with high densities. Less than 25 mph. Considerable delay.

Source: Highway Capacity Manual, Special Report 209, 3rd Edition, Transportation Research Board, 1994.

According to the North Central Texas Council of Governments' (NCTCOG) system performance evaluation and ranking of existing and committed levels of transportation projects, this portion of Denton County is anticipated to experience severe congestion if no transportation improvement projects are constructed after 2015. FM 720 is projected to operate at a LOS of E in 2010 and a LOS F in 2030 and 2040 without the proposed improvements.

With the addition of the proposed improvements, the projected LOS for 2030 would be B and in 2040 the projected LOS would be C. The LOS is a qualitative measure of describing operational conditions within a traffic stream or at an intersection, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The improvements to FM 720 would support the local and regional needs of improving the transportation network with increased capacity in order to facilitate reduced traffic congestion.

Reduce Traffic Congestion

The capacity constraints of existing streets and alternate north/south highways near the project study area, and the limitations on the availability of right-of-way (ROW) for new roadways have created and would intensify congestion. The proposed project would reduce congestion by increasing the capacity along this portion of FM 720.

Improve Design Deficiencies

Although the roadway met design standards at the time of its original construction, there are elements that no longer meet current design standards. The design deficiencies include sharp curves and no shoulders. Improvements to these design elements are anticipated to improve roadway operations and allow FM 720 to meet currently accepted TxDOT design standards.

Right-of-Way Requirements and Utility Adjustments

The existing proposed ROW width is 90 feet. The proposed ROW width would be 130 feet. The amount of ROW that would be acquired is approximately 27 acres. The proposed project would convert 27 acres of residential, commercial and undeveloped lands into transportation ROW.

There are six displacements associated with the proposed project, which include one residential duplex and five commercial properties. All acquisitions and relocations would be conducted in accordance with the uniform Relocation Assistance and Real Property Acquisition Policies Act. Relocation resources are available to all displacees without discrimination.

Several utilities exist within the existing ROW in the project area, including television cables, fiber optic cables, electrical cables, telephone cables, storm sewer lines, water lines, and gas lines, some of which would require relocation due to the expansion of the roadway. All of the affected utilities would be adjusted or relocated prior to construction of the proposed project. The adjustments and relocation of any utilities would be handled so that no substantial interruptions would occur. Plans for relocating any utilities would be provided by the appropriate utility company.

Project Cost

The estimated total cost for the proposed project is $73,572,259. Funding would come from State Highway (SH) 121 Regional Toll Revenue (RTR) and local funds, TTC Minute Order 111845 (**Appendix E**).

DESCRIPTION OF EXISTING FACILITY

Existing Facility

The existing ROW width is 90 feet wide. The current roadway is an undivided two-lane roadway, with 10-foot to 11-foot wide travel lanes with no shoulders. The posted speed limit is 55 mph. The existing typical section is provided in **Figure 4-1**.

Surrounding Terrain and Land Use

The topography around the project area is level to slightly rolling. The land use adjacent to the proposed project consists of agricultural pasture and crop land, vacant land, commercial/retail facilities, scattered single-family residences, and single-family subdivisions. It is not anticipated

that the proposed project would change the land use as it now exists or is planned for future development. The project is consistent with local planning efforts. **Figure 3** provides the surrounding conditions.

Information contained in the U. S. Department of Agriculture Web Soil Survey (December, 2004) indicates the soils within the project area are comprised of Birome fine sandy loam with 3 to 5 percent slopes; Callisburg fine sandy loam with 1 to 3 percent slopes; Ferris-Heiden clays with 5 to 15 percent slopes; Gasil fine sandy loam with 1 to 3 percent slopes; Gasil fine sandy loam with 3 to 8 percent slopes; Konsil fine sandy loam with 1 to 3 percent slopes; Navo clay loam with 0 to 1 percent slopes; Navo clay loam with 1 to 3 percent slopes; Navo clay loam with 3 to 5 percent slopes; Wilson clay loam with 0 to 1 percent slopes; and, Wilson clay loam with 1 to 3 percent slopes.

Traffic Projections

Traffic forecasts for this project were received from TxDOT's TPP. The projected average daily traffic (ADT) in the year 2010 is 10,600 vpd. In the design year (2030), the ADT is projected to be 23,600 vpd. This represents an increase of approximately 123 percent in traffic volume by 2030.

ALTERNATIVES

No-Build

The No-Build alternative was considered in assessing improvements to FM 720. This alternative was not considered viable because the existing facility does not meet current TxDOT design standards, i.e., sharp curves, no shoulders. The No-Build alternative would not meet the need and purpose of the project. The projected growth in traffic demand would exceed the capacity of the FM 720 roadway without any improvements. Under the No Build alternative, the integrity of the roadway structure would continue to decline.

Build

The Build alternative would involve the expansion of the existing facility from a two-lane rural roadway to a six-lane urban divided roadway in Denton County, Texas. Additional ROW would be needed for the Build alternative. The Build alternative would consist of three 12-foot wide lanes in each direction with 2-foot wide curb offsets, a 6-foot wide graded area, two 11-foot wide outer grassy borders, and one 16-foot wide raised median. At various cross streets the median would be reduced to accommodate 11-foot wide left turn lanes. Ten-foot wide right turn lanes would also be constructed at specific cross streets.

Approximately 500 feet of FM 720 would be realigned north from Eldorado Parkway. The roadway would curve west to Eldorado Parkway in order to intersect at a right angle instead of the existing skewed intersection.

The Build alternative would be consistent with local and regional transportation and land use planning efforts. It would meet the proposed project's need and purpose by increasing capacity to meet the daily traffic use and enhance roadway conditions for motorists using FM 720. The Build alternative would have a design speed of 40 mph. The proposed typical sections are illustrated in **Figure 4-2** and the proposed project layout is provided in **Figure 5**. The Build alternative is the preferred alternative.

POTENTIAL SOCIAL, ECONOMIC AND ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

Regional and Community Growth

The proposed project is located in Denton County and traverses the cities of Little Elm, Oak Point, and Lincoln Park. The area surrounding the proposed project is undergoing rapid population growth. Denton County population grew by 56.5 percent from 273,525 people in 1990 to 428,080 people in 2000 (U.S. Census Bureau). The City of Little Elm population grew by 190.5 percent from 1,255 people in 1990 to 3,646 people in 2000 (U.S. Census Bureau). The City of Oak Point population grew by 167 percent from 645 people in 1990 to 1,722 people in 2000 (U.S. Census Bureau). The City of Lincoln Park population grew by 80.1 percent from 287 people in 1990 to 517 people in 2000 (U.S. Census Bureau). According to the 2000 Census, the 16-county north central Texas region added nearly 1.2 million residents since the 1990 census, accounting for nearly one-third of the total population growth in Texas. **Table 2** summarizes the population trends and forecasts in the project area.

Table 2: Population Trends And Forecasts For Selected Locations

Location	1970 Census	1980 Census	1990 Census	2000 Census	2030[1] Forecast	Growth Rate 2000-2030
Lincoln Park	unavailable	unavailable	287	517	unavailable	--
Oak Point	unavailable	387	645	1,722	10,438	506%
Little Elm	363	926	1,255	3,646	unavailable	--
Denton County	75,633	143,126	273,525	428,080	1,085,343	154%
NCTCOG Region (16 counties)	2,506,618	3,116,181	4,111,750	5,309,277	9,107,900	72%

Source: NCTCOG, *2009 Current Population Estimates*, March 2009.
[1] NCTCOG *North Central Texas 2030 Demographic Forecast*, March 2009.

Community Cohesion

Community cohesion is a term that refers to an aggregate quality of a residential area. Cohesion is a social attribute that indicates a sense of community, common responsibility, and social interaction within a limited geographic area. It is the degree to which residents have a sense of belonging to their neighborhood or community or a strong attachment to neighbors, groups, and institutions as continual association over time.

The proposed project would not affect, separate, or isolate, any distinct neighborhoods, ethnic groups, or other specific groups. However, the acquisition of additional ROW totaling approximately 27 acres would result in the relocation of five structures (one residential duplex and four businesses) along the FM 720 alignment. Temporary access driveways would be provided to abutting property owners during construction and permanent access would be provided after construction is completed. Everything possible would be done to minimize the inconvenience to the vehicles using the roadway during the construction phase.

The places of employment located within the FM 720 project limits consist of retail, financial services, light industry, churches and other services. Currently, land use along FM 720 is a mixture of single family residential and commercial properties, with large tracks of undeveloped land, some in agricultural production. The proposed project would provide a positive impact to

the short-term employment opportunities in the area and future development of facilities that would provide long-term employment opportunities.

The proposed project would not restrict access to any existing public or community services, businesses, commercial areas, or employment centers. In the long-term, the entire community would benefit from the proposed project, including improved mobility and reduced traffic congestion.

During construction, there would be a short-term economic gain to the area due to new job opportunities and a temporary boost to the local economy. Drivers would benefit economically from various design improvements, which would reduce vehicle operating costs. There would be no division of farm operations as a result of the proposed improvements.

Displacements
There are six potential displacements associated with the Build Alternative, which include one residential duplex and five commercial properties. The following summary in **Table 3** lists potential displacements associated with the proposed project. The locations of the residences and businesses to be displaced are shown on **Figure 5**.

Table 3: Potential Displacements Associated with the Build Alternative

Address	Type	Field Observation
1800 FM 720	Commercial (vacant)	A vacant building exists on the property. The property is classified by the Denton County Appraisal District as commercial.
1819 FM 720	Commercial	Action Collision Center is an automotive body repair shop proposed to be acquired.
1900 FM 720	Commercial	Two businesses are located at this property: 1) Posey Welding, and 2) Posey Express BBQ Posey Express BBQ is proposed to be acquired.
1911 FM 720 and 1913 FM 720	Residential (duplex)	Both residential units appeared to be occupied.
2102 FM 720	Commercial (vacant)	A vacant building exists on the property. The property is classified by the Denton County Appraisal District as commercial.
5901 Edgewood Place	Commercial	A warehouse containing Cruz Tire Shop and Auto Dent Express is proposed to be acquired.

Consistent with the U.S. Department of Transportation (USDOT) policy as mandated by the Surface Transportation and Uniform Relocation Assistance Act of 1987, TxDOT provides relocation resources to all displaced persons without discrimination. All property owners, from whom property is needed, are entitled to receive just compensation for their land and property. Just compensation is based upon the fair market value of the property. TxDOT also provides, through its Relocation Assistance Program, payment and services to aid in movement to a new location.

TxDOT offers relocation assistance to all individuals, families, businesses, farmers, ranchers and nonprofit organizations displaced as a result of a State highway or other transportation project. In order to assist those who are required to move, TxDOT provides, through its relocation program, payments and services to aid in movement to a new location. This assistance applies to tenants as well as owners occupying the real property for an orderly, timely

and efficient move. A relocation counselor would contact the affected property owners and tenants.

The final disposition of properties that would require relocation would be determined by TxDOT during the ROW acquisition process. All acquisitions and relocations would be conducted in accordance with the uniform Relocation Assistance and Real Property Acquisition Policies Act. Relocation resources are available to all displacees without discrimination.

The three commercial properties with existing businesses contain a small restaurant, a welding shop, and three automobile repair shops. The welding shop, Posey Welding, would not be displaced by the proposed project; however, the restaurant and automobile repair shops would potentially be displaced. There are numerous existing and planned opportunities for restaurant and auto repair services in the vicinity of the project study area. According to future land use maps of Oak Point and Little Elm, over one-half of the undeveloped land within the two jurisdictions is planned for residential, commercial, or institutional development. A review of numerous real estate websites indicates that within the zip code containing the displaced commercial properties there are approximately 11 commercial properties available for lease and approximately 12 commercial properties available for sale. These properties range from vacant land to proposed pad sites and existing structures. The auto repair shops, Action Collision Center and Cruz Tire Shop are potential displacements. The proposed ROW would impact an awning connected to the main office of Action Collision Center but would not impact the building. It is possible that Action Collision Center would continue to function as a business after completion of the proposed project. Exact impacts to this business would be determined during the detailed design phase of the project planning process. The proposed ROW would also potentially displace a warehouse containing Cruz Tire Shop and Auto Dent Express. The proposed ROW would impact Cruz Tire Shop, but because the structure is a warehouse, both businesses would be affected. No existing automobile repair shops or comparable structures are currently available for sale or lease; however, if both businesses are displaced, there is the possibility that the buildings could be moved within the existing parcels. Manta.com estimates that up to nine people are employed by Action Collision Center. There is no public data available for Cruz Tire Shop or Auto Dent Express; however, based on the size and location of the warehouse, each appears to have approximately 5 employees. Employees of the potentially displaced businesses may or may not be affected by the proposed project. If the businesses remain in Little Elm or a neighboring town, the employees could retain their positions. If the businesses are shut-down because of the proposed project, other auto shops are present in Little Elm and the surrounding areas that could hire those who become unemployed.

No free-standing restaurant sites are currently on the market; however, Posey Express BBQ is a small structure that could be moved within the owner's existing one-acre parcel. Additionally, there are existing and proposed strip shopping malls in the area that are leasing small spaces for restaurant/retail use. No data is available related to the number of employees at Posey Express BBQ; however, based on the size of the structure it is estimated that less than five people are employed by the restaurant and these are probably members of the Posey family. Other restaurants are present in Little Elm, Oak Point and surrounding towns; therefore, displaced employees would have the opportunity to look for comparable work elsewhere. Many of the commercial properties available for lease or purchase face FM 720/Eldorado Parkway within the city of Little Elm just like those businesses to be displaced.

One residential duplex would be displaced by the proposed project. According to zillow.com and rent.com, there are no houses or apartments for rent in the immediate project area but there are four houses for rent within two miles of the project limits (US 380 and Eldorado Parkway) and one senior community with one or two bedroom rentals within the zip code of the project area. None of the houses are duplexes and they range from a three-bedroom for $1,100/month to a five-bedroom for $2,500/month. The senior community offers one or two bedroom apartments

for $680 to $810/month for residents aged 55 years and older. Within six miles of the project area zip code there is one additional apartment complex with no age restriction that offers one, two or three bedroom apartments for $575 to $850/month. Although displaced tenants may not find comparable housing nearby, there is the potential that the owner could rebuild the existing duplex on their remaining property. The owner has approximately 6 acres of land adjacent to the existing duplex. Additionally, real estate websites indicate that there are approximately 370 homes for sale within the project area zip code. These homes range in price from $45,000 to $4.5 million. The TxDOT Dallas District ROW office searches all housing within 50 miles of a displaced property and offers additional help if no adequate housing can be found.

Additionally, three commercial properties located on the north side of FM 720 between Edgewood Drive and Greenwood Drive would be impacted by the proposed ROW. While no displacements would occur at these properties, potential business impacts are summarized below in **Table 4**.

Table 4: Potential Impacts Associated with the Build Alternative

Address	Type	Field Observation
5904 Crestwood Place	Commercial	A portion of the parking lot for Sunrise Automotive/U-Haul Company is proposed to be acquired. Approximately 14 parking spaces would be lost and the fence around the parking lot would require adjustment.
5901 Crestwood Place	Commercial	The Education Center – Little Elm Campus would lose a portion of the dirt driveway/parking area adjacent to FM 720.
5904 Edgewood Place	Commercial	A portion of the parking area/outdoor storage area for Alpha Fence Company would be acquired. The tall wooden fence with brick columns around the property would require adjustment.

Sunrise Automotive/U-Haul, The Education Center and Alpha Fence Company would be able to continue to function in their current capacity after ROW acquisition and no permanent impacts to their employees or clients would occur.

Limited English Proficiency

Executive Order 13166 – *Improving Access to Services for Persons with Limited English Proficiency* (LEP) – requires federal agencies to examine the services they provide and identify any need for services to those with LEP. The Executive Order requires federal agencies to work to ensure that recipients of federal financial assistance provide meaningful access to their LEP applicants and beneficiaries. Failure to ensure that LEP persons can effectively participate in or benefit from federally assisted programs and activities may violate the provision under Title VI of the Civil Rights Restoration Act of 1987 and Title VI regulations.

Census block group data from the 2000 Census were obtained to determine whether there were persons with LEP near the project area (U.S. Census Bureau, 2000). Within Block Group 1 of Census Tract 201.02 there were a total of 1,871 people. Of these, 9.0 percent spoke English "less than well". Within Block Group 2 of Census Tract 201.02, there were a total of 3,279 people. Of these, 1.0 percent spoke English "less than well'. All LEP populations speak Spanish. A windshield survey revealed that there are no business signs or advertisements in non-English languages located along the proposed project.

Public Meeting notices were published in three newspapers, *The Dallas Morning News* and *Denton Record Chronicle* on September 13, 2006 and October 2, 2006, as well as *Al Día,* a

regional Spanish-language paper, on September 12, 2006 and October 2, 2006. The Public Meeting was held on October 12, 2006 by TxDOT. No public comments were made and two written comments were received. No requests for information in Spanish were made.

A Public Hearing would be scheduled to present information about the proposed project to interested citizens, and allow them the opportunity for public comment. Public Hearing notices would be published in the Spanish language newspaper *Al Dia*. These notices would also be mailed to adjacent property owners. Because the Public Hearing would be conducted in English, the public would be able to request language interpreters or other special communication needs prior to the Public Hearing. Through the public involvement process, the requirements of Executive Order 13166 are satisfied.

The No-Build alternative would not impact community cohesion. However, the existing roadway conditions would continue to deteriorate, and congestion would increase as residential and commercial development continues along FM 720.

Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" requires each Federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations". The Federal Highway Administration (FHWA) has identified three fundamental principles of environmental justice:

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

Disproportionately high and adverse human health or environmental effects are defined by FHWA as adverse effects that:

1. Are predominately borne by a minority population and/or a low-income population or
2. Will be suffered by the minority population and/or low-income population and are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the nonminority population and/or non-low- income population.

The race and ethnicity of the population of the study area were analyzed. According to FHWA Order 6640.23 (1998), "FHWA Actions to Address Environmental Justice in Minority and Low-Income Populations", population groups defined as minorities include the following:

1. Black (having origins in any of the black racial groups of Africa);
2. Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture of origin, regardless of race);
3. Asian American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or
4. American Indian and Alaskan Native (having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).

A household income at or below the Department of Health and Human Services poverty guidelines ($22,350 for a family of four in 2011) is considered low-income. According to the Census 2000, 23 percent of the population in Block Group (BG) 1 and 12 percent of the population in BG 2 are considered to be minority. Additionally, 15.7 percent of the population in BG 1 and 5.5 percent of the population in BG 2 are considered to be low-income (**Tables 5** and **6**).

Table 5: Racial and Ethnic Distribution

Comparison Area	Total Population	White Alone %	Black or African American Alone %	American Indian and Alaska Native Alone %	Asian or Pacific Islander Alone %	Native Hawaiian and Other Pacific Islander Alone %	Some other race %	Population of two or more races %	Hispanic or Latino %
BG 1, CT 201.02	1,871	77.0	1.1	1.1	0.1	--	--	1.2	19.5
BLOCK 1039	48	97.9	--	--	--	--	--	--	2.1
BLOCK 1040	123	82.1	--	--	--	--	--	--	17.9
BLOCK 1051	75	97.3	--	2.7	--	--	--	--	--
BLOCK 1052	0	--	--	--	--	--	--	--	--
BLOCK 1062	56	69.6	--	3.6	--	--	--	--	26.8
BLOCK 1065	2	100.0	--	--	--	--	--	--	--
BLOCK 1066	159	66.7	1.3	--	--	--	--	0.6	31.4
BLOCK 1075	20	95.0	--	--	--	--	--	--	5.0
BLOCK 1076	0	--	--	--	--	--	--	--	--
BLOCK 1077	5	100.0	--	--	--	--	--	--	--
BLOCK 1078	3	100.0	--	--	--	--	--	--	--
BG 2, CT 201.02	3,279	88.0	0.8	0.9	0.3	0.1	0.2	1.5	8.3
BLOCK 2000	16	68.8	--	--	--	--	--	--	31.3
BLOCK 2027	6	100.0	--	--	--	--	--	--	0.0
BLOCK 2028	0	--	--	--	--	--	--	--	--
BLOCK 2059	142	90.8	--	--	--	--	--	1.4	7.7
BLOCK 2060	58	48.3	--	13.8	--	--	--	3.4	34.5
BLOCK 2061	5	100.0	--	--	--	--	--	--	--
BLOCK 2062	76	82.9	--	--	2.6	--	--	--	14.5

Source: U.S Census Bureau, Census 2000
BG – Block Group, CT – Census Tract

Table 6: Median Household Income and Poverty Level

Comparison Area	Total Population	Income in 1999 below poverty level (%)	Median household income in 1999 ($)
BG 1, CT 201.02	1,871	15.7	44,966
BG 2, CT 201.02	3,279	5.5	67,829

Source: U.S Census Bureau, Census 2000
BG – Block Group, CT – Census Tract

The study area does contain minority and low-income populations. In Block 1066 of BG 1, Census Tract (CT) 201.02, 31.4 percent of the population is Hispanic or Latino. In Blocks 2000 and 2060 of BG 2, CT 201.02, approximately one-third of the population is Hispanic or Latino. In Block 2060, over half of the population is minority. However, while environmental justice populations are present in the project study area, the residential displacements associated with the proposed project would occur in Block 1078 which is 100 percent White. It is unknown if the two businesses that would be displaced are frequented by environmental justice populations. The businesses appear to be locally-owned, owner-operated businesses with a limited number of employees.

The proposed project consists of the widening of the existing facility to better serve the mobility needs of all motorists. ROW acquisition would mainly affect large areas of undeveloped land. Detours during project construction would cause traffic delays for all populations but no long-term adverse impacts are expected to occur. Impacts to environmental justice communities might occur from the proposed widening; however, based on the above discussion and analysis, no disproportionately high and adverse impacts on minority or low-income populations are anticipated as a result of this proposed project. Therefore, the requirements of Executive Order 12898 are satisfied.

The No-Build alternative would not impact minority or low-income populations. However, the existing roadway conditions would continue to deteriorate and increase congestion as residential and commercial development continues along FM 720.

Impact on 4(f) Properties
Additional ROW would be required for the proposed project; however, the proposed project would not require the use of, nor substantially impair the purposes of, any publicly owned land from a public park, recreational area, wildlife and waterfowl refuge lands or historic sites of national, state, or local significance. Therefore, a 4(f) statement is not required.

The No-Build alternative would not require the use of privately owned land from historic sites of national, state, or local significance. The No Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Public Facilities and Services
One charter public school, The Education Center – Little Elm Campus, is located adjacent to FM 720. None of the school buildings would be impacted by the proposed project. A portion of an unofficial dirt driveway would be acquired through ROW acquisition. No other public facilities such as parks, hospitals or fire/police stations are located within or immediately adjacent to the project area. Oak Grove Methodist Church and its cemetery are located on the east side of the project area near the northern terminus of the project. Lloyd Cemetery is approximately 0.05 mile east of the project site. Both sites are outside of the proposed ROW. The construction, operation, and maintenance of the proposed improvements would not adversely affect these public facilities. Due to the additional lanes, emergency public services would have a safer, more efficient facility to use in the performance of their various duties.

Lakes, Rivers and Streams
FM 720, within the project limits, crosses four waterways including an unnamed tributary to Cantrell Slough and three unnamed tributaries to Lewisville Lake. Because none of these crossings are navigable waterways, a navigational clearance under the General Bridge Act of 1946 and Section 9 of the Rivers and Harbors Act of 1899 (administered by the U.S. Coast Guard [USCG]), and Section 10 of the Rivers and Harbors Act of 1899 (administered by the U.S. Army Corps of Engineers [USACE]) would not be required. Coordination with the USCG (for Section 9 and the General Bridge Act) and the USACE (for Section 10) would not be required.

The No-Build alternative would not affect any surface water bodies. However, it would also not remedy the existing traffic problems and would allow for continued deterioration of traffic flow conditions.

Waters of the U.S. and Wetlands
The proposed project crosses an unnamed tributary to Cantrell Slough and three unnamed tributaries to Lewisville Lake. These waters of the U.S. are regulated by the USACE under the authority of Section 404 of the Clean Water Act.

A wetland delineation was conducted in accordance with the USACE *2008 Great Plains Interim Regional Supplement.* The general locations of the wetland data points are shown on **Figure 5.** Wetland data forms and stream data forms are included in **Appendix A**. Results of the wetland delineation found one wetland associated with an unnamed tributary to Cantrell Slough. The wetland is an intermittently inundated, emergent palustrine (**Figure 9 - Photo 6**). There are no wetlands present at the remaining water crossings or anywhere else along the project.

Table 7 lists the waters of the U.S. and wetlands in the project area, impacts to the water bodies that would result from implementation of the proposed project, and all applicable USACE permits. Approximately 0.23 acres of waters of U.S. and wetlands would be impacted by the proposed project.

Table 7: Impacts to Waters of the U.S.

ID No.	Name of Water Body	Existing Structure	Proposed Structure	Permanent Fill		Temporary Fill		NWP	PCN* (Y/N)
				Waters (acres and linear feet)	Wetlands (acres)	Waters (acres and linear feet)	Wetlands (acres)		
1	Tributary to Lewisville Lake	One 36-inch reinforced concrete pipe	Presently unknown	0.02 ac approx 136 linear feet	None	N/A	N/A	14	N
2	Tributary to Lewisville Lake	Two 36-inch reinforced concrete pipes	Presently unknown	< 0.01 ac approx 126 linear feet	None	N/A	N/A	14	N
3	Tributary to Lewisville Lake	Two 36-inch reinforced concrete pipes	Presently unknown	0.01 ac approx 106 linear feet	None	N/A	N/A	14	N
4	Tributary to Cantrell Slough	One 36-inch reinforced concrete pipe	Presently unknown	< 0.01 ac approx 35 linear feet	0.19	N/A	N/A	14	Y

*PCN – Preconstruction Notification

As shown in **Table 7**, the crossings of Sites 1, 2, and 3 would be authorized under Nationwide Permit (NWP) 14, *Linear Transportation Crossings*. The crossing of Site 4 would be authorized under NWP 14 with a Preconstruction Notification (PCN) and would require associated mitigation.

Wild and Scenic Rivers
The project would not impact any present, proposed, or potential unit of the National Wild and Scenic Rivers System.

The No-Build alternative would not require permitting under Section 404. The No Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions which result from the heavy traffic volume on FM 720.

Water Quality
The streams crossing the project area drain into Lewisville Lake (Segment 0823). This segment is not designated as either threatened or impaired in the 2008 Clean Water Act Section 303(d) list, and the project is not within 5 miles upstream of a threatened or impaired water segment. The four streams within the construction limits of the project area drain into Lewisville Lake, which is a public water supply. However, impacts to these streams would be minimal and it is not expected that Lewisville Lake would be affected by construction of the project.

Section 402 of the Clean Water Act
Because this project would disturb more than five acres of surface area, TxDOT would not be categorically exempt from requirements to comply with Texas Commission on Environmental Quality (TCEQ) Texas Pollutant Discharge Elimination System (TPDES) Phase II. In order to comply with TPDES Phase II General Permits for Construction Activities requirements, a Notice of Intent would be filed with TCEQ stating that TxDOT would have a Storm Water Pollution Prevention Plan (SW3P) in place during the construction of this project. This SW3P utilizes the temporary control measures as outlined in the manual "Standard Specifications for Construction of Highways, Streets, and Bridges". Impacts would be minimized by avoiding work by construction equipment directly in the stream channels and adjacent areas. No permanent water quality impacts are expected as a result of the Build alternative. Every effort would be made for proper soil conservation and preservation during the planning, development, and construction of this project.

This project is not located within the boundaries of a regulated Municipal Separate Storm Sewer System.

Section 401 of the Clean Water Act: Water Quality Certification
General Condition 21 of the Nationwide Permit Program requires applicants using Nationwide Permit 14 to comply with Section 401 of the Clean Water Act and General Condition 12 requires applicants to provide erosion and sediment controls. Compliance with Section 401 requires the use of Best Management Practices (BMPs) to manage water quality on construction sites. The SW3P would include at least one BMP from the 401 Water Quality Certification Conditions for Nationwide Permits as published by the Texas Commission on Environmental Quality (TCEQ), April 26, 2007. These BMPs would address each of the following categories:

Category I - Erosion Control,
Category II - Sedimentation Control, and
Category III - Post Construction Total Suspended Solids Control

Category I would be addressed by applying temporary reseeding (TxDOT-approved seeding specifications) and mulch to disturbed areas. Category II would be addressed by installing silt fences combined with rock berms. Category III would be addressed by constructing grassy swales. The storm sewer system would outfall into approximately 200-foot long grassy swales prior to discharging into waters of the U.S. Other approved methods may be substituted if necessary using one of the BMPs from the identical category.

The No-Build alternative would not require erosion control nor would it impact a 303(d) listed water body because there would be no construction associated with this alternative. However, the existing facility currently operates well above its maximum capacity of traffic flow. The No-Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Floodplain Impacts
Denton County is a participant in the National Flood Insurance Program. The project area is located on Flood Insurance Rate Map Numbers 48121C0405 E and 48121C0415, dated April 2, 1997. The project is located in Zone X (Other Areas), which is defined as areas determined to be outside the 500-year floodplain. The hydraulic design for this project would be in accordance with current FHWA and TxDOT design policies. The facility would permit the conveyance of the design-year flood, inundation of the roadway being acceptable, without causing substantial damage to the facility, stream or other property. The proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Coordination with the local Floodplain Administrator would not be required.

The No-Build alternative would not affect floodplains. The No-Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Invasive Species/Beneficial Landscaping

Permanent soil erosion control features would be constructed as soon as feasible during the early stages of construction through proper sodding and/or seeding techniques. Disturbed areas would be restored and stabilized as soon as the construction schedule permits and temporary sodding would be considered where large areas of disturbed ground would be left bare for a considerable length of time. In accordance with Executive Order 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping, seeding and replanting with TxDOT approved seeding specifications that is in compliance with Executive Order 13112 would be done where possible. Moreover, abutting turf grasses within the ROW are expected to re-establish throughout the project length. Soil disturbance would be minimized to ensure that invasive species would not establish in the ROW.

Threatened/Endangered Species

The Natural Diversity Database (NDD), available through the Texas Parks and Wildlife Department (TPWD), was consulted on November 16, 2010, to determine if any state listed threatened or endangered species had been sighted within the proposed project area. According to NDD data, the Texas garter snake (*Thamnophis sirtalis annectens,* EO ID 434) was reported within the Little Elm and Denton East quadrangles, which contain the proposed project. No sightings of any threatened or endangered species are reported within the Little Elm and Denton East quadrangles. One managed area, Lewisville Lake, is located within 1.5 miles of the proposed project. Sightings and managed areas located in the adjacent quads (Sanger, Green Valley, Aubrey, Celina, Frisco, Hebron, Lewisville East, Lewisville West, Argyle, and Denton West) can be found in **Table 8**. Due to the limitations of NDD information, the results of the database search cannot be interpreted as presence/absence data.

Table 8: Element Occurrence (EO) List

EO Id	Scientific Name	Common Name	Federal Status	State Status
3741	*Schizachyrium scoparium-sorghastrum nutans* series	Little bluestem-indiangrass series		
2293	S*chizachyrium scoparium-sorghastrum nutans* series	Little bluestem-indiangrass series		
434	*Thamnophis sirtalis annectens*	Texas garter snake		
"blank" – No regulatory listing status				
Source: NDD November 16, 2010				

A review of state and federal lists of threatened and endangered species for Denton County was performed. A table containing the habitat requirements and survey results of the project area for threatened and endangered species listed for Denton County can be found in **Table 9**.

Table 9: Federal/State-Listed Threatened/Endangered Species and State Species of Concern for Denton County

SPECIES	FEDERAL STATUS	STATE STATUS	DESCRIPTION OF SUITABLE HABITAT	HABITAT PRESENT	SPECIES EFFECT	SPECIES IMPACT
BIRDS						
American Peregrine Falcon *Falco peregrinus anatum*	—	T	Year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No	- -	No Impact
Arctic Peregrine Falcon *Falco peregrinus tundrius*	—		Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No	- -	No Impact
Bald Eagle *Haliaeetus leucocephalus*	DM	T	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds.	Yes	No Effect	No Impact
Henslow's Sparrow *Ammodramus henslowii*	—		Wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking.	No	- -	No Impact
Peregrine Falcon *Falco peregrinus*	—	T	Both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (*F. p. anatum*) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, *F.p. tundrius* is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.	No	- -	No Impact
Sprague's Pipit *Anthus spragueii*	—		Only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.	No	- -	No impact

Table 9: Federal/State-Listed Threatened/Endangered Species and State Species of Concern for Denton County

SPECIES	FEDERAL STATUS	STATE STATUS	DESCRIPTION OF SUITABLE HABITAT	HABITAT PRESENT	SPECIES EFFECT	SPECIES IMPACT
Western Burrowing Owl *Athene cunicularia hypugaea*	—		Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows.	No	- -	No Impact
White-faced Ibis *Plegadis chihi*	—	T	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests 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	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.	No	No Effect	No Impact
Wood Stork *Mycteria americana*	—	T	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960.	No	- -	No Impact
MAMMALS						
Plains spotted skunk *Spilogale putorius interrupta*	—		Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	Yes	- -	May impact
Red wolf *Canis rufus*	E*	E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies.	No	No Effect	No Impact
MOLLUSKS						
Fawnsfoot *Truncilla donaciformis*	—		Small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in still to swiftly flowing waters; Red (historic), Cypress (historic), Sabine (historic), Neches, Trinity, and San Jacinto River basins.	No	- -	No Impact
Little spectaclecase *Villosa lienosa*	—		Creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins.	No	- -	No Impact
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

Table 9: Federal/State-Listed Threatened/Endangered Species and State Species of Concern for Denton County

SPECIES	FEDERAL STATUS	STATE STATUS	DESCRIPTION OF SUITABLE HABITAT	HABITAT PRESENT	SPECIES EFFECT	SPECIES IMPACT
Texas heelsplitter *Potamilus amphichaenus*	—	T	Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.	No	- -	No Impact
Wabash pigtoe *Fusconaia flava*	—		Creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow.	No	- -	No Impact
REPTILES						
Texas garter snake *Thamnophis sirtalis annectens*	—		Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August.	Yes	- -	May impact
Texas horned lizard *Phrynosoma cornutum*	—	T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September.	No	- -	No Impact
Timber/ canebrake rattlesnake *Crotalus horridus*	—	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil, or black clay; prefers dense ground cover, i.e. grapevines or palmetto.	Yes	- -	No Impact
PLANTS						
Glen Rose yucca *Yucca necopina*	—		Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June.	No	- -	No Impact

E – Endangered

T – Threatened

DM – Delisted taxon, recovered, being monitored first five years

"–" – No designation occurring within identified county

"blank" – Rare, but with no regulatory listing status

"- -" – No determination of effect or impact required because species lacks federal and/or state listing status

"*" – TPWD T&E species list indicates species could be present in identified county; however, USFWS T&E species list does not indicate a listing status for the species in the county.

Sources: U.S. Fish & Wildlife Service (January 9, 2009), Texas Parks & Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs, County Lists of Texas Special Species (Denton, February 28, 2011), and Field Visit (April 2009, April 2010).

After reviewing habitat requirements, reviewing the results of the NDD search, and conducting a field investigation, it was determined that there is limited suitable habitat within the proposed project area for the Bald Eagle, the timber/canebrake rattlesnake, the plains spotted skunk, and the Texas garter snake, but no other state or federally listed threatened or endangered species, or species of concern. The project area is adjacent to Lewisville Lake, which is suitable habitat for the Bald Eagle. However, the Bald Eagle primarily perches and roosts on tall mature trees. The project area is primarily maintained grasses along a two-lane roadway with few tall trees. The Bald Eagle is not likely to be found within the project area. No evidence of this species was found during the field investigation. The habitat to support the timber/canebrake rattlesnake is

adjacent to the jurisdictional waters present within the project area. The riparian habitat is sparse and does not provide the dense groundcover preferred by the rattlesnake. No evidence of this species was found during the field investigation. In Texas, the timber/canebrake rattlesnake is most likely to be found in bottomland areas in the Pineywoods region of east Texas.

Some suitable habitat was noted within the construction limits for the plains spotted skunk and the Texas garter snake; however, no known occurrences have been documented in USGS quadrangles surrounding the project area for either species. During construction of the proposed Build alternative, if implemented, there would be temporary impacts to open fields and streams which could serve as habitat for these species. After construction, the impacted areas would be returned to preconstruction conditions and any habitat would reestablish itself. There are also ample fields, streams and wetlands outside of the proposed construction limits of the proposed Build Alternative that could serve as plains spotted skunk and Texas garter snake habitat to replace the permanently impacted habitat.

None of the listed species in **Table 9** were detected along the project area during the field investigations on April 8, 2009 and April 12, 2010. This project would have no effect on any federally listed species, its habitat, or designated critical habitat, nor would it adversely impact any state listed species. Two species of concern may be impacted by the proposed project.

The No-Build alternative would not affect any threatened or endangered species because there would be no construction associated with this alternative. However, the No-Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Vegetation/Wildlife Habitat

According to the TPWD Texas Natural Regions map, the proposed project is in the Oak Woods and Prairies Natural Region. The TPWD 1984 *Vegetation Types of Texas* map shows that the proposed project is located within the physiognomic regions classified as “Other Native and/or Introduced Grasses”. While some areas along the proposed project exhibit this classification, other areas exhibit the characteristics of the “Crops” and “Post Oak Woods/Forest” classifications.

Land Use

The land use adjacent to the proposed project consists of agricultural pasture and crop land, vacant land, commercial facilities, scattered single-family residences, and single-family subdivisions. It is not anticipated that the proposed project would change the land use as it now exists or is planned for future development.

Maintained Vegetation

Approximately 30.7 acres of the existing ROW and easements are mowed and maintained herbaceous vegetation consisting of Bermuda grass (*Cynodon dactylon*), black medic (*Medicago lupulina*), Carolina crane’s-bill (*Geranium carolinianum*), common vetch (*Vicia sativa*), curly dock (*Rumex crispus*), dallisgrass (*Paspalum dilatatum*), Japanese brome (*Bromus japonicus*), Johnson grass (*Sorghum halepense*), perennial wild-rye (*Lolium perenne*), Southern dewberry (*Rubus trivialis*), southwest bedstraw (*Galium virgatum*), and wild onion (*Allium canadense*).

Approximately 1.8 acres of maintained landscape trees and shrubs have been incorporated into the landscape along the west side of the proposed project from approximately 400 feet south of Trailblazer Road to 875 feet north of Cross Oak Ranch Road. The trees and shrubs consist of cedar elm (*Ulmus crassifolia*), Shumard's oak (*Quercus shumardii*), Southern wax myrtle (*Myrica cerifera*), and sweet gum (*Liquidambar styraciflua*). The trees and shrubs range in size from two

to six inches diameter at breast height (dbh) with an average of four inches dbh. The trees are 10 to 20 feet high with an average of 15 feet. Canopy cover is less than 10 percent.

Unusual Vegetation Features

Unusual vegetation features, as outlined in the TxDOT-TPWD *Memorandum of Agreement (MOA) for the Finalization of the 1998 Memorandum of Understanding (MOU) Concerning Habitat Descriptions and Mitigation*, are defined as "unmaintained vegetation, trees or shrubs along a fenceline, riparian vegetation, trees that are unusually larger than other trees in the area, and unusual stands or islands of vegetation." There are no unusual stands or islands of vegetation in the proposed project area. The remaining unusual vegetation features in the proposed project area are discussed as follows:

Unmaintained Vegetation

Unmaintained vegetation within the proposed project ROW and easements includes herbaceous vegetation, fenceline trees, upland woodlands, riparian vegetation, and trees that are unusually larger than other trees in the area. TxDOT Woodland Data Forms are provided in **Appendix B**. The unmaintained vegetation types and their associated impacts are described in the following sub-sections:

- Herbaceous Vegetation

Approximately 21.7 acres of herbaceous vegetation is unmaintained within the proposed project ROW. This vegetation includes Bermuda grass, black medic, Carolina crane's-bill, common sunflower (*Helianthus annuus*), common vetch, curly dock, dallisgrass, giant goldenrod (*Solidago gigantea*), giant ragweed (*Ambrosia trifida*), Japanese brome, Johnson grass, perennial wild-rye, Southern dewberry, southwest bedstraw, and wild onion.

- Fenceline Trees

Approximately 3.4 acres of woody fenceline vegetation is present within the existing and proposed project ROW. The overstory vegetation consists of black locust (*Robinia pseudoacacia*), Bradford pear (*Pyrus calleryana*), Eastern red cedar (*Juniperus virginiana*), gum bumelia (*Sideroxylon lanuginosa*), honey mesquite (*Prosopis glandulosa*), and sugarberry (*Celtis laevigata*). The trees range in size from saplings to 36 inches dbh with an average of six inches dbh. The trees are 15 to 50 feet high with an average height of 20 feet. Canopy cover ranges from less than 10 percent to 25 percent. Typical understory vegetation consists of Bermuda grass, catch-weed bedstraw (*Galium aparine*), common greenbrier (*Smilax rotundifolia*), Johnson grass, poison ivy (*Toxicodendron radicans*), saw greenbrier (*Smilax bona-nox*), Southern dewberry, and southwest bedstraw.

- Upland Woodlands

Approximately 1.9 acres of upland woodlands are located within the existing and proposed project ROW. The overstory vegetation consists of American elm (*Ulmus americana*), blackjack oak (*Quercus marilandica*), black willow (*Salix nigra*), cedar elm, Eastern red cedar, green ash (*Fraxinus pennsylvanica*), gum bumelia, honey mesquite, live oak (*Quercus virginiana*), osage orange (*Maclura pomifera*), pecan (*Carya illinoinensis*), post oak (*Quercus stellata*), redbud (*Cercis canadensis*), Shumard's oak, Southern catalpa (*Catalpa bignonioides*), sugarberry, sweet gum, water oak (*Quercus nigra*), white ash (*Fraxinus americana*), and white mulberry (*Morus alba*). The trees range in size from saplings to 36 inches dbh with an average of 12 inches dbh. The trees are 15 to 60 feet high with an average of 40 feet. Canopy cover ranges from less than 10 percent to 50 percent. Typical understory vegetation consists of Bermuda grass, giant golden-rod, giant ragweed, Japanese brome, Johnson grass, Southern dewberry, and southwest bedstraw.

- Riparian Vegetation

Approximately 0.4 acre of riparian vegetation is present within the existing and proposed project ROW. The overstory vegetation consists of black willow, cottonwood (*Populus deltoides*), green ash, post oak, and sugarberry. Typical understory vegetation consists of Carolina crane's-bill, common greenbrier, giant goldenrod, honey suckle (*Lonicera japonica*), poison ivy, saw greenbrier, Southern dewberry, and southwest bedstraw.

- Unusually Large Trees

Unusually large trees relative to other trees in the area occur within the existing and proposed ROW. These trees stand out because they are relatively isolated or are taller than other trees that are nearby. Most of the large trees are within the riparian areas, upland woodlands, fencelines, or are located within the existing project ROW and easements. The unusually large trees are described in **Table 10**. The table provides the species, number of trees, approximate dbh, and location for individual trees that have at least a 20-inch dbh (this includes trees with multiple trunks at dbh).

Table 10: Large Trees

ID	Common Name	Scientific Name	DBH* (inches)	Location
1	American elm	*Ulmus americana*	30	Proposed ROW
2	Water oak	*Quercus nigra*	36	Proposed ROW
3	Osage orange	*Maclura pomifera*	Twin trunk 36	Proposed ROW
4	Honey mesquite	*Prosopis glandulosa*	36	Proposed ROW
5	Pecan	*Carya illinoinensis*	24	Proposed ROW
6	Post oak	*Quercus stellata*	36	Proposed ROW
7	Post oak	*Quercus stellata*	24	Proposed ROW
8	Post oak	*Quercus stellata*	30	Existing ROW
9	Post oak	*Quercus stellata*	24	Existing ROW
10	Post oak	*Quercus stellata*	18 trees - 24 to 30	Existing and proposed ROW

*DBH – diameter at breast height

Special Habitat Features

Special habitat features, as outlined in the TxDOT-TPWD *MOA for the Finalization of the 1998 MOU Concerning Habitat Descriptions and Mitigation*, are defined as bottomland hardwoods, caves, cliffs and bluffs, native prairies, ponds, seeps or springs, snags (dead trees) or groups of snags, water bodies (creeks, streams, rivers, lakes, etc.), and existing bridges with known or easily observed bird or bat colonies. There are no bottomland hardwoods, caves, cliffs and bluffs, native prairies, ponds, seeps or springs, snags, or existing bridges with known or easily observed bird or bat colonies in the proposed project area. The remaining special habitat feature, water bodies, is discussed in the Waters of the U.S. and Wetlands section of this EA.

Summary

Table 11 shows a summary of the impacts of the proposed project on the habitat types within the proposed project's existing and proposed ROW and easements. These impacts are associated with clearing of existing vegetation cover as required for the construction of the proposed project.

Table 11: Vegetation Impacts Along FM 720

Habitat Type	Total Acres Impacted
Maintained Herbaceous Vegetation	30.7
Maintained Woody Vegetation	1.8
Unmaintained Herbaceous Vegetation	21.7
Fenceline Trees/Shrubs	3.4
Upland Woodlands	1.9
Riparian Vegetation	0.4
Total	**59.9**

In accordance with Provision (4)(A)(ii) of the TxDOT-TPWD Memorandum of Understanding, habitats given consideration for non-regulatory mitigation during project planning include the following:

- Habitat for federal candidate species if mitigation would assist in the prevention of the listing of the species;
- Rare vegetation series (S1, S2, or S3) that also locally provide habitat for a state-listed species;
- All vegetation communities listed as S1 or S2, regardless of whether or not the series in question provide habitat for state listed species;
- Bottomland hardwoods, native prairies, and riparian areas; and,
- Any other habitat feature considered to be locally important.

Vegetation to be removed during construction of the proposed project would not assist in the prevention of the listing of a federal candidate species, is not a rare vegetation series, and is not a native prairie. Additionally, there is no known local importance of the vegetation to be removed by the proposed project. Mitigation was considered for the approximately 0.4 acre of riparian vegetation that would potentially be removed. However, this habitat is of poor quality, and habitat of similar composition and structure is present outside of the proposed ROW. Areas outside the limits of actual construction would not be disturbed and the riparian habitat would re-vegetate after project completion. Therefore, no compensatory mitigation is proposed for impacts to riparian habitat.

No landscaping would be part of the proposed project. Disturbed areas would be re-vegetated according to TxDOT's standard practices for rural areas, which to the extent practical, is in compliance with EO 13122 on Invasive Species and the Executive Memorandum on Beneficial Landscaping.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. Migratory patterns would not be affected by the proposed project. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided. The contractor would remove all old migratory bird nests from October 1 to February 15 from any structure where work will be done. In addition, the contractor would be prepared to prevent migratory birds from building nests between February 15 and October 1, per the Environmental Permits, Issues, and Commitments (EPIC) plans.

The No-Build alternative would not affect any migratory birds because there would be no construction associated with this alternative. However, the No-Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Cultural Resources

Cultural resources are structures, buildings, archeological sites, districts (a collection of related structures, buildings, and/or archeological sites), cemeteries and objects. Both federal and state laws require consideration of cultural resources during project planning. At the federal level, NEPA and the Natural Historic Preservation Act of 1966, among others, apply to transportation projects such as this one. In addition, state laws such as the Antiquities Code of Texas apply to these projects. Compliance with these laws often requires consultation with the Texas Historic Commission (THC)/Texas State Historic Preservation Officer (SHPO) and/or federally-recognized tribes to determine the project's effects on cultural resources. Review and coordination of this project followed approved procedures for compliance with federal and state laws.

Historic Resources

This project was previously coordinated in 2005 and 2008 in which TxDOT Historians determined and THC concurred that all 37 historic-age resources were not eligible for listing on the National Register of Historic Places (NRHP) (see letters in **Appendix C** dated January 7, 2005 and January 24, 2008). Due to the lapse of time and the 2011 letting date, a reconnaissance survey was conducted in 2010 to identify any additional historic-age resources constructed between 1961 and 1966.

A review of the NRHP, the list of State Archeological Landmarks, and the list of Recorded Texas Historic Landmarks indicated that no historically significant resources have been previously documented within the area of potential effects (APE). It has been determined through consultation with the SHPO that the APE for the proposed project is 150-ft from the proposed ROW. A reconnaissance survey undertaken in April 2010 revealed that there are nine additional historic-age resources (built prior to 1966) located within the project APE. Therefore, the 2005, 2008, and 2010 survey efforts identified a total of 46 historic-age resources in the project APE. TxDOT Historians determined that none of the historic-age resources are NRHP-eligible.

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects," Appendix 4 (2) of the Programmatic Agreement for Transportation Undertakings, (PATU) between the FHWA, the Texas SHPO, the Advisory Council on Historic Preservation, and TxDOT and the Memorandum of Understanding (MOU), TxDOT Historians determined that no historic properties are present within the proposed project's APE and individual project coordination with SHPO is not required.

The No-Build alternative would not impact any historical resources because there would be no construction associated with this alternative. However, the No Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Archeological Resources

A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties (36 CFR 800.16(l)) or State Archeological Landmarks (13 TAC 26.12) in the APE. The APE comprises the existing ROW within the project limits and any areas of new ROW or easements. The APE extends to a maximum depth of three feet below the modern ground surface. Section 106 review and consultation proceeded in accordance with the First Amended Programmatic Agreement among the FHWA, TxDOT, the Texas SHPO, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU), as well as the MOU between the THC and TxDOT. The following documentation presents TxDOT's findings and explains the basis for those findings.

An intensive survey of the APE was performed by Ecological Communications, Inc. (ECOMM) under Texas Antiquities Permit No. 5659. This survey revealed no archeological deposits within the proposed undertaking's APE. The proposed FM 720 project is situated in an upland setting with low potential to contain archeological resources. The project location had been greatly altered by utility construction, residential encroachment, agricultural practices, and roadway development. The likelihood of identifying intact cultural deposition is slight. Surface inspection and subsurface shovel testing indicated only road fill and modern construction materials.

TxDOT completed its review on August 26, 2010. Section 106 consultation with federally recognized Native American tribes with a demonstrated historic interest in the area was initiated on September 4, 2009. No objections or expressions of concern were received within the comment period.

Pursuant to Stipulation VI of the PA-TU, TxDOT finds that the APE does not contain archeological historic properties (36 CFR 800.16(l)), and thus the proposed undertaking would not affect archeological historic properties. The project does not merit further field investigations. Project planning can also proceed, in compliance with 13 TAC 26.20(2) and 43 TAC 2.24(f)(1)(C) of the MOU. If unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the PA and MOU.

Prime, Unique and Special Farmland Impacts

Prime and unique farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber and oilseed crops. They have the quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when treated and managed using acceptable farming methods.

According to the Farmland Protection Policy Act (FPPA) 7 U.S.C. 4202(a), agencies whose projects impact soils identified as prime or unique in section 1540(c)(1) of the Act are to use defined criteria to identify and take into account the adverse effects their programs might have on the preservation of farmland; consider alternative actions which might lessen adverse effects, and ensure their programs are compatible with state and local government and private programs and policies to protect farmlands.

Designation of prime and unique farmlands is made by the Natural Resources Conservation Service (NRCS). According to the NRCS, the state of Texas does not recognize unique farmland. Therefore, all soils designated as prime in Denton County by the NRCS are also unique, for purposes relating to the FPPA 7 U.S.C. 4202(a).

Based upon a list from the NRCS, the NRCS considers 36 soils within Denton County to be prime farmland soils. **Table 12** shows those soils within the project area that the NRCS considers as prime farmland soils, and therefore subject to the FPPA.

Table 12: Prime Farmland Soils

Soil Name	Percent Slope
Callisburg fine sandy loam	1 – 3
Gasil fine sandy loam	1 – 3
Konsil fine sandy loam	1 – 3

Source: Soil Survey of Denton County, Texas, 1980

Pursuant to the FPPA, Form CPA -106 (Farmland Conversion Impact Rating) was completed for the proposed project and provided to the NRCS for determination. Based upon the NRCS determination, the proposed project would not affect any prime or unique farmland. The proposed project had a total score of 95 points which is too low to require further coordination

with the NRCS. A copy of the NRCS letter and NRCS CPA-106 form is provided in **Appendix D**.

The No-Build alternative would not affect any prime or unique farmland because there would be no construction associated with this alternative. However, the No-Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Air Quality Assessment

The proposed project is located within Denton County, which is part of the Dallas-Fort Worth area that has been designated by the U. S. Environmental Protection Agency (EPA) as a serious nonattainment area for the eight-hour standard for the pollutant ozone and a small portion of Collin County is in non-attainment for lead. However, in accordance with federal guidelines in Section 93.126, of Title 40 CFR, the proposed project, a Non Regionally Significant Roadway – MTP Reference: TH2 1843, is exempt from conformity determination.

The proposed project is consistent with the area's financially constrained long-range *Mobility 2030 – 2009 Amendment* (Metropolitan Transportation Plan [MTP]). The U.S. Department of Transportation (FHWA/FTA) found the MTP to conform to the State Implementation Plan (SIP) on June 12, 2007. The FHWA found the 2011-2014 TIP to conform to the SIP on February 1, 2011. All projects in the DFW Metropolitan Area 2011-2014 TIP that are proposed for federal or state funds were initiated in a manner consistent with the federal guidelines in Section 450 of Title 23 CFR and Section 613.200, Subpart B of Title 49 CFR. Energy, environment, air quality, cost and mobility considerations are addressed in the programming of the TIP. The appropriate MTP and TIP pages are located in **Appendix E**.

Traffic Air Quality Analysis

Traffic data for the design year (2030) is 23,600 vpd. A prior TxDOT modeling study demonstrated that it is unlikely that a carbon monoxide standard would ever be exceeded as a result of any project with an average daily traffic (ADT) below 140,000 vpd. The ADT projections for the project do not exceed 140,000 vpd; therefore a Traffic Air Quality Analysis was not required.

Congestion Management Process (CMP)

The CMP is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs. The proposed project was developed from NCTCOG's operational CMP which meets all requirements of 23 CFR 500.109 incorporating the transportation planning requirements of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). On April 9, 2009, the NCTCOG's Regional Transportation Council (RTC) approved the MTP, which contains elements of the CMP.

The operational management and travel demand reduction strategies are commitments made by the region at two levels: program level and project level implementation. Program level commitments are inventoried in the regional CMP, which was adopted by the NCTCOG Regional Transportation Council. They would be included in the financially constrained MTP and future resources would be earmarked for their implementation.

The CMP element of the plan would carry an inventory of all project commitments (including those resulting from major investment studies) detailing type of strategy, implementing responsibilities, schedules, and expected costs. At the project implementation level, travel demand reduction strategies and commitments would be added to the regional TIP or included in the construction plans. The regional TIP would provide for programming of these projects at

the appropriate time with respect to the single-occupancy vehicle (SOV) facility implementation and project specific elements. Individual CMP projects in the area are listed in **Table 13**.

Table 13: CMP Projects in the Study Area

Project Code	Street / Name	City	County	Implementing Agency	Project Type	Year of Implementation	Total Project Cost
11531	FM 720 FROM GARZA LN TO FM 423	DENTON	DENTON	TXDOT-DALLAS	ADDITION OF LANES	2010	$74,455,728
82050	LEWISVILLE LAKE TOLL BRIDGE FROM SWISHER RD TO GARZA LN	VARIOUS	DENTON	NTTA	NEW ROADWAY	2009	$75,000,000
20099	WITT ROAD FROM ELDORADO PARKWAY (FM 720) TO KING ROAD	LITTLE ELM	DENTON	LITTLE ELM	ADDITION OF LANES	2009	$5,560,479
28003	FM 423 FROM US 380 TO 0.8 MILES SOUTH OF FM 2934	VARIOUS	DENTON	TXDOT-DALLAS	ADDITION OF LANES	2010	$44,888,407

Source: North Central Texas Council of Governments, www.dfwinfo.com, TIPINS, November 2010.

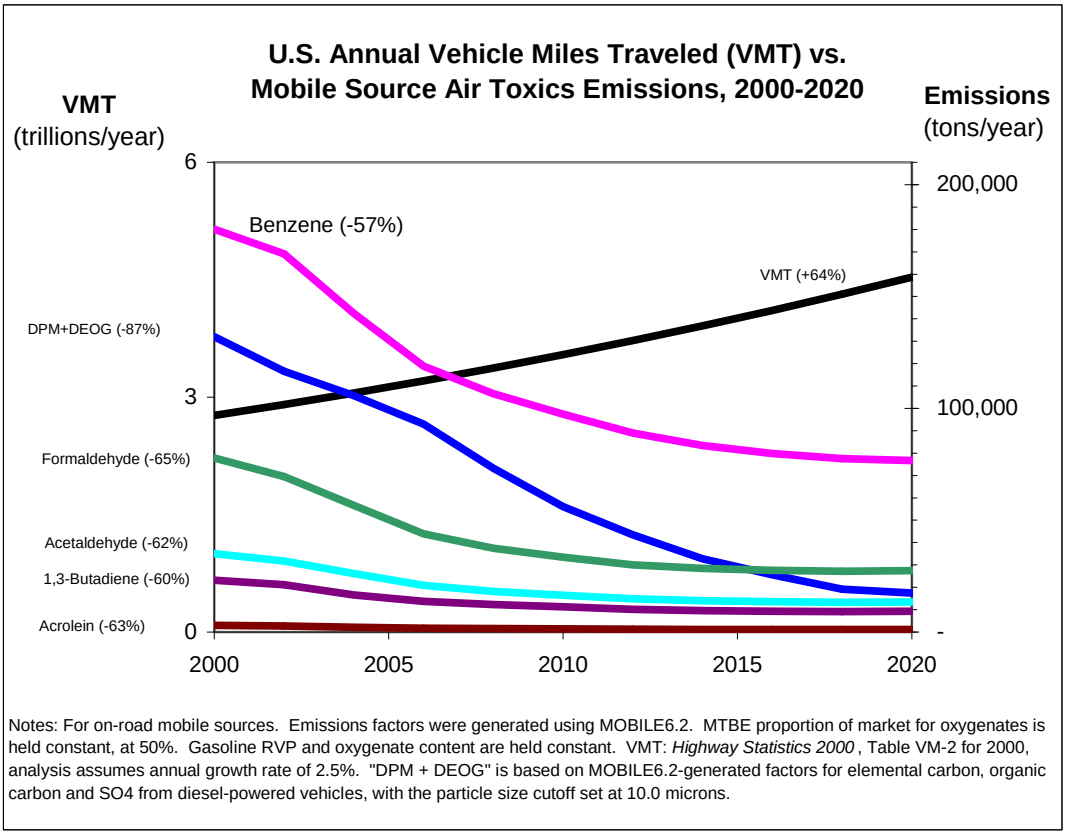
In an effort to relieve traffic congestion and the need for single occupant vehicle (SOV) lanes in the region, TxDOT and NCTCOG will continue to promote appropriate congestion management strategies through the Congestion Mitigation and Air Quality program, the CMP, and the MTP. The congestion reduction strategies considered for the proposed project would help alleviate congestion in the SOV study boundary, but would not eliminate it. Therefore, the proposed project is justified. The CMP analysis for added SOV capacity projects in the TMA is on file and available for review at NCTCOG.

Mobile Source Air Toxics (MSATs)

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act (CAA). The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and would reduce on-highway diesel particulate matter (PM) emissions by 87 percent, as shown in the following graph:



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000* , Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

In an ongoing review of MSATs, the EPA finalized additional rules under authority of CAA Section 202(l) to further reduce MSAT emissions that are not reflected in the above graph. The EPA issued Final Rules on Control of Hazardous Air Pollutants from Mobile Sources (72 FR 8427, February 26, 2007) under Title 40 Code of Federal Regulations Parts 59, 80, 85 and 86. The rule changes were effective April 27, 2007. As a result of this review, EPA adopted the following new requirements to significantly lower emissions of benzene and the other MSATs by: (1) lowering the benzene content in gasoline; (2) reducing non-methane hydrocarbon (NMHC) exhaust emissions from passenger vehicles operated at cold temperatures (under 75 degrees Fahrenheit); and (3) reducing evaporative emissions that permeate through portable fuel containers.

Beginning in 2011, petroleum refiners must meet an annual average gasoline benzene content standard of 0.62 percent by volume, for both reformulated and conventional gasolines, nationwide. The national benzene content of gasoline in 2007 is about 1.0 percent by volume. EPA standards to reduce NMHC exhaust emissions from new gasoline-fueled vehicles will become effective in phases. Standards for light-duty vehicles and trucks (equal to or less than 6000 pounds [lbs]) become effective during the period of 2010 to 2013, and standards for heavy light-duty trucks (6,000 to 8,000 lbs) and medium-duty passenger vehicles (up to 10,000 lbs) become effective during the period of 2012 to 2015. Evaporative requirements for portable gas containers become effective with containers manufactured in 2009. Evaporative emissions must be limited to 0.3 grams of hydrocarbons per gallon per day.

EPA has also adopted more stringent evaporative emission standards (equivalent to current California standards) for new passenger vehicles. The new standards become effective in 2009 for light vehicles and in 2010 for heavy vehicles. In addition to the reductions from the 2001 rule, the new rules will significantly reduce annual national MSAT emissions. For example, EPA estimates that emissions in the year 2030, when compared to emissions in the base year prior to the rule, will show a reduction of 330,000 tons of MSATs (including 61,000 tons of benzene),

reductions of more than 1,000,000 tons of volatile organic compounds, and reductions of more than 19,000 tons of PM2.5.

Project Specific MSAT Analysis Information

Numerous technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. In Chapter 3 of its Regulatory Impact Analysis (RIA) for the 2007 MSAT rules, EPA states that there are a number of additional significant uncertainties associated with the air quality, exposure and risk modeling. The modeling also has certain key limitations such as the results are most accurate for large geographic areas, exposure modeling does not fully reflect variation among individuals, and non-inhalation exposure pathways and indoor sources are not taken into account. Chapter 3 of the RIA is found at:

http://www.epa.gov/otaq/regs/toxics/fr-ria-sections.htm.

However, it is possible to qualitatively assess the "relative" levels of future MSAT emissions under the project. Although a qualitative assessment cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:

www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

For each alternative in this EA, the amount of MSATs emitted would be proportional to the VMT assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases would offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. Because the estimated VMT under each of the Alternatives is nearly the same it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives.

Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives would have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under the Build alternative than the No-Build alternative. The localized increases in MSAT concentrations would likely be most pronounced at the high-traffic intersections along FM 720. However, the magnitude and the duration of these potential increases compared to the No

Build alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build alternative could be higher relative to the No Build alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will cause region-wide MSAT levels to be significantly lower than today.

Sensitive Receptor Analysis

There may be localized areas where ambient concentrations of MSATs are slightly higher in any build scenario than in the no build scenario. Dispersion studies have shown that the "roadway" air toxics start to drop off at about 100 meters. By 500 meters, most studies have found it very difficult to distinguish the roadway from background toxic concentrations in any given area. An assessment of some potential sensitive receptors within both 100 and 500 meters has been conducted. Sensitive receptors include those facilities most likely to contain large concentrations of the more sensitive population (including hospitals, schools, licensed day care facilities, and elder care facilities).

Sensitive receptors located along the project corridor are shown on **Figure 6**. A listing of all the sensitive receptors can be found in **Tables 14** and **15**.

Table 14: Sensitive Receptors by Distance

Alternative	Length (miles)	Number of Receptors:	
		Within 328 ft (100 meters)	Between 328 ft (100 meters) and 1640 ft (500 meters)
Build Alternative	4.7	3	1

Table 15: Sensitive Receptors in the Project Area

Map ID No.	Name	Address	City	Zip Code	Distance from Proposed ROW in ft*
1	Oak Grove Methodist Church (playground)	4125 FM 720	Aubrey	76227	161
2	Living Word Baptist Church (playground)	2315 W FM 720	Little Elm	75068	282
3	The Education Center	5901 Crestwood Place	Little Elm	75068	85
4	Narrow Lake Park	100 Kavewood Drive	Little Elm	75068	1047

**Distance provided is an approximation.*

Unavailable Information for Project Specific MSAT Impact Analysis: This environmental document includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools and lack of health-based MSAT standards do not enable prediction of the project-specific health impacts of the emission changes associated with the alternatives in this environmental document. Because of these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete: Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For PM, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations. However, MOBILE6.2 is currently the only available tool for use by FHWA/TxDOT and, therefore, is used for comparison of alternatives in larger scale projects.

2. Dispersion: The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects: Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with

calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs: Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that might result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancerous hazard from MSATs. Prolonged exposures might impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more

comprehensive evaluation of the health impacts specific to this project.

In the preamble to the 2007 MSAT rule, EPA summarized recent studies with the following statement: "Significant scientific uncertainties remain in our understanding of the relationship between adverse health effects and near-road exposure, including the exposures of greatest concern, the importance of chronic versus acute exposures, the role of fuel type (e.g., diesel or gasoline) and composition (e.g., % aromatics), relevant traffic patterns, the role of co-stressors including noise and socioeconomic status, and the role of differential susceptibility within the 'exposed' populations" (Citation: Volume 73 Federal Register Page 8441 (February 26, 2007) Control of Hazardous Air Pollutants from Mobile Sources).

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

FHWA acknowledges that the Build alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

In this document, a qualitative assessment has been provided relative to the MSAT emissions and has acknowledged that the proposed project may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

Air Quality Assessment – No-Build Alternative
The No-Build alternative would not improve air quality because the existing facility currently operates well above its maximum capacity of traffic flow. These conditions are expected to worsen with time as Denton County experiences continued residential and commercial growth. The No-Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Noise Assessment
A noise analysis for the proposed roadway improvements was performed in accordance with TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Highway Traffic Noise*. Sound from highway traffic is generated primarily from a vehicle's 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." Also, 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."

Traffic noise analyses typically include the following elements:

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

The FHWA has established Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur. The criteria are presented in **Table 16**.

A noise impact occurs when either an absolute or relative criterion is met. The absolute criterion is met when the predicted noise level at a receiver approaches, equals, or exceeds the NAC. "Approach" is defined as 1 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. The relative criterion is met when the predicted noise level substantially exceeds the existing noise level at a receiver, even though the predicted noise level does not approach, equal, or exceed the NAC. "Substantially exceeds" is defined as more than 10 dBA. For example, a noise impact would occur at a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11-dBA increase). When a traffic noise impact occurs, a noise abatement measure is any positive action to reduce the impact of traffic noise on an activity area.

Table 16: FHWA Noise Abatement Criteria

Activity Category	dBA/L_{eq}	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary 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

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.

The FHWA Traffic Noise Model (TNM) software was used to calculate existing and predicted traffic noise levels at 36 representative locations within the area of acoustical influence of the proposed project (**Figures 7-1** through **7-9**). 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.

As indicated in **Table 17**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone, and the construction of noise barriers.

Table 17: Traffic Noise Levels at Receivers in the Project Study Area

Receiver	NAC Category	NAC Level	Existing (dBA)	Predicted 2032 (dBA)	Change (+/-) (dBA)	Noise Impact
R1 – Residence	B	67	60	62	+2	No
R2 – Church Playground	B	67	59	62	+3	No
R3 – Residence	B	67	59	63	+4	No
R4 – Residence	B	67	56	60	+4	No
R5 – Residence	B	67	58	62	+4	No
R6 – Residence	B	67	56	59	+3	No
R6a – Residence	B	67	57	60	+3	No
R7 – Residence	B	67	57	64	+7	No
R8 – Residence	B	67	54	61	+7	No
R9 – Residence	B	67	59	64	+5	No
R10 – Residence	B	67	60	64	+4	No
R11 – Residence	B	67	62	65	+3	No
R12 – Residence	B	67	62	64	+2	No
R13 – Residence	**B**	**67**	**61**	**66**	**+5**	**Yes**
R14 – Residence	B	67	61	64	+3	No
R15 – Residence	B	67	60	64	+4	No
R16 – Residence	**B**	**67**	**61**	**66**	**+5**	**Yes**
R17 – Residence	**B**	**67**	**62**	**68**	**+6**	**Yes**
R18 – Residence	B	67	59	61	+2	No
R19 – Residence	B	67	57	60	+3	No
R20 – Residence	**B**	**67**	**63**	**70**	**+7**	**Yes**
R21 – Residence	**B**	**67**	**63**	**69**	**+6**	**Yes**
R22 – Residence	**B**	**67**	**63**	**70**	**+7**	**Yes**
R23 – Residence	B	67	58	59	+1	No
R24 – Residence	**B**	**67**	**62**	**68**	**+6**	**Yes**
R25 – Residence	B	67	62	63	+1	No
R26 – Residence	B	67	61	62	+1	No
R27 – Residence	B	67	61	62	+1	No
R28 – Residence	B	67	61	61	+0	No
R29 – Residence	B	67	60	60	+0	No
R30 – Residence	B	67	64	65	+1	No
R31 – Residence	B	67	61	64	+3	No
R32 – Church playground	B	67	53	57	+4	No
R33 – Residence	B	67	54	58	+4	No
R34 – Residence	B	67	59	61	+2	No
R35 – Residence	B	67	59	62	+3	No
R36 – Residence	B	67	56	60	+4	No

Before any abatement measure can be incorporated into the project, it must be both feasible and reasonable. In order to be feasible, the measure must reduce noise levels by at least 5 dBA at impacted receivers; and to be reasonable it must not exceed $25,000 for each benefited receiver. The following noise abatement measures were considered.

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of 1 dBA per five mile-per-hour (mph) reduction in speed does not outweigh the

associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.
Alteration of horizontal and/or vertical alignments: any alteration of the existing alignment would require additional ROW, which would move the roadway closer to the adjacent homes, increasing noise levels at those receivers. Vertical alteration is not reasonable since the road needs to match existing roadway both north and south of the construction limits. The proposed roadway needs to keep similar geometry to the existing portions of FM 720.

Buffer zone: the acquisition of sufficient undeveloped land adjacent to the highway project to preclude future development that could be impacted by highway traffic noise would not be cost effective/reasonable and land adjacent to the highway is currently not available due to existing residential development.

Noise barriers: this is the most commonly used noise abatement measure. Two noise barriers were determined to be feasible and reasonable for impacted receivers represented by R13, R16, R17, R20, R21, and R22 and, therefore, are proposed for incorporation into the project. Based on preliminary calculations, the first noise barrier, approximately 2,400 feet in length and 8 feet in height, would reduce noise levels by at least 5 dBA for 30 benefited receivers at a total cost of $288,000, or $9,600 for each benefited receiver (**Figure 7-7**). The second noise barrier, approximately 400 feet in length and 10 feet in height, would reduce noise levels by at least 5 dBA for 6 benefited receivers at a total cost of $60,000 or $10,000 for each benefited receiver (**Figure 7-6**). Any subsequent project design changes may require a reevaluation of this preliminary noise barrier proposal. The final decision to construct the proposed noise barrier would not be made until after the completion of the project design, utility evaluation and polling of adjacent property owners.

R24 would be impacted by the proposed improvements and a noise barrier designed to achieve the minimum feasible reduction of 5 dBA in noise at the receiver would exceed the reasonable, cost-effective criterion of $25,000. The receiver represents a single residence that faces the roadway. None of the noise abatement measures described above is both feasible and reasonable; therefore, no abatement measures are proposed for this receiver.

Land use activity areas located adjacent to the roadway consists of Category B (residential), Category C (commercial), and Category D (undeveloped land) properties. New development is currently planned, designed or programmed in the project study area. There is no NAC for undeveloped land. However, to avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs should ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2032) noise impact contours (**Table 18**).

Table 18: Noise Impact Contours in the Project Study Area

Land Use	Impact Contour	Distance from Proposed ROW Line
Residential	66 dBA	55 feet

A copy of the traffic noise analysis would be provided to local officials to ensure, to the maximum extent possible, future developments are planned, designed, and programmed in a manner that would avoid traffic noise impacts. On the date of approval of this EA (Date of Public Knowledge), Denton County, City of Denton, TxDOT, and FHWA are no longer responsible for providing noise abatement for new development adjacent to the proposed project.

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise during construction, is constantly moving in unpredictable patterns but construction noise would be short-term. In addition, construction normally occurs during daylight

hours when occasional loud noises are more tolerable. None of the receivers would be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities would not be expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

The No-Build alternative would not improve noise because the existing facility currently operates well above its maximum capacity of traffic flow. These conditions are expected to worsen with time as Denton County experiences continued residential and commercial growth. The No-Build alternative would not remedy the existing traffic problems, and would allow for continued deterioration of traffic flow conditions.

Hazardous Waste/Substance

A review of selected federal and state regulatory databases was conducted to determine the potential for encountering hazardous materials and substances within the project study area. In addition, a field survey of the project limits was conducted on July 25, 2006 and April 8, 2009 to confirm the location of selected listed facilities, and to observe the general environmental conditions at these sites and within the project limits. The regulatory listings are limited and include only those sites that were known to the regulatory agencies at the time of publication to be contaminated or in the process of evaluation for potential contamination. The databases were searched within the standard search radii of the project study area per the American Society for Testing and Materials (ASTM) standards.

The following is a list of the federal and state standard ASTM databases that were reviewed: EPA, National Priorities List (NPL), EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List, CERCLIS No Further Remedial Action Planned (NFRAP), EPA Resource Conservation and Recovery Information System (RCRIS) or RCRA Notifiers List, RCRA Corrective Action Sites (CORRACTS) List, RCRIS Treatment, Storage and Disposal (TSD) list, EPA Emergency Response Notification System (ERNS), TCEQ State Superfund Registry, TCEQ Registered Underground Petroleum Storage Tank (UST) List, TCEQ Leaking Petroleum Storage Tank (LPST) List, TCEQ Solid Waste Municipal Landfill Facility (SWF/LF) List, TCEQ Closed Landfill Inventory (CLI), and TCEQ Voluntary Cleanup Program (VCP). Other supplemental ASTM databases reviewed that had sites within the project study area included EPA Facility Index System (FINDS), Toxic Substances Control Act (TSCA), Toxic Chemical Release Inventory System (TRIS), TCEQ Registered Aboveground Storage Tank (AST), Drycleaners Registration database (Drycleaners) and TCEQ Industrial and Hazardous Waste Sites (IHW).

Review of the federal, state and regulatory databases indicated three mapped and one unmapped sites within a one mile radius of the project alignment. The four sites include two UST sites, one leaking underground storage tank (LTANK) site, two AST sites, and one site listed under the VCP and the activity use and limitations (AUL) databases. **Table 19** provides a summary of the facilities identified within the project study area. The locations of the mapped sites are presented on **Figure 8**.

Table 19: Hazardous Material Locations in the Project Study Area

Property Name and Location	Map ID Number*	Database	Site Details
Earl's Beer 26411 Highway 380 Aubrey, TX 76227	1	LTANKS, UST	Four composite gasoline storage tanks installed on 01/01/1988. Groundwater impacted, no apparent threats or impacts to receptors. Final concurrence issued, case closed.
Putman Services 1904 W Highway 720 Little Elm, TX 75068	2	AST	One aboveground steel diesel storage tank. Tank temporarily out of use as of 08/20/2000.
Sonntag Trucking FM 720 Little Elm, TX 75068	2	AST	One aboveground steel diesel storage tank. Tank temporarily out of use as of 3/17/2000.
Courtesy Liquor FM 423	3	UST	Two underground steel gasoline storage tanks installed on 01/01/1971. Tanks removed from the ground.
Little Elm Tract Northwest Corner of FM 423 and Eldorado Parkway Little Elm, TX	Unmapped	VCP, AUL	Soil contaminated with metals. Site complying with TRRP.
The Bottle Shop 16049 Mulberry Little Elm, TX 75068	Unmapped	LPST	Minor soil contamination. Tank closure in 1993. Final concurrence issued, case closed.
1800 W FM 720 Little Elm, TX 75068	Unmapped	LPST	Leak discovered in 2005. Groundwater impacted; no apparent threat to receptors. Final concurrence issued, case closed.

** Source: Environmental Data Resources, Inc. (January 2006), TCEQ LPST query (April 2009)*

The two registered UST sites include Earl's Beer and Courtesy Liquor. There are four USTs registered at the Earl's Beer site. The composite USTs were installed in 1988 and were used for storage of gasoline. The four tanks are reported as being in use. There are two USTs registered at the Courtesy Liquor site. The steel USTs were installed in 1971 and were used to store gasoline. Both tanks were reportedly removed from the ground in 1997. No violations have been reported in connection to the Courtesy Liquor site.

The LTANKS site corresponds to Earl's Beer. There has been one report of groundwater impact, with no apparent threats or impacts to receptors at this site. The TCEQ has issued final concurrence in this site and the case is closed.

The AST sites include Putman Services and Sonntag Trucking. Putman Services reports one steel AST used for storage of diesel. The AST was registered in 1999 and is reported to be temporarily out of use as of 2000. There is one AST reported at the Sonntag Trucking site. The AST was registered in 1998 and is reported as being temporarily out of use as of 2000. No violations are reported in connection to the two AST sites.

The VCP and AUL is an unmapped site located at the Little Elm Tract, within a one-mile radius from the project study area. Soil at this site was reportedly contaminated with metals. The cleanup phase is reported as complete, with the site complying with Texas Risk Reduction Program (TRRP) cleanup levels.

A search of TCEQ's LPST database on April 16, 2009 revealed two additional LPST sites within 0.25-mile of the proposed project. One site, The Bottle Shop, reported minor soil contamination in 1993. The other unnamed site reported groundwater impacts in 2005. The TCEQ has issued final concurrence to both sites and the cases are closed.

Based upon the generator status, compliance status, distance and/or topographic position to the Build alternative, none of the UST, LTANKS, AST, VCP, AUL, or LPST sites are considered of environmental concern to the Build alternative.

As the plans, specifications, and estimate are developed, TxDOT would continue to evaluate the potential for hazardous materials to affect the proposed construction in the project study area. This may require the performance of a subsurface investigation in the project study area. If impacted soils and groundwater are encountered, then TxDOT would develop appropriate soils and/or groundwater management plans for activities within these areas. The management plans would be initiated in accordance with all applicable federal, state and local regulations.

The No-Build alternative would not impact hazardous waste and substances because no construction would take place.

Visual Impacts
Aesthetic values would be emphasized on this project. It has always been the policy of TxDOT to build visually pleasing travel ways, coupling beauty with their functional capability.

The No-Build alternative would not impact aesthetic values.

Construction Impacts
Construction impacts would consist of utility adjustments and relocations. Driver inconvenience would be minimized using the roadway for access to adjacent and nearby businesses during the construction phase.

Construction may temporarily degrade air quality through dust and exhaust gases associated with construction equipment. Measures to control fugitive dust would be considered and incorporated into the final design and construction specifications. The proposed project would be constructed in phases so that lanes would be open at all times. During construction, lane closures would be of minimal duration. No residences, businesses, or parks would be adversely impacted by the construction of the proposed project. No detours would be required by the proposed project.

The No-Build alternative would not require utility adjustments and relocations.

Items of Special Nature
There are no items of special nature or interest such as navigation or airway-highway clearances, special permits or agreements involved in this project. The project would not affect land or water uses within an area covered by a State Coastal Zone Management Program, nor would it impact coastal barrier resources. Coordination with the U.S. Coast Guard would not be required. The project would not impact any present, proposed, or potential unit of the National Wild and Scenic Rivers System.

The No Build alternative would not impact any items of special nature or interest such as navigation or airway-highway clearances, special permits, or agreements involved with this project.

Indirect Effects

The Council on Environmental Quality (CEQ) defines indirect effects as those "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts 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" (40 CFR Section 1508.8). Indirect effects differ from the direct impacts associated with the construction and operation of the proposed project and are caused by another action or actions that have an established relationship or connection to the proposed project. These induced actions are those that would not or could not occur except for the implementation of the proposed project.

TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (June 2009) and the National Cooperative Highway Research Program (NCHRP) 466: *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* were used to prescreen and/or analyze potential indirect impacts associated with the Build alternative. TxDOT's guidance outlines seven steps that should be followed when determining the indirect effects caused by a proposed transportation project. These steps include:

1. Scoping
2. Identify the Study Area's Goals and Trends
3. Inventory the Study Area's Notable Features
4. Identify Impact-Causing Activities of Proposed Action and Alternatives
5. Identify Potentially Substantial Indirect Effects for Analysis
6. Analyze Indirect Effects and Evaluate Results
7. Assess Consequences and Consider/Develop Mitigation (as Appropriate)

Step 1: Scoping

The proposed project is located in Denton County, and is surrounded on three sides by Lewisville Lake. As shown in **Table 2**, the population of Denton County increased by 466 percent from 1970 to 2000 and is expected to increase by 154 percent by 2030. Portions of FM 720 are located within the municipal boundaries of Lincoln Park, Oak Point, and Little Elm. **Table 20** introduces the level of effort required for the indirect impacts analysis through the scoping process.

Table 20: Level of Effort Required for Indirect Impacts Analysis

Project Variables		Assessment Methodology
Project Type	Roadway Expansion	Qualitative – roadway widening
Project Scale	Small – 4.7 miles, new ROW	Qualitative – simple, lower-cost design
Project Scope	Local	Qualitative – local, non-regionally significant project
Stage of Study	Design Alternatives	Quantitative – specific design identified and direct impacts are quantifiable
Project Setting	Undeveloped agricultural fields interspersed with some single family residential areas.	Qualitative – low development pressure
Design Features	Two new lanes added in each direction with raised median.	Quantitative – additional capacity with reduced access because of median
Project Purpose	To enhance roadway conditions and to facilitate smoother traffic conditions for motorists using FM 720.	Qualitative – purpose is to improve existing conditions, not to change local or regional accessibility
Data Available	Discussions with cities, maps, field data	Qualitative – limited data available beyond estimations

Note: Based on rationale provided in Figure 3-1 on page 27 of NCHRP Report 466.

Because of the project variables associated with the proposed project, the indirect impacts analysis will be a qualitative analysis with some quantitative data provided. The City of Oak Point and its extended territorial jurisdiction (ETJ) encompass 70 percent of the proposed FM 720 project limits. The remaining portion of the project is within the City of Little Elm (20 percent), the Town of Lincoln Park (3 percent) and Denton County (7 percent).

In order to establish the appropriate Area of Influence (AOI), various methods were considered and it was determined that using ecological boundaries was the best method of identifying an AOI. The proposed project is a north-south roadway that is located between two arms of Lewisville Lake. The proposed widening would not affect areas beyond the lake; therefore, the lake serves as an appropriate boundary to the east and west. In the northwest portion of the AOI, the boundary follows the lake floodplain which extends along a tributary. Because there are no east-west roadways that connect FM 720 to the area west of the tributary, it was determined that the proposed project would not influence the area west of the tributary. Instead, this area would be indirectly affected by improvements to US 380. The northwest boundary extends to US 380, the northern logical terminus of the proposed project. US 380 serves as an appropriate northern boundary because impacts beyond US 380 would likely be attributable to the widening of that roadway in 2004. In order to accurately account for indirect impacts related only to FM 720, the southern boundary was based on the proposed project's southern terminus: the intersection of FM 720 and Eldorado Parkway. Extending the AOI beyond this limit would include areas to the south and east that would develop based on the planned widening of Eldorado Parkway to four lanes and the proposed widening of FM 720 to six lanes (1567-01-029). Both roadways are regionally significant roadways that will be widened before 2030. Because no east-west roadway or environmental feature is present close to the southern logical terminus, a straight line was drawn from the logical terminus to the lake floodplain to the east and west to provide the southern AOI boundary. A map of the AOI is provided in **Figure 10** and the total area of the AOI is 6,380 acres. The AOI includes most of the City of Oak Point and portions of the Town of Little Elm and the City of Lincoln Park.

As stated previously, the purpose of the proposed project is to enhance roadway conditions and to facilitate smoother traffic conditions for motorists using FM 720. Although regional movement might benefit from the proposed project, based on the need and purpose and the roadway's designation as non-regionally significant, it is not a determining factor associated with the proposed project; therefore, the indirect effects study area is limited to areas expected to change based on the opinions of local authorities.

The temporal boundaries of the indirect impacts analysis extend through 2020, which includes the proposed completion date of the proposed project (2013) and parallels the limits of the City of Oak Point's *Comprehensive Plan*.

Step 2: Identify the Study Area's Goals and Trends

Within the AOI, approximately 3,240 acres are within the City of Oak Point, 1,134 acres are within the Town of Little Elm and 35 acres are within the City of Lincoln Park. It should be noted that the City of Lincoln Park is only 128 acres in size with a population of 650 people. There is a presiding mayor; however, there is not a planning department or Comprehensive Plan and no city services are provided. The goals and trends within the AOI as they relate to Lincoln Park will not be assessed. The goals and trends of Oak Point and Little Elm are discussed below.

City of Oak Point Goals and Trends

The City of Oak Point's *Comprehensive Plan* (modified in August 2004) indicates that FM 720 is considered a primary major thoroughfare and the proposed widening has been a planned roadway improvement for at least the past nine years. The City is primarily residential with some public facilities, light industry and agriculture. No commercial establishments currently exist in the City of Oak Point. In 2002, approximately 45 percent of the land within the city limits and ETJ was agricultural. In 2009, approximately 20 percent of the land was in agricultural production. Future land use maps indicate that the final build-out of the city allows less than one percent of agriculture/open space with 94 percent residential and four percent commercial. This conversion of land use is consistent with the 506 percent expected population growth from 2000 to 2030 and the ultimate population of 24,795 people. Current zoning maps are consistent with this land use.

Future land use in the City of Oak Point is provided in **Table 21**.

Table 21: City of Oak Point Future Land Use

Category	Estimated Acres	Percent
Ranch Residential	565	10.6%
Estate Residential	2,585	48.7%
Country Residential	201	3.8%
High Density Residential	1,536	28.9%
Manufactured Home	109	2.1%
Commercial	218	4.1%
Public	8	0.1%
Agricultural/Private Open Space	49	0.9%
Park and Open Space	20	0.4%
Light Industrial	19	0.4%
Total	**5,310**	**100%**

Source: City of Oak Point Comprehensive Plan, 2002.

The City of Oak Point has designated approximately 480 acres as the FM 720 Overlay District. This District extends along both sides of FM 720 within the city limits (**Figure 10**) and was established by the City in order to "manage the commercial development along FM 720 while maintaining its rural character" (*Oak Point Comprehensive Land Use Plan*, 2002). The City of Oak Point has indicated that this area is dedicated to commercial and planned development associated with the proposed expansion of FM 720. The FM 720 Overlay District would be the only area with commercial development in the City of Oak Point. Development of this commercial area would be guided by the City's land use policies and goals. The 218 acres of commercial development within the Overlay District would include retail, restaurants, public facilities, and personal and professional services. Land use goals would guide the architecture

and landscape design in order to keep the rural atmosphere of the City of Oak Point. The remaining 262 acres in the Overlay District would be residential and civic.

The following goals were identified in the Comprehensive Plan and are general in nature but can be applied to the AOI.

- …Maintain The City of Oak Point's country atmosphere with an appropriate variety of land uses for both residential and commercial development.
- …Provide access and circulation throughout the City of Oak Point while preserving the rural quality and identity of The City of Oak Point.
- …Encourage appropriate commercial and retail development in the City Oak Point to improve the City's tax base while minimizing impacts on the surrounding areas.

The overall goals and trends for the City of Oak Point within the AOI include developing commercial properties adjacent to FM 720; maintaining the rural character of the area through architecture and landscaping; and providing a range of residential options from 2+ acre lots to manufactured homes.

Town of Little Elm Goals and Trends

The Town of Little Elm's *Comprehensive Plan 2008* indicates that FM 720 is considered a primary roadway. The Little Elm Master Thoroughfare Plan proposes FM 720 to be a six-lane divided roadway with a ROW width of 120 feet. The town is primarily residential with some commercial/retail facilities and recreational facilities. Lewisville Lake makes up almost half of the town limits and ETJ. In 2008, the largest land use in the town limits was floodplain and lake. Residential uses were only 16.2 percent of the land uses and public and commercial/retail land use comprised 6.9 and 2.3 percent of the town, respectively. As shown in **Table 22**, residential land uses would comprise 40.7 percent of the town and ETJ limits and Lewisville Lake and floodplains would comprise 44 percent in the future. This land use is consistent with current zoning and would accommodate the ultimate population of 90,077 people (Chapter 6, *Comprehensive Plan 2008*).

Table 22: Town of Little Elm Future Land Use including the ETJ

Category	Estimated Acres	Percent
Estate Residential	533	2.9%
Low Density Residential	6,521	35.7%
Medium Density Residential	220	1.2%
High Density Residential	91	0.5%
Manufactured Home	67	0.4%
Lakeside District	271	1.5%
Public\Semi-Public	308	1.7%
Parks and Open Space	815	4.5%
Private Recreation	27	0.1%
Retail/Office	620	3.4%
Eldorado Corridor District	149	0.8%
Business Commercial	531	2.9%
Town Center	70	0.4%
Lake and Floodplain	8,044	44.0%
Total	**18,267**	**100%**

Source: Town of Little Elm Comprehensive Plan 2008

Within the AOI, the existing land use within the Town of Little Elm is approximately 50 percent vacant, 40 percent single-family homes, eight percent commercial, and the remaining two

percent is public/semi-public and industrial. This land use is consistent with the current zoning in the town limits; the vacant areas are zoned agricultural, single-family or commercial. The Future Land Use Plan also exhibits complementary land uses but assumes a full build-out with no agricultural land. All land uses in the Town of Little Elm within the AOI would be single-family residential, business commercial or retail/office.

There are approximately 886 acres within the AOI that are part of the Town of Little Elm ETJ. The majority of these acres are already developed single-family lots. However, 400 acres are identified as Extended Planning Area A in the comprehensive plan. Currently this area is vacant agricultural land that could be annexed into the town at a later date. However, this area is not expected to annex into the Town of Little Elm. This means that no town services would be provided (water, sewer, etc.) and that planning and zoning would not be guided by the town. Subdivision requirements could be upheld by the town in the extended planning area but the 400 acres is not planned or platted to be subdivided.

No goals have been identified in the *Comprehensive Plan 2008* that pertain specifically to the AOI. The following are general goals established by the town that would apply in the AOI.

- Develop access management standards for TxDOT roadways to predetermine the location of median openings and improve traffic flow.
- Investigate the addition of bicycle lanes to existing roadways.
- Actively promote the implementation of the adopted Future Land Use Plan.
- Ensure that FM 720, FM 423 and US 380 are appropriately landscaped as per their significant influence on the image of the town.

Because the majority of the Town of Little Elm is located east of the AOI, there are not many identified goals that could pertain to the AOI. The Town of Little Elm is focused on improving their Town Center and developing land adjacent to US 380. The area adjacent to the proposed project does not have sewer or water facilities and would not be available for development for another five years. The town's comprehensive plan indicates that growth rate in the town will average at 4.5 percent through 2017 and that the majority of the growth in the town has already occurred. Approximately 67 percent of the town is built-out and it is expected that the final growth of the town will occur much slower than the previous growth.

The overall goals and trends for the Town of Little Elm within the AOI include a slow development of the remaining single-family lots; delayed development of vacant commercial lots because of the lack of utilities; improved mobility on FM 720 from medians and bike lanes; adherence to the Future Land Use Plan; and, lack of development guidance within the Extended Planning Area.

Regional Goals and Trends

The NCTCOG MTP defines transportation systems and services in the area containing the boundaries of the study area. The MTP addresses regional transportation needs that are identified through forecasting current and future travel demand, developing and evaluating system alternatives and selecting those options which best meet the mobility needs of the region. The proposed facility is included in this plan.

Step 3: Inventory the Study Area's Notable Features

The following are the notable features located within the AOI:

- Oak Grove Methodist Church – established in 1880 by a circuit preacher. The church and associated cemetery have served five generations of the Oak Grove community.
- Oak Grove Cemetery – located behind Oak Grove Methodist Church.
- Lloyd Cemetery (Lower Oak Grove Cemetery) - established in 1880. Once Oak Grove Cemetery was created, many graves were moved from Lloyd Cemetery to Oak Grove.
- Taylor family cemetery
- Two unnamed cemeteries
- Prestonwood Polo Club – privately owned but open to the public to watch polo matches
- Six acres of bottomland hardwoods
- 995 acres of upland woodland

No other notable features are found within the AOI. There are no prime or unique farmlands, archeological sites, environmental justice populations, LEP populations, or parks or public facilities.

Step 4: Identify Impact-Causing Activities of Proposed Action and Alternatives
The following is a list of project impact-causing activities provided by NCHRP Report 466:

Modification of Regime – The total footprint of the proposed project is 78 acres; including the 27 acres of new ROW. Impact to vegetation would total approximately 59.9 acres. Of the 59.9 acres, approximately 52.4 acres of maintained and unmaintained herbaceous vegetation, 1.8 acres of landscaped shrubs and trees, 3.4 acres of fence line trees, 0.4 acre of riparian vegetation, and 1.9 acres of upland woodlands would potentially be impacted. Twenty-seven trees with a dbh equal to or greater than 20-inches would potentially be impacted. The area would be reseeded and replanted based on TxDOT-approved seeding specifications. There would not be a substantial modification to the existing habitat because of the construction of the proposed project. No alteration to the streams crossing the project area is anticipated.

Land Transformation and Construction – The proposed project involves widening FM 720 from a two-lane undivided roadway to a six-lane divided roadway. The existing ROW of FM 720 is 90 feet wide. The proposed ROW is 130 feet wide. Approximately 500 feet of FM 720 would be realigned north from Eldorado Parkway. Approximately 27 acres of land would be converted to transportation ROW. No support or ancillary facilities would be constructed as part of the proposed project.

Resource Extraction – Approximately 150,649 cubic yards of surface excavation would be required to construct the new roadway. Approximately 26 percent of the excavation dirt would be used as fill for the proposed project. As shown in **Table 7**, approximately 0.32 acre of disturbance would occur within the waters of the U.S. and wetland that cross FM 720 because of the replacement of existing culverts and pipes.

Processing – No construction easements would be required for the proposed project and information on product storage during construction is not available.

Land Alteration – Because the proposed project is the widening of an existing roadway, no substantial land alteration would occur.

Resource Renewal – No resource renewal is proposed as part of the proposed project.

Changes in Traffic – The proposed project is expected to increase capacity and improve mobility in the project area. The addition of new through lanes, right turn lanes, and left turn lanes would decrease congestion at the various cross streets and neighborhood entrances.

Waste Emplacement and Treatment – Waste emplacement and treatment is not part of the proposed project.

Chemical Treatment – The use of fertilizer is anticipated during re-vegetation. Periodic applications of herbicide may occur during the maintenance phase of the proposed project.

Access Alteration – Access to adjacent properties would decrease slightly due to the introduction of a 16-foot wide raised median. However, right and left turn bays would be constructed at various locations not yet determined.

Step 5: Identify Potentially Substantial Indirect Effects for Analysis
Three types of indirect effects are discussed in NCHRP Report 466 and TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses*.

- *encroachment-alteration effects* – effects that alter the behavior and functioning of the physical environment, are related to design features, but are indirect in nature because they can be separated from the project in time or distance
- *induced growth effects* – changes in traffic patterns and accessibility attributable to the design can influence the location of residential and commercial growth
- *effects related to induced growth* – effects attributable to induced growth and not to project design features

Encroachment Alteration Effects
Encroachment-alteration effects are characterized into two categories: ecological effects and socioeconomic effects. Possible ecological effects include habitat fragmentation, degradation of habitat, and altered energy flows. Because the proposed project is the expansion of an existing facility, no new habitat fragmentation is expected. As indicated in **Step 4**, 27 acres of land would be converted to transportation ROW and 59.9 acres of vegetation would be impacted (92 percent would be herbaceous vegetation). Within a 6,380-acre AOI, along a 4.7-mile project, these impacts would not be substantial. Because the vegetation impacts are primarily to common herbaceous vegetation, no degradation of habitat is expected. Although the AOI is bounded by Lake Lewisville and associated streams, the function of the lake environment would not be affected by the design features associated with the widening of FM 720 because the project is over 0.5-mile away from the lake in any direction.

Indirect socioeconomic effects from the proposed project would not occur. FM 720 is the only major roadway in the AOI and connects the community to US 380, Eldorado Parkway (and indirectly to the Lewisville Lake Toll Bridge), and the regionally-significant portion of FM 720. Naylor Road is the only other north-south roadway in the AOI but it connects local neighborhoods to US 380; it does not connect to any other major roadways. Traffic patterns would not be affected by the proposed project because FM 720 would continue to serve these regional roadways and the local connecting roadways and driveways. The introduction of a median is unlikely to cause motorists to use alternate travel routes because there are no other options for accessing the properties adjacent to FM 720. The neighborhoods adjacent to FM 720 typically have one or two entrances onto FM 720 and do not connect to other neighborhoods or local streets. Many of the commercial properties facing FM 720 can only be accessed from FM 720. The intersection to Shahan Prairie Road, a major cross street that leads to an elementary school and local neighborhoods, would be constructed with pedestrian facilities to ensure no negative alterations to social patterns would occur. The AOI includes two lake communities, Oak Point and Little Elm, that have grown from 645 people and 1,255 people in 1990 to 2,786 people and 25,898 people in 2010 (*Census 2010*), respectively. This represents a 331 percent and 1,962 percent increase in population within these two communities. It is not expected that the socio-economic fabric of the community would be altered to a greater degree from the widening of FM 720 than it has been from the influx of new residents.

Ecological and socioeconomic encroachment-alteration effects are not expected and will not be discussed in **Step 6**.

Induced Growth Effects

As noted in **Step 2**, the portion of Little Elm within the AOI is not expected to develop until utilities are provided in the area. Town officials indicated that the portion of the Town of Little Elm directly adjacent to FM 720 is designated for commercial and retail development but development would not occur for another five years. The improvements to FM 720 would not expedite the placement of utilities within the city limits. The 400-acre Extended Planning Area could develop into single-family residences; however, there are no existing plats or planned developments for this area. Because of the depressed housing market and slow economy, it is unlikely this area outside the city limits and with no direct access to a major roadway would develop even with the expansion of FM 720. Induced effects from the proposed project within the Town of Little Elm are not expected and will not be discussed in **Step 6**.

Historically, there has not been any commercial development within the City of Oak Point; however, the City expects commercial development to follow the proposed widening of FM 720. The City of Oak Point is primarily a residential community because of its location between two arms of Lewisville Lake. Within the city limits and ETJ there are approximately 5,200 residential lots developed or planned for development. City officials desire to bring commercial development to the City of Oak Point within the AOI in order to provide goods and services to the residential communities. Induced development within the City of Oak Point is expected and will be discussed in **Step 6**.

Effects Related to Induced Growth

The AOI is part of the EPA designated nine-county serious nonattainment area for ozone. The AOI is currently in attainment for all other NAAQS pollutants, with the exception of a small part of Collin County that is in non-attainment for lead, effective December 31, 2010. This project is located outside of that portion of Collin County in non-attainment for lead (please refer to the Air Quality Assessment section). Based on the results of Steps 1 through 4 that evaluated the possible project-related actions that can indirectly impact air, it was determined that the proposed project would not be anticipated to cause indirect air quality impacts in the AOI. No change in attainment status is anticipated within the AOI as the result of emissions associated with the proposed project. In order for the region to achieve ozone attainment, a variety of point, non-point, and mobile source emission reduction strategies must be implemented for the entire Dallas-Fort Worth nonattainment area as outlined in the SIP. Indirect air quality impacts from MSATs are unquantifiable due to existing limitations to determine pollutant emissions, dispersion, and impacts to human health. Emissions would likely be lower than present levels in future years as a result of the EPA's national control regulations (i.e., new light-duty and heavy duty on road fuel and vehicle rules, the use of low sulfur diesel fuel). Even with an increase in VMT and possible temporary emission increases related to construction activities, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on road emissions, MSATs, and the ozone precursors VOC and NOx. As the proposed project is not anticipated to result in indirect air quality impacts, further discussion in **Steps 6 and 7** is not necessary.

Because induced development related to the widening of FM 720 is likely, effects related to the induced development could occur. These effects will be analyzed in **Step 6**.

Step 6: Analyze Indirect Effects and Evaluate Results

As discussed in **Step 2**, the City of Oak Point has established the FM 720 Overlay District adjacent to FM 720 (**Figure 10**). This area was identified in the comprehensive plan as the commercial center for the City of Oak Point. The 218 acres of commercial development within the Overlay District would include retail, restaurants, public facilities, and personal and professional services. The remaining 262 acres in the Overlay District would be residential and civic. The City of Oak Point stated that this commercial development would be associated with

the widening of FM 720. With the improved roadway, the city plans to promote development that would serve the needs of the remaining areas of the city.

Outside of the FM 720 Overlay District, there are approximately 3,242 acres available for development within the AOI (including 270 acres within the City of Lincoln Park ETJ). These acres represent large and small tracts of land that are either vacant or currently in agricultural use, and some undeveloped residential lots near Lewisville Lake. None of the notable features listed in **Step 3** are part of the 480-acre FM 720 Overlay District or the 3,242 acres of developable land except the 995 acres of upland woodlands. Approximately 54 acres of upland woodland would be impacted by development of the FM 720 Overlay District. The remaining notable features would remain unchanged by induced development.

The City of Oak Point's Future Land Use Plan (2006) indicates that all of the 3,242 acres of undeveloped land would eventually be used for residential purposes. Because the City of Oak Point is a "rural" community, all future residential development would consist primarily of half-acre and one-acre lots. Only the high-density residential areas that have already been developed are included on the Future Land Use Map. However, there are currently no plans for additional residential development. The widening of FM 720 is only expected to induce commercial development. It is not expected that the proposed project would induce growth outside of the FM 720 Overlay District. Residential development in this area is influenced by the presence of the lake, market forces, the desire to live in a "country atmosphere" and regional connectivity. Residential development is more likely to occur because of the improved regional connectivity from the recently completed Lewisville Lake Toll Bridge (**Figure 10**). The toll bridge provides a direct connection to IH 35E from the municipalities of Oak Point and Little Elm. Before August of 2009 the residents of the City of Oak Point had to travel approximately 13 miles to reach IH 35E. The toll bridge has reduced this trip to approximately 7.5 miles. Since August 2009 the toll bridge has averaged 213,000 users a month. Because the toll bridge is open and will be in use for the next three years before construction of the proposed project is completed, it can be assumed that development in the AOI will occur ahead of the FM 720 widening. However, it is important to note that the current economic climate has affected development nationwide and it is likely that future development in the area would actually be slower than previously anticipated.

Assuming that all commercial areas in the Overlay District would develop once the proposed project is completed; 218 acres would be converted from upland woodland (54 acres) and herbaceous vegetation (164 acres) to retail stores, restaurants and parking lots.

Step 7: Assess Consequences and Consider/Develop Mitigation (as Appropriate)
The development of land within the FM 720 Overlay District would be guided by city policies, procedures and regulations. Any mitigation required by the city would be the responsibility of the developer.

Cumulative Impacts
The CEQ regulations (40 CFR §1508.7) define cumulative impacts (i.e., effects) as "the impact on the environment which results from the incremental impact of the proposed action when added to other past, present and reasonably foreseeable future actions." As this regulation suggests, the purpose of a cumulative impacts analysis is to view the direct and indirect impacts of the proposed project within the larger context of past, present, and future activities that are independent of the proposed project, but which are likely to affect the same resources in the future. These same resources are then evaluated from the standpoint of their relative abundance among similar resources within a larger geographic area. Broadening the view of resource impacts in this way allows the decision maker to evaluate the incremental impacts of the proposed Build alternative in light of the overall health and abundance of selected resources. In essence, a cumulative impacts evaluation creates a model of the predicted condition of each

resource that is independent of the proposed project, and then analyzes the expected direct and indirect impacts of the project within that context to determine if there is a cumulative impact. The evaluation process for each resource considered may be expressed in shorthand form as follows:

BASELINE CONDITION + PROJECT IMPACTS + FUTURE IMPACTS = CUMULATIVE IMPACTS
(historical and current) (direct and indirect) (reasonably foreseeable)

The evaluation of cumulative impacts discussed in this report follows the eight steps in TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses* (December 2006), which reflects the requirements of controlling case law (see *Fritiofson v. Alexander*, 772 F.2d 1225, 5th Circuit, 1985). The methodology used to prepare this evaluation is also in accordance with guidance from the CEQ, *Considering Cumulative Effects under the National Environmental Policy Act* (1997).

The following eight steps of TxDOT's *Guidance* serve as guidelines for identifying and assessing cumulative impacts:

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 affect resources;
5. Identify other reasonably foreseeable actions that may affect resources;
6. Assess potential cumulative impacts to each resource;
7. Report the results; and,
8. Assess and discuss mitigation issues for all adverse impacts.

Step 1 – Identify Resources to Consider

The initial step of the cumulative impacts analysis uses information from the evaluation of direct and indirect impacts in the selection of environmental resources that should be evaluated for cumulative effects. TxDOT's *Guidance* states: If a project would not cause direct or indirect impacts on a resource, it would not contribute to a cumulative impact on the resource. The cumulative impact analysis should focus only on: (1) those resources significantly impacted by the project; and (2) resources currently in poor or declining health or at risk even if project impacts are relatively small (less than significant). Similarly, the CEQ guidance recommends narrowing the focus of the cumulative impacts analysis to important issues of national, regional, or local significance so as to 'count what counts', not produce superficial analysis of a long laundry list of issues that have little relevance to the impacts of the proposed action or the eventual decisions. Thus, the cumulative impacts analysis should focus only on those resources that are substantially affected by the proposed project by direct and/or indirect impacts. Whether a resource is substantially affected is a function of the existing abundance and condition of the resource, and would include resources that are currently in poor or declining health, or are at risk even if the proposed project impacts are not major. **Table 23** identifies the resources to be analyzed in the cumulative impacts analysis.

Table 23: Resources Considered for the Cumulative Impacts Analysis

Resource	Direct Impacts from Proposed Project	Indirect Effects from Proposed Project	Poor/Declining Health or At Risk Resource?	Result
Community Cohesion	None	No substantial effects	No	No analysis
Environmental Justice	No disproportionately high or adverse impacts	No substantial effects	No	No analysis
Public Facilities/Services	None	No substantial effects	No	No analysis
Historical Sites	No potential to affect historic properties	No substantial effects	No	No analysis
Archeological Resources	None	No substantial effects	No	No analysis
Threatened/ Endangered Species	Habitat present for two species, but no effect to any threatened/ endangered species	Riparian habitat present, but no effect to species	No	No analysis
Air Quality	Denton County in non-attainment for 8-hour standard for the pollutant ozone	No substantial effects	At Risk	Cumulative impact analysis conducted
Hazardous Materials	None	No substantial effects	No	No analysis
Land Use	27 acres of land would be converted from residential/ commercial/vacant land use to transportation land use	218 acres of land would be developed in accordance with the Future Land Use Map – no substantial effects	No	No analysis
Waters of the U.S.	Approximately 0.04 acre waters and 0.19 acre wetlands would be permanently impacted	Up to 2,300 linear feet of waters potentially affected	At Risk	Cumulative impact analysis conducted
Floodplains	None	No substantial effects	No	No analysis
Vegetation/Wildlife Habitat	0.4 acre of riparian vegetation, 6.8 acres of wooded areas and 52.5 acres of herbaceous vegetation impacted	No substantial effects	At Risk	Cumulative impact analysis conducted
Farmland	None	No substantial effects	No	No analysis

Step 2 – Define Resource Study Area

As recommended by the CEQ guidance, specific indicators of each resource's condition have been identified. The use of indicators of a resource's health, abundance, and/or integrity are helpful tools in formulating quantitative or qualitative metrics for characterizing overall effects to resources. These indicators are also key aspects of each resource that have already been evaluated in terms of the project's direct and indirect impacts, and facilitate greater consistency and objectivity in the analysis of cumulative effects (**Table 24**).

Table 24: Resources and Indicators for the Cumulative Impact Analysis

Resource	Indicators of Resource Condition and Potential Impacts	Resource Study Area (RSA)
Vegetation/Wildlife Habitat	Wildlife Habitat: the amount and type of impacts to high quality habitat	Adjacent watershed areas
Waters of the U.S.	Water Quality: expected change in water quality in nearby water bodies	Adjacent watershed areas
Air Quality	8-Hour Ozone Standard: ability of the region to meet this air quality standard.	9-county nonattainment area for the DFW Metropolitan Area

The Resource Study Area (RSA) for each resource was chosen using resource-specific data, and reflects the influence that the proposed project would have on the surrounding area. Due to laws and regulations concerning waters of the U.S., agricultural practices and residential/commercial development usually avoid streams and can leave portions of pristine

habitat in place. For this reason, quality wildlife habitat and vegetation are usually found within stream systems, adjacent to intermittent and perennial streams. The proposed project is within the Lewisville Lake watershed. The RSA for vegetation/wildlife habitat and waters of the U.S. was identified by determining the sub-basins of the Lake Lewisville tributaries that surround the proposed project area. The air quality RSA is based on the established nonattainment area for the Dallas/Fort Worth area. Maps of the RSAs are shown in **Figures 11** and **12**. The temporal boundaries of the cumulative impacts analysis are the same as the indirect effects analysis. The boundaries extend from 2000 through 2020, which includes an important decennial U.S. Census to account for trends in population growth and demographic change; includes the most recent economic growth and decline, which is also a determinant in regional and community growth; includes the proposed completion date of the proposed project (2012), and includes the future land use plans and estimated development expected by the City of Oak Point.

Step 3 – Define Current Status and Historical Context

Approximately 14,800 acres comprise the RSA for the vegetation/wildlife habitat and waters of the U.S. resources (**Figure 11**). Denton County has historically been a farming county; however, less than 10 percent of the RSA is still farmed. Since the creation of Lewisville Lake in 1957 and the incorporation of the cities of Little Elm and Oak Point in 1966 and 1976, respectively, the population within the RSA has consistently increased while farming activities have decreased. The population of both cities increased dramatically in the 1990s and since 2000 an average of 43 and 821 single-family home building permits in Oak Point and Little Elm, respectively, have been approved each year.

The RSA is located in the Cross Timbers ecoregion which historically was a dense hardwood forest. Since settlement of the area began in the 1840s, forested areas have been continually reduced by agriculture and urbanization. The damming of the Elm Fork Trinity River to create Lewisville Lake covered up approximately 29,500 acres of altered Blackland Prairie and Cross Timbers woods. There is very little virgin Cross Timbers woodlands remaining and none is found within the proposed project RSA. Existing wooded areas within the RSA are primarily found within USACE floodplain and private property adjacent to Lewisville Lake. Approximately 12 percent (1,776 acres) of the RSA is wooded.

The majority of the RSA boundary follows the Lewisville Lake shoreline and the northern boundary approximates the watershed basin for nearby streams that flow into the lake. Approximately 8,200 linear feet of stream are present within the RSA. Historically, the major water body in the area was the Elm Fork Trinity River which flows south toward Dallas. The completion of Lewisville Lake in the 1950s produced a new segment of the Elm Fork Trinity River. Lewisville Lake was created as a reservoir for the City of Dallas and it currently provides flood control and water conservation for the north Texas area. Neither the lake nor its tributaries in the RSA have been listed as threatened or impaired on the Texas 303(d) list.

The proposed project is within Denton County which is part of the EPA designated eight-hour, nine-county serious nonattainment area for the pollutant ozone and a small portion of Collin County is in non-attainment for lead (**Figure 12**). The enactment of the Clean Air Act (CAA) of 1970 authorized the development of comprehensive federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources. Four major regulatory programs affecting stationary sources were initiated: the NAAQS, SIPs, New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPs). The EPA was created on May 2, 1971 to implement the various requirements included in the CAA of 1970.

Major amendments were added to the CAA in 1977. The 1977 Amendments primarily concerned provisions for the Prevention of Significant Deterioration (PSD) of air quality in areas attaining the NAAQS. The 1977 CAA Amendments also contained requirements pertaining to sources in

non-attainment areas for NAAQS. A non-attainment area is a geographic area that does not meet one or more of the federal air quality standards. Both of these 1977 CAA Amendments established major permit review requirements to ensure attainment and maintenance of the NAAQS.

The 1990 CAA Amendments established specific criteria which must be met for air quality. The EPA was authorized to designate areas in "nonattainment" or failing to meet established NAAQS. In July 1997, the EPA announced a new NAAQS for ground-level ozone. The EPA phased out and replaced the previous one-hour standard with an eight-hour standard to protect public health against longer exposure to this air pollutant.

The EPA establishes limits on atmospheric pollutant concentrations through enactment of the NAAQS for six principal, or criteria, pollutants. The EPA designated nine counties in the DFW area as nonattainment for ozone. The region is currently in attainment for all other criteria pollutants, with the exception of a small part of Collin County that is in nonattainment for lead, effective December 31, 2010. This project is located outside that portion of Collin County in nonattainment for lead. Although there have been year-to-year fluctuations, the ozone trend continues to show improvement. The trend of improving air quality in the region is attributable in part to the effective integration of highway and alternative modes of transportation, cleaner fuels, improved emission control technologies, and NCTCOG regional clean air initiatives. The current health of the air quality within the RSA is considered "improving".

Step 4 – Direct and Indirect Impacts

Approximately 7.1 acres of wooded areas and 0.4 acre of riparian vegetation would be directly impacted by the proposed project. Indirect effects could cause the loss of up to 54 acres of wooded area and 164 acres of altered herbaceous vegetation.

The replacement of existing culverts along FM 720 would directly impact approximately 0.04 acre of waters and 0.19 acre of wetlands. There would not be indirect effects to waters of the U.S or wetlands.

It is not anticipated that the proposed project would have adverse effects on air quality. The proposed action's traffic projection does not exceed 140,000 vehicles per day for either the existing or design year and thus is exempt from a TAQA for carbon monoxide because previous analyses of similar projects did not result in a violation of NAAQS.

Because the proposed action's traffic projection does not exceed 140,000 vehicles per day for either the existing or design year, it also has a low potential for adverse MSAT effects. The EPA examined the impacts of existing and newly promulgated mobile source control programs, including its RFG program, its NLEV standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, acrolein, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent.

The DFW region is currently in attainment for all criteria pollutants, with the exception of ozone and a small portion of Collin County which is in nonattainment for lead. The nine-county non-attainment area has an attainment date of June 15, 2010. It should be noted that the SIP associated with the new (2004) 8-hour ozone is not due until three years after EPA designates an area in non-attainment for the new standard. Currently it is anticipated that the SIP would be due in 2013. The proposed project is consistent with the 2030 MTP that was found to conform to the ozone SIP for DFW. The SIP is required by the CAA Amendments to improve regional air quality for ozone. Although the DFW region remains in non-attainment for ozone, the number of

daily exceedances of the federal standards for ozone has decreased within the past decade. There have been year-to-year fluctuations in ozone levels; however, the ozone trend continues to show improvement. This trend is attributable in part to the effective integration of highway and alternative modes of transportation, cleaner fuels, improved emission control technologies, and NCTCOG's regional clean air initiatives.

The 164 acres of induced development would include commercial and retail facilities. The new development would increase air emissions from area sources (small businesses such as gas stations, paint and body shops, bakeries), on-road mobile sources (motorized vehicles), and non-road mobile sources (lawn mowers, construction equipment).

Step 5 – Reasonably Foreseeable Actions

Conversations with the City of Oak Point and the City of Little Elm revealed that past, present and reasonably foreseeable actions within the RSA primarily consist of residential developments with some commercial, civic and transportation actions as well. The following is a list of past and present actions that have occurred since 2002 in the RSA.

- Little Elm ISD Elementary – 17 acres
- Hunters Ridge residential – 500 acres
- Woodridge Estates, Phase 1, residential – 60 acres
- Wellington Trace residential – 40 acres
- Cross Oak Ranch, residential – 740 acres
- Villages of Cross Roads, commercial and residential – 210 acres
- Providence, residential – 510 acres
- Lewisville Lake Toll Bridge (adjacent to RSA)

Reasonably foreseeable developments include the following:

- Shahan Lakeview, residential – 100 acres
- Prairie Oaks, residential – 140 acres
- Woodridge Estates, Phase 2, residential – 170 acres
- Denton ISD high school and stadium – 135 acres
- Eldorado Parkway expansion
- FM 720 from Eldorado Parkway to FM 423 expansion

The total amount of land within the RSA that will be developed because of past, present and reasonably foreseeable actions is 2,622 acres.

Step 6 - Assess Potential Cumulative Impacts

The information contained in **Table 25** represents the starting point for assessing the potential cumulative impacts to each resource. **Table 25** summarizes the information gathered in Steps 1 through 5 and represents the potential cumulative impacts to each resource, which are further discussed in the next section.

In order to identify cumulative impacts the direct impacts, indirect effects and past, present and reasonably foreseeable actions were overlain on aerial photography using a Geographic Information System (GIS) tool, ArcMap 9.3. Additionally, USGS maps, NWI maps and field observations were included in the GIS analysis. The air quality analysis was a qualitative analysis based on regional data provided by local, state and federal agencies.

Table 25: Resource Impacts

Resource	Direct Impact	Indirect Effect	Past, Present and Reasonably Foreseeable Projects	Cumulative Impacts
Vegetation/ Wildlife Habitat	7.1 acres of woodlands, 0.4 acre riparian vegetation, and 52.4 acres of herbaceous vegetation impacted	Up to 54 acres of woodlands and 164 acres herbaceous vegetation potentially affected	2,622 acres mixed vegetation impacts	61.1 acres of woodlands; 0.4 acre riparian vegetation; 216.4 acres of herbaceous vegetation and 2,622 acres mixed vegetation
Waters of the U.S.	Approximately 0.04 acre waters and 0.19 acre wetlands permanently impacted	No effect	Up to 8,200 linear feet of waters potentially affected (includes streams in indirect effects study area)	0.4 acre of permanent impacts and over 8,200 linear feet of water quality impacts
Air Quality	Project traffic volumes expected to result in minimal impacts on air quality; improved mobility and circulation may benefit air quality.	No substantial effects	Denton County in non-attainment for 8-hour standard for the pollutant ozone	Increase in urbanization would likely have a negative impact on air quality but planned transportation improvements and improved mobility in the area are anticipated to have a cumulatively beneficial impact on air quality.

Steps 7 and 8 – Report Results and Discuss Mitigation

As noted in **Table 23**, vegetation/wildlife habitat and waters of the U.S. are only two of the land use types found in the project area. Farmland, floodplains, and developed areas are also present in the project area and in the RSA established for vegetation/wildlife habitat. As noted in **Step 3**, less than 10 percent of the RSA is in agricultural production. Although historically the area was farmed, the creation of Lake Lewisville in 1957 opened the area to residential developments that emphasized "lakefront properties." As the Dallas/Fort Worth metropolitan area expanded north, the population of the RSA increased because Little Elm and Oak Point are ideally located near Lake Lewisville and yet also close to commercial centers. The development pattern in the RSA has moved consistently from agricultural/undeveloped land to large-lot residential developments. US 380 is located in the northern portion of the RSA and was improved to a four-lane roadway in 2004. New commercial developments, like restaurants and gas stations, are slowly opening along US 380; however, the development pattern within the RSA is primarily residential. In 20 years, between 1990 and 2010, the City of Oak Point grew 331 percent and the Town of Little Elm grew 1,962 percent. Single-family home building permits increased every year until the recent economic downturn. Land use in the RSA, including vegetation/wildlife habitat and waters of the U.S, has been consistently transformed into residential lots. The cumulative impacts identified in **Table 25** are consistent with the existing development patterns.

The RSA for vegetation/wildlife habitat and waters of the U.S. encompasses approximately 14,800 acres. Based on aerial photography from 1999 and 2001, the RSA was not heavily developed 10 years ago. Oak Point city officials indicate that single-family homes are required to build on half-acre or one-acre lots. Residential areas near the lake are sparsely developed with much of the land left in a vegetated state. However, properties outside the city limits of Oak Point and inland from the lake are smaller and heavily developed. Assuming a 70 percent impervious surface factor for the past, present and reasonably foreseeable residential developments, approximately 1,730 acres of vegetation would be permanently impacted and the remaining 740 acres would be revegetated after construction. One hundred and fifty-two acres would be cleared for school campuses and it is unlikely that these acres would provide any native vegetation or wildlife habitat after construction is complete. The total permanent impacts on vegetation and wildlife habitat are approximately 2,143 acres out of 14,800 acres. This is less than 15 percent of the RSA. The direct and indirect impacts to vegetation specific to the proposed widening would be less than one percent of the RSA. The vegetation impacts

associated with the proposed project would be minor compared to the past, present and reasonably foreseeable actions. Also, the impacts from the proposed project are consistent with the current status of the resource; vegetation in the RSA is primarily introduced, non-native vegetation that is present because of past agricultural disturbances and current residential development.

Municipal governments have the authority to avoid, minimize, and mitigate the impacts of private property development to habitat within their jurisdictions through application of regulations that guide the intensity, type, and location of new development. The zoning and land use regulations of the cities of Oak Point, Lincoln Park and Little Elm are designed to minimize the adverse effects of growth and urbanization.

The impacts of the proposed project and other transportation projects to riparian habitat would be avoided and minimized in compliance with the TxDOT/TPWD MOA. The impacts of reasonably foreseeable private development to vegetation and habitat would be avoided, minimized, and mitigated through enforcement of applicable municipal zoning and land use regulations. Additionally, USFWS and TPWD regulations would apply for those actions that are subject to state and federal jurisdiction.

Within the RSA for waters of the U.S. there are approximately 8,200 linear feet of streams. All streams flow into Lewisville Lake. The potential earth disturbance from the proposed widening project would be 74 acres. Indirect/induced development from the proposed project would potentially disturb 480 acres and past, present and reasonably foreseeable actions would disturb 2,622 acres. Earth disturbance to 3,176 acres would lead to an increase in storm water runoff. During storm events, sediments and pollutants in the storm water runoff from the disturbed ground would have the potential to impact water quality. The direct and indirect impacts to waters of the U.S. specific to the proposed widening would be less than one acre. Earth disturbance from the proposed project would affect three percent of the RSA. These impacts are minor compared to the impacts to waters of the U.S. from past, present and reasonably foreseeable projects. The current health of the waters in the RSA is “good” and the magnitude of impacts from the proposed project would not be great enough to change that determination.

Waters of the U.S. are regulated by the USACE under authority of Section 404 of the CWA. Section 404 of the CWA authorizes the USACE to issue permits for the discharge of dredged or fill material into waters of the U.S., including wetlands. The intent of this law is to protect the nation's waters from the indiscriminate discharge of material capable of causing pollution, and to restore and maintain their chemical, physical, and biological integrity. Any discharge into waters of the U.S. must be in accordance with Section 404(b)(1) guidelines developed by the EPA in conjunction with the USACE.

At the state level, the TCEQ has jurisdiction over mitigation activities for impacts to water quality. Developers are required to comply with the TPDES General Permits for Construction Activities requirements that are administered by the TCEQ. In addition, the TCEQ monitors the water quality of water bodies in Texas, prepares reports that describe the status of the waters based on historical data on surface water and groundwater quality, identifies water bodies that are not meeting standards set for their use, and prepares and implements remedial action plans for those water bodies that are not meeting standards set for their use.

The cumulative impacts on air quality from the Build alternative and other reasonably foreseeable transportation projects are addressed at the regional level by analyzing the air quality impacts of transportation projects in the MTP and the TIP. The Build alternative and the other reasonably foreseeable transportation projects were included in the MTP and the TIP and have been determined to conform to the ozone non-attainment SIP. Planned transportation improvements are intended to cumulatively reduce congestion on a regional scale, with a

resultant decrease in pollutant emissions. Therefore, when combined, the proposed transportation improvements in the project area are anticipated to have a cumulatively beneficial impact on air quality.

A variety of federal, state, and local regulatory controls as well as local plans and projects have had a beneficial impact on regional air quality. The CAA, as amended, provides the framework for federal, state, tribal, and local rules and regulations to protect air quality. The CAA required the EPA to establish NAAQS for pollutants considered harmful to public health and the environment. In Texas, the TCEQ has the legal authority to implement, maintain, and enforce the NAAQS. The TCEQ establishes the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general comprehensive plan. Authorization in the Texas Clean Air Act (TCAA) allows the TCEQ to do the following: collect information and develop an inventory of emissions; conduct research and investigations; prescribe monitoring requirements; institute enforcement; formulate rules; establish air quality control regions; encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and to establish and operate a system of permits for construction or modification of facilities. Local governments having some of the same powers as the TCEQ can make recommendations to the commission concerning any action of the TCEQ that may affect their territorial jurisdiction, and can execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA or the rules or orders of the TCEQ.

The CAA also requires states with areas that fail to meet the NAAQS prescribed for criteria pollutants to develop a SIP. The SIP describes how the state would reduce and maintain air pollution emissions in order to comply with the federal standards. Important components of a SIP include emission inventories, motor vehicle emission budgets, control strategies, and an attainment demonstration. The TCEQ develops the Texas SIP for submittal to the EPA. One SIP is created for each state, but portions of the plan are specifically written to address each of the nonattainment areas. These regulatory controls, as well as other local transportation and development initiatives implemented by local governments and other entities provide the framework for growth throughout the area consistent with air quality goals. As part of this framework, all major transportation projects, including the proposed project, are evaluated at the regional level by the NCTCOG for conformity with the SIP.

The cumulative impact of reasonably foreseeable future growth and urbanization on air quality within this area would be minimized by enforcement of federal and state regulations, including the EPA and TCEQ, which are mandated to ensure that such growth and urbanization would not prevent compliance with the ozone standard or threaten the maintenance of the other air quality standards.

CONCLUSION

The engineering, social, economic, and environmental investigations conducted thus far on the proposed project indicate that it would result in no significant impacts on the quality of human health or the environment. A Finding of No Significant Impact is anticipated for this project.

Figures

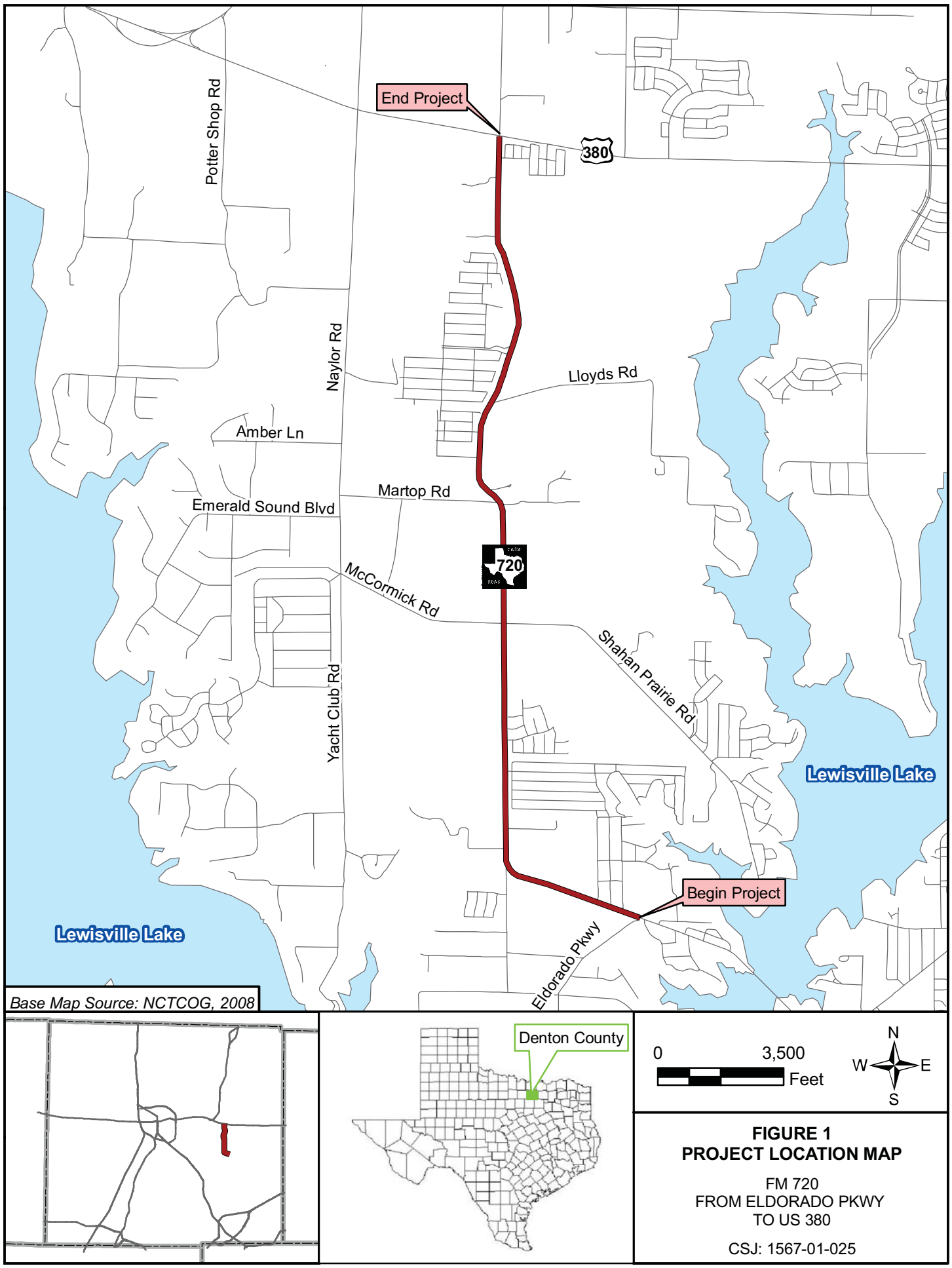
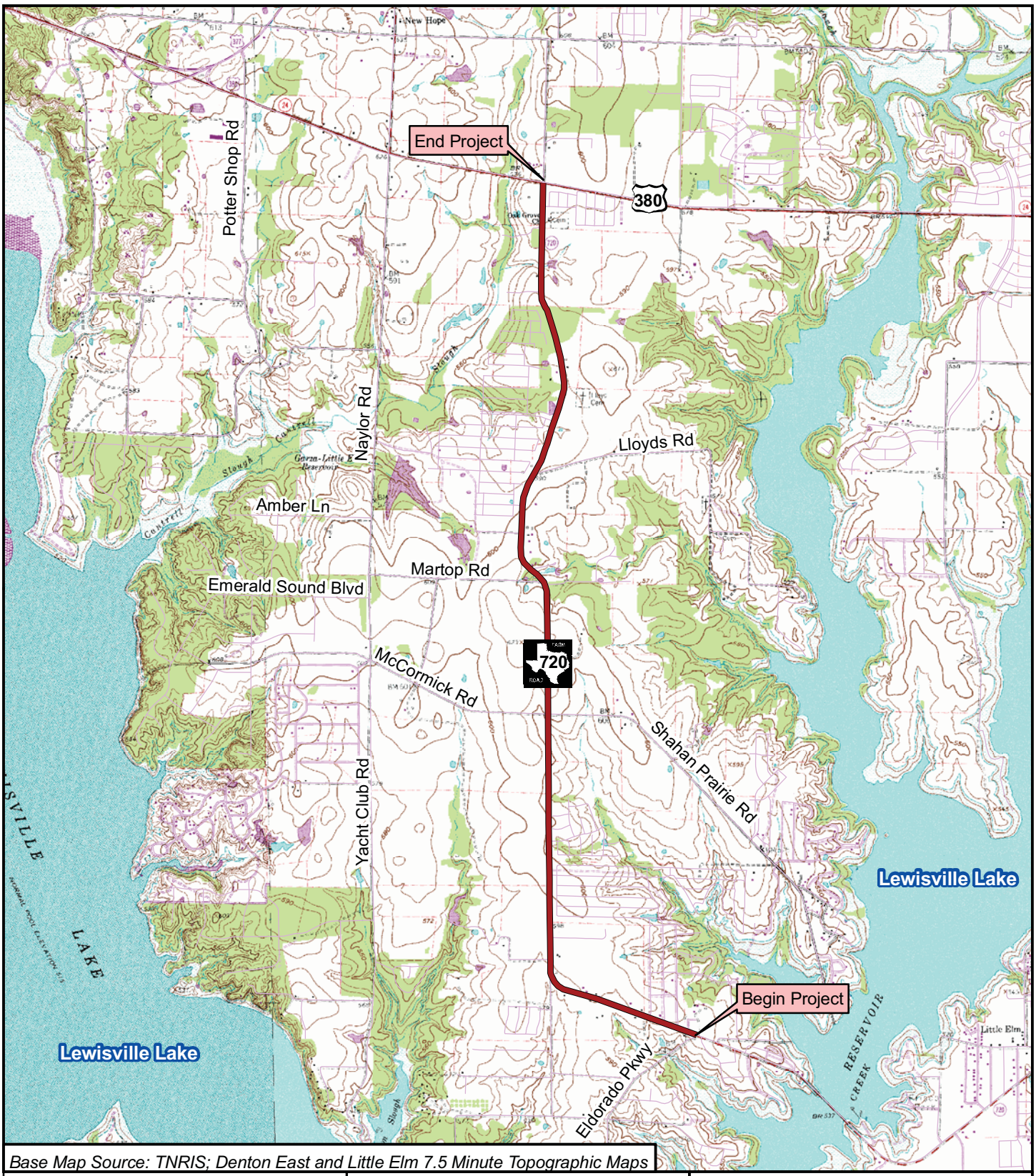


FIGURE 1
PROJECT LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

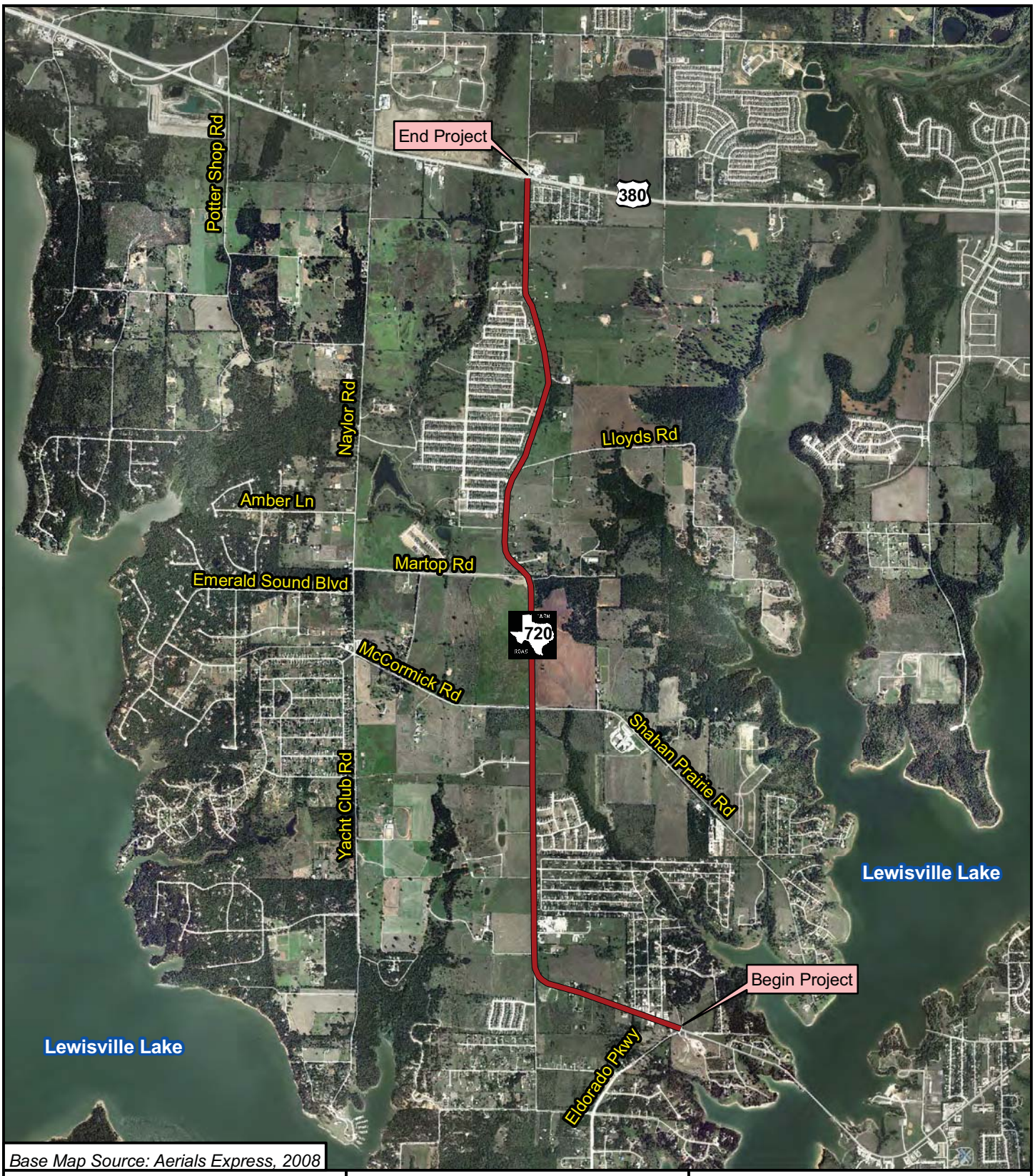


Base Map Source: TNRIS; Denton East and Little Elm 7.5 Minute Topographic Maps

FIGURE 2
USGS TOPOGRAPHIC MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



Base Map Source: Aerials Express, 2008

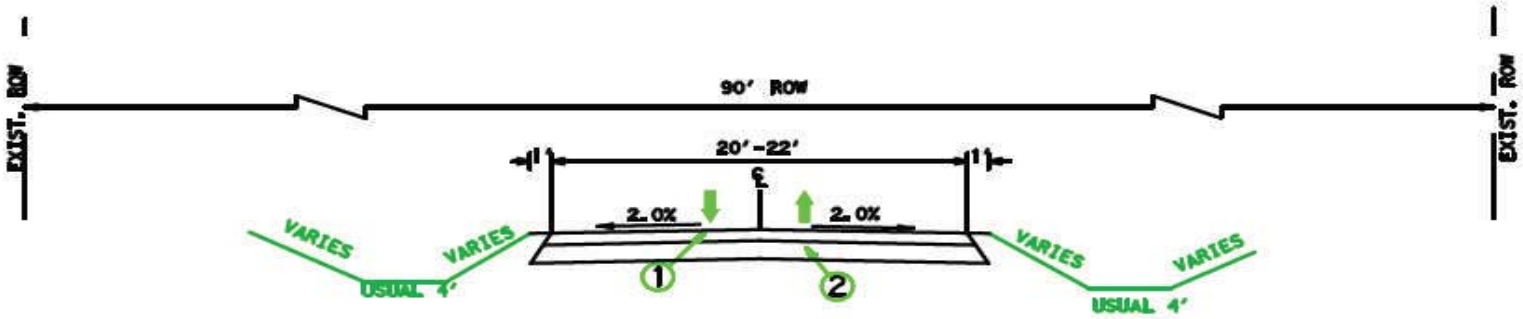
N
W E
S

0 3,500
Feet

FIGURE 3
AERIAL PHOTOGRAPH

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



EXISTING TYPICAL SECTION

SOURCE: TXDOT

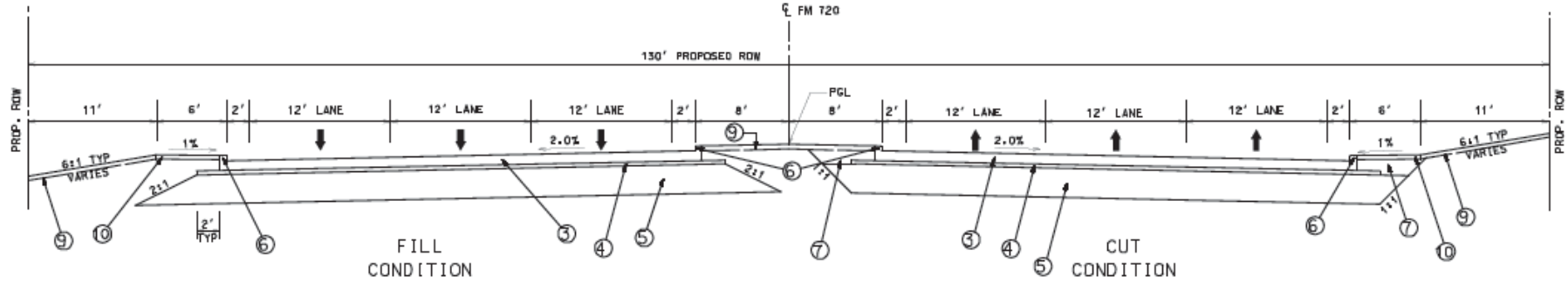
FOR REPORT PURPOSES ONLY

Not for construction, bidding, or permit purposes.

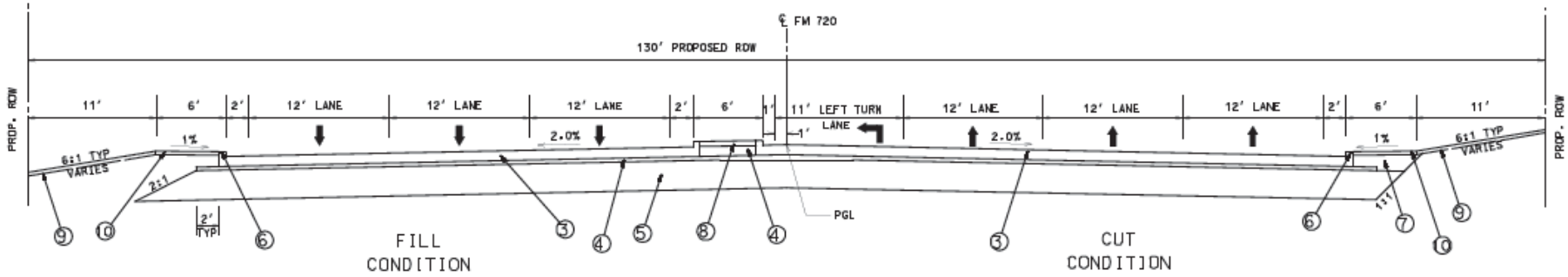
FIGURE 4-1
EXISTING TYPICAL SECTION

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



PROPOSED TYPICAL SECTION



PROPOSED TYPICAL SECTION
WITH LEFT TURN LANE

LEGEND

① TWO COURSE SURFACE TREATMENT (PER AS BUILT)
② 48 C.Y. PER STA. ROADBED TREATMENT (PER AS BUILT) ⊥ 6"
③ CRCP
④ HMAC (TY B) BASE
⑤ LIME TREATED SUBGRADE
⑥ TYPE I CURB (MONO)
⑦ BACKFILL
⑧ CONCRETE MEDIAN
⑨ BLOCK SOD
⑩ 4" CONC. SIDEWALK

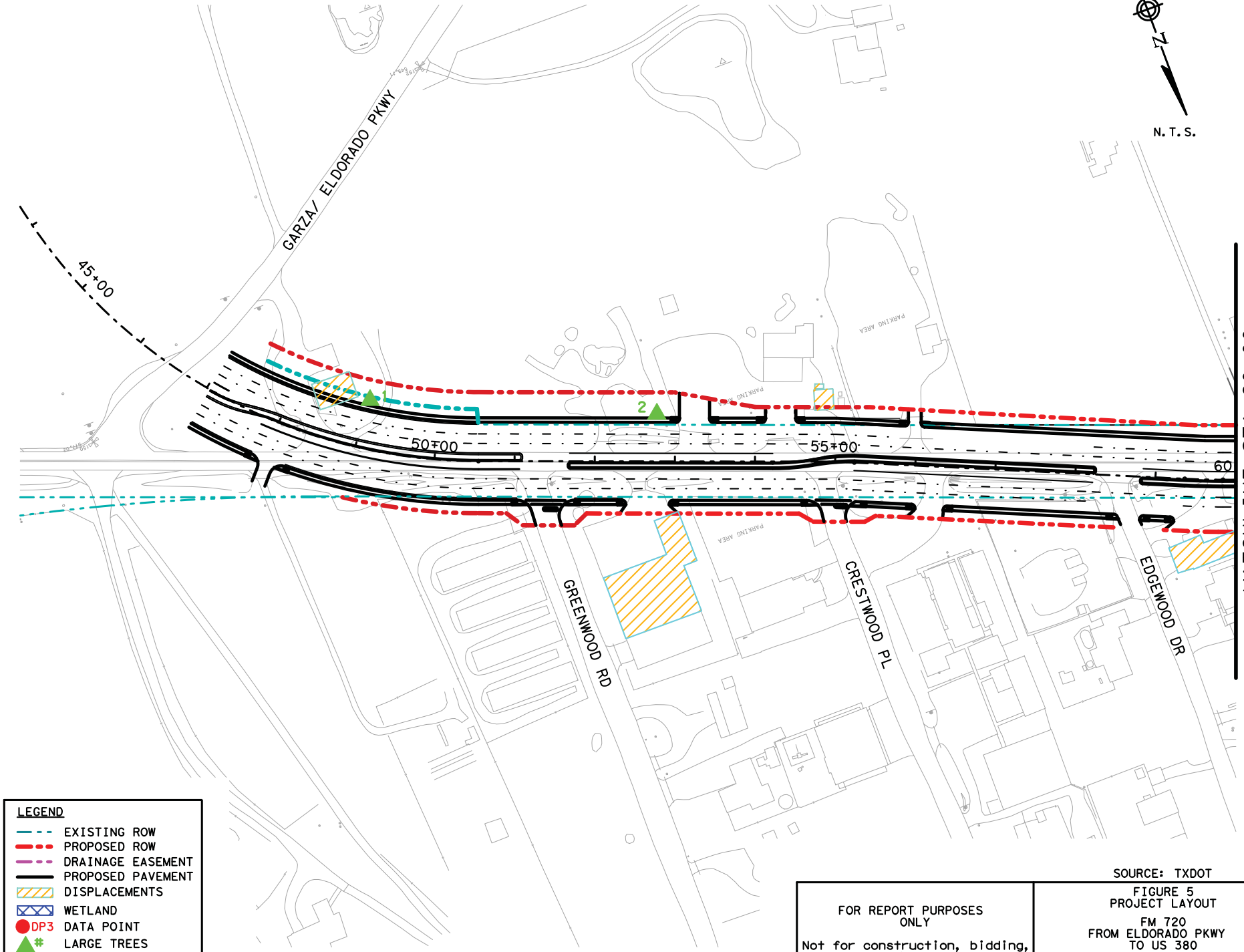
FOR REPORT PURPOSES ONLY

Not for construction, bidding, or permit purposes.

FIGURE 4-2
PROPOSED TYPICAL SECTIONS

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

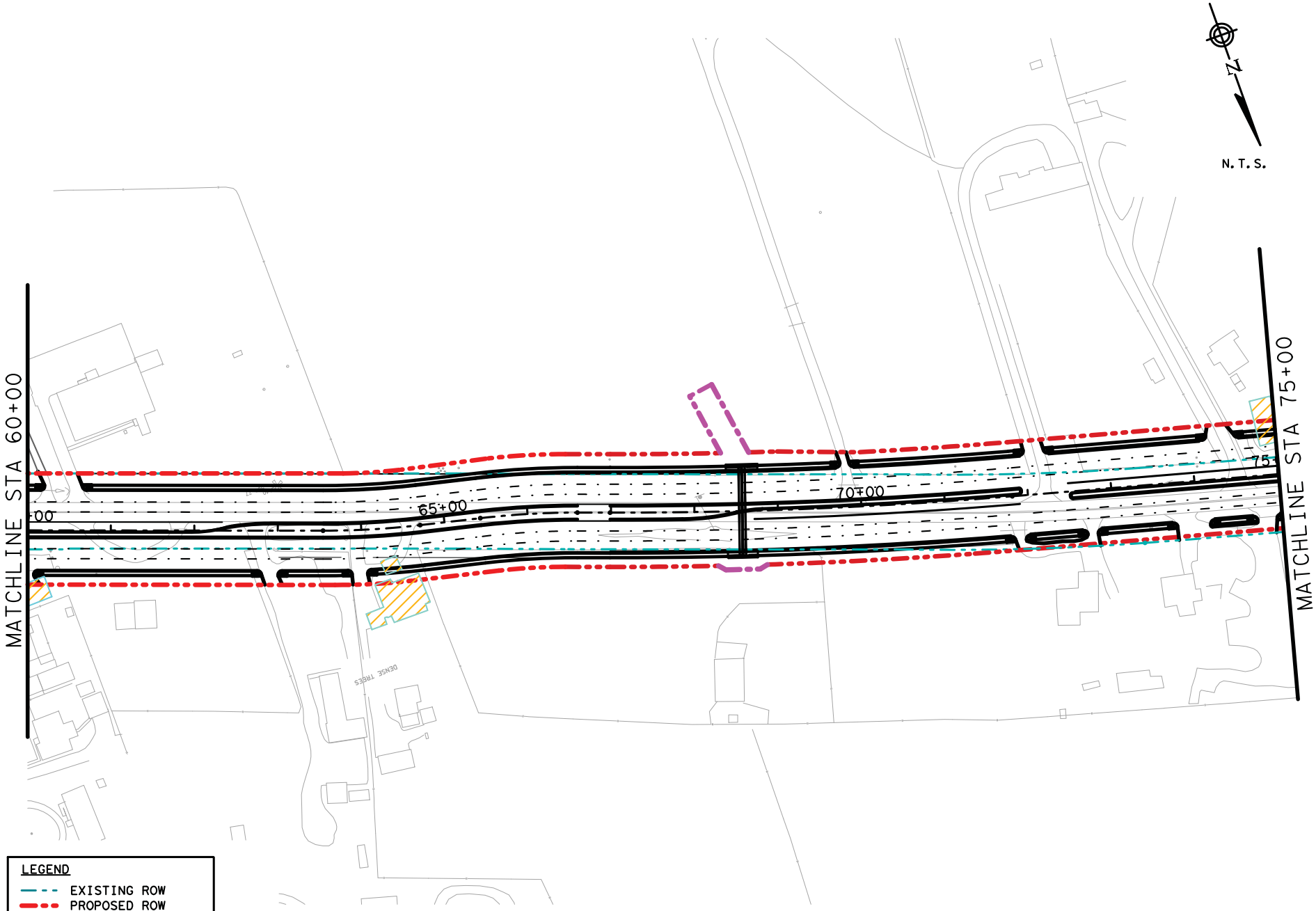
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 1 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

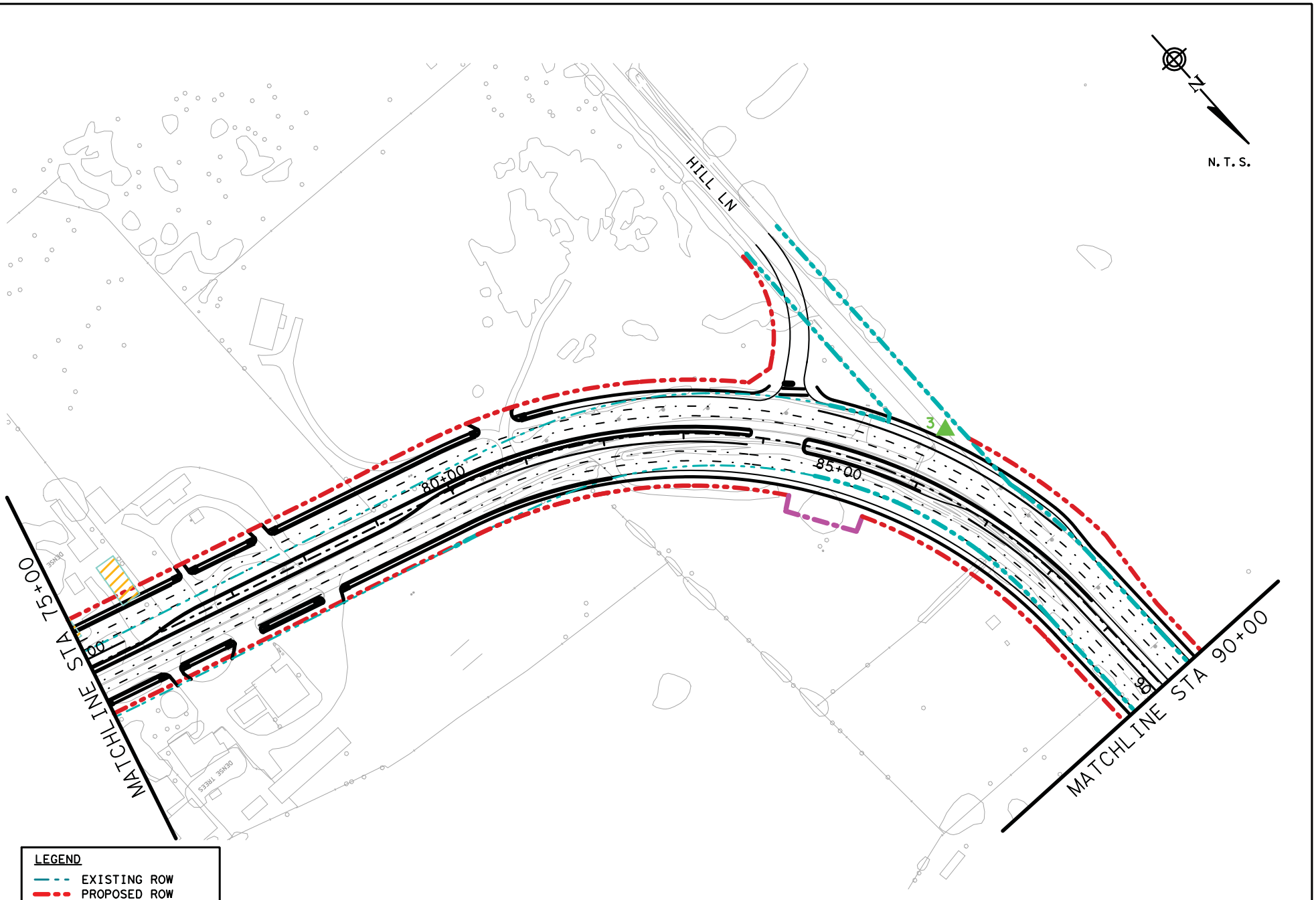
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 2 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

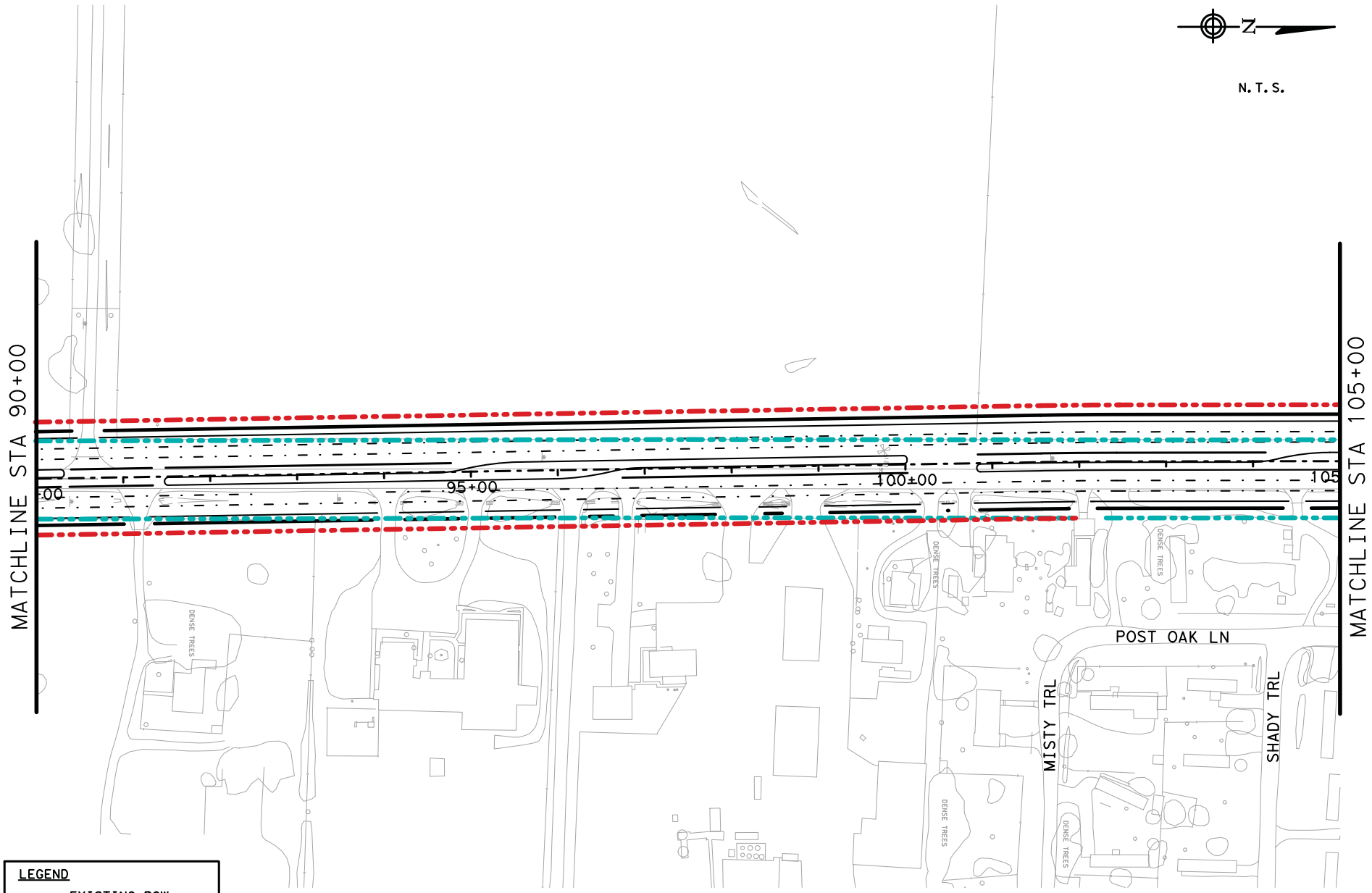
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 3 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

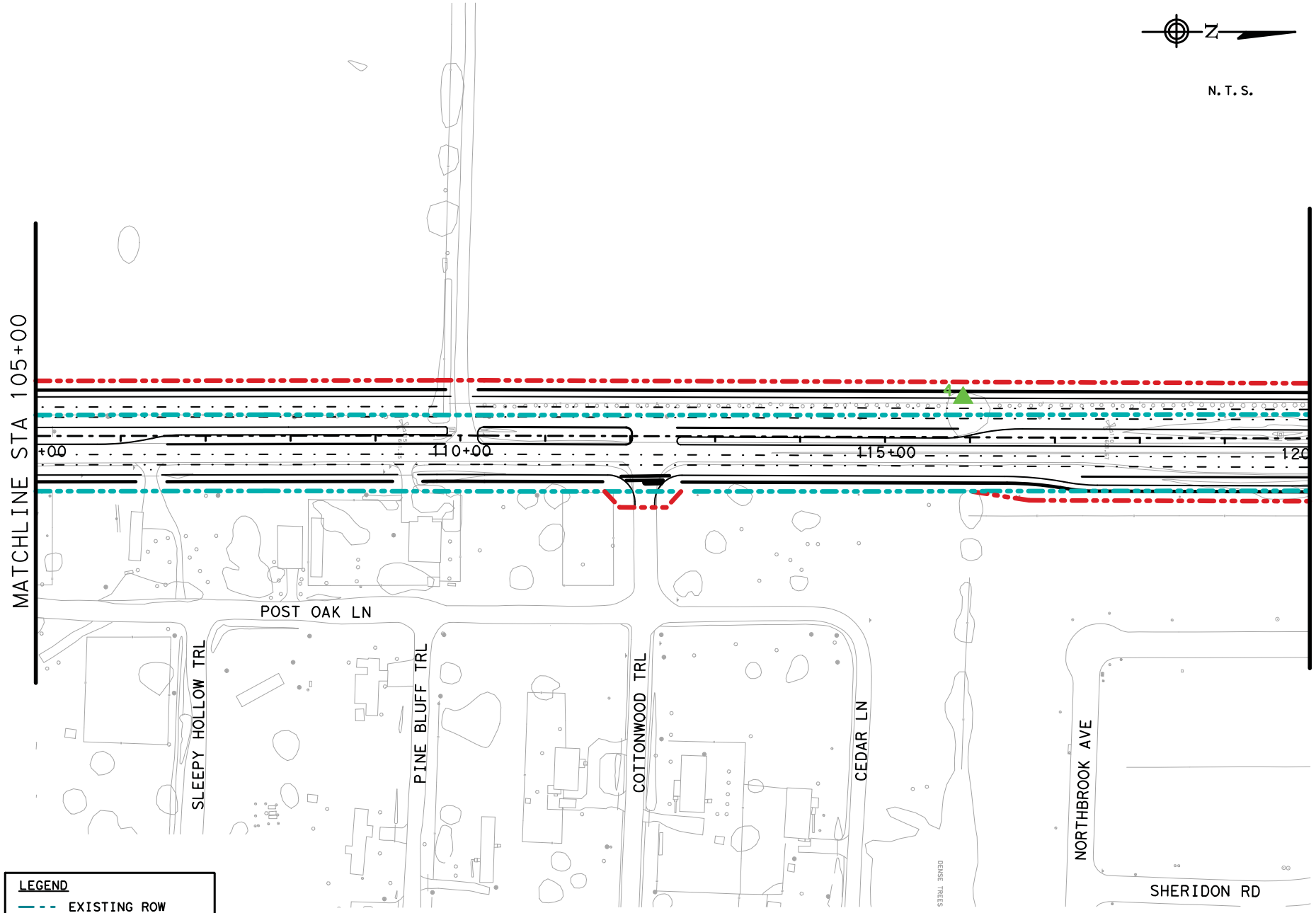
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 4 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

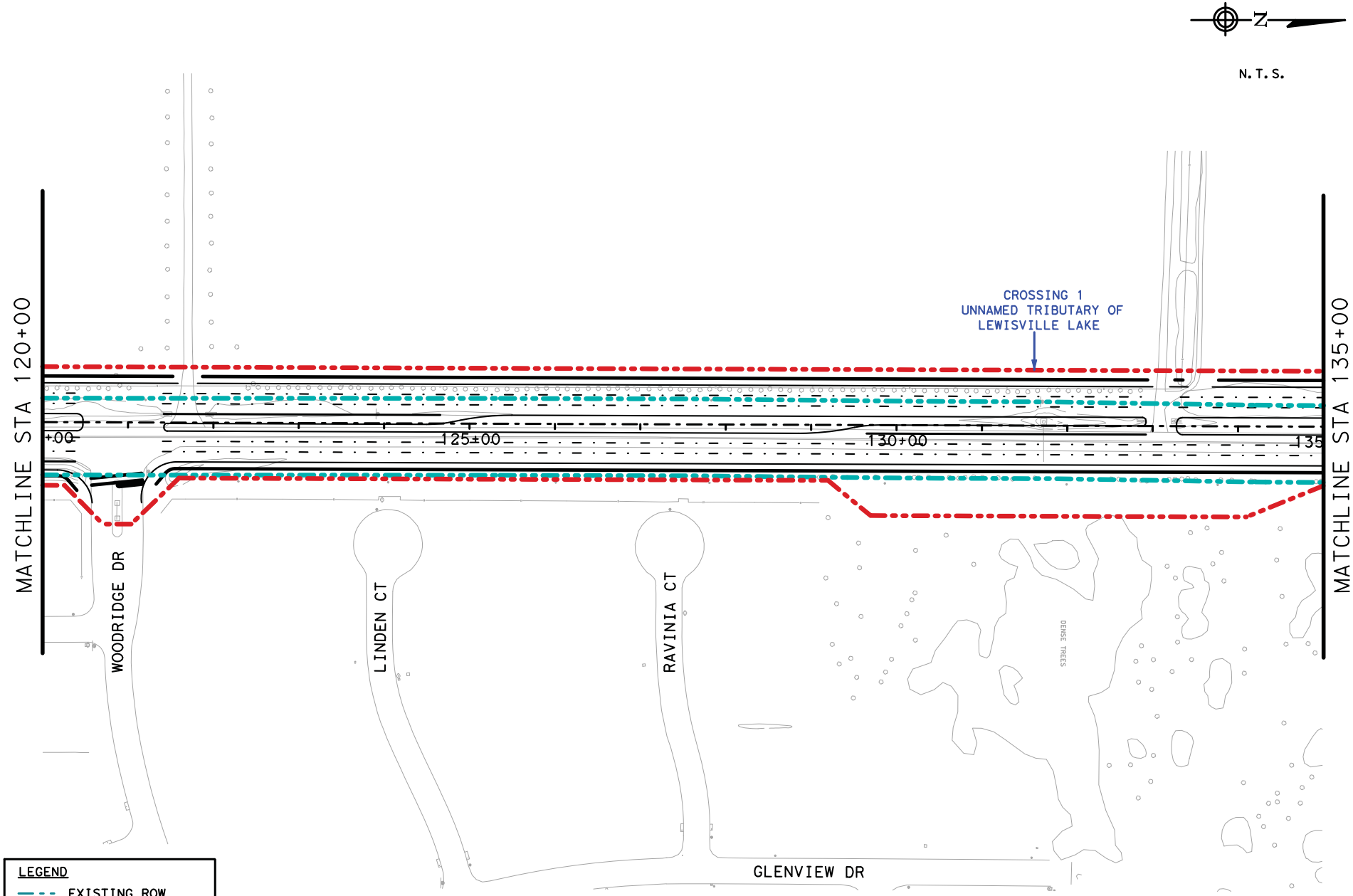
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 5 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

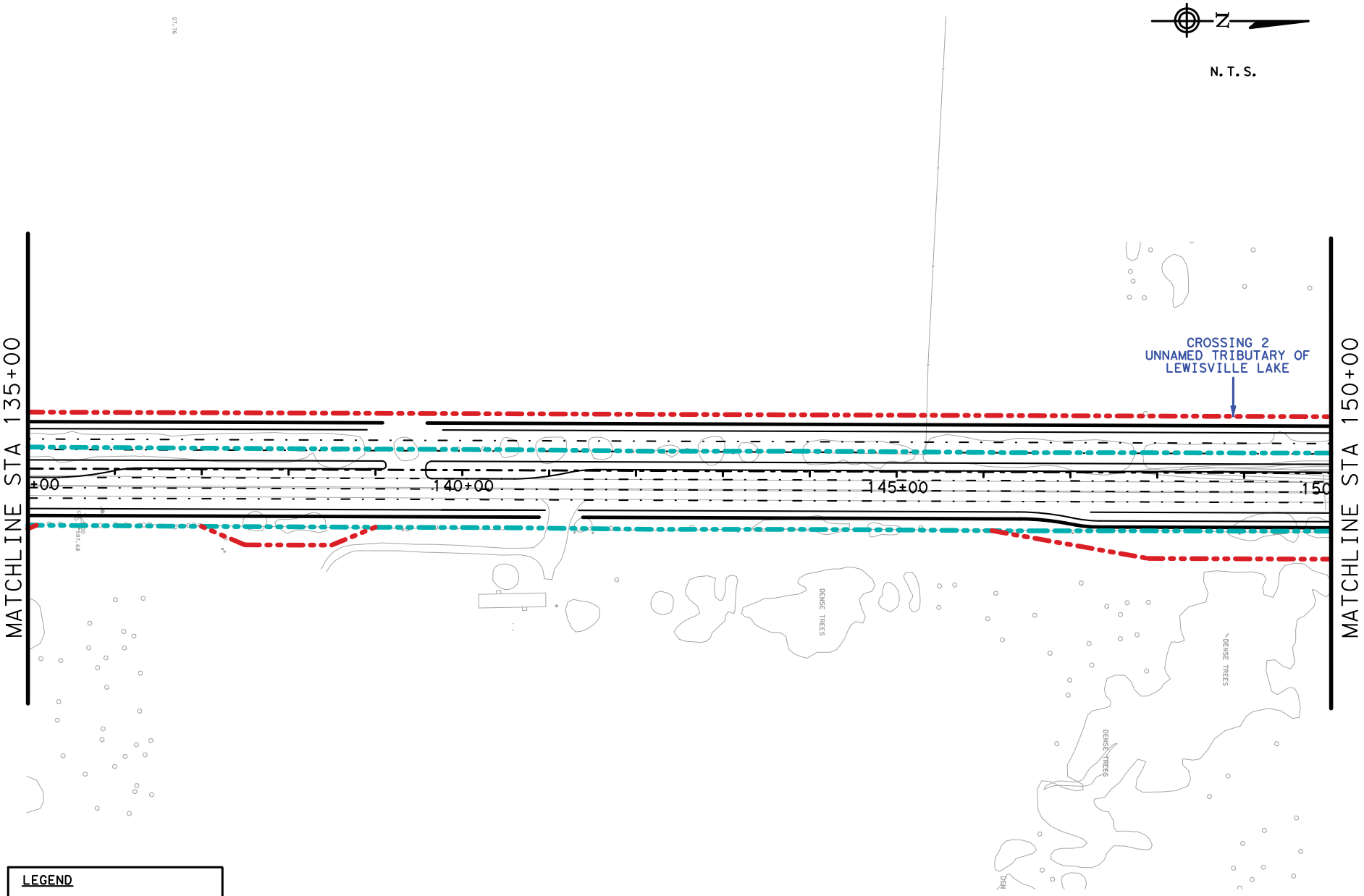
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 6 OF 17



LEGEND

- EXISTING ROW
- PROPOSED ROW
- DRAINAGE EASEMENT
- PROPOSED PAVEMENT
- DISPLACEMENTS
- WETLAND
- DP3 DATA POINT
- # LARGE TREES

SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

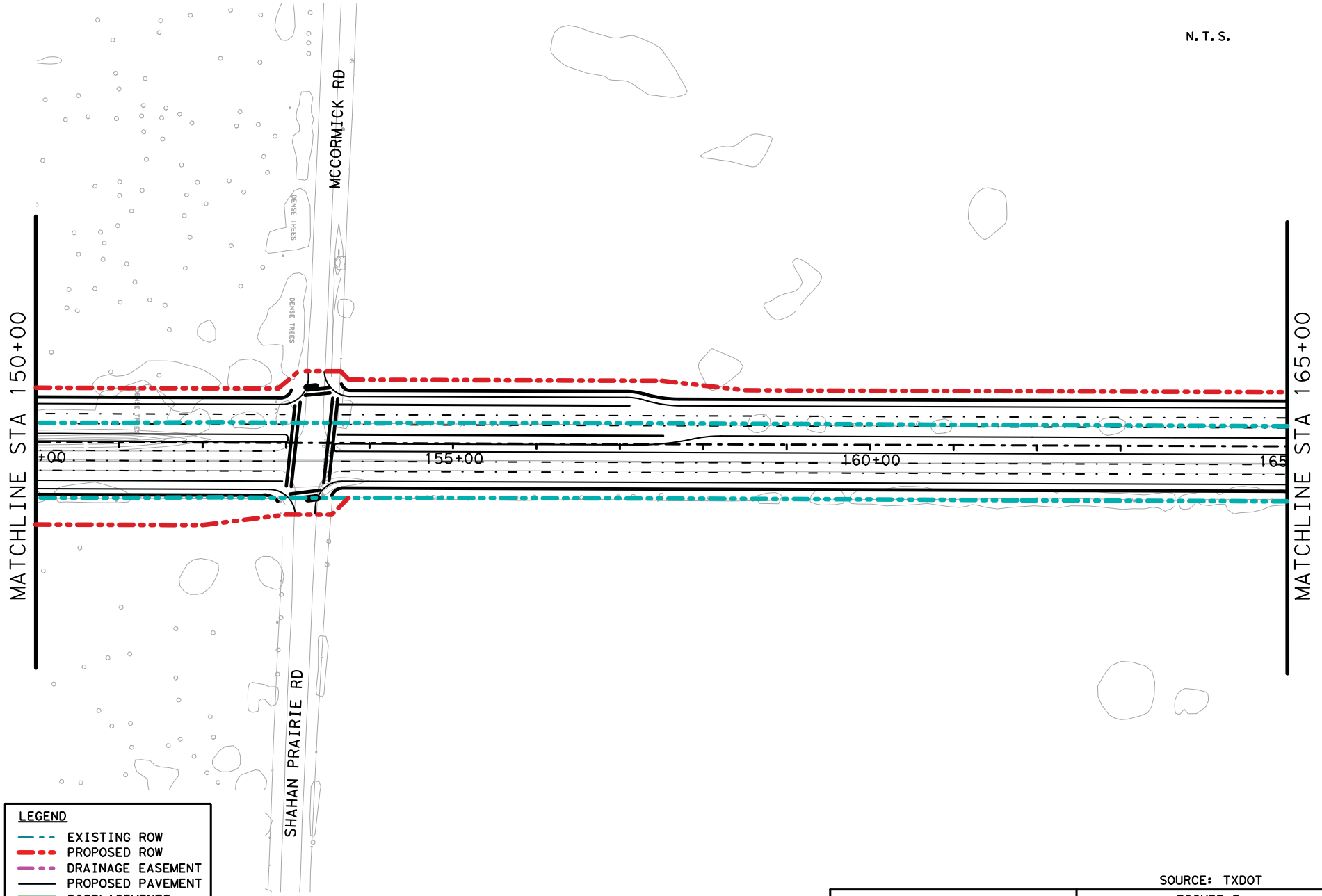
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 7 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

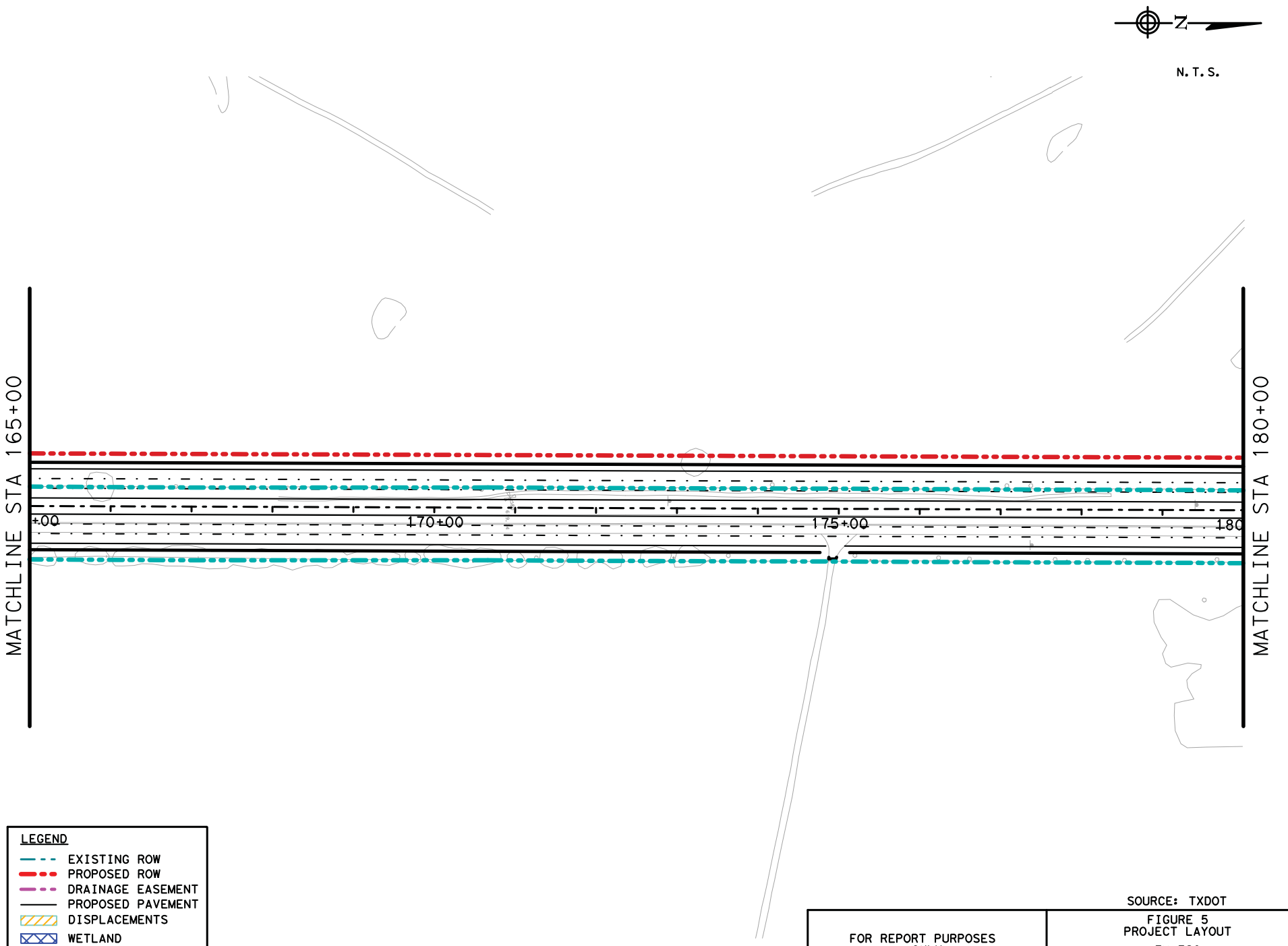
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 8 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

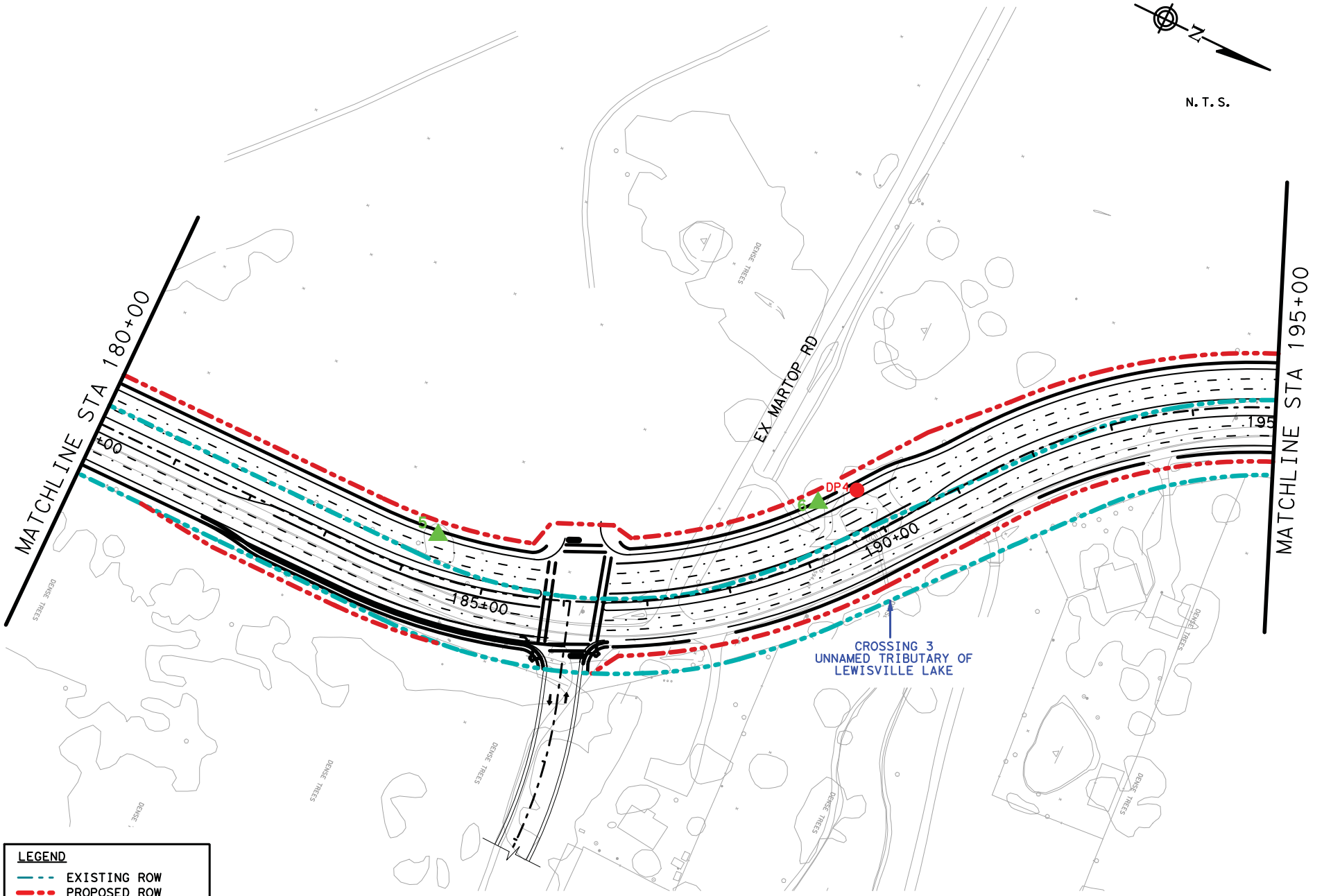
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 9 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

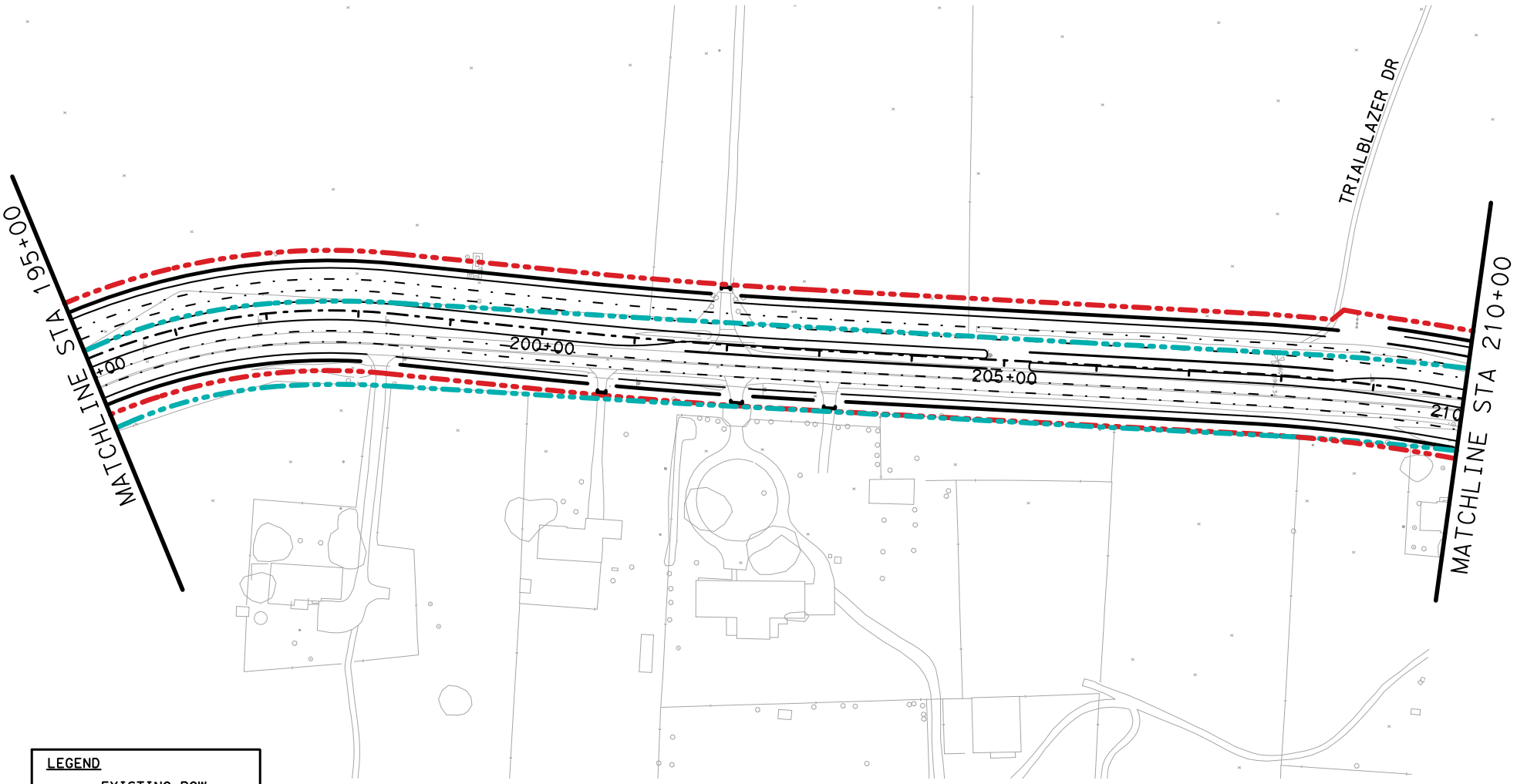
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 10 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 11 OF 17

SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

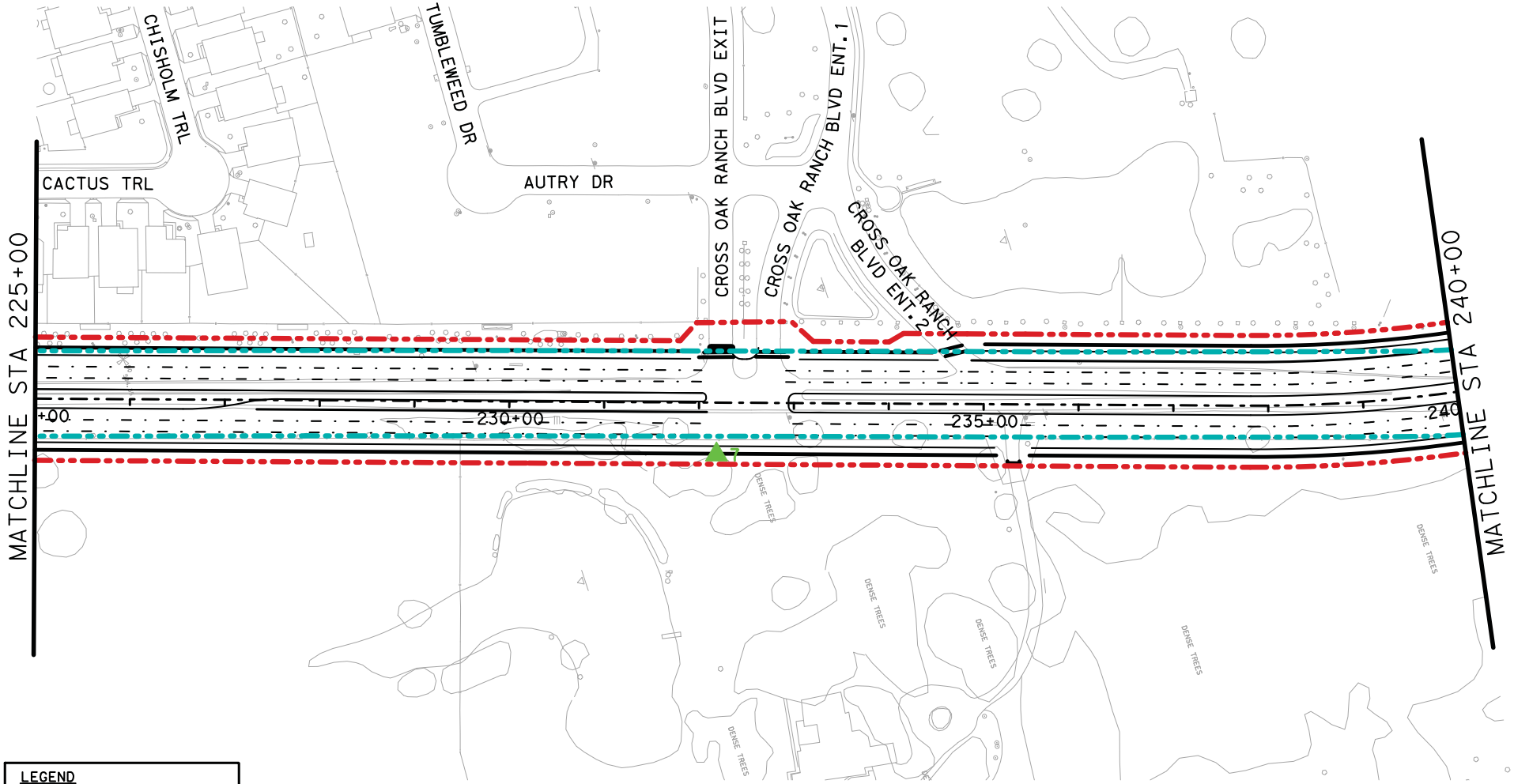
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 12 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

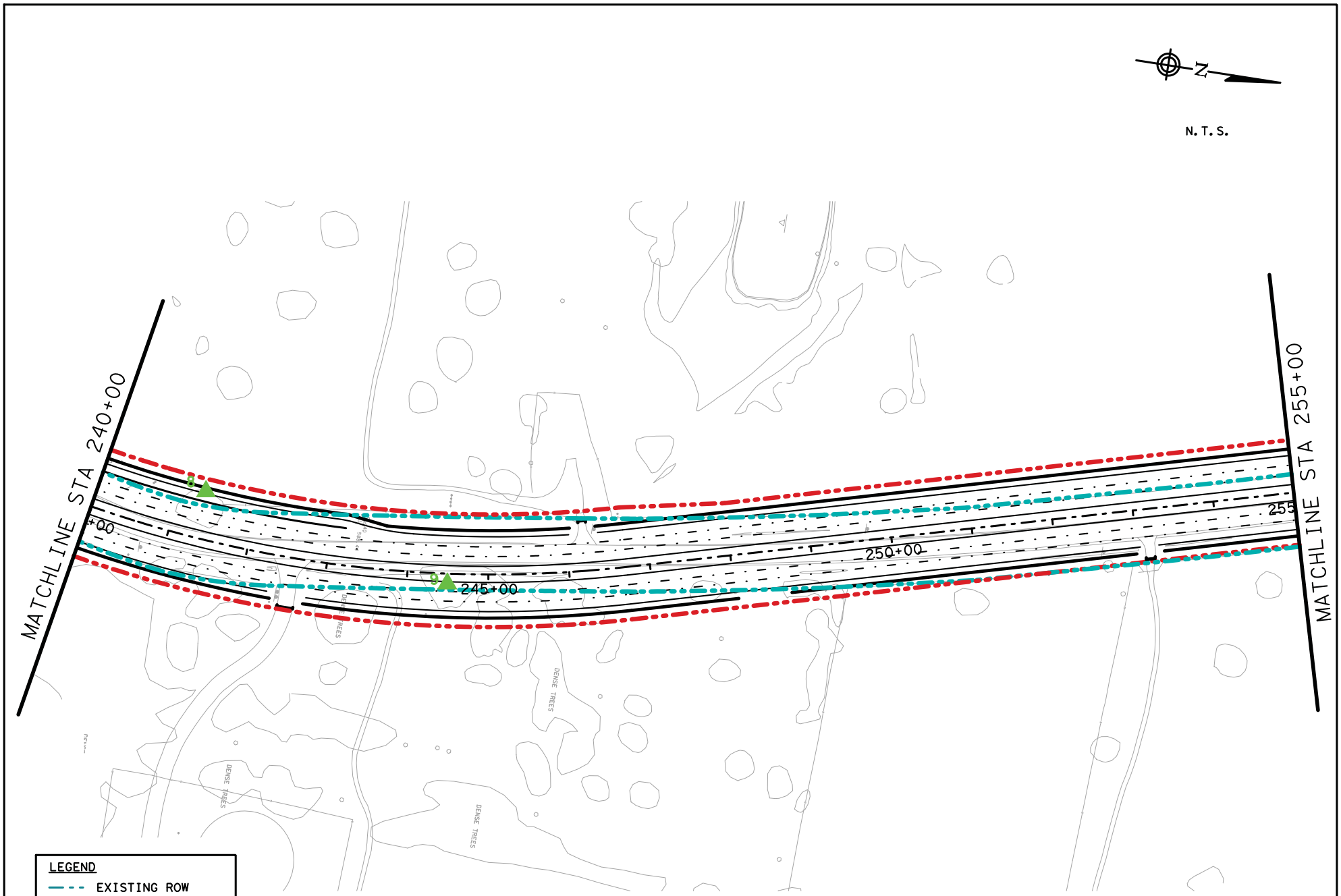
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 13 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

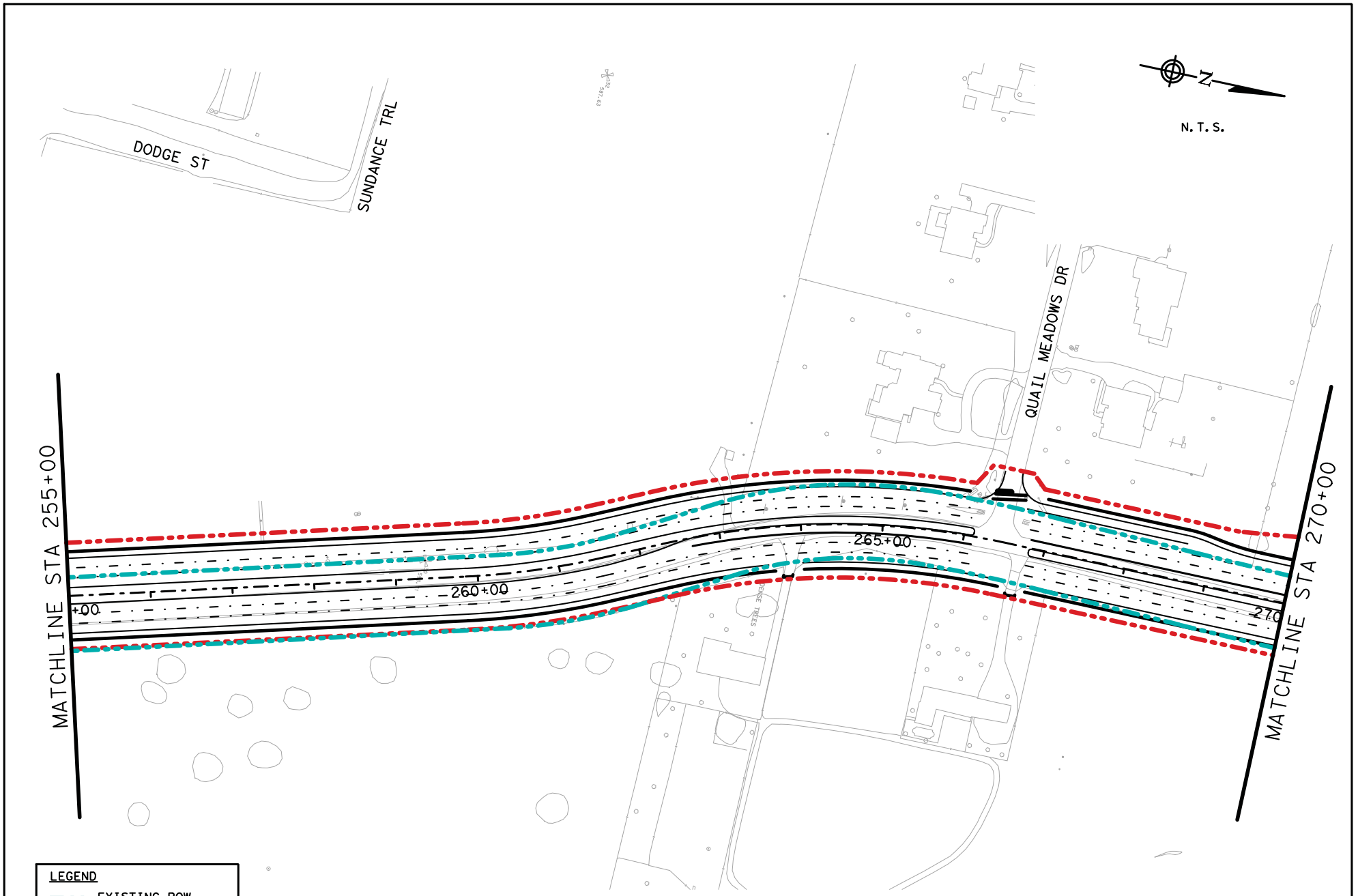
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 14 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

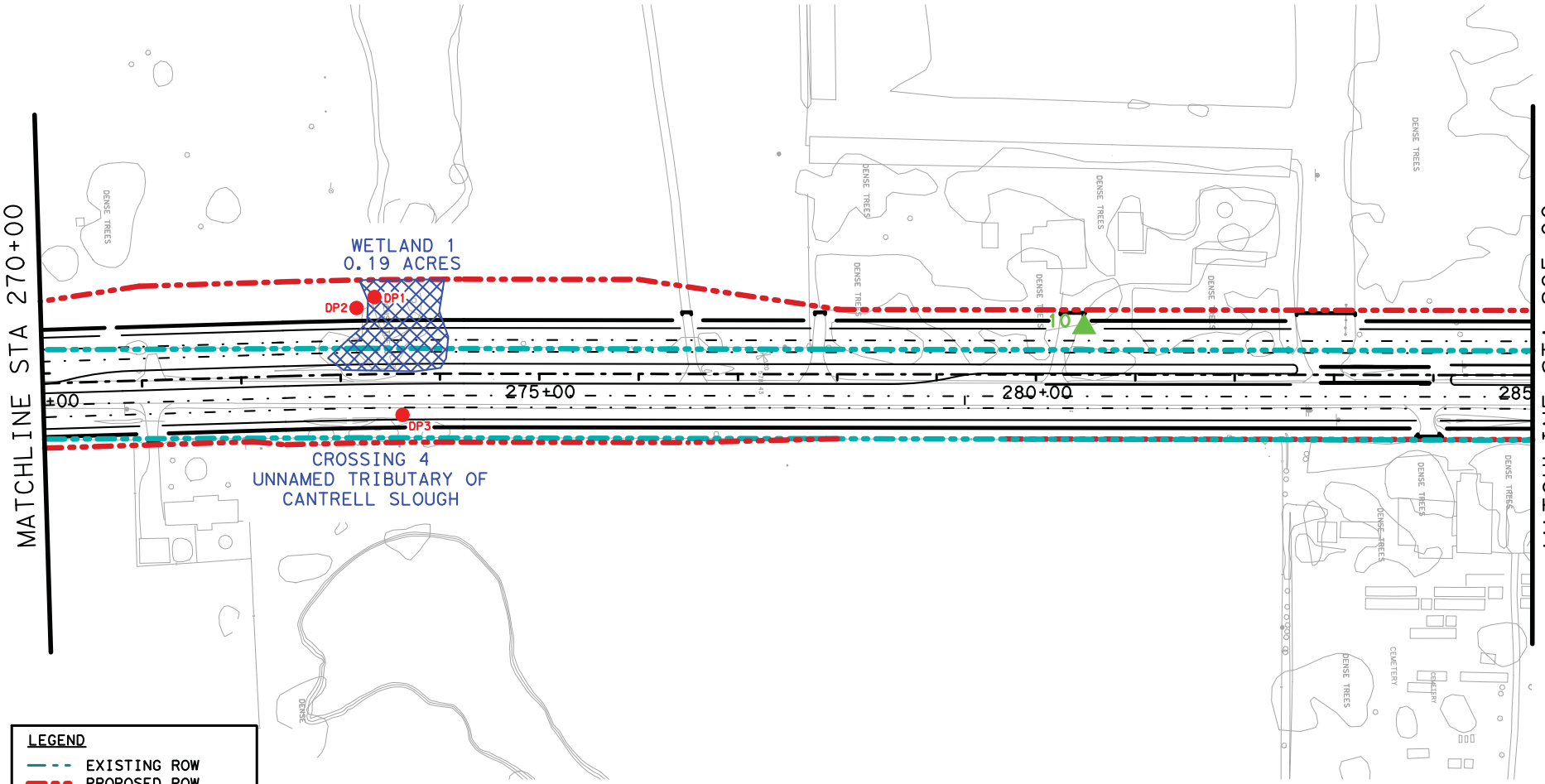
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 15 OF 17



SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

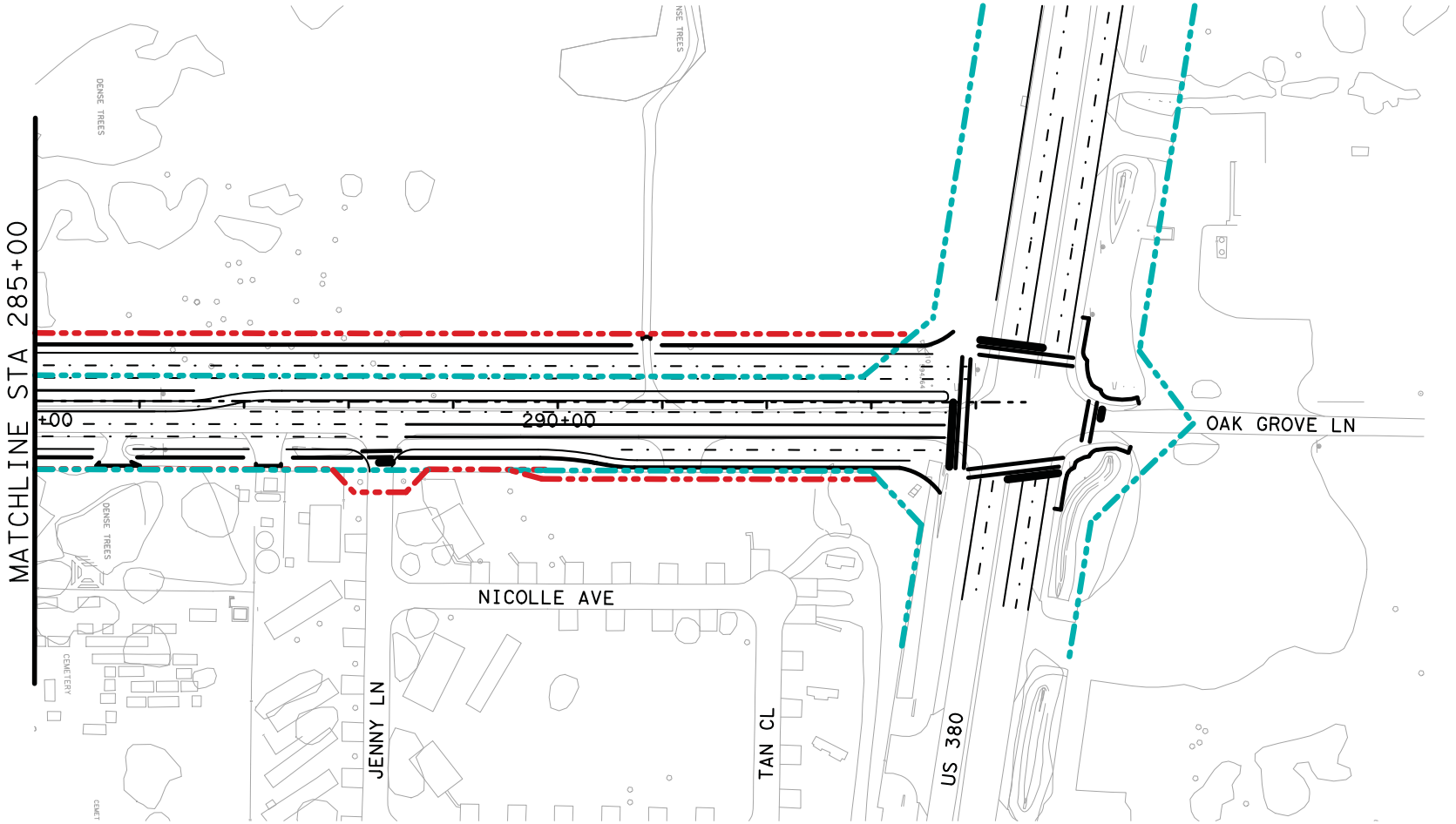
FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 16 OF 17

N

N. T. S.



LEGEND

- EXISTING ROW
- PROPOSED ROW
- DRAINAGE EASEMENT
- PROPOSED PAVEMENT
- DISPLACEMENTS
- WETLAND
- DP3 DATA POINT
- # LARGE TREES

SOURCE: TXDOT

FOR REPORT PURPOSES ONLY

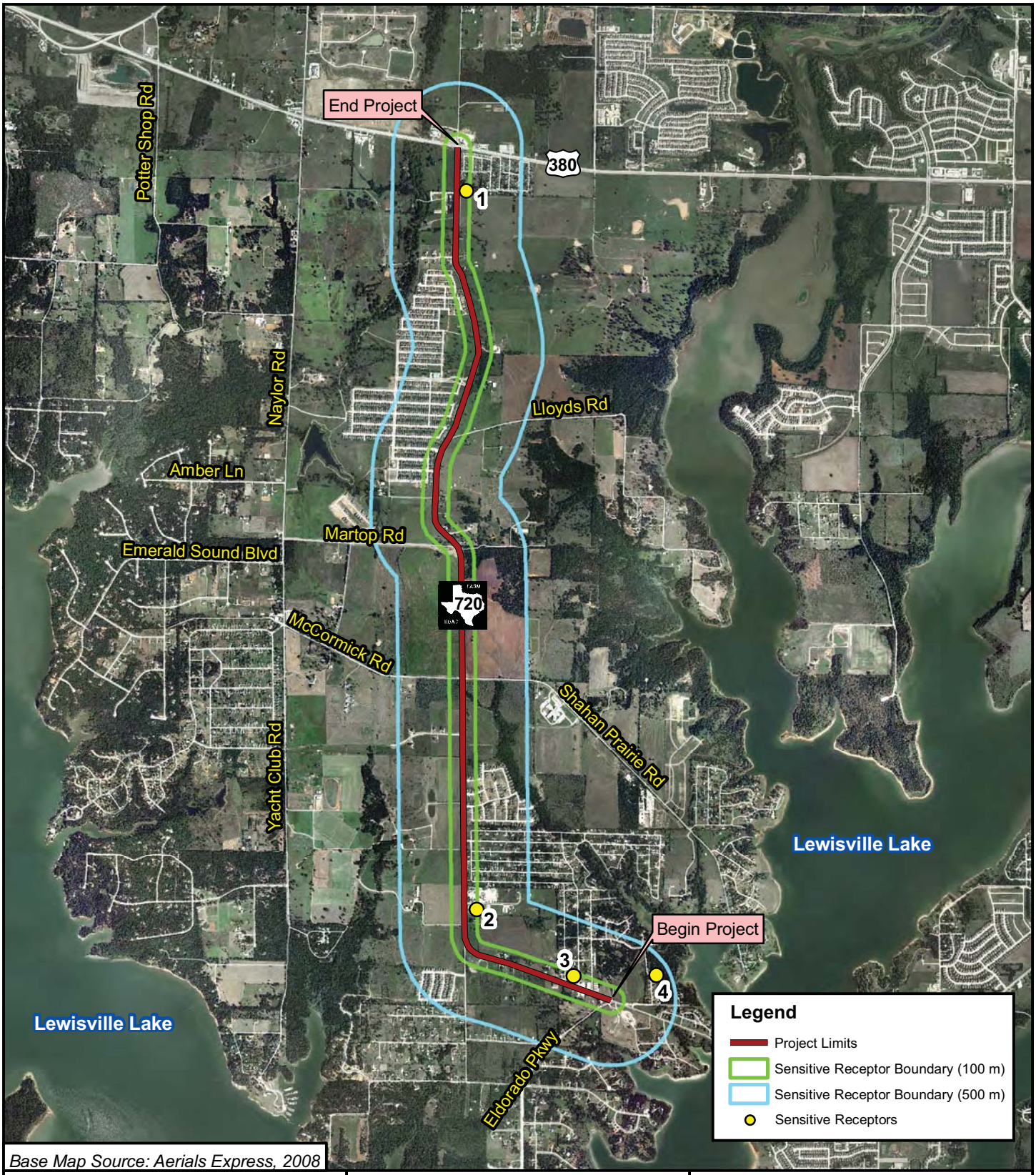
Not for construction, bidding, or permit purposes.

FIGURE 5
PROJECT LAYOUT

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

SHEET 17 OF 17



Base Map Source: Aerials Express, 2008

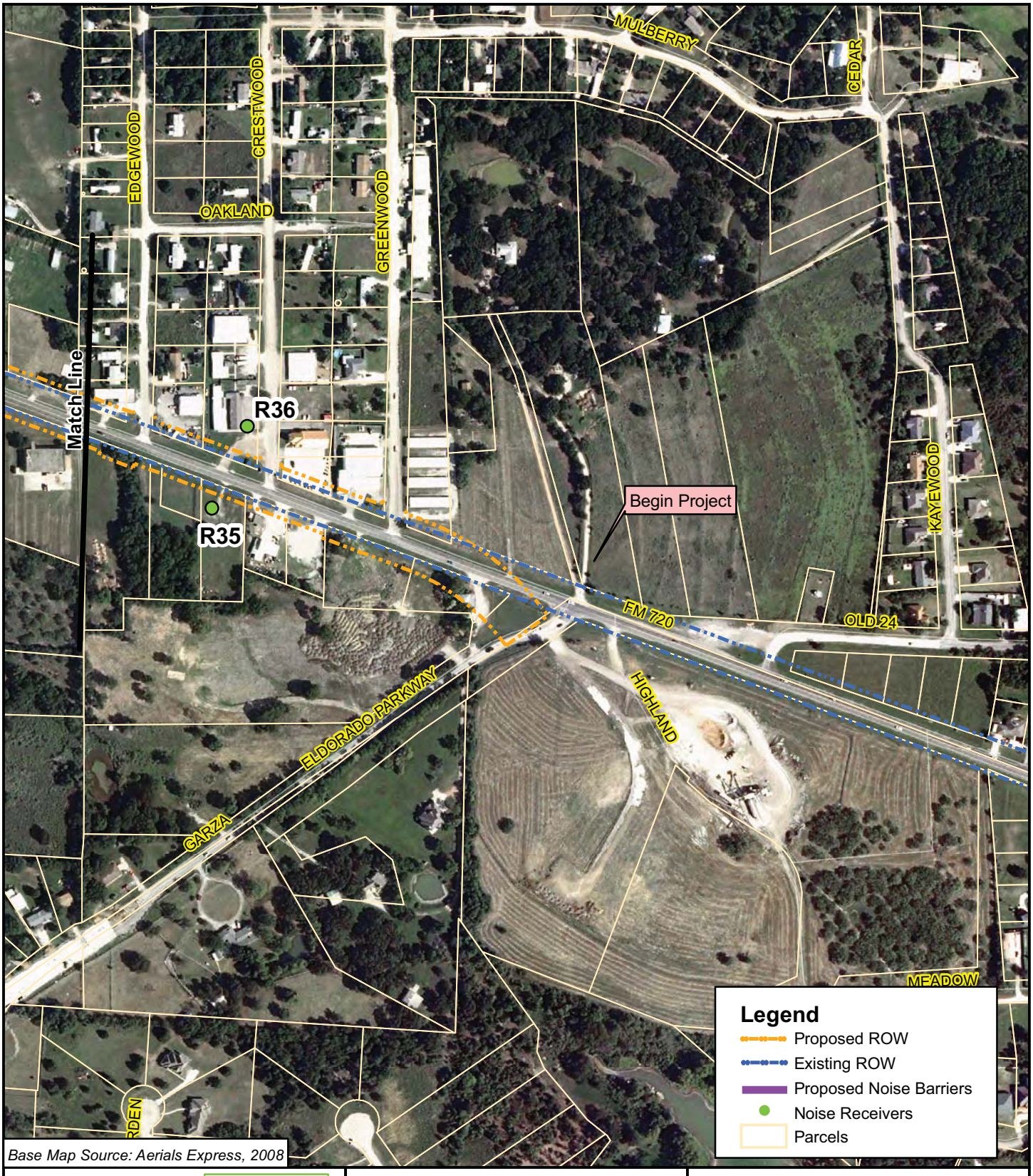
N
W E
S

0 3,500
Feet

FIGURE 6
SENSITIVE RECEPTORS MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



0 270 540

Feet

FIGURE 7-1
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

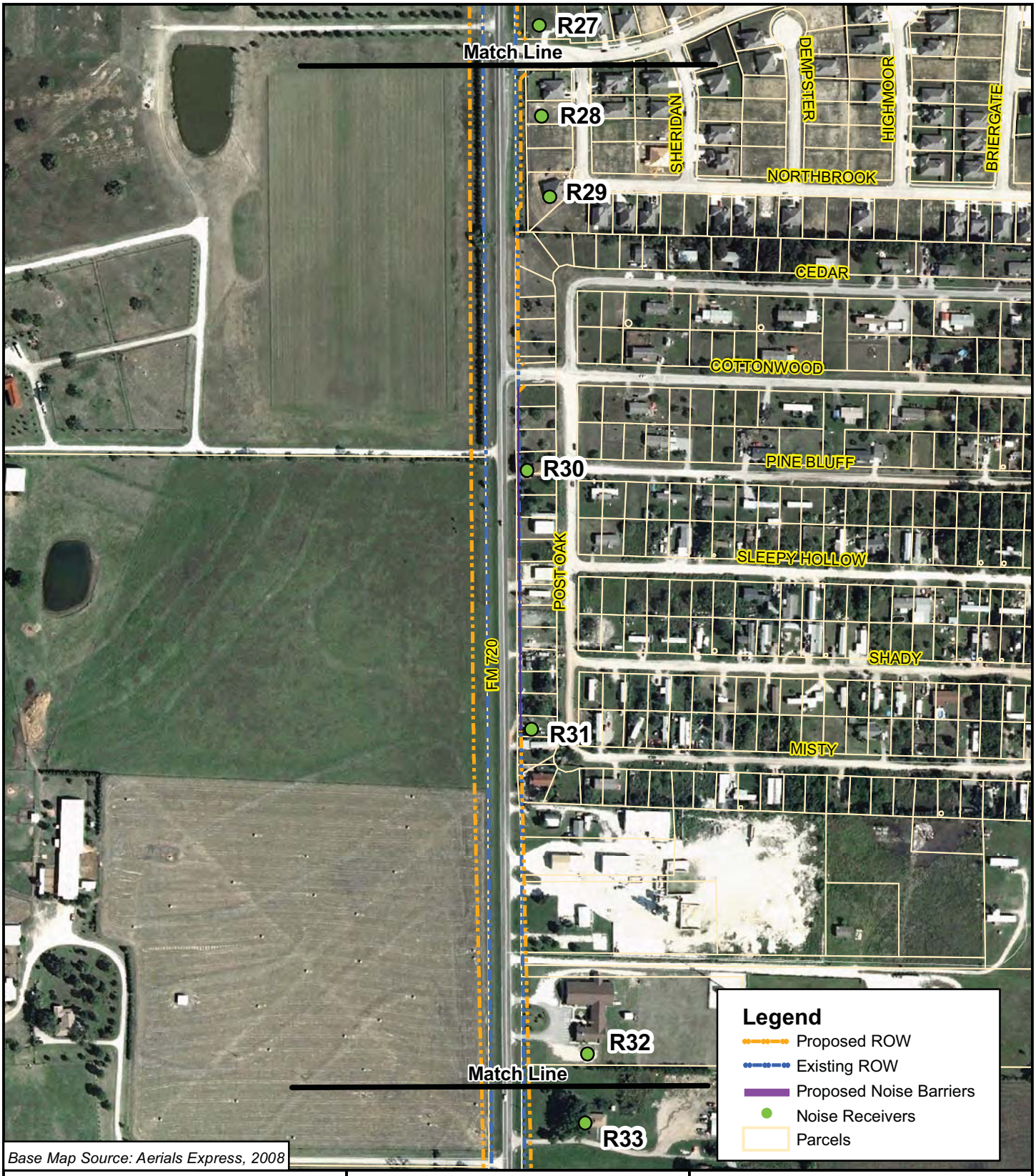
N
W E
S

0 275 550
Feet

FIGURE 7-2
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



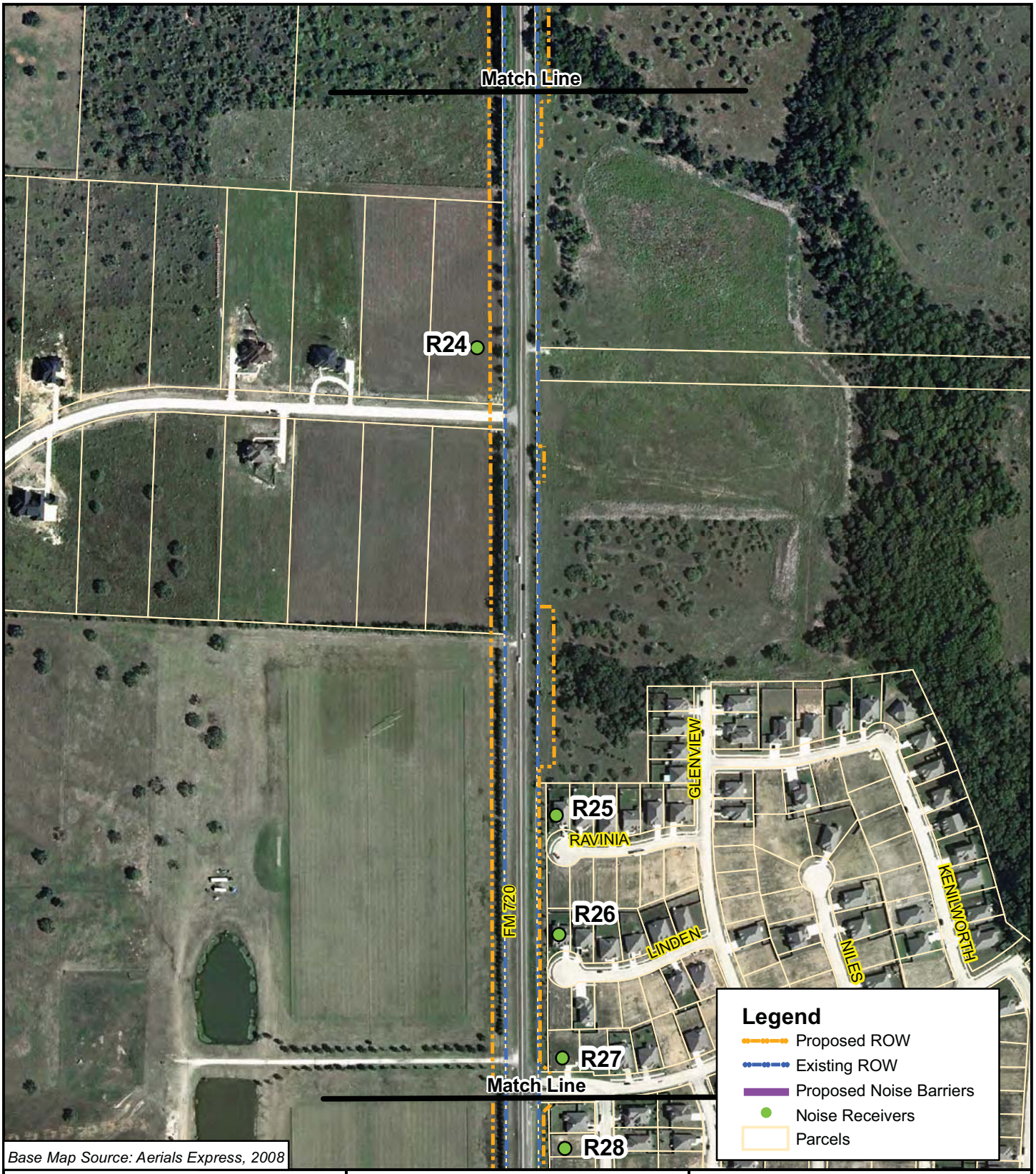
N
W E
S

0 280 560
Feet

FIGURE 7-3
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



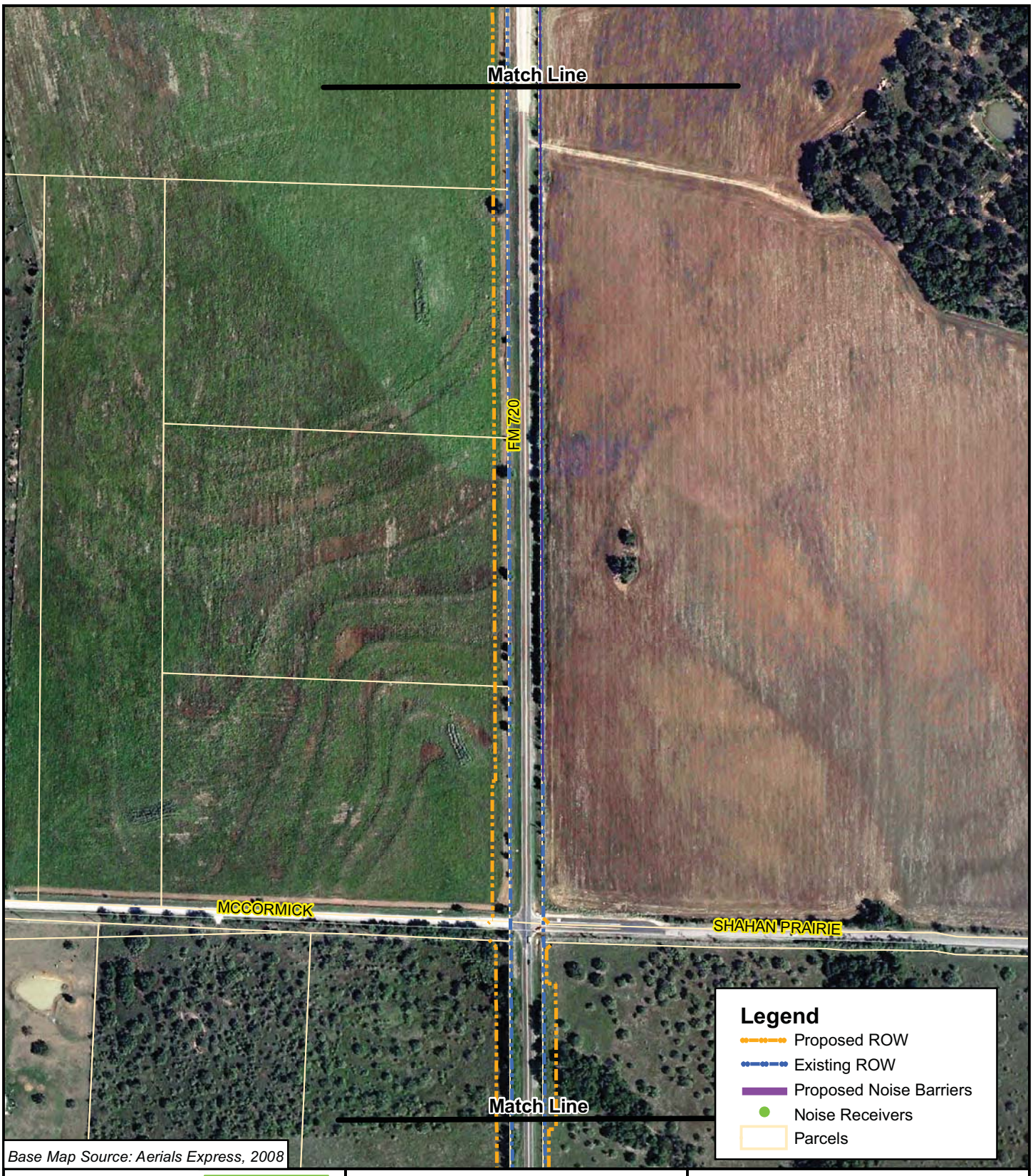
N
W E
S

0 280 560
Feet

FIGURE 7-4
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



0 280 560 Feet

FIGURE 7-5
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

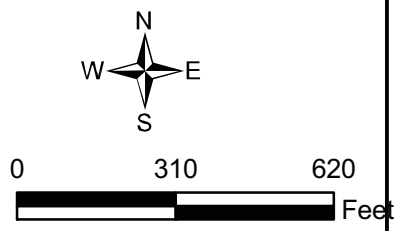


FIGURE 7-6
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

N
W E
S

0 320 640
Feet

FIGURE 7-7
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

N
W E
S

0 320 640
Feet

FIGURE 7-8
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

N
W E
S

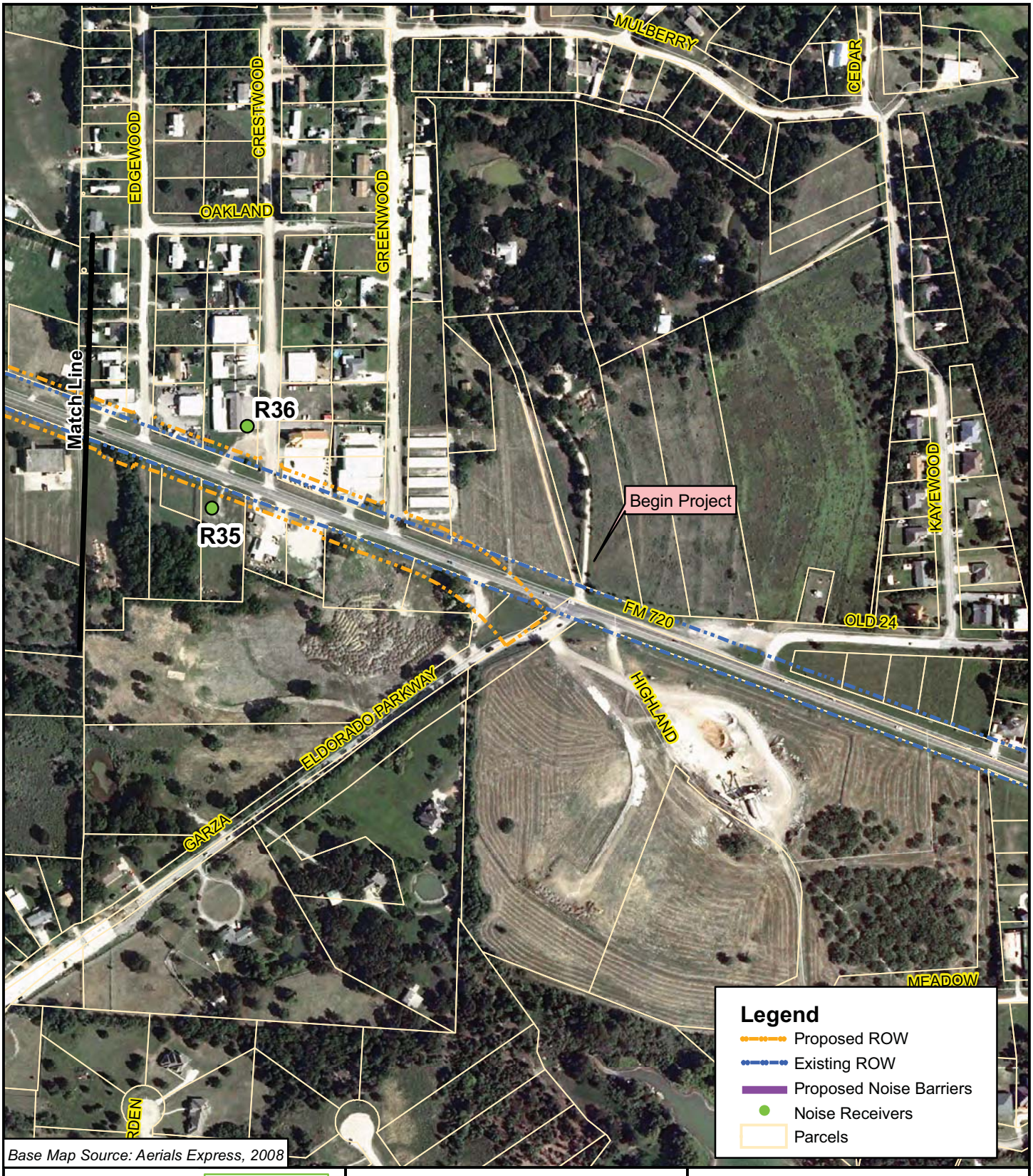
0 320 640

Feet

FIGURE 7-9
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



0 270 540

Feet

FIGURE 7-1
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

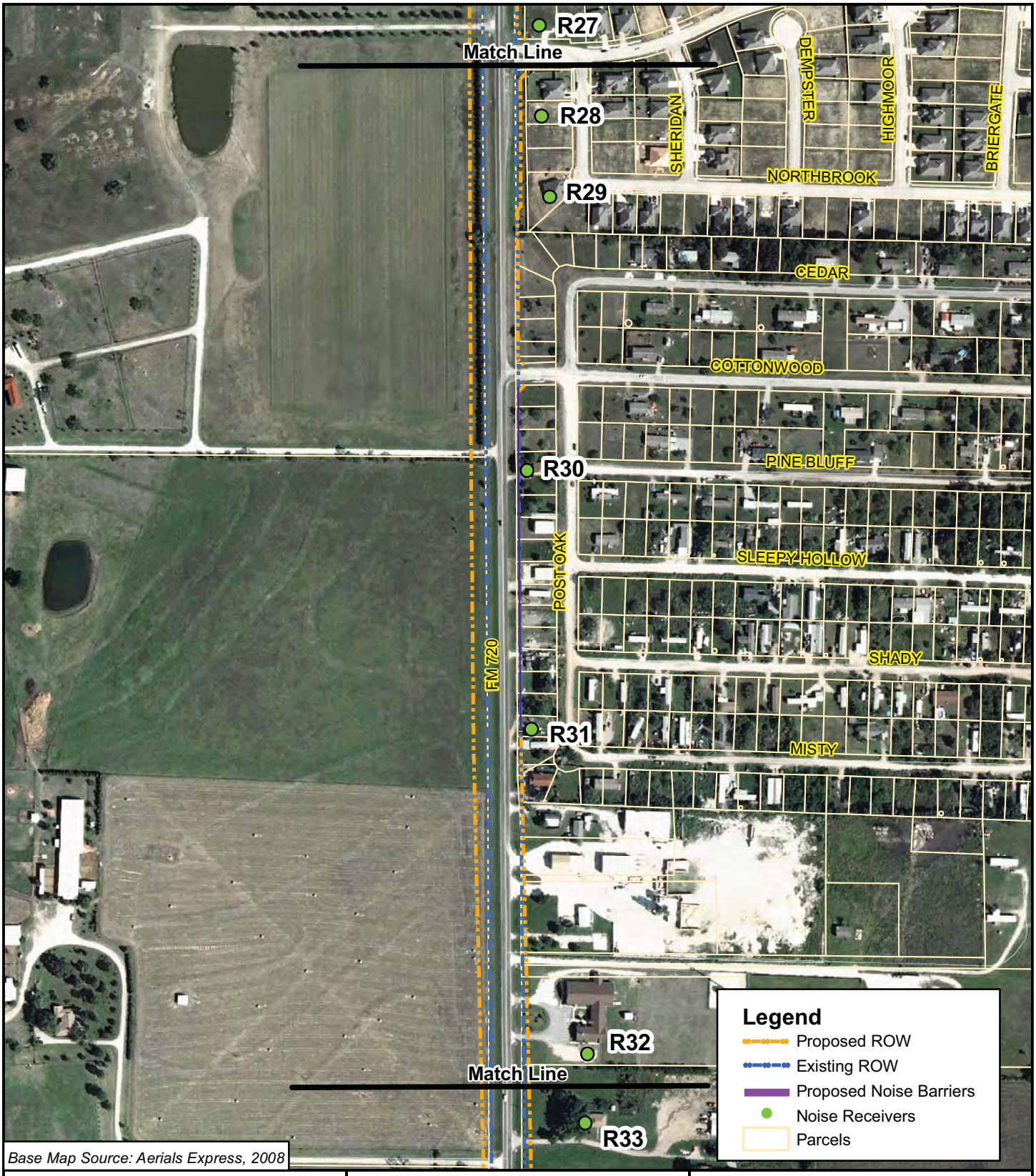
N
W E
S

0 275 550
Feet

FIGURE 7-2
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



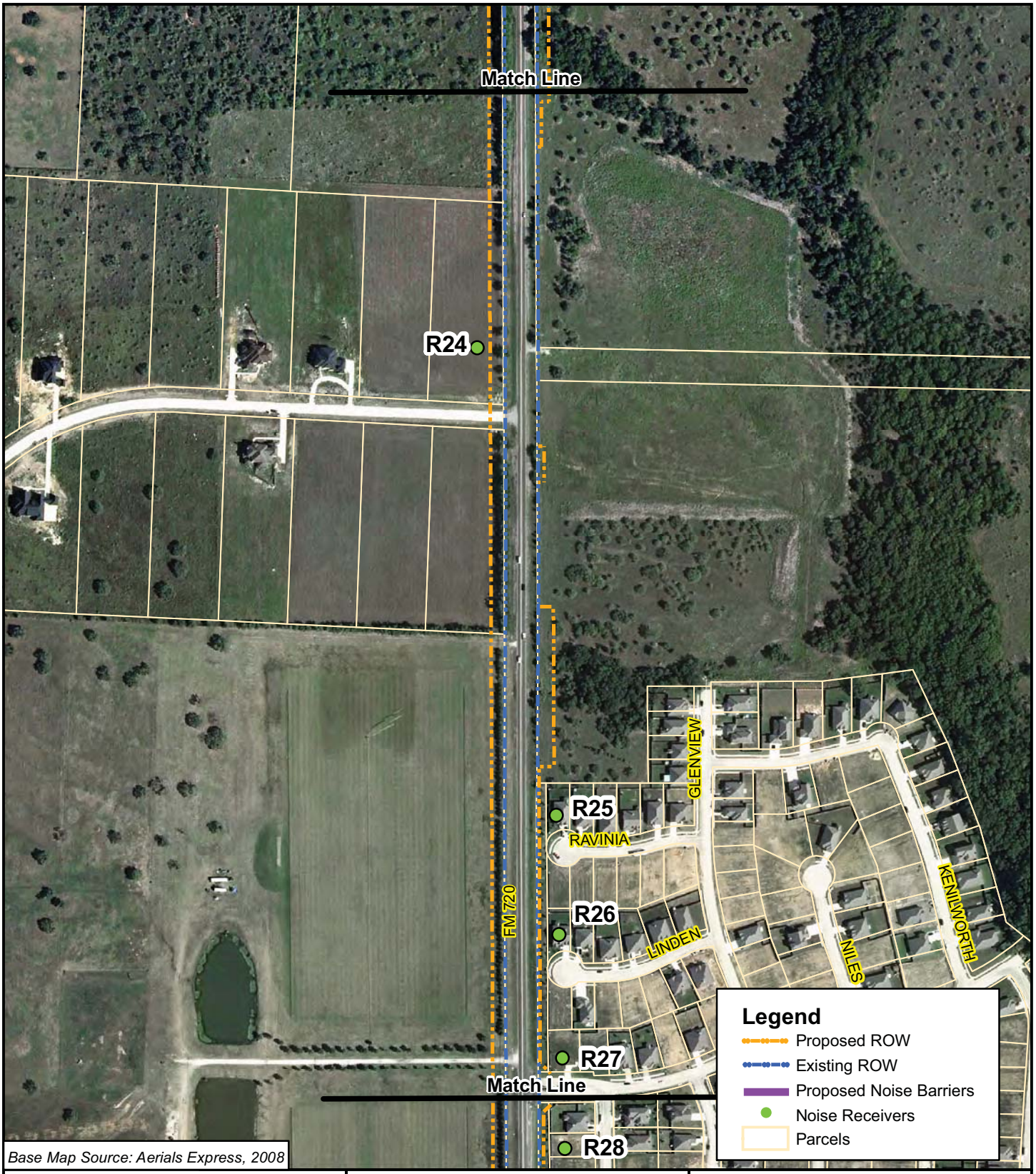
N
W E
S

0 280 560
Feet

FIGURE 7-3
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



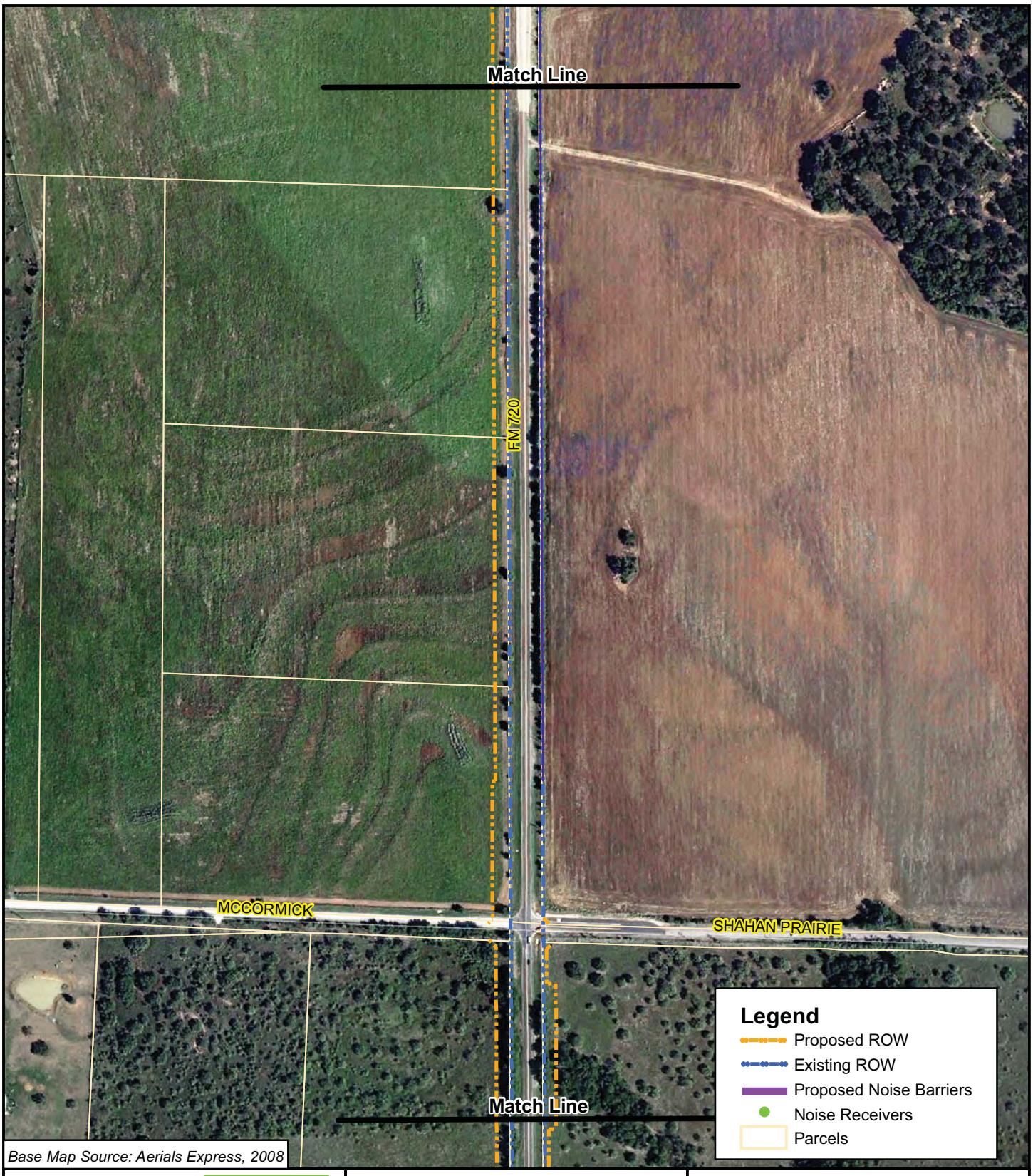
N
W E
S

0 280 560
Feet

FIGURE 7-4
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



0 280 560 Feet

FIGURE 7-5
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

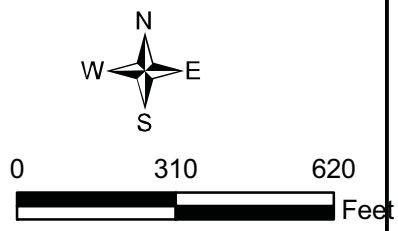


FIGURE 7-6
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

N
W E
S

0 320 640
Feet

FIGURE 7-7
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

N
W E
S

0 250 500
Feet

FIGURE 7-8
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

N
W E
S

0 320 640

Feet

FIGURE 7-9
NOISE RECEIVER LOCATION MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

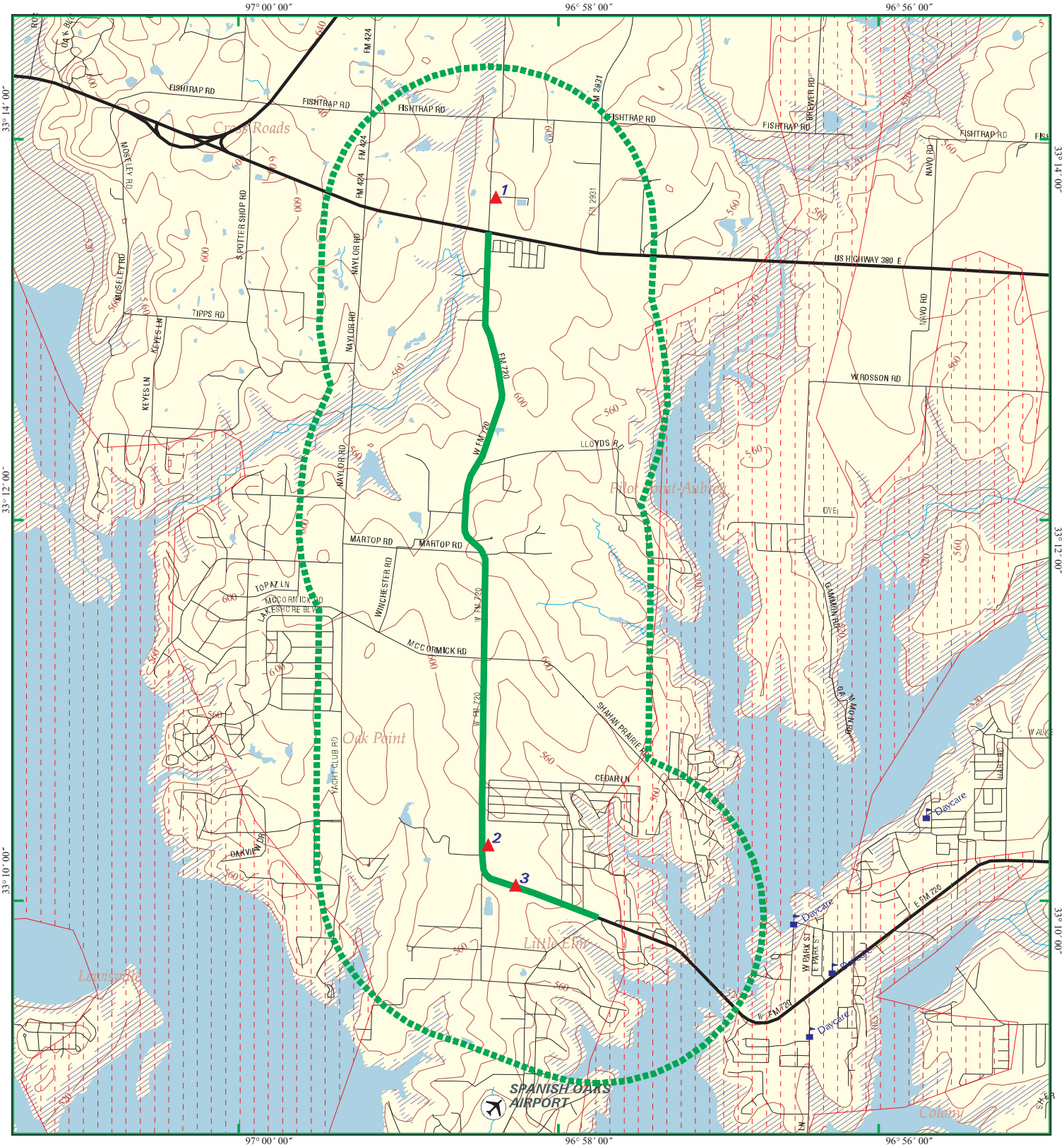


FIGURE 8

Hazardous Materials Location Map

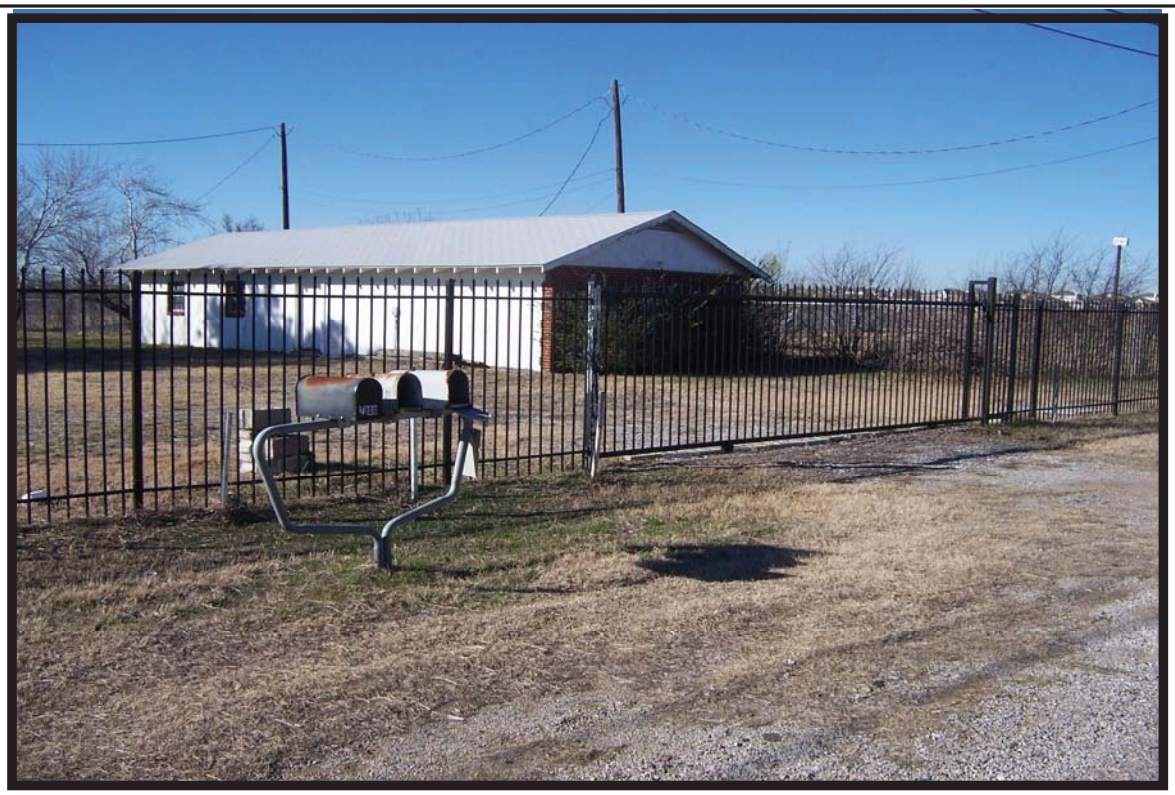
Little Elm, TX

- Listed Sites
- Earthquake Epicenters (Richter 5 or greater)
- Search Boundary
- Roads
- Major Roads
- Waterways
- Railroads
- Contour Lines
- Pipelines
- Powerlines
- Fault Lines
- Water
- Superfund Sites
- Federal DOD Sites
- Indian Reservations BIA
- 100-Yr Flood Zones

N

0 1/4 1/2

Scale in Miles



Photograph #1 - Proposed Displacement
Looking south at a vacant commercial structure (2102 FM 720) proposed for acquisition.

Photograph #2 – Proposed Displacement
Looking north at a residential duplex (1911 and 1913 FM 720) proposed for acquisition.

FM 720 from Eldorado Parkway to US 380		
Project Study Area Photographs		
FIGURE 9	CSJ No: 1567-01-025	DATE 03/08

Photograph #3 – Proposed Displacement
Looking south at Posey Express BBQ (1900 FM 720) that is proposed for acquisition.

Photograph #4 – Proposed Displacement
Looking north at Action Collision Center, a commercial body shop (1819 W. FM 720) that is proposed for acquisition.

FM 720 from Eldorado Parkway to US 380		
Project Study Area Photographs		
FIGURE 9	CSJ No: 1567-01-025	DATE 03/08

Photograph #5 – Proposed Displacement
Looking west at a vacant commercial structure (1800 FM 720) proposed for acquisition.

FM 720 from Eldorado Parkway to US 380		
Project Study Area Photographs		
FIGURE 9	CSJ No: 1567-01-025	DATE 03/08

Photograph #6 – Water of the US
Looking west (downstream) at an unnamed tributary to Cantrell Slough.

Photograph #7 – Water of the US
Looking east (upstream) at an unnamed tributary to Cantrell Slough.

FM 720 from Eldorado Parkway to US 380		
Project Study Area Photographs		
FIGURE 9	CSJ No: 1567-01-025	DATE 03/08

Photograph #8 – Water of US
Looking west (upstream) at an unnamed Tributary to Lake Lewisville.

Photograph #9 – Water of US
Looking east (downstream) at an unnamed Tributary to Lewisville Lake.

FM 720 from Eldorado Parkway to US 380		
Project Study Area Photographs		
FIGURE 9	CSJ No: 1567-01-025	DATE 03/08

Photograph #10 – Water of the US
Looking south (downstream side) at unnamed Tributary to Lewisville Lake.

Photograph #11 – Water of the US
Looking south (upstream side) at unnamed Tributary to Lewisville Lake.

FM 720 from Eldorado Parkway to US 380		
Project Study Area Photographs		
FIGURE 9	CSJ No: 1567-01-025	DATE 03/08

Photograph #12 – Proposed Displacement
Looking north at commercial warehouse proposed for displacement.

Photograph #13 – Maintained vegetation
View looking west along FM 720 westbound lane.

FM 720 from Eldorado Parkway to US 380		
Project Study Area Photographs		
FIGURE 9	CSJ No: 1567-01-025	DATE 11/10

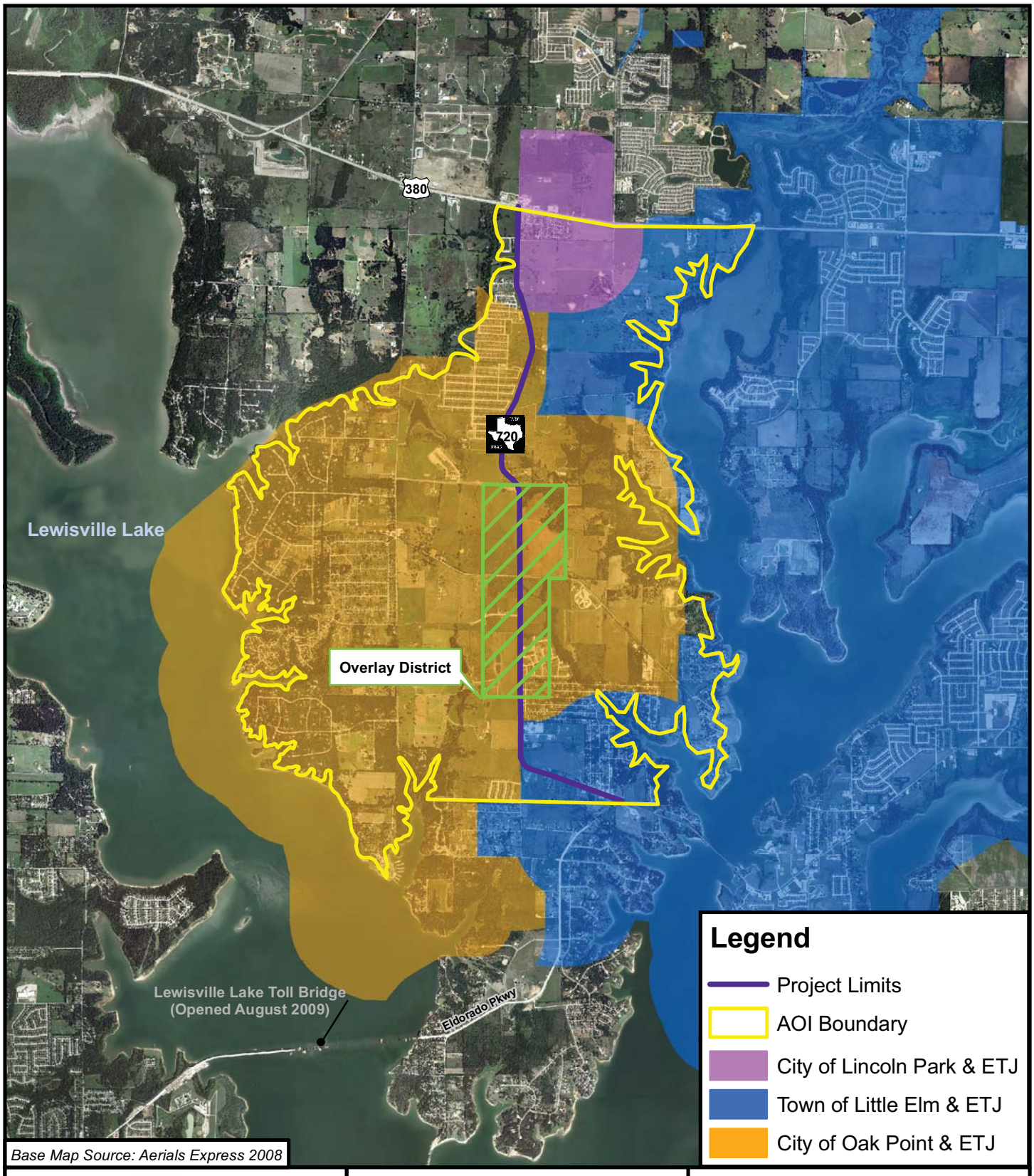
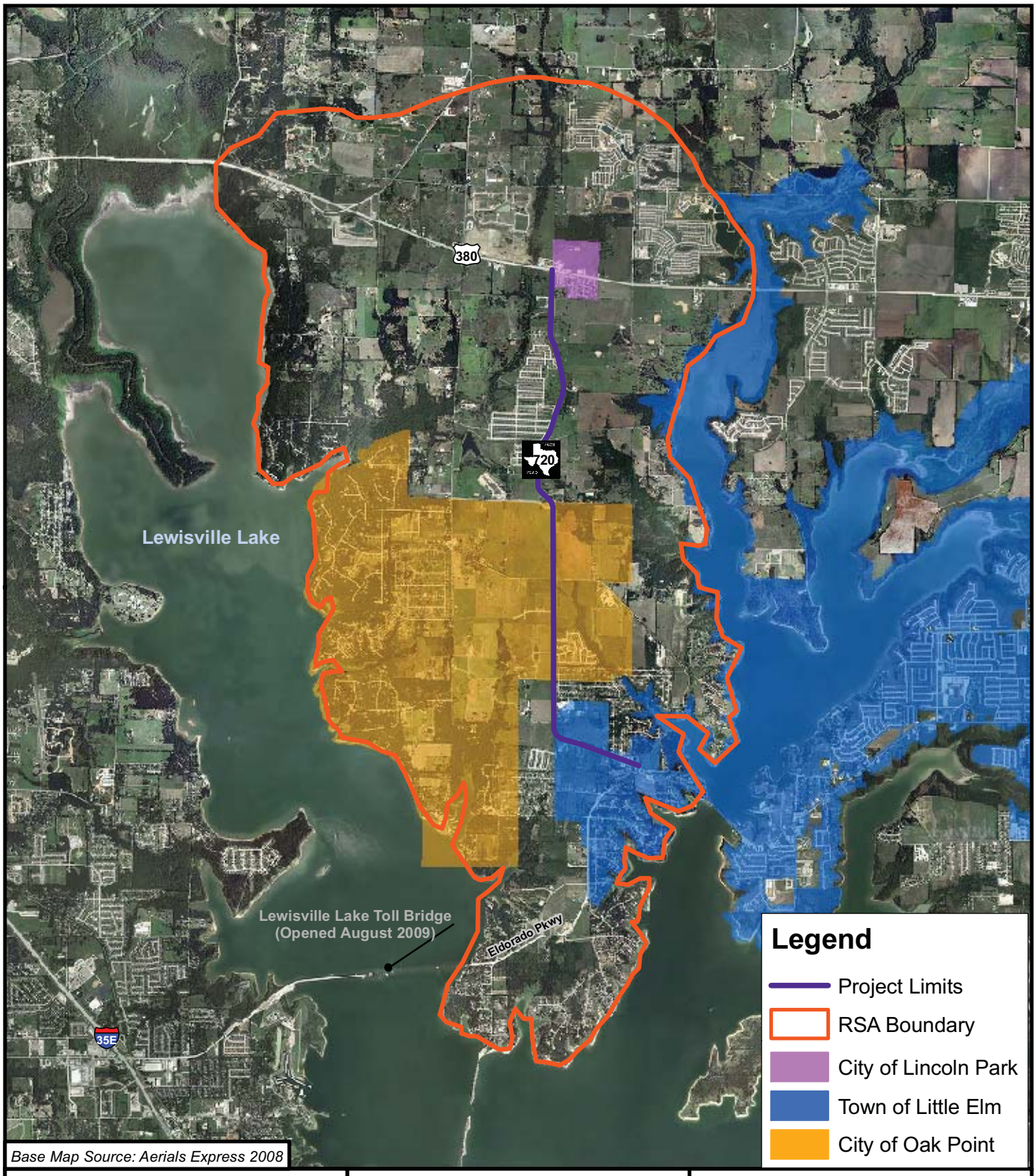


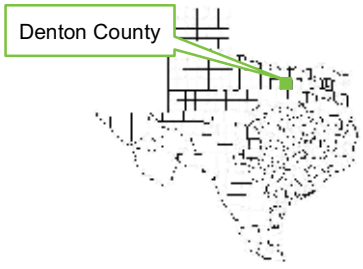
FIGURE 10
INDIRECT EFFECTS
AREA OF INFLUENCE MAP

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



Base Map Source: Aerials Express 2008



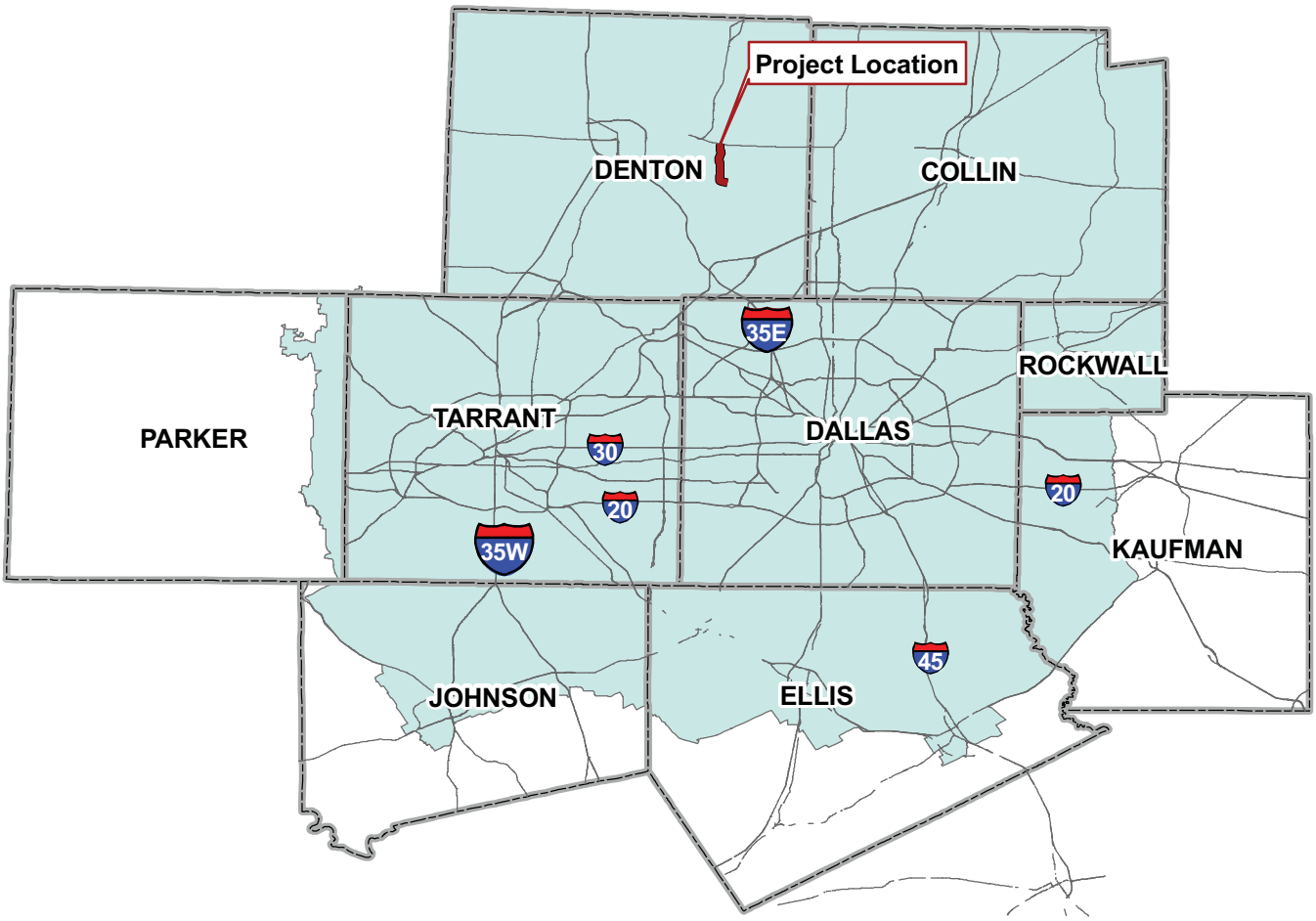
N
W E
S

0 6,000
Feet

FIGURE 11
CUMULATIVE IMPACTS
RESOURCE STUDY AREA MAP
NATURAL RESOURCES

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025



NINE-COUNTY OZONE NON-ATTAINMENT AREA FOR THE DFW METROPOLITAN AREA

LEGEND

Eight-Hour Ozone Non-Attainment Area

N
W E
S

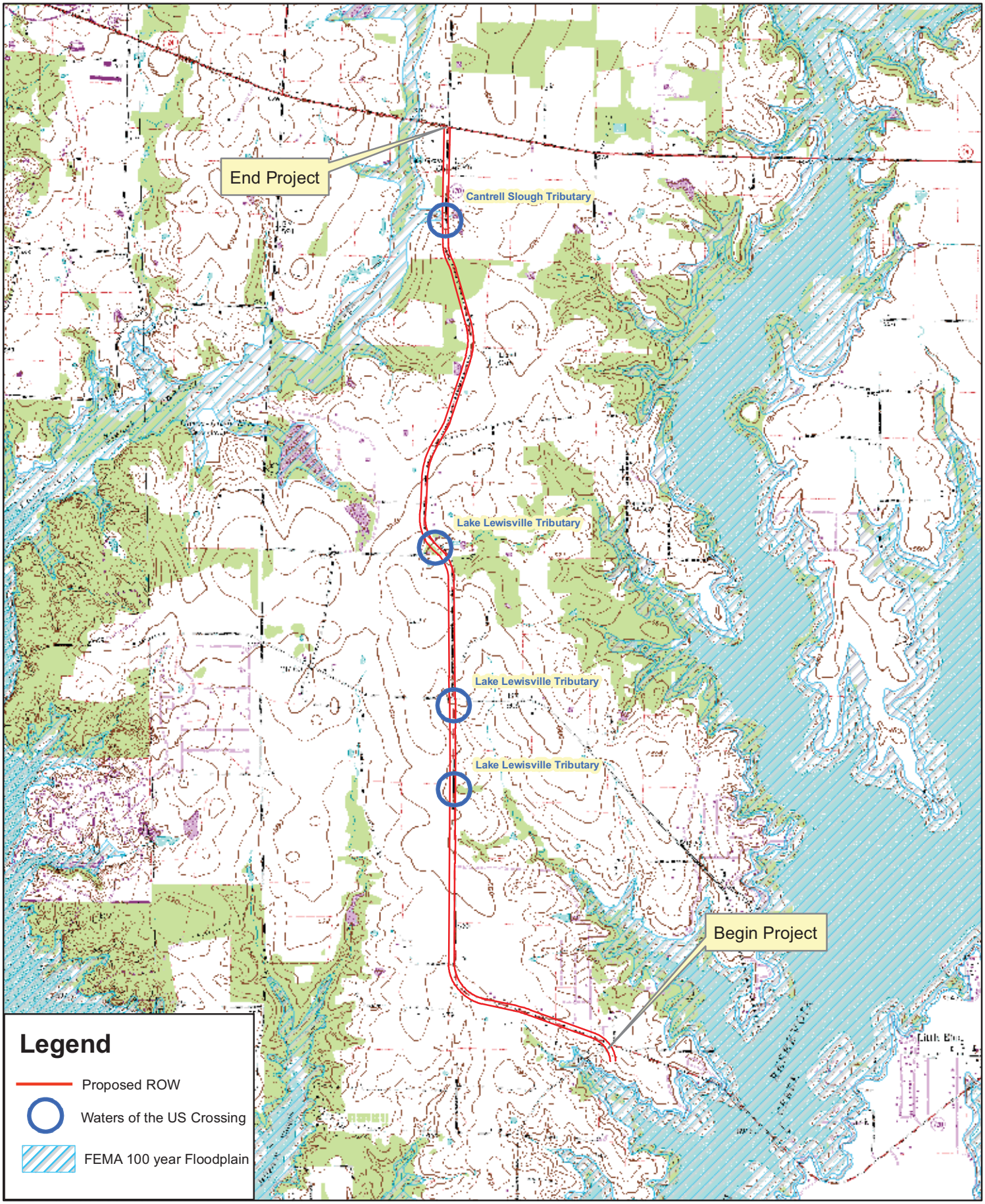
NOT TO SCALE

FIGURE 12
CUMULATIVE IMPACTS
RESOURCE STUDY AREA MAP
AIR QUALITY

FM 720
FROM ELDORADO PKWY
TO US 380

CSJ: 1567-01-025

Appendix A



Source: USGS 7.5 Minute Quadrangle Topographic Map, Little Elm, 1968, NCTCOG 2008, FEMA 2008.

0 1,500 3,000 Feet

N

FM 720
from Eldorado Parkway to US 380

Waters of the U.S. Map

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 720 City/County: Denton County Sampling Date: June 16, 2009

Applicant/Owner: Texas Department of Transportation State: Texas Sampling Point: #1

Investigator(s): Chris Hagar, Meghan D. Bradley, Madeline Percin Section, Township, Range: «Range»

Landform (hillslope, terrace, etc.): Stream bank Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR): J Lat: 96°58'37.063"W Long: 33°13'5.279"N Datum: D North American 1983

Soil Map Unit Name: Gasil fine sandy loam (3 to 8% slopes) NWI Classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	Is the Sampled Area		
Hydric Soil Present?	Yes X	No	Within a Wetland?	Yes X	No
Wetland Hydrology Present?	Yes X	No			

Remarks: Sampled just inside the southern boundary of a wetland marsh associated with an unnamed tributary of Cantrell Slough on the west side of FM 720 approximately 0.38 mile south of US 380.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute% Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	20	Y	FAC
2.			
3.			
4.			
	20	= % Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. None			
2.			
3.			
4.			
5.			
	0	= % Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. *Cynodon dactylon*	50	Y	FACU
2. *Ambrosia trifida*	30	Y	FAC
3. *Typha latifolia*	5		OBL
4. *Physostegia digitalis*	5		FAC
5. *Solidago gigantea*	5		FACW-
6. *Rubus trivialis*	5		FAC
7.			
8.			
9.			
10.			
	100	= % Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
	0	= % Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: #1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6”	10YR 4/2	60	7.5YR 5/6	30	C	M	Clay	
0-6”			10YR 6/1	10	D	M	Clay	
6-16”	10YR 4/2	30	7.5YR 5/6	70	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histols (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR 1, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: ___

Depth (inches): ___ **Hydric Soil Present?** **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Agal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___ **Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 720 City/County: Denton County Sampling Date: June 16, 2009

Applicant/Owner: Texas Department of Transportation State: Texas Sampling Point: #2

Investigator(s): Chris Hagar, Meghan D. Bradley, Madeline Percin Section, Township, Range: «Range»

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR): J Lat: 96°58'36.949"W Long: 33°13'5.091"N Datum: D North American 1983

Soil Map Unit Name: Gasil fine sandy loam (3 to 8% slopes) NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	Is the Sampled Area		
Hydric Soil Present?	Yes X	No	Within a Wetland?	Yes	No X
Wetland Hydrology Present?	Yes	No X			

Remarks: Remarks: Sampled just outside and up-gradient of the southern boundary of a wetland marsh associated with an unnamed tributary of Cantrell Slough on the west side of FM 720 approximately 0.38 mile south of US 380.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute% Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
	0 = % Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. None			
2.			
3.			
4.			
5.			
	0 = % Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. *Ambrosia psilostachya*	20	Y	FAC-
2. *Ambrosia trifida*	10	Y	FAC
3. *Cyperus rotundus*	10	Y	FAC
4. *Plantago wrightiana*	5		UPL
5. *Oxalis corniculata*	5		FACU
6.			
7.			
8.			
9.			
10.			
	50 = % Total Cover		
Woody Vine Stratum (Plot size:)			
1. None			
2.			
	0 = % Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks:

SOIL

Sampling Point: #2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16”	10YR 4/2	60	10YR 5/6	10	C	M	SCL	
0-16”			5YR 4/6	10	C	M	SCL	
0-16”	10YR 4/1	10			C	M	SCL	
0-16”	10YR 5/1	10			C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- _____ Histols (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5) (**LRR F**)
- _____ 1 cm Muck (A9) (**LRR F, G, H**)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- _____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ Loamy Mucky Mineral (F1)
- _____ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- _____ Redox Dark Surface (F6)
- _____ Depleted Dark Surface (F7)
- _____ Redox Depressions (F8)
- _____ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- _____ 1 cm Muck (A9) (**LRR 1, J**)
- _____ Coast Prairie Redox (A16) (**LRR F, G, H**)
- _____ Dark Surface (S7) (**LRR G**)
- _____ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- _____ Reduced Vertic (F18)
- _____ Red Parent Material (TF2)
- _____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____ **Hydric Soil Present?** **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1)
- _____ Sediment Deposits (B2)
- _____ Drift Deposits (B3)
- _____ Agal Mat or Crust (B4)
- _____ Iron Deposits (B5)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Salt Crust (B11)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Dry-Season Water Table (C2)
- _____ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- _____ Presence of Reduced Iron (C4)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surface (B8)
- _____ Drainage Patterns (B10)
- _____ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- _____ Crayfish burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Geomorphic Position (D2)
- _____ FAC-Neutral Test (D5)
- _____ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____ **Wetland Hydrology Present?** **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 720 City/County: Denton County Sampling Date: June 16, 2009

Applicant/Owner: Texas Department of Transportation State: Texas Sampling Point: #3

Investigator(s): Chris Hagar, Meghan D. Bradley, Madeline Percin Section, Township, Range: «Range»

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR): J Lat: 96°58'35.642"W Long: 33°13'5.515"N Datum: D North American 1983

Soil Map Unit Name: Gasil fine sandy loam (3 to 8% slopes) NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	Is the Sampled Area		
Hydric Soil Present?	Yes	No X	Within a Wetland?	Yes	No X
Wetland Hydrology Present?	Yes	No X			

Remarks: Sampled just above the toe of slope of a roadside drainage ditch adjacent to an unnamed tributary of Cantrell Slough on the west side of FM 720 approximately 0.38 mile south of US 380.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute% Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
	0 = % Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. None			
2.			
3.			
4.			
5.			
	0 = % Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. *Ambrosia psilostachya*	45	Y	FAC-
2. *Cynodon dactylon*	45	Y	FACU+
3. *Rumex crispus*	5		FACW
4. *Solidago gigantea*	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	100 = % Total Cover		
Woody Vine Stratum (Plot size:)			
1. None			
2.			
	0 = % Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	50	x 3 =	150
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	100 (A)		340 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks:

SOIL

Sampling Point: #3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 3/2	70	7.5YR 3/4	5	C	PL	SCL	
0-16"	Gravel	10	Fill					
0-16"	10YR 4/1	10	7.5YR 3/4	5	C	PL	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histols (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (**LRR F**)
- ____ 1 cm Muck (A9) (**LRR F, G, H**)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR 1, J**)
- ____ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____ **Hydric Soil Present?** **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Agal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Dry-Season Water Table (C2)
- ____ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ____ Crayfish burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____ **Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 720 City/County: Denton County Sampling Date: June 16, 2009

Applicant/Owner: Texas Department of Transportation State: Texas Sampling Point: #4

Investigator(s): Chris Hagar, Meghan D. Bradley, Madeline Percin Section, Township, Range: «Range»

Landform (hillslope, terrace, etc.): Stream bank Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR): J Lat: 96°58'40.109"W Long: 33°11'46.748"N Datum: D North American 1983

Soil Map Unit Name: Navo clay loam (1 to 3% slopes) NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	Is the Sampled Area		
Hydric Soil Present?	Yes X	No	Within a Wetland?	Yes	No X
Wetland Hydrology Present?	Yes	No X			

Remarks: Remarks: Sampled approximately one foot above the OHWM of an unnamed tributary of Lake Lewisville on the west side of FM 720 approximately 1.95 miles south of US 380.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute% Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
	0 = % Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. None			
2.			
3.			
4.			
5.			
	0 = % Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. *Bromus japonicus*	55	Y	FACU
2. *Ambrosia psilostachya*	30	Y	FAC-
3. *Ambrosia trifida*	10		FAC
4. *Xanthium spinosum*	5		FAC-
5.			
6.			
7.			
8.			
9.			
10.			
	100 = % Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. None			
2.			
	0 = % Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	100 (A)		335 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: #4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 2/1	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histols (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (**LRR F**)
- ____ 1 cm Muck (A9) (**LRR F, G, H**)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR 1, J**)
- ____ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: ____

Depth (inches): ____ **Hydric Soil Present?** **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Agal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Dry-Season Water Table (C2)
- ____ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ____ Crayfish burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____ **Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Stream Data Form #: 1
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009
USGS Stream Name: Tributary to Lewisville Lake
County/State: Denton, TX
USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:
Associated Wetland(s): No
GPS Data: 33o10'50.502"N 96o58'36.64"W

Stream Type: Intermittent Characteristics Manipulated/Altered. Explain: Roadway culverted.
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 6 feet
OHWM Height (in): 12 inches
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☒ Gravel ☐ Vegetation Type: <Select Veg. Type> Percent Cover

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☒ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☒ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☒ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.
Bermuda Grass (Cynodon dactylon), Virginia Wild-Rye (Elymus virginicus), Sawtooth Greenbrier (Smilax bona-nox), Sugarberry (Celtis laevigata), Black Willow (Salix nigra), Japanese Brome (Bromus japonicus), Garden Vetch (Vicia sativa), Coralberry (Symphoricarpos orbiculatus)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	1
Project Name:	FM 720
CSJ:	1567-01-025

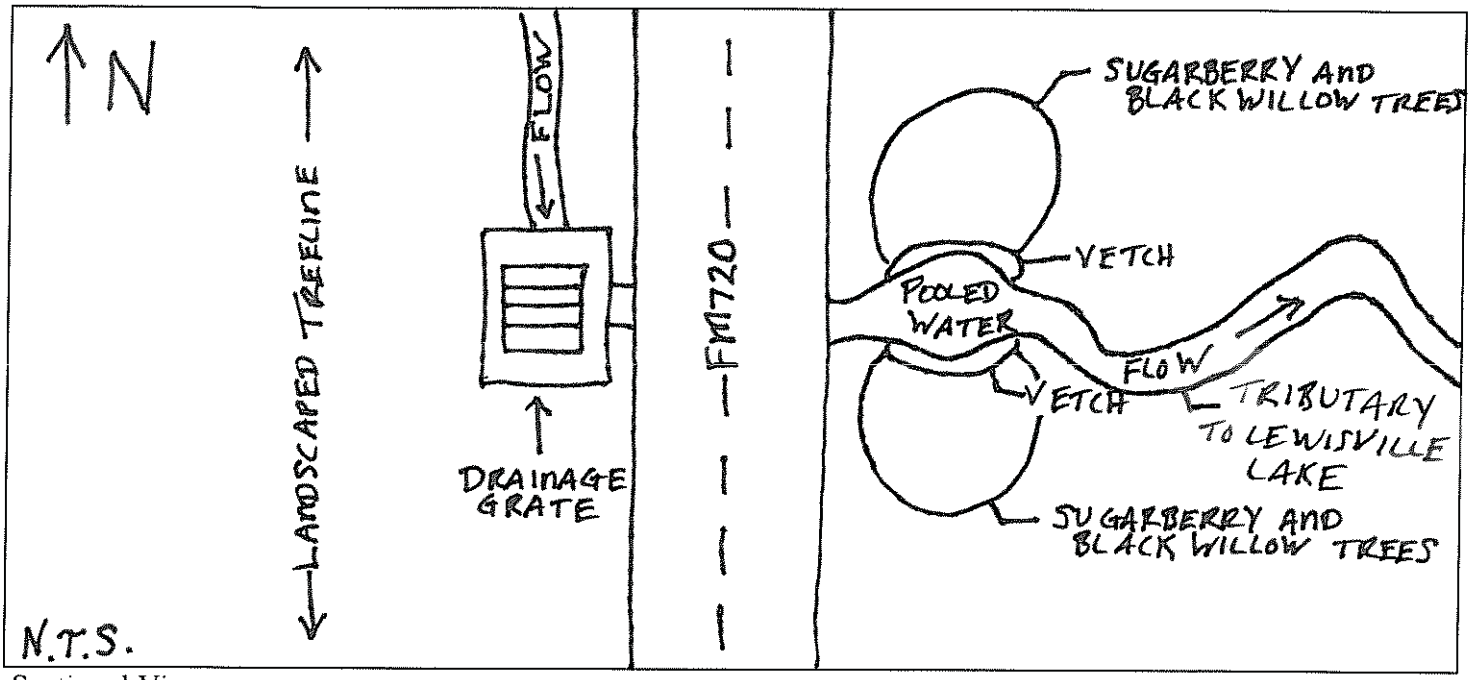
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

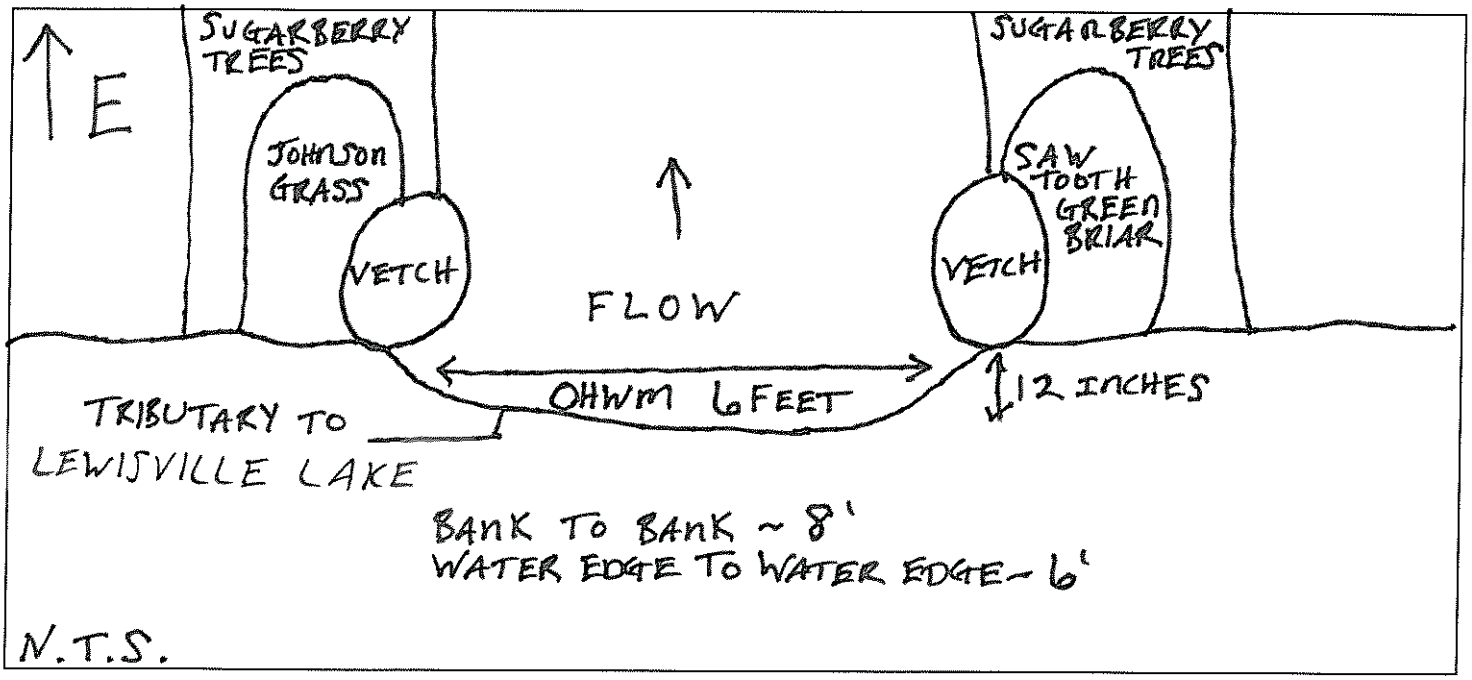
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Stream Data Form #: 2
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009
USGS Stream Name: Tributary to Lewisville Lake
County/State: Denton, TX
USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:
Associated Wetland(s): No
GPS Data: 33o11'8.314"N 96o58'36.621"W

Stream Type: Ephemeral Characteristics Manipulated/Altered. Explain: Roadway culverted.
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: Southeast
OHWM Width (ft): 2 feet
OHWM Height (in): 6 inches
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☒ Other: Asphalt
- ☒ Sands ☐ Bedrock ☐ Muck
- ☒ Gravel ☐ Vegetation Type: <Select Veg. Type> Percent Cover

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☒ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☒ Other characteristics (pollutants, etc.) No water present, stream was dry.

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.
Giant Ragweed (Ambrosia trifida), Bermuda Grass (Cynodon dactylon), Cedar Elm (Ulmus crassifolia), Sugarberry (Celtis laevigata), Giant Golden-rod (Solidago gigantea), Winged Elm (Ulmus alata), Johnson Grass (Sorghum halapense)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	2
Project Name:	FM 720
CSJ:	1567-01-025

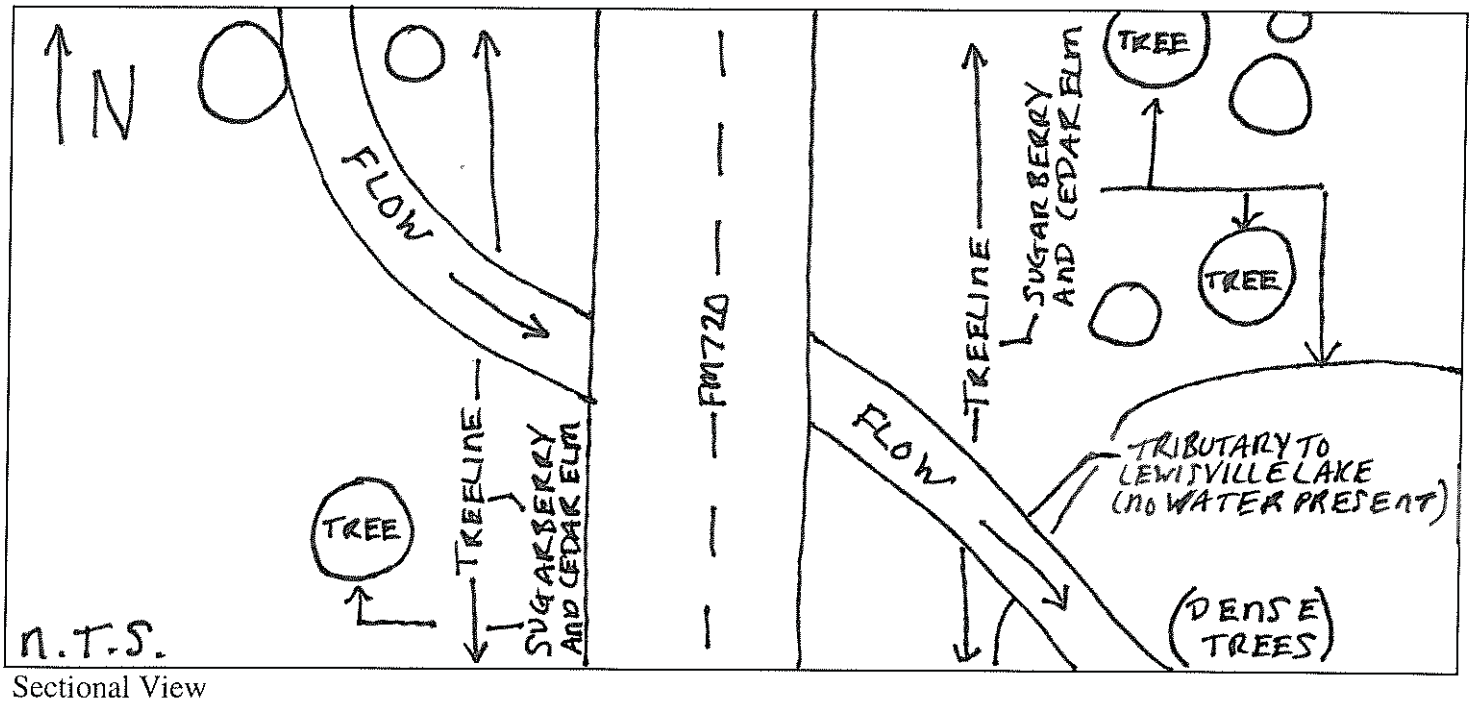
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

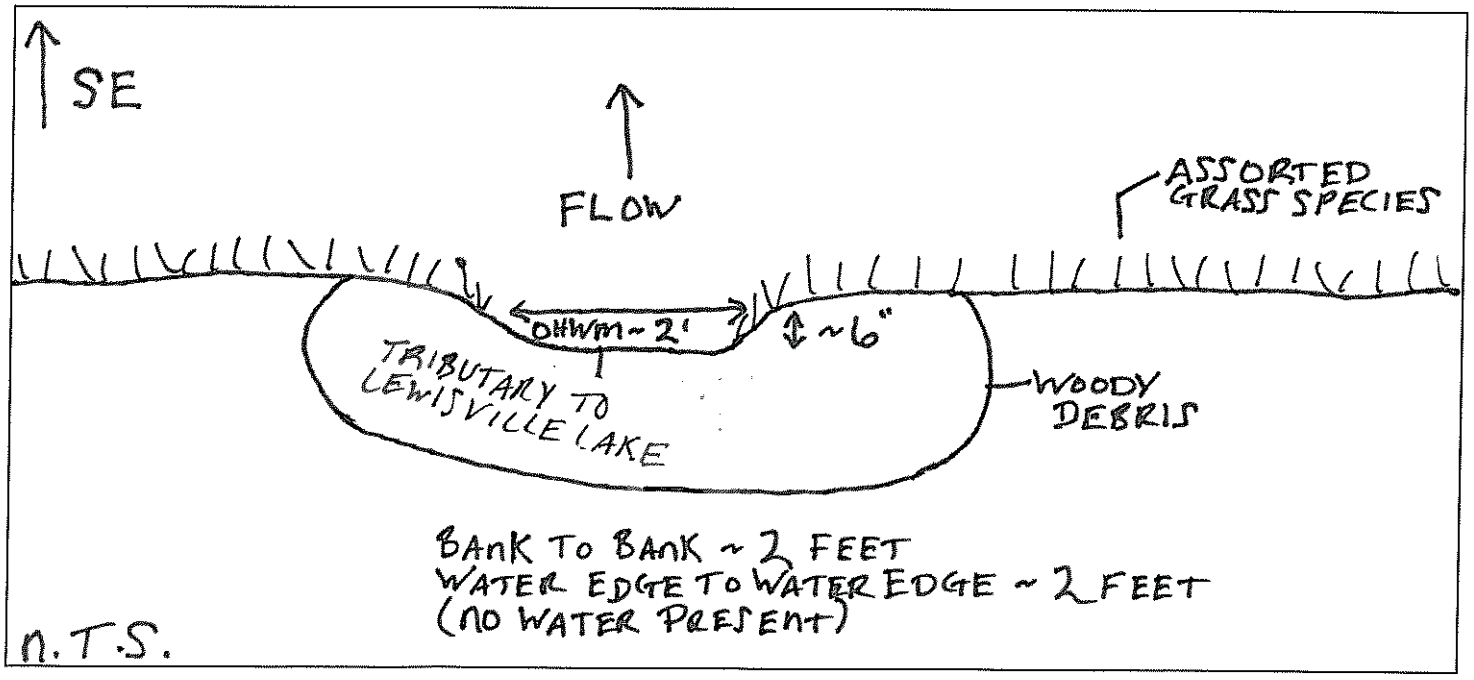
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Stream Data Form #: 3
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009
USGS Stream Name: Tributary to Lewisville Lake
County/State: Denton, TX
USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:
Associated Wetland(s): No
GPS Data: 33o11'47.022"N 96o53'38.909"W

Stream Type: Ephemeral Characteristics Manipulated/Altered. Explain: Stock pond to the west.
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 4 feet
OHWM Height (in): 6 inches
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: <Select Veg. Type> Percent Cover

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☒ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☒ Other characteristics (pollutants, etc.) No water present, stream was dry.

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.
Japanese brome (Bromus japonicus), Western Ragweed (Ambrosia psilostachya), Giant Ragweed (Ambrosia trifida), Spiny Cockle-Bur (Xanthium strumarium), Bermuda Grass (Cynodon dactylon), Cedar Elm (Ulmus crassifolia), Black Willow (Salix nigra), Sugarberry (Celtis laevigata), Post Oak (Quercus stellata)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	3
Project Name:	FM 720
CSJ:	1567-01-025

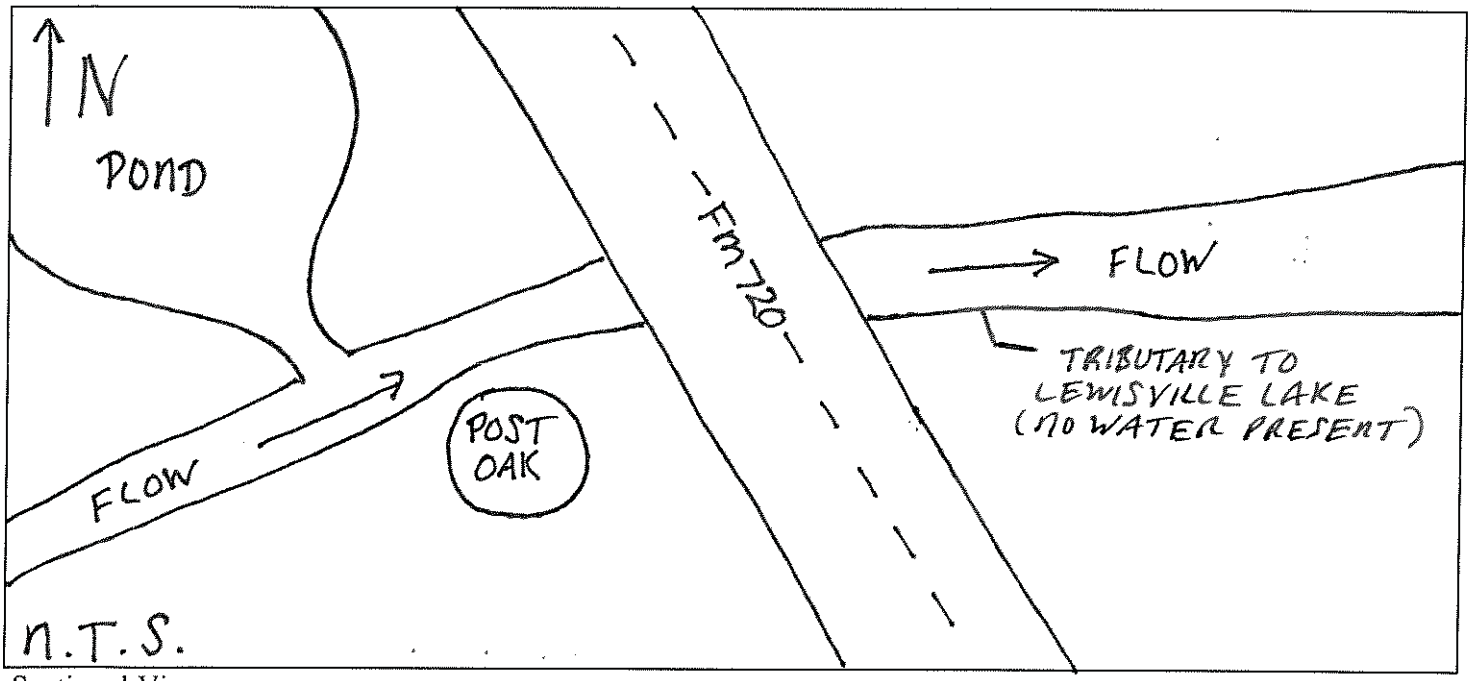
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

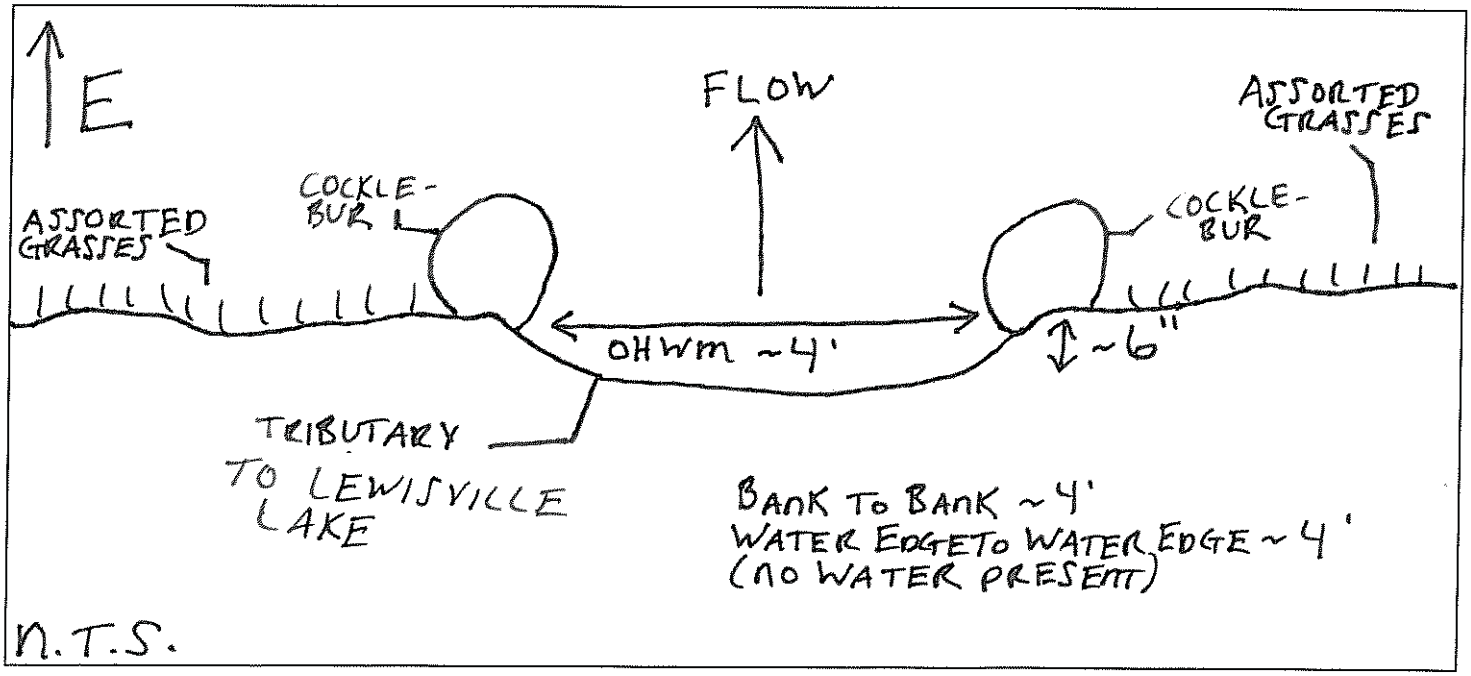
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Stream Data Form #: 4
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009
USGS Stream Name: Tributary to Cantrell Slough
County/State: Denton, TX
USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:
Associated Wetland(s): Yes
GPS Data: 33o13'4.876"N 96o58'35.946"W

Stream Type: Intermittent Characteristics: Manipulated/Altered. Explain: Stock pond to the west.
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: West
OHWM Width (ft): 4 to 10 feet
OHWM Height (in): 12 inches
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 90

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☒ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☒ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☒ vegetation matted down, bent, or absent
  - ☒ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.
American Elm (Ulmus americana), Black Willow (Salix nigra), Bermuda grass (Cynodon dactylon), Giant Ragweed (Ambrosia trifida), Cattail (Typha latifolia), False Dragonhead (Physostegia digitalis), Giant Golden-rod (Solidago gigantea), Dewberry (Rubus trivialis)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	4
Project Name:	FM 720
CSJ:	1567-01-025

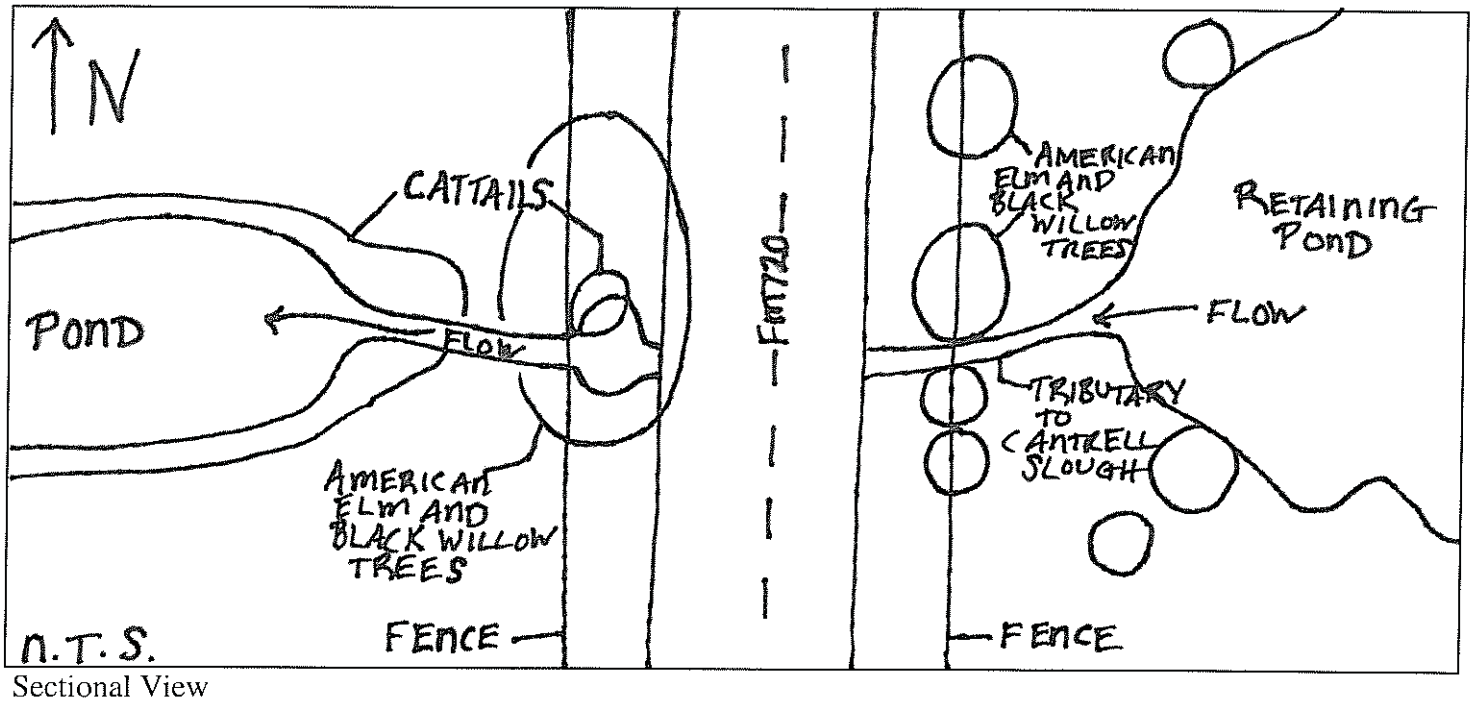
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

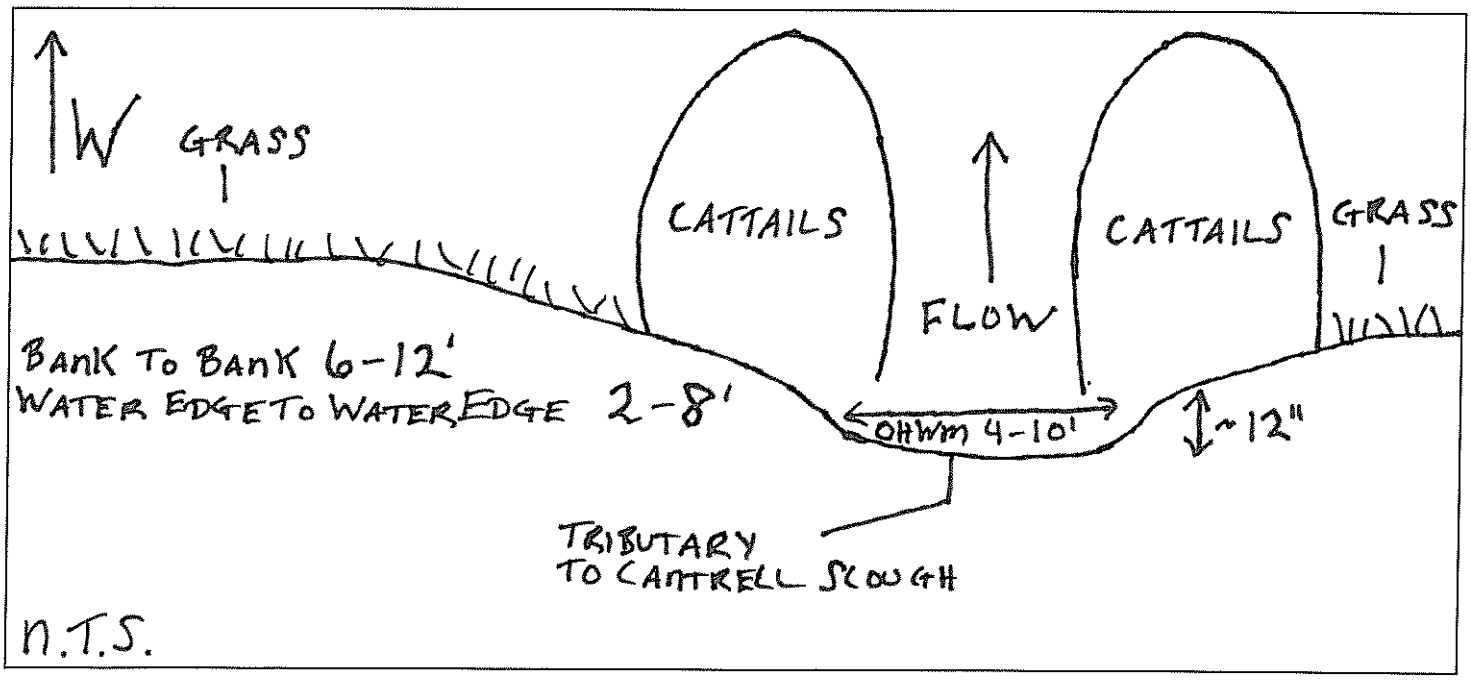
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Stream Data Form #: 1
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009

USGS Stream Name: Tributary to Lewisville Lake
County/State: Denton, TX

USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:

Associated Wetland(s): No
GPS Data: 33o10'50.502"N 96o58'36.64"W

Stream Type: Intermittent Characteristics
Manipulated/Altered. Explain: Roadway culverted.

Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East

OHWM Width (ft): 6 feet
OHWM Height (in): 12 inches

Stream Bottom composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☒ Gravel ☐ Vegetation Type: <Select Veg. Type> Percent Cover

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
☒ Overhanging trees/shrubs ☒ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

☒ Bed and banks
☒ OHWM (check all indicators that apply):

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of soil
- ☐ shelving
- ☐ vegetation matted down, bent, or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other (list):
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

Water Quality:

☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.

Bermuda Grass (Cynodon dactylon), Virginia Wild-Rye (Elymus virginicus), Sawtooth Greenbrier (Smilax bona-nox), Sugarberry (Celtis laevigata), Black Willow (Salix nigra), Japanese Brome (Bromus japonicus), Garden Vetch (Vicia sativa), Coralberry (Symphoricarpos orbiculatus)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	1
Project Name:	FM 720
CSJ:	1567-01-025

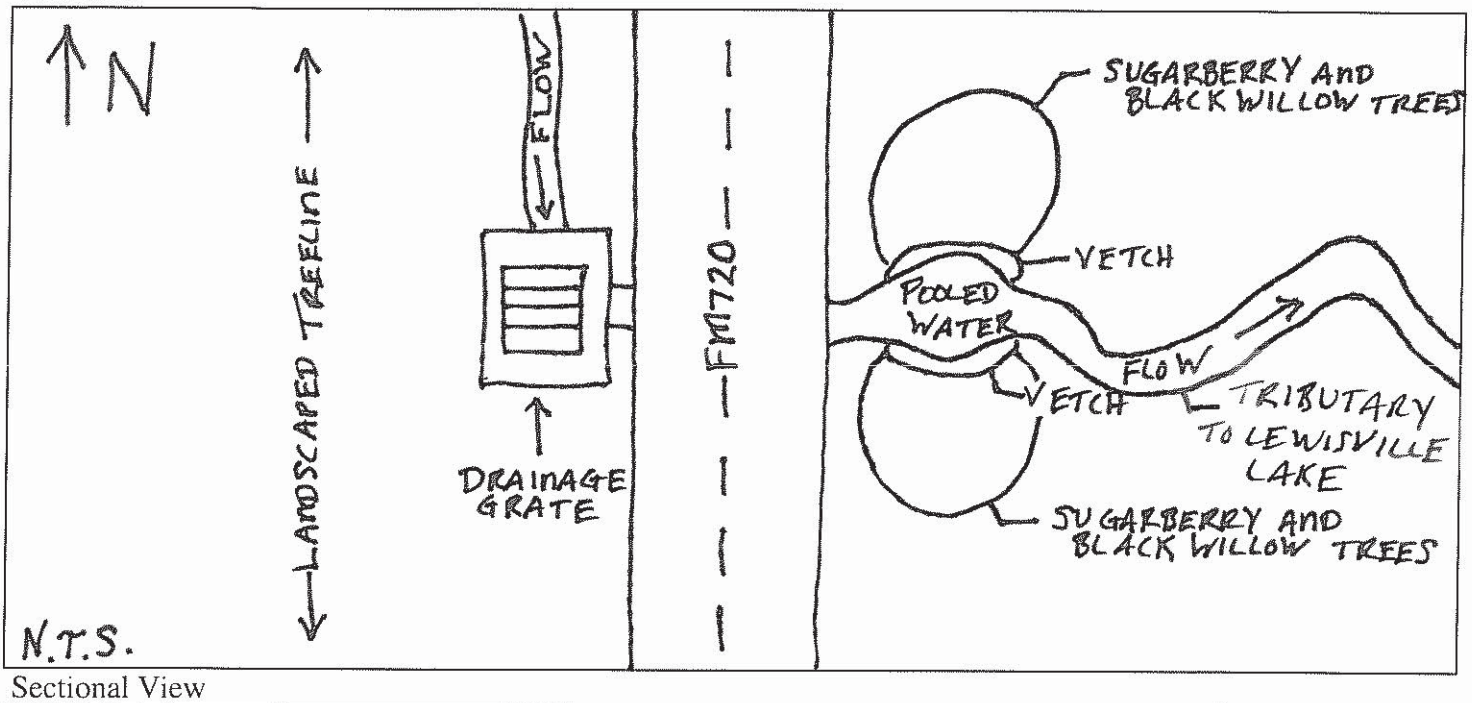
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

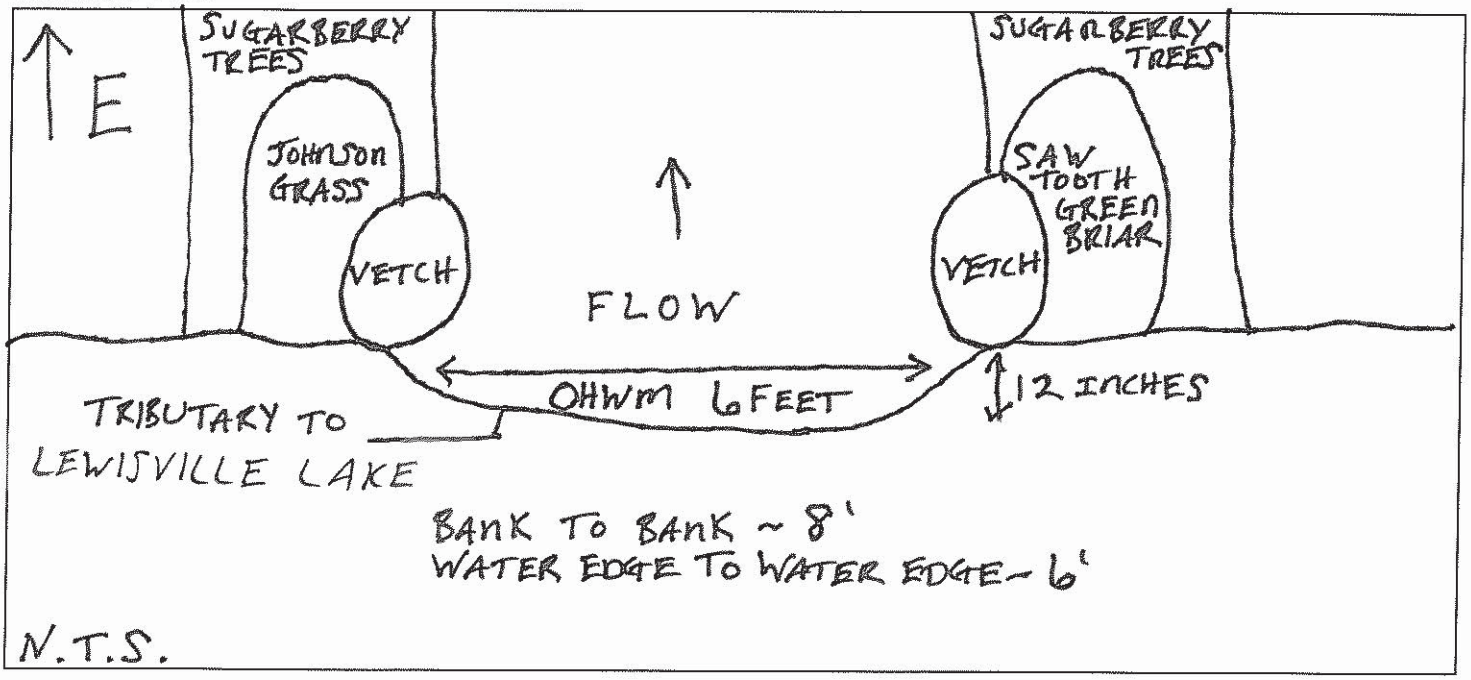
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Stream Data Form #: 2
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009

USGS Stream Name: Tributary to Lewisville Lake
County/State: Denton, TX

USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:

Associated Wetland(s): No
GPS Data: 33o11'8.314"N 96o58'36.621"W

Stream Type: Ephemeral Characteristics: Manipulated/Altered. Explain: Roadway culverted.

Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: Southeast

OHWM Width (ft): 2 feet
OHWM Height (in): 6 inches

Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☒ Other: Asphalt
- ☒ Sands ☐ Bedrock ☐ Muck
- ☒ Gravel ☐ Vegetation Type: <Select Veg. Type> Percent Cover

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☒ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☒ Other characteristics (pollutants, etc.) No water present, stream was dry.

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.

Giant Ragweed (Ambrosia trifida), Bermuda Grass (Cynodon dactylon), Cedar Elm (Ulmus crassifolia), Sugarberry (Celtis laevigata), Giant Golden-rod (Solidago gigantea), Winged Elm (Ulmus alata), Johnson Grass (Sorghum halapense)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	2
Project Name:	FM 720
CSJ:	1567-01-025

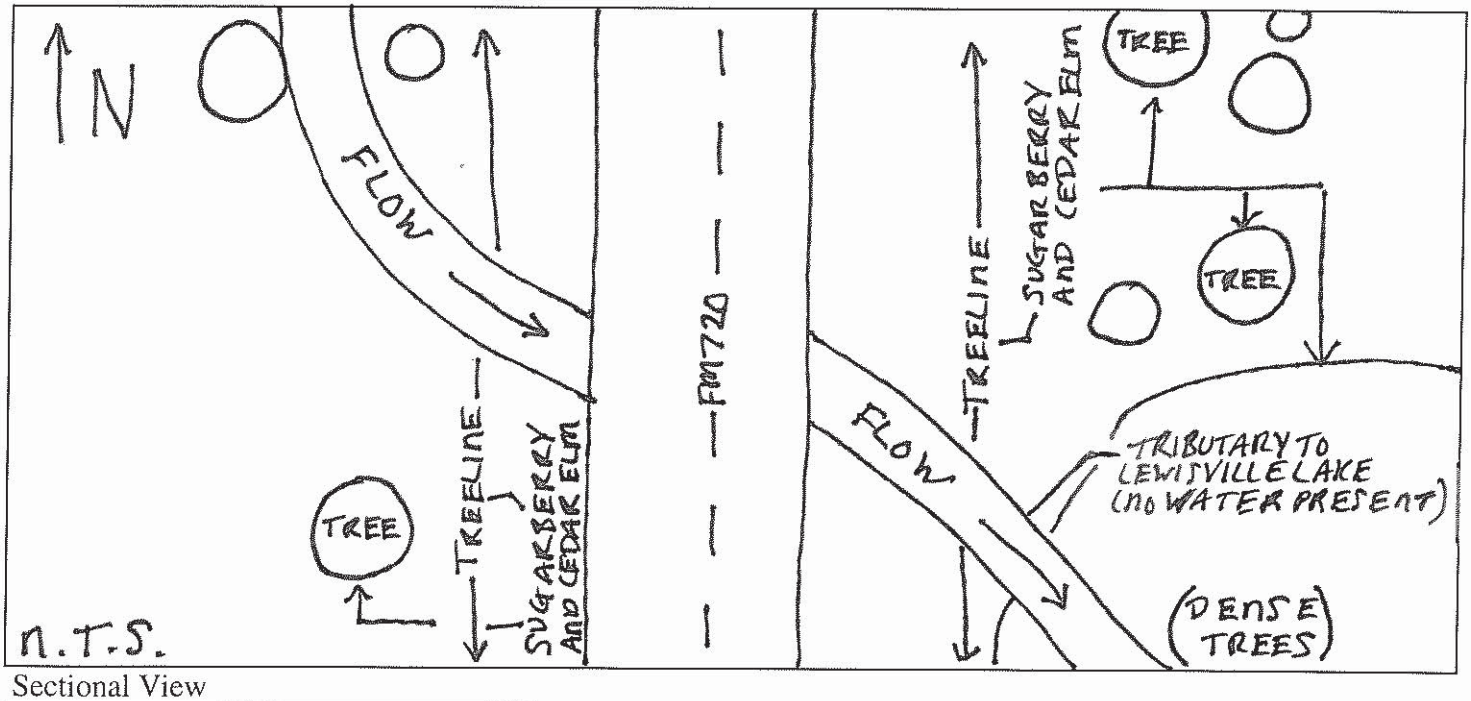
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

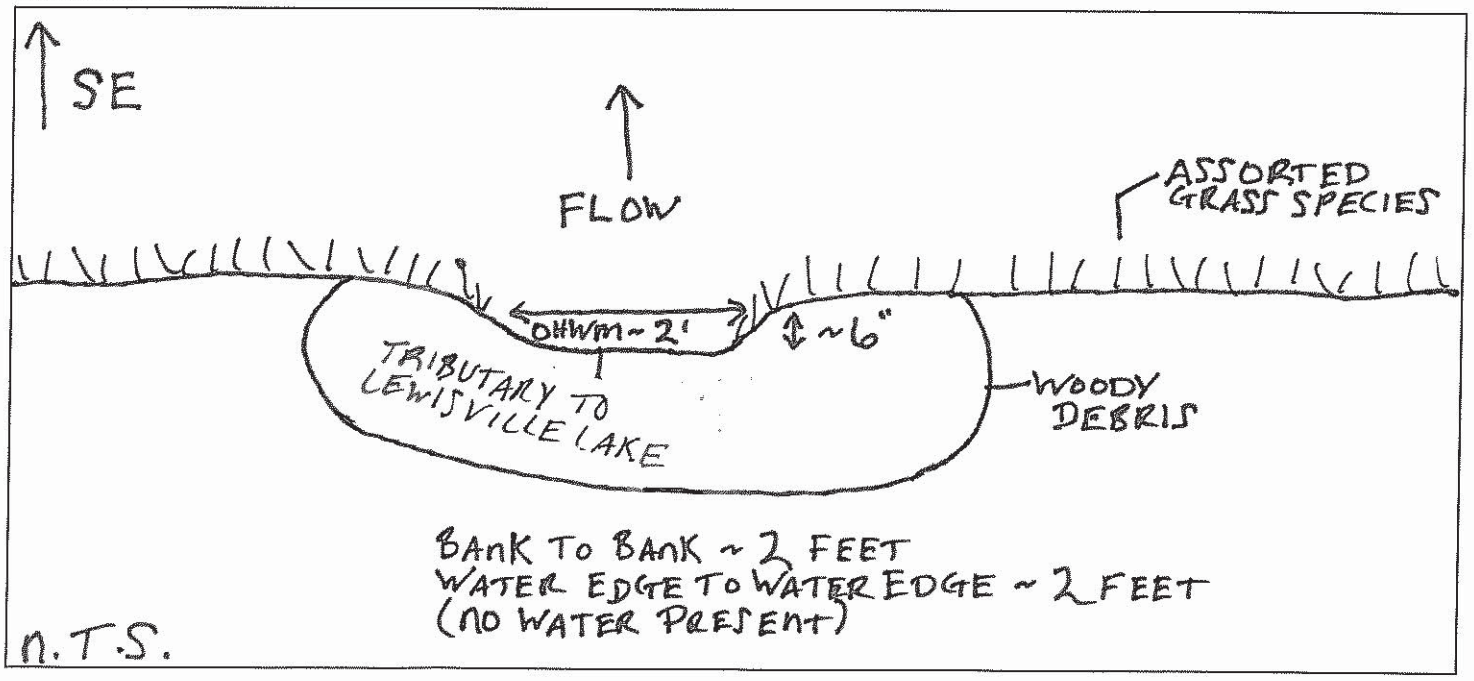
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Stream Data Form #: 3
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009

USGS Stream Name: Tributary to Lewisville Lake
County/State: Denton, TX

USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:

Associated Wetland(s): No
GPS Data: 33o11'47.022"N 96o53'38.909"W

Stream Type: Ephemeral Characteristics
Manipulated/Altered. Explain: Stock pond to the west.

Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East

OHWM Width (ft): 4 feet
OHWM Height (in): 6 inches

Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: <Select Veg. Type> Percent Cover

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☒ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☒ Other characteristics (pollutants, etc.) No water present, stream was dry.

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.

Japanese brome (Bromus japonicus), Western Ragweed (Ambrosia psilostachya), Giant Ragweed (Ambrosia trifida), Spiny Cockle-Bur (Xanthium strumarium), Bermuda Grass (Cynodon dactylon), Cedar Elm (Ulmus crassifolia), Black Willow (Salix nigra), Sugarberry (Celtis laevigata), Post Oak (Quercus stellata)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	3
Project Name:	FM 720
CSJ:	1567-01-025

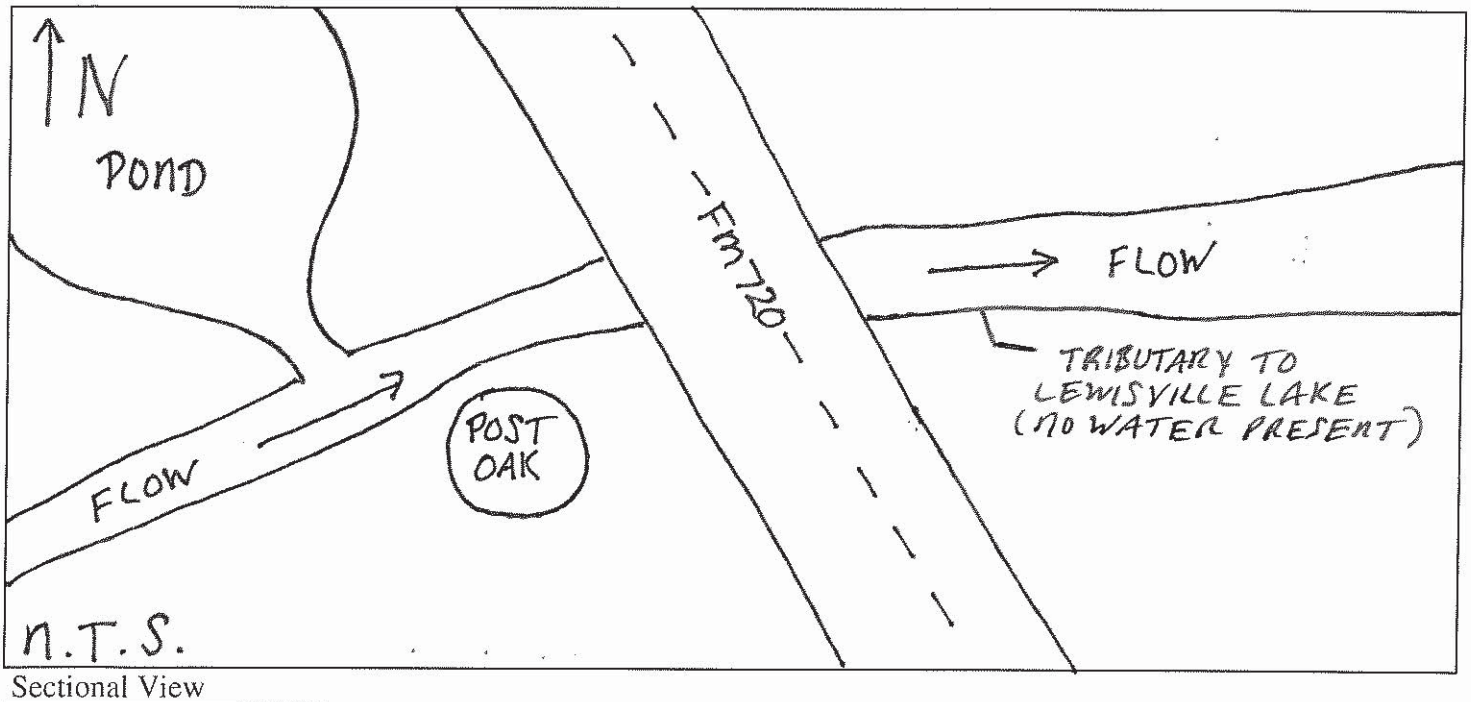
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

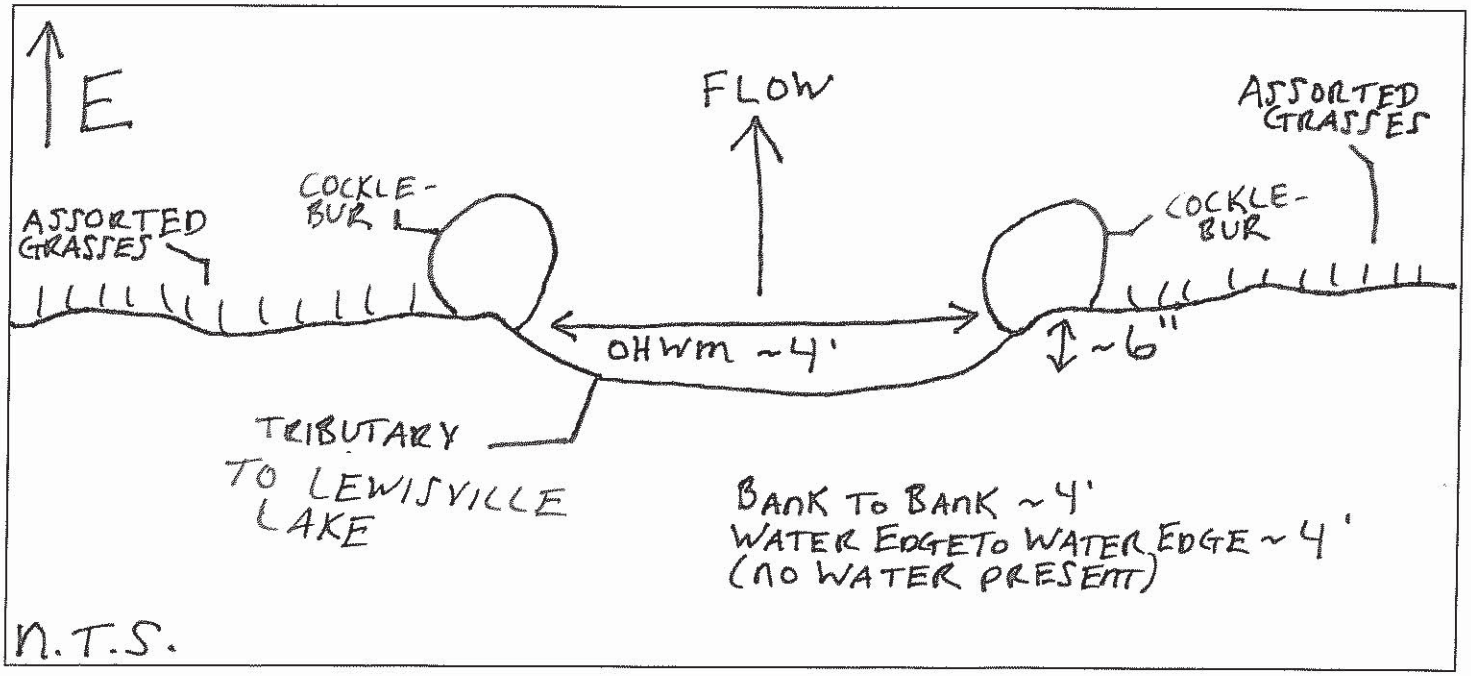
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Stream Data Form #: 4
Project Name: FM 720
CSJ: 1567-01-025

Stream Data Form

Surveyor(s): Chris Hagar, Meghan D. Bradley, Madeline Percin
Date of Field Work: June 16, 2009

USGS Stream Name: Tributary to Cantrell Slough
County/State: Denton, TX

USGS Topo Quad Name: Little Elm
Stream Number [303(d) List]:

Associated Wetland(s): Yes
GPS Data: 33o13'4.876"N 96o58'35.946"W

Stream Type: Intermittent
Characteristics Manipulated/Altered. Explain: Stock pond to the west.

Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: West

OHWM Width (ft): 4 to 10 feet
OHWM Height (in): 12 inches

Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 90

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☒ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☒ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☒ vegetation matted down, bent, or absent
  - ☒ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Riparian Vegetation: List species observed.

American Elm (Ulmus americana), Black Willow (Salix nigra), Bermuda grass (Cynodon dactylon), Giant Ragweed (Ambrosia trifida), Cattail (Typha latifolia), False Dragonhead (Physostegia digitalis), Giant Golden-rod (Solidago gigantea), Dewberry (Rubus trivialis)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Timber Cane/Brake Rattlesnake (Crotalus horridus)

Stream Data Form #:	4
Project Name:	FM 720
CSJ:	1567-01-025

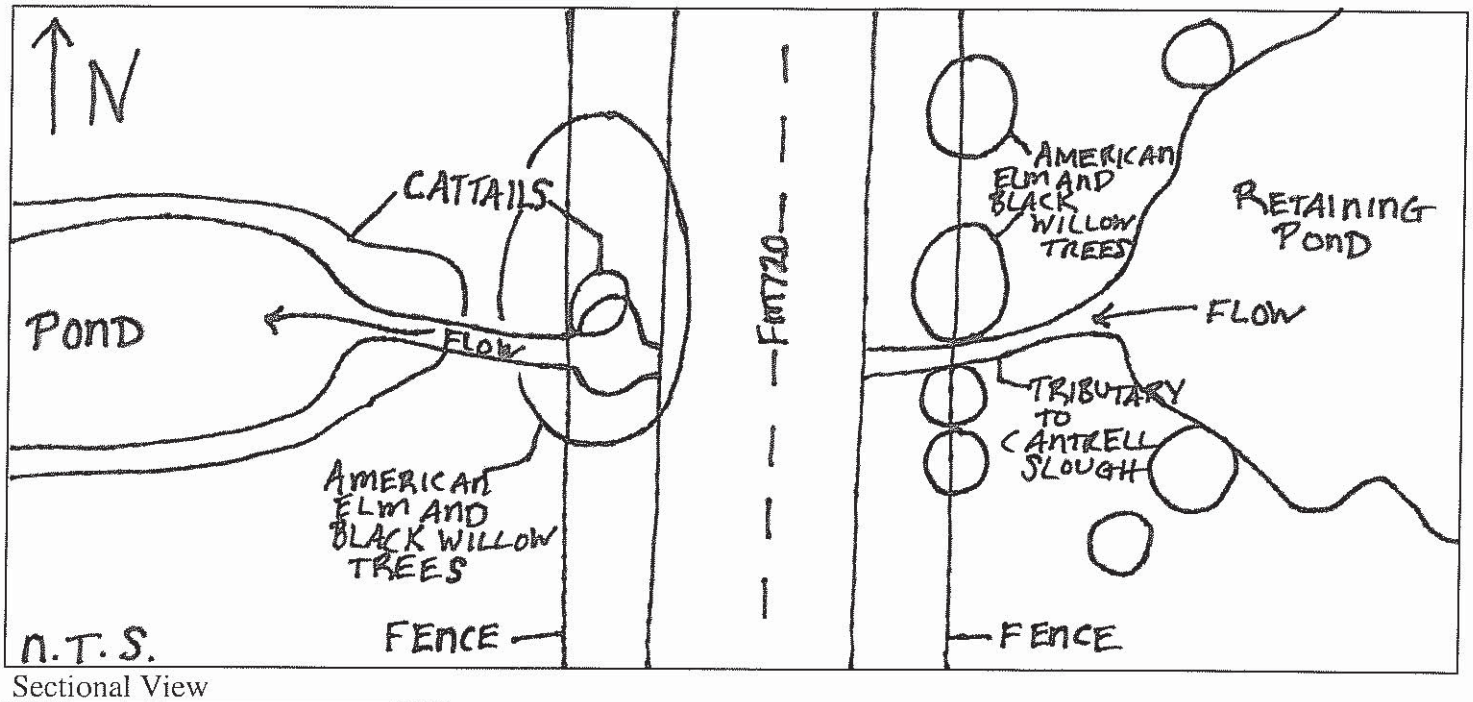
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

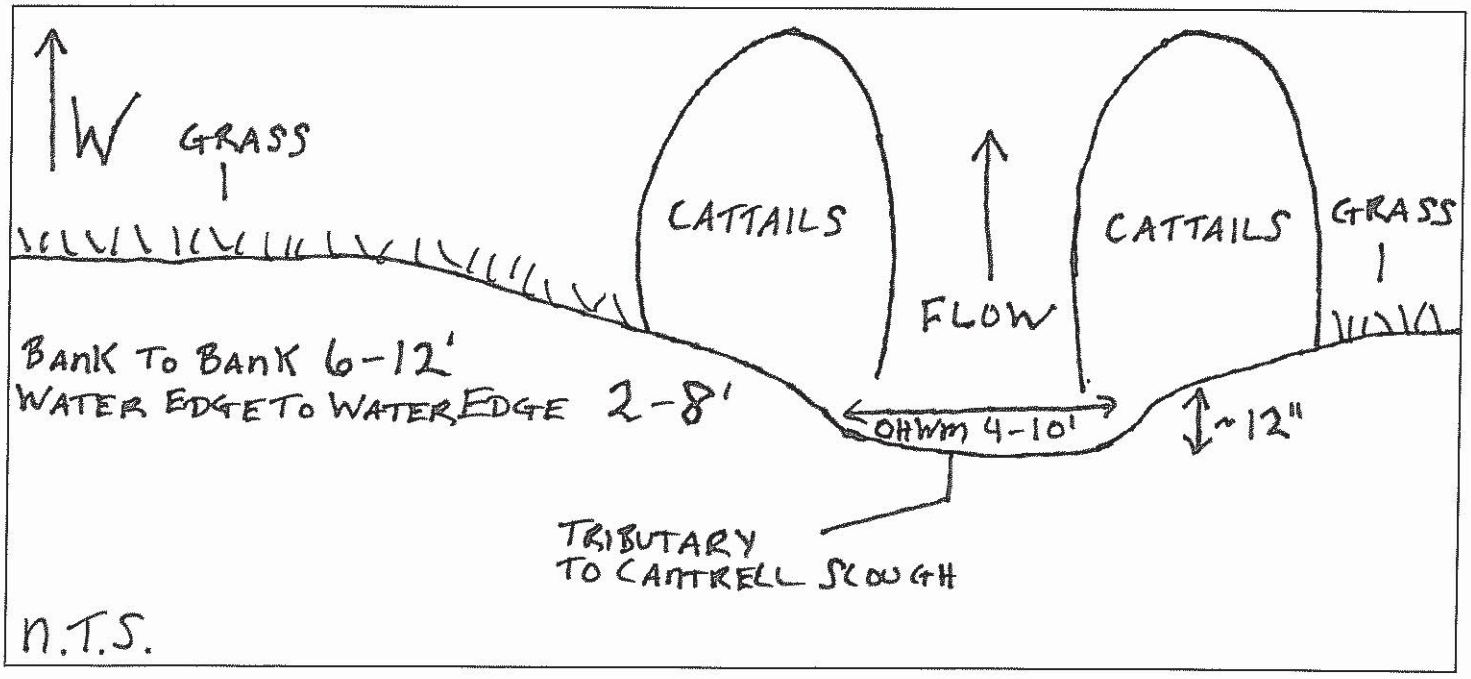
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View



Sectional View



Appendix B

TxDOT WOODLANDS DATA FORM

GENERAL

Project/Site	FM 720 from El Dorado Parkway (FM 720) to US 380			Date	4/12/10
CSJ	1567-01-025	Investigator	CH, MB	County	Denton
Filename					
Project Scope					
Widen existing roadway from a two-lane rural roadway to a six-lane urban divided roadway.					
Description of Wooded Site (riparian, upland, fenceline, overstory/understory, disturbed, diverse, etc.)					
Maintained landscape trees.					
Is Site Unusual or Typical of Others in the Area?	Typical				

SPECIES DESCRIPTION

Species by Order of Dominance		
Common Name	Taxonomic Name	Range of Sizes (dbh)
Cedar elm	*Ulmus crassifolia*	2" to 6", avg. = 4"
Shumard's oak	*Quercus shumardii*	2" to 6", avg. = 4"
Sweet gum	*Liquidambar styraciflua*	2" to 6", avg. = 4"
Southern wax myrtle	*Myrica cerifera*	1" to 2", avg. = 1"
Acreage of Trees to be Removed	1.8	
Density per Acre	18	
Remarks, Description of any Unique, Large, or Mature Trees (≥20" dbh)		
The trees are 10 to 20 feet high with an average of 15 feet. Canopy cover is less than 10 percent. No large trees present at this location.		

HABITAT VALUE

Is the Site Adjacent to Water?	No
Is the Site in a Developed Area?	Yes
Do Plants Produce Nuts, Berries, or Acorns?	
Quercus shumardii – acorns, *Myrica cerifera* – drupe.	
Land Use in the Project Area.	
Agricultural pasture and crop land, vacant land, commercial facilities, scattered single-family residences, and single-family subdivisions.	
Evidence or Sightings of Wildlife in the Project Area?	
Song birds, coyote.	
Remarks	
Located along the west side of the proposed project from approximately 400 feet south of Trailblazer Road to 875 feet north of Cross Oak Ranch Road	

TxDOT WOODLANDS DATA FORM

GENERAL

Project/Site	FM 720 from El Dorado Parkway (FM 720) to US 380			Date	4/12/10
CSJ	1567-01-025	Investigator	CH, MB	County	Denton
Filename					
Project Scope					
Widen existing roadway from a two-lane rural roadway to a six-lane urban divided roadway.					
Description of Wooded Site (riparian, upland, fenceline, overstory/understory, disturbed, diverse, etc.)					
Fenceline					
Is Site Unusual or Typical of Others in the Area?	Typical				

SPECIES DESCRIPTION

Species by Order of Dominance		
Common Name	Taxonomic Name	Range of Sizes (dbh)
Sugarberry	*Celtis laevigata*	Saplings to 16“, avg. = 6”
Eastern red cedar	*Juniperus virginiana*	2” to 6”, avg. = 4”
Honey mesquite	*Prosopis glandulosa*	Saplings to 36“, avg. = 4”
Gum Bumelia	*Sideroxylon lanuginosa*	Saplings to 4“, avg. = 2”
Black locust	*Robinia pseudoacacia*	2” to 4”, avg. = 4”
Bradford pear	*Pyrus calleryana*	One tree at 4”
Acreage of Trees to be Removed	3.3	
Density per Acre	327	
Remarks, Description of any Unique, Large, or Mature Trees (≥20” dbh)		
The trees are 15 to 50 feet high with an average of 20 feet. Canopy cover ranges from less than 10 percent to 25 percent. Typical understory vegetation consists of Bermuda grass (*Cynodon dactylon*), catch-weed bedstraw (*Galium aparine*), common greenbrier (*Smilax rotundifolia*), Johnson grass (*Sorghum halepense*), poison ivy (*Toxicodendron radicans*), saw greenbrier (*Smilax bona-nox*), Southern dewberry (*Rubus trivialis*), and southwest bedstraw (*Galium virgatum*). Large trees are present (see above).		

HABITAT VALUE

Is the Site Adjacent to Water?	No
Is the Site in a Developed Area?	Semi-rural
Do Plants Produce Nuts, Berries, or Acorns?	
Sugarberry – drupe, Eastern red cedar – berry-like cone, honey mesquite – legume pod, gum Bumelia – berry, black locust – legume pod, Bradford pear – pome.	
Land Use in the Project Area.	
Agricultural pasture and crop land, vacant land, commercial facilities, scattered single-family residences, and single-family subdivisions.	
Evidence or Sightings of Wildlife in the Project Area?	
Song birds, coyote.	
Remarks	
At various locations extending throughout the entire project limits.	

TxDOT WOODLANDS DATA FORM

GENERAL

Project/Site	FM 720 from El Dorado Parkway (FM 720) to US 380			Date	4/12/10
CSJ	1567-01-025	Investigator	CH, MB	County	Denton
Filename					
Project Scope					
Widen existing roadway from a two-lane rural roadway to a six-lane urban divided roadway.					
Description of Wooded Site (riparian, upland, fenceline, overstory/understory, disturbed, diverse, etc.)					
Upland					
Is Site Unusual or Typical of Others in the Area?	Typical				

SPECIES DESCRIPTION

Species by Order of Dominance		
Common Name	Taxonomic Name	Range of Sizes (dbh)
Sugarberry	*Celtis laevigata*	Saplings to 16“, avg. = 6”
Cedar elm	*Ulmus crassifolia*	2” to 12”, avg. = 4”
Post oak	*Quercus stellata*	12” to 36“, avg. = 18”
American elm	*Ulmus americana*	Saplings to 30“, avg. = 16”
Honey mesquite	*Prosopis glandulosa*	Saplings to 16“, avg. = 10”
Eastern red cedar	*Juniperus virginiana*	2” to 10“, avg. = 6”
Shumard's oak	*Quercus shumardii*	6” to 12“, avg. = 10”
Osage orange	*Maclura pomifera*	12” to 36“, avg. = 18”
Blackjack oak	*Quercus marilandica*	12” to 18”, avg. = 16”
Live oak	*Quercus virginiana*	6” to 16“, avg. = 12”
Gum Bumelia	*Sideroxylon lanuginosa*	2” to 4”, avg. = 4”
Green ash	*Fraxinus pennsylvanica*	4” to 12“, avg. = 10”
Sweet gum	*Liquidambar styraciflua*	4” to 10“, avg. = 6”
Redbud	*Cercis canadensis*	4” to 6“, avg. = 4”
Pecan	*Carya illinoinensis*	18” to 24”, avg. = 18”
Black willow	*Salix nigra*	One 6” tree
Southern Catalpa	*Catalpa bignonioides*	One 10” tree
Water oak	*Quercus nigra*	One 36” tree
White ash	*Fraxinus americana*	One 16” tree
White mulberry	*Morus alba*	One 10” tree
Acreage of Trees to be Removed	1.7	
Density per Acre	18	
Remarks, Description of any Unique, Large, or Mature Trees (≥20” dbh)		
The trees range in size from saplings to 36 inches dbh with an average of 12 inches dbh. The trees are 15 to 60 feet high with an average of 40 feet. Canopy cover ranges from less than 10 percent to 50 percent. Typical understory vegetation consists of Bermuda grass (*Cynodon dactylon*), giant golden-rod (*Solidago gigantea*), giant ragweed (*Ambrosia trifida*), Japanese brome (*Bromus japonicus*), Johnson grass (*Sorghum halepense*), Southern dewberry (*Rubus trivialis*), and southwest bedstraw (*Galium virgatum*). Large trees are present (see above).		

TxDOT WOODLANDS DATA FORM

HABITAT VALUE

Is the Site Adjacent to Water?	No
Is the Site in a Developed Area?	Developed to semi-rural
Do Plants Produce Nuts, Berries, or Acorns?	
Sugarberry – drupe, post oak – acorn, honey mesquite – legume pod, Eastern red cedar – berry-like cone, Shumard oak – acorn, osage orange – syncarp, blackjack oak – acorn, live oak – acorn, gum Bumelia – berry, redbud – legume pod, pecan – nut, Catalpa – bean-like capsule, water oak – acorn.	
Land Use in the Project Area.	
Agricultural pasture and crop land, vacant land, commercial facilities, scattered single-family residences, and single-family subdivisions.	
Evidence or Sightings of Wildlife in the Project Area?	
Song birds, coyote.	
Remarks	
At various locations extending throughout the entire project limits.	

TxDOT WOODLANDS DATA FORM

GENERAL

Project/Site	FM 720 from El Dorado Parkway (FM 720) to US 380			Date	4/12/10
CSJ	1567-01-025	Investigator	CH, MB	County	Denton
Filename					
Project Scope					
Widen existing roadway from a two-lane rural roadway to a six-lane urban divided roadway.					
Description of Wooded Site (riparian, upland, fenceline, overstory/understory, disturbed, diverse, etc.)					
Riparian					
Is Site Unusual or Typical of Others in the Area?	Typical				

SPECIES DESCRIPTION

Species by Order of Dominance		
Common Name	Taxonomic Name	Range of Sizes (dbh)
Sugarberry	*Celtis laevigata*	Saplings to 6“, avg. = 6”
Green ash	*Fraxinus pennsylvanica*	4” to 6“, avg. = 6”
Black willow	*Salix nigra*	Saplings to 6“, avg. = 4”
Cottonwood	*Populus deltoides*	Saplings to 4“, avg. = 2”
Post oak	*Quercus stellata*	10” to 12“, avg. = 12”
Acreage of Trees to be Removed	0.4	
Density per Acre	436	
Remarks, Description of any Unique, Large, or Mature Trees (≥20” dbh)		
The trees are 15 to 60 feet high with an average of 40 feet. Canopy cover ranges from less than 10 percent to 50 percent. Typical understory vegetation consists of Bermuda grass (*Cynodon dactylon*), giant golden-rod (*Solidago gigantea*), giant ragweed (*Ambrosia trifida*), Japanese brome (*Bromus japonicus*), Johnson grass (*Sorghum halepense*), Southern dewberry (*Rubus trivialis*), and southwest bedstraw (*Galium virgatum*). No large trees are present.		

HABITAT VALUE

Is the Site Adjacent to Water?	Yes
Is the Site in a Developed Area?	
Do Plants Produce Nuts, Berries, or Acorns?	
Sugarberry – drupe, post oak – acorn.	
Land Use in the Project Area.	
Agricultural pasture and crop land, vacant land, commercial facilities, scattered single-family residences, and single-family subdivisions.	
Evidence or Sightings of Wildlife in the Project Area?	
Song birds, coyote.	
Remarks	
At one location approximately 0.4 miles south of US 380 along east and west sides of roadway.	

Appendix C

Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

January 7, 2005

SECTION 106: DETERMINATION OF NRHP ELIGIBILITY

Denton County (Dallas District)
CSJ# 1567-01-025

FM 720 from 0.6 miles East Southeast of Garza Lane to US 380

Ms. Adrienne Campbell
History Division
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Ms. Campbell:

In accordance with the Programmatic Agreement among TxDOT, FHWA, the Advisory Council on Historic Preservation and THC, this letter initiates Section 106 consultation on the eligibility of historic-age resources for listing in the National Register of Historic Places (NRHP) within the Area of Potential Effects (APE) of the proposed undertaking.

INTRODUCTION

The proposed project calls for the widening and reconstructing approximately 5.4 miles of Farm to Market Road (FM) 720 from 0.6 miles East Southeast of Garza Lane (west end of Lake Lewisville Bridge) to United States Highway (US) 380 in Denton County, Texas. Currently, the existing road is a two-lane undivided roadway with 10- to 11- foot wide travel lanes and one foot buffers on either side of the roadway. The proposed action will maintain the two lane undivided roadway; however, the two travel lanes will be widened to 12 feet each and 10-foot shoulders will be added. **No new right-of-way** will be acquired for this undertaking, as the existing right-of-way will accommodate the widening activities. Project location maps are attached for your review.

IDENTIFICATION EFFORTS TO IDENTIFY HISTORIC PROPERTIES

The methodology used to identify recorded and potentially eligible properties located in the Area of Potential Effects (APE), which for this project was determined to be 150-feet from the proposed right-of-way limits, included a records search of public records and a windshield survey. Background research was conducted using the Texas Historical Commission's (THC) *Texas Historic Sites Atlas* to identify sites listed on the National Register of Historic Places (NRHP), designated State Archeological Landmarks (SAL), Recorded Texas Historic

Landmarks, (RTHL), and the Official State Historical Markers (OSHM). The record search revealed that there are no previously recorded NRHP, SAL, or RTHL properties located within the project APE. There is, however, one OSHM that is within limits of the APE. The marker, erected in 1973, is located at the Oak Grove Methodist Church. It is located directly adjacent to the church door and is approximately 65 east of the current edge of pavement. The proposed project will not impact or relocate the marker.

In accordance with 36 CFR 800, a qualified architectural historian conducted a cultural resources survey to identify properties potentially eligible for listing in the National Register of Historic Places. *The survey identified twenty-four historic-age (pre-~~1966~~ 1959) properties, including one cemetery, within the APE.* A copy of the survey report, which includes a historic context of the area, an inventory table of resources, location maps of the properties, and site forms, is enclosed for your reference.

DETERMINATIONS OF NATIONAL REGISTER ELIGIBILITY

I have evaluated these twenty-four properties through the Criteria of Eligibility and I have determined that all the sites are **not eligible** for NRHP listing. The surveyed structures represent common vernacular types that do no clearly reflect the distinctive characteristic of type, period, method of construction, work or a master or high artistic value. The buildings do not appear to have important associations with significant historical figures or events. Additionally, several of the properties evidence unsympathetic alterations which have compromised their integrity.

Specifically, Resource ID 2a, the Oak Grove Church, built in 1881, has undergone numerous alterations, including new vinyl siding, replacement doors and windows, and a large addition on the south side of the building. Therefore, this building is **not eligible** due to its severe loss of integrity.

Lastly, although the enclosed Historic Resources Survey Report recommends the Oak Grove Cemetery (Resource ID 3) as NRHP-eligible for its age and association with the early settlement of Oak Grove, TxDOT staff has re-evaluated that recommendation, and determined that the resource is **not eligible** to the NRHP, as it does not possess the significance necessary to meet Criterion Consideration D for Cemeteries:

First, the report's historic context specifies that the Oak Grove Community was established in 1851. The establishment of the cemetery in 1881, however, post-dates the settlement of the community by thirty years (page 3). As a result, the cemetery is not of a great age in relation to the area's historic context, and it does not illustrate an association with important historic events representing the early development period of the community or region (Criterion A).

Second, there is no evidence to show that the cemetery contains a collection of "graves of persons of transcendent importance" to the history of the community, state or nation (Criterion B).

Third, the historic integrity of the cemetery is questionable. With the exception of the few original headstones, the cemetery appears to be a modern burial ground. The few late nineteenth- and early twentieth-century burials are now isolated amidst the modern graves. As

evidenced in the photographs, modern fencing surrounds the cemetery, and there is no evidence of a designed landscape (Criterion C).

For these reasons, the cemetery, *which will be buffered from the construction activities by the church building itself*, is **not eligible** for the NRHP.

CONCLUSIONS

In accordance with 36 CFR 800 and the Programmatic Agreement, I hereby request your signed concurrence with these determinations of NRHP eligibility. We request your written concurrence with these determinations within 20 days of receiving this letter. If you need further information, please call me at 416-2770 or contact me within the 20-day review period in order to streamline the review process.

Sincerely,

Mario L. Sánchez, Ph.D., R.A.
Historical Architect
Environmental Affairs Division

MLS: mrf

Attachments

CONCUR
NO HISTORIC PROPERTIES IN APE

NAME: _____ DATE: 1-13-05

for F. Lawerence Oaks, State Historic Preservation Officer

Texas Department of Transportation
DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

January 24, 2008

SECTION 106: Determination of Eligibility
Denton County
CSJ# 1567-01-025

FM 720 from El Dorado Parkway to US 380

Ms. Adrienne Campbell
History Programs
Texas Historical Commission
Austin, Texas 78711

Dear Ms. Campbell:

In accordance with the Programmatic Agreement for Transportation Undertakings (PA-TU) between the Texas Department of Transportation (TxDOT), the Federal Highway Administration (FHWA), the Advisory Council for Historic Preservation (ACHP), and the Texas Historical Commission (THC), this letter *continues* Section 106 consultation (36 CFR 800.4) on the eligibility and effect of the proposed undertaking on historic properties in the project's area of potential effects (APE.)

Previous Coordination

This project was previously coordinated with THC on January 7, 2005 (please see attached letter). TxDOT Historians determined and THC concurred that all sites were not eligible for inclusion in the National Register of Historic Places. At that time, the project as proposed included widening the existing FM 720 roadway from 24' to 44'. The two 10'-11' travel lanes and 1' shoulders would be widened to two 12' travel lanes and 10' shoulders. No new right-of-way was required. A reconnaissance survey conducted in September 2004 identified and documented all pre-1959 resources in the project APE of 150' from the existing and proposed right-of-way. The survey identified 24 historic-age resources. A record search revealed no previously recorded NRHP, SAL, or RTHL properties located within the APE. One Official Texas Historical Marker (OTHM), erected in 1973, was identified in the project APE and is located at Oak Grove Methodist Church, directly adjacent to the front door. The proposed project did not and currently would not impact or relocate the marker.

Current Coordination

Since the 2005 coordination, the project has undergone substantial design changes. The current proposed facility now includes widening the roadway to a maximum of approximately 140', consisting of six 12' travel lanes, 6' sidewalks, 11' outer medians, one 16' inner median, and curb and gutter. At Martop Road and Shahan Prairie/McCormick Road, there would also be one 11' left turn lane and one 10' right turn lane. The project now calls for **27 acres of new right-of-way**. As a result of these changes, an additional reconnaissance survey was undertaken in September 2006 to update the survey findings and re-coordination of the project is necessary.

The September 2006 survey included resources that had not been identified, assessed, and coordinated by the 2004 survey. The record search revealed no previously recorded NRHP, SAL, or RTHL properties or Official State Historical Markers (OTHM) located within the APE, which for this re-evaluation of the project was determined to remain 150' from the existing and proposed ROW. The 2006 survey identified 13 additional historic-age resources (built prior to 1961) within the APE. The newly identified resources included eight residential buildings, three commercial properties, one agricultural building, and one cemetery (Lloyd Cemetery). The attached 2004 and 2006 reconnaissance surveys provide the supporting documentation, historic context, and photographs detailing these findings.

Determinations of Eligibility

We have re-evaluated the 24 historic-age resources identified in 2004 and through application of the Criteria of Eligibility for listing in the National Register of Historic Places, we have determined that all sites are **not eligible** for inclusion in the register. Additionally, we evaluated the newly-identified 13 historic-age resources and we have determined that all sites are **not eligible** for inclusion in the register. All 37 historic-age resources (total number of resources identified in 2004 and 2006) do not have associations with significant historical figures or events. Moreover, the resources do not rise to the level of significance necessary for eligibility as they represent common vernacular types that do not clearly reflect the distinctive characteristic of type, period, method of construction, work of a master or high artistic value.

Specifically, Lloyd Cemetery (Resource #1-06), also known as Lower Oak Grove Cemetery, is located on the east side of FM 720, approximately 1.0 mile south of US 380. Although the attached 2006 survey recommends the cemetery as eligible for NRHP-listing, TxDOT Historians have re-evaluated the resource and have determined that the cemetery is **not eligible** for NRHP-listing under Criterion Consideration D: Cemetery.

The town of Lloyd was founded in 1850 but the 1880 cemetery post-dates the settlement of the community by thirty years. Consequently, the cemetery does not possess great age in relation to the town of Lloyd's historic context and is not associated with the early settlement of the area. Moreover, historical research could not confirm that persons of transcendent importance are buried in the cemetery. Additional research revealed that when nearby Oak Grove Cemetery was established a few years after Lloyd Cemetery, many of the graves from Lloyd Cemetery were moved to Oak Grove Cemetery. Finally, the cemetery does not exhibit a designed landscape. As a result, Lloyd Cemetery is not eligible for the NRHP.

Conclusion

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects" of the PA-TU and the MOU, TxDOT has determined that there are no historic properties in the project APE. We request your written concurrence with these determinations of eligibility within 20 days of receiving this letter. If you need further information, feel free to call me at 416-2623.

Sincerely,

Alexis Reynolds

Alexis A. Reynolds, Historian
Environmental Affairs Division

CONCUR: NO HISTORIC PROPERTIES IN PROJECT APE

NAME: _____ DATE: 1/28/08

for F. Lawerence Oaks, State Historic Preservation Officer

CC: CRM 10/15/04

Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

15 October 2004

Texas Antiquities Code and Section 106 Coordination
Denton County
CSJ 1567-01-025
FM 720 from US 380 to Lake Lewisville Bridge

James E. Bruseth, Ph.D.
Department of Antiquities Protection
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Dr. Bruseth:

The proposed project will be undertaken with state and federal assistance. As required by the National Historic Preservation Act of 1966, as amended, and by Senate Bill 58, The Antiquities Code of Texas, and our Memorandum of Understanding with your agency, we are coordinating the proposed project with your office.

Floyd Largent of Geo-Marine, Inc. conducted an archeological impact evaluation of the proposed road widening project on 27 September 2004. His report is attached. The project is located in an upland prairie setting. No historic properties were identified during the inventory. Mr. Largent recommended no further work on the project.

We request your concurrence that no archeological sites listed in, or determined eligible for designation in the National Register of Historic Places will be affected by the proposed project and that no further archeological investigation is required. If you have any questions, please call Barbara Hickman at 512-416-2637 or e-mail bhickman@dot.state.tx.us.

Sincerely,

Barbara J Hickman

Barbara J Hickman, Staff Archeologist
Archeological Studies Program
Environmental Affairs Division

Attachment
cc w/o attachment: Dallas District, attn: Mr. Dan Perge
ERG CRM/file Reading file JG BJH

Concurrence by: _____ 10-15-04

For Lawerence Oaks, State Historic Preservation Officer — Date

Appendix D

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request **4/6/09**	4. Sheet 1 of **1**
1. Name of Project **FM 720 from Eldorado Pkwy to US 380**	5. Federal Agency Involved **DOT**	
2. Type of Project **Transportation**	6. County and State **Denton County, Texas**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS **4/23/09**	2. Person Completing Form **Micki Yoder**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated **1,323** / Average Farm Size **136**
5. Major Crop(s) **Wheat**	6. Farmable Land in Government Jurisdiction Acres: **395,726** %	7. Amount of Farmland As Defined in FPPA Acres: **379,886** %
8. Name Of Land Evaluation System Used **LESA**	9. Name of Local Site Assessment System **NA**	10. Date Land Evaluation Returned by NRCS **4/28/09**

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment ____ Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	27			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	0			
C. Total Acres In Corridor	27	0	0	0
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	7.12			
B. Total Acres Statewide And Local Important Farmland	19.93			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	1			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	88			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	60			
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area in Nonurban Use — 15	9			
2. Perimeter in Nonurban Use — 10	6			
3. Percent Of Corridor Being Farmed — 20	7			
4. Protection Provided By State And Local Government — 20	0			
5. Size of Present Farm Unit Compared To Average — 10	2			
6. Creation Of Nonfarmable Farmland — 25	0			
7. Availablility Of Farm Support Services — 5	3			
8. On-Farm Investments — 20	7			
9. Effects Of Conversion On Farm Support Services — 25	0			
10. Compatibility With Existing Agricultural Use — 10	1			
TOTAL CORRIDOR ASSESSMENT POINTS — 160				
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — 100	60			
Total Corridor Assessment (From Part VI above or a local site assessment) — 160				
TOTAL POINTS *(Total of above 2 lines)* — 260	95	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
A	**27**	**5/5/09**	YES ☐ NO ☑

5. Reason For Selection:

Signature of Person Completing this Part: | DATE **5/5/09**

NOTE: Complete a form for each segment with more than one Alternate Corridor

United States Department of Agriculture
NRCS
Natural Resources Conservation Service

101 S. Main Street
Temple, TX 76501-6624
Phone: 254-742-9861
FAX: 254-742-9859

April 28, 2009

Civil Associates, Inc.
1521 Northwest Highway
Garland, TX 75041

Attention: Meghan D. Bradley, Environmental Scientist

Subject: LNU--Farmland Protection
FM 720 from Eldorado Parkway to US 380 Project
Denton County, Texas

We have reviewed the information provided concerning the FM 720 from Eldorado Parkway to US 380 Project in Denton County, Texas, as outlined in your email dated April 6, 2009. This is part of the National Environmental Policy Act (NEPA) evaluation for the Federal Highway Administration and TxDOT. We have evaluated the proposed area as required by the Farmland Protection Policy Act (FPPA).

The proposed project does contain soils classified as Important Farmland, and we have completed Parts II, IV and V of the Farmland Conversion Impact Rating for Corridor Type Projects (form CPA-106) and are returning it so that Parts VI and VII can be completed by the appropriate Federal Agency. We request a copy of the final document.

Information and instructions on filling Part VI and Part VII can be obtained from: http://www.nrcs.usda.gov/programs/fppa/ FPPA Rule, 7 CFR 658 **-pages 478-479**

We have attached the completed CPA-106 form. Thank you for the resource materials you submitted to help in our evaluation. If you have any questions please call Micki Yoder at (254) 742-9826, Fax (254)-742-9859.

Sincerely,

Micki Yoder

Micki Yoder
NRCS/State Resources Inventory Specialist

Enclosure

Appendix E

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
DALLAS	COLLIN	1392-01-034	FM 1378	E	FAIRVIEW	TXDOT-DALLAS	**$300,000**

LIMITS FROM: SOUTH OF FM 2786 (STACY ROAD)
LIMITS TO: NORTH OF FARMSTEAD ROAD
TIP DESCRIPTION: RECONSTRUCT AND WIDEN TWO LANE RURAL HIGHWAY TO FOUR LANE DIVIDED URBAN
REMARKS: ADD PROJECT; LOCAL CONTRIBUTION PAID FOR BY COLLIN COUNTY

REV DATE: 02/2011
MPO PROJECT ID: 83218
FUNDING CATEGORY: LC
2030 MTP REFERENCE: TH2 1939
2035 MTP REFERENCE: RSA1-176.5

Project History: CONSTRUCTION FUNDING IN FY 2014

Total Project Cost Information:

Preliminary Engineering:	$300,000
Right Of Way:	$0
Construction:	$5,910,035
Construction Engineering	$295,502
Contingencies:	$384,152
Indirects:	$286,637
Bond Financing:	$0
Total Project Cost:	**$7,176,326**

Cost of Approved Phases: **$300,000**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
Local Contribution:	$0	$0	$0	$0	$300,000	$300,000
Funding by Share:	$0	$0	$0	$0	$300,000	**$300,000**

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
DALLAS	DENTON	1567-01-025	FM 720	C,E,R	VARIOUS	TXDOT DALLAS	**$46,089,865**

LIMITS FROM: ELDORADO PKWY (FM 720)
LIMITS TO: US 380
TIP DESCRIPTION: WIDEN TWO LANE RURAL TO SIX LANES URBAN DIVIDED
REMARKS: REVISE FUNDING; DFW RTR-DE1 FUNDS; DENTON COUNTY TO PAY LOCAL CONTRIBUTION

REV DATE: 02/2011
MPO PROJECT ID: 20178
FUNDING CATEGORY: RTR,LC
2030 MTP REFERENCE: TH2 1843
2035 MTP REFERENCE: NRSA1-DAL-36

Project History:

Total Project Cost Information:

Preliminary Engineering:	$2,093,270
Right Of Way:	$4,120,000
Construction:	$39,876,595
Construction Engineering	$1,532,665
Contingencies:	$3,065,330
Indirects:	$1,665,496
Bond Financing:	$0
Total Project Cost:	**$52,353,357**

Cost of Approved Phases: **$46,089,865**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
RTR:	$0	$0	$35,317,276	$8,829,319	$0	$44,146,595
Local Contribution:	$0	$0	$0	$0	$1,943,270	$1,943,270
Funding by Share:	$0	$0	$35,317,276	$8,829,319	$1,943,270	**$46,089,865**

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
DALLAS	DENTON	1785-01-028	FM 407	C,E,R	BARTONVILLE	TXDOT DALLAS	**$18,481,248**

LIMITS FROM: FM 1830
LIMITS TO: WEST OF LANTANA TRAIL
TIP DESCRIPTION: WIDEN FROM 2 LANE RURAL TO 4 LANE URBAN
REMARKS: REVISE LIMITS; LETS WITH 1950-01-032

REV DATE: 02/2011
MPO PROJECT ID: 20023
FUNDING CATEGORY: RTR,TXDOT ROW,LC
2030 MTP REFERENCE: TH1 353.2
2035 MTP REFERENCE: NRSA1-DAL121

Project History:

Total Project Cost Information:

Preliminary Engineering:	$1,026,666
Right Of Way:	$6,522,518
Construction:	$10,932,064
Construction Engineering	$396,759
Contingencies:	$573,097
Indirects:	$431,145
Bond Financing:	$0
Total Project Cost:	**$19,882,249**

Cost of Approved Phases: **$18,481,248**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
RTR:	$0	$0	$11,532,064	$0	$0	$11,532,064
TXDOT ROW:	$0	$5,645,852	$0	$0	$0	$5,645,852
Local Contribution:	$0	$0	$0	$0	$1,303,332	$1,303,332
Funding by Share:	$0	$5,645,852	$11,532,064	$0	$1,303,332	**$18,481,248**

PHASE: C=CONSTRUCTION, E = ENGINEERING, R = ROW, T = TRANSFER

MOBILITY 2030 - 2009 AMENDMENT

Revised 01-27-2010

Non-Regionally Significant Roadways
Dallas District

MTP REFERENCE	TIP CODE	PROJECT TYPE	CSJ	PROJECT	FROM	TO	DESCRIPTION
TH2 181	674.00	Addition of Lanes	0918-45-367	Samuell Boulevard	IH 30	Buckner Boulevard	Widen Roadway - 2-lanes to 4-lanes
TH2 182	660.00	Addition of Lanes	0918-45-368	Montfort Drive	Peterson Lane	Alpha Road	Widen Roadway - 4-lanes to 5-lanes
TH2 183	2437.00	Addition of Lanes	0918-46-124	Kelly Boulevard	Rosemeade Parkway	Michaelangelo Drive	Widen Roadway - 2-lanes to 4-lanes
TH2 184	2310.00	Addition of Lanes	0918-45-236	Denton Drive	Webb Chapel East	Farmers Branch city limits	Intersection improvements
TH2 185	367.00	Addition of Lanes	0918-45-275	Trinity Mills	Kelly Boulevard	Midway Road	Widen Roadway - 4-lanes to 6-lanes
TH2 186	661.00	Addition of Lanes	0918-45-366	Motor Street	Harry Hines Boulevard	Maple Avenue	Widen Roadway - 2-lanes to 4-lanes
TH2 187	622.00	Addition of Lanes	0918-45-369	Elam Road	St Augustine Road	Acres Drive	Widen Roadway - 4-lanes to 6-lanes
TH2 188	11005.00	Reconstruct Roadway	0918-47-945	Sandy Lake Road	Carrollton W city limits	Old Denton Road	Reconstruct Roadway - 4-lanes undivided to 4-lanes divided
TH2 189	633.00	Addition of Lanes	0918-45-372	Hatcher Street HATCHER ST	Spring Avenue	Haskell Avenue/Military Parkway	Add 1-lane continuous left turn lane to existing 4-lanes
TH2 1810	11533.00	Addition of Lanes	0918-47-984	Freeport Parkway	Sandy Lake Road	Ruby Road	Widen Roadway - 2-lanes to 4-lanes
TH2 1811	11080.00	New Roadway	0918-45-905	Pioneer Drive	Esters Road	West ROW of SH 161	Delete project to reconstruct 2-lane undivided roadway
TH2 1812	11237.20	New Roadway	0918-48-902	Conflans Road	West of SH 161	Valley View	New roadway - 0-lanes to 4-lanes divided (extension)
TH2 1813	11463.00	New Roadway	0918-22-085	Red Oak Road	Red Oak Road underpass	2,750 feet east of IH 35E	Realign Roadway - Red Oak Road
TH2 1814	11466.00	New Roadway	0918-25-017	SH 276	Rockwall North	IH 30/Bypass Street	Widen Roadway - 2-lanes to 4-lanes divided urban
TH2 1815	11532.00	New Roadway	0918-47-983	Freeport Parkway	SH 121	Sandy Lake Road	New roadway - 0-lanes to 6-lanes
TH2 1816	11528.10	New Roadway	0918-48-900	Gifford	Macarthur	Bagdad	New roadway - 0-lanes to 4-lanes
TH2 1817	51257.00	Addition of Lanes	1318-01-010	FM 1181	BI 45-G in Ennis	IH 45	Construct Roadway - 4-lanes undivided urban
TH2 1818	11217.00	Addition of Lanes	0081-11-012	FM 426	1.4 miles west of Loop 288	1.1 Miles east of Loop 288	Widen Roadway - 2-lanes to 4-lanes divided urban
TH2 1819	N/A	Addition of Lanes	1016-01-906	FM 551	At IH 30		Bridge widening - 2-lanes to 4-lanes; includes frontage roads
TH2 1820	2984.00	Addition of Lanes	1014-03-039	FM 740	FM 3097	FM 1140	Widen Roadway - 2-lanes to 4-lanes divided urban
TH2 1821	641.00	Addition of Lanes	8094-18-005	Jupiter Road	Garland Road	Centerville Road	Widen Roadway - 2-lanes to 3-lanes roadway with a continuous left turn lane
TH2 1822	684.00	Addition of Lanes	0918-45-374	Valley View/Walnut	IH 635/Greenville	Forest Ridge	Widen Roadway - 4-lanes to 6-lanes
TH2 1823	51255.00	Addition of Lanes	1290-03-016	SH 276	FM 549	FM 551	Widen Roadway - 2-lanes to 6-lanes divided urban
TH2 1824	2998.00	Addition of Lanes	1290-02-017	SH 276	SH 205	FM 549	Widen Roadway - 2-lanes to 6-lanes divided urban
TH2 1825	51480.00	Addition of Lanes	1290-04-011	SH 276	FM 548	Honey Creek Circle/Hunt County line	Widen Roadway - 2-lanes to 6-lanes divided urban
TH2 1826	N/A	Addition of Lanes	1290-03-020	SH 276	FM 551	FM 548	Widen Roadway - 2-lanes to 6-lanes divided urban
TH2 1827	N/A	Addition of Lanes	0047-14-907	US 75	At Bloomdale Road	None	Construct WB bridge
TH2 1828	11113.00	New Roadway	0918-24-119	McDermott Road	Coit Road	Ohio Drive	Ohio to Rasor Pkwy - widen to 4-lanes divided; Rasor Pkwy to Coit - widen to 6-lanes divided
TH2 1829	11112.00	New Roadway	0918-24-936	Los Rios Boulevard	Jupiter Road	Parker Road	Construct Roadway - 4-lane divided
TH2 1830	11231.20	New Roadway	N/A	Cook Street	Ash Street	Frisco Square	New roadway - 0-lanes to 2-lane
TH2 1831	11231.30	New Roadway	N/A	Frisco Square	DNT & Library	Church & BNSF RR	New roadway - 0-lanes to 4-lane
TH2 1832	11231.40	New Roadway	N/A	Page Street	DNT & E Library	Church & Cook Street	New roadway - 0-lanes to 2-lane
TH2 1833	11231.50	Addition of Lanes	N/A	DNT	Platinum Parkway	Main Street	Widen Roadway - 2-lanes to 3-lanes
TH2 1834	11231.60	Addition of Lanes	N/A	Cotton Gin Road	NB DNT	SB DNT	Widen Roadway - 2-lanes WB to 4-lanes WB
TH2 1835	N/A	New Roadway	1014-04-901	FM 1777	IH 30 North Frontage Road	SH 66	New location - Phase I
TH2 1836	N/A	New Roadway	0751-01-040	FM 148	North of US 175	US 175	Realign highway east of Crandall (2-lanes undivided)
	677.00	Addition of Lanes	8090-18-010	Skillman Street	UPRR	Lovers Lane	Delete project to widen from 4-lanes to 6-lanes
TH2 1837	11714.00	Addition of Lanes	0009-12-074	Hickory Hill/Erby Campbell	SH 66 in Royse City	IH 30	New interchange at IH 30; widen 2-lanes to 4-lanes divided
TH2 1838	20109.00	Addition of Lanes	0619-05-034	FM 544	FM 2281	0.17 Miles west of Josey Lane	Widen Roadway - 2-lane rural highway to 6-lane divided urban
TH2 1839	N/A	Addition of Lanes	0918-45-973	Danieldale Road	IH 35E	Houston School Road	Reconstruct Roadway - city street
TH2 1840	N/A	Grade Separation	0918-45-974	Wintergreen & Pleasant Run	Millers-Ferry & UPRR		Grade separations
TH2 1841	N/A	Addition of Lanes	0918-45-773	Sandy Lake Road	N Coppell Road	S Coppell Road	Widen Roadway - 4-lane divided roadway with drainage improvements
~~TH2 1842~~	~~N/A~~	~~Addition of Lanes~~	~~0135-12-025~~	~~FM 3537~~	~~SH 289~~	~~FM 2478~~	~~Widen Roadway - 2-lanes to 6-lanes divided~~
TH2 1843	N/A	Widening	1567-01-025	FM 720	Garza Lane/Eldorado Parkway	US 380	Widen Roadway - rural 2-lane to 6-lane urban divided
~~TH2 1844~~	~~11724.00~~	~~Addition of Lanes~~	~~3148-01-006~~	~~FM 3097~~	~~FM 740~~	~~Tubbs Road~~	~~Widen Roadway - 2-lanes to 4-lanes divided~~
TH2 1845	11725	New Roadway	0918-46-965	Memorial Drive	Navajo Lane	Spring Creek Parkway	Construct Roadway - 4-lane divided overpass/underpass across Burlington Northern Santa Fe Railway
TH2 1846	11727.00	Addition of Lanes	0918-45-926	Motor Street/Medical District Drive	IH 35E	Harry Hines Boulevard	Widen Roadway - 4-lanes to 6-lanes divided

SOURCE: North Central Texas Council of Governments

Transportation Code, §228.012 requires the Texas Department of Transportation (department) to create a separate account in the state highway fund to hold payments received by the department under a comprehensive development agreement (CDA), the surplus revenue of a toll project or system, and payments received under Transportation Code, §§228.0111(g)(2) and (i)(2).

The department is required to create subaccounts in the account for each project, system, or region, and to hold money in a subaccount in trust for the benefit of the region in which a project or system is located. Interest earned on money in a subaccount shall be deposited to the credit of that subaccount. The department may assign the responsibility for allocating money in a subaccount to a metropolitan planning organization (MPO) in which the region is located.

The department has created subaccounts in the state highway fund to hold the payments received from the North Texas Tollway Authority (NTTA) for the right to develop, finance, design, construct, operate, and maintain the SH 121 toll project from Business SH 121 in Denton County to US 75 in Collin County (SH 121 payments).

Pursuant to Transportation Code, §228.012, the SH 121 payments may be used to pay the costs of a transportation project, highway project, or air quality project within a department district in which any part of the SH 121 toll project is located. The SH 121 toll project is located in the Dallas District. An air quality project is a project or program of the department or another governmental entity that the commission determines will mitigate or prevent air pollution caused by the construction, maintenance, or use of public roads.

In Minute Order 110727, dated October 26, 2006, the Texas Transportation Commission (commission) approved, and authorized the department's executive director to enter into, a memorandum of understanding (MOU) with the Regional Transportation Council (RTC), the transportation policy council of the North Central Texas Council of Governments (NCTCOG), a federally designated MPO, concerning the administration, sharing, and use of surplus toll revenue and CDA concession payments in the region served by the NCTCOG. The SH 121 toll project is located in the region served by the NCTCOG.

Responsibility for allocating the SH 121 payments has already been assigned, to a degree, to the RTC under the MOU. The MOU provides that the selection of projects to be financed using those funds shall be made by the RTC, subject to commission concurrence. The projects are to be selected in a cooperative department-RTC selection process which considers the desires of the cities and counties in which the project is located. The RTC has developed a plan for regional sharing of surplus toll revenue and CDA concession payments, based on the location of the toll project from which these revenues are derived and the residential location of toll users in the region served by the NCTCOG.

The department has established a work program to account for and track projects in the Dallas District that are to be funded with the SH 121 payments. In Minute Order 111215, dated January 31, 2008; Minute Order 111439, dated July 31, 2008; Minute Order 111528, dated September 25, 2008; Minute Order 111553, dated October 30, 2008; and Minute Order 111822, dated May 28, 2009 the commission concurred with certain projects identified by the RTC to be funded with those payments, and approved the placement of those projects in the work program. The RTC,

through an extensive public involvement process, has identified additional projects in the Dallas District to be funded with the SH 121 payments.

IT IS THEREFORE ORDERED by the commission that, pursuant to the MOU, it concurs with the projects as shown in Exhibit A that have been selected by the RTC to be funded with the SH 121 payments, and approves the placement of the projects in the work program with CONSTRUCT authority, to be developed consistent with applicable state and federal laws, regulations, and procedures. Pursuant to the finding of the RTC, the commission determines that the projects shown in Exhibit A are transportation or highway projects, or air quality projects that will mitigate or prevent air pollution caused by the construction, maintenance, or use of public roads, and are therefore eligible to be funded with the SH 121 payments.

IT IS FURTHER ORDERED by the commission that it concurs with the projects as shown in Exhibit B as amendments to previous minute orders.

IT IS FURTHER ORDERED that, unless otherwise approved by the commission, all direct costs associated with the projects for which federal and state funds have not been allocated shall be charged to this work program, including the costs of right of way acquisition, preliminary engineering, and construction engineering, and the costs of department staff incurred in the development, procurement, and construction of the projects.

Submitted and reviewed by:

Director, Finance Division

Recommended by:

Executive Director

111854 JUN 25 09

Minute Number Date Passed

Exhibit B

RTC Work Program of Previously Approved Projects
Using Account 1 "Near Neighbor, Near Timeframe Projects" Fund

Denton County

CSJ	ROW CSJ	PROJECT LOCATION	DESCRIPTION	RTR AUTHORIZED TO THE WORK PROGRAM[1]	FIXED?	PHASES FUNDED UNDER WORK PROGRAM	MINUTE ORDER	ESTIMATED TOTAL PROJECT COSTS
0918-46-235 ~~0918-46-970~~	Not Assigned	Corporate Drive From Waters Ridge Drive To DGNO Railroad	Construct four lane divided roadway	$1,588,862		PE CONST	#111553 Oct-30-08	$1,986,077
0918-46-236 ~~0918-46-971~~	Not Assigned	Corporate Drive From DGNO Railroad To Elm Fork Trinity River Bridge	Construct four lane divided roadway	$5,379,342		PE CONST	#111553 Oct-30-08	$6,724,117
0918-46-237 ~~0918-46-972~~	Not Assigned	Corporate Drive at Elm Fork Trinity River Bridge	Construct four lane divided roadway	$4,716,073		PE ROW CONST	#111553 Oct-30-08	$5,895,091
0918-46-238 ~~0918-46-973~~	Not Assigned	Corporate Drive From Elm Fork Trinity River Bridge To Holford's Prairie Road	Construct four lane divided roadway	$8,166,038		PE ROW CONST	#111553 Oct-30-08	$10,207,547
0918-46-239 ~~0918-45-974~~	Not Assigned	Corporate Drive From Holford's Prairie Road To FM 2281	Construct four lane divided roadway	$3,609,256		PE CONST	#111553 Oct-30-08	$4,511,570
0918-46-240 ~~0918-46-975~~	Not Assigned	Corporate Drive From FM 544 To Josey Lane	Construct four lane divided roadway	$14,266,876		PE ROW CONST	#111553 Oct-30-08	$17,833,596
0918-46-241 ~~0918-46-976~~	Not Assigned	Corporate Drive From Josey Lane To Trinity Drive	Construct four lane divided roadway	$3,064,684		PE CONST	#111553 Oct-30-08	$3,830,854
1311-01-034	1311-01-042	FM 1171 From West of US 377 To West of Shiloh Road	Widen 2 lane rural to 6 lane divided urban highway	$28,270,802		CONST	#111553 Oct-30-08	$35,338,502
1311-01-035	1311-01-043	FM 1171 From IH 35 West To US 377	Widen 2 lane rural to 4 lane of ultimate 6 lane divided urban highway	$11,427,179		CONST	#111553 Oct-30-08	$14,283,974
1315-02-009	1315-02-010	FM 423 from US 380 to 0.8 Miles South of FM 2934	Widen 2 lane to 6 lane divided Urban	$39,175,000		PE ROW CONST	#111215 Jan-31-08	$51,270,367
1567-01-025	1567-01-034	FM 720 From US 380 To Garza Lane	Widen 2 lane rural roadway to a 4 lane divided urban cross section	$35,317,276		ROW CONST	#111553 Oct-30-08	$44,146,595
1567-01-029	1567-01-032	FM 720 from 0.2 Mile West of Garza Lane (West of Lake Lewisville) to 0.1 Mile West of FM 423	Widen 2-lane rural roadway to 4-lane divided urban (ultimate 6-lane)	$28,000,000		PE ROW CONST	#111215 Jan-31-08	$46,286,420
1567-02-020	1567-02-030	FM 423 from Stewarts Creek Road to SH 121	Stewarts Creek to Cougar Alley, widen 2 to 6 Lane Divided Urban; Cougar Alley to SH 121, widen 2 to 8 lane divided urban	$51,700,000		PE ROW CONST	#111215 Jan-31-08	$64,928,292
1567-02-027	1567-02-029	FM 423 From South of FM 2934 to Stewarts Creek Road	Widen 2 lane rural to 6 lane of ultimate 8 lane divided urban highway	$37,625,000		PE ROW CONST	#111215 Jan-31-08	$53,379,582
1785-01-028	1785-01-031	FM 407 From 1830 To Jeter Road	Widen from 2 lane rural to 4 lane urban	$9,225,652		CONST	#111553 Oct-30-08	$11,532,064

[1] Does not include Local or State Matching funds

Project Modification from prior minute order

Revised June 15, 2009

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