CATEGORICAL EXCLUSION

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121) TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

CITIES OF FRISCO AND McKINNEY
COLLIN COUNTY, TEXAS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

AND

TEXAS DEPARTMENT OF TRANSPORTATION

FEBRUARY 2014

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I. INTRODUCTION

This Categorical Exclusion (CE) evaluates the social, economic, and environmental impacts that would result from the implementation of proposed improvements (the proposed project) to Farm to Market (FM) 2478 (Custer Road) from Sam Rayburn Tollway (State Highway [SH] 121) to Stonebridge Drive within the Cities of Frisco and McKinney in Collin County, Texas. The length of the proposed project is approximately 2.95 miles. Refer to **Figure 1** for the Project Location Map, **Figure 2** for the U.S. Geological Survey (USGS) Topographic Map, **Figure 3** for the Aerial Map and **Appendix A** for Project Area Photographs.

Design plans can be inspected at the Texas Department of Transportation (TxDOT) Dallas District Office, located at 4777 East Highway 80, Mesquite, Texas, 75150.

II. PROJECT DESCRIPTION

A. Need and Purpose

The existing FM 2478 is functionally deficient and does not effectively serve the current and future transportation needs of the growing population adjacent to and surrounding the proposed project. The proposed improvements would eliminate a bottle neck that is created by the four-lane facility from SH 121 to Stonebridge Drive. The roadway is a six-lane facility outside the proposed project limits.

The purpose of the proposed project is to provide better mobility and bring the roadway up to current design standards.

B. Existing Facility

The existing facility within the project limits is a four-lane divided urban roadway with 12-foot wide outside lanes, 11-foot wide inside lanes, 44-foot wide median, and no shoulders in a usual 120-foot wide right-of-way (ROW). Five-foot wide discontinuous sidewalks exist within the project limits. The existing speed limit is 50 miles per hour (mph). The typical section for the existing roadway is presented in **Figure 4** and the locations of existing sidewalks are shown in **Figure 5**.

C. Right-of-Way Requirements and Utility Adjustments

No additional ROW or easements are required for the construction of the proposed project. The approximately 120 feet wide existing ROW is sufficient to accommodate the proposed project; therefore, no residential or commercial displacements would be required. The existing ROW was acquired at the time of the original roadway construction to accommodate both the interim-four-lane construction and the ultimate build-out of a six-lane section. The current project is adding the two inside lanes due to increased traffic volumes. Additional drainage, utility, and construction easements are not anticipated for the proposed project.

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, may require relocation due to the expansion of the roadway. Affected utilities would be adjusted or relocated prior to construction of the proposed project. The adjustments and relocation of any utilities would be managed so that no substantial interruptions would occur. Plans for relocating utilities would be provided by the appropriate utility company.

D. Project Funding

The proposed project is a Pass-Through funded project and is included in the approved 2013-2016 Transportation Improvement Program (TIP) and in the Metropolitan Transportation Plan (MTP): *Mobility 2035-2013 Update*. The project is covered under CSJ 2351-01-020. The project is federally, state, and locally-funded, with a total project cost of $8,276,651 as of January 18, 2013. Engineering and construction are authorized under this CSJ. The proposed project is anticipated to be let for construction in September 2014. The estimated time of completion is September 2015.

Copies of the applicable pages of the MTP and the TIP with project listings are included in **Appendix D**.

E. Local Support

Collin County and the Cities of Frisco and McKinney are in support of this project.

F. Traffic Projections

Table 1 presents average daily traffic (ADT) numbers for FM 2478 within the proposed project limits, as provided by TxDOT Transportation Planning and Programming Division (TPP).

Table 1: Average Daily Traffic (Vehicles Per Day)		
Limits	**Year 2015**	**Year 2035**
SH 121 to Stonebridge Drive	34,600	59,800
Source: *TxDOT TPP Division, February 27, 2013.*		

G. Bicycle and Pedestrian Accommodations

In accordance with a federal policy statement on Bicycle and Pedestrian Accommodations Regulations and Recommendations by the U.S. Department of Transportation signed on March 11, 2010, the inclusion of bicycle and pedestrian facilities were considered as part of the proposed project.

A 14-foot wide outside shared use lane in each direction is proposed to accommodate bicyclists. Five-foot wide (minimum) sidewalks are proposed on both sides of FM 2478 to ensure that continuous Americans with Disabilities Act (ADA) compliant pedestrian route for the full limits of the proposed project is provided. The intersections of FM 2478 at Custer Bridges/McKinney Town Crossing, Rolater Road/Collin McKinney Parkway, Stacy Road/FM 3537, and Stonebridge Drive would be signalized. Crosswalks would be constructed at these signalized locations to accommodate pedestrians and bicyclists. This meets the recommendation of the aforementioned federal policy statement.

Additionally, a raised central median (minimum width 7-feet) would be constructed throughout the length of the proposed project to allow pedestrians to safely cross FM 2478. As shown in **Figure 5** and noted in **Figure 4**, the sidewalk plan is to provide a continuous sidewalk for the full length of the project.

H. Independent Utility and Logical Termini

FM 2478 is planned to expand from four to six travel lanes from SH 121 to Stonebridge Drive. This typical section will match the six-lane sections south of SH 121 and north of Stonebridge Drive.

I. Surrounding Area

The project area is urban and mostly developed. Vacant parcels are located on the west side of FM 2478, north and south of FM 3537 (Stacy Road), and on the east side of FM 2478, north and south of Collin McKinney Parkway. The developed properties adjacent to the proposed project are single family residential, townhomes, commercial, and retail establishments. Refer to **Figure 3** for an aerial map of the project area.

Surrounding terrain in the project area is gently rolling. The proposed project crosses three tributaries of Rowlett Creek, which drain into Rowlett Creek. Rowlett Creek flows into Lake Ray Hubbard, which is part of the Trinity River basin. The vegetation within the project limits consists of maintained native and introduced grasses, scattered forbs, and landscape shrubs trees.

III. ALTERNATIVES

A. No Build

The No Build Alternative was considered in assessing improvements to FM 2478 from SH 121 to Stonebridge Drive. This alternative was not considered viable because the existing facility does not meet current TxDOT design standards, i.e., no continuous sidewalks and shared lanes. The No Build Alternative would not meet the need and purpose of the proposed project. The projected increase in traffic demand would exceed the capacity of the FM 2478 roadway without any improvements. Under the No Build Alternative, the integrity of the roadway structure would continue to decline.

B. Build Alternative

The proposed project is the expansion of FM 2478 from a four-lane divided urban roadway to a six-lane divided urban roadway from SH 121 to Stonebridge Drive. The Build Alternative would add a single 11-foot wide inside lane and incorporate a 14-foot wide outside shared use lane in each direction to the existing roadway, creating two 11-foot wide lanes and one 14-foot shared use lane in each direction with one-foot inside lane and two-foot outside lane offsets. The curb and gutter roadway would also include 11-foot wide left turn lanes and minimum median width of 7 feet. The 2.95-mile improvements would include the addition of a continuous ADA compliant pedestrian route. The proposed sidewalks would tie in to the existing sidewalks and would be constructed on both sides of the proposed project.. The proposed project would also include the expansion of an existing bridge at the tributary to Rowlett Creek crossing.

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 2478. The Build Alternative would have a design speed of 45 mph. The proposed typical sections are illustrated in **Figure 4** and the proposed project layout is provided in **Figure 5**. The Build Alternative is the Preferred Alternative.

IV. POTENTIAL SOCIAL, ECONOMIC, AND ENVIRONMENTAL EFFECTS OF PROPOSED ACTION

A. Regional and Community Growth

Impacts, both positive and negative, to economic, environmental, and social attributes of the project area resulting from the proposed project are anticipated. Local and regional economic population growth would be the determining factors in the future development of the area.

The North Central Texas Council of Governments (NCTCOG), the MPO, collects demographic data for the North Central Texas region. According to the 2010 Census, the 16-county North Central Texas region added nearly 1.2 million residents since the 2000 Census.

Table 2 summarizes the population trends and forecasts in the project area.

Table 2: Population Trends and Forecasts for Selected Locations

Location	1980 Census	1990 Census	2000 Census	2010 Census	Growth Rate 1980-2010	2030**/ 2035*** Forecast	Growth Rate 2010-2030 (2010-2035 for Collin County)
City of Frisco	3,499	6,141	33,714	116,989	3,244%	227,911**	94.8%
City of McKinney	16,256	21,283	54,369	131,117	707%	225,933**	72.3%
Collin County	144,576*	264,036*	491,675*	782,341*	441%	1,404,149***	80%

Sources: *Census Population by City, 1970-2010; U.S. Census 2010 PL94-171; NCTCOG (February 2011)*
** - Census Population by County, 1970-2010; U.S. Census 2010 PL94-171; NCTCOG (February 2011)*
*** - NCTCOG 2030 Demographic Forecast (April 2003)*
**** - NCTCOG 2040 Demographic Forecast (February 2011)*

Table 2 shows that by 2035, Collin County is projected to have over 1,404,000 residents. On average, Collin County is expected to add population at a rate of approximately 24,872 persons per year during the 25-year period. According to the NCTCOG's 2030 Demographic Forecast, the Cities of Frisco and McKinney have projected growth rate percentages of 94.8 and 72.3 percent, respectively, in 20 years. This ongoing growth trend is acknowledged in the long-range *MTP: Mobility 2035 – 2013 Update*, which contains goals and policies that focus on the need to enhance and coordinate the regional transportation system to accommodate transportation infrastructure safely and efficiently. The proposed project is anticipated to have a beneficial effect on regional and community growth.

B. Socio-Economic Resources

1. Acquisitions, Relocations and Displacements

The proposed project would be constructed entirely within existing ROW; therefore, acquisitions, relocations or displacements would not occur as a result of the proposed improvements.

2. 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 restrict access to any existing public or community services, businesses, commercial areas, or employment centers. Pedestrian and bicycle facilities would be constructed as part of the proposed project allowing for improved connectivity between existing and future facilities. Inconvenience to the motorists using the roadway during the construction phase would be minimized. Detours are not proposed during construction of the proposed project. Temporary access driveways would be provided to abutting property owners during construction and permanent access would be provided after construction is completed. Subdivision entrances would remain on FM 2478 after the improvements. For those opting to

cross the six-lane facility on foot, the minimum 7-foot wide raised median would give pedestrians the option to cross the four-lane facility in two shorter and safer segments allowing them to more easily and safely navigate across bi-directional traffic, focusing on one direction at a time. FM 2478 within the proposed project limits is an established roadway. The proposed project would be constructed entirely within existing ROW and would not affect, separate, or isolate any distinct neighborhoods, ethnic groups, or other specific groups within or adjacent to the proposed project area. Project completion would increase the roadway capacity and improve traffic flow, benefitting local and non-local commuters, area businesses, and local residents. The proposed main lanes and left turn lanes would provide safer access to residential neighborhoods and commercial properties and improve travel movements and traffic flow in the area. Community cohesion would not be impacted by the proposed project.

The places of employment located within the FM 2478 project limits consist of commercial and retail facilities. Currently, land use along FM 2478 is a mixture of single family residential, townhomes, commercial, and retail properties, with tracts 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 has the potential to 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.

3. Environmental Justice (EJ)

Executive Order (EO) 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; and,
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 Census 2010, population groups defined as minorities include the following:

1. Black or African American;
2. Hispanic or Latino;
3. Asian;
4. American Indian and Alaska Native;
5. Native Hawaiian and Other Pacific Islander;
6. Some Other Race; or,
7. Two or More Races.

For this CE, Census 2010 data, *2007-2011 American Community Survey 5-Year Estimates* (ACS) data and windshield survey have been used to identify areas with high minority concentrations and low incomes. According to Census 2010 data, five census tracts (CT) consisting of five census block groups (BG) encompass the proposed project and 13 census blocks are adjacent to the proposed project. Because census blocks are the smallest geographical unit for which there is recent racial and ethnic data available (i.e., Census 2010), the 13 census blocks adjacent to the proposed project were selected as the study area. Data obtained from these blocks, BGs, and CTs were analyzed to determine racial and ethnic characteristics in the proposed project area. A total of 890 persons were recorded within the census blocks in 2010. The racial and ethnic distribution within these blocks and associated BGs and CTs is presented in **Table 3**.

Table 3: Racial and Ethnic Distribution Based on Census 2010

Comparison Area	Total Population	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some other race alone	Two or more races	Hispanic or Latino
CT 305.11	**4,733**	**3,042 64.3%**	**363 7.7%**	**26 0.5%**	**533 11.3%**	**2 <0.1%**	**17 0.4%**	**111 2.3%**	**639 13.5%**
BG 1	2,311	1,591 68.8%	138 6.0%	17 0.7%	238 10.3%	2 0.1%	13 0.6%	61 2.6%	251 10.9%
Block 1000	*29*	*6 20.7%*	*1 3.4%*	-	*10 34.5%*	*1 3.4%*	-	*6 20.7%*	*5 17.3%*
CT 305.12	**4,353**	**3,034 69.7%**	**171 3.9%**	**23 0.5%**	**751 17.3%**	**2 0.1%**	**12 0.3%**	**102 2.3%**	**258 5.9%**
BG 1	1,806	1,444 80.0%	57 3.2%	8 0.4%	159 8.8%	2 0.1%	11 0.6%	29 1.6%	96 5.3%
Block 1007	99	74 74.7%	-	1 1.0%	16 16.2%	-	-	1 1.0%	7 7.1%
Block 1010	277	234 84.4%	1 0.4%	-	26 9.4%	-	-	1 0.4%	15 5.4%
CT 305.13	**3,670**	**2,283 62.2%**	**441 12.0%**	**15 0.4%**	**395 10.8%**	**1 <0.1%**	**5 0.1%**	**87 2.4%**	**443 12.1%**
BG 1	741	494 66.7%	106 14.3%	4 0.5%	64 8.6%	1 0.1%	-	12 1.6%	60 8.1%
Block 1017	33	21 63.6%	1 3.0%	-	9 27.3%	-	-	2 6.1%	-
Block 1032	*1*	-	-	-	-	-	-	-	*1 100%*
Block 1035	105	61 58.1%	33 31.4%	-	2 1.9%	-	-	1 1.0%	8 7.6%
Block 1048	0	-	-	-	-	-	-	-	-
Block 1052	*5*	-	-	-	-	-	-	*1 20.0%*	*4 80.0%*
Block 1053	0	-	-	-	-	-	-	-	-
CT 305.17	**5,879**	**4,126**	**568**	**34**	**438**	**4**	**12**	**112**	**585**

Table 3: Racial and Ethnic Distribution Based on Census 2010									
Comparison Area	Total Population	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some other race alone	Two or more races	Hispanic or Latino
		70.2%	**9.7%**	**0.5%**	**7.4%**	**0.1%**	**0.2%**	**1.9%**	**10.0%**
BG 1	3,687	2,628 71.3%	339 9.2%	24 0.6%	270 7.3%	2 0.1%	10 0.2%	72 2.0%	342 9.3%
Block 1038	0	-	-	-	-	-	-	-	-
Block 1039	10	9 90.0%	-	-	1 10.0%	-	-	-	-
CT 305.18	**1,690**	**1,141 67.5%**	**161 9.5%**	**6 0.4%**	**196 11.6%**	**1 0.1%**	**4 0.2%**	**60 3.5%**	**121 7.2%**
BG 1	1,429	984 68.9%	123 8.6%	3 0.2%	171 12.0%	1 0.1%	1 0.1%	50 3.4%	96 6.7%
Block 1005	212	190 89.6%	6 2.8%	-	4 1.9%	-	-	-	12 5.7%
Block 1007	119	101 84.9%	-	1 0.8%	5 4.2%	-	-	7 5.9%	5 4.2%
Source: *U.S. Census Bureau; American FactFinder; Census 2010; 2010 SF1 100% data; P9 data; http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml; generated October 3, 2012.*									

A low-income population is defined as one with a median annual income for a family of four equal to or below the 2013 U.S. Department of Health and Human Services national poverty guideline of $23,550. **Table 4** provides the median household incomes in 2011 inflation-adjusted dollars and the percent of households below the poverty guideline for the surrounding CTs (according to the ACS). The five CTs which encompass the proposed project were selected as the low-income study area because CTs are the smallest geographical unit for which there is recent poverty status data available (i.e., ACS). Median household income data is also presented at the BG level. Poverty status data for BGs is not available.

Table 4: Median Household Income and Poverty Level			
Comparison Area	**Total Population**	**Persons with Income Below Poverty Guideline**	**Median household income in 2010 inflation-adjusted dollars ($)**
CT 305.11	4,633	89 1.9%	$91,662
BG 1	2,136	N/A	$92,354
CT 305.12	4,417	29 0.7%	$126,071
BG 1	2,055	N/A	$141,458
CT 305.13	2,774	284 10.2%	$81,007
BG 1	889	N/A	$98,295
CT 305.17	5,462	67 1.2%	$105,703
BG 1	2,774	N/A	$112,344
CT 305.18	1,535	23 1.5%	$128,750

Table 4: Median Household Income and Poverty Level			
Comparison Area	**Total Population**	**Persons with Income Below Poverty Guideline**	**Median household income in 2010 inflation-adjusted dollars ($)**
BG 1	1,348	N/A	$124,967
Source: *U.S. Census Bureau; Legacy American FactFinder; 2007-2011 American Community Survey 5-Year Estimates; B01003, B17001 and B19013 data; <http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts=>; generated January 2, 2013.*			

As shown in **Tables 3** and **4**, the study area does contain minority and low-income populations. Of the 13 census blocks adjacent to the proposed project, three have no recorded population and three contain a minority population greater than 51 percent. The three census blocks with a minority population greater than 51 percent are italicized in **Table 3** and are shown in **Figure 6**. The percent minority in these three census blocks exceeds that of their associated BGs. The population of these census blocks range from one to 29 persons. Census block 1000 has a recorded population of 29 people, 23 of which are minority (79.3 percent). This census block is bordered by FM 720 to the north, FM 2478 to the east, Rolater Road to the south, and Independence Parkway to the west. Approximately ¾ of the land within census block 1000 is undeveloped and used for agricultural purposes. There are scattered single-family residences in the western half of the census block; accessible from Independence Parkway. According to ACS data, the median household income for the associated BG is $113,884 and only 2.6 percent of the population within the associated CT has income below the poverty guideline. Because these residences are scattered and do not appear to represent a distinct neighborhood or community and have a median household income well above the poverty guideline, a distinct EJ population group is not present. Additionally, Liberty High School of the Frisco Independent School District (ISD) is located in the southern portion of the census block; accessible from Rolater Road. The remaining two census blocks (1032 and 1052) with high minority populations represent six people and are not indicative of a distinct population.

All project area BGs and CTs have a median household income well above the national poverty guideline. For project area CTs, the percent of persons within each CT with income below the national poverty guideline ranges from 0.7 to 10.2 percent.

The proposed project consists of the expansion of the existing facility to better serve the mobility needs of all motorists. The proposed project would improve existing traffic conditions, benefiting all motorists equally. The proposed project would not have disproportionately high and adverse impacts on any minority and/or low-income populations; therefore, the requirements of EO 12898, pertaining to environmental justice, are satisfied.

4. Limited English Proficiency

EO 13166, *Improving Access to Services for Persons with Limited English Proficiency* (LEP) requires agencies to examine the services they provide, identify any need for services to those with LEP, and develop and implement a system to provide those services so that LEP persons can have meaningful access to them. The EO 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 prohibition under Title VI of the Civil Rights Restoration Act of 1987 and Title VI regulations. **Table 5** displays the LEP percentages for persons in the project area age five years and older than speak English “not well” or “not at all” according to ACS data.

Table 5: Limited English Proficiency Populations						
Census Unit	**Total Population**	**LEP**	**Speaks Spanish: Speaks English Less Than Well**	**Speaks Other Indo-European Languages: Speaks English Less Than Well**	**Speaks Asian and Pacific Island Languages: Speaks English Less Than Well**	**Speaks Other Languages: Speaks English Less Than Well**
CT 305.11	4,106	53 1.3%	40 1.7%	-	13 0.2%	-
BG 1	1,788	25 1.4%	25 2.5%	-	-	-
CT 305.12	3,697	23 0.6%	23 0.6%	-	-	-
BG 1	1,809	0 0.0%	-	-	-	-
CT 305.13	2,529	10 0.4%	10 0.4%	-	-	-
BG 1	808	10 1.2%	10 1.2%	-	-	-
CT 305.17	4,736	110 2.3%	-	-	110 2.3%	-
BG 1	2,428	0 0.0%	-	-	-	-
CT 305.18	1,298	16 1.2%	-	16 1.2%	-	-
BG 1	1,160	0 0.0%	-	-	-	-
Source: *U.S. Census Bureau; Legacy American FactFinder; 2007-2011 American Community Survey 5-Year Estimates; B16004 data; http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts=>; generated January 2, 2013.*						

According to ACS data, two of the five project area BGs contain persons with LEP that speak English "not well" or "not at all". Total percent LEP of these two BGs are greater than their associated CT. Within the project area BGs, Spanish is the only non-English language spoken by persons with LEP.

A windshield survey, conducted on November 12, 2012, revealed that there are no business signs or advertisements in non-English languages located adjacent to the proposed improvements. Because persons with LEP are present within the proposed project area according to ACS data, a LEP population is present within the proposed project area.

A Public Hearing would be conducted for the proposed project. Reasonable steps would be taken to ensure that LEP persons have meaningful access to the programs, services, and information TxDOT provides. The Public Hearing notices would be advertised in Spanish (predominant second language per **Table 5**). During the Public Hearing, an interpreter for a specific language to LEP would be provided if the request is made prior to the event date. Through the steps listed above, the requirements of EO 13166 are satisfied.

5. Land Use

Land use adjacent to the Build Alternative is single family residential, townhomes, commercial, retail, vacant, and agricultural. According to City of Frisco Geographic Information Systems (GIS) website's interactive map, properties on the west side of the proposed project are zoned for C-1 (Commercial-1), PH (Patio Home), R (Retail), MF-15 (Multi-Family-15), SF-8.5 (Single-

Family-8.5), 2F (Two-Family [Duplex]), SF-7 (Single-Family-7), SF-16 (Single-Family-16), and SF-10 (Single-Family-10).

According to the City of McKinney's GIS Website's interactive map, properties on the east side of the proposed project are zoned for PD (Planned Development) and AG (Agriculture). The construction of the proposed project is not anticipated to affect land use within the project area.

C. Section 4(f) Resources

The proposed project would not require the use of, nor substantially impair the purposes of any publicly owned lands from a public park, recreational area, wildlife and waterfowl refuge lands or historic sites of national, state, or local significance as determined by the federal, state, or local officials having jurisdiction. Therefore, a 4(f) evaluation would not be required.

D. Public Facilities and Services

No public facilities such as parks, hospitals, or fire/police stations are located immediately adjacent to the proposed project. The construction, operation, and maintenance of the proposed project would not adversely affect public facilities. Emergency public services would have a safer, more efficient facility to use in the performance of their duties.

E. Cultural Resources

Cultural resources are structures, buildings, archeological sites, districts (a collection of related structures, buildings, and/or archeological sites), cemeteries, and objects. Federal and state laws require consideration of cultural resources during project planning. At the federal level, National Environment Policy Act (NEPA) and the National 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 Historical Commission/Texas State Historic Preservation Officer (THC/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.

1. Historical Resources

A review of the National Register of Historic Places (NRHP), the list of State Archeological Landmarks (SAL), 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 feet from the existing ROW along FM 2478 from SH 121 to Stonebridge Drive. A reconnaissance survey undertaken in November 2012 revealed that there are no historic-age resources (built prior to 1969) located within the project APE. The survey cut-off date is based on the current letting date of 2014.

Pursuant to Stipulation V *Undertakings with No Potential to Affect Historic Resources* of the First Amended Programmatic Agreement Regarding the Implementation of Transportation Undertakings between FHWA (PA-TU), the Texas SHPO, the Advisory Council on Historic Preservation, and TxDOT and the Memorandum of Understanding (MOU), TxDOT Historians determined that no historic-age properties are present and that individual project coordination with SHPO is not required (**Appendix B**).

2. Archeological Resources

Existing agreements for compliance with applicable cultural resource laws define this project as a type that has no potential to affect archeological resources. No consultation with the THC/SHPO or other groups was required (**Appendix B**).

F. Biological Resources

1. Wildlife Habitat/Vegetation

The proposed project is located in the Blackland Prairie region. According to the Texas Parks and Wildlife Department's (TPWD) *The Vegetation Types of Texas* (1984) publication, the proposed project area is located within the Crops (Type 44) cultivated cover crops or row crops providing food and/or fiber for either man or domestic animals. This type may portray grassland associated with crop rotations. A field survey conducted by qualified biologists on November 12, 2012, determined that the vegetation within the immediate area is not consistent with the Crops vegetation classification. Maintained and unmaintained herbaceous and riparian vegetation are present along the proposed project.

The field survey, conducted November 12, 2012, revealed that the vegetation within the existing ROW and easements is primarily maintained grasses. Dominant vegetation within the proposed project area is presented in **Table 6**.

Table 6: Dominant Vegetative Species Identified within the Project Area

Strata	Common Name	Scientific Name
Forb	Bermuda grass	*Cynodon dactylon*
Forb	silver bluestem	*Bothriochloa saccharoides*
Forb	Johnson grass	*Sorghum halepense*

Source: Field Investigation (November 12, 2012).

All work for the proposed project would occur within the existing ROW and easements. Approximately 15.3 acres of maintained herbaceous vegetation could be permanently impacted by construction of the proposed project. Representative vegetation can be seen in **Appendix A – Project Area Photographs**. An aerial photograph of the proposed project area is provided as **Figure 5**.

In accordance with the TxDOT-TPWD Memorandum of Agreement (MOA), unusual features to be identified within the proposed project area could include:

(a) Unmaintained vegetation;
(b) Trees or shrubs along a fenceline (ROW) adjacent to a field (fencerow vegetation) ;
(c) Riparian vegetation (particularly where fields/cropland extends up to or abuts the vegetation associated with the riparian corridor);
(d) Trees that are considered historically significant, ecologically significant, or locally important (such as champion trees as listed on the Texas A&M Forest Service Big Tree Registry http://txforestservice.tamu.edu/main/article.aspx?id=1336); and
(e) Unusual stands or islands (isolated) of vegetation.

Of these unusual features, unmaintained vegetation and riparian vegetation exists within the proposed project area.

Unmaintained Vegetation
Unmaintained vegetation is present on both banks of the tributary to Rowlett Creek (Crossing 3). This area is confined in between the existing bridge. Dominant unmaintained herbaceous vegetation consists of Virginia wildrye (*Elymus virginicus*), Johnsongrass, Canada goldenrod (*Solidago canadensis*), great ragweed (*Ambrosia trifida*), southern cattail (*Typha domingensis*), and common moonseed (*Menispernum canadense*). Approximately 0.02 acre of unmaintained vegetation would be impacted by the Build Alternative. Refer to **Table 8** for additional information on the tributaries to Rowlett Creek.

Riparian Vegetation
Riparian buffer is present on both banks of the tributaries to Rowlett Creek (Crossings 2 and 3), adjacent to the existing roadway's outside lanes. Dominant overstory vegetation consists of American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*) and red mulberry (*Morus rubra*). The trees range in size from sapling to 8-inch diameter at breast height (dbh), with an average dbh of three inches. Canopy cover is 70 percent, and tree heights range from 15 to 45 feet with an average tree height of 25 feet. Dominant understory vegetation consists of the overstory species saplings and muscadine grape (*Vitis rotundifolia*). There would be no impacts to riparian woodlands from the proposed project.

Coordination per the 1999 MOU between TxDOT and TPWD is concluded. According to the MOA between TxDOT and TPWD, special habitat features are classified as:

(a) Bottomland hardwoods
(b) Caves
(c) Cliffs and bluffs
(d) Native prairie (particularly those with climax species of native grasses and forbs)
(e) Seeps or springs
(f) Snags (dead trees) or groups of snags
(g) Existing bridges with known or easily observed bird or bat colonies
(h) Rookeries
(i) Prairie dog towns

No Special Habitat Features are located within the proposed project area.

In accordance with Title 43 of the Texas Administrative Code §2.22, coordination with TPWD would not be required for this proposed project because the proposed project would not affect mature woody vegetation.

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

1. Habitat for federal candidate species (impacted by the project) if mitigation would assist in the prevention of the listing of the species;
2. rare vegetation series (S1, S2, or S3) that also locally provide habitat for a state-listed species;
3. all vegetation communities listed as S1 or S2, regardless of whether or not the series in question provide habitat for state-listed species;
4. bottomland hardwoods, native prairies and riparian sites; and,
5. any other habitat feature considered locally important that the TxDOT District chooses to consider.

Of the previously listed habitat to be given consideration for non-regulatory mitigation, riparian habitat is located within the proposed project area. However, the riparian areas would not be impacted by the proposed project. During project development, TxDOT would design, use, and promote construction practices that minimize adverse effects on both regulated and unregulated wildlife habitat. Existing vegetation, especially native trees, would be avoided and preserved where practicable.

2. Endangered Species Act (ESA)

The ESA affords protection for federally listed threatened and endangered species and, where designated, critical habitat for these species. The U.S. Fish and Wildlife Service (USFWS) maintains a list of Federally threatened and endangered species of potential occurrence for each Texas county as does TPWD. TPWD maintains special species lists through the Natural Diversity Database (NDD) by county. Data was obtained from the TPWD's NDD list on May 6, 2013. This information was verified using TPWD's NDD mimic (Version 12/13/2011) on May 26, 2013. The NDD review met all the requirements of the TxDOT-TPWD MOA for sharing and maintaining NDD information. The search radius was 10 miles from the proposed project area. **Table 7** provides elements of occurrence of state and federally listed species within a 10 mile buffer, but outside of a 1.5 mile buffer of the proposed project. The Texas NDD is a potential presence database that cannot be interpreted as presence/absence data.

3. Federal and State Threatened and Endangered Species

Table 7 addresses, the Federal and State Threatened or Endangered Species for Collin County, their listed status, habitat requirements, and anticipated effects from the proposed project. A field survey was performed by qualified biologists on November 12, 2012. Based on this survey, it was determined that the proposed project area contains no habitat for federally listed threatened and endangered species. The proposed project would have no effect on federally listed species or critical habitat.

Based on this survey, it was determined that the proposed project area is within the range and contains habitat for the state threatened Timber/Canebrake rattlesnake. Therefore, coordination with TPWD is required. There would be no impacts to habitat and the potential for encountering the species during construction is low. The proposed project is not anticipated to impact State listed species.

4. State Species of Concern

Table 7 addresses the TPWD's Annotated County List of Rare Species for Collin County which includes other species that the State considers rare, but have no formal regulatory status at the State or Federal level. Potential habitat for one rare species, the Texas garter snake, is present within the proposed project area. Impacts to potential habitat would be minor, and the potential for encountering the species during construction is low.

Table 7: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County						
Species	**Federal Status**	**State Status**	**Description of Suitable Habitat**	**Habitat Present**	**Species Effect/ Impact**	**Justification**
BIRDS						
American Peregrine Falcon *Falco peregrinus anatum*	DL*	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 effect/ No impact	No habitat present and no species observed during field survey.
Arctic Peregrine Falcon *Falco peregrinus tundrius*	DL*		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 effect	No habitat present and no species observed during field survey.
Bald Eagle *Haliaeetus leucocephalus*	DL*	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.	No	No effect/ No impact	No habitat present and no species observed during field survey.
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 habitat present and no species observed during field survey.
Interior Least Tern *Sterna antillarum athalassos*	E*	E	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony.	No	No effect/ No impact	No habitat present and no species observed during field survey.

Table 7: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County						
Species	**Federal Status**	**State Status**	**Description of Suitable Habitat**	**Habitat Present**	**Species Effect/ Impact**	**Justification**
Peregrine Falcon *Falco peregrinus*	DL*	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 effect/ No impact	No habitat present and no species observed during field survey.
Piping Plover *Charadrius melodus*	T*	T	Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats.	No	No effect/ No impact	No habitat present and no species observed during field survey.
Sprague's Pipit *Anthus spragueii*	C*		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 effect	No habitat present and no species observed during field survey.
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 habitat present and no species observed during field survey.
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	No habitat present and no species observed during field survey.
Whooping Crane *Grus americana*	E, EXPN	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	No habitat present and no species observed during field survey.
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	No habitat present and no species observed during field survey.

Table 7: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County						
Species	**Federal Status**	**State Status**	**Description of Suitable Habitat**	**Habitat Present**	**Species Effect/ Impact**	**Justification**
CRUSTACEANS						
A crayfish *Procambarus steigmani*	—		Burrower in long-grass prairie; all animals were collected with traps, thus there is no knowledge of depths of burrows; herbivore; crepuscular, nocturnal.	No	--	No habitat present and no species observed during field survey.
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.	No	--	No habitat present and no species observed during field survey.
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	Extirpated from Texas.
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 habitat present and no species observed during field survey.
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 habitat present and no species observed during field survey.
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	No habitat present and no species observed during field survey.
Texas heelsplitter *Potamilus amphichaenus*	—	T	Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.	No	--/No impact	No habitat present and no species observed during field survey.
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 habitat present and no species observed during field survey.

Table 7: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County						
Species	**Federal Status**	**State Status**	**Description of Suitable Habitat**	**Habitat Present**	**Species Effect/ Impact**	**Justification**
REPTILES						
Alligator snapping turtle *Macrochelys temminckii*	—	T	Perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October.	No	--/No impact	No habitat present and no species observed during field survey.
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	Might Impact	Potential impacts to habitat would be minor, and the potential for encountering the species during construction is low.
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	No habitat present and no species observed during field survey.
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	Might impact	Based on the survey, it was determined that the proposed project area adjacent to the outside lanes contains habitat for the state threatened timber/canebrake rattlesnake. However, these areas would not be impacted by the Build Alternative. The potential for encountering species during construction is low.
TPWD NDD RESULTS						
Eo Id 988 - Little Bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.
Eo Id 2718 - Little Bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.
Eo Id 2719 - Little Bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.

Table 7: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County						
Species	**Federal Status**	**State Status**	**Description of Suitable Habitat**	**Habitat Present**	**Species Effect/ Impact**	**Justification**
Eo Id 3578 - American Elm-chinkapin oak-hackberry Series (*Ulmus americana-quercus muhlenbergia-celtis spp. series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.
Lavon Lake Managed Area (USACE)					N/A	Managed Area more than 1.5 miles from the proposed project area.
E – State or Federal Listed Endangered EXPN – Experimental Population(s) of Reintroduced Individuals) T – State or Federal Listed Threatened C – Federal Candidate for Listing DL – Federally Delisted "–" – 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. Eo Id – Element Occurrence Identification Number N/A – Not applicable Note: For federal candidate species or species in the post-delisting monitoring period, the species was evaluated as if it were listed, but no consultation is required.						
Sources: USFWS (March 19, 2013), TPWD, Wildlife Division, Wildlife Division, Diversity and Habitat Assessment Programs, County Lists of Texas Special Species (Collin, February 28, 2011), and field investigation (November 12, 2012).						

5. Migratory Bird Treaty Act (MBTA)

The MBTA 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. Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structures that would be affected by the proposed project, and would complete any bridge work and/or vegetation clearing. 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. 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.

Evidence of migratory bird species, Eastern Phoebe (*Sayornis phoebe*), was found during the November 12, 2012, field survey. Bird nests were observed beneath the tributary to Rowlett Creek Bridge (**Appendix A**). Measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young.

6. *Magnuson-Stevens Fishery Conservation and Management Act*

The project is not located within a county that has tidally influenced water; therefore, the project area does not contain essential fish habitat.

7. Fish and Wildlife Coordination Act (FWCA)

All impacts to waters of the U.S. would be authorized under the U.S. Army Corps of Engineers (USACE) 404 Nationwide Permit (NWP) Program; therefore, the USFWS considers FWCA coordination to have been completed as part of the NWP's review last authorized and reissued in 2012.

8. Farmland Protection Policy Act (FPPA) and Soils

The proposed project is within the Blackland Prairie Natural Region, which was historically dominated by tallgrass prairie on uplands and deciduous bottomland woodland and forest along rivers and creeks. Fire and grazing bison maintained the prairie before early settlers moved in and introduced ranching and farming to the area. In the 1870s, with the advent of the railroad, large tracts of the prairie were transformed into cotton fields and the original flora and fauna of the prairie was quickly overtaken by agricultural crops and introduced grasses. Other crops historically grown in the area included wheat, cotton, corn and feed. The expansion of Dallas northward has triggered population growth in the region, with farmland being replaced by residential subdivisions.

Adjacent to the proposed project, one small parcel of land in McKinney is zoned as agricultural use. Land use within the project limits are predominantly zoned for residential and commercial use.

No additional ROW is required; therefore, the proposed project is exempt from the requirements of the FPPA and required no coordination with the Natural Resources Conservation Service (NRCS).

According to the NRCS Web Soil Survey, the soils underlying the Build Alternative consist of Austin silty clay, 1 to 3 percent slopes; Austin silty clay, 3 to 5 percent slopes, eroded; Eddy gravelly clay loam, 3 to 8 percent slopes, eroded; Houston Black clay, 0 to 1 percent slopes; Houston Black clay, 1 to 3 percent slopes; Lewisville silty clay, 3 to 5 percent slopes, eroded; and Stephen-Eddy complex, 3 to 5 percent slopes, eroded.

9. Invasive Species and Beneficial Landscaping

In accordance with EO 13112 on Invasive Species and the EM on Beneficial Landscaping, landscaping would be limited to seeding and replanting the ROW with native species of plants where possible. Soil disturbance would be minimized to reduce the establishment of invasive species in the ROW.

10. Texas Parks and Wildlife Department Coordination

Coordination with TPWD was required for the proposed project because it is within the range and in suitable habitat of a state-listed threatened species. Coordination with TPWD was initiated on June 5, 2013 and TPWD responded on June 20, 2013 with the finding that the proposed project, as described in the Technical Memorandum, is not anticipated to result in significant adverse impacts to rare, threatened or endangered species, or other fish and wildlife resources (**Appendix B**). Coordination between TxDOT and TPWD is concluded.

G. Water Resources

1. Section 404 of the Clean Water Act (CWA): Waters of the U.S. and Nationwide Permits

The proposed project crosses three tributaries to Rowlett Creek; one is ephemeral and two are intermittent. An analysis of USGS topographic maps, Federal Emergency Management Agency (FEMA) maps, field reconnaissance, and the presence of an ordinary high water mark (OHWM) reveals potentially jurisdictional waters of the U.S. that would be impacted by the proposed

project. Crossings 1 and 2 would not be impacted by the proposed project; however, bridge expansion would impact the intermittent tributary at Crossing 3. Crossing 3 has an OHWM of 6 feet. A summary of impacts is presented in **Table 8**. Refer to **Appendix A** for the project area photographs and to **Appendix C** for the stream data form.

Table 8: Impacts to Waters of the U.S.

Name of Water Body or other location indicator	Existing Structure	Proposed Work or Structure	Permanent Fill		Temporary Fill		NWP	PCN (Y/N)
			Open Waters (acres and linear feet)	Wetlands or other Special Aquatic Sites (acres)	Open Waters (acres and LF)	Wetlands or other Special Aquatic Sites (acres)		
Crossing 1 – Tributary to Rowlett Creek (ephemeral)	3-6'x3' Concrete box culvert	None	0	0	0	0	N/A	N/A
Crossing 2 - Tributary to Rowlett Creek (intermittent)	3-8'x4' concrete box culvert	None	0	0	0	0	N/A	N/A
Crossing 3 - Tributary to Rowlett Creek (intermittent)	92.9-foot long 3-span pre-stressed concrete beams	Addition of inside lanes and columns at bridge	0.0005 acre (10 LF)	0	0.012 acre (39 LF)	0	14	N

NWP – Nationwide Permit
PCN – Preconstruction Notification
LF – Linear Feet
Y/N – Yes/No

The purpose of the proposed activity is to widen the FM 2478 bridge at the tributary of Rowlett Creek (Crossing 3). Appropriate measures would be taken to maintain normal downstream flows and minimize flooding. Temporary fills would consist of materials and be placed in a manner that would not be eroded by expected high flows. Temporary fills would be removed in their entirety and the affected area returned to pre-construction elevations, and re-vegetated as appropriate. The activity would comply with all general and regional conditions applicable to NWP 14.

A PCN for NWP 14 at Crossing 3 – tributary of Rowlett Creek would not be required because the permanent and temporary impacts do not exceed 0.1 acre, no wetland or special aquatic site are present, and there is no potential to affect listed species or designated critical habitat, or any historic properties listed or eligible for listing on the NRHP.

The activities at the three tributaries of Rowlett Creek have been identified as single and complete projects as defined in the NWPs because each crossing occurs at a separate and distant location.

2. Section 401 of the CWA: Water Quality Certification

This project would not require a PCN; therefore, Section 401 Certification would not be required.

3. EO 11990, Wetlands

EO 11990 on wetlands does not apply because no wetlands will be impacted.

4. Rivers and Harbors Act of 1899, Section 10

This project does not involve work in or over a navigable water of the U.S.; therefore, Section 10 of the Rivers and Harbors Act does not apply.

5. Section 303(d) of the CWA

Runoff from this project would not discharge directly into a Section 303 (d) listed threatened or impaired water, or into a stream within five miles upstream of a 2010 Section 303 (d) listed threatened or impaired water.

6. Section 402 of the CWA: Texas Pollutant Discharge Elimination System (TPDES), Construction General Permit (CGP)

The Build Alternative would include five or more acres of earth disturbance. TxDOT would comply with the Texas Commission on Environmental Quality (TCEQ) TPDES CGP. A Storm Water Pollution Prevention Plan (SW3P) would be implemented and a construction site notice would be posted on the construction site. A Notice of Intent would be required. The SW3P utilizes the temporary control measures as outlined in the TxDOT's manual Standard Specifications for the Construction of Highways, Streets, and Bridges. 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 the Build Alternative.

7. Section 402 of the CWA: TPDES, Municipal Separate Storm Sewer System (MS4)

This project is located within the boundaries of the Phase II (Collin County Urbanized Areas of the Cities of Frisco and McKinney, Texas) MS4, and would comply with the applicable MS4 requirements.

8. Floodplains

Collin County and the Cities of Frisco and McKinney are participants in the National Flood Insurance Program. According to the FEMA Flood Insurance Rate Map No. 48085C0265 J (June 2, 2009), the proposed project is located within Zones A, AE, and X. Zone A is an approximate 100-year floodway area for which flood elevations have not been determined. Zone AE is an approximate 100-year floodway area for which base flood elevations have been determined. Zone X is areas determined to be outside the 500-year floodplain. The proposed project would not increase the base flood elevation to a level that would violate the applicable floodplain regulations or ordinances. The hydraulic design practices for this project would be in accordance with current TxDOT design policy and standards. The highway facility would permit conveyance of the design-year flood levels, inundation of the roadway being acceptable, without causing substantial damage to the highway, stream, or other property. Coordination with the local Floodplain Administrator would be required.

9. Trinity River Corridor Development Certificate (CDC)

This project is not within the Trinity River Corridor Development Regulatory Zone; therefore, a CDC would not be required.

10. General Bridge Act/Section 9 of the Rivers and Harbors Act (U.S. Coast Guard Permit)
This project does not involve work in or over a navigable water of the U.S.; therefore, Section 9 of the Rivers and Harbors act does not apply.

H. Noise Impacts

This analysis was accomplished in accordance with TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (2011).

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 "dB(A)."

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."

The traffic noise analysis typically includes 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 the following 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 (**Table 9**).

Table 9: Noise Abatement Criteria

Activity Category	FHWA dB(A) Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.

Table 9: Noise Abatement Criteria		
Activity Category	**FHWA dB(A) Leq**	**Description of Land Use Activity Areas**
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

A noise impact occurs when either the absolute or relative criterion is met:

Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the NAC. "Approach" is defined as one dB(A) below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dB(A) or above.

Relative criterion: 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 dB(A). For example: a noise impact would occur at a Category B residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. 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.

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 10** and **Figure 5**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

Table 10: Traffic Noise Levels dB(A) Leq						
Representative Receiver	**NAC Category**	**NAC Level**	**Existing**	**Predicted 2035**	**Change (+/-)**	**Noise Impact**
R1 - Restaurant	E	72	67	70	+3	No
R2 - Residential	B	67	58	63	+5	No
R3 - Residential	B	67	62	65	+3	No
R4 - Residential	B	67	54	58	+4	No
R5 - Residential	B	67	63	66	+3	Yes
R6 - Residential	B	67	61	64	+3	No
R7 - Apartment (Pool)	B	67	64	67	+3	Yes
R8 - Residential	B	67	63	66	+3	Yes
R9 - Residential	B	67	63	66	+3	Yes
R10 - School	D	52	40	44	+4	No

Table 10: Traffic Noise Levels dB(A) Leq						
Representative Receiver	**NAC Category**	**NAC Level**	**Existing**	**Predicted 2035**	**Change (+/-)**	**Noise Impact**
R11 - Residential	B	67	66	68	+2	Yes

As indicated in **Table 10**, 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.

Before any abatement measure can be proposed for incorporation into the project, it must be both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at greater than 50 percent of impacted, first row receivers by at least 5 dB(A); and to be "reasonable," it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least 5 dB(A) and the abatement measure must be able to reduce the noise level at least one impacted, first row receiver by at least 7 dB(A).

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) per 5 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 displace existing businesses and residences, require additional ROW and not be cost effective/reasonable.

Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receiver locations with the following results:

R5: This receiver represents a subdivision with existing 6-foot tall masonry walls that provide a sound level reduction. Due to the benefits provided by the existing developer walls, further noise mitigation that would achieve the minimum feasible reduction of 5 dB(A) for at least 50 percent of the first row receivers and the noise reduction design goal of 7 dB(A) for at least one first row receiver would exceed the reasonable, cost-effectiveness criterion of $25,000.

R7 This receiver represents an apartment complex with an existing 7-foot tall masonry wall that provides a sound level reduction. Due to the benefits provided by the existing developer walls, further noise mitigation that would achieve the minimum feasible reduction of 5 dB(A) for at least 50 percent of the first row receivers and the noise reduction design goal of 7 dB(A) for at least one first row receiver would exceed the reasonable, cost-effectiveness criterion of $25,000.

R8 and R9: these receivers are separate, individual residences. Noise barriers that would achieve the minimum feasible reduction of 5 dB(A) while achieving a 7 dB(A) noise reduction design goal at each of these receivers would exceed the reasonable, cost-effectiveness criterion of $25,000.

R11: This receiver represents a subdivision with existing 6-foot tall masonry walls that provide a sound level reduction. Due to the benefits provided by the existing developer walls, further noise mitigation that would achieve the minimum feasible reduction of 5 dB(A) for at least 50 percent of the first row receivers and the noise reduction design goal of 7 dB(A) for at least one first row receiver would exceed the reasonable, cost-effectiveness criterion of $25,000.

None of the above noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project.

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2035) noise impact contours.

Land Use	Impact Contour	Distance from ROW
NAC category B & C	66 dB(A)	44 feet
NAC category E	71 dB(A)	86 feet

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receivers is expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions will 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.

A copy of this traffic noise analysis will be available to local officials. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

I. Hazardous Waste/Substance

Based on the project activities, roadway and bridge expansion, an Initial Site Assessment (ISA) was conducted on January 2013 to identify potential hazardous materials in the project area. The ISA consisted of a review of project design and ROW requirements, a site survey, a land use review, and a limited database search. Additional information and/or reports are maintained in the district project file.

Petroleum Storage Tanks

Within the project limits, there are four registered petroleum storage tanks (RPST) facilities. One of the registered facilities is listed as a leaking petroleum storage tank (LPST) site. The site survey and research into the historical land use did not reveal any other abandoned and/or active gasoline service stations. There is no ROW acquisition or easements required for the proposed project. No substantial excavation is anticipated.

Leaking PSTs

Because excavation greater than three feet would be required, the LPST and RPST files for facilities adjacent to the project limits were reviewed. The review of TCEQ's database query indicated no LPST sites adjacent to the proposed project; however, two LPST sites were identified within a 0.5-mile radius. TCEQ issued the final concurrence for the two LPST sites and the cases are closed. No substantial excavation is anticipated and no substantial lowering

of the vertical alignment is required. Therefore, it is not anticipated that petroleum contamination would be encountered during construction.

Pipelines
During the site investigation, a gas pipeline was found to bisect the proposed project. The location of the pipeline can be found on **Figure 3**. No substantial excavation is anticipated and no substantial lowering of the vertical alignment is required at this location for the proposed project.

Asbestos Containing Materials (ACM)
The proposed project includes the renovation of one bridge. The bridge may contain ACM and shall be inspected to verify presence or absence of ACM. At least 10 working days prior to the bridge renovation, a 10-Day Notification shall be submitted to the Texas Department of State Health Services (DSHS).

Lead Based Paint (LBP)
One bridge would be renovated as part of the proposed project. The bridge consists of pre-stressed concrete beams and steel pedestrian sidewalk railings. The railings are located adjacent to outside lanes and would not be removed or renovated by the proposed project. However, prior to project letting, should the steel pedestrian railings require renovation or removal, they will be analyzed for the presence or absence of LBP. If the LBP is discovered, contingencies would be developed to address worker safety, material recycling and proper management of any paint related wastes, as necessary.

Any unanticipated hazardous materials encountered during construction would be handled according to applicable federal and state regulations per TxDOT Standard Specifications.

J. 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.

K. Construction Impacts
Construction impacts would consist of the addition of main lanes and sidewalks within the existing ROW. 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.

L. Air Quality Assessment
This project is located within Collin County, which is part of the Dallas-Fort Worth (DFW) area that has been designated by the U.S. Environmental Protection Agency (EPA) as a moderate non-attainment area for the eight-hour standard for the pollutant ozone and a small portion of Collin County is in non-attainment for lead. The conformity rules do apply.

The proposed action is consistent with the area's financially constrained MTP NCTCOG *Mobility 2035 – 2013 Update* and the 2013-2016 TIP. Both the MTP and TIP were found to conform to the TCEQ State Implementation Plan (SIP) by FHWA on July 19, 2013 and November 1, 2012, respectively. Copies of the MTP and TIP pages are included in **Appendix D**. All projects in the 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.

1. *Traffic Air Quality Analysis* (TAQA)

Traffic data for the design year 2035 is 59,800 vehicles per day (vpd). A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that a carbon monoxide standard would ever be exceeded as a result of any project with an average annual daily traffic (AADT) below 140,000. The AADT projections for the project do not exceed 140,000 vpd; therefore a TAQA was not required.

2. *Lead National Ambient Air Quality Standards (NAAQS)*

This project is located in the DFW ten-county, non-attainment area which is in attainment or unclassifiable for all NAAQS, except ozone and lead. A small portion of Collin County in the vicinity of the City of Frisco is in non-attainment for the lead NAAQS; however, this project is located outside that portion of Collin County in non-attainment for lead, effective December 31, 2010.

3. *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 project was developed from NCTCOG's operational CMP, which meets all requirements of 23 CFR 500.109. The CMP, first adopted in 2007 by NCTCOG RTC, was updated July 2013.

The region commits to operational management improvements and travel demand reduction strategies at two levels of implementation: program level and project level. Program level commitments are inventoried in the regional CMP, which was adopted by the NCTCOG; they are included in the financially constrained MTP, and future resources are reserved for their implementation.

The CMP element of the plan carries an inventory of all project commitments (including those resulting from major investment studies) that details type of strategy, implementing responsibilities, schedules, and expected costs. At the project's programming stage, travel demand reduction strategies and commitments will be added to the regional TIP or included in the construction plans. The regional TIP provides for programming of these projects at the appropriate time with respect to the single-occupancy vehicle (SOV) facility implementation and project-specific elements.

Committed congestion reduction strategies and operational improvements within the study boundary will consist of the individual projects listed in **Table 11**.

Table 11: Congestion Management Process Projects						
Street/Name	**City**	**County**	**Implementing Agency**	**Project Type**	**Year of Implementation**	**Total Project Cost**
Stonebrook Parkway from Dallas North Tollway (DNT) to SH 289	Frisco	Collin	Frisco	Addition of Lanes	2013	$11,666,560
CS from Phillips Creek Ranch Hike and Bike Trail to Stonebrook, Lebanon, and Lone Star Parkways	Frisco	Collin	Frisco	Bike/Pedestrian	2013	$5,382,706
DNT at Main St.	Frisco	Collin	Frisco	Intersection Improvements	2013	$255,900
SH 121 Frontage Road at Ohio Drive	Frisco	Collin	Frisco	Intersection Improvements	2013	$294,469
US 380 from FM 423 to Denton/Collin County Line	McKinney	Collin	TxDOT – Dallas	Addition of Lanes	2013	$14,277,120
SH 5 Corridor Planning Study from Northern City Limits to Southern Limits	McKinney	Collin	McKinney	Special Studies	2013	$156,250
Historic Flour Mill Catalyst TOD Louisiana Street from SH 5 to Various Streets	McKinney	Collin	McKinney	Bike/Pedestrian	2013	$2,200,000
Dallas Parkway/DNT Frontage Roads from SH 121 to Warren Parkway	Frisco	Collin	Frisco	Addition of Lanes	2014	$2,500,000
Frisco/North Texas Tollway Authority Fiberoptic Connection	Frisco	Collin	Frisco	ITS	2015	$326,098
Main Street From FM 423 to DNT	Frisco	Denton	Frisco	Addition of Lanes	2015	$5,166,700
US 380 from Bois d'Arc to West of Lake Forest Drive	McKinney	Collin	TxDOT – Dallas	Addition of Lanes	2015	$9,865,371
Allstar Avenue from DNT to Frisco Street	Frisco	Collin	Frisco	New Roadway	2016	$715,957
Lebanon Road from Coit Road to Independence Parkway	Frisco	Collin	Frisco	Addition of Lanes	2016	$12,798,740

Table 11: Congestion Management Process Projects						
Street/Name	**City**	**County**	**Implementing Agency**	**Project Type**	**Year of Implementation**	**Total Project Cost**
DNT at BNSF railroad	Frisco	Collin	Frisco	Park & Ride Rail Station	2016	-
Source: NCTCOG TIPINS, http://www.nctcog.org/trans/tip/tipins/, January 2013.						

In an effort to reduce congestion and the need for SOV lanes in the region, TxDOT and NCTCOG will continue to promote appropriate congestion reduction strategies through the Congestion Mitigation and Air Quality program, the CMP, and the MTP. The congestion reduction strategies considered for this project would help alleviate congestion in the SOV study boundary, but would not eliminate it.

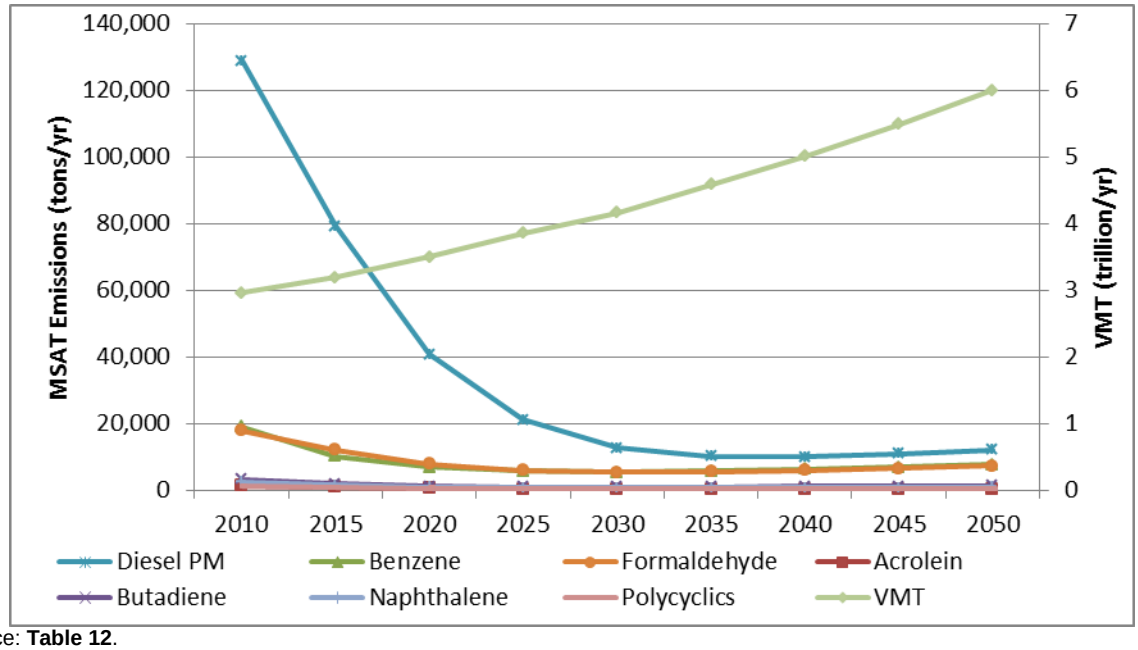
Therefore, the proposed project is justified. The CMP analysis for added SOV capacity projects in the Transportation Management Area is on file and available for review at NCTCOG.

4. Mobile Source Air Toxics (MSATs)

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA MSAT rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Based on an FHWA analysis using EPA's MOVES2010b model, as shown in **Graphic 1** and **Table 12**, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Graphic 1:
PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050
FOR VEHICLES OPERATING ON ROADWAYS
USING EPA's MOVES2010b MODEL



Source: **Table 12**.

Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Table 12: Projected National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways Using EPA's MOVES2010b Model

Pollutant / VMT	Pollutant Emissions (tons) and Vehicle-Miles Traveled (VMT) by Calendar Year									Change
	2010	2015	2020	2025	2030	2035	2040	2045	2050	2010 to 2050
Acrolein	1,244	805	476	318	258	247	264	292	322	-74%
Benzene	18,995	10,195	6,765	5,669	5,386	5,696	6,216	6,840	7,525	-60%
Butadiene	3,157	1,783	1,163	951	890	934	1,017	1,119	1,231	-61%
Diesel PM	128,847	79,158	40,694	21,155	12,667	10,027	9,978	10,942	11,992	-91%
Formaldehyde	17,848	11,943	7,778	5,938	5,329	5,407	5,847	6,463	7,141	-60%
Naphthalene	2,366	1,502	939	693	607	611	659	727	802	-66%
Polycyclics	1,102	705	414	274	218	207	219	240	262	-76%
Trillions VMT	2.96	3.19	3.5	3.85	4.16	4.58	5.01	5.49	6	102%

Source: EPA MOVES2010b model runs conducted during May – June 2012 by FHWA.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the NEPA. The FHWA, EPA, the Health Effects Institute (HEI), and others have funded and conducted research studies to try to more clearly define potential risks from

MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

Project-Specific MSAT Information

A qualitative analysis provides 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:
http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.pdf

For each alternative in this document, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build Alternative 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 preferred 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 MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Also, 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 annual MSAT emissions by over 80 percent between 2010 and 2050. 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.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the HEI. Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the

adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA’s approach to addressing risk in its two step decision framework.

Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable. Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to

decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Conclusion

In this document, a qualitative MSAT assessment has been provided relative to the various alternatives of MSAT emissions and has acknowledged 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.

5. Air Quality Construction Emissions Reduction Strategies

During the construction phase of this project, temporary increases in air pollutant emissions may occur from construction activities. The primary construction-related emissions are particulate matter (fugitive dust) from site preparation. These emissions are temporary in nature (only occurring during actual construction); it is not possible to reasonably estimate impacts from these emissions due to limitations of the existing models. However, the potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures such as covering or treating disturbed areas with dust suppression techniques, sprinkling, covering loaded trucks, and other dust abatement controls, as appropriate.

The construction activity phase of this project may generate a temporary increase in MSAT emissions from construction activities, equipment and related vehicles. The primary MSAT construction related emissions are particulate matter from site preparation and diesel particulate matter from diesel powered construction equipment and vehicles.

However, considering the temporary and transient nature of construction-related emissions, as well as the mitigation actions to be utilized, it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

M. Indirect Impacts

The Council on Environmental Quality (CEQ) defines indirect impacts 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 impacts 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.

The National Cooperative Highway Research Program (NCHRP) Report 466, *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* and the TxDOT *Guidance on Preparing Indirect and Cumulative Impact Analyses (*revised September 2010*)* were used to analyze potential indirect impacts of the proposed project. The TxDOT *Guidance on Preparing Indirect and Cumulative Impact Analyses* outlines seven steps that should be followed when determining the indirect impacts 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 the Proposed Action and Alternatives
5. Identify Potentially Substantial Indirect Impacts for Analysis
6. Analyze Indirect Impacts and Evaluate Results
7. Assess Consequences and Consider/Develop Mitigation (as appropriate)

Step 1: Scoping

The proposed project is located in southwestern Collin County, within the Cities of Frisco and McKinney. **Table 13** introduces the level of effort determined for the indirect impacts analysis through the scoping process.

Table 13: Level of Effort Required for Indirect Impacts Analysis

Project Variables		Assessment Methodology
Project Type	The proposed project is an expansion of an existing 2.95-mile roadway. Large projects such as transit and large intermodal project and new location roadways require more complex assessment methodology. Because this is a smaller scale project with no required additional ROW, a qualitative approach is sufficient. According to Figure 3-1 (Factors to Consider when Matching Methodologies to Project Type) on page 27 of *NCHRP Report 466*, "sketch qualitative measures may suffice for a small roadway widening but would be insufficient for a new highway". Quantitative data would be used in instances where applicable data is available.	Qualitative
Project Scale	The proposed project is approximately 2.95 miles in length and additional ROW would not be acquired. The proposed project is a pass thru funded project with an estimated construction cost of $8,276,651 as of January 18, 2013. According *NCHRP Report 466*, "smaller projects, as measured in budget or level of complexity, are more often analyzed with qualitative methods, while larger projects are amenable to more detailed quantitative approaches." Because of the small scale/complexity of the proposed project and overall medium project cost/budget, a qualitative approach would be utilized in the analysis. Quantitative data would be used in instances where the applicable data is available.	Qualitative
Project Scope	The proposed project extends from SH 121 to Stonebridge Drive in the Cities of Frisco and McKinney in Collin County, Texas. According to *NCHRP Report 466*, "regional projects would require more complex quantitative methods than local projects, system planning projects may be suited to qualitative or quantitative efforts based on setting and data available." Because this is a local project, a qualitative effort would be utilized in the assessment. Quantitative data would be used in instances where applicable data is available.	Qualitative
Stage of Study	According to *NCHRP Report 466*, "as alternatives are described in better detail, impacts must be analyzed more thoroughly and precisely." A quantitative assessment would be utilized for the proposed project because the design alternatives have been studied in great detail, the specific design has been identified, and the direct impacts have been quantified."	Quantitative
Project Setting	The proposed project is located in the Cities of Frisco and McKinney in Collin County, Texas. According to *NCHRP Report 466*, "projects in urban areas with low levels of growth may be analyzed with qualitative measures. Quantitative measures may be required in less urban areas such as suburbs or particularly the urban fringe with high levels of growth and environmental sensitivity. Rural settings where development pressure is thought to be low may require only sketch qualitative analysis." Because the proposed project is in a suburban fringe/rural area with high levels of projected growth, quantitative data would be used in instances where applicable data is available.	Quantitative

Table 13: Level of Effort Required for Indirect Impacts Analysis		
Project Variables		**Assessment Methodology**
Design Features	The proposed project is the expansion of a four-lane divided urban roadway to a six-lane divided urban roadway from SH 121 to Stonebridge Drive. The 2.95-mile improvements would include the addition of sidewalks and the expansion of an existing bridge at the tributary to Rowlett Creek crossing. The Build Alternative would add a single 11-foot wide inside lane and incorporate a 14-foot wide outside shared use lane in each direction to the existing roadway, creating two 11-foot wide lanes and one 14-foot shared use lane in each direction with one-foot inside lane and two-foot outside lane offsets. The curb and gutter roadway would also include 11-foot wide left turn lanes and minimum median width of 7 feet. According to *NCHRP Report 466*, "projects with high levels of access controls (I.e. widely spaced interchanges) are likely to require a lower level of analysis since any induced development is likely to be focused at access points. Similarly, projects that do not provide additional capacity are unlikely to change accessibility and therefore require a lower level of analysis that can be qualitative in nature." Because the proposed project is adding capacity with reduced access due to the presence of median, a qualitative analysis would be conducted. Quantitative data would be used in instances where applicable data is available.	Qualitative
Project Purpose	The purpose of the proposed project is to provide better mobility and bring the existing roadway up to current design standards. According to *NCHRP Report 466*, "projects designed only to relieve congestion may not need extensive analysis if they do not significantly change local or regional accessibility. Projects planned to serve existing development require a detailed assessment of the effects of that development. Projects intended to promote regional development must describe the nature and effects of that development." Because the proposed project would not substantially change local (not a new roadway) or regional accessibility or promote regional development, a qualitative level of effort would be utilized for the analysis.	Qualitative
Data Available	According to *NCHRP Report 466*, "the type of data available may have more influence on approach than other factors. Some of the more complex quantitative methods require detailed parcel level data in computer readable form, information not available in all cases." Qualitative/quantitative methodologies such as interviews with Cities of Frisco and McKinney's engineering and planning officials and data collection from maps, planning documents, demographics, and site reconnaissance would be utilized. Quantitative data would be used in instances where the applicable data is available.	Qualitative/ Quantitative
Note: Based on rationale provided in Figure 3-1 on page 27 of NCHRP Report 466.		

Various methods can be implemented to determine the most accurate study area or Area of Influence (AOI) associated with potential indirect effects caused by a proposed project. According to TxDOT's guidance on analyzing indirect effects, there are four preferred methods for determining the AOI: 1) adopting political/geographic boundaries, 2) using the project's commuteshed, 3) using watershed or habitat boundaries, or 4) incorporating data from stakeholder interviews or public involvement. Two of the four methods were employed for this analysis: adopting political/geographic boundaries and using habitat boundaries. The AOI boundary for this analysis consists of the sub-basins associated with Rowlett Creek and West Rowlett Creek within the area that extends north of Eldorado Parkway, east of Alma Road, and west along Independence Parkway. These sub-basins were selected as the north, east and west boundaries of the AOI because they serve as a natural barrier to indirect effects. The AOI also extends along SH 121 to the south. SH 121 was selected as the southern boundary because it is a major roadway/tollway and serves as the southern political boundary for the Cities of Frisco and McKinney within the proposed project area. Therefore, it is unlikely that

indirect impacts from the proposed project would extend south of SH 121. There are approximately 5,305 acres within the AOI (**Figure 7**).

Temporal boundaries for the indirect effects extend from construction of the proposed project until 2035, the end of the current MTP planning cycle. The planning cycle of the City of Frisco's comprehensive plan extends to the growth and development to the year 2026 and beyond and the planning cycle of the City of McKinney's comprehensive plan intended to direct the long-term physical development and growth of the city to the year 2020.

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

The City of Frisco

Between 1990 and 2000, the City of Frisco's population increased 449 percent and continued growth has occurred for the past years. The city's population is projected to increase 114 percent from 71,330 residents in 2010 to 152,721 residents in 2040. According to U.S. Census Bureau data in 2000 and 2011, the percentage of the population age 16 years and over that was in the labor force stayed consistent at approximately 78 percent. In both years, the dominant occupation was 'management, professional and related occupations' and the dominant industry was 'professional, scientific, and management, and administrative and waste management services'. The median household income increased 34 percent, from $79,149 in 2000 to $105,647 in 2011 (*Census 2000* and *2007-2011 ACS*). According to the *2002* and *2007 Economic Census'*, retail trade recorded the greatest number of establishments (254 and 421, respectively) and greatest number of paid employees (4,744 and 7,750, respectively).

According to aerial photography from 2001, approximately 40 percent of the land in Frisco appeared to be developed and the majority of development within Frisco was single-family residential. Residential subdivisions were found predominately in south-central Frisco, between the Burlington Northern Railroad and Coit Road. Commercial/office/retail development was located primarily adjacent to major roadways (SH 121, US 289, and Main Street). Today, nearly three-quarters of the land within Frisco appears to be developed. Residential subdivisions continue to dominate developed land in the city. Tracts of undeveloped land are present in eastern and far-northern Frisco. Commercial/office/retail development has expanded, also being present along Dallas North Tollway. The western half of the AOI comprises of the City of Frisco. Several residential subdivisions are present in the city within the AOI. Based upon aerial photography, it appears that the majority of these subdivisions are built out except for the southern section of the Villages of Stonelake Estates. It can also be determined from aerial photography and a field visit on November 12, 2012, that new subdivisions are currently under construction. Agricultural and vacant lands exist within the AOI.

The City does not have established goals specific for the AOI; however, the city's general principles and actions include:

- Encourage the most desirable, efficient use of land while maintaining and enhancing local aesthetics.
- Encourage a balance of land uses to serve the needs of citizens and to ensure a diverse economic base.
- Ensure that land use recommendations for development and redevelopment respect environmental factors and support innovative development.
- Establish land use policies that support the maintenance and enhancement of downtown Frisco.

- Support the creation of unique residential properties and retailing to encourage long-term stability and reinvestment.
- Reinforce the vision of Frisco as a city of excellence for residents and businesses.
- Review the city's development standards and examine ways in which such standards can be improved to achieve increased livability and sustainability.
- Encourage the development of quality housing throughout the city that meets a diversity of housing needs, for the full life-cycle of citizens.
- Recognize the importance of existing neighborhoods to the character of Frisco by implementing policies that will support their long-term sustainability and livability.
- Recognize the importance of continually ensuring that Frisco will be a safe community.
- Ensure that the city's transportation system is cost-effective and adequate to meet the needs of the current and projected population.
- Plan for transportation needs according to the type of development that is anticipated to be developed in the future.
- Identify how alternative modes of transportation can be incorporated in Frisco.
- Work with adjacent cities and county and state governmental entities on efforts to maintain and/or expand the transportation system.
- Employ smart growth principles to help ensure the city's future sustainability.
- Prioritize potential growth areas within the city and within the city's limited extraterritorial jurisdiction (ETJ).
- Establish a population growth model that will help the city meet needs on the basis of an officially calculated and anticipated growth rate and ultimate population.

The City of Frisco's Interactive Zoning Map (accessed January 2013) shows that the currently undeveloped land in the AOI is zoned Commercial, Multi-Family, Retail, Single-Family Residential, Townhomes, and Two-Family (Duplex).

The City of McKinney

Between 1990 and 2000, the City of McKinney's population increased 155 percent and continued growth has occurred for the past years. The city's population is projected to increase 169 percent from 130,000 residents in 2010 to 350,000 residents in 2040. According to U.S. Census Bureau data, in 2000 and 2011, the percentage of the population age 16 years and over that was in the labor force stayed consistent at approximately 70 percent. In both years, the dominant occupation was 'management, professional and related occupations'. The dominant industry in 2000 was 'manufacturing' and was 'educational services, and health care and social assistance' in 2011. The median household income increased 28 percent, from $63,366 in 2000 to $80,855 in 2011 (*Census 2000* and *2007-2011 ACS*). According to the *2002* and *2007 Economic Census'*, professional, scientific, and technical services recorded the greatest number of establishments (202 and 303, respectively). In 2002, the manufacturing industry held the greatest number of paid employees (5,839) and in 2007, retail trade held the greatest number of paid employees (6,504).

According to aerial photography from 2001, approximately 50 percent of the land in McKinney appeared to be developed and the majority of development within McKinney was single-family residential. Single family-residences were found primarily in eastern McKinney, encompassed by University Drive, Airport Drive, Industrial Boulevard, and US 75. Residential subdivisions were found predominately in central McKinney, encompassed by Custer Road, Virginia Parkway, Airport Drive, and McKinney Ranch Parkway. Commercial/office/retail/industrial development was located primarily adjacent to major roadways (US 75, SH 5, and Industrial Boulevard). Today, over three-quarters of the land within McKinney appears to be developed.

Residential subdivisions continue to dominate developed land in the city. Tracts of undeveloped land are present in far-eastern and far-northern McKinney. Commercial/office/retail development has expanded, also being present along Custer Road and SH 121. The eastern half of the AOI comprises of the City of McKinney. Land use in the AOI within the city is residential (single and multi-family), retail, office, golf course, and vacant land. Several residential subdivisions are present in the city within the AOI. It can also be determined from aerial photography and a field visit on November 12, 2012, that new subdivisions are currently under construction.
The city does not have established goals specific for the AOI; however, the city's goals include:

- Economic development vitality for a sustainable and affordable community.
- Preservation of historic McKinney.
- Attractive hometown that promotes McKinney's character.
- Leisure and recreational opportunities for residents.
- Financially sound city government.
- Utility and infrastructure systems (water supply, wastewater treatment, storm drainage, etc.) adequately serving existing and future residents, businesses, and visitors.
- A multi-modal transportation network that is clean, safe, and efficient attractive urban design elements (gateways, corridor treatments, edges, and view sheds).
- A multi-modal transportation network that is clean, safe, and efficient.
- Attractive urban design elements (gateways, corridor treatments, edges, and view sheds).
- Public safety services consistent with community values.
- A managed traffic flow and thoroughfare system.
- Land use compatibility and mix.
- Protect environmental resources of McKinney.
- Affordable city services that enhance the quality of life.
- A well-planned future.

The AOI is located in the western sector and regional employment center of the city's Future Land Use Plan map. The anticipated land use in the AOI includes low density residential, commercial, office and mixed-used. Based upon aerial photography and site visits on November 12, 2012, this land is currently vacant but is a part of the Craig Ranch. Craig Ranch is a 2,200-acre master-planned business, retail, and residential community.

The NCTCOG *Mobility 2035 – 2013 Update* MTP defines transportation systems and services in the area containing the boundaries of the AOI. 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

Public Facilities
Public Facilities found within the AOI include Sam and Ann Roach Middle School, Lucille Rogers Ashley Elementary School, Independence High School, Dr. J. M. Ogle Elementary School, Liberty High School, Bert and Eloise Isbell Elementary School, Bill Vandeventer Middle School, Foncine Settlement Park, Stephen's Green Park, Independence/Rolater Park, Taychas Trail, Limestone Quarry Park, Gabe Nesbitt Community Park, Tom Allen Jr. Park, Rowlett Creek Park, Veterans Memorial Park, and Methodist McKinney Hospital.

Community Facilities

Legacy Learning Center, Children's Montessori Academy, Xplor, Daffadolis Preschool, Baybrooke Village Care and Rehab Center, and Stonefield Assisted Living are community facilities found within the AOI.

Religious worship facilities include Jubilee Church, Rejoice Lutheran Church, The Ranch Community Church, Karya Siddhi Hanuman Temple, and Redeemer Presbyterian Church.

Cultural Resources/Socio-Economic Resources

No NRHP neighborhoods, NRHP properties, or historical markers are found in the AOI. Census BGs 305.121, 305.122, 305.222, 305.292, 305.234, 305.111, 305.312, 305.291, 305.171, 305.162, 305.182, 305.181, 314.051, 305.235, 316.41, 305.172, and 305.131 encompass the AOI and the 2010 Census indicated a combined population of 34,921. Approximately 67 percent of the BGs are White, nine percent are Black or African American, 10 percent are Hispanic or Latino, nine percent are Asian, one percent are American Indian and Alaska Native, one percent are Native Hawaiian and Other Pacific Islander, one percent are some other race, and two percent are two or more races. Approximately four percent of the BGs live below the poverty level. Windshield surveys, conducted on November 12, 2012, did not provide any evidence against these statistics and no readily identifiable minority or low-income groups were found in the area.

Natural Resources

Rowlett Creek, West Rowlett Creek, and unnamed tributaries to Rowlett Creek and West Rowlett Creek are found within the AOI. Agricultural/vacant land is present in the central-western portion of the AOI. Based on aerial mapping, approximately 91.6 acres of riparian habitat, 143.4 acres of bottomland hardwoods, 1,842.3 acres of farmland, 52 acres of fence row trees, 144.2 acres of upland woodlands, and 483.6 acres of undeveloped land/herbaceous vegetation are present within the AOI. Based on the vegetation found within the AOI, state and federally listed threatened and endangered species, and state listed species of concern and their corresponding habitat are likely found within the AOI. These species may include the Bald Eagle, Western Burrowing Owl, plains spotted skunk, fawnsfoot, little spectaclecase, Louisiana pigtoe, Texas heelsplitter, Wabash pigtoe, Texas garter snake, and timber/canebrake rattlesnake.

The notable features are presented in **Figure 7**.

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

A thorough understanding of project design features and the range of impacts they might cause is the first step toward the identification of encroachment-alteration and access-alteration indirect effects. The impact-causing activities from the proposed project are discussed below:

Modification of Regime – The total footprint of the proposed project is approximately 46 acres. Impacts to vegetation would total 15.32 acres. Of the 15.32 acres, approximately 15.30 acres of maintained herbaceous vegetation and 0.02 acre of unmaintained herbaceous vegetation would potentially be impacted and transformed into pavement. There would not be a substantial modification to the existing habitat because of the construction of the proposed project.

As shown in **Table 8**, approximately 0.0005-acre of impact would occur within the waters of the U.S. that cross FM 2478 due to the addition of columns from the widening of the existing bridge.

This impact is not substantial and is not anticipated to alter the hydrology of the stream. Section 404 General Conditions associated with the NWP 14 would be observed.

Land Transformation and Construction – The proposed project involves widening FM 2478 from a four-lane divided urban roadway to a six-lane divided urban roadway. Expansion would occur within the existing median and no additional ROW or easements would be required. No support or ancillary facilities would be constructed as part of the proposed project.

Resource Extraction – Approximately 12 acres and 18,869 cubic yards of surface excavation would be required to construct the new roadway. Approximately five percent of the excavated soil would be used as fill for the proposed project.

Processing – 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 left-turn lanes would decrease congestion at the various neighborhood entrances and cross streets.
The air quality in the AOI is currently considered in poor or declining health because it is within the moderate non-attainment area for ozone.

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

Chemical Treatment – Periodic applications of herbicide may occur during the maintenance phase of the proposed project.

Access Alteration – The proposed project would provide improved access to subdivisions, commercial facilities and public facilities adjacent to FM 2478 because of the addition of dual left-turn lanes and addition of travel lanes.

Step 5: Identify Potentially Substantial Indirect Impacts for Analysis

The objective of this step is to compare the list of proposed impact-causing activities with the list of goals discussed in Step 2 and notable features discussed in Step 3. This step would explore potential cause-effect relationships and establish which effects are potentially substantial and merit subsequent indirect effects analysis (**Table 14**).

Table 14: Comparison Between Impact-Causing Activities and Goals and Notable Features		
Impact-Causing Activity (Direct Impact)	**Would an Impact-Causing Activity Hinder Pursuit of Goals Listed in Step 2? (Yes/No)**	**Would an Impact-Causing Activity Impact a Notable Feature Listed in Step 3? (Yes/No)**
Modification of Regime	No	No
Land Transformation and Construction	No	No
Resource Extraction	No	No
Processing	N/A	N/A
Land Alteration	No	No
Resource Renewal	No	No
Changes in Traffic	No	No
Waste Emplacement and Treatment	No	No
Chemical Treatment	No	No
Access Alteration	No	No
N/A – Information not available.		

As shown in **Table 14**, there would be no substantial impacts to the notable features identified within the AOI as a result of the proposed project.

Three types of indirect effects are discussed in NCHRP Report 466.

- *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.

Ecological Effects: Possible ecological effects include habitat fragmentation, degradation of habitat, disruption of natural processes, pollution effects on species, and disruption of ecosystem functioning. The proposed project would be constructed within existing ROW and easements where no new habitat fragmentation would occur. The vegetation within the ROW and easements consists of predominantly low quality maintained and unmaintained herbaceous species. No other indirect impacts to the ecological system are anticipated. Impacts to the surrounding ecosystem's carrying capacity are not anticipated; therefore, there would be no impact to current species population levels. The proposed project is not anticipated to cause indirect air quality impacts in the AOI and no change in attainment status is anticipated within the AOI as a result of emissions associated with the proposed project. Ecological encroachment-alteration effects will not be discussed in Steps 6 and 7.

Socioeconomic Effects: No direct encroachment effects such as changes in travel patterns and access, or relocation or alteration of homes, businesses, or public facilities would occur. Therefore, no adverse socioeconomic indirect effects such as neighborhood cohesion or stability, travel patterns and access, perceived quality of the natural environment, safety and

privacy, or aesthetic and cultural values is anticipated. Socio-economic encroachment-alteration effects will not be discussed in Steps 6 and 7.

Induced Growth Effects

The City of Frisco

The City of Frisco's Interactive Zoning Map (accessed January 2013) shows that the currently undeveloped land in the AOI is zoned Commercial, Multi-Family, Retail, Single-Family Residential, Townhomes, and Two-Family (Duplex).

According to the City of Frisco Engineering Department, the proposed project is not anticipated to induce development or increase the rate of existing development in the AOI. Development in the AOI is driven by population growth and would occur with or without the proposed project. This undeveloped land totals approximately 944.7 acres.

The City of McKinney

The City of McKinney's Interactive Zoning Map (accessed January 2013) shows that currently undeveloped land within the AOI is primarily zoned Planned Development with one parcel zoned Agriculture. Craig Ranch, a master-planned community, occupies much of the AOI within the City of McKinney and is where the majority of the Planned Development zoning occurs. Planned Development within Craig Ranch consists of Commercial, Employment Center, Mixed Use, Multi-Family, Recreation Facilities, and Single Family designations. Areas in the City of McKinney zoned Planned Development outside of the Craig Ranch development consist of Multi-Family, Neighborhood Businesses Uses, Office, Open Space, Regional Employment Center Overlay District, and Retail designations.

According to the City of McKinney Planning Department, the proposed project is not anticipated to induce development or increase the rate of existing development in the AOI. All vacant land within the City of McKinney portion of the AOI is already planned for development and is forecast to be completed within five to 10 years regardless of the proposed project. This undeveloped land totals approximately 361.9 acres. Because this undeveloped land is already planned and platted, the 361.9 acres is considered a foreseeable action and will not be analyzed for potentially induced development.

Approximately 82.2 percent (4,360.5 acres) of the AOI is developed, under construction, or is planned future development. This leaves approximately 17.8 percent (944.7 acres) within the AOI available for development.

Although discussions with planners in the Cities of Frisco and McKinney indicated that the proposed project would not be a driving force for new development; the proposed project would be a contributing factor by improving commutability to currently undeveloped land, which could potentially increase the rate of development in the City of McKinney portion of the AOI. In addition, there is still the potential that the proposed project could induce development in the City of Frisco portion of the AOI. Therefore, 944.7 acres of potentially induced development in the City of Frisco will be carried forward in the analysis.

Effects Related to Induced Growth

The 944.7 acres of potentially induced development in the AOI would impact vegetation and wildlife habitat, and has the potential to impact waters of the U.S. Therefore, vegetation and wildlife habitat effects related to induced development will be carried forward in the analysis. It is not anticipated that other notable features such as public facilities, community facilities, cultural resources, or economic resources would be impacted.

The AOI is part of the EPA designated 10-county non-attainment area for ozone. The AOI is currently in attainment for all other NAAQS pollutants. 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 DFW 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 volatile organic compounds and nitrogen oxide. As the proposed project is not anticipated to result in indirect air quality impacts, further discussion in Steps 6 and 7 below is not necessary.

Step 6: Analyze Indirect Impacts and Evaluate Results

Induced Growth Effects

Currently, approximately 82.2 percent (4,360.5 acres) of the AOI is developed, under construction, or has planned future development. This leaves approximately 17.8 percent (944.7 acres) of land within the AOI available for development. Discussions with city planners and the use of future land use and zoning designations from city maps aided in categorizing the type of development that could potentially occur within the undeveloped areas.

Effects Related to Induced Growth

The estimated 944.7 acres of induced development would result in impacts to vegetation, threatened/endangered species and their associated habitat, and water resources. Based on aerial mapping, approximately 91.6 acres of riparian habitat, 143.4 acres of bottomland hardwoods, 1,842.3 acres of farmland, 52 acres of fence row trees, 144.2 acres of upland woodlands, and 483.6 acres of undeveloped land/herbaceous vegetation are present within the AOI.

Approximately 21.8 acres (24 percent) of riparian vegetation, 28.8 acres (20 percent) of bottomland hardwoods, 788.7 acres (43 percent) of farmland, 18.5 acres (36 percent) of fence row trees, 59.2 acres (41 percent) of upland woodlands, and 26.2 acres (five percent) of undeveloped land/herbaceous vegetation within the AOI could be impacted by induced development.

Within the AOI there are approximately 14.7 miles of streams, 3.6 acres of wetlands, and 15.4 acres of open waters/ponds. Approximately 3.9 miles (27 percent) of streams, 0.8 acre (22 percent) of wetlands, and 0.7 acre (five percent) of open waters/ponds within the AOI could be impacted by induced development.

Step 7: Assess Consequences and Consider/Develop Mitigation, (as Appropriate)

Induced Growth Effects

Induced growth effects associated with the Build Alternative would impact approximately 17.8 percent of the AOI. The induced growth and associated effects are consistent with the goals/trends for the AOI. Land development activities would be regulated by the local municipalities. The mitigation of the potential development within the AOI considered for this assessment would be the responsibility of the agencies with the authority to implement such controls. This authority rests with the municipal governments and, to a lesser extent, the county. Examples of municipal government regulations include tree ordinances and development code. The responsibility of transportation providers such as TxDOT, local and regional transit agencies, and the local governments would be to implement a transportation system to complement the land use.

Effects Related to Induced Growth

Avoidance or minimization of impacts to waters of the U.S. and wetlands should be performed during the development design phase so that only the least amount of impact occurs. Mitigation is only conducted when impacts to waters of the U.S. and wetlands cannot be avoided. Typical mitigation for impacts to waters of the U.S. includes the construction of mitigation areas or purchasing credits from a mitigation bank. Mitigation is frequently conducted as one of the requirements for obtaining a Section 404 permit. The USACE decides what the ratio of the mitigation area would be relative to the acreage of impacts to waters of the U.S. A typical mitigation ratio is three times the amount of acreage impacted, while the minimum mitigation ratio is one time the amount of acreage impacted (i.e. 1:1 ratio). A mitigation bank is a wetland, stream, or other aquatic resource area that has been restored, established, enhanced, or in certain circumstances, preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources permitted under Section 404 or a similar state or local wetland regulation. Mitigation banks are used in situations where the construction of a mitigation area is not practical. Mitigation banks are a form of “third-party” compensatory mitigation, in which the responsibility for compensatory mitigation implementation and success is assumed by a party other than the permittee. The USACE would have jurisdiction over mitigation activities for impacts to waters of the U.S., and as such, would determine the mitigation responsibilities of the developers.

The implementation of water pollution abatement control measures, such as BMP’s used to address erosion, sedimentation, and post-construction TSS control would help to mitigate impacts to water quality during and after the construction of potential new developments. Providing or enhancing vegetative buffers along streams and ponds would provide some filtration to storm water runoff and help to mitigate impacts to water quality.

Incorporating parks, open spaces, and riparian corridors within and around potentially developed areas would provide wildlife habitat and shelter. Planting these areas with native grain-bearing grasses, and native fruit or nut-bearing trees and shrubs would provide food for wildlife, and would help to mitigate impacts to habitat used by threatened/endangered species and other wildlife.

N. Cumulative Impacts

The CEQ defines cumulative impacts as those which result from the incremental impact of the action when added to other current and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. As such, it may be difficult to understand the role that a proposed action may have in contributing to the overall or cumulative impacts to an area or resource.

In order to conduct the cumulative impact analysis, it was essential to build on information derived from the direct and indirect impacts analyses. TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses* (revised September 2010) 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 effects 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 effects of the proposed action or the eventual decisions." Thus, the cumulative effects analysis should focus only on those resources that are substantially directly or indirectly affected by the proposed project or are in poor/declining health.

In accordance with TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses* (revised September 2010), this analysis follows the following recommended approach:

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 of each resource
4. Identify direct impacts and/or the indirect effects that may contribute to cumulative impact
5. Identify other reasonably foreseeable actions that may affect resources
6. Assess the potential cumulative impacts to each resource
7. Report the results
8. Assess and discuss mitigation issues for adverse impacts

Step 1 – Identify Resources to Consider in the Analysis

The proposed project's cumulative impacts were narrowed down by carrying forward the direct and indirect impacts that may contribute to a cumulative impact. The cumulative impacts analysis focused on resources substantially impacted by the proposed project and resources in poor or declining health or at risk that are directly or indirectly impacted by the proposed project. The resources which were evaluated for direct and indirect impacts are listed in **Table 15**. The table summarizes the direct and indirect impacts anticipated for each resource and identifies whether or not the resource is carried forward for cumulative impacts analysis. As shown in the table, the following resources are candidates for cumulative impacts analysis: vegetation and wildlife habitat, farmland, waters of the U.S., and air quality. These resources were analyzed to identify adverse effects from cumulative impacts.

Table 15: Resources to be Evaluated in the Cumulative Impacts Analysis					
Resource or Topic Evaluated		**Direct Effects**	**Indirect Effects**	**Carried Forward for Cumulative Effects Analysis**	**Reason for Elimination**
Socio-economics	Community Cohesion	No direct impacts to community cohesion are anticipated.	Indirect effects associated with community cohesion are not anticipated.	No	No adverse direct or indirect impacts to community cohesion would occur because of the Build Alternative.
	Environmental Justice	No disproportionately high or adverse direct impacts.	Indirect effects associated with minority or low-income populations are not anticipated.	No	No adverse direct or indirect effects are anticipated.
	Economy	No direct impacts are anticipated.	Indirect effects associated with the economy are not anticipated.	No	No adverse direct or indirect effects are anticipated.
Public Facilities and Services		No direct impacts are anticipated.	No indirect effects are anticipated.	No	No direct or indirect effects are anticipated.
Section 4(f) and Section 6(f) Resources		No direct impacts are anticipated.	No indirect effects are anticipated.	No	No direct or indirect effects are anticipated.
Cultural Resources	Historic Structures	There are no historic-age resources (built prior to 1969) located within the APE (proposed ROW).	No indirect effects are anticipated.	No	No direct or indirect effects are anticipated.
	Archeological Resources	Existing agreements for compliance with applicable cultural resource laws define this project as a type that has no potential to affect archeological resources	No indirect effects are anticipated.	No	No direct or indirect effects are anticipated.
Vegetation and Wildlife Habitat		Approximately 15.30 acres of maintained herbaceous vegetation and 0.02 acre of undeveloped/unmaintained vegetation would be permanently impacted by the proposed project. Suitable habitat within the proposed project area may be present for the timber/canebrake rattle and Texas garter snake. However, these habitat areas would not be impacted by the Build Alternative.	Approximately 943.2 acres of vegetation and wildlife habitat have the potential to be indirectly impacted within the AOI.	Yes, resource is in poor and/or declining health	N/A

Table 15: Resources to be Evaluated in the Cumulative Impacts Analysis				
Resource or Topic Evaluated	**Direct Effects**	**Indirect Effects**	**Carried Forward for Cumulative Effects Analysis**	**Reason for Elimination**
Farmland	No direct impacts to farmland would occur as the proposed project is being constructed within existing ROW.	Approximately 788.7 acres of farmland have the potential to be indirectly impacted within the AOI. Because farmland serves as wildlife habitat, the acreage of impacts was also included under Vegetation and Wildlife Habitat.	Yes, resource is in poor and/or declining health	N/A
Migratory Birds	No impacts to migration patterns or migratory bird habitat are anticipated.	No indirect effects are anticipated.	No	No direct or indirect effects are anticipated.
Waters of the U.S.	The proposed project would permanently impact approximately 10 LF (0.0005 acre) and temporarily impact 39 LF (0.012 acre) of a tributary to Rowlett Creek.	Approximately 3.9 linear miles (20,358 LF), 0.7 acre of open water/ponds, and 0.8 acre of streams have the potential to be indirectly impacted within the AOI.	Yes, resource is in poor and/or declining health	N/A
Water Quality	Potential impacts would be minimized by BMPs associated with Tier I projects and are not anticipated to be substantial.	Future development could result in decreased water quality; however, development must comply with existing TCEQ regulations. No substantial adverse effect is anticipated.	No	Direct or indirect effects are not anticipated to be substantial and resource is not in poor or declining health.
Floodplains	Approximately 1.3 acres of the existing project ROW is located within a FEMA designated 100- year floodplain. The proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances.	No indirect effects are anticipated.	No	Direct or indirect effects are not anticipated to be substantial and resource is not in poor or declining health.
Air Quality	Direct impacts on air quality from the proposed project are primarily those associated with the increased capacity, as well as the resulting projected increases in VMT.	No adverse indirect effects are anticipated.	Yes, resource is in poor and/or declining health	N/A
Noise	Noise impacts would occur at five receivers. None of the noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project.	No adverse indirect effects are anticipated.	No	No substantial direct or indirect effects are anticipated.

Table 15: Resources to be Evaluated in the Cumulative Impacts Analysis				
Resource or Topic Evaluated	**Direct Effects**	**Indirect Effects**	**Carried Forward for Cumulative Effects Analysis**	**Reason for Elimination**
Visual/Aesthetics	The proposed project improvements are expected to blend with the general character of the area.	No indirect effects are anticipated.	No	No direct or indirect effects are anticipated.
Hazardous Materials	The proposed project would be constructed within the existing ROW. No new ROW would be required. Acquisition of known hazardous materials sites would not occur.	No adverse indirect effects are anticipated.	No	No direct or indirect effects are anticipated.
N/A – Not Applicable. Source: Study Team, January, 2013.				

Land Use

In **Table 15**, land use is not shown as a resource to be assessed for cumulative impacts because land types which are resources (e.g., farmland, wetlands, etc.) have been included and will be assessed as necessary. However, the change in land use brought about by direct and indirect impacts from transportation projects and other reasonably foreseeable projects will be discussed in order to identify if these changes would have a cumulative impact on the project area. Land use is not a 'resource' such as vegetation and air quality, but is the 'result of decisions' involving both civic authorities and the property owner about the use of land. Land use in the project area is regulated by the Cities of Frisco and McKinney through land use plans and zoning/development ordinances designed to manage growth and to achieve targeted social objectives throughout these municipalities. Municipal zoning and land use regulations control the intensity and type of development and control where land should be developed and where land should be preserved.

Step 2 – Define the Study Area for Each Affect Resource

Resource study areas (RSA) have both temporal and geographic components. The temporal component of an RSA is the timeframe in which effects to resources are expected to occur. For the natural resources (vegetation and wildlife habitat and waters of the U.S.), the year 2009 was used as the beginning temporal boundary as it corresponds to Phase 1 of the Texas Ecological Systems Classification Project which is an effort undertaken by a multidisciplinary group to provide current land cover classification and mapping for Texas with the intent to facilitate improved planning and management. For farmland, the year 1981 was used as the beginning temporal boundary because the Agriculture and Food Act of 1981 contains the Farmland Protection Policy Act. The Act addresses the protection of farmland against urban sprawl affecting millions of acres of farmland each year. The beginning temporal boundary for analyzing air quality cumulative impacts is 1990. This date was established because the CAA, as amended in 1990 (CAAA), authorized EPA to designate areas in non-attainment for failing to meet established NAAQS. The year 2035 was chosen as the future temporal limit for all RSAs in order to capture the primary impacts that would be realized by the proposed project and estimated changes in roadway traffic volumes, as well as the expected implementation of local land use plans and the *Mobility 2035 – 2013 Update* MTP.

The geographic area of each RSA would vary from resource to resource. **Table 16** lists the affected resources and their corresponding RSAs. Maps of the RSAs are shown in **Figures 7 - 9**.

Table 16: Resource Study Areas for Affected Resources

Affected Resource	Resource Study Area	RSA Temporal Boundaries
Natural Resources: Vegetation and Wildlife Habitat Waters of the U.S.	Sub-basins of Rowlett Creek and West Rowlett Creek (5,305 acres) **Figure 7**	2009 - 2035
Farmland	Collin County **Figure 8**	1981 - 2035
Air Quality	Ozone - Ten-county Ozone Non-attainment Area for the DFW Metropolitan Area. CO – Project ROW line MSATs – Affected Transportation Network **Figure 9**	1990 - 2035

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 FM 2478 project is located within the Rowlett Creek and West Rowlett Creek watersheds, which are part of the East Fork Trinity River watershed. The geographical RSA for jurisdictional waters and vegetation and wildlife habitat used in this analysis consists of sub-basins associated with Rowlett Creek and West Rowlett Creek. These sub-basins total approximately 5,305 acres.

The United States Department of Agriculture (USDA) conducts a Census of Agriculture every five years. Agricultural/farmland data is available from the census at the state and county level. For this reason, the boundary of Collin County has been selected as the RSA for farmland. Collin County is 886 square miles (566,564 acres).

Evaluating Air Quality in relation to cumulative impacts requires looking at three distinct RSAs, as described below:

- Ozone - The RSA for evaluating the ozone NAAQS was designated as the DFW moderate eight-hour ozone non-attainment area, which includes Collin, Dallas, Denton, Tarrant, Ellis, Johnson, Kaufman, Parker, Rockwall, and Wise Counties.
- CO - The RSA for CO was based on the ROW line, which represents the locations with the highest potential for CO concentrations. However, the nature of the proposed project does not warrant a TAQA. Therefore, CO levels resulting from this project would not be expected to exceed the NAAQS for CO and negatively impact air quality in this area.
- MSATs - The RSA for MSAT is the affected transportation network in the 12-county MPA. Unlike the other resources evaluated, air quality impacts from MSATs have been evaluated qualitatively in this proposed project by TxDOT and FHWA. MSATs are regulated by EPA on a national basis through requirements for fuels and vehicle technology. The MSAT RSA qualitatively evaluated emission changes based upon the proposed project and national trends.

Land Use

As land use is not a resource in the traditional sense as discussed in CEQ regulations and guidance documents, defining a RSA for the cumulative impacts assessment cannot be adequately addressed. Land, the resource affected by land use decisions, is represented in many forms (farmland, woodland, waters, etc.) which would suggest an RSA similar to that identified for these resources. However, land use decisions are subject to social, economic and political ideals which would lead to a RSA based on these types of boundaries. In order to analyze the cumulative changes in land use, the discussion will focus on the indirect effects AOI/natural resources RSA because it encompasses the land use changes from the proposed project and the land use changes associated with indirect impacts already identified in this document.

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

Vegetation and Wildlife Habitat

The Rowlett Creek and West Rowlett Creek drainage sub-basins RSA is within the Blackland Prairie Natural Region, which was historically dominated by tallgrass prairie on uplands and deciduous bottomland woodland and forest along rivers and creeks. The RSA is located approximately nine miles north of the City of Dallas within the Cities of Frisco and McKinney where urban sprawl meets more rural, undeveloped land to the north of the cities. To the north

and east is the City of McKinney; to the west is the City of Frisco; and to the south are the highly developed City of Plano and the suburban City of Allen. The majority of the land within and surrounding the RSA is developed. Undeveloped land and croplands are present to the west and southeast. The expansion of Dallas northward has triggered population growth in the region, with farmland being replaced by residential subdivisions.

According to data from Phase 1 of the Texas Ecological Systems Classification Project (2009), dominant vegetation types mapped within the RSA include Row Crops, Urban Low Intensity, Blackland Prairie: Disturbance or Tame Grassland, Barren, Native Invasive: Deciduous Woodland, and Urban High Intensity.

Aerial photography of the RSA from August 2010 indicates that the primary vegetation within the RSA is farmland and herbaceous vegetation. Healthy riparian areas are also found adjacent to Rowlett Creek, tributaries to Rowlett Creek, West Rowlett Creek, and tributaries to Rowlett Creek. Approximately 14.7 linear miles of jurisdictional waters are present within the RSA. The amount of riparian habitat available within the RSA is not easily quantifiable; however, assuming an average width of 60 feet for associated riparian habitat, the jurisdictional waters in the RSA that run through wooded areas (based on aerial photography) would support approximately 91.6 acres of riparian habitat. Approximately 1,842.3 acres of farmland, 144.2 acres of upland woodland, 143.4 acres of bottomland hardwood, 52 acres of fence row trees, and 483.6 acres of undeveloped land/herbaceous vegetation comprise the remainder of the vegetation in the RSA.

Approximately 46 percent (2,440.1 acres) of the RSA is currently developed. The majority of development within the RSA is single-family residential which comprises 61.4 percent (1,497.1 acres) of developed areas in the RSA. Other development types include multi-family residential at 3.7 percent (91.2 acres); commercial/retail/office at 21.6 percent (526 acres); public/institutional at 6.5 percent (160.2 acres); and, park/open space at 6.8 percent (165.6 acres).

Farmland

As discussed in the Vegetation and Wildlife Habitat section, agricultural practices dominated the region in the 1870s, when the railroad was introduced to the area. Farmland data for Collin County from the *Census of Agriculture* is presented below in **Table 17**.

Table 17: Farmland Data for Collin County

	1982	**1987**	**1992**	**1997**	**2002**	**2007**
No. of Farms	1,543	1,501	1,235	1,407	2,135	2,235
Land in Farms	354,799 acres	305,235 acres	275,638 acres	270,434 acres	309,630 acres	290,831 acres
Average Size of Farm	230 acres	203 acres	223 acres	192 acres	145 acres	130 acres
Total Cropland	242,414 acres	199,398 acres	191,060 acres	190,161 acres	N/A	N/A
Harvested Cropland	165,657 acres	107,235 acres	114,634 acres	122,000 acres	130,915 acres	114,856 acres

Table 17: Farmland Data for Collin County						
	1982	**1987**	**1992**	**1997**	**2002**	**2007**
Dominant Crop	Wheat for grain 67,960 acres	Hay-alfalfa, other, wild, silage 36,137 acres	Sorghum for grain or seed 37,034 acres	Hay-alfalfa, other tame, small grain, wild, grass silage, green chop, etc. 34,494 acres	Forage-land used for all hay and haylage, grass silage, and greenchop 43,144 acres	Forage-land used for all hay and haylage, grass silage, and greenchop 46,288 acres
Source: *Census of Agriculture for 1982, 1987, 1992, 1997, 2002, and 2007; < http://www.agcensus.usda.gov/index.php>; accessed August 2012.* N/A – Not available Note: As of June 2013, the *2012 Census of Agriculture* has yet to be released by the USDA.						

As shown in **Table 17**, the number of farms reported had increased approximately 45 percent (692 farms) between the *1982* and *2007 Census of Agriculture*. However, the land in farms has decreased approximately 18 percent (63,968 acres) and the average size of farms has decreased approximately 44 percent (100 acres) in the same time period. Based on the data presented, in 2007 51 percent of Collin County land was in farms.

Waters of the U.S.

There are approximately 14.7 miles of streams, 3.6 acres of wetlands, and 15.4 acres of open waters/ponds within the Rowlett Creek and West Rowlett Creek drainage sub-basins RSA. Historically, agricultural activities were the primary activities conducted within the RSA. These activities did not require the fill and degradation of waters of the U.S. Due to the emerging residential setting within the RSA, impacts consisting of bridging, culverting, and filling waters of the U.S. are occurring more frequently within the RSA.

In the City of Frisco, on the west side of FM 2478, is a tributary to Rowlett Creek and West Rowlett Creek. Large portions of these creeks currently run through residential subdivisions and parks in Frisco.

On the east side of FM 2478, in the City of McKinney, flows Rowlett Creek and several associated tributaries. The majority of the RSA on the east side of FM 2478 is occupied by Craig Ranch, a master-planned business, retail, and residential community. Within Craig Ranch, between SH 121 and Stacy Road, Rowlett Creek flows through the TPC Craig Ranch Golf Course.

Air Quality

The EPA establishes limits on atmospheric pollutant concentrations through enactment of the NAAQS for six principal, or criteria, pollutants. The EPA designated ten counties in the DFW area as non-attainment 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 non-attainment for lead, effective December 31, 2010. This project is located outside that portion of Collin County in non-attainment 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.

Land Use
As noted in the Indirect Impacts Assessment, the land uses in each municipality within the AOI consist primarily of residential areas (1,588.3 acres) with some commercial/retail/office, public/institutional, and agricultural/open space land uses. **Table 2** presents population data for the two municipalities and indicates continual population growth over the past 30 years with the expectation that growth will continue and the previous explanations of the history of the area indicate that the municipalities within the RSA are primarily young cities that have been growing as residential communities since their incorporations. Discussions with local planners and city staff plus future land use maps indicate that the municipalities plan to emphasize residential development with commercial/retail/office/industrial development occurring primarily along main roadways (DNT, Preston Road [SH 289], US 75, SH 121, SH 5, and Airport Drive). Land use changes since 2010 have consisted of the conversion of vacant land or agricultural land into single-family residential subdivisions.

Step 4 – Identify Direct and/or the Indirect Impacts that May Contribute to a Cumulative Impact

Vegetation and Wildlife Habitat
Approximately 15.32 acres of vegetation would be permanently impacted by the proposed project. Within the RSA, approximately 943.2 acres of vegetation could be transformed due to induced development.

Farmland
Farmland (row crops, orchard, and grazing) would not be impacted by the proposed project. Within the RSA, approximately 788.7 acres of farmland have the potential to be indirectly impacted by induced development. The indirect impact to farmland is also considered in the Vegetation and Wildlife Habitat section as farmland serves as habitat.

Waters of the U.S.
Approximately 10 LF (0.0005 acre) of jurisdictional waters would be directly impacted by the proposed project. Additionally, 39 LF (0.012 acre) of jurisdictional waters would be temporarily impacted by the proposed project. Within the RSA, approximately 20,358 LF (3.9 miles) of streams, 0.8 acre of wetlands, and 0.7 acre of open waters/ponds have the potential to be indirectly impacted by induced development.

Air Quality
Direct impacts on air quality and MSATs from the project are primarily those associated with the increased capacity, accessibility and the resulting projected increases in VMT. Emission reductions as a result of EPA's new fuel and vehicle standards are anticipated to offset impacts associated with VMT increases.

Indirect impacts on air quality and MSATs are primarily related to any expected development resulting from project's increased accessibility or capacity to the area. Any increased air pollutant or MSAT emissions resulting from the potential development of the area must meet regulatory emissions limits established by the TCEQ and EPA as well as obtain appropriate authorization from the TCEQ and therefore are not expected to result in any degradation of air quality or MSAT levels.

Step 5 – Identify other Reasonably Foreseeable Actions that May Affect Resources

To identify other current and reasonably foreseeable actions within the RSA, aerial photographs were reviewed, and field visits and interviews with city planners and engineers from the Cities of Frisco and McKinney were conducted. The actions identified during these interviews are listed in **Table 18**.

Table 18: Other Current and Reasonably Foreseeable Actions

Development	Area (acres)
Frisco	
Future Frisco ISD High School	52.4
Shaddock East Elementary and Middle Schools (Frisco ISD)	30.7
Vandeventer Middle School (Frisco ISD)	2.2
Chicken Express	0.8
Children's Garden Montessori Academy	5.7
Custer Bridges Retail Development Center	47.7
Eternity Community Church	4.7
Kids 'R' Kids Child Care Center	2.7
McDonald's – 16125 Eldorado Parkway	1.1
McDonald's – 6225 Custer Road	2.3
Independence Estates (SFR)	22.2
Lawler Park North (SFR)	5.2
Richwoods (SFR)	46.6
Villages at Willow Bay (SFR)	42.9
Villages of Stonelake Estates (SFR)	138.3
Future Retail/Commercial	3.7
Total for Frisco	**409.2**
McKinney	
Craig Ranch Master-Planned Business, Retail, and Residential Community	576.5
Discovery at Rowlett Creek Addition	15.3
Fairway Meadows Addition	12.6
Stone Hollow	42.8
Villas at Willow Grove Townhomes	7.6
Future Frisco ISD Elementary School in Craig Ranch	13.4
Gabe Nesbitt Community Park Expansion	45.3
Planned Development – Neighborhood Business	130.6
Planned Development – Planned Center	16.1
Planned Development – Light Manufacturing	10.6
Planned Development – Neighborhood Convenience	29.3
Planned Development – Office	97.9
Planned Development – Retail/Commercial	10.0
Planned Development – Single-Family	104.1
Total for McKinney	**1,112.1**
Total for Project Area	**1,521.3**

Source: Interviews with city planners/engineers (January 2013) from the Cities of Frisco and McKinney; McKinney Planning Department Interactive Map, http://maps.mckinneytexas.org/planningflex/; City of Frisco GIS Department Interactive Map, http://maps.friscotexas.gov/; Frisco ISD Land Tracts and Potential Future Facilities, Updated June 14, 2012, http://www.friscoisd.org/ly/departments/facilitiesfinance/documents/land-tract.pdf; Craig Ranch Community Map, http://craigranchtexas.com/map/; Craig Ranch Commercial Properties Map, http://www.craigranchcommercial.com/; and Craig Ranch Master Plan Map, http://craigranchliving.com/.

Current and reasonably foreseeable transportation projects within the RSAs include the following:

- Widening of Main Street (FM 720) from Preston Road (SH 289) to Custer Road (FM 2478); two to six lanes, divided.
- Widening of Eldorado Parkway from Custer Road (FM 2478) to Fragrant Drive; four to six lanes.
- Widening of Alma Road from Stacy Road (FM 720) to McKinney Fire Station #8; two to four lanes.
- Widening of Silverado from Alma Road to Comstock Elementary School; two to four lanes.
- Widening of Stacy Road (FM 720) from Custer Road (FM 2478) to Ridge Road; four to six lanes.
- Craig Ranch Parkway from SH 121 (Sam Rayburn Tollway) to Collin-McKinney Parkway; new location, six lane roadway.
- Silverado Trail from Custer Road (FM 2478) to existing Silverado Trail; new location, four lane roadway.
- Widening of Alma Road from Silverado Trail to Stacy Road (FM 720); four to six lanes.
- Proposed City of Frisco and City of McKinney Trails within the RSA total approximately 3.5 miles.

In determining the acreage of current and reasonably foreseeable transportation projects within the RSA, an assumed lane width of 12 feet with one-foot curb offsets and 5-foot (minimum) sidewalks were used for roadway widening and new location roadways, and an assumed trail width of 6 feet was used.

The current and reasonably foreseeable actions total approximately 1,558.5 acres within the RSAs.

Step 6 - Assess Potential Cumulative Impacts to Each Resource

Vegetation and Wildlife Habitat

Potential cumulative impacts considered and discussed include direct and indirect impacts to the vegetation and wildlife habitat as a result of implementation of the proposed project in combination with the effects of current and reasonably foreseeable public and private actions. The 5,305-acre Rowlett Creek and West Rowlett Creek sub-basins RSA was considered sufficient to capture most cumulative effects of the proposed project on vegetation and wildlife habitat because these sub-basins contain the streams and associated vegetative habitat that wildlife depends on for food, water, and shelter. Acreages of vegetation types in the RSA were determined from aerial photographs and topographic maps. For the purposes of this analysis, it was assumed that any of the current and reasonably foreseeable developments would displace all the native vegetation and wildlife habitat within the confines of the development.

The vegetation within the RSA includes approximately 91.6 acres of riparian habitat, 1,842.3 acres of farmland, 483.6 acres of undeveloped land/herbaceous vegetation, 144.2 acres of upland woodland, 143.4 acres of bottomland hardwood, and 52 acres of fence row trees. Common rural and urban wildlife use the riparian, upland woodland, bottomland hardwood, and herbaceous habitats present in the area. The vegetation and streams surrounding FM 2478 are connected to other vegetated areas both south and east of the roadway, creating open corridors that can be used by aerial and terrestrial animals. While unlikely, development within the RSA

could fragment existing vegetation into small, distinct segments surrounded by manmade structures instead of the existing continuous corridors, effectively removing travel corridors for any animals.

Farmland

Potential cumulative impacts considered and discussed include indirect impacts to farmland as a result of implementation of the proposed project in combination with the effects of current and reasonably foreseeable public and private actions. Acres of farmland in the RSA were determined from the acres of land in farms reported in the *2007 Census of Agriculture* for Collin County. For the purposes of this analysis, it was assumed that any of the current and reasonably foreseeable developments would displace all the farmland within the confines of the development.

Based on the *2007 Census of Agriculture*, it is estimated that there are approximately 290,831 acres of land in farms within the 566,564 acre RSA. Potential development within the RSA could remove existing farms or fragment them into smaller lots.

Waters of the U.S.

Potential cumulative impacts considered and discussed include impacts on waters of the U.S. resulting from the direct impacts and indirect impacts of the proposed project, in combination with the effects of other current and reasonably foreseeable public and private actions. The 5,305-acre Rowlett Creek and West Rowlett Creek sub-basins RSA was considered sufficient to capture most cumulative impacts of the Build Alternative on waters of the U.S. because the waters within the proposed project area are included in these sub-basins. Data is not available to quantify the acreage of streams in the RSA; however, stream lengths in the RSA can be measured using aerial photographs and topographic maps, and the acreage of wetlands can be determined from NWI maps. Therefore, linear mile is the measurement unit used for determining stream impacts and acres is the measurement unit used for determining wetland impacts.

Waters within the RSA include approximately 14.7 miles (77,687 LF) of streams, 3.6 acres of wetlands, and 15.4 acres of open waters/ponds. Common rural and urban wildlife use the riparian areas adjacent to streams and wetlands within the RSA. The streams and accompanying wildlife habitat surrounding FM 2478 are connected to other stream systems located to the south and east of the roadway, creating wildlife corridors that can be used by aerial, aquatic, and terrestrial animals. While unlikely, development within the RSA could fragment existing creeks into small, distinct segments surrounded by manmade structures instead of the existing continuous corridors, effectively removing travel corridors for any wildlife.

Air Quality

Any increased air pollutant or MSAT emissions resulting from increased capacity, accessibility and development are projected to be more than offset by emissions reductions from EPA's new fuel and vehicle standards or addressed by EPA's and TCEQ's regulatory emissions limits programs. Projected traffic volumes are expected to result in no impacts on air quality; improved mobility and circulation may benefit air quality. Increases in urbanization would likely have a negative impact on air quality. However planned transportation improvements in the project area as listed in a conforming MTP and TIP, coupled with EPA's vehicle and fuel regulations fleet turnover, are anticipated to have a cumulatively beneficial impact on air quality.

Table 19 summarizes the information gathered in steps 1 through 5 and presents the potential cumulative impacts to each resource.

Table 19: Resource Impacts				
Resource	**Direct Impact**	**Indirect Impact**	**Current and Reasonably Foreseeable Projects**	**Cumulative Impacts**
Vegetation/ Wildlife Habitat	15.30 acres of maintained herbaceous vegetation and 0.02 acre of undeveloped land/herbaceous vegetation would be directly impacted.	26.2 acres of undeveloped land/ herbaceous vegetation, 18.5 acres of fence row trees, 28.8 acres of bottomland hardwood tree, 21.8 acres of riparian vegetation, 59.2 acres of upland woodland trees, and 788.7 acres of farmland could be impacted.	395.8 acres of undeveloped land/ herbaceous vegetation, 22.5 acres of fence row trees, 40.4 acres of bottomland hardwood tree, 19.9 acres of riparian vegetation, 31.9 acres of upland woodland trees, and 1,044.7 acres of farmland could be impacted.	Within the RSA 15.30 acres of maintained herbaceous vegetation, 41 acres of fence row trees, 69.2 acres of bottomland hardwood trees, 41.7 acres of riparian vegetation, 91.1 acres of upland woodland trees, 1,833.4 acres of farmland; and 422.02 acres of undeveloped land/ herbaceous vegetation could be impacted due to direct impacts, potential induced development, and current and reasonably foreseeable actions. Direct impact not substantial.
Farmland	Direct impacts to farmland are not expected.	Within the RSA, approximately 788.7 acres of farmland could potentially be indirectly impacted. The indirect impact to farmland is also considered in the Vegetation and Wildlife Habitat impact as farmland serves as habitat.	Approximately 1,044.7 acres of farmland could potentially be affected. The impact to farmland from current and reasonably foreseeable actions is also considered in the Vegetation and Wildlife Habitat impact as farmland serves as habitat.	Within the RSA, 1,833.4 acres of farmland could be impacted due to potential induced development and current and reasonably foreseeable actions. Direct impact not substantial.

Table 19: Resource Impacts				
Resource	**Direct Impact**	**Indirect Impact**	**Current and Reasonably Foreseeable Projects**	**Cumulative Impacts**
Waters of the U.S.	Approximately 0.0005 acre (10 LF) of permanent stream impacts and 0.012 acre (39 LF) of temporary stream impacts. No direct impacts to wetlands or open waters/ponds. A PCN is not required.	Approximately 3.9 linear miles (20,358 LF) of streams, 0.7 acre of open waters/ponds, and 0.8 acre of wetlands could potentially be indirectly impacted.	Up to 4.5 linear miles (23,546 LF) of streams, 3.1 acres of open waters/ponds, and 0.2 acre of wetlands could potentially be impacted.	0.0005 acre (10 LF) of permanent impacts and 0.012 acre (39 LF) of temporary impacts. 8.4 linear miles (43,904 LF) of streams, one acre of wetlands, and 3.8 acres of open waters/ponds could be impacted by potential induced development and current and reasonably foreseeable actions within the RSA. A PCN is not required. Direct impact not substantial.
Air Quality	Collin County is in non-attainment for 8-hour standard for the pollutant ozone.	No substantial impacts.	Increase in urbanization would likely have a negative impact on air quality.	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.

Land Use

The decisions leading to land use changes are initially determined by the municipality and enacted through a zoning ordinance. The decision as to the land use for a particular parcel of property is further modified by the city through the adoption of comprehensive land use plans, land development regulations, and the city's participation in the preparation of regional transportation plans which plan and program roadway improvements. Because of this land use decision-making process which jointly involves the city and the property owner, there is no inherent value to an existing type of land use that compels it to remain unchanged. For this reason it cannot simply be assumed that conversion of an existing land use to transportation use is an adverse impact to land use because the proposed transportation use of a particular piece of land may offer tremendous benefits for the community/region that is to be served by the transportation project.

The determination of whether a proposed change in land use is adverse or beneficial may only be objectively judged within the planning/zoning framework established by municipal leaders. Consequently, the identified changes in land use associated with the proposed project have been assessed to ensure that the nature and extent of the expected changes are consistent with the overall planning objectives of the various municipalities. The primary indicator of whether project-related changes in land use are adverse or beneficial depends on whether these changes are specifically mentioned in comprehensive land use plans or, if not mentioned by name, whether approval for the changes are implied by more broadly-stated policies and objectives. Unfortunately, changes in land use outside municipal limits cannot be objectively judged because there are no planning documents for county lands. Any land use changes beyond the city limits of Frisco and McKinney but within the RSA can only be noted within the overall trend in land use change and are not subject to objective judgment.

Step 7 – Report the Results

Vegetation and Wildlife Habitat

The cumulative impacts on vegetation and wildlife habitat resulting from the 15.32 acres of direct impacts in combination with the approximately 943.2 acres of vegetation impacts from estimated induced development within the RSA and 1,555.2 acres of impacts to undeveloped land from the previously described current and reasonably foreseeable public and private actions would decrease the amount of vegetation and wildlife habitat in the RSA by approximately 2,511.02 acres (91.1 percent of total vegetation within RSA). The direct impacts to vegetation would be less than one percent of the cumulative impacts; therefore, the impacts from the proposed project are not considered substantial.

Farmland

The cumulative impact on farmland resulting from the 788.7 acres of farmland impacts from estimated induced development within the RSA and 1,044.7 acres from the previously described current and reasonably foreseeable public and private actions would decrease the amount of farmland in the RSA by approximately 1,833.4 acres (one percent of total farmland within RSA). Direct impacts to farmland would not occur: therefore, the impacts from the proposed project are not considered substantial.

Waters of the U.S.

The cumulative impacts on waters of the U.S. includes impacts to 0.009 linear mile (49 LF) of streams from the direct impacts; 3.9 linear miles (20,358 LF) of streams, 0.7 acre of open waters/ponds and 0.8 acres of wetlands from estimated induced development within the RSA; and, 4.5 linear miles (23,546 LF) of streams, 3.1 acres of open waters/ponds, and 0.2 acre of wetlands from current and reasonably foreseeable actions. The cumulative impact to streams totals 8.409 linear miles (43,953 LF), 3.8 acres of impacts to open waters/ponds, and one acre of impacts to wetlands. Cumulative impacts could potentially impact approximately 56.6 percent of waters of the U.S., 24.7 percent of open waters/ponds, and 27.8 percent of wetlands within the RSA. The proposed project would not contribute to direct impacts to wetlands or open waters/ponds, and direct impacts to waters of the U.S. would be less than one percent of the cumulative impacts; therefore, the impact from the proposed project is not considered substantial.

Air Quality

The cumulative impacts on air quality from the proposed project and other current and reasonably foreseeable transportation projects are addressed at the regional level by analyzing the air quality impacts of transportation projects in the *MTP: Mobility 2035 – 2013 Update* and the 2013-2016 TIP. The proposed project and other reasonably foreseeable transportation projects were included in the *MTP: Mobility 2035 – 2013 Update* and the 2013-2016 TIP and have been determined to conform to the SIP. When combined, planned transportation improvements, revised EPA fuel and vehicle regulations, and fleet turnover are anticipated to have a cumulatively beneficial impact on air quality.

Land Use

Within municipal settings, the owner of real property is constrained to the range of permissible land uses prescribed by the city zoning ordinance applicable to that property. While private property owners are subject to the constraints of zoning, public works projects such as road improvements are not subject to zoning rules because such projects are planned and owned by government agencies who act for the benefit of the community or region. This presents a dilemma because there is no universally accepted hierarchy of land uses that can be referenced to ascertain whether a change from private to public land use is always adverse or always beneficial. For example, to the private owner of real estate that is located adjacent to the existing ROW, the change may be perceived as adverse, but may be viewed as highly beneficial to the rest of the community.

Based on a review of the relevant land use plans and feedback from interviews with city planners, the direct and indirect impacts of the proposed project on land use are in harmony with city planning objectives. The potential developments that could occur based on expected population growth and an improved economy (1,558.5 acres) would follow local regulations and guidelines which are consistent with the cities objectives to build thriving residential communities. In addition to the land use changes associated with direct and indirect impacts, the current and reasonably foreseeable actions identified in Step 4 would follow the trends and expectations of the two municipalities within the RSA. The proposed project would add to the cumulative changes in land use that have been occurring and would continue to occur. The two municipalities are on the suburban fringe and have been undergoing changes from rural farm communities to suburban neighborhoods for approximately 20 years. The land use changes identified throughout this categorical exclusion are not only in line with city leaders and community members' expectations, but they are consistent with the overall trends in land use change. Although land use changes may be considered negative on a parcel by parcel basis (e.g. the conversion of a residential parcel to transportation ROW), the broader impact would have cumulatively beneficial effects on the surrounding communities, as such changes are necessary to implement the desired land use objectives embodied in local and regional plans.

Step 8 – Assess and Discuss Mitigation Issues for all Adverse Impacts

Vegetation and Wildlife Habitat

Incorporating parks, open spaces, and riparian corridors around and within developed areas would provide wildlife habitat and shelter. Planting these areas with native fruit or nut-bearing trees and shrubs, and native grain-bearing grasses would provide food for wildlife, and would help to mitigate impacts to habitat used by wildlife.

In the City of Frisco's *2006 Parks, Recreation and Open Space Master Plan*, providing nature trails/greenway corridors along the primary drainage corridor of West Rowlett Creek, among others creeks, and providing open spaces/nature areas were listed as high priority items under

recommendations for facility improvements. Benefits recognized from the implementation of these items include flood control/reducing danger of flooding, maintenance of riparian habitat, and protection of the natural environment. Several future nature trails/greenway corridors and open spaces/natural areas were identified in the Plan's *Ten Year Action Plan*.

Subsection 4.01: Tree Preservation Requirements of the City of Frisco's *Zoning Ordinance* (adopted April 5, 2011), discusses the purpose of the requirements, the removal of trees through a permit or exception, mitigation requirements, preservation/protection measures, and penalties for violation. Mitigation for trees removed includes the replacement of protected tree(s) based on size, transplanting protected trees, and planting replacement trees on a city property and/or common open space and/or paying a fee if the replacement tree(s) cannot be located on the property. Additionally, all trees (dbh of 6 inches or greater) in a pre-reclamation riparian buffer or floodplain shall be mitigated, regardless of species.

In *Section 9: Parks, Recreation and Open Space Element* of *McKinney's Comprehensive Plan* (amended January 2010), prairies, wilderness, creeks, and lakes are all considered elements worthy of protection. The protection of riparian habitat and vegetation associated with Rowlett Creek and its tributaries, among other creeks, is identified as being essential to water quality and wildlife diversity. Opportunities listed for open space land dedication include woodlands, heritage farmland, and significant wildlife habitat, among others.

The purpose of *Section 146-136: Tree Preservation* of the City of McKinney's Zoning Ordinance "is to promote tree preservation through site design and by controlling indiscriminate removal of trees; and to contribute to the long-term viability of existing trees through their protection during construction or land disturbing activities; while balancing rights of property owners with the interests of the community." The Section discusses tree permit requirements and the types of permits; standards for tree preservation and exemptions allowing tree removal; tree replacement and protection requirements; and enforcement and violations. Protective measures for protected trees and their primary root zones include prohibiting material storage, equipment cleaning/liquid disposal, and construction vehicle traffic/parking within the limits of the primary root zone of any protected tree. All construction plans are to include tree protection measures. Seventy percent of quality trees within the 100-year floodplain, with a dbh of six inches or greater may not be critically altered. However, certain exemptions do apply. Trees with a dbh greater than 42 inches may not be removed, nor may their critical root zone be altered. However, the owner/applicant may apply for a tree removal permit, and if denied, appeal the decision to the city council.

Integrating these plans and ordinances into future planning and development in the Cities of Frisco and McKinney will ensure that the importance of stream corridors and floodplains, as well as the remaining open space, as valuable habitat is recognized and considered before development occurs.

Farmland

It is not possible to fully mitigate for the loss of agricultural acreage without bringing non-farmed land into production. This concept is not likely to be economically feasible; however, it is possible to partially compensate or mitigate for the loss of farmland through conservation easements and other means. Farmland mitigation programs are somewhat similar in concept to wetlands mitigation. They involve protecting farmland by providing equivalent farm acreage elsewhere when agricultural land is converted to other uses, or paying a fee when farmland is converted to other uses. One example of a farmland mitigation program is in Davis, California, where developers are required to permanently protect one acre of farmland for every acre of

agricultural land they convert to other uses. Developers can place an agricultural conservation easement on farmland in another part of the city or pay a fee to satisfy mitigation. This basic approach to mitigate for the loss of agricultural land has been used successfully in other areas of California as well.

The NRCS would have jurisdiction over mitigation activities for cumulative impacts to farmlands, and as such, would determine the mitigation responsibilities of individual developers.

Waters of the U.S.

The City of Frisco identifies Rowlett Creek and West Rowlett Creek as major creeks (*Subdivision Ordinance 12-06-42*, amended June 19, 2012). This ordinance states that the development of any portion of a property within the 100-year floodplain of any major creek is prohibited. An erosion control setback and building/yard setback are also dedicated. According to the *Zoning Ordinance* (adopted April 5, 2011), requirements for non-residential and multi-family development adjacent to the fully-developed 100-year floodplain of a major creek include maintenance access to the floodplain, hike and bike trail, and creek, and hike and bike trail incorporation, among others. Retail, commercial and industrial development adjacent to a major creek is required to provide two to three amenities, as approved by the Planning and Zoning Commission. Examples of approved amenities include a landscape edge adjacent to the floodplain, hike and bike trail construction, and creek restoration, among others. Enforcement of these ordinances as well as being located within city designated parks allows for protection of these creeks from the fill and degradation activities associated with development.

Division 6: Floodplain Regulations of the City of McKinney's *Development Regulations* state that while no new construction is allowed in floodplain areas, it is allowed in areas that can be reclaimed from the floodplain. The regulations require that the lowest floor of new residential construction in reclaimed floodplain areas or substantial improvements to an existing residential structure in floodplain areas shall be elevated at least two feet above the design flood elevation. The same applies to nonresidential construction. The maintenance of natural floodplains of major streams, including Rowlett Creek, shall enhance water quality, mitigate regional erosion, and provide regional flood control measures.

Avoidance or minimization of impacts to waters of the U.S. and wetlands should be performed during the development design phase so that the least amount of impacts occurs. Mitigation is only conducted when impacts to waters of the U.S. and wetlands cannot be avoided. Typical mitigation for impacts to waters of the U.S. includes the construction of mitigation areas or purchasing credits from a mitigation bank. Mitigation is frequently conducted as one of the requirements for obtaining a Section 404 permit. The USACE decides what the ratio of the mitigation area would be relative to the acreage of impacts to waters of the U.S. A typical mitigation ratio is three times the amount of acreage impacted, while the minimum mitigation ratio is one time the amount of acreage impacted (i.e. 1:1 ratio).

A mitigation bank is a wetland, stream, or other aquatic resource area that has been restored, established, enhanced, or in certain circumstances, preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources permitted under Section 404 or a similar state or local wetland regulation. Mitigation banks are used in situations where the construction of a mitigation area is not practical. Mitigation banks are a form of "third-party" compensatory mitigation, in which the responsibility for compensatory mitigation implementation and success is assumed by a party other than the permittee. The USACE would have jurisdiction over mitigation activities for impacts to waters of the U.S., and as such, would determine the mitigation responsibilities of the developers.

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 CAA 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 to control and reduce emissions; 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 to reduce emissions, 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 non-attainment areas. These regulatory controls, as well as other local transportation and development initiatives implemented throughout the DFW metropolitan area 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 current and 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 attainment with the ozone non-attainment standard or threaten the maintenance of the other air quality standards.

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

V. PERMITS AND COMMITMENTS

This section summarizes the elements that constitute the EPIC sheet. The EPIC sheet, found in the Environmental Tracking System, documents and communicates permit issues and environmental commitments that must be incorporated into the Plans, Specifications, and Estimates. The permits, impacts and commitments relevant to the proposed project are as follows:

I. CWA, Section 402 TPDES Commitments

This project would include five or more acres of earth disturbance. TxDOT would comply with TCEQ's TPDES CGP. A SW3P would be implemented, and a construction site notice would be posted on the construction site. A NOI would be required.

II. CWA, Section 401and 404 Compliance Commitments

No action required for the proposed project other than must comply with the conditions of the permit.

III. Cultural Resources Commitment

In the event that 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-TU and MOU.

IV. Vegetation Resources Commitment

No action required for the proposed project.

V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and MBTA Commitment

The proposed project, if implemented, would have no effect on any federally listed species, its habitat, or designated critical habitat. The proposed project, if implemented, would have the potential to impact the following state-listed or species of concern and their habitats:

- Texas garter snake
- Timber/canebrake rattlesnake

Suitable habitats were noted within the project limits for these species; however, no known occurrences have been recorded within 1.5 miles of the proposed project area. During construction of the proposed project, there would be temporary and permanent impacts to the tributary of Rowlett Creek, which could serve as habitat for the Texas garter snake. After construction, the temporarily disturbed areas would be returned to preconstruction contours. Areas abutting the limits of construction for the proposed project would remain as potential habitat for these species.

Special Notes:

The MBTA 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. Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structures that would be affected by the proposed project, and would complete any bridge work and/or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building Nests between February 15 and October 1, per the EPIC plans. 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.

Evidence of migratory bird species was found during the November 12, 2012, field survey. Bird nests were observed beneath the tributary to Rowlett Creek bridge. Measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young.

VI. Hazardous Materials or Contamination Issues Commitment
The proposed project includes the renovation of one bridge. The bridge may contain ACM and shall be inspected to verify presence or absence of ACM. At least 10 working days prior to the bridge demolition, a 10-Day Notification shall be submitted to the TDSHS.

One bridge would be renovated as part of the proposed project. The bridge consists of pre-stressed concrete beams and steel pedestrian sidewalk railings. The railings are located adjacent to outside lanes and would not be removed or renovated by the proposed project. However, prior to project letting, should the steel pedestrian railings require renovation or removal, they will be analyzed for the presence or absence of LBP. If the LBP is discovered, contingencies would be developed to address worker safety, material recycling and proper management of any paint related wastes, as necessary.

VII. Other Environmental Issues Commitment
Measures to control fugitive dust would be considered and incorporated into the final design and construction specifications.

VI. PUBLIC INVOLVEMENT

On the August 21, 2012, city council meeting, the City of Frisco Engineering Department requested the city council's consideration and approval of a Resolution authorizing the City Manager to execute a Pass-Through Agreement by and between the City of Frisco and TxDOT for TxDOT to provide funding for the construction of the proposed project. Resolution No. 12-08-149R was signed and executed on the same date.

As part of the public involvement process, a Public Hearing would be conducted for the proposed project.

VII. CONCLUSION

A. Recommendation of a Preferred Alternative

The No Build Alternative would avoid the direct impacts envisioned for the Build Alternative; however, it would not address the need and purpose of the proposed project.

The existing FM 2478 is functionally deficient and does not effectively serve the current and future transportation needs of the growing population adjacent to and surrounding the proposed project. The purpose of the proposed project is to provide better mobility and bring the roadway up to current design standards. If constructed, the Build Alternative would fulfill the project's need and purpose.

Functional Deficiency
The proposed project is the expansion of FM 2478 from a four-lane divided urban roadway to a six-lane divided urban roadway from SH 121 to Stonebridge Drive. The Build Alternative would add a single 11-foot wide inside lane and incorporate a 14-foot wide outside shared use lane in each direction to the existing roadway, creating two 11-foot wide lanes and one 14-foot shared use lane in each direction with one-foot inside lane and two-foot outside lane offsets. The curb and gutter roadway would also include 11-foot wide left turn lanes and minimum median width of 7 feet. The 2.95-mile improvements would include the addition of a continuous sidewalk.

The proposed sidewalk construction along with existing sidewalk already located along the corridor, would provide a continuous ADA complaint pedestrian route on both sides of the proposed project. The proposed project would also include the expansion of an existing bridge at the tributary to Rowlett Creek crossing. The proposed improvements would eliminate a bottle neck that is created by the four-lane facility from SH 121 to Stonebridge Drive. FM 2478, north of Stonebridge Drive and south of SH 121 is a six-lane facility.

Transportation and Land Use Goals

The Build Alternative would be consistent with the local and regional transportation and land use planning efforts. It would meet the proposed project's need of better mobility by increasing the roadway's capacity from a four-lane divided urban roadway to a six-lane divided urban roadway.

According to the NCTCOG's *2030 Demographic Forecast*, the 20-year projected growth rate percentage between 2010 and 2030 for the City of Frisco is 94.8 percent and 72.3 percent for the City of McKinney. This on-going growth trend is acknowledged in the long-range *MTP*: *Mobility 2035 – 2013 Update*, which contains goals and policies that focus on the need to enhance and coordinate the regional transportation system to accommodate transportation infrastructure safely and efficiently. Although local and regional economic growth would still be the determining factors in the future development of the area, the Build Alternative would provide improved mobility in the project area for the projected growth.

B. CE Determination

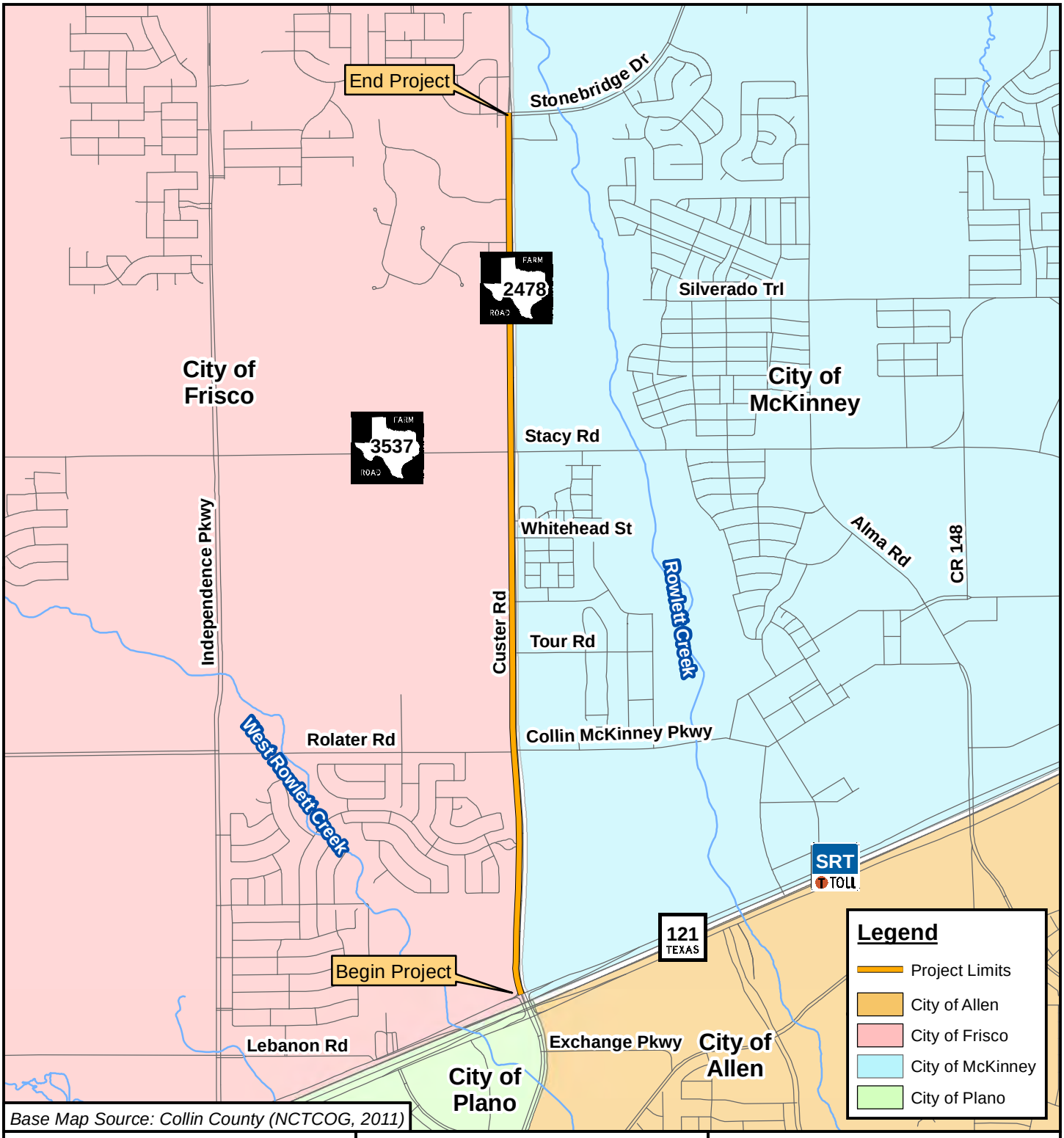
The proposed action meets the criteria for a Categorical Exclusion (CE) as defined in the Programmatic Agreement for the Review and Approval of NEPA Categorically Excluded Transportation Projects (PA) executed by the Texas Division of the Federal Highway Administration (FHWA) and the Texas Department of Transportation (TxDOT) on November 7, 2011, or received an exception (attached) from FHWA to process the proposed action as a CE.

No significant social, economic, and/or environmental impacts associated with this project have been discovered. Therefore, the proposed action qualifies as a Categorical Exclusion.

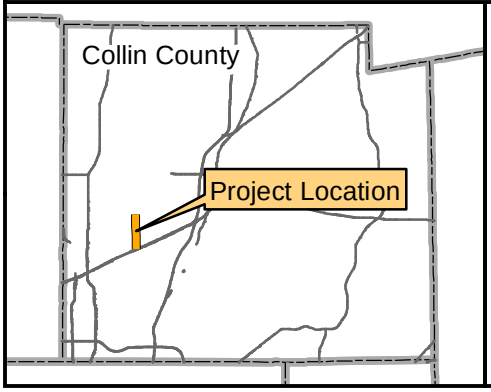
MOOSA SAGHIAN
Name (Printed)

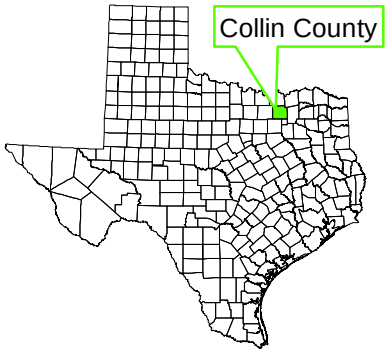
Moosa Saghian 2-4-2014
Certified/Approved Date

FIGURES



Base Map Source: Collin County (NCTCOG, 2011)





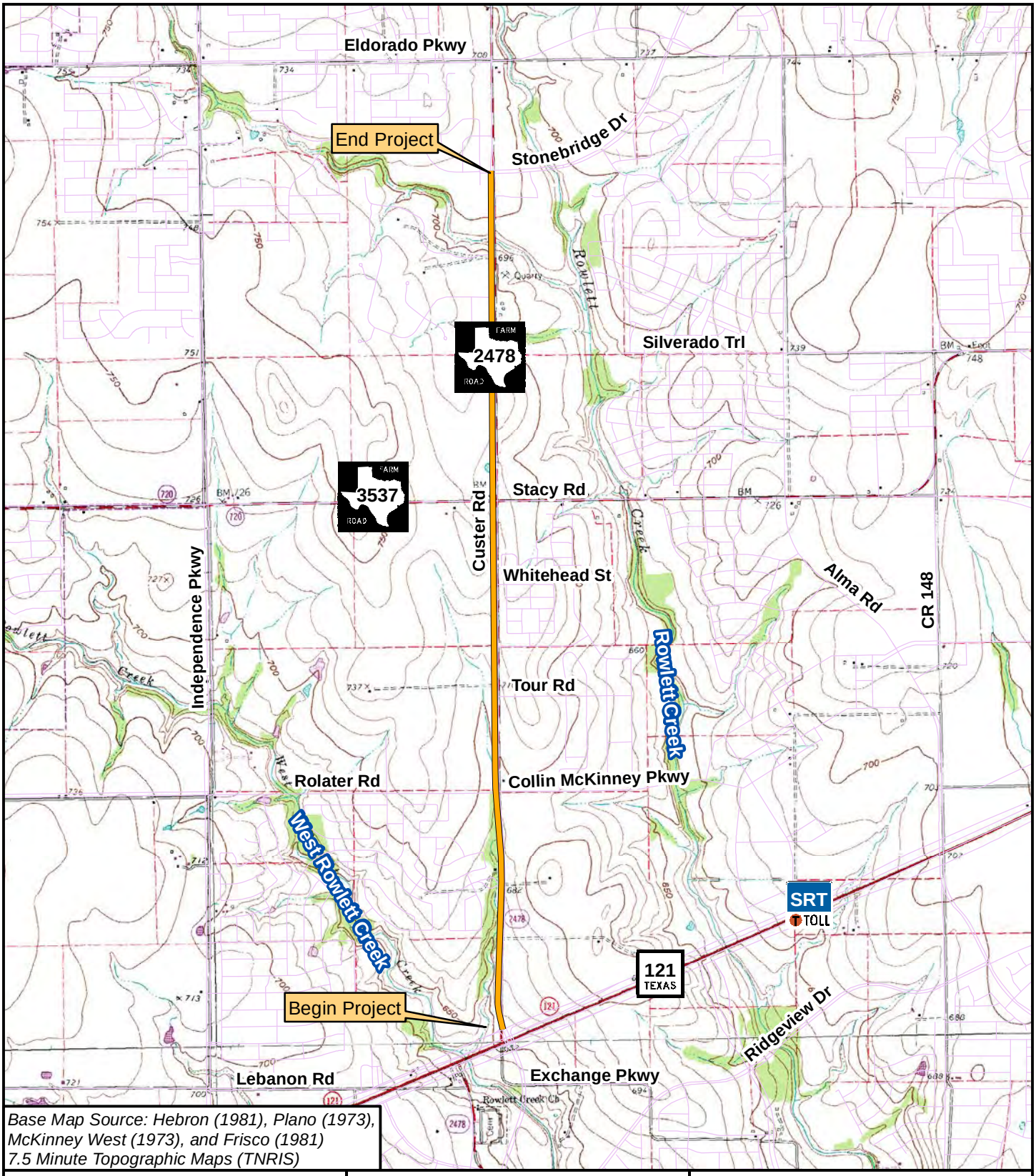
0 2,500 Feet

N W E S

FIGURE 1
PROJECT LOCATION MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020



Base Map Source: Hebron (1981), Plano (1973), McKinney West (1973), and Frisco (1981) 7.5 Minute Topographic Maps (TNRIS)

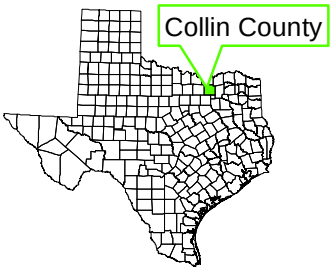


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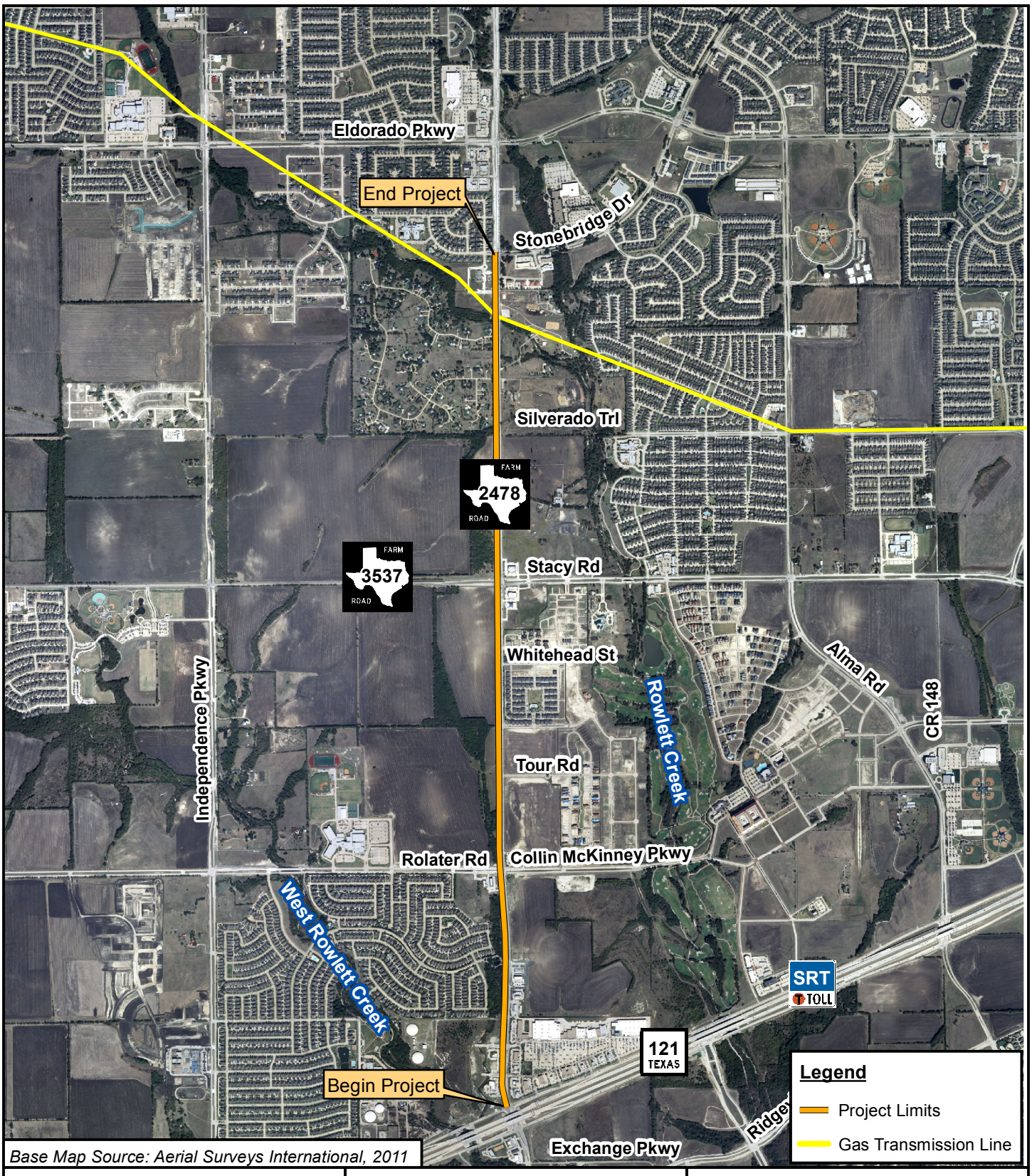
FIGURE 2
USGS TOPOGRAPHIC MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020



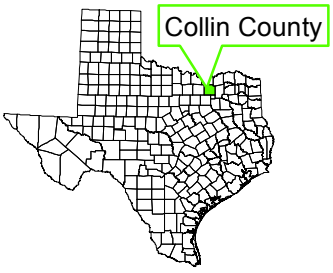


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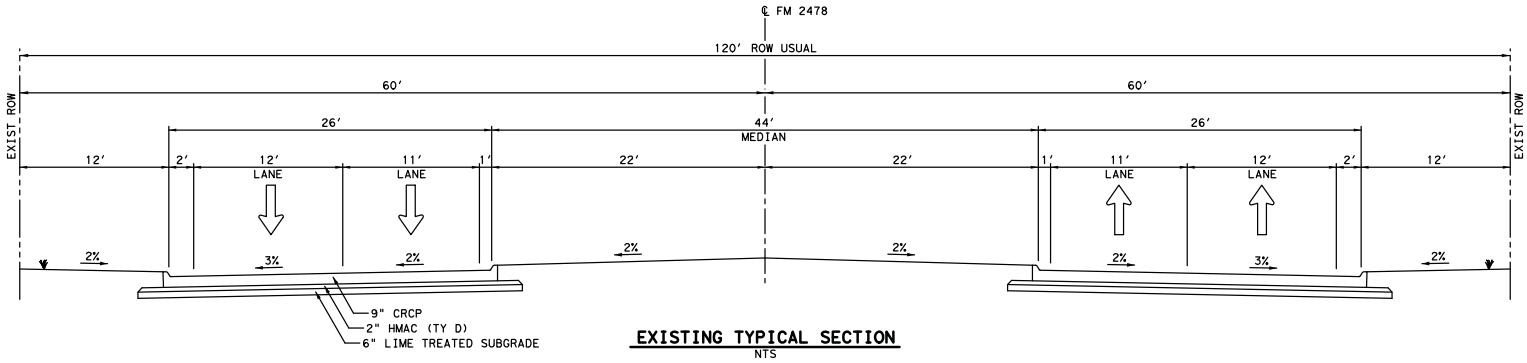
FIGURE 3
AERIAL MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020



EXISTING TYPICAL SECTION
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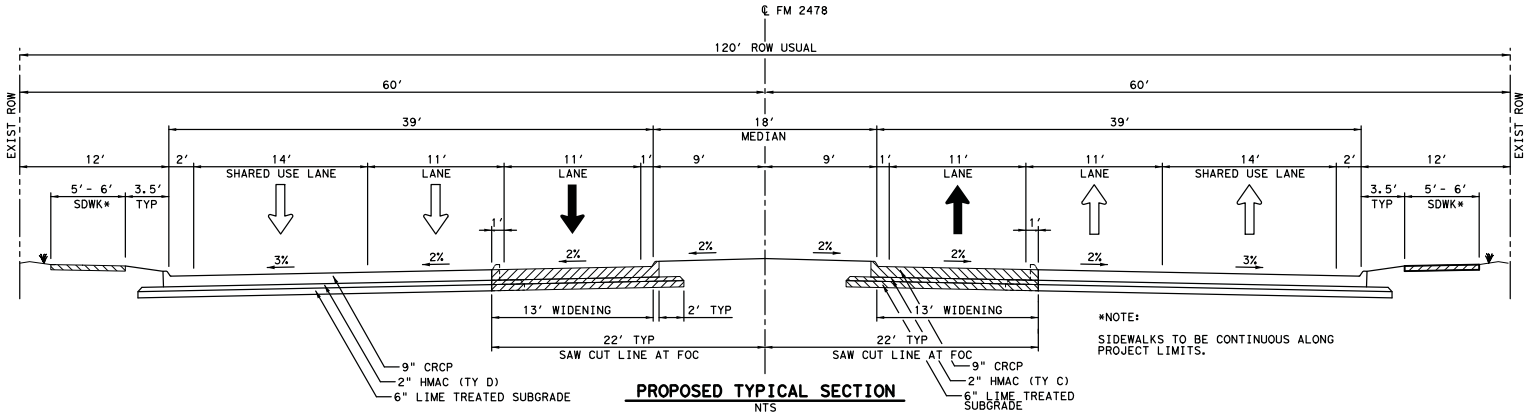

PROPOSED TYPICAL SECTION
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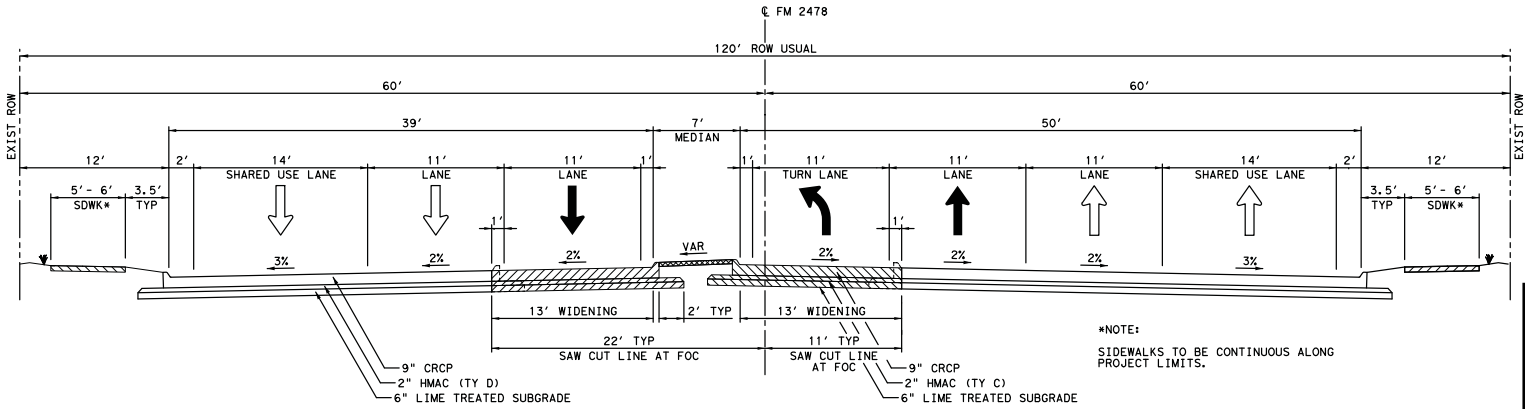
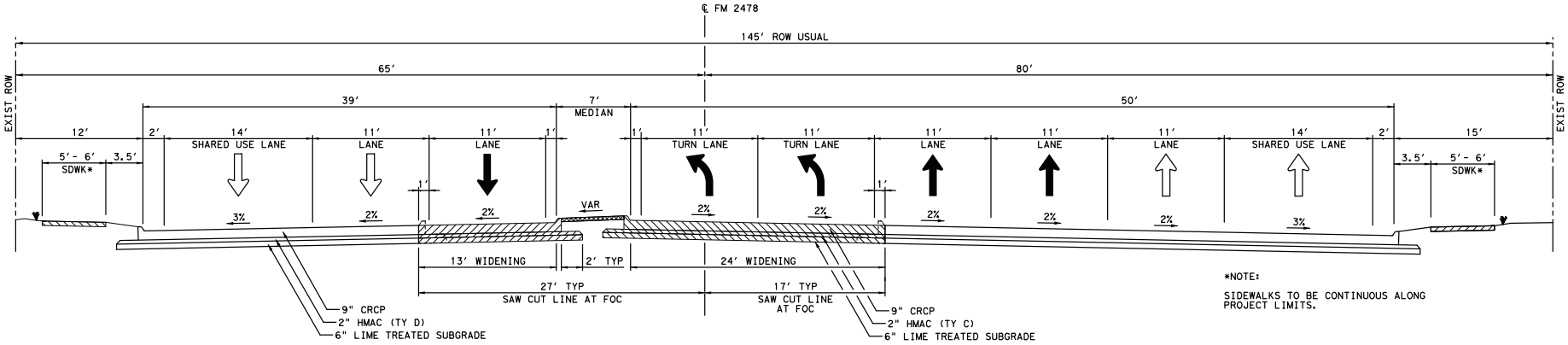


PROPOSED LEFT TURN LANE TYPICAL SECTION
NTS

FIGURE 4
TYPICAL SECTIONS
FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE
CSJ: 2351-01-020
SHEET 1 OF 3



PROPOSED DUAL LEFT TURN LANE TYPICAL SECTION
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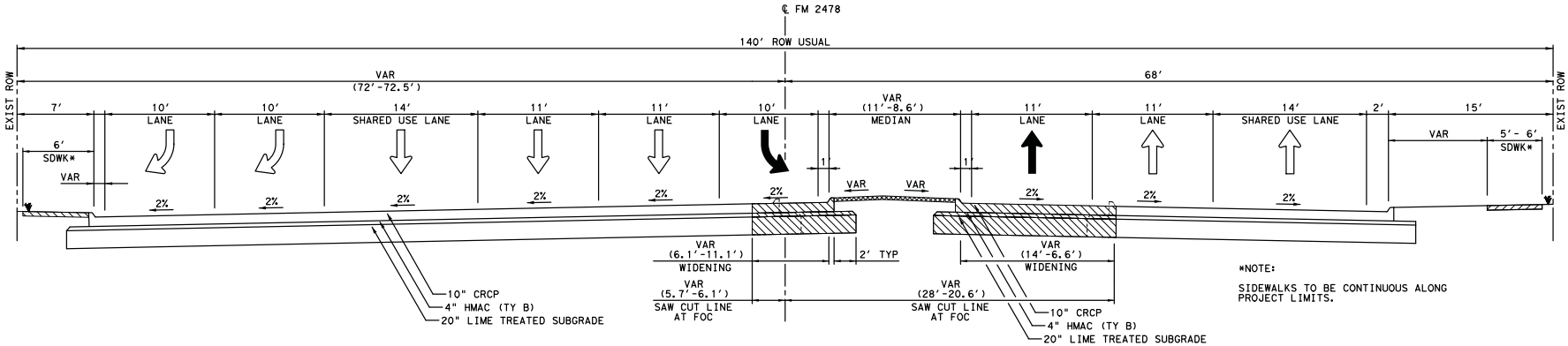

PROPOSED DUAL RIGHT TURN LANE TYPICAL SECTION
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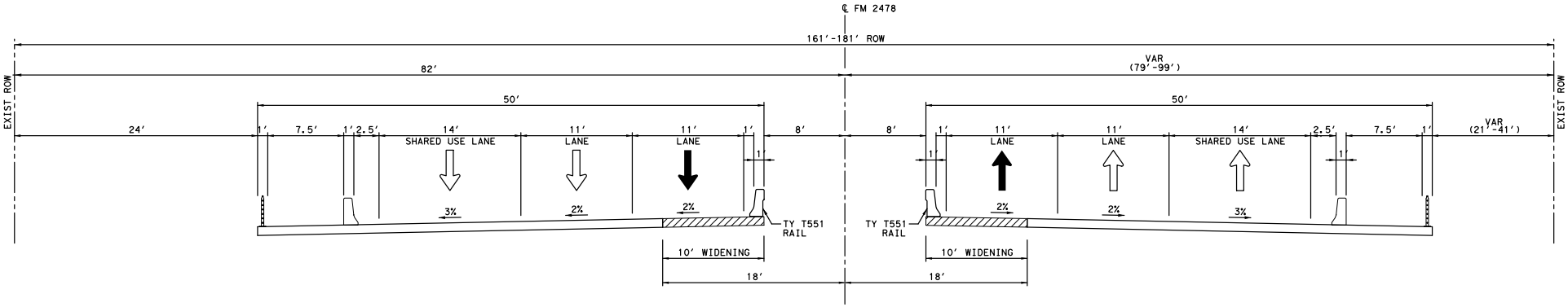
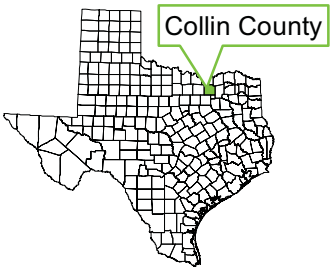
FIGURE 4
TYPICAL SECTIONS
FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE
CSJ: 2351-01-020
SHEET 2 OF 3



PROPOSED BRIDGE WIDENING TYPICAL SECTION
NTS

FIGURE 4
TYPICAL SECTIONS
FM 2478
FROM SAM RAYBURN
TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE
CSJ: 2351-01-020
SHEET 3 OF 3



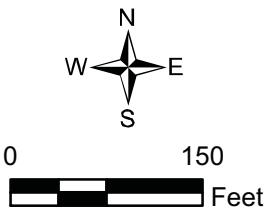
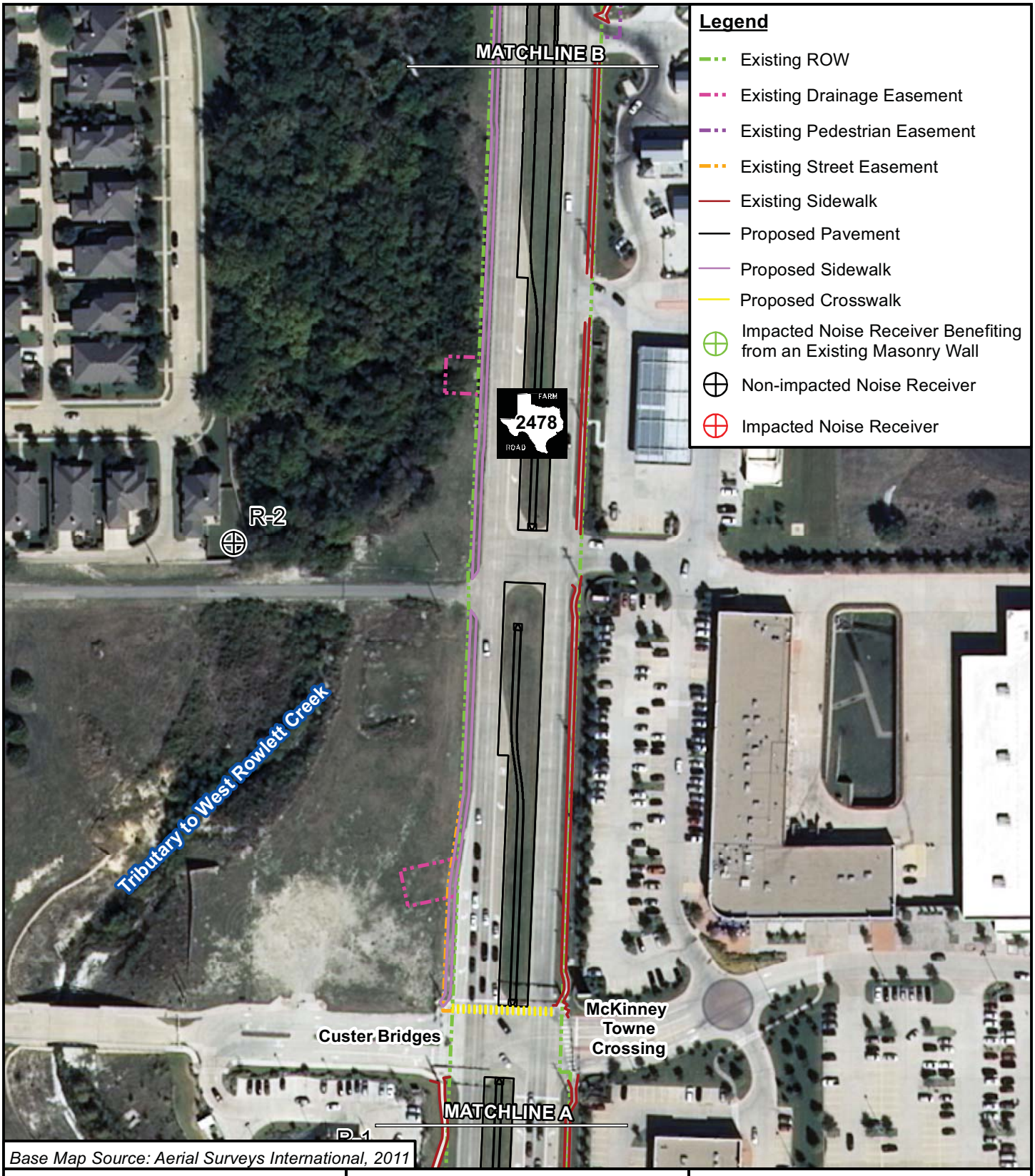


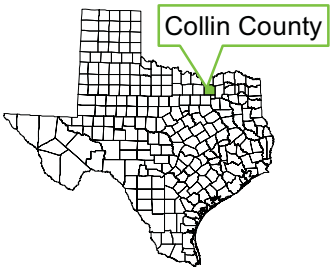
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 1 OF 14





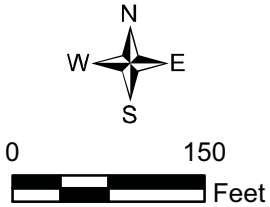


FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 2 OF 14

Base Map Source: Aerial Surveys International, 2011

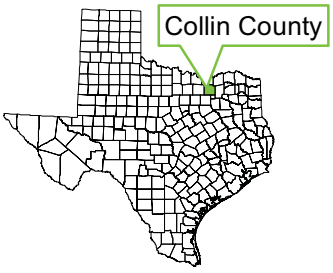


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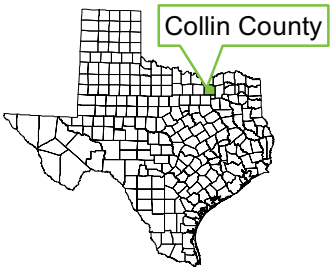
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 3 OF 14

Base Map Source: Aerial Surveys International, 2011



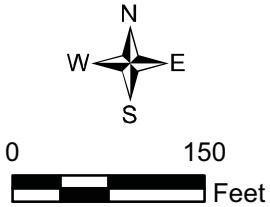


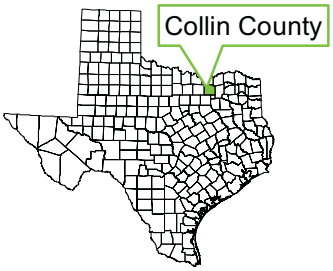
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 4 OF 14

Base Map Source: Aerial Surveys International, 2011



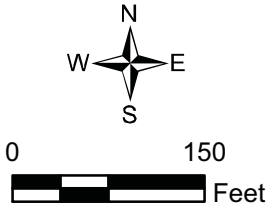


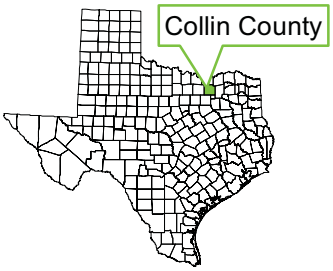
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 5 OF 14

Base Map Source: Aerial Surveys International, 2011



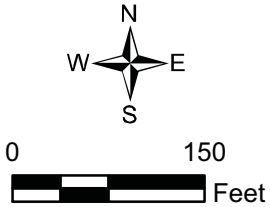
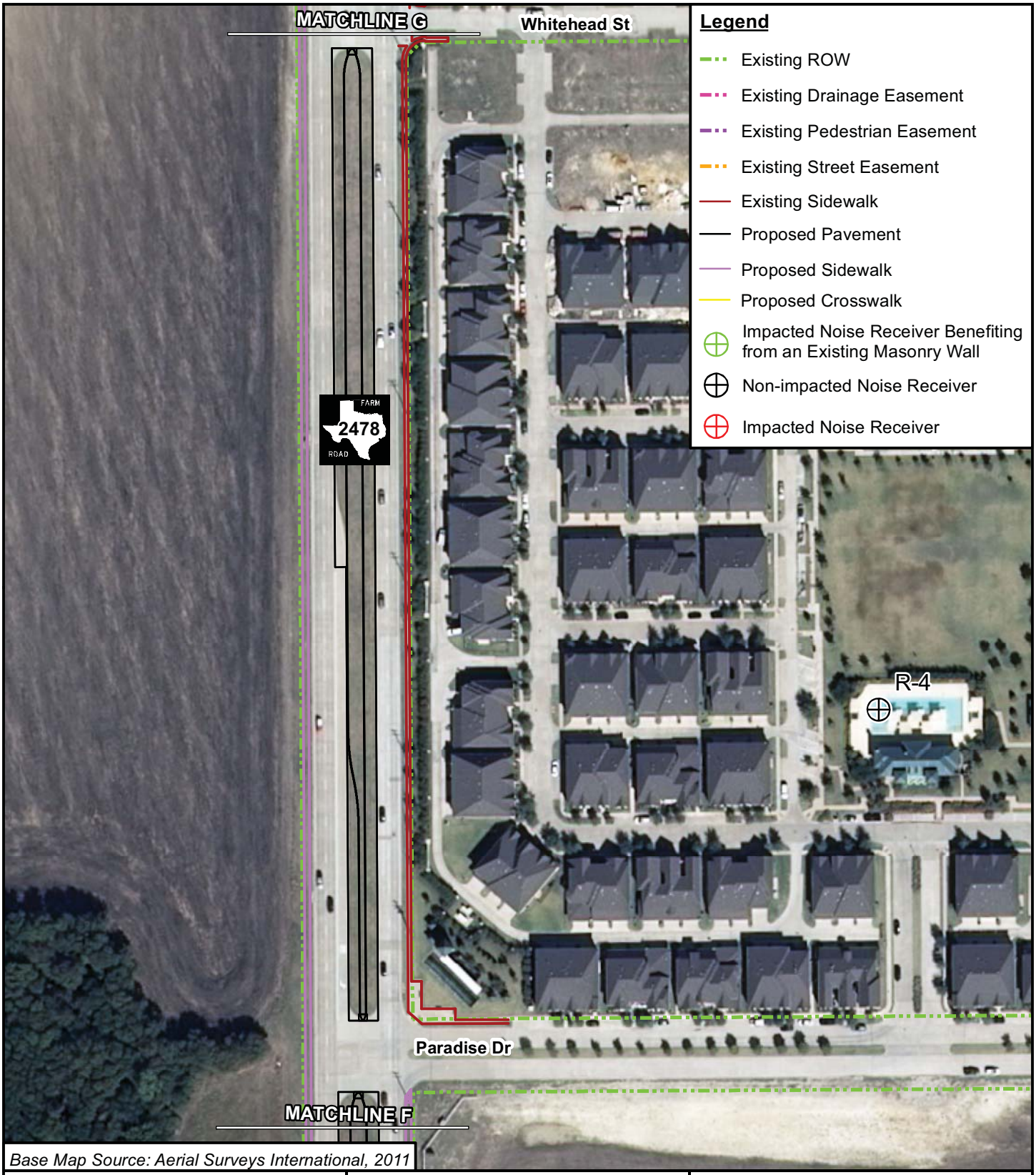


FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 6 OF 14



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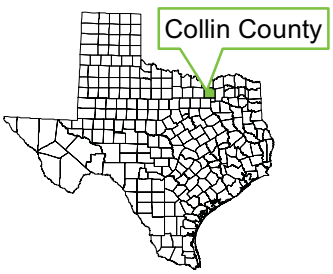


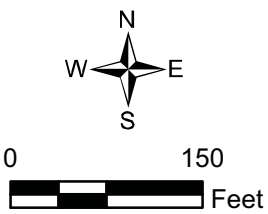


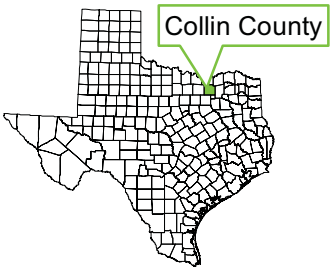
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 7 OF 14

Base Map Source: Aerial Surveys International, 2011



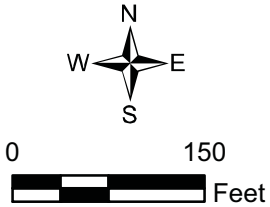
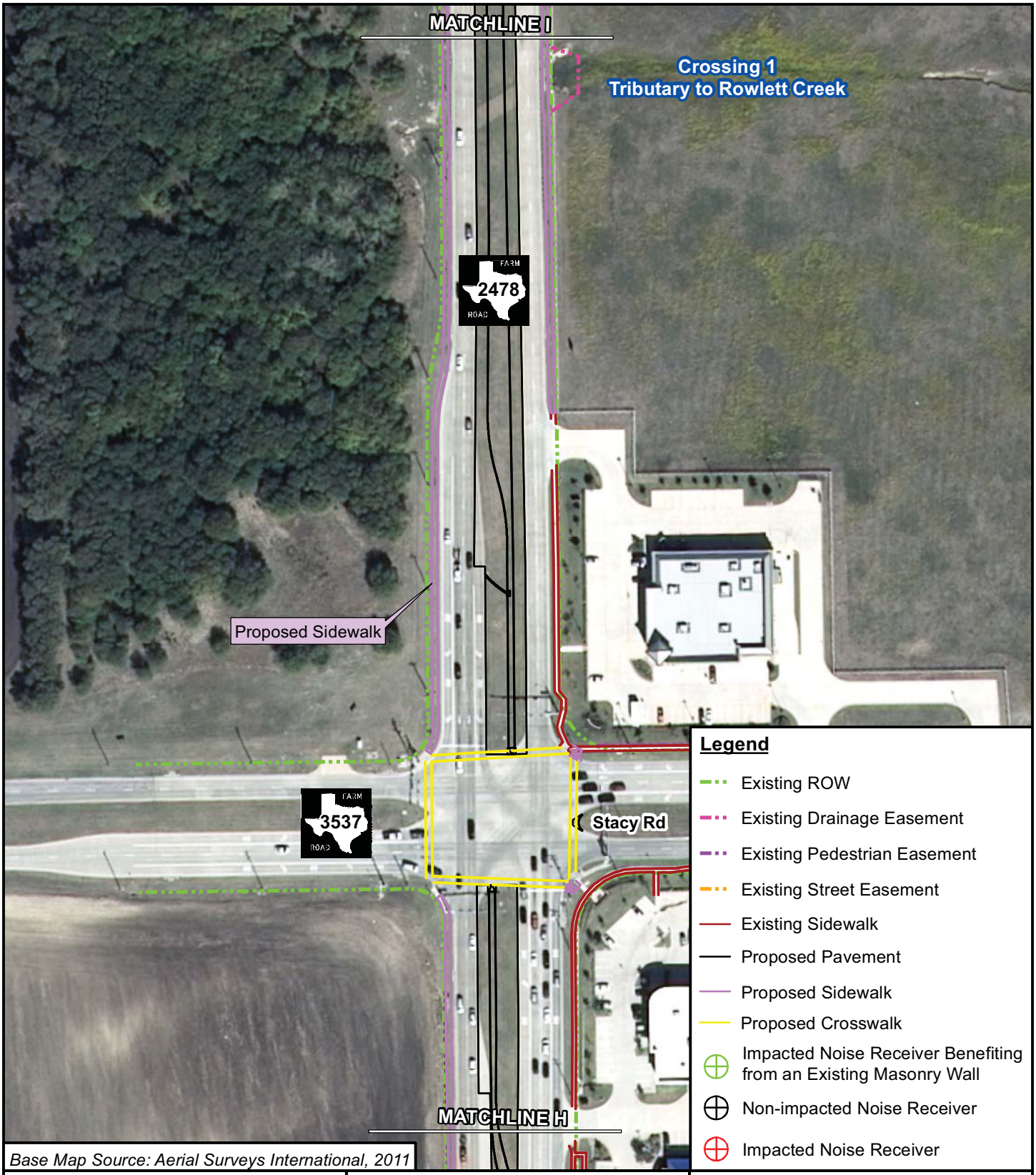


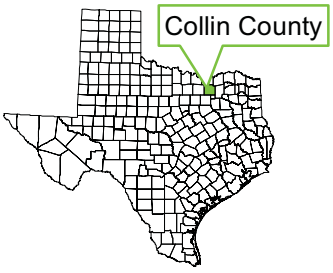
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020



Base Map Source: Aerial Surveys International, 2011



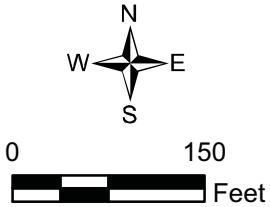


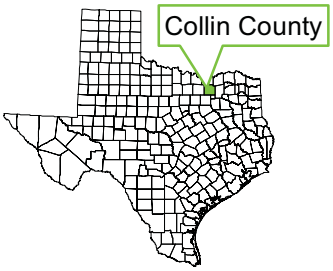
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 9 OF 14

Base Map Source: Aerial Surveys International, 2011



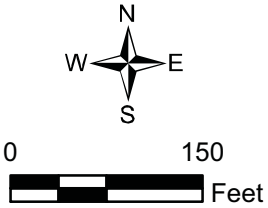


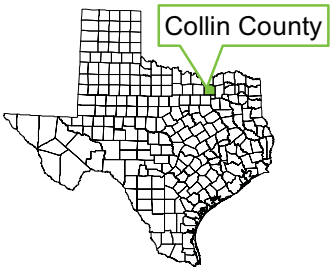
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 10 OF 14

Base Map Source: Aerial Surveys International, 2011



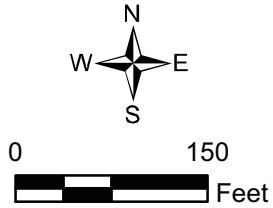
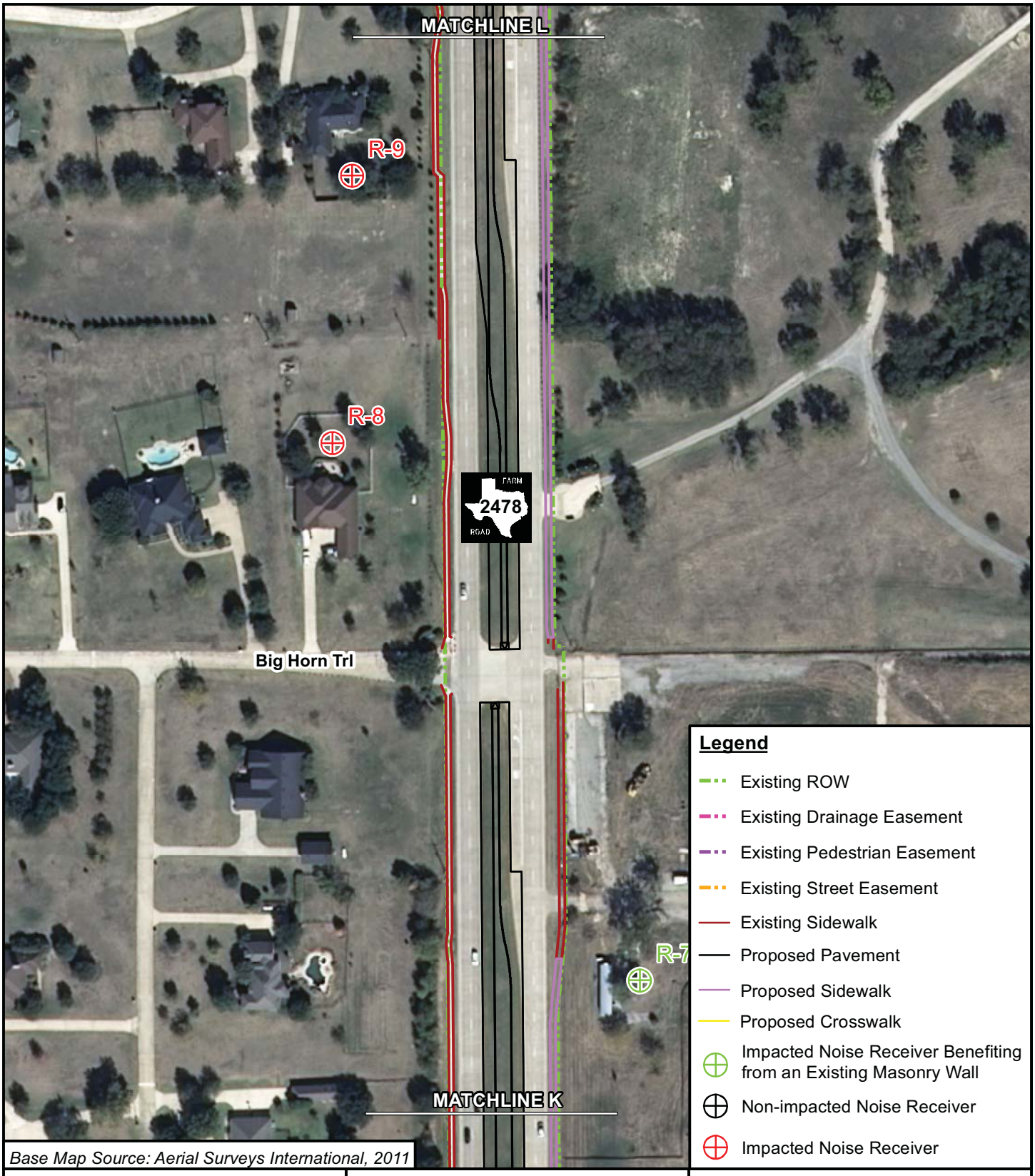


FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 11 OF 14



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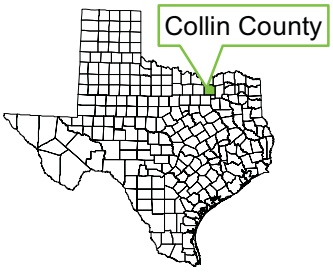


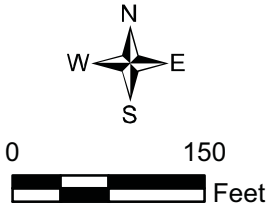


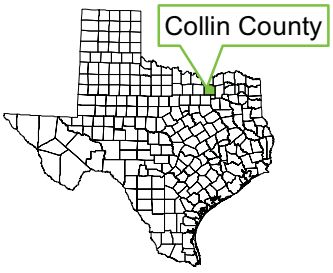
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 12 OF 14

Base Map Source: Aerial Surveys International, 2011



N
W E
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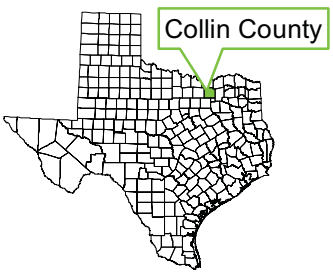
FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 13 OF 14

Base Map Source: Aerial Surveys International, 2011



N
W E
S

0 150
Feet

FIGURE 5
PROJECT LAYOUT MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

SHEET 14 OF 14

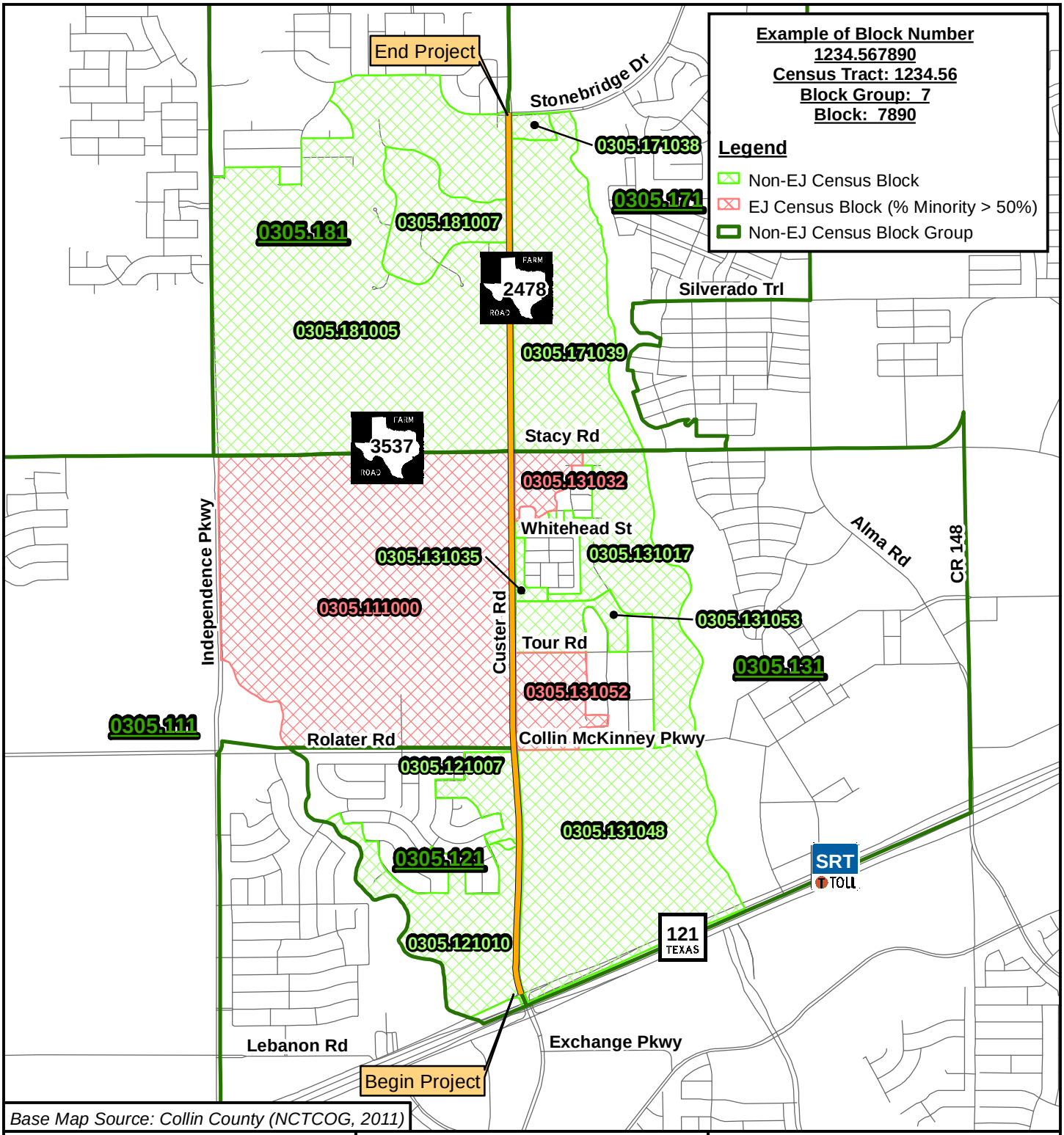
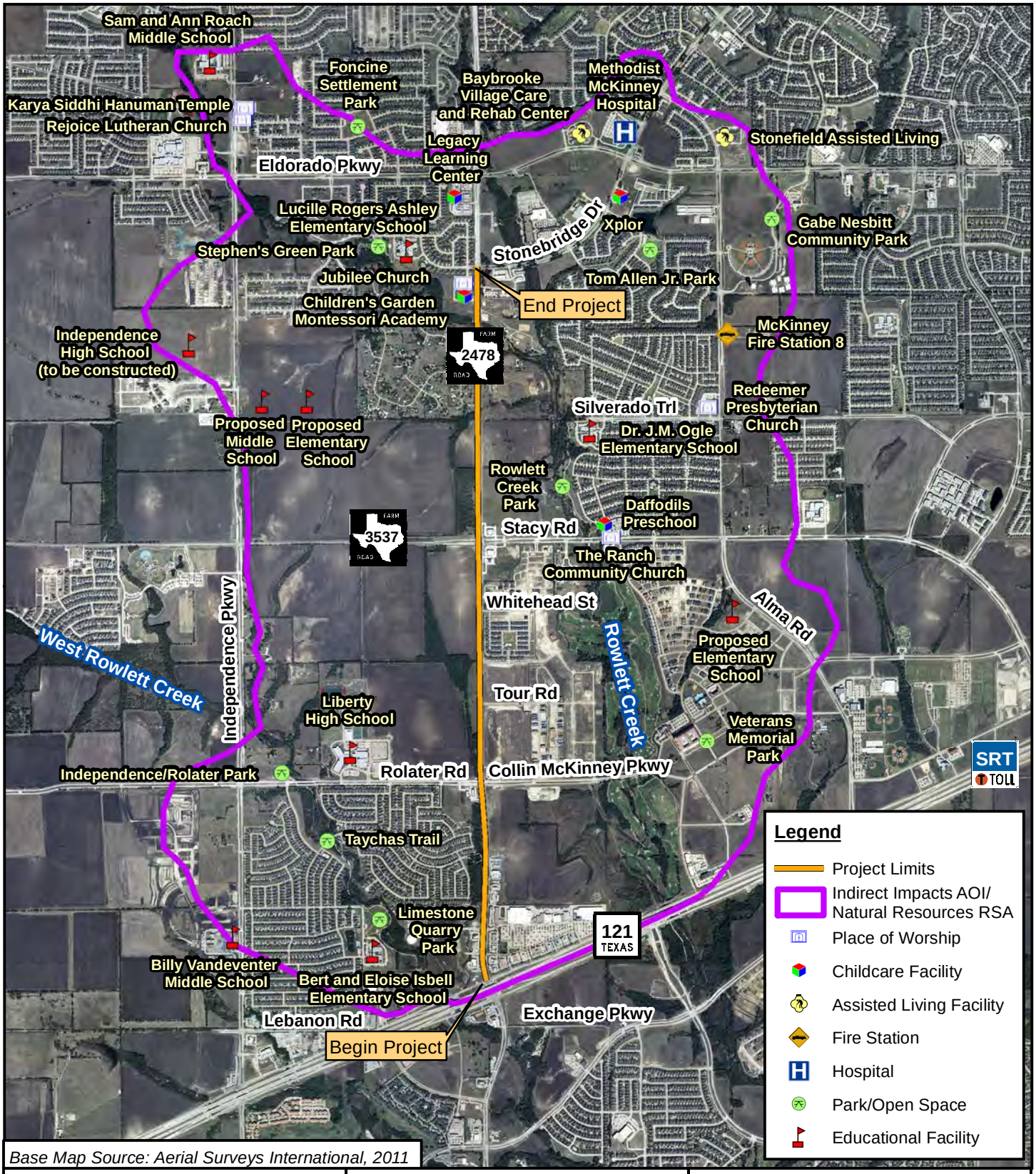


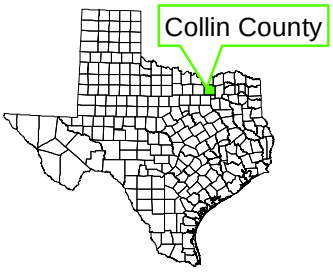
FIGURE 6
CENSUS GEOGRAPHY MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020



Base Map Source: Aerial Surveys International, 2011



N
W E
S

0 3,000 Feet

FIGURE 7
INDIRECT IMPACTS AOI MAP & CUMULATIVE IMPACTS NATURAL RESOURCES RSA MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

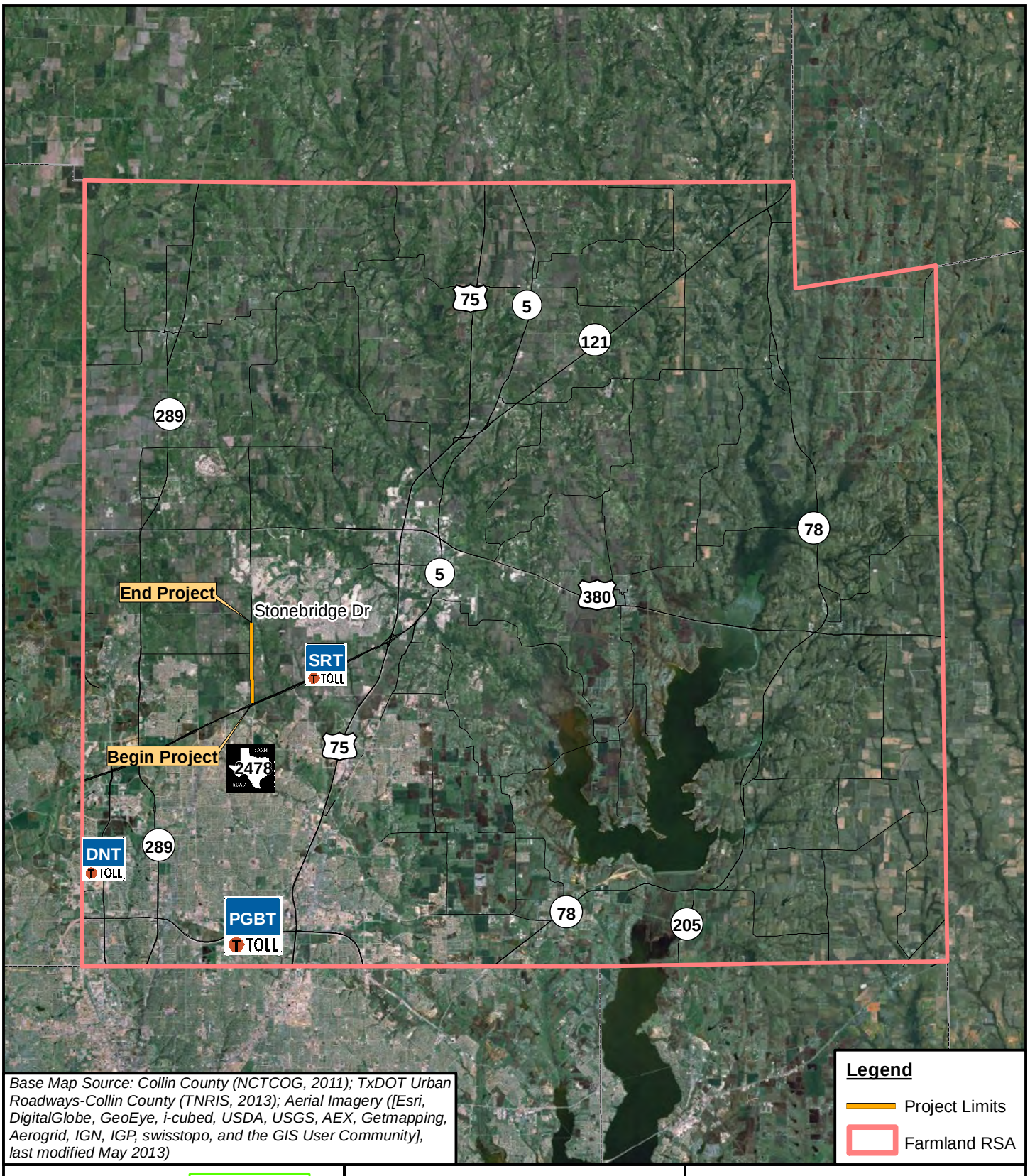
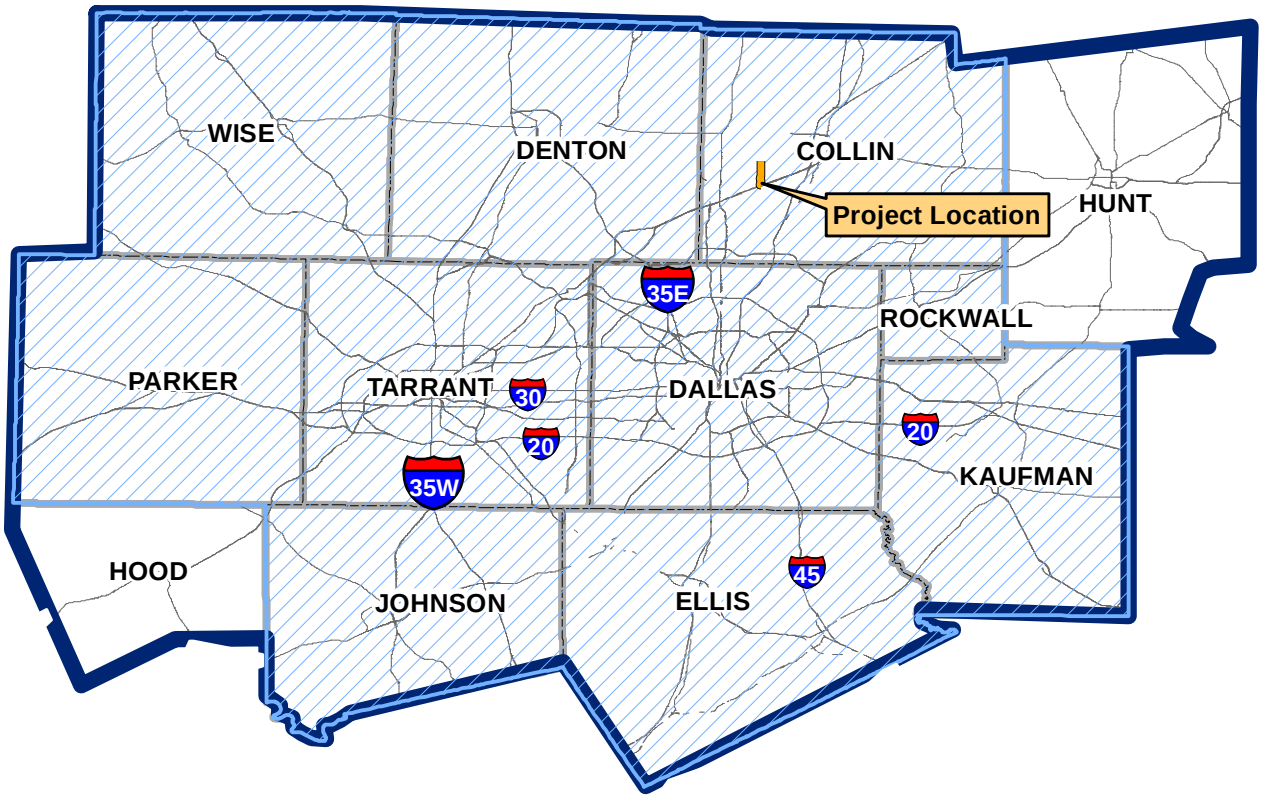


FIGURE 8
CUMULATIVE IMPACTS
FARMLAND RSA MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

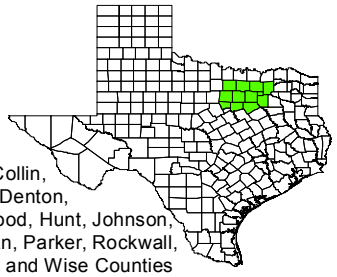
CSJ: 2351-01-020



LEGEND

- CO RSA
- Ozone RSA – DFW 8-hour Non-attainment Area
- MSAT RSA – Affected Transportation Network
- County Line

Base Map Source: NCTCOG (2011) and U.S. EPA (2012)



MPA: Collin, Dallas, Denton, Ellis, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties

N
W E
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0 125,000
Feet

FIGURE 9
CUMULATIVE IMPACTS
AIR QUALITY RSA MAP

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE

CSJ: 2351-01-020

APPENDIX A
Project Area Photographs

Photograph 1: View looking south along existing FM 2478 at SH 121 (Begin Project). The existing grassy median is the proposed location of the additional main lanes.

Photograph 2: View looking north along existing FM 2478 at SH 121 (Begin Project).

Photograph 3: View looking southwest existing developer's wall and sidewalk adjacent the proposed project southeast of FM 2478.

Photograph 4: View looking south along the existing FM 2478 and the adjacent residential subdivision (east) and active agricultural land (west).

APPENDIX A
PROJECT AREA PHOTOGRAPHS

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE
CSJ: 2351-01-020
Sheet 1 of 3

Photograph 5: View looking north at adjacent commercial properties to FM 2478.

Photograph 6: View looking northwest at the existing FM 2478 bridge crossing the tributary to Rowlett Creek. Additional lanes and columns would be added in the median, crossing the stream.

Photograph 7: View looking west at the southbound FM 2478 bridge and the tributary to Rowlett Creek. Forefront of the picture is the approximate location of the additional lanes and bridge columns.

Photograph 8: View looking west underneath the southbound FM 2478 bridge crossing the tributary to Rowlett Creek.

APPENDIX A
PROJECT AREA PHOTOGRAPHS

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE
CSJ: 2351-01-020

Photograph 9: View looking southwest at the tributary to Rowlett Creek. The stream bank and bed consist of gravel, cobbles, and bedrock.

Photograph 10: View looking northeast at a bird nest (EasterN Pheobe) underneath the FM 2478 bridge.

Photograph 11: View looking south along existing FM 2478 at Stone Creek Lane.

Photograph 12: View looking south along existing FM 2478 at Stonebridge Drive (End Project).

APPENDIX A
PROJECT AREA PHOTOGRAPHS

FM 2478
FROM SAM RAYBURN TOLLWAY (SH 121)
TO STONEBRIDGE DRIVE
CSJ: 2351-01-020

APPENDIX B
Coordination Documents

Standards of Uniformity for Historic Resources: Certification for PCE Projects

Historical Studies Project Coordination Request SOU

The District completes Section 1 for submission with the information required. If appropriate, the qualified contractor will fill out Section 2. This SOU will be reviewed by ENV HIST staff and returned to the District if the information does not meet SOU Standards. The District will address any information insufficiencies OR initiate steps necessary to address ENV HIST recommendations. The District will resubmit this form upon addressing any additional information needs.

Section 1 includes information that is minimally required to properly facilitate the review process. Please submit all relevant documentation at one time.

	SECTION 1: Information Required to Process Historic Resources Coordination and Consultation **[To be completed with all appropriate documentation attached by District personnel. Quality Control must be performed by District personnel if completed by a consultant]**	**Comments***
1	District provided: ☒ Active CSJ (or equivalent if the project is not a construction project) against which environmental work can be charged. ☒ Project has been entered into ECOS	See attached continuation sheet
2	District indicated the targeted: ☒ ENV clearance date ☒ anticipated letting date.	See attached continuation sheet
3	District provided: ☒ “historic-age” date (Let date minus 45 years)	See attached continuation sheet
4	District identified: ☒ proposed additional ROW (estimated in acres) ☒ any easements (estimated in acres)	See attached continuation sheet
5	District provided aerial map(s) or equivalent of the project area. Map includes: ☒ current ROW ☒ proposed ROW ☒ Area of Potential Effects (APE) ☒ known historic resources ☒ major streets names	See attached Project Location and Area of Potential Effects Map
6	As determined in consultation with ENV HIST, the District provided: ☒ the project description ☒ preliminary plans showing: ☒ the existing ROW boundaries	See attached continuation sheet

Standards of Uniformity for Historic Resources: Certification for PCE Projects

SECTION 1: Information Required to Process Historic Resources Coordination and Consultation **[To be completed with all appropriate documentation attached by District personnel. Quality Control must be performed by District personnel if completed by a consultant]**	**Comments***
☐ proposed right of way boundaries ☒ property parcel boundaries ☐ temporary easements See attached ☐ permanent easements	
District provided: ☒ typical roadway sections ☐ proposed roadway sections	See attached continuation sheet
District provided: ☒ results of the Texas Historic Sites Atlas search, identifying NHL, NRHP, RTHL and OTHM resources located within one-quarter mile of the project area. *Markers to be relocated must be identified*. ☒ The results of the search are listed: ☒ in table format ☒ sites are identified on aerial map(s) or equivalent	See attached continuation sheet
For Bridge Projects **or projects with historic-age bridges in the project area**, the District provided: ☐ the Bridge Inventory Number ☐ reported results of Historic Bridge Inventory Search (available from ENV HIST) ☐ The results of the search are listed: ☐ in table format ☐ **ALL** bridges are identified on aerial map(s) or equivalent ☐ As appropriate and in consultation with ENV HIST, District provides copy of CHC consultation letter and results of consultation	See attached continuation sheet
The District consulted with ENV HIST to determine: ☐ if rest area(s) have been evaluated for inclusion in the NRHP. ☐ The results of the search are: ☐ listed in table format ☐ sites are identified on aerial map(s) or equivalent	See attached continuation sheet

Standards of Uniformity for Historic Resources: Certification for PCE Projects

	SECTION 1: Information Required to Process Historic Resources Coordination and Consultation [To be completed with all appropriate documentation attached by District personnel. Quality Control must be performed by District personnel if completed by a consultant]	Comments*
11	When right of entry (ROE) is required, as determined in consultation with ENV HIST, the District sends out ENV HIST ROE forms to affected land owners. District provided: ☐ dated ROE letters sent out to ENV HIST	See attached continuation sheet
12	If applicable, the District appropriately identified: ☒ consulting parties (as stipulated by federal and state historic preservation law) ☐ individuals, local governments and known historic preservation groups are listed with contact information	See attached continuation sheet
13	District provided: ☐ representative photographs of the project area, including: ☒ adjacent buildings ☒ road features ☒ areas of construction	See attached continuation sheet
	ADDITIONAL COMMENTS:	

*A District's response and/or comments should reflect known data about the project and identify any data limits that would prevent the District from providing the requested information. (Attach pages as necessary)

	SECTION 2: Additional project Information that can be provided by a qualified TxDOT Consultant [A professionally qualified Historian or Architectural Historian must provide the following information; however, Quality Assessment and Quality Control must be performed by District personnel if completed by a consultant]	Comments*
1	☒ Period of Historical Significance (if known)	See attached continuation sheet
2	Research repositories used or will be used: ☒ State Archives ☐ CSJ log books ☒ local repositories ☒ Other sources identified	See attached continuation sheet
3	☒ Typical built resources in the APE and study area (e.g. modern commercial, mid-20th century residential, etc.)	See attached continuation sheet
4	☒ Literature review appropriate to the study area	See attached continuation sheet
5	☒ A succinct summary of the literature review results with: ☐ clear descriptions of identification, evaluation and documentation tasks required and a description of potential areas of significance appropriate to the survey area	See attached continuation sheet
6	Additional documentation: ☒ methodology ☒ historic context ☒ bibliography	See attached continuation sheet

SECTION 2: QUALIFIED HISTORIAN CERTIFICATION

As a Secretary of Interior's Standards qualified historian, I certify that the provided information contains no factual errors affecting the finding(s).

Qualified Historian Name: _____ William P Hersch _____

Date: 12/6/12

SECTION 1&2: DISTRICT PERSONNEL CERTIFICATION

I reviewed all submitted documents for quality control and assessment.

District Personnel Name:_____ Date:_____

District/County **18 / Dallas** Highway FM2478 CSJ 2351-01-020
Contractor **N/A** Submittal Date 4/17/13

	PART 3: ENV HIST Determinations Additional actions required by the District. SOU to be resubmitted with requested information *[DO NOT WRITE on this page; for ENV HIST STAFF ONLY]*	Yes
1	Project information is **insufficient** to determine level of Historic Resource Review and Consultation (see attached comments indicating why information is insufficient).	☐
2	Project information is sufficient to recommend that a **Reconnaissance Survey** be performed.** ENV HIST staff will consult with the District to (1) specify survey needs and (2) develop a scope of work and a timeline for receiving contract deliverables.	☐
3	Project information is sufficient to recommend that an **Intensive Survey** be performed.** ENV HIST staff will consult with the District to (1) specify survey needs and (2) develop a scope of work and a timeline for receiving contract deliverables.	☐
4	**Additional Comments:**	

** All work must meet appropriate Standards of Uniformity. Please consult ENV HIST if assistance is required through an ENV Scientific Services Contract.

	PART 4: ENV HIST Certification *[TO BE FILLED OUT BY ENV HIST STAFF; TO BE INCLUDED WITH DISTRICT'S SUBMISSION TO THE REC]*
1	ENV HIST staff determined that the project information is sufficient to record Section 106 actions on HIST screen in ETS. The appropriate NEPA language has been submitted to the District and recorded in ETS.
2	ENV HIST Reviewer Name: [signature] Date: 4/22/13

Certification Standards for Projects that Do Not Require Project Specific Archeology Review

Dallas District

CSJ: 2351-01-020

PROJECT CSJ: 2351-01-020			
HIGHWAY NUMBER: Custer Road (FM 2478)			
PROJECT LIMITS: SH 121 to Stonebridge Drive			
PROJECT DESCRIPTION: The proposed project is the expansion of Custer Road from a four-lane divided urban roadway to a six-lane divided urban roadway. The improvements would also include the expansion of a bridge at the Rowlett Creek tributary crossing and addition of sidewalks for the entire length of the project. All expansion will be conducted within the existing ROW.			
Standards of Uniformity for Archeology Date: 10/09/2009			
Project Classified as Routine Maintenance	**Yes**	**No**	**N/A**
Project entails routine roadway maintenance (such as vegetation control, traffic control, and routine painting and striping) that does not have the potential to affect State Archeological Landmarks or historic properties.			X
Project Is Not Routine Maintenance But Contains Only Elements from the Following List	**Yes**	**No**	**N/A**
Installation, repair, or replacement of fencing, signage, traffic signals, railroad warning devices, safety end treatments, cameras and intelligent highway system equipment;			X
Earthmoving projects involving less than 100 cubic yards of excavation below the original grade;	X		
Routine structural maintenance and repair of non-historic bridges, highways, railroad crossings, picnic areas, and rest areas;			X
In-kind repair, replacement of non-historic lighting, signals, curbs and gutters, and sidewalks;			X
Seal coat, crack seal, overlay, milling, grooving, resurfacing, rehabilitation, or restoration done within existing right-of-way on an existing road and completely within the footprint of existing base course;			X
Replacement, upgrade, and repair of safety barriers, ditches, storm drains, and culverts constructed after the depression-era period (i.e. after 1939) except in association with historic bridges;			X
Intersection improvements that require no additional right of way or minimal additional right of way within a developed/disturbed area;	X		
Placement of riprap to prevent erosion of waterway banks and bridge piers provided no ground disturbance is required;			X
All maintenance work between a highway and an adjacent frontage road;			X
Installation of noise barriers or alterations to existing publicly owned buildings less than 50 years old, to provide for noise reduction except in potential or listed National Register districts;			X

Certification Standards for Projects that Do Not Require Project Specific Archeology Review

Dallas District

CSJ: 2351-01-020

Driveway and street connections;	X		
All work within interchanges and within medians of divided highways except where graves are present;			X
All work between the flowlines of the ditches and channels and above the original line and grade;			X
Project Is Not Routine Maintenance But Contains Only Elements from the Following List	**Yes**	**No**	**N/A**
Ditch and channel maintenance provided removal of fill is above the original line and grade;			X
Repairs needed as a result of an event, natural or man-made, which causes damage to a designated state highway, resulting in an imminent threat to life or property of the traveling public or which substantially disrupts or may disrupt the orderly flow of traffic and commerce; or			X
Sidewalk construction or modification—including ADA ramps—except (i) sidewalk installations where the depth of impacts exceeds one foot or (ii) projects within the historic districts of Goliad, Rio Grande City, Roma, San Antonio, San Elizario, and San Ygnacio or (iii) projects within the city limits of Anahuac, San Patricio, and Socorro.	X		
Rehabilitation, reconstruction, or replacement of bridges within the within previously disturbed right of way, except in association with historic bridges;	X		
Construction of bicycle or pedestrian lanes, paths, or facilities;	X		
Adding shoulders, travel lanes or adding auxiliary lanes, such as parking, weaving, turning, or climbing lanes within previously disturbed right-of-way;	X		
Other Project Elements	**Yes**	**No**	**N/A**
The project contains only elements listed under criteria 1 or 2.	X		
Supporting Documentation	**Yes**	**No**	**N/A**
Documentation included in the project files or maintenance log support the conclusion that this project contains only elements listed under criterion 1 or 2. Documentation includes a location map and project description.	X		

Certification Standards for Projects that Do Not Require Project Specific Archeology Review

Dallas District

CSJ: 2351-01-020

The undersigned certifies that the project meets the criteria above. Therefore, the project qualifies as an Undertaking with No Potential to Affect Archeological Historic Properties under Stipulation V and Appendix 3 of the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings. It also qualifies as a project that does not have potential to affect State Archeological Landmarks under 43 TAC 2.24(e).

Certified by:

Jan M Heady — Printed Name

Jan M Heady — Signature

4/17/13 — Date

Trans. Engineer — Title

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Civil Associates, Inc.

TBPE Firm Reg. No.: F-6981

June 5, 2013

Karen B. Hardin
Texas Parks and Wildlife Department (TPWD)
Wildlife Habitat Assessment Program
4200 Smith School Road
Austin, TX 78744-3291

RE: TxDOT/TPWD MOU/MOA Coordination Documentation Technical Memorandum
FM 2478 from SH 121 to Stonebridge Drive
Frisco, Collin County, Texas
CSJ: 2351-01-020

Dear Ms. Hardin:

Civil Associates, Inc., on behalf of the City of Frisco and the Texas Department of Transportation (TxDOT), is currently conducting a Categorical Exclusion for the proposed expansion of the existing FM 2478 from a four-lane divided urban roadway to a six-lane divided urban roadway from SH 121 to Stonebridge Drive. The 2.95-mile improvements would include the addition of a continuous sidewalk for the entire length of the project and the expansion of an existing bridge at the tributary to Rowlett Creek crossing. The proposed project is located in Collin County. The purpose of the proposed project is to provide better mobility and bring the roadway up to current design standards.

We are seeking your input in accordance with the MOA. Attached is the Technical Memorandum. If you should need further information concerning this project, please contact me at 214-703-5151 ext. 4575.

Sincerely,

Alma R. Canning

Alma R. Canning
Senior Environmental Scientist
Civil Associates, Inc.
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CC: Syed Haq, P.E., Kennedy Consulting Ltd.
Sandra Williams, TxDOT Dallas District

TxDOT/TPWD MOU/MOA
COORDINATION DOCUMENTATION
TECHNICAL MEMORANDUM
CSJ: 2351-01-020
FM 2478
Collin County
June 5, 2013

Introduction

The Texas Department of Transportation (TxDOT) and the City of Frisco propose to expand the existing FM 2478 from a four-lane divided urban roadway to a six-lane divided urban roadway from SH 121 to Stonebridge Drive. The 2.95-mile improvements would include the addition of a continuous sidewalk for the entire length of the project and the expansion of an existing bridge at the tributary to Rowlett Creek crossing. The proposed project is located in Collin County. All work for the proposed project would occur within existing right-of-way (ROW) and easements. **Attached with this Technical Memorandum are:** Project location map, USGS topographic map, aerial map, project existing and proposed roadway typical section, proposed project layout, and project area photographs.

Existing Facility

The existing facility within the project limits is a four-lane divided urban roadway with 12-foot wide outside lanes, 11-foot wide inside lanes, 44-foot wide median, and no shoulders in a usual 120-foot wide ROW. Five-foot wide discontinuous sidewalks exist within the project limits.

Proposed Facility

The proposed facility would add a single 11-foot wide inside lane and incorporate a 14 foot wide outside shared use lane in each direction to the existing roadway, creating two 11-foot wide lanes and one 14-foot shared use lane in each direction with one-foot inside lane and two-foot outside lane offsets. The curb and gutter roadway would also include 11-foot wide left turn lanes and minimum median width of 7 feet.

Habitat Characterizations and Impact Descriptions

The proposed project is located in the Blackland Prairie region. According to the Texas Parks and Wildlife Department's (TPWD) The Vegetation Types of Texas (1984), the proposed project area is located within the Crops (Type 44) cultivated cover crops or row crops providing food and/or fiber for either man or domestic animals. This type may portray grassland associated with crop rotations.

A field survey conducted by qualified biologists on November 12, 2012, determined that the vegetation within the immediate area is not consistent with the Crops vegetation classification. Maintained and unmaintained herbaceous and riparian vegetation are present along the proposed project.

The field survey revealed that the vegetation within the existing ROW and easements is primarily maintained grasses. Dominant vegetation within the proposed project area is presented in **Table 1**.

Table 1: Dominant Vegetative Species Identified within the Project Area

Strata	Common Name	Scientific Name
Forb	Bermuda grass	*Cynodon dactylon*
Forb	silver bluestem	*Bothriochloa saccharoides*
Forb	Johnson grass	*Sorghum halepense*

Source: Field Investigation (November 12, 2012).

All work for the proposed project would occur within the existing ROW and easements. Approximately 12.6 acres of maintained herbaceous vegetation could be permanently impacted by construction of the proposed project.

In accordance with the TxDOT –TPWD Memorandum of Agreement (MOA), unusual features to be identified within the proposed project area could include:

- Unmaintained vegetation;
- Trees or shrubs along a fenceline (ROW) adjacent to a field;
- Riparian vegetation;
- Trees that are unusually larger than other trees in the area; and,
- Unusual stands or islands (isolated) of vegetation.

Of these unusual features, unmaintained vegetation and riparian vegetation exists within the proposed project area.

Unmaintained Vegetation
Unmaintained vegetation is present on both banks of the tributary to Rowlett Creek (Crossing 3). This area is confined in between the existing bridge. Dominant unmaintained herbaceous vegetation consists of Virginia wildrye (*Elymus virginicus*), Johnsongrass, Canada goldenrod (*Solidago canadensis*), great ragweed (*Ambrosia trifida*), southern cattail (*Typha domingensis*), and common moonseed (*Menispernum canadense*). Approximately 0.02 acre of unmaintained vegetation would be impacted by the Build Alternative.

Riparian Vegetation
Riparian buffer is present on both banks of the tributaries to Rowlett Creek (Crossings 2 and 3), adjacent to the existing roadway's outside lanes. Dominant overstory vegetation consists of American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*) and red mulberry (*Morus rubra*). The trees range in size from sapling to 8-inch diameter at breast height (dbh), with an average dbh of three inches. Canopy cover is 70 percent, and tree heights range from 15 to 45 feet with an average tree height of 25 feet. Dominant understory vegetation consists of the overstory species saplings and muscadine grape (*Vitis rotundifolia*). There would be no impacts to riparian woodlands from the proposed project.

Coordination per the 1999 MOU between TxDOT and TPWD is concluded. According to the MOA between TxDOT and TPWD, special habitat features are classified as:

(a) Bottomland hardwoods
(b) Caves
(c) Cliffs and bluffs
(d) Native prairie (particularly those with climax species of native grasses and forbs)
(e) Ponds
(f) Seeps or springs
(g) Snags or groups of snags
(h) Water bodies
(i) Existing bridges with known or easily observed bird or bat colonies.

The special habitat features identified within the project area are the channels of the tributaries to Rowlett Creek which are water bodies.

Water Bodies
Within the proposed project limits, FM 2478 crosses three tributaries to Rowlett Creek. Approximately 0.0005 acre (10 linear feet [LF]) of the tributary to Rowlett Creek (Crossing 3) would be permanently impacted due to the widening of the northbound and southbound main lanes at the FM 2478 bridge over the creek and up to 0.012 acre (39 LF) of the tributary would be temporarily impacted during construction of the proposed bridge. Best management practices would be used to avoid and/or minimize impacts to water quality.

No other Unusual Vegetation Features or Special Habitat Features are located within the proposed project area.

In accordance with Title 43 of the Texas Administrative Code §2.22, coordination with TPWD would not be required for this proposed project because the proposed project would not affect mature woody vegetation.

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

1. Habitat for Federal candidate species (impacted by the project) if mitigation would assist in the prevention of the listing of the species;

2. rare vegetation series (S1, S2, or S3) that also locally provide habitat for a State-listed species;

3. all vegetation communities listed as S1 or S2, regardless of whether or not the series in question provide habitat for State-listed species;

4. bottomland hardwoods, native prairies and riparian sites; and,

5. any other habitat feature considered locally important that the TxDOT District chooses to consider.

Of the previously listed habitat to be given consideration for non-regulatory mitigation, riparian habitat is located within the proposed project area. However, the riparian areas would not be impacted by the proposed project. During project development, TxDOT would design, use, and promote construction practices that minimize adverse effects on both regulated and unregulated wildlife habitat. Existing vegetation, especially native trees, would be avoided and preserved where practicable.

Endangered Species Act

The Endangered Species Act affords protection for federally listed threatened and endangered species and, where designated, critical habitat for these species. The U.S. Fish and Wildlife Service (USFWS) maintains a list of Federally threatened and endangered species of potential occurrence for each Texas county as does TPWD. TPWD maintains special species lists through the Natural Diversity Database (NDD) by county. Data was obtained from the TPWD's NDD list on May 6, 2013. This information was verified using TPWD's NDD mimic (Version 12/13/2011) on May 26, 2013. The NDD review met all the requirements of the TxDOT-TPWD MOA for sharing and maintaining NDD information. The search radius was 10 miles from the proposed project area. **Table 2** provides elements of occurrence of state and federally listed species within a 10 mile buffer, but outside of a 1.5 mile buffer of the proposed project. The Texas NDD is a potential presence database that cannot be interpreted as presence/absence data.

Federal and State Threatened and Endangered Species

Table 2 addresses, the Federal and State Threatened or Endangered Species for Collin County, their listed status, habitat requirements, and anticipated effects from the proposed project. A field survey was performed by qualified biologists on November 12, 2012. Based on this survey, it was determined that the proposed project area contains no habitat for federally listed threatened and endangered species. The proposed project would have no effect on federally listed species or critical habitat.

Based on this survey, it was determined that the proposed project area is within the range and contains habitat for the state threatened Timber/Canebrake rattlesnake. Therefore, coordination with TPWD is required. There would be no impacts to habitat and the potential for encountering the species during construction is low. The proposed project is not anticipated to impact State listed species.

State Species of Concern

Table 2 addresses the TPWD's Annotated County List of Rare Species for Collin County which includes other species that the State considers rare, but have no formal regulatory status at the State or Federal level. Potential habitat for one rare species, the Texas garter snake, is present within the proposed project area. Impacts to potential

habitat would be minor, and the potential for encountering the species during construction is low.

Migratory Bird Treaty Act

The MBTA 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. Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structures that would be affected by the proposed project, and would complete any bridge work and/or vegetation clearing. 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. 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.

Evidence of migratory bird species, Eastern Phoebe (*Sayornis phoebe*), was found during the November 12, 2012, field survey. Bird nests were observed beneath the tributary to Rowlett Creek bridge. Measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young.

Table 2: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect/ Impact	Justification
BIRDS						
American Peregrine Falcon *Falco peregrinus anatum*	DL*	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 effect/ No impact	No habitat present and no species observed during field survey.
Arctic Peregrine Falcon *Falco peregrinus tundrius*	DL*		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 effect	No habitat present and no species observed during field survey.
Bald Eagle *Haliaeetus leucocephalus*	DL*	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.	No	No effect/ No impact	No habitat present and no species observed during field survey.

Table 2: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect/ Impact	Justification
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 habitat present and no species observed during field survey.
Interior Least Tern *Sterna antillarum athalassos*	E*	E	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony.	No	No effect/ No impact	No habitat present and no species observed during field survey.
Peregrine Falcon *Falco peregrinus*	DL*	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 effect/ No impact	No habitat present and no species observed during field survey.
Piping Plover *Charadrius melodus*	T*	T	Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats.	No	No effect/ No impact	No habitat present and no species observed during field survey.
Sprague's Pipit *Anthus spragueii*	C*		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 effect	No habitat present and no species observed during field survey.
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 habitat present and no species observed during field survey.
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	No habitat present and no species observed during field survey.
Whooping Crane *Grus americana*	E, EXPN	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	No habitat present and no species observed during field survey.

Table 2: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County						
Species	**Federal Status**	**State Status**	**Description of Suitable Habitat**	**Habitat Present**	**Species Effect/ Impact**	**Justification**
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	No habitat present and no species observed during field survey.
CRUSTACEANS						
A crayfish *Procambarus steigmani*	—		Burrower in long-grass prairie; all animals were collected with traps, thus there is no knowledge of depths of burrows; herbivore; crepuscular, nocturnal.	No	--	No habitat present and no species observed during field survey.
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.	No	--	No habitat present and no species observed during field survey.
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	Extirpated from Texas.
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 habitat present and no species observed during field survey.
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 habitat present and no species observed during field survey.
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	No habitat present and no species observed during field survey.
Texas heelsplitter *Potamilus amphichaenus*	—	T	Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.	No	--/No impact	No habitat present and no species observed during field survey.
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 habitat present and no species observed during field survey.

Table 2: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect/ Impact	Justification
REPTILES						
Alligator snapping turtle *Macrochelys temminckii*	—	T	Perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October.	No	--/No impact	No habitat present and no species observed during field survey.
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	Might Impact	Potential impacts to habitat would be minor, and the potential for encountering the species during construction is low.
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	No habitat present and no species observed during field survey.
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	Might impact	Based on the survey, it was determined that the proposed project area adjacent to the outside lanes contains habitat for the state threatened timber/canebrake rattlesnake. However, these areas would not be impacted by the Build Alternative. The potential for encountering species during construction is low.
TPWD NDD RESULTS						
Eo Id 988 - Little Bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.
Eo Id 2718 - Little Bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.
Eo Id 2719 - Little Bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.
Eo Id 3578 - American Elm-chinkapin oak-hackberry Series (*Ulmus americana-quercus muhlenbergia-celtis spp. series*), Federal/State status – none. Occurrence within 10 mile buffer, but outside of the 1.5 mile buffer.					--	Element of occurrence more than 1.5 miles from project area.
Lavon Lake Managed Area (USACE)					N/A	Managed Area more than 1.5 miles from the proposed project area.

Table 2: Federal and State-Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern in Collin County

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect/ Impact	Justification
E – State or Federal Listed Endangered EXPN – Experimental Population(s) of Reintroduced Individuals) T – State or Federal Listed Threatened C – Federal Candidate for Listing DL – Federally Delisted "–" – 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. Eo Id – Element Occurrence Identification Number N/A – Not applicable Note: For federal candidate species or species in the post-delisting monitoring period, the species was evaluated as if it were listed, but no consultation is required.						
Sources: U.S. Fish & Wildlife Service (March 19, 2013), TPWD, Wildlife Division, Wildlife Division, Diversity and Habitat Assessment Programs, County Lists of Texas Special Species (Collin, February 28, 2011), and field investigation (November 12, 2012).						

Fish and Wildlife Coordination Act (FCWA)

All impacts to waters of the U.S. would be authorized under the U.S. Army Corps of Engineers 404 Nationwide Permit Program; therefore, the USFWS considers FWCA coordination to have been completed as part of the NWP's review last authorized and reissued in 2012.

Environmental Permits, Issues, and Commitments

This section summarizes the elements that constitute the EPIC Sheet. The EPIC sheet, found in the Environmental Tracking System, documents and communicates permit issues and environmental commitments that must be incorporated into the Plans, Specifications, and Estimates. The permits, impacts and commitments relevant to the proposed project are as follows:

Vegetation Resources Commitment

No action required for the proposed project.

Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Bird Treaty Act Commitment

The proposed project, if implemented, would have no effect on any federally listed species, its habitat, or designated critical habitat. The proposed project, if implemented, would have the potential to impact the following state-listed or species of concern and their habitats:

- Texas garter snake
- Timber/canebrake rattlesnake

Suitable habitats were noted within the project limits for these species; however, no known occurrences have been recorded within 1.5 miles of the proposed project area. During construction of the proposed project, there would be temporary and permanent impacts to the tributary of Rowlett Creek, which could serve as habitat for the Texas

garter snake. After construction, the temporarily disturbed areas would be returned to preconstruction contours. Areas abutting the limits of construction for the proposed project would remain as potential habitat for these species.

Special Notes:
Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structures that would be affected by the proposed project, and complete any bridge work/demolition and/or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October 1, per the EPIC plans. 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.

Attached with this Technical Memorandum are:

- Project location map
- USGS topographic map
- Aerial map
- Project existing and proposed roadway typical section
- Proposed project layout
- Project area photographs

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comprehensive solutions

Civil Associates, Inc.

TBPE Firm Reg. No.: F-6981

June 5, 2013

Karen B. Hardin
Texas Parks and Wildlife Department (TPWD)
Wildlife Habitat Assessment Program
4200 Smith School Road
Austin, TX 78744-3291

RE: TxDOT/TPWD MOU/MOA Coordination Documentation Technical Memorandum
FM 2478 from SH 121 to Stonebridge Drive
Frisco, Collin County, Texas
CSJ: 2351-01-020

Dear Ms. Hardin:

Civil Associates, Inc., on behalf of the City of Frisco and the Texas Department of Transportation (TxDOT), is currently conducting a Categorical Exclusion for the proposed expansion of the existing FM 2478 from a four-lane divided urban roadway to a six-lane divided urban roadway from SH 121 to Stonebridge Drive. The 2.95-mile improvements would include the addition of a continuous sidewalk for the entire length of the project and the expansion of an existing bridge at the tributary to Rowlett Creek crossing. The proposed project is located in Collin County. The purpose of the proposed project is to provide better mobility and bring the roadway up to current design standards.

We are seeking your input in accordance with the MOA. Attached is the Technical Memorandum. If you should need further information concerning this project, please contact me at 214-703-5151 ext. 4575.

Sincerely,

Alma R. Canning

Alma R. Canning
Senior Environmental Scientist
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alma@civilassociates.com

TEXAS PARKS & WILDLIFE

Based on the project description, the Wildlife Habitat Assessment Program does not anticipate significant adverse impacts to rare, threatened or endangered species, or other fish and wildlife resources.

Signed: Karen B Hardin

Date: 6-20-2013

TPWD Project # 30371

CC: Syed Haq, P.E., Kennedy Consulting Ltd.
Sandra Williams, TxDOT Dallas District

APPENDIX C
Stream Data Form

Stream Data Form #: 1
Project Name: Custer Road (FM 2478)
CSJ: 2351-01-020

Stream Data Form

Surveyor(s): MDB and RP
Date of Field Work: 11/12/12
USGS Stream Name: Tributary to Rowlett Creek
County/State: Collin, TX
USGS Topo Quad Name: McKinney West
Stream Number [303(d) List]: N/A
Associated Wetland(s): None
GPS Data: 33°9'55.0989"N 96°43'58.6486"W

Stream Type: Intermittent Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Eroding banks in some locations
Stream Flow Direction: East

OHWM Width (ft): six to 25 feet, typical = six feet
OHWM Height (in): three to 12 inches, typical = three 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.
small frogs and fish

Riparian Vegetation: List species observed.
muscadine grape (*Vitis rotundifolia*), American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), southern cattail (*Typha domingensis*), black willow (*Salix nigra*), Virginia wildrye (*Elymus virginicus*), Johnsongrass (*Sorghum halepense*), Canada goldenrod (*Solidago canadensis*), great ragweed (*Ambrosia trifida*), red mulberry (*Morus rubra*), and common moonseed (*Menispernum canadense*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
timber/canebrake rattlesnake (*Crotalus horridus*)

Stream Data Form #:	1
Project Name:	Custer Road (FM 2478)
CSJ:	2351-01-020

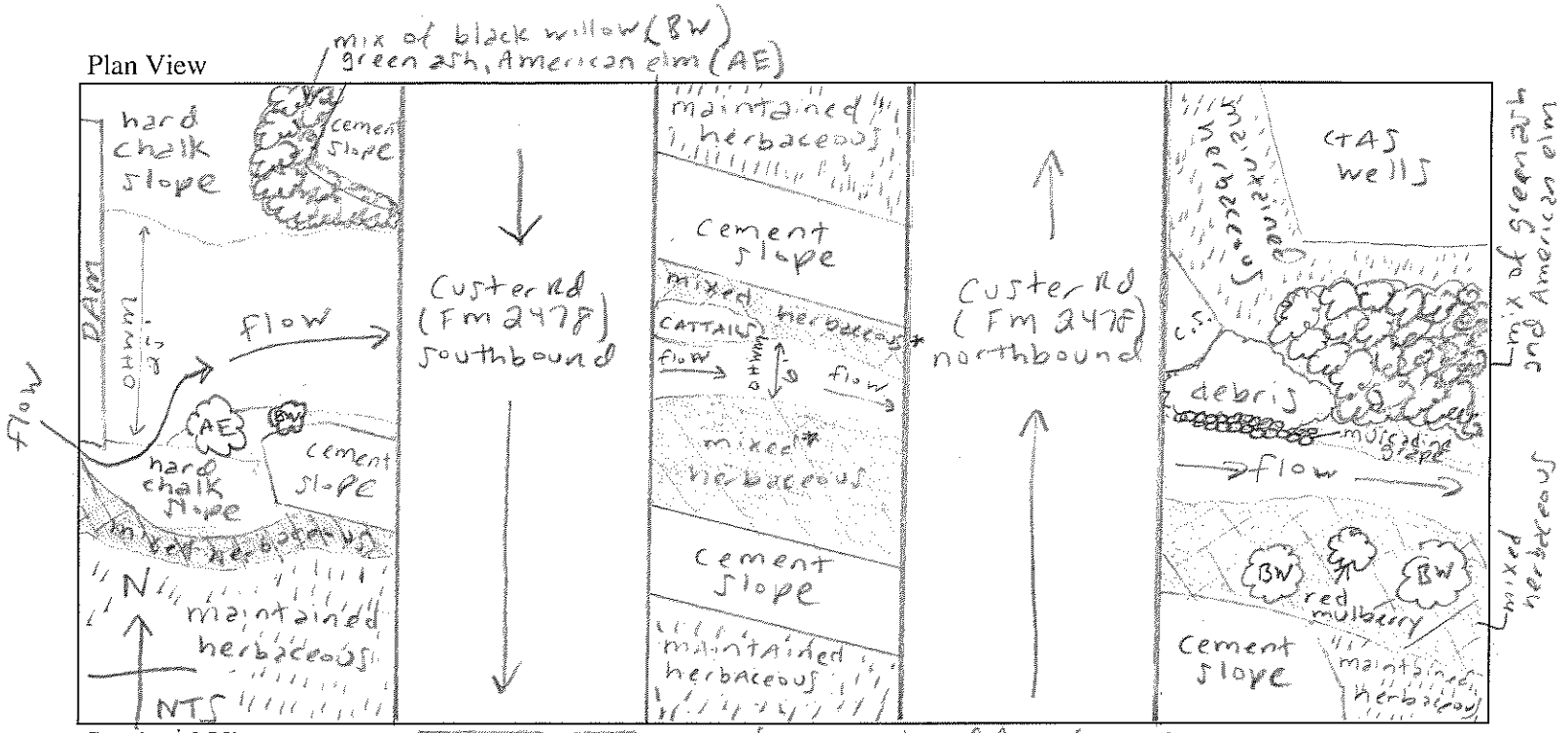
Stream Data Form (continued)

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

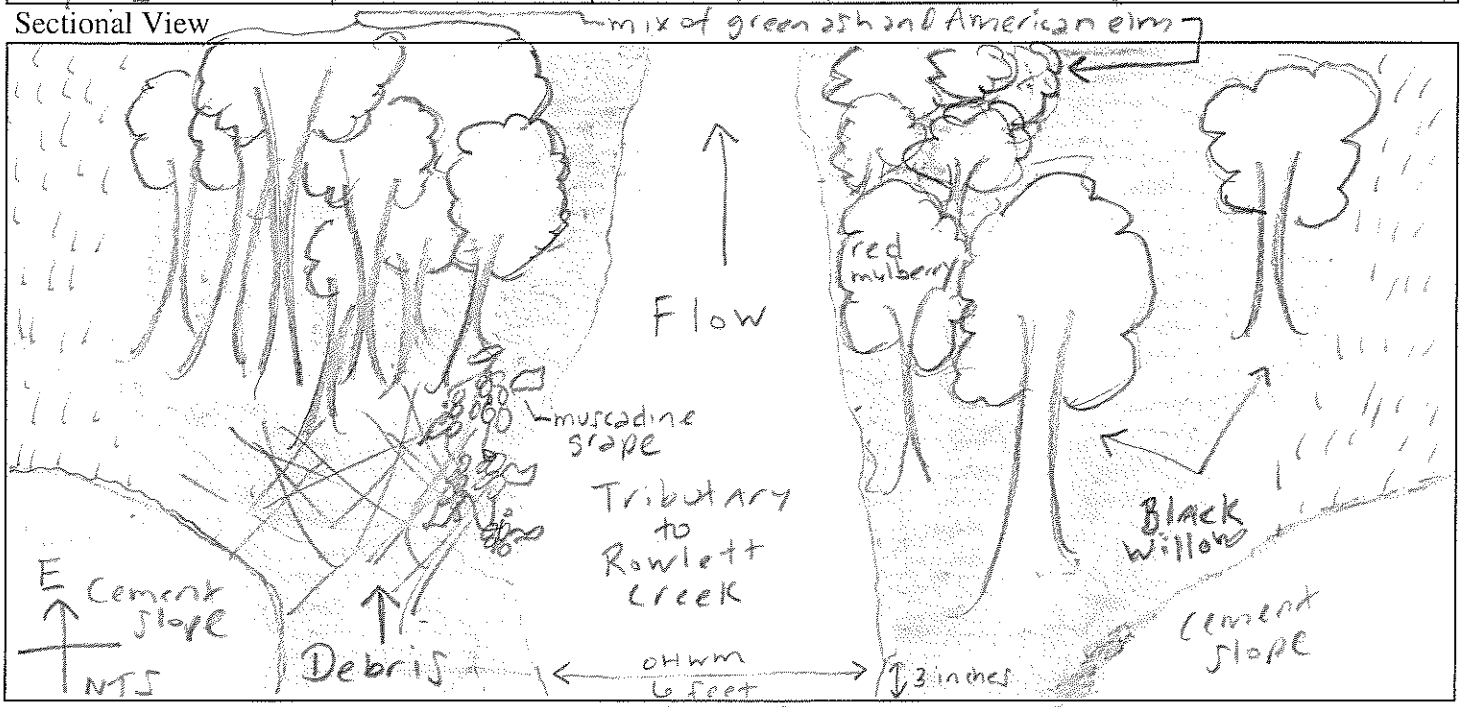
Sketch should include:

- 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



*mixed herbaceous - Virginia wildrye, Johnsongrass, Canada goldenrod, great ragweed, and common moonseed.

- mixed herbaceous

- maintained herbaceous

APPENDIX D
MTP and TIP

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
DALLAS	DALLAS	1068-04-162	IH 30	E,R	DALLAS	DALLAS	**$250,000**

LIMITS FROM: IH 30 PEDESTRIAN AND BICYCLE CONNECTIONS
LIMITS TO: WEST BOUND FROM RIVERFRONT BOULEVARD TO BECKLEY AVE
TIP DESCRIPTION: ENHANCE BICYCLE/PEDESTRIAN CONNECTIONS WITH IH 30; IMPROVE THE GRADES ON THE CONNECTIONS; (PHASE 2)
REMARKS: ADD PROJECT TO TIP/STIP; LOCAL CONTRIBUTION TO BE PAID BY DALLAS

REV DATE: 02/2013
MPO PROJECT ID: 83260
FUNDING CAT: 3LC
MTP REFERENCE: BP2-002, BP2-012, BP2-017, BP2-018

Project History:

Total Project Cost Information:

Preliminary Engineering:	$100,000
Right Of Way:	$150,000
Construction:	$3,250,000
Construction Engineering	$0
Contingencies:	$0
Indirects:	$0
Bond Financing:	$0
Total Project Cost:	**$3,500,000**

Cost of Approved Phases: **$250,000**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
3LC:	$0	$0	$0	$0	$250,000	$250,000
Funding by Share:	$0	$0	$0	$0	$250,000	**$250,000**

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
DALLAS	COLLIN	2351-01-020	FM 2478	C,E	FRISCO	FRISCO	**$8,276,651**

LIMITS FROM: SH 121
LIMITS TO: STONEBRIDGE DRIVE
TIP DESCRIPTION: WIDENING OF 4 LANE ROADWAY TO 6 LANE DIVIDED ROADWAY
REMARKS: ADD CONSTRUCTION PHASE AND INCREASE FUNDING; RTR 161-CC2 FUNDS; LOCAL CONTRIBUTION PAID BY THE CITY OF FRISCO

REV DATE: 02/2013
MPO PROJECT ID: 20274
FUNDING CAT: 3RTR161,3LC
MTP REFERENCE: RSA1-224.0

Project History:

Total Project Cost Information:

Preliminary Engineering:	$1,011,505
Right Of Way:	$0
Construction:	$7,265,146
Construction Engineering	$0
Contingencies:	$0
Indirects:	$0
Bond Financing:	$0
Total Project Cost:	**$8,276,651**

Cost of Approved Phases: **$8,276,651**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
3RTR161:	$0	$0	$786,400	$196,600	$0	$983,000
3LC:	$0	$0	$0	$0	$7,293,651	$7,293,651
Funding by Share:	$0	$0	$786,400	$196,600	$7,293,651	**$8,276,651**

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
DALLAS	DALLAS	2374-03-077	IH 20	E,R	DALLAS	TXDOT-DALLAS	**$718,763**

LIMITS FROM: WEST OF HAYMARKET RD
LIMITS TO: WEST OF US 175
TIP DESCRIPTION: CONSTRUCT 2 LANE EB AND WB FRONTAGE ROADS AND NEW RAMPS
REMARKS: REVISE LIMITS, SCOPE, CITY AND FUNDING; LOCAL CONTRIBUTION TO BE PAID BY BALCH SPRINGS

REV DATE: 02/2013
MPO PROJECT ID: 54041
FUNDING CAT: 3LC,S102
MTP REFERENCE: FT1-30.80.12

Project History: CONSTRUCTION FUNDS IN FY2014

Total Project Cost Information:

Preliminary Engineering:	$500,000
Right Of Way:	$218,763
Construction:	$4,682,500
Construction Engineering	$225,905
Contingencies:	$0
Indirects:	$0
Bond Financing:	$0
Total Project Cost:	**$5,627,168**

Cost of Approved Phases: **$718,763**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
3LC:	$0	$0	$0	$0	$500,000	$500,000
S102:	$0	$218,763	$0	$0	$0	$218,763
Funding by Share:	$0	$218,763	$0	$0	$500,000	**$718,763**

Regionally Significant Arterial Listings

TxDOT Dallas District

Revised May 2, 2013

MTP ID	County	Street Name	From Street Name	To Street Name	2013 Lanes	2035 Lanes	Operational Between*	CSJ_1	CSJ_2	COG_1	COG_2	YOE Estimated Cost
RSA1- 216.0	Collin	Coit Road	Sam Rayburn Tollway (SH 121)	0.1 miles south of McCallum Blvd. (Dallas County line)	6	6	2013	8010-18-001		2003.00	81245.00	$9,565,920
RSA1- 223.1	Collin	Eldorado Parkway	Alma Road	Lake Forest Drive	4	6	2019-2028					$15,812,160
RSA1- 223.2	Collin	Eldorado Parkway	Lake Forest Drive	Hardin Blvd.	4	6	2019-2028					$11,094,720
RSA1- 223.3	Collin	Eldorado Parkway	Hardin Blvd.	US 75 frontage	4	6	2019-2028					$12,667,200
RSA1- 223.4	Collin	Eldorado Parkway	SH 5	US 75 frontage	4	6	2019-2028					$13,977,600
RSA1- 223.7	Collin	Eldorado Parkway	Stonebridge Drive	Alma Road	4	6	2019-2028					$3,407,040
RSA1- 223.8	Collin	Eldorado Parkway	FM 2478/Custer Road	Stonebridge Drive	4	6	2029-2035					$13,693,680
RSA1- 225.0	Collin	FM 1378	Lucas Branch Road	FM 2514/Parker Road	2	6	2019-2028	0918-24-970		20271.00		$20,005,440
RSA1- 225.1	Collin	FM 1378	FM 2514/Parker Road	FM 3412/Brown Street	2	6	2013-2018	1392-01-029	0918-24-970	81256.00	20271.00	$5,416,320
RSA1- 225.4	Collin	FM 1378	FM 3412/Brown Street	FM 544	2	6	2013-2018	0619-06-007	0918-24-171		20075.00	$1,288,560
RSA1- 237.0	Collin	FM 1378	SH 5	Farmstead	2	2	N/A					
RSA1- 237.05	Collin	FM 1378	Farmstead	Stacy Road	2	4	2013-2018	1392-04-034		83218.00		$5,678,400
RSA1- 237.07	Collin	FM 1378	Stacy Road	Rock Ridge Road	2	4	2013-2018	1392-01-032		20081.00		$1,266,720
RSA1- 237.1	Collin	FM 1378	Rock Ridge Road	FM 3286	2	6	2019-2028					$32,847,360
RSA1- 224.0	Collin	FM 2478	Stonebridge Drive	Sam Rayburn Tollway (SH 121) frontage southbound	4	6	2013-2018	2351-01-020		20274.00		$6,508,320
RSA1- 224.1	Collin	FM 2478	US 380	Stonebridge Drive	2	6	2013-2018	2351-01-013		81414.00		$7,512,960
RSA1- 224.2	Collin	FM 2478/Cluster Road	Sam Rayburn Tollway (SH 121)	FM 2170/McDermott Drive	6	6	N/A					
RSA1- 224.3	Collin	FM 2478/Cluster Road	FM 2170/McDermott Drive	Legacy Drive	6	6	2013	8014-18-001		2172.00		$2,271,360
RSA1- 224.4	Collin	FM 2478/Cluster Road	Legacy Drive	Spring Creek Parkway	6	6	N/A					
RSA1- 223.0	Collin	FM 2934/Eldorado Parkway	Dallas North Tollway frontage NB	FM 2478/Custer Road	2/4	6	2019-2028*	2980-01-008		82381.00		$53,901,120
RSA1- 233.0	Collin	FM 455	future Dallas North Tollway (Denton County line)	SH 289	2	2	N/A					
RSA1- 233.1	Collin	FM 455	SH 289	US 75 frontage southbound	2	2	N/A					
RSA1- 233.2	Collin	FM 455	US 75 frontage southbound	US 75 Frontage northbound	2	4	2019-2028					$873,600
RSA1- 233.3	Collin	FM 455	US 75 frontage northbound	SH 5	2	6	2019-2028*	0816-04-044		20032.00		$8,604,960
RSA1- 222.0	Collin	FM 544/Park Blvd.	Midway Road (Denton County line)	US 75	6	6	N/A					
RSA1- 217.0	Collin	FM 544/Plano Parkway	US 75	SH 78	6	6	2013	8026-18-001		11461.00		$10,417,680
RSA1- 221.0	Collin	Midway Road	PGBT	Trinity Mills Road	6	6	N/A					
RSA1- 234.0	Collin	Outer Loop staged facility	US 75	SH 121	0	N/A	2019-2028					$39,574,080
RSA1- 234.1	Collin	Outer Loop staged facility	Dallas North Tollway	US 75	0	N/A	2019-2028					$116,363,520
RSA1- 232.0	Collin	Parker Road	US 75	SH 5/K Avenue	6	6	N/A					
RSA1- 231.0	Collin	Plano Parkway	SH 289	Norman Whitsitt Parkway/15th Street	6	6	N/A					
RSA1- 231.1	Collin	Plano Parkway	Norman Whitsitt Parkway/15th Street	Coit Road	6	6	N/A					

*Some facilities are staged and may have interim improvements that are not consistent with the proposed build