ENVIRONMENTAL ASSESSMENT
and
SECTION 4(f) EVALUATIONS for
HIGHLAND LAKES PARK and
USACE PROPERTY

IH 35E: FROM PRESIDENT GEORGE BUSH TURNPIKE TO FM 2181

CSJs: 0196-02-068, 0196-01-096, 0196-02-073, 0196-02-114, 0196-03-245

DALLAS AND DENTON COUNTIES, TEXAS

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Corridor improvements are proposed for Interstate Highway (IH) 35E from IH 635 in Dallas, Dallas County, Texas to U.S. Highway (U.S.) 380 in Denton, Denton County, Texas, a distance of approximately 28 miles. This Environmental Assessment (EA) examines the social, economic, and environmental impacts for the Texas Department of Transportation (TxDOT) proposed reconstruction of approximately 12 miles of the IH 35E corridor within the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County, Texas. The project limits extend from President George Bush Turnpike (PGBT) in Dallas County, Texas, to Farm-to-Market (FM) 2181 (Swisher Road) in Denton County, Texas.

IH 35E, from PGBT to FM 2181, is within a primarily urbanized area with a few undeveloped areas adjacent to the right-of-way (ROW). The current facility consists of six mainlanes (three in each direction) with two lane frontage roads from PGBT to FM 2181. Two lane frontage roads are mostly continuous along the corridor with the exception of the bridge over Lewisville Lake where there are no frontage roads. The northbound frontage roads merge into the mainlanes just north of FM 407 (Justin Road) and resume at the Denton Drive South exit north of the lake. The southbound frontage roads merge into the mainlanes just north of the lake and resume immediately south of the lake. There are 13 main arterial streets and 1 rail line that cross the existing facility as an underpass or overpass within the project limits.

The entire IH 35E corridor between the Cities of Dallas and Denton is in a state of rapid growth and needs substantial improvements to the existing transportation system. The growth pattern within the project area is anticipated to continue. This would necessitate that the proposed improvements be implemented to accommodate the anticipated traffic increase within the project area.

Beginning in 1998, TxDOT utilized the Major Investment Study (MIS) process to identify problems and needs within the corridor. Public input was solicited from state, local, and regional agencies involved in transportation and comprehensive planning in the Dallas-Fort Worth (DFW) region, as well as from local communities. From this input alternatives such as arterial improvements, rail improvements, bus transit improvements, bicycle/pedestrian facilities, and congestion management process (CMP) strategies for the IH 35E corridor were evaluated.

The recommendation from the MIS was an alternative that would follow the existing alignment and expand the existing facility. The preferred alternative described in the MIS proposed a mainlane section which consisted of 10 mainlanes (5 in each direction). The MIS also recommended the following design elements:

- Barrier separated reversible High Occupancy Vehicles (HOV)/managed lanes should be added to IH 35E and would operate in the direction of peak period traffic flow;
- Two 12-foot (ft) wide reversible HOV/managed lanes from PGBT to FM 407 and one 14-ft wide reversible HOV/managed lane from FM 407 to FM 2181 with variable shoulders would be added;

- No conversion of existing mainlanes into tolled reversible HOV/managed lanes, only 2 of the 12 proposed expressway lanes (10 mainlanes and 2 reversible/HOV managed lanes) would be tolled; and
- Continuous three lane frontage roads in each direction were proposed within the corridor according to the MIS.

The proposed improvements detailed in this EA include eight mainlanes (four in each direction); two to four lane collector distributor (each direction) from south of PGBT to north of SH 121; four concurrent tolled HOV/managed lanes in the center median of IH 35E; and two, three and four-lane continuous frontage roads in each direction along the entire project corridor including auxiliary lanes at the cross streets. The design process produced an overall configuration that differs slightly from the preferred alternative presented in the MIS; however, the central improvement themes remain the same – additional mainlanes, continuous frontage roads in each direction along the corridor, addition of HOV/managed lanes in the center median, and no conversion of existing mainlanes into tolled HOV/managed lanes.

The area adjacent to the IH 35E corridor between Dallas and Denton is in a state of rapid growth and continues to need substantial improvements to the existing transportation system. The growth pattern described in **Section I.B** necessitates substantial transportation improvements to accommodate the projected increases in traffic demand to the already insufficient regional transportation system. In the foreseeable future, the proposed IH 35E facility would substantially benefit communities in the project area by increasing capacity, managing traffic congestion, and improving mobility within the region.

INTRODUCTION

IH 35E is a major north/south thoroughfare constructed in the 1950s and early 1960s that bisects North Central Texas. Improvements are proposed for IH 35E from IH 635 in Dallas, Dallas County, Texas to U.S. 380 in Denton, Denton County, Texas, a distance of approximately 28 miles. This EA addresses a 12-mile portion of the 28-mile corridor that begins on the northwest side of Dallas and travels through the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek. The proposed project would also cross the Hickory Creek arm of Lewisville Lake just south of the Town of Hickory Creek.

A. Logical Termini

The IH 35E corridor is currently being evaluated in three separate sections. A separate EA and preliminary design is associated with each of the three independent actions. Each section is a segment of independent utility and is a reasonable expenditure even if no additional transportation improvements in the area are made and do not restrict the consideration of alternatives for other reasonably foreseeable projects. The proposed would satisfy identified needs and has been considered in the context of the local area socioeconomics and topography, the future travel demand, and other infrastructure improvements in the area. The portion of IH 35E being assessed in this EA is referred to as the Middle Section, which extends from PGBT to FM 2181, both being major traffic generators. According to the North Central Texas Council of Governments (NCTCOG), which serves as the Metropolitan Planning Organization (MPO) for the DFW region, PGBT is classified as a freeway/tollway system, and FM 2181 is a regionally significant arterial. Both are considered major traffic generators.

The construction limits and EA account for transitions into the existing roadway and extend from approximately 0.7 mile north of PGBT to approximately 0.5 mile north of FM 2181. The individual sections and their corresponding logical termini are:

Section	***Logical Termini***	***Approximate Distance***
South Section	IH 635 to PGBT	5 Miles
Middle Section	**PGBT to FM 2181**	**12 Miles**
North Section	FM 2181 to U.S. 380	11 miles

The IH 35E Corridor Improvement Map in **Appendix A, Figure 1** illustrates the overall proposed improvements for IH 35E from IH 635 to U.S. 380.

I. DESCRIPTION OF PROPOSED ACTION

A. Description of Proposal

TxDOT proposes the reconstruction of approximately 12 miles of IH 35E within the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County, Texas. The project limits extend from PGBT to FM 2181. The design process produced an overall configuration that differs slightly from the preferred alternative presented in the MIS; however, the central improvement themes remain the same – additional mainlanes, continuous frontage roads in each direction along the corridor, addition of HOV/managed lanes in the center median, and no conversion of existing mainlanes into tolled HOV/managed lanes. The Project Location Map in **Appendix A, Figure 2** illustrates

the project limits for this environmental document. Proposed typical sections are presented in **Appendix B** and illustrate the following:

- eight mainlanes (four in each direction);
- two to four collector distributor lanes (each direction) from south of PGBT to north of SH 121;
- four concurrent tolled HOV/managed lanes in the center median of IH 35E;
- two, three, and four-lane continuous frontage roads in each direction along the entire project corridor including auxiliary lanes at the cross streets; and
- approximately 179 acres of ROW and approximately 54 acres of proposed easement.

Collector distributors consist of parallel lanes running between the mainlanes and the frontage roads that "collect" the traffic from closely spaced entrance ramps and then "distribute" it onto the facility at a single entrance ramp beyond the congested areas.

The proposed alignment would generally follow the existing alignment. Portions of the proposed IH 35E alignment would be re-aligned to both the east and west of the existing facility from PGBT to approximately FM 407 to accommodate the proposed reconstruction. At FM 407 the former Union Pacific Railroad (UPRR) ROW runs generally parallel to the east side of IH 35E north to Denton Drive South. Due to the Denton County Transportation Authority (DCTA)/ Dallas Area Rapid Transit (DART) (former UPRR) ROW, the proposed IH 35E alignment would re-align to the west of the existing facility from FM 407 to south of FM 2181. Proposed ROW for the proposed reconstruction would generally be acquired from the west side of the existing IH 35E facility with portions of the proposed ROW being acquired from the east side between Corporate Drive to Valley Ridge Boulevard in order to minimize impacts.

From Garden Ridge Boulevard to Denton Drive South, IH 35E presently occupies approximately 77.8 acres of U.S. Army Corps of Engineers (USACE) Property through a fee simple easement across Lewisville Lake. The proposed project would incorporate continuous pedestrian sidewalks along each side of the Lewisville Lake bridge. The proposed northbound sidewalk would would begin at Highland Village Road and end at Hickory Hills Boulevard. The proposed southbound sidewalk would begin at Denton Drive South and end at Hickory Hills Boulevard. The proposed sidewalks would allow for the continuation of public-access to recreational amenities along the Trinity Trail hike and bike facility across Lewisville Lake. This portion of the Trinity Trail is the northward spine, formerly referred to as the Dalhoma Trail, of the regional Trinity Trails System.

The proposed implementation timeline for these projects involves reconstructing IH 35E in multiple phases. The phased construction of IH 35E may consist of both interim and ultimate improvements. Interim improvements will remain in place until later phases construct the planned ultimate improvements.

In addition to these improvements, a Corridor Aesthetic Master Plan would be developed providing technical illustrative corridor design guidelines providing aesthetic design guidance for architectural and landscape highway design elements. Such elements would include roadway- and community-related elements, roadside elements, and landscape opportunities. The aesthetic design guidelines and Corridor Aesthetic Master Plan would ultimately function as a guiding tool related to context-sensitive design considerations for contractor implementation of the proposed project. Further details of the Corridor Aesthetic Master Plan are provided in **Section IV.C.7**.

Cooperating Agency Status

A federal, state, tribal or local agency having special expertise with respect to an environmental issue or jurisdiction by law may be a cooperating agency in the National Environmental Policy Act (NEPA) process. In May 2004 the Federal Highway Administration (FHWA), in cooperation with TxDOT, requested that the USACE participate as a cooperating agency on this project due to their legal jurisdiction and special expertise because the proposed reconstruction of IH 35E crosses USACE property in the Lewisville Lake area and a Section 404 permit and mitigation is required. FHWA requested the following activities to maximize interagency coordination:

- Invitations to coordination meetings;
- Consulting with USACE on any relevant technical studies required for the project;
- Organizing joint field reviews;
- Providing project information, including study results;
- Encouraging USACE to express their views on subjects within their jurisdiction or expertise; and
- Include information in the project development documents that cooperating agencies need in order to discharge their NEPA responsibilities and any other requirements regarding jurisdictional approvals, permits, licenses and/or clearances.

In July 2006, USACE responded and formalized their status as a cooperating agency and stated that their jurisdiction would focus on activities affecting USACE property and the Section 404 permit approval process.

The coordination letters regarding the cooperating agency status can be reviewed in **Appendix E**. **Section V**., USACE Property, contains documentation regarding USACE coordination, data needed in order to discharge their NEPA responsibilities, and other information regarding jurisdictional approvals, permits, licenses and/or clearances.

HOV/Managed Lanes Concept

The Regional Transportation Council (RTC), the independent transportation policy body of the MPO comprised of elected or appointed officials representing cities, counties, and transportation providers, has adopted the "managed lane" concept over the HOV concept due to the following factors: 1) the ability to provide and manage additional capacity in the corridor, 2) the provision of trip reliability for HOV and transit, 3) the potential for improved air quality through encouragement of increased vehicle occupancy and person movements, and 4) the generation of revenue to construct, operate, and maintain the facility.

HOV/Managed lanes require some form of active management to be in place at the time of operation. According to the RTC's Business Terms for TxDOT-Sponsored Managed Lane Facilities, utilizing managed lanes would require toll collection for both single occupancy and HOV users (two or more occupants). A reduced toll rate (half price) would be applied towards HOV users and publicly-operated vanpools during the AM and PM peak periods. During the off-peak periods, HOVs would pay the same toll as Single Occupancy Vehicles (SOV). The RTC may choose to phase out the HOV discount for the AM and PM peak periods once the air quality attainment maintenance period comes to an end.

Managed lanes have the potential to operate as "toll" lanes in the region as one of several potential traffic volume management strategies; it is up to the region to determine the needs and methods best suited for a specific corridor. These management methods can include:

- Immediate Action (Buffer Separated) HOV (Non-toll)
- Traditional (Barrier Separated) HOV (Non-toll)
- Traditional Toll Roads
- Managed Toll Roads (reduced toll rates for HOV users)
- Managed HOV (reduced tolls for HOV and full tolls for single occupancy vehicles)
- Managed Express Lanes (congestion priced tolling)

By utilizing the above methods of traffic management, the RTC seeks to expand and also manage roadway capacity by influencing travel behavior. Market-based pricing and vehicle occupancy conditions allow managed lanes to operate at higher speeds than parallel mainlanes during peak periods. The level of service (LOS) in the managed lane will determine the toll rate, which would be adjusted dynamically to manage demand and ensure travel time reliability. Managed lanes also grant the regional authorities the flexibility they need to properly manage the regional transportation network to improve, maintain, and exceed air quality standards, achieve mobility goals, and provide revenue to maintain corridors; thus making available and leveraging the traditional federal aid dollars for other needed projects throughout the region.

The management method for IH 35E from PGBT to FM 2181 is proposed as barrier separated, concurrent flow, Managed HOV/Express Lane. More information pertaining to the toll rates that would be applied to users of the HOV/Managed lanes (or tolled HOV/Managed Lanes), as it is referred to going forward in this document, is contained in **Section IV.C4, Economic Impacts of Tolling**.

Public outreach was conducted in early to mid 2006 as this policy was being developed. The RTC held three public meetings from April 24-26, 2006 and the policy was adopted by the RTC on May 11, 2006. The policy was modified in September 2006 and September 2007 and the final policy is detailed in **Appendix D, Business Terms for TxDOT-Sponsored Managed Lane Facilities**.

The RTC adopted a policy regarding excess revenue sharing in August 2006 that focused on TxDOT sponsored managed lane toll projects as described in **Appendix D, Excess Toll Revenue Sharing: Managed Lane Policy**. The purpose of the Excess toll Revenue Sharing Policy for Managed Lanes was to establish a framework for the allocation of future toll revenues from projects in the North Central Texas region. Excess toll revenue is defined as annual toll revenue after the annual debt service, and after annual reserve funds have been set aside to cover facility operational costs, anticipated preventative maintenance activities, assigned profit and related expenses, and the expected cost of rehabilitation or reconstruction of the toll facility. For all TxDOT-sponsored toll facilities, this new policy put forth that 1) all excess revenue generated from individual toll projects shall remain in the TxDOT district in which that revenue-generating project is located; 2) excess revenue generated from individual toll projects shall be placed in county-specific accounts and prorated based on the residential county of all toll payers on all tollways; and 3) projects funded with excess toll revenue should be selected in a cooperative TxDOT-RTC selection process which considers the desires of the cities and counties where the revenue-generating project is located.

In the foreseeable future, the proposed IH 35E facility could substantially benefit communities in the project area by generating revenue for additional transportation projects that could also increase capacity, manage traffic congestion, improve mobility, and enhance/maintain the system to current design standards.

Texas Senate Bill (S.B.) 792 mandates that the local toll authority [in the case of IH 35E, the North Texas Tollway Authority (NTTA)], have the first right of refusal. That is, the NTTA gets the first option to construct the toll or managed aspect of the project. The NTTA decided against building the facility in September 2008. TxDOT intends to develop the project and may enter into a comprehensive development agreement for this purpose.

The preliminary design schematic encompassing the proposed improvements has been prepared by TxDOT and is available for inspection at the Dallas District Office, 4777 E. Hwy 80, Mesquite, Texas 75150-6643.

B. Need and Purpose

The proposed project, which traverses Dallas and Denton Counties, is an essential element of the local and regional transportation system. Within the project area, IH 35E serves multiple purposes. It functions as an interstate and also serves as a major arterial serving local trips to and from work, school, shopping, etc. It also serves as an important regional commuter route connecting the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth and the Town of Hickory Creek, as well as neighboring developing communities.

The area adjacent to the IH 35E corridor between Dallas and Denton is in a state of rapid growth and continues to need substantial improvements to the existing transportation system. Between 1980 and 2000, the populations of Dallas and Denton Counties increased 42.5 percent and 202.5 percent, respectively.[1] As shown in **Table I-1**, these trends are expected to continue in the foreseeable future according to the NCTCOG 2030 Demographic Forecast.

Table I-1: Population Trends

Area	1980	1990	2000*	2005*	2030*	Percent change: 1980 to 2030*
Dallas County	1,556,390	1,852,810	2,232,476	2,390,491	2,817,191	81.0%
Denton County	143,126	273,525	428,080	545,987	1,085,343	658.3%
City of Carrollton	40,595	82,169	109,364	114,164	124,086	205.65%
City of Lewisville	24,273	46,521	78,360	87,841	111,168	357.9%
City of Highland Village	3,246	7,027	12,144	13,558	18,624	473.7%
City of Lake Dallas	3,177	3,656	6,378	7,317	9,209	189.8%
City of Corinth	1,264	3,944	11,365	19,947	27,070	2,041.6%
Town of Hickory Creek	1,422	1,893	2,005	2,467	3,996	181.0%

Source: North Central Texas Council of Governments, *Census Total Population by Decade* and *2030 Demographic Forecast**. *http://www.nctcog.org/*

This growth pattern necessitates substantial transportation improvements to accommodate the projected increases in traffic demand to the already insufficient regional transportation system.

The purpose of the proposed project is to address the transportation needs by increasing capacity, managing traffic congestion, improving mobility, and improving roadway deficiencies within the DFW metropolitan area. The "DFW metropolitan area" is defined as the portion of the region expected to be contiguously urbanized during the 20-year planning horizon. This area includes all of Collin, Dallas, Denton, Rockwall, and Tarrant Counties, and contiguous portions of Ellis, Johnson, Kaufman, and Parker Counties. Because this is also the aerial extent of the

[1] North Central Texas Council of Governments. *Census Total Population by Decade.* http://www.nctcog.org/ris/census/searchcounty.asp

Metropolitan Planning Area (MPA) as defined in *Mobility 2030 – 2009 Amendment*, the terms "DFW Metropolitan Area" and "MPA" can be used interchangeably. In October 2009, the MPA was expanded to a 12-county region; however, unless otherwise specified, the MPA utilized for various analyses and referenced throughout this document is the MPA prior to its October 2009 expansion. The expanded MPA (as of October 2009) includes the following 12 counties in their entirety: Collin, Dallas, Denton, Rockwall, Tarrant, Ellis, Johnson, Kaufman, Parker, Hunt, Wise, and Hood Counties. The project would also serve to enhance the regional and national transportation system.

Increase Capacity

There is a critical need to provide sufficient highway capacity improvements, which can provide increased people and goods-carrying capacity in the project area. As described in **Table I-1**, the NCTCOG is predicting triple digit population growth or more by 2030 in all the areas adjacent to IH 35E, except Dallas County, since 1980. The majority of the proposed project is located within Denton County, which is projected to double in size from 2005 (545,987) to 2030 (1,085,343).

The projected population growth would increase demand along the IH 35E corridor; this increased demand would exceed existing capacity. According to data obtained from TxDOT's Transportation Planning and Programming (TPP) Division, the percent increase of projected average daily traffic (ADT) from 2010 to 2030 within two traffic analysis sections of Belt Line Road to Valley Ridge Boulevard and Valley Ridge Boulevard to U.S. 377 is 44 percent and 46 percent, respectively. See **Section II.C** for additional analysis regarding traffic projections.

Manage Traffic Congestion

The traffic capacity constraints of existing streets and alternate north/south highways near the project area and limitations on the availability of ROW for major capacity improvements have created and would continue to intensify congestion. As further detailed in **Section II.C., Traffic Projections**, ADT increases ranging from 44 percent to 46 percent between the limits of Belt Line Rd. and U.S. 377 are expected to occur from 2010 to 2030. The volume of heavy truck traffic associated with the North American Free Trade Agreement (NAFTA) route is anticipated to increase. Adding additional travel lanes would reduce the number of vehicles per lane per mile of roadway, thus reducing the concentration of heavy trucks along the route.

Congestion can best be described in terms of LOS and travel speeds along a roadway. The LOS is a qualitative measure of describing operational conditions within a traffic stream or at an intersection, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The LOS are designated A through F (A being the best and F the worst) and cover the entire range of traffic operations that may occur. The August 2009 TxDOT *Interstate Access Justification Analysis* report provides a LOS analysis for the proposed project under the Build and No-Build scenarios for year 2030. Because the report contains a LOS value for each roadway segment within project limits, the reported LOS values were compiled to provide a general operating condition LOS as follows:

	LOS	
Roadway Segment Type	***Build 2030***	***No-Build 2030***
General Purpose Lanes (Mainlanes)	D, E, F	F
HOV/Managed Lanes	A, B	---

Source: Compiled from the TxDOT *Interstate Access Justification Analysis* report (August 2009).

The TxDOT report concludes that under the Build scenario, the mainlanes would mostly operate at unacceptable LOS (D, E, F) and that the HOV/managed lanes would operate under adequate LOS (A, B). The report also concludes that all the roadway segments within project limits would operate at an unacceptable LOS (F) in the year 2030 under the No-Build scenario. However, as the report concludes, under the Build scenario, the poor LOS along the mainlanes would provide an incentive to utilize the HOV/managed lanes, which would operate at adequate LOS (A, B) and help manage traffic congestion within project limits.

For a list of specific roadway segments within project limits and corresponding LOS, please refer to the August 2009 TxDOT *Interstate Access Justification Analysis* report (Tables 9 through 14).

Improve mobility
Transportation mobility is a critical need in the DFW metropolitan area. The lack of adequate mobility causes residents to have limited access to job opportunities and employers are denied full access to the region's pool of job skills and talents. Limited mobility also results in increasing amounts of unproductive time spent moving people and goods from one point to another. Economic costs associated with traffic congestion have a direct effect on the competitiveness of the area and its ability to create and sustain long-term employment opportunities.

Improve roadway deficiencies
The existing IH 35E roadway has deteriorated since its original construction in the 1950s and 1960s. This facility was originally built with a design speed of 50 miles per hour (mph) and for lower traffic volumes. Currently, highway ramps are too close to existing cross streets and to each other. Bridge clearances over and under IH 35E vary and do not meet current design standards.

Local Policy
The proposed IH 35E project includes the HOV/managed lane concept, which would help generate revenue to fund needed transportation projects included in the *Mobility 2030 – 2009 Amendment*. As a result regional toll/managed lane network has been integrated into the financially constrained MTP.

The implementation of the concurrent HOV/managed lanes would support the overall regional transportation system need by generating revenue for the operation and maintenance of IH 35E as well as funding additional regionally significant projects.

C. Funding

As listed in the 2008-2011 Transportation Improvement Plan (TIP) pertaining to the proposed project, the total estimated cost for the IH 35E improvements is $1,203,637,382 (August 2009 revisions). The project would be funded by MTP *Category 10 – Miscellaneous*. Information on the sources of the funding as reported in the 2008-2011 TIP (February 2010 revisions) is shown below.

CSJ Number	***Funding Source***
0196-02-068	3 percent federal, 55 percent state, 42 percent local contribution
0196-01-096	48 percent state, 52 percent local contribution
0196-02-073	42 percent state, 58 percent local contribution

CSJ Number	***Funding Source***
0196-02-114	42 percent state, 58 percent local contribution
0196-03-245	100 percent state

D. Related Studies and Relevant Documents

There are numerous projects and studies that are in various stages of project development that are relevant to the proposed project.

IH 35E Major Investment Study (MIS)

The IH 35E MIS, initiated by TxDOT in 1998, evaluated roadway conditions and various potential alternatives for improving congestion along IH 35E from the SH 121 Bypass to U.S. 380. The IH 35E MIS was a cooperative and collaborative process with interaction between the public, local governments and agencies, and a Project Coordination Work Group (PCWG). The PCWG was composed of representatives from TxDOT, permitting or stakeholder agencies, local city and county governments, and citizens volunteering to represent specific groups or organizations. From June 1998 to September 1999, seven meetings of the PCWG and four Public Meetings (two in Lewisville and two in Denton) were held in relation to the IH 35E MIS preparation. Ideas and suggestions obtained from the PCWG, as well as from the public, helped shape the list of alternatives modeled in the MIS.

The MIS alternatives included a no-build alternative, a no-build alternative with Congestion Management System (CMS) strategies (e.g. Intelligent Transportation Systems [ITS]), widening the mainlanes of IH 35E (including ramp, interchange, and frontage road improvements), widening FM 2499 (parallel facility to the west of IH 35E), widening FM 423 (parallel facility to the east of IH 35E), the addition of mass transit (e.g., commuter rail) throughout the corridor, the addition of reversible HOV/managed lanes, and the addition of reversible express lanes. For these alternatives, the NCTCOG Travel Demand Model (TDM) evaluated performance measures such as person miles and hours of travel, percent lane miles at LOS E and F, person hours of congestion, and daily cost of congestion. Although many of the above strategies helped alleviate congestion, it was a combination of mainlane widening and HOV/managed lane use that had the best potential for decreasing congestion and improving mobility along the entire study corridor. Following the study, it was recommended that reconstruction of IH 35E could occur in three sections (South, Middle, and North). Steps taken through the MIS process aided in the identification of the proposed project's (Middle Section) Build Alternative (see **Section III.B**).

SH 121 in Denton County

TxDOT completed studies to operate SH 121 as an electronic toll facility. The concept of an electronic toll collection system was approved for SH 121 and as a result, tolls are collected using a completely electronic system; the system is not able to accept cash. These studies documented the effects of opening the nearly completed SH 121 from 0.23 mile west of Business SH 121 to the Dallas North Tollway (DNT) as an electronic toll facility. The project received environmental clearance to open as a toll facility on April 14, 2006 and is currently open to traffic.

Lewisville Lake Corridor (FM 2181/FM 720/FM 2934)

The Lewisville Lake Corridor projects would serve as a new east-west connection between IH 35E and the DNT. The Lewisville Lake toll bridge would be a part of the Lewisville Lake Corridor connecting FM 2181 (Swisher Road) in the City of Lake Dallas to Eldorado Parkway in the City of Frisco. The NTTA is working cooperatively with Denton County to construct a toll

bridge across the northwestern arm of Lewisville Lake. The corridor includes eight sections that total 13.8 miles.

Lewisville Lake Programmatic Environmental Assessment
The Lewisville Lake Programmatic Environmental Assessment (PEA), prepared by the USACE, discusses the environmental impacts of more than 300 individual development actions being proposed by 18 public and private entities within the next 10 years on federal lands around Lewisville Lake. The PEA identifies the future and foreseeable individual development actions and assesses the potential cumulative impacts from these actions on the human and natural environment. This project crosses Lewisville Lake and falls within the limits of the PEA; therefore, impacts to USACE property will comply with established PEA mitigation ratios.

Trinity River and Tributaries Environmental Impact Statement (TREIS) and Record of Decision (ROD) (Dated April 29, 1988)
This document, also prepared by the USACE, developed a permitting strategy for the Trinity River and its tributaries. It highlighted the need for planning within the region and cooperation among the governmental entities along the Trinity River corridor to achieve quality development. It concluded that additional regional increase in flood hazards for either the 100-year or Standard Project Flood (SPF) are undesirable and that the thrust of floodplain management in the short term should be to stabilize the flood hazard at existing levels through regulation. The proposed project is also within the limits of the Trinity River ROD, which requires all project actions to adhere to the SPF floodplain because a permit under Section 404 is required based on the build alternative selected for IH 35E.

Denton County Transportation Authority (DCTA)
The DCTA has prepared a service plan that includes a rail component and three layers of bus service, including Regional Connector Bus Service, Local Routes, and Demand Response Service, as well as a network of Park-and-Rides/Regional Rail and Bus Facilities to serve citizens in Denton County. These elements have been proposed to provide services to help mitigate and improve many mobility issues in the near term, as well as link the County's larger cities to rail when that service is implemented. The proposed service plan would implement non-highway projects in the same corridor as the proposed IH 35E project.

The Metropolitan Transportation Plan (MTP)
This plan defines transportation systems and services in the DFW metropolitan area. It serves as a guide for the expenditure of state and federal funds through the year 2030. The plan 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 IH 35E project (from PGBT to FM 2181) is included in this plan.

Transportation Improvement Plan (TIP)
The TIP is a staged, multiyear listing of surface transportation projects for funding by federal, state, and local sources within the DFW metropolitan area. It is developed through a cooperative effort of the RTC, TxDOT, local governments, and transportation authorities. The TIP contains projects with committed funds over a multi-year period. The proposed IH 35E project is included in this plan.

E. Project Support

IH 35E is part of IH 35 which extends from Mexico to Canada and is a vital corridor for intrastate, interstate, and international movement of people and goods. IH 35 splits in the City of Hillsboro, located south of Dallas, with IH 35E traveling through Dallas and IH 35W traveling through the City of Fort Worth. These two roadways merge again in the City of Denton. IH 35E has been identified as a high priority corridor for international commerce under NAFTA due to its connection to highway facilities serving the Northeast and Midwest.

TxDOT uses a systematic interdisciplinary approach to project planning to assure full consideration is given to all appropriate social, economic, and environmental effects of proposed highway projects. Interdisciplinary planning contributes to effective decisions in the best public interest by supporting balanced consideration of safe and efficient transportation needs and national, state, and local environmental protection goals. Engineering analyses and alternative facility designs are prerequisite components of interdisciplinary planning for this proposed project.

In 1998, TxDOT initiated a MIS to gather community input and forward recommendations throughout the process. To gather input from the public, three work groups were created. Each workgroup involved one or more target audiences to ensure that all interested parties had an opportunity to be involved. The three Project Work Groups created were the Executive Work Group, the Community Work Group and the Staff Work Group. Thirteen coordination meetings were held throughout the MIS development process and occurred in the summer and fall of 1998 and 1999.

On March 20, 2003, a public meeting was conducted as part of the EA process for the proposed IH 35E reconstruction project. The public meeting was held at the Lewisville City Hall, 1197 West Main Street, Lewisville, Texas. The meeting took place from 6:00 p.m. to 8:30 p.m. in the Council Chamber. Public notices were sent to local, city, and state officials and letters were sent to non-elected public officials.

Between the time period when the first public meeting was held in 2003 and 2008, the proposed IH 35E reconstruction project underwent schematic design modifications and coordination with the adjacent municipalities occurred.

On November 13, 2008, a public meeting was conducted as part of the EA process for the proposed IH 35E reconstruction project. The public meeting was held at the City of Lewisville Community Room in the Municipal Annex Building, 1197 West Main Street, Lewisville, Texas 75067. The meeting took place from 5:00 p.m. to 8:00 p.m. Public notices were sent to adjacent property owners and local, city, and state officials; letters were sent to non-elected public officials.

The objective of the public meeting was to present an overview of the proposed IH 35E project and gather public comments. A sign-in table was located at the meeting entrance for people to sign the attendance sheet, and obtain handouts and a comment sheet. Meeting attendance on November 13, 2008 consisted of 169 local residents and interested individuals.

A registration table was set up outside the doorway of the Community Room. As meeting attendees entered the room, they were encouraged to sign-in and pick up project information and comment and speaker forms. Once registered, meeting attendees could then view the displayed

exhibits for the proposed project. Exhibits consisted of aerial photography, schematics, typical sections, and a project brochure showing the project location and detailing the need and purpose was provided as a handout. Environmental constraints maps were also shown and included information such as floodplains, water bodies, wetlands, potential historic structures, parks, churches, schools, emergency buildings, airports, and railroads. A court reporter was available to record public comments. Sixteen comment cards were returned at the meeting; no verbal comments were recorded by the court reporter during the meeting.

Stakeholder work group meetings have been held beginning in August 2008 to facilitate communication between TxDOT and adjacent municipalities as well as other public agencies with interests along the IH 35E corridor. Stakeholders invited to the stakeholder work group meetings are defined as municipal, county, or other public agencies affiliated with the proposed IH 35E improvements, such as the USACE, DART, DCTA, NCTCOG, and the University of North Texas. In addition to the public meeting and stakeholder meetings, various meetings and/or presentations have been given to public officials associated with several municipalities along the project corridor. These meetings provided an overview of the proposed project, initial/draft/modified IH 35E design concepts, reasons for design modifications, anticipated timeline for the construction of the proposed project, status on operations and funding, and allowed the public officials an opportunity to ask questions or communicate other potential stakeholder interests. A listing of various stakeholder, public, and project meetings is provided in **Table I-2**.

The proposed Build Alternative has undergone substantial adjustments from what was originally proposed and currently exists and what was initially presented and is supported by local stakeholder groups, which include adjacent property owners, adjacent municipalities, and other interested parties. For example, the mainlane alignment near Main Street in the City of Lewisville was shifted to avoid displacing or adversely impacting a church, hospital, and a business. The resulting alignment minimized displacements and promoted enhancements to other properties in the form of improved access and enhanced safety due to improved sight distance. Design modifications such as this were coordinated between the local stakeholders and property owners to achieve a balanced and feasible solution based upon comments of support received at public meetings and stakeholder work group meetings.

Table I-2: Various Stakeholder, Public and Project Meetings

Meeting Date and Location	Meeting Attendees	Topics Discussed
March 20, 2003 Lewisville City Hall 1197 W. Main St. Lewisville, TX	Public Meeting – open to the public	Project history and overview; specific design information; ROW acquisition and relocation process; gathered public comments.
August 6, 2008 Lewisville City Hall 151 W. Church St. Lewisville, TX	Stakeholder Work Group #1 – TxDOT-Dallas District, University of North Texas, City of Lewisville, City of Highland Village, City of Corinth, USACE, Town of Hickory Creek, City of Carrollton, City of Farmers Branch, DCTA, DART, City of Denton, NCTCOG, Representatives for Congressman Michael Burgess, and various consultants	Project overview; reasoning for design modifications; draft/initial modified design concepts; overview of possible delivery options; stakeholder outreach; schedule; work with NTTA to determine responsible agency; other issues/next steps.
August 27, 2008 Lewisville City Hall 151 W. Church St. Lewisville, TX	City of Lewisville, City of Highland Village, DCTA	Project overview; stakeholder outreach; schedule; initial/modified concepts; next steps/other issues.
September 3, 2008 Lake Dallas City Hall 212 Main St. Lake Dallas, TX	Town of Hickory Creek and Cities of Lake Dallas and Corinth	Project overview; stakeholder outreach; schedule; draft/initial/modified concepts; next steps/other issues.
October 1, 2008 Lewisville City Hall 151 W. Church St. Lewisville, TX	Stakeholder Work Group #2 – TxDOT-Dallas District, City of Denton, City of Farmers Branch, City of Carrollton, University of North Texas, City of Lewisville, City of Highland Village, City of Corinth, Town of Hickory Creek, DCTA, North Texas Rail Group, NCTCOG, and various consultants	Project overview; refined modified design concepts; stakeholder outreach; schedule; other issues/next steps.
October 15, 2008 URS Corporation 3010 LBJ Freeway, Suite 1300 Dallas, TX	DCTA	Status on operations and funding; reasons for design modifications; presentation of project limits, typical sections, and mainlane access locations; stakeholder outreach; open house/public meeting schedule.
October 17, 2008 Carrollton City Hall 1945 E. Jackson Rd. Carrollton, TX	City of Carrollton	Status on operations and funding; reasons for modifications; presentation of project limits, typical sections, and mainlane access locations; stakeholder outreach; open house/public meeting schedule.

Meeting Date and Location	Meeting Attendees	Topics Discussed
October 17, 2008 Lewisville City Hall 151 W. Church St. Lewisville, TX	City of Lewisville	Status on operations and funding; reasons for modifications; presentation of project limits, typical sections, and mainlane access locations; stakeholder outreach; open house/public meeting schedule.
October 21, 2008 Hickory Creek Town Hall 1075 Ronald Reagan Ave. Hickory Creek, TX	Town of Hickory Creek - City Council	Status on operations and funding; reasons for modifications; presentation of project limits, typical sections, and mainlane access locations; stakeholder outreach; open house/public meeting schedule.
October 23, 2008 DCTA 1660 S. Stemmons, Suite 215 Lewisville, TX	DCTA Board	Status on operations and funding; reasons for modifications; presentation of project limits, typical sections, and mainlane access locations; stakeholder outreach; open house/public meeting schedule.
November 3, 2008 Corinth City Hall 3300 Corinth Pkwy. Corinth, TX	City of Corinth – City Council	Status on operations and funding; reasons for modifications; presentation of project limits, typical sections, and mainlane access locations; stakeholder outreach; open house/public meeting schedule.
November 5, 2008 Lewisville City Hall 151 W. Church St. Lewisville, TX	Stakeholder Work Group #3 – TxDOT-Dallas District, City of Denton, NCTCOG, University of North Texas, City of Corinth, City of Carrollton, City of Lewisville, Town of Hickory Creek, City of Farmers Branch, City of Highland Village, and various consultants	Schematic design; environmental documentation; stakeholder outreach; schedule; other issues/next steps.
November 11, 2008 Carrollton City Hall 1945 E. Jackson Rd. Carrollton, TX	City of Carrollton – City Council	Status on operations and funding; reasons for modifications; presentation of project limits, typical sections, and mainlane access locations; stakeholder outreach; open house/public meeting schedule.
November 13, 2008 1197 W. Main St. Lewisville, TX	Public Meeting – open to the public	Open house format.

Meeting Date and Location	Meeting Attendees	Topics Discussed
December 3, 2008 Lewisville City Hall 151 W. Church St. Lewisville, TX	Stakeholder Work Group #4 – TxDOT-Dallas District, City of Denton, NCTCOG, City of Corinth, City of Carrollton, University of North Texas, DCTA, City of Lewisville, Town of Hickory Creek, Dallas County, USACE, and various consultants	Schematic design; environmental documentation; stakeholder outreach; EA/schematic schedule; ROW; other issues/next steps.
February 4, 2009 Lewisville City Hall 151 W. Church St. Lewisville, TX	Stakeholder Work Group #5 – TxDOT-Dallas District, City of Lewisville, City of Dallas, City of Farmers Branch, City of Corinth, City of Carrollton, Denton County, University of North Texas, City of Highland Village, USACE, Town of Hickory Creek, NCTCOG, DCTA, City of Denton, Lewisville Chamber of Commerce, and various consultants	Schematic design; environmental documentation; stakeholder outreach; EA/schematic schedule; phasing of construction; other issues/next steps.
May 6, 2009 Lewisville City Hall 151 W. Church St. Lewisville, TX	Stakeholder Work Group #6 – TxDOT-Dallas District, NCTCOG, City of Farmers Branch, City of Corinth, City of Carrollton, University of North Texas, City of Lewisville, FHWA, Town of Hickory Creek, City of Denton, City of Lewisville, Denton County, City of Highland Village, Denton County Commissioner Hugh Coleman, and various consultants	Schematic design; environmental documentation; stakeholder outreach; EA/schematic schedule; phasing of construction; other issues/next steps.
June 16, 2009 Carrollton City Hall 1945 E. Jackson Rd. Carrollton, TX	City of Carrollton	Schematic design; overview of project financing and delivery options; outcome of state legislative session; construction financing and phasing plan.
June 16, 2009 Lewisville City Hall 151 W. Church St. Lewisville, TX	City of Lewisville	Schematic design; overview of project financing and delivery options; outcome of state legislative session; construction financing and phasing plan.
June 17, 2009 Lake Dallas City Hall 212 Main Street Lake Dallas, 75065	City of Lake Dallas	Schematic design; overview of project financing and delivery options; outcome of state legislative session; construction financing and phasing plan.
June 17, 2009 Denton Civic Center 321 E. McKinney Denton, Texas 76201	City of Denton	Schematic design; overview of project financing and delivery options; outcome of state legislative session; construction financing and phasing plan.

Meeting Date and Location	Meeting Attendees	Topics Discussed
August 6, 2009 Lewisville City Hall 151 W. Church St. Lewisville, TX	Stakeholder Work Group #7 – TxDOT-Dallas District, NCTCOG, City of Farmers Branch, City of Corinth, City of Carrollton, Denton County, University of North Texas, City of Lewisville, City of Highland Village, Town of Hickory Creek, City of Dallas, USACE, DCTA, and various consultants	Schematic design; outcome of state legislative session; options for project financing; construction financing and phasing plan; and corridor champion development.
August 19, 2009	Presentation to Elected Officials – TxDOT-Dallas District, Town of Hickory Creek, City of Carrollton, City of Highland Village, DCTA, Denton County, City of Denton, City of Corinth, University of North Texas, City of Lewisville, NCTCOG, Representative for Congressman Michael Burgess, and various consultants	Planning and development; outcome of legislative session; and construction phasing and financing plans.
January 13, 2010	Stakeholder Work Group #8 – TxDOT-Dallas District, City of Farmers Branch, City of Corinth and EDC, City of Carrollton, Denton County Judge Horn, Denton County Commissioner Mitchell, Denton County Commissioner Coleman, Denton County, University of North Texas, City of Lewisville, City of Highland Village, Town of Hickory Creek, City of Denton and various consultants	Schematic design and environmental document status; outcome of state legislative session; options for project financing; construction financing and phasing plan, corridor champion development; and stakeholder outreach.

Numerous meetings have also occurred with the USACE since March 2004 to discuss the proposed project's impacts to USACE property, proposed mitigation, and permitting requirements. Meetings with staff from various USACE departments including Operations (Elm Fork Project Office), Regulatory, Real State and Planning have been conducted on the following dates: May 5, 2009, October 31, 2008, October 16, 2008, August 30, 2007, June 22, 2007, November 14, 2006, June 7, 2006, April 6, 2006, February 28, 2006.

An Open House/Public Hearing was held on November 18, 2010 at the Lewisville High School. There were 174 registered attendees, 17 of which were elected officials or municipal officers. A Summary and Analysis document detailing the Public Hearing and the associated comments received was submitted to TxDOT ENV on December 14, 2010.

In order to update those who attended the 2010 Public Hearing and adjacent property owners on the status of the proposed project, TxDOT published a notice in seven area papers during October and November 2010. The same notice was mailed to the adjacent property owners, based on Dallas County Appraisal District and Denton County Appraisal District records. The

notice was released by the TxDOT Dallas District's Public Information Office to local media on November 15, 2010.

The notice requested that any comments or questions regarding the proposed project be made to the TxDOT Dallas District by November 29, 2010 and 20 comments were received. Of the 20 comments received, 8 expressed concern and/or inquiries relating to traffic noise, project design features affecting access (to frontage road) and limiting driveway space, ROW acquisition, project timeline, lack of public input relating to project alignment selection at Main Street in the City of Lewisville, and/or exposure to air toxics.

Twelve of the 20 comments expressed support for the project and/or requested the project not be delayed any longer. Of the 12 comments in support, 1 was from an elected official (Denton County Judge) and 1 was from a public official (Director of Transportation for the City of Denton). No design changes were made as a result of comments received from the November 2010 public hearing.

Additional Public Involvement Opportunities

Stakeholder Work Group meetings will continue throughout the project development process. Once resource agency review/coordination is complete, the project may be approved by FHWA as satisfactory for further processing. If this determination is made, TxDOT would proceed with conducting a public hearing for this project.

Additional public involvement opportunities would also evolve in relation to the development of a Corridor Aesthetic Master Plan, which would provide aesthetic design guidelines incorporating context-sensitive solutions that would integrate community values, wishes, and desires into the design of the IH 35E corridor. Stakeholder comments would be considered during the aesthetic design guideline and Corridor Aesthetic Master Plan development process as well as the design process of the proposed facility to incorporate desired community-specific aesthetic features.

II. DESCRIPTION OF EXISTING FACILITY

A. Existing Facility

IH 35E, from PGBT to FM 2181, is within a primarily urbanized area with a few undeveloped areas adjacent to the ROW as depicted in **Appendix F: General Corridor Photographs**. The existing facility consists of six 12-ft mainlanes and has a posted speed limit of 60 mph. Additionally, there are two-lane frontage roads with a posted speed limit of 45 mph and a 24-ft median from PGBT to north of Lewisville Lake. The mainlanes are divided by a concrete traffic barrier (CTB) throughout the project limits. The existing ROW varies from approximately 256 to 300 ft along the corridor. The inside shoulders of the mainlanes are 12-ft wide and the outside shoulders are 10-ft wide. The frontage roads consist of 12-ft lanes and are mostly continuous along the corridor with the exception of the Lewisville Lake bridge, where there are no frontage roads. The northbound frontage road merges into the mainlanes just north of FM 407 and resume at the Denton Drive South exit north of the lake. The southbound frontage road merges into the mainlanes just north of the lake and resumes immediately south of the lake. Existing typical sections are presented in **Appendix B**.

There are 13 arterial streets and 1 rail line that cross (as an underpass or overpass) the existing facility within the project limits. The structures associated with these crossings are listed in **Table II-1.**

Table II-1: Existing Structures Along IH 35E from PGBT to FM 2181

Bridges along IH 35E	Southbound Vertical Clearance	Northbound Vertical Clearance
Frankford Road Overpass	19’11”	18’7”
SH 121 Bypass Overpass	16’3”	16’3”
Hebron Parkway/ FM 3040 Overpass	17’6”	16’6”
Corporate Drive Overpass	16’7”	16’7”
Fox Avenue Overpass	15’10”	15’11”
SH 121 Business Underpass	15’9”	15’9”
FM 1171 (Main Street) Overpass	16’2”	16’2”
Valley Ridge Overpass	16’8”	16’4”
Atchison, Topeka and Santa Fe Railway Overpass	16’0”	15’8”
FM 407 (Justin Road) Overpass	16’3”	16’3”
Garden Ridge Boulevard Overpass	21’5”	22’5”
Denton Drive South Overpass	15’10”	15’5”
Denton Drive North Overpass	16’0”	16’0”

Bridges along IH 35E	Southbound Vertical Clearance	Northbound Vertical Clearance
FM 2181 (Swisher Road) Underpass	16’ 6”	16’ 6”

Currently, 6 miles of parallel off-street bicycle facilities (to the east of IH 35E through Lewisville and Carrollton) exist near the project in the cities of Lewisville, and Highland Village.

B. Surrounding Terrain

According to the Carrollton, Lewisville East, and Lewisville West U.S. Geological Survey (USGS) topographic maps for the corridor, the elevations in the project area range from a maximum of approximately 570 ft above mean sea level (msl) to a minimum of approximately 450 ft msl (**Appendix A: Figure 3**). The project area can be characterized as gently sloping with a local topographic trend to the south and east from IH 35E.

C. Traffic Projections

According to data obtained from the TxDOT’s TPP Division, the limits of the proposed IH 35E improvements are located within two traffic analysis sections. These sections, Belt Line Road to Valley Ridge Boulevard and Valley Ridge Boulevard to U.S. 377, include the proposed IH 35E Middle section limits. The 2010 ADT from Belt Line Road to Valley Ridge Boulevard would be 200,300 ADT, and is projected to increase to 288,000 ADT in 2030. The 2010 ADT from Valley Ridge Boulevard to U.S. 377 would be 166,000 ADT. This is projected to increase to 242,100 ADT in 2030. The ADT for the two sections include both northbound and southbound mainlanes. The percent increase of projected ADT is shown in **Table II-2**.

Table II-2: Percent Increase of Projected ADT

Roadway Segment	ADT in Vehicles per Day (vpd)		% Increase
	2010	Projected (2030)	
From Belt Line Road to Valley Ridge Boulevard	200,300	288,000	44%
From Valley Ridge Boulevard to U.S. 377	166,000	242,100	46%

Source: TxDOT TPP Division (February 2009).

III. ALTERNATIVES

Beginning in 1998, TxDOT utilized the MIS process to gather community input and evaluate alternatives such as arterial improvements, rail improvements, bus transit improvements, bicycle/pedestrian facilities, and CMP strategies for the IH 35E corridor. The arterial, hike/bike, rail, and Travel Demand Management/Transportation Systems Management (TDM/TSM) strategies identified in the long-range plan were recommended in addition to several other arterial improvements recommended as part of this project. The alternatives analyzed and discussed below address the roadway solutions identified from the MIS process.

A. Alternative A: No-Build

The No-Build Alternative (Alternative A) represents the case in which the proposed project is not constructed. Various costs are associated with the implementation of Alternative A. The maintenance of the existing system becomes higher the longer the improvements and/or reconstruction are postponed. Vehicle operating costs are increased as motorists continue to utilize the existing facility. The monetary value of time lost by motorists due to lower operating speeds is increased on the congested roadway. There are also intangible costs associated with the affects to emergency vehicles by longer response times.

Alternative A consists of leaving the transportation system in its existing state which was not considered viable because it would not meet the need and purpose of the proposed project. The projected growth in population and traffic demand would exceed the capacity of IH 35E without any improvements. The alternative would not increase capacity or reduce congestion to meet the projected future growth of the area. Design deficiencies of the existing facility would remain, and the overall regional mobility would be impaired. The compatibility of this corridor with other adjacent TxDOT improvements would not occur and result in increased travel times which reduces mobility and increases air quality concerns.

Section 4(f)

The No-Build Alternative is not feasible and prudent to avoid Section 4(f) properties because it neither addresses nor corrects the need as cited, which necessitated the proposed project.

In conclusion, Alternative A would not satisfy the 2030 transportation demand. Alternative A: No-Build is carried forward throughout the document as a baseline comparison to Alternative B: Build.

B. Alternative B: Build

Considering the projected growth patterns and population projections for the corridor, the Build Alternative (Alternative B) was evaluated to accommodate the projected traffic demand. There would be limitations associated with improving the capacity of the existing freeways and thoroughfares for additional vehicle trips in the project area. Physical constraints such as the existing DCTA/DART ROW and Lewisville Lake pose considerable physical obstacles. Additionally, existing and planned land use patterns pose challenges to the needed construction of highway improvements. Other factors considered include the presence of adjacent parkland, including USACE property on either side of IH 35E and the cost and number of displacements associated with additional ROW needs. The growth and expansion of the cities adjacent to the corridor are considered as well as how best to accommodate their increased use of IH 35E.

Alternative B would involve following the existing alignment and proposed reconstruction of the existing facility. The proposed typical mainlane section for Alternative B would consist of eight 12-ft wide lanes (four in each direction) with 10-ft wide inside and outside shoulders and two to four collector distributor lanes (each direction) from south of PGBT to north of SH 121. Frontage roads would mostly consist of two, three, and four 11-ft wide lanes in each direction with 2-ft wide curb offsets (to the inside) for a maximum width of 49 ft. The frontage roads would be continuous throughout the length of the project. The proposed frontage roads along the Lewisville Lake Bridge would consist mostly of two 11-ft wide lanes. Continuous pedestrian sidewalks are proposed along each side of the entire project. Along the Lewisville Lake Bridge, the proposed northbound sidewalk would be 14-ft wide and approximately 1.4 miles in length. This sidewalk would begin at Highland Village Road and end at Hickory Hills Boulevard. The proposed southbound sidewalk along the Lewisville Lake Bridge would be 8-ft wide and approximately 1.5 miles in length. This sidewalk would begin at Denton Drive South and end at Highland Village Road. Along the rest of the corridor, the proposed sidewalks would be 6-ft wide and be located along to the frontage roads. During the final design phase of the project, TxDOT will make every effort to separate the sidewalks from the frontage road as much as possible. In order to accommodate pedestrian travel across IH 35E, the cross roads would include sidewalks. The proposed sidewalks would meet Americans with Disabilities Act (ADA) design criteria.

In order to accommodate bicycle travel along the IH 35E corridor, the frontage roads would include a 14-ft wide outer lane (excluding gutter) for shared use by bicycles and vehicles. The cross roads within the project limits would also accommodate bicycle travel by including a 14-ft wide outer lane for shared use by bicycles and vehicles. The proposed typical sections displaying the proposed IH 35E and cross roads typical sections are included in **Appendix B**.

TxDOT and the DCTA (under separate projects) have committed to construct 10.6 miles of additional off-street bicycling facilities located along IH 35E between Lake Lewisville and central Denton, which includes 2.2 miles within TxDOT ROW along IH 35E across Lewisville Lake. A parallel bicycle route is also planned along the DCTA/DART commuter rail line and is included in the draft *Trail Master Plan* for the City of Lewisville as a bike route spine and in the *Mobility 2030* as a recommended Veloweb route (high speed bicycle trail) for the region. The DCTA/DART commuter rail line is located along the east side of IH 35E either immediately adjacent or within 1/2 mile of IH 35E. The Regional Veloweb is essentially a series of small off-road trails designed for use primarily by fast moving bicyclists and is designed to encourage concurrent pedestrian transportation use.

Four 12-ft wide concurrent HOV/managed lanes with minimum 10-ft wide shoulders (to the outside) would be added from PGBT to FM 2181. The northbound and southbound HOV/managed lanes would be separated by a 10-ft wide median and a CTB. These concurrent HOV/managed lanes would be tolled. CTBs would be used to separate the mainlanes from the HOV/managed lanes. The design speed of the proposed project is 70 mph on the mainlanes, 70 mph on the HOV/managed lanes, 40 mph on the frontage roads, and 40 mph on the ramps. The proposed project would be constructed within a proposed ROW width that varies from approximately 380 to 556 ft. Proposed typical sections are presented in **Appendix B**. There would be no conversion of existing mainlanes into tolled HOV/managed lanes; 4 of the 12 proposed expressway lanes would be tolled.

The proposed improvements would result in constructing, rebuilding, or upgrading the existing and proposed overpasses, bridges, and interchanges along IH 35E from PGBT to FM 2181 (**Table II-1**). The SH 121 bypass at IH 35E and south bound connectors is a stand-alone project and has been constructed. The proposed bridge across Lewisville Lake would consist of four 12-ft wide mainlanes with 10-ft wide outside shoulders. The bridge would contain four 12-ft HOV/managed lanes with 10-ft wide shoulders. A typical section of the proposed Lewisville Lake Bridge and the accommodations for the future extension of the Trinity Trail is located in **Appendix B**.

The proposed cross streets would vary from two lanes without u-turns to eight lanes with u-turns. The proposed ROW width for the cross streets varies from approximately 88 to a maximum width of 668 ft at Turbeville Road/Hundley Road.

Section 4(f)
Several build options were assessed under Alternative B to determine if it would be feasible and prudent to avoid the Section 4(f) properties (USACE Property and Highland Lakes Park) through engineering design or transportation system management techniques. Design and techniques such as double-decking the mainlanes over frontage roads, reducing or eliminating frontage roads, and bridging the managed lanes were considered.

Double-decking the mainlanes over the frontages roads would shift the proposed centerline alignment approximately 50 ft east. This shift would not require property from either Highland Lakes Park or USACE Property, including Copperas Branch Park, however, this option would not allow for an exit ramp from southbound IH 35E. This option would create adverse community impacts to adjacent homes and substantially increase the cost of the proposed facility. Additionally, this option would still require the acquisition of other Section 4(f) property (Lewisville Lake Park) and as well as the required relocation of portions of the DCTA/DART ROW, and displacement of a substantial number of residences and businesses.

Eliminating frontage roads would not allow for access to Highland Lakes Park or the Highland Lakes II subdivision which utilizes the park, and deny access to Copperas Branch Park or the subdivision which utilizes the park. To gain access to Garden Ridge Boulevard and to Highland Village Road, motorists would need to circulate back to their respective closest road. This option would reduce the operational and safety benefits provided by a three-lane frontage road and would create adverse community impacts to the parks and adjacent homes.

Bridging the managed lanes over the mainlanes would require cantilever design and construction. Cantilever construction allows for long structures without external bracing and a beam is anchored at one end and projected into space. While this option would meet current transportation needs, future transportation needs could not be met and would substantially increase the cost of the proposed facility.

These options would result in a substantial missed opportunity to benefit the Section 4(f) properties and the identified need would not be met. There is no feasible and prudent option under the Alternative B which avoids the use of the Section 4(f) properties.

The Build Alternative is carried forward throughout the document as the preferred alternative.

IV. POTENTIAL SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS OF THE PREFERRED ALTERNATIVE

The environmental impacts associated with the project are assessed for natural resources (**Section IV.A**), land use (**Section IV.B**), the community as a resource (**Section IV.C**), and other resources/issues such as cultural resources, potential hazardous materials issues, and items of special nature (**Section IV.D**).

The implementation of the four HOV/managed lanes was considered and assessed in **Section IV.C - Community Impact Assessment**. Specific resources/issues include the following:

- Socio-Economic Impacts
- Economic Impact of Tolling
- Environmental Justice
- Air Quality
- Traffic Noise
- Traffic Operations

A. Natural Resources

A.1 Lakes, Rivers, and Streams

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no impacts to lakes, rivers, and streams are anticipated.

Alternative B: Build Impact
The waterways in the project area are associated with the Trinity River Basin. The major waterways which intersect the proposed project corridor include the Elm Fork of the Trinity River, Timber Creek, Prairie Creek, and Lewisville Lake. IH 35E crosses the Elm Fork of the Trinity River just north of Frankford Road. IH 35E also crosses Timber Creek, a perennial stream, just south of the SH 121 Bypass, and again just north of Hebron Parkway. Prairie Creek, a perennial stream, is perpendicular to IH 35E and is crossed by IH 35E just south of Valley Ridge Road. Lewisville Lake is crossed by IH 35E near the north end of the project area between Highland Village Road and Denton Drive South. The location of these waterways is shown in **Appendix A: Figure 3**.

The waterways crossed by IH 35E are not navigable waterways. Navigational clearance under the General Bridge Act of 1946, Section 9 of the Rivers and Harbors Act of 1899 (administered by the U.S. Coast Guard [USCG]) and Section 10 of the Rivers and Harbors Act of 1899 (administered by the USACE) is not applicable. Coordination with the USCG (for Section 9 and the Bridge Act) and the USACE (for Section 10) would not be required.

A.2 Waters of the U.S., including Wetlands

Alternative A: No-Build Impact
Under the No-Build alternative for IH 35E, no impacts to waters of the U.S., including wetlands, are anticipated.

Alternative B: Build Impact

Pursuant to Executive Order (EO) 11990 (Protection of Wetlands) and Section 404 of the Clean Water Act (CWA), an investigation was conducted to identify potential jurisdictional waters of the U.S., including wetlands, within the proposed project limits. According to the USACE, the federal agency having authority over waters of the U.S., wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Areas within the proposed project ROW were identified, characterized, and delineated in order to evaluate the potentially jurisdictional status of the sites. Alternatives were reviewed as required by EO 11990 on wetlands, after avoidance and minimization of impacts were implemented and no other practicable alternatives to wetland impacts were identified. An analysis of USGS topographic maps, National Wetland Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) maps, and field reconnaissance reveals potentially jurisdictional waters of the U.S. (including wetlands) that would be impacted by the proposed project. Each of the features identified were delineated and the total acreage of each feature was determined.

Ten wetland features were delineated within the proposed project limits totaling approximately 11.11 acres. Of the 10 wetland features within the proposed project ROW, eight wetlands are considered potentially jurisdictional and total approximately 10.99 acres. Two wetland features totaling approximately 0.12 acre, an isolated wetland associated with the upland retention/detention pond and Wetland 7 located within an upland drainage ditch, are considered potentially non-jurisdictional. The acreage amounts for the two potentially non-jurisdictional wetlands are not included in the overall impact calculations. USACE Routine Wetland Determination Data Forms are included in **Appendix D: Supplemental Data**.

Twenty water features were delineated within the proposed project limits totaling approximately 66.91 acres. Of the 20 water features within the proposed project ROW, 19 are considered potentially jurisdictional and total approximately 66.70 acres. One feature totaling approximately 0.21 acre, an unnamed impoundment that serves as an upland detention/retention pond, is considered potentially non-jurisdictional. The acreage associated with this feature is not included in the overall impact calculations. Stream Data Forms were prepared for each stream and are included in **Appendix D: Supplemental Data**.

Water and wetland features beyond the proposed ROW and easements of the proposed project were not included in these calculations. The delineated waters and wetlands are further described in **Table IV-1** and their locations are included on the **Corridor Maps** in **Appendix C**. Wetland 1B would be bridged with a retaining wall constructed adjacent to the wetland resulting in an impact of less than 0.01 acre to Wetland 1B.

Wetlands 2, 3, 4, and 8 and Waters 2, 3, 5, 6, 7, 10, 14, and 15 would be bridged and minimal permanent impacts would result from the placement of columns within the delineated boundaries of the permanent features. Waters 4 and 8 would be bridged and no columns would be placed within the delineated boundaries of these features. Wetland 5 would be filled for the construction of the northbound frontage road and a retaining wall would be utilized to reduce impacts to the wetland feature. Temporary impacts may result from the construction activities during the construction of the bridge structures.

Wetland 6 and Water 16 would be filled in their entirety as a result of the proposed project. Water 9 is adjacent to a bridged section and no permanent impacts are anticipated to this water feature. Waters 11, 13, and 17 contain existing culverts which would be extended. Water 12 is within the existing ROW for Grandy's Lane and contains an existing culvert. No modification would occur to this culvert and no impacts are anticipated. The approximate acreage and linear feet of permanent and temporary impacts to potentially jurisdictional features are included in **Table IV-1**.

There are three features (two wetland features and one water feature) that are potentially non-jurisdictional included in **Table IV-1** that are not summarized in this section. The three features include Wetland 7, Upland Retention/Detention Pond, and Fringe Wetland of Retention/Detention Pond.

Waters of the U.S. on USACE Property within Proposed Easements

Of the 20 total water features delineated, five water features are within the USACE property boundary totaling approximately 55.83 acres. Of the 10 total wetland features delineated, one wetland feature is located within the USACE property boundary and totals approximately 0.79 acre. Although these areas are located on USACE property beyond the proposed ROW limits needed to construct IH 35E, they are within the temporary easement limits. The additional area was delineated to assess impacts associated with the proposed construction of a park access road and new park entry point from Highland Village Road into Copperas Branch Park. As part of the proposed Section 4(f) mitigation, a new park entrance and access road is proposed and further discussed as part of the USACE Property Section 4(f) Evaluation provided in **Appendix G**.

Waters 14 and 15 would be bridged and minimal impacts would result from the placement of columns within the delineated boundaries of the features. Waters 1-Park and 2-Park are adjacent to the proposed park access road/bridge and no permanent impacts are anticipated. Water 3-Park would be bridged and minimal impacts would result from the placement of columns within the delineated boundary of this feature. A section of Wetland 1-Park would be bridged and a section filled as a result of the proposed construction of the park access road. Temporary impacts may result from the proposed construction activities during the construction of the proposed bridge structures. The approximate acreage and linear feet of permanent impacts to potentially jurisdictional features are included in **Table IV-1**.

Table IV-1: Waters of the U.S. within Proposed ROW and Easements

Area	Feature	Feature Name	Delineated Acres and/or Linear Feet	Water of the U.S.? (Yes/No)	Existing Structure	Proposed Work or Structure	Approximate Permanent Impacts (Acres/ Linear Feet)	Approximate Temporary Impacts (Acres/ Linear Feet)	*Associated Observation Points (OP)	Crossing Type	Proposed Permit	Corridor Sheet Number
1	**Wetland 1B	Unnamed Wetland	0.52/ N/A	Yes	Retaining Wall	Retaining Wall and Bridge	<0.01/ N/A	0.20/ N/A	OP 1B UP and OP 1B WET	Single and Complete	NWP 14, with a PCN	1
	Wetland 2	Unnamed Wetland	0.04/ N/A	Yes	Retaining Wall	Bridge	<0.01/ N/A	0.02/ N/A	OP 2 UP and OP 2 WET			
	**Water 2	Unnamed Impoundment	2.92/ N/A	Yes	Bridge	Bridge	<0.01/ N/A	2.47/ N/A	N/A			
	Wetland 3	Unnamed Wetland	1.17/ N/A	Yes	Bridge	Bridge	<0.01/ N/A	0.95/ N/A	OP 3 UP and OP 3 WET			
	Wetland 4	Unnamed Wetland	2.15/ N/A	Yes	Bridge	Bridge	<0.01/ N/A	1.38/ N/A	OP 4 UP, OP 4 WET, OP 4A UP, OP 4A WET			
	Water 3	Unnamed Impoundment	0.97/ N/A	Yes	Bridge	Bridge	<0.01/ N/A	0.79/ N/A	N/A			
	Total Approximate Impacts for Area 1						**0.01/ N/A**	**5.81/ N/A**				
2	Water 4	Elm Fork Trinity River	1.14/ 584	Yes	Bridge	Bridge	0.00/ N/A	0.11/ 50	Stream Data Form Water 4	Single and complete	NWP 14	2
3	Wetland 5	Unnamed Wetland	0.57/ N/A	Yes	None	Fill and Retaining Wall	0.45/ N/A	0.12/ N/A	OP 5 UP and OP 5 WET	Single and complete	NWP 14, with a PCN	2
	Water 5	Unnamed Impoundment	0.26/ N/A	Yes	None	Bridge	<0.01/ N/A	0.12/ N/A	N/A			
	Wetland 6	Unnamed Wetland	0.01/ N/A	Yes	None	Fill	0.01/ N/A	0.00/ N/A	OP 6 UP, OP 6 WET			
	Total Approximate Impacts for Area 3						**0.46/ N/A**	**0.24/ N/A**				

Area	Feature	Feature Name	Delineated Acres and/or Linear Feet	Water of the U.S.? (Yes/No)	Existing Structure	Proposed Work or Structure	Approximate Permanent Impacts (Acres/ Linear Feet)	Approximate Temporary Impacts (Acres/ Linear Feet)	*Associated Observation Points (OP)	Crossing Type	Proposed Permit	Corridor Sheet Number
4	Water 6	Timber Creek	0.70/ 1,178	Yes	Bridge	Bridge	<0.01/ 0	0.08/ 150	Stream Data Form Water 6	Single and complete	NWP 14	2 and 3
	Water 7	Timber Creek	2.54/ 999	Yes	Bridge	Bridge	<0.01/ N/A	0.67/ 197	Stream Data Form Water 7			
	Total Approximate Impacts for Area 4						**<0.01/ 0**	**0.75/ 347**				
5	Wetland 7	Unnamed Wetland	0.06/ N/A	No	Upland Drainage Ditch	Upland Drainage Ditch	N/A	N/A	N/A (Upland Drainage Ditch)	Upland Drainage Ditch	N/A	4 and 5
6	Water 8	Timber Creek	0.75/ 945	Yes	Bridge	Bridge	0.00/ N/A	0.06/ 50	Stream Data Form Water 8	Single and complete	NWP 14, with a PCN	5 and 6
	Wetland 8	Unnamed Wetland	5.74/ N/A	Yes	Bridge	Bridge	0.01/ N/A	2.28/ N/A	OP 8 UP, OP 8 WET, OP 8A UP, OP 8A WET			
	Water 9	Tributary of Timber Creek	0.05/ 427	Yes	None	None	0.00/ 0	0.05/ 427	Stream Data Form Water 9			
	Total Approximate Impacts for Area 6						**0.01/ 0**	**2.39/ 477**				
7	Water 10	Prairie Creek	0.38/ 751	Yes	Culvert	Bridge	<0.01/ 0	0.04/ 388	Stream Data Form Water 10	Single and complete	NWP 14	10
8	Water 11	Tributary of Prairie Creek	0.48/ 1,792	Yes	Culvert	Culvert Extension	0.21/ 866	0.06/ 256	Stream Data Form Water 11	Single and complete	NWP 14, with a PCN	11
	Upland Retention/ Detention Pond	Unnamed Impoundment	0.21/ N/A	No	None	Fill	N/A	N/A	N/A			
	Isolated Fringe Wetland of Retention/ Detention Pond	Unnamed Wetland	0.06/ N/A	No	None	Fill	N/A	N/A	OP 9 UP and OP 9 WET			
	Water 12	Tributary of Prairie Creek	0.04/ 43	Yes	Culvert	None	0.00/ 0	0.00/ 0	Stream Data Form Water 12			
	Total Approximate Impacts for Area 8						**0.21/ 866**	**0.06/ 256**				
9	Water 13	Tributary of Lewisville Lake	0.17/ 482	Yes	Culvert	Culvert Extension	0.08/ 210	0.01/ 220	Stream Data Form Water 13	Single and complete	NWP 14	13

Area	Feature	Feature Name	Delineated Acres and/or Linear Feet	Water of the U.S.? (Yes/No)	Existing Structure	Proposed Work or Structure	Approximate Permanent Impacts (Acres/ Linear Feet)	Approximate Temporary Impacts (Acres/ Linear Feet)	*Associated Observation Points (OP)	Crossing Type	Proposed Permit	Corridor Sheet Number
10	***Water 14	Lewisville Lake	11.48/ N/A	Yes	Bridge	Bridge	0.01/ N/A	0.00/ N/A	N/A	Single and complete	NWP 14, with a PCN	14-16
	***Water 1-Park	Unnamed Impoundment	0.22/ N/A	Yes	None	Bridge	0.00/ N/A	0.01/ N/A	N/A			
	***Water 2-Park	Unnamed Impoundment	0.41/ N/A	Yes	None	Bridge	0.00/ N/A	0.00/ N/A	N/A			
	***Water 3-Park	Tributary of Lewisville Lake	0.69/ 1,069	Yes	None	Bridge	0.00/ 0	0.00/ N/A	Stream Data Form Water 3-Park			
	***Wetland 1-Park	Unnamed Wetland	0.79/ N/A	Yes	None	Bridge and Fill	0.38/ N/A	0.31/ N/A	OP 1-Park UP and OP 1-Park WET			
	***Water 15	Lewisville Lake	43.03/ N/A	Yes	Bridge	Bridge	0.07/ N/A	0.46/ N/A	N/A			
	Total Approximate Impacts for Area 10						**0.46/ 0**	**0.78/ 0**	-			
11	Water 16	Tributary of Lewisville Lake	0.02/ 150	Yes	None	Fill	0.02/ 150	0.00/ 0	Stream Data Form Water 16	Single and complete	NWP 14	18
12	Water 17	Tributary of Lewisville Lake	0.45 515	Yes	Culvert	Culvert Extension	0.03/ 130	0.01/ 146	Stream Data Form Water 17	Single and complete	NWP 14	19

Notes:
* Observation points are only associated with wetland features and Stream Data Forms are only associated with streams. No data forms were prepared for open water, ponded areas. UP=upland, WET=wetland.
**Feature is outside of the proposed project ROW and easements according to current design.
*** Feature is located on USACE property.

The placement of temporary or permanent dredge or fill material into waters of the U.S. (including wetlands) that are determined to be jurisdictional would be authorized by Nationwide Permit (NWP) 14 (Linear Transportation Projects). NWP 14 authorizes temporary structures, fills, and work necessary to construct the linear transportation project. A NWP 14 Preconstruction Notification (PCN) would be required for Areas 1, 3, 6, 8, and 10 because the permanent fill impact exceeds the NWP 14 threshold of 0.10 acre of impacts, but are less than 0.50 acre of impacts, and/or because fill would be placed in a special aquatic site (wetland). It is anticipated that temporary impacts in jurisdictional waters and wetlands would occur during construction.

In general, temporary fill impacts for jurisdictional streams that would be bridged were determined by calculating a 50 foot wide access corridor across the length of the feature to facilitate an access road during construction. For potentially jurisdictional wetland features at the edge of a proposed bridge structure, such as Wetland 1B, a 50 foot wide area at each bridge bent was calculated for construction of the new bridge structure. However, it was estimated that temporary impacts would be greater to Wetland 8 due to the size of the wetland and its location under the proposed bridge. In addition, mats would be utilized within this wetland where feasible to minimize temporary impacts. A 50 foot wide access corridor which would result in temporary fill was calculated for Wetland 3 to provide access across the entire feature. Due to the size of Wetland 3, mats would be needed in addition to the access corridor for the construction of the entire bridge structure. The proposed design would bridge an impoundment (Water 3) and because of the depth of this jurisdictional feature, it is anticipated that temporary fill would be needed for access during construction. The temporary fill impacts were calculated to encompass an area from the proposed facility out to 50 feet from the edge of the proposed bridge. Additional temporary impacts at Area 1 are also the result of the removal of the existing Frankford Avenue facility. For the removal of existing Frankford Avenue, an area that encompasses the existing facility and extending 50 feet from the edge of the existing bridge or from the edge of existing structure to the existing/proposed ROW would be temporarily impacted to provide for construction access. In areas where temporary fills are needed, the affected areas would be returned to their pre-existing conditions. If it is necessary for heavy machinery to work in a wetland, then the placement of mats would occur to minimize soil disturbance to the extent possible. Additional temporary impacts attributed to construction activities including boat ramps and bulkheading on USACE property are still being determined in coordination with the design engineers.

An Individual Permit (IP) Application (USACE Project Number SWF-2004-00105) was submitted to the USACE Fort Worth District in April 2008 and would be modified to reflect the current Section 404 permitting requirements for the construction of the proposed project. Coordination with the USACE Lewisville Lake Office and the USACE Operations Maintenance Branch would also occur to address Section 404 impacts and appropriate permitting, and mitigation on USACE property.

Channelization would not be required to construct the proposed project. Compensatory mitigation for Section 404 impacts would be coordinated with the USACE and performed in accordance with the terms of the approved permit.

Because the roadway design is not final at this time, impacts to potentially jurisdictional areas were approximated based on the most current schematic design. Mitigation measures that have been considered include:

- Avoidance, where practicable, by spanning potentially jurisdictional areas with bridges.
- Minimization of impacts by limiting excavation and/or fill quantities.
- Compensatory mitigation for remaining unavoidable impacts performed in accordance with TxDOT and USACE procedures.

If, after the proposed project is let for construction, additional jurisdictional impacts (beyond those covered in the proposed Section 404 permit application) are identified due to the construction contractor's elected construction methodologies or activities, the contractor would be responsible for obtaining the appropriate Section 404 permit from the USACE for the additional impacts.

A.3 Floodplains

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no impacts to floodplains are anticipated.

Alternative B: Build Impact
Flood Insurance Rate Maps (FIRM) numbers 48113C0160J (Effective Date 8/23/01), 48121CO705F (Effective Date 8/23/01), 48121C0565F (Effective Date 8/23/01), 48121C0545E (Revised Date 4/02/97), 48121CO534E (Revised Date 4/02/97), and 48121CO532E (Effective Date 4/02/97) for Dallas County, Texas were reviewed to determine flood zones within the area for the proposed project. Within the proposed project area IH 35E crosses six areas which are designated as special flood hazard areas inundated by the 100-year flood, Zone A, no base flood elevations determined. Other areas are designated as Zone X, areas determined to be outside the 500-year floodplain. Dallas and Denton Counties and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek are participants in the National Flood Insurance Program (NFIP).

The project crosses within the FEMA designated 100-year floodplain at the Elm Fork Trinity River, Timber Creek, Prairie Creek, at a tributary of Prairie Creek, at Lewisville Lake, and at a tributary of Lewisville Lake as depicted in **Appendix A: Figure 3, FEMA Floodplain and USGS Quadrangle Maps**. The hydraulic design for this project would be in accordance with current FHWA and TxDOT design policies. The facility would permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing significant damage to the facility, stream, or other property. The proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances.

The project is within the Trinity River Corridor Development Regulatory Zone and a Corridor Development Certificate (CDC) would be required.

The proposed project crosses USACE property at Lewisville Lake. Because the Lewisville Lake PEA states that no reduction in storage capacity and no impact to the floodplain elevation can occur, the amount of fill placed within the flood pool elevation must be compensated for by removing fill at a nearby location. The cut and fill amounts located within the current USACE easement are anticipated to result in an overall positive benefit to flood storage of Lewisville Lake. Precise amounts of cut and fill would be determined during the detailed design phase of the project. No reduction in storage capacity and no impacts to the floodplain elevation are anticipated from the proposed project.

A.4 Water Quality

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no impacts to water quality are anticipated.

Alternative B: Build Impact
The Section 401 Certification requirements for NWP 14 would be met by implementing approved erosion controls, sedimentation controls, and post-construction total suspended solids controls from TCEQ's 401 Water Quality Certification Conditions for NWPs.

Category I would be addressed by applying temporary reseeding (TxDOT approved seeding specifications) and mulch to disturbed areas. Category II would be addressed by installing silt fences combined with rock berms. Category III would be addressed by permanent plantings according to TxDOT's approved seeding specifications to create vegetation-lined drainage ditches. These ditches would accept roadway runoff as sheet flow and filter it along the front slopes of the ditches as well as the bottom of the ditch. A Tier I Water Quality Certification would be required for the proposed project.

Impaired Waters
Runoff from the proposed project construction would flow directly into Lewisville Lake (Segment 0823), the Elm Fork Trinity River below Lewisville Lake (Segment 0822), and several creeks that flow into Lewisville Lake and the Elm Fork Trinity River. Runoff from this project would discharge directly into Segment 0822 of the Elm Fork Trinity River which is listed as impaired for bacteria in the 2008 303(d) list. Coordination with the TCEQ is required and was initiated on January 11, 2010. TCEQ responded with no comment on January 21, 2010.

Storm Water
To minimize adverse effects to water quality during construction, the proposed project would utilize temporary erosion and sedimentation control practices (i.e., silt fence, rock berm, and drainage swales) from the TxDOT's manual "Standard Specifications for the Construction of Highways, Streets, and Bridges." Where appropriate, these temporary erosion and sedimentation control structures would be in place prior to the initiation of construction and would be maintained throughout the duration of the construction. Clearing of vegetation would be limited and/or phased in order to maintain a natural water quality buffer and minimize the amount of erodible earth exposed at any one time. Upon completion of the earthwork operations, disturbed areas would be restored and reseeded according to the TxDOT's specifications for "Seeding for Erosion Control".

Texas Pollutant Discharge Elimination System (TPDES)
This project would include five or more acres of earth disturbance. TxDOT would comply with TCEQ's TPDES Construction General Permit (CGP). A SW3P would be implemented, and a construction site notice would be posted on the construction site. A Notice of Intent (NOI) would be required.

A.5 Threatened/Endangered Species and Wildlife Habitat

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, additional ROW would not be acquired; therefore, no impacts and/or no effect to threatened/endangered species nor wildlife habitat are anticipated.

Alternative B: Build Impact

The limits for this project are situated within the Carrollton, Lewisville East, and Lewisville West USGS topographic quadrangle maps (**Appendix A: Figure 3)**. The majority of the proposed project area exhibits urban development of various kinds, such as commercial, industrial, and residential with some isolated pockets of undeveloped land.

The pertinent U.S. Fish and Wildlife Service (USFWS) and Texas Parks and Wildlife Department (TPWD) Annotated County list of Threatened, Endangered, and Rare Species was reviewed and **Table IV-2** provides the state-listed and federal-listed threatened (T) and endangered (E) species indigenous to Dallas and Denton Counties, Texas. After reviewing habitat requirements and conducting a field visit on February 19, 2009, it was determined that this project would have no effect on any federally listed threatened or endangered species, its habitat, or designated habitat, nor would it adversely impact any state-listed species within the project limits.

Table IV-2: Federal, State Listed Threatened/Endangered Species, and Texas Parks & Wildlife Department's Species of Concern
Dallas and Denton Counties

Species	County	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Species Impact
Birds							
American peregrine falcon *Falco peregrinus anatum*	Dallas and Denton	—	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 U.S. and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No	- -	No impact. No suitable open areas or bodies of water present within the proposed project ROW. (see habitat discussion below)
Arctic peregrine falcon *Falco peregrinus tundrius*	Dallas and Denton	—		Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No	- -	No impact. No suitable open areas or bodies of water present within the proposed project ROW. (see habitat discussion below)
Bald eagle *Haliaeetus leucocephalus*	Dallas and Denton	DM	T	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds. Eagles select habitat with low human disturbance, suitable forest structure, and abundant prey. Functional nesting habitat generally encompasses a large undisturbed area, including foraging and nesting habitat, and should be contiguous acreage.	No	No effect. No suitable habitat present due to the extent of urbanization and human activity within the proposed project ROW. (see habitat discussion below)	- -

Species	County	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Species Impact
Black-capped vireo *Vireo atricapilla*	Dallas	E	E	The Black-capped vireo typically nests in shrublands and open woodlands with a distinctive patchy structure. Typically, the vegetation will be from three to 15 feet high and have a highly variable canopy. Brush cover usually ranges from 30 percent to 70 percent and territories include adjacent open areas, and woody areas with up to 100 percent canopy closure. Woody shrubs with foliage from ground level to about four feet appear to be a critical component of breeding habitat as it provides the supporting vegetation for nest and foraging sites. Throughout the habitat, plant composition appears less important than the presence of adequate broadleaved shrubs, foliage to ground level, and the mixture of open grassland and woody cover. These factors are also important in providing habitat for the insects on which the vireo feeds.	No	No effect. No shrublands and open woodlands with the preferred distinctive patchy structure and composition are present within the proposed project ROW. (see habitat discussion below)	- -
Golden-cheeked warbler *Dendroica chrysoparia*	Dallas	E	E	Woodlands of Spanish Oak and Ashe Juniper on the Edwards Plateau from mid March into late June or early July, then heads for wintering grounds in southern Mexico and Central America.	No	No effect. No Spanish Oak or Ashe Juniper woodlands are present within the proposed project ROW. (see habitat discussion below)	- -
Henslow's sparrow *Ammodramus henslowii*	Dallas and Denton	—		Wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking.	No	- -	No impact. No suitable habitat containing bunch grasses, vines, and brambles are present within the proposed project ROW.
Interior least tern *Sterna antillarum athalassos*	Dallas and Denton	E	E (Dallas County only)	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 suitable habitat present within the proposed ROW. (see habitat discussion below)	- -
Peregrine falcon *Falco peregrinus*	Dallas and Denton	—	T	Both subspecies migrate across the state from more northern breeding areas in U.S. and Canada to winter along coast and farther south; subspecies (*F. p. anatum*) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, *F.p. tundrius* is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.	No	- -	No impact. No suitable open areas with high vantage points or bodies of water present within the proposed ROW. (see habitat discussion below)

Species	County	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Species Impact
Piping plover *Charadrius melodus*	Dallas and Denton	T	T (Dallas County only)	Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats.	No	No effect. No suitable open areas with sandy beaches present within the proposed ROW. (see habitat discussion below)	- -
Western burrowing owl *Athene cunicularia hypugaea*	Dallas and Denton	—		Prefers open areas with short vegetation and bare ground in desert, grassland, and shrub-steppe environments. Typically utilizes abandoned burrows (primarily prairie dogs and ground squirrels) for nesting and roosting.	No	- -	No impact. No suitable habitat containing preferred nesting or roosting areas, such as abandoned burrows, are present within the proposed project ROW.
White-faced ibis *Plegadis chihi*	Dallas and Denton	—	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.	Yes	- -	No impact. No suitable nesting areas are present within the proposed project ROW. (see habitat discussion below)
Whooping crane *Grus americana*	Dallas and Denton	E	E	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.	No	No effect. No suitable habitat such as estuaries, prairie marshes savannah, grasslands, croplands, and pastures present within the proposed ROW. (see habitat discussion below)	- -
Wood stork *Mycteria americana*	Dallas and Denton	—	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. Urbanization and the conversion of all habitat types, mainly wetland loss, serve as the primary threat to the species' foraging and breeding habitat.	No	- -	No impact. No suitable habitat within the proposed ROW due to the extent of residential and commercial developments. (see habitat discussion below)

Species	County	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Species Impact
Reptiles							
Alligator snapping turtle *Macrochelys temminckii*	Dallas	—	T	Perennial water bodies, deep water of rivers, canals, lakes and oxbows; also swamps, bayous, ponds near deep running water; usually in water with mud bottom and abundant aquatic vegetation.	Yes	- -	No impact. Suitable habitat may be present at the Elm Fork Trinity River which would be bridged by the proposed project.
Texas horned lizard *Phrynosoma cornutum*	Dallas and Denton	—	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 suitable habitat containing open areas that are dry with scattered vegetation are present within the proposed ROW.
Timber/ canebrake rattlesnake *Crotalus horridus*	Dallas and Denton	—	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil, or black clay; prefers dense ground cover, i.e. grapevines or palmetto.	Yes	- -	No impact. Suitable habitat present at riparian zones along streams within the proposed project ROW. (see habitat discussion below)
Texas garter snake *Thamnophis sirtalis annectens*	Dallas and Denton	—		Wet or moist micro-habitats 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	- -	No impact. Suitable habitat present at riparian zones along streams within the proposed project ROW. (see habitat discussion below)
Mammals							
Cave myotis bat *Myotis velifer*	Dallas	—		This species is found primarily at lower elevations (the Sonoran and Transition life zones) of the southwest, in areas dominated by creosote bush, palo verde, brittlebush, and cactus. Roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned cliff swallow (*Hirundo pyrrhonota*) nests. Generally found over most of western Texas, including South Texas, eastern portions of the Panhandle, and north-central Texas.	No	- -	No impact. No preferred habitat is present within the proposed ROW.
Plains spotted skunk *Spilogale putorius interrupta*	Dallas and Denton	—		Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	Yes	- -	No impact. Corridors of forested habitats are present adjacent to the proposed project, however these habitats do not cross the proposed project corridor. (see habitat discussion below)

Species	County	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Species Impact
Red wolf *Canis rufus*	Denton	E*	E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies.	No	No effect. The proposed project corridor is urbanized and suitable habitat is not present.	- -
Mollusks							
Fawnsfoot *Truncilla donaciformis*	Dallas and Denton	—		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.	Yes	- -	No impact. Suitable habitat may be present in the perennial stream systems in the proposed project ROW which would be bridged.
Little spectaclecase *Villosa lienosa*	Dallas and Denton	—		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.	Yes	- -	No impact. Suitable habitat may be present in the perennial stream systems in the proposed project ROW which would be bridged.
Louisiana pigtoe *Pleurobema riddellii*	Dallas and Denton	—	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.	Yes	- -	No impact. Suitable habitat may be present in the perennial stream systems in the proposed project ROW which would be bridged.
Pistolgrip *Tritogonia verrucosa*	Dallas and Denton	—		Stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through San Antonio River basins.	Yes	- -	No impact. Suitable habitat may be present in the perennial stream systems in the proposed project ROW which would be bridged.
Rock pocketbook *Arcidens confragosus*	Dallas and Denton	—		Mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate moderate currents and some reservoirs, east Texas, Red through Guadalupe River basins.	Yes	- -	No impact. Suitable habitat may be present in the perennial stream systems in the proposed project ROW which would be bridged.

Species	County	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Species Impact
Sandbank pocketbook *Lampsilis satura*	Dallas and Denton	—	T	Small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River.	Yes	- -	No impact. Suitable habitat may be present in the Trinity River in the proposed project ROW which would be bridged. However, the species is not known to utilize the Trinity River basin.
Texas heelsplitter *Potamilus amphichaenus*	Dallas and Denton	—	T	Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.	Yes	- -	No impact. Suitable habitat may be present in the perennial stream systems in the proposed project ROW which would be bridged.
Wabash pigtoe *Fusconaia flava*	Dallas and Denton	—		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.	Yes	- -	No impact. Suitable habitat may be present in the perennial stream systems in the proposed project ROW which would be bridged.
Insects							
Black Lordithon rove beetle *Lordithon niger*	Dallas	—		Historically known from Texas. Inhabits old growth hardwood or mixed coniferous forest.	No	- -	No impact. No suitable habitat present such as old growth hardwood or mixed coniferous forest within the proposed project ROW.
Plants							
Glen rose yucca *Yucca necopina*	Dallas and Denton	—		Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June.	No	- -	No impact. No suitable habitat present such as grasslands on sandy soils within the proposed project ROW.
Warnock's coral-root *Hexalectris warnockii*	Dallas	—		Prefers leaf litter and humus in oak-juniper woodlands in mountain canyons in the Trans Pecos region. May often be found on narrow terraces at lower elevations to the east.	No	- -	No impact. No suitable habitat present such as oak-juniper woodlands or narrow terraces within the proposed project ROW.

Species	County	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Species Impact
E – Endangered T – Threatened DM – Delisted taxon, recovered, being monitored first five years "–" – No designation occurring within identified county "blank" – Rare, but with no regulatory listing status "- -" – No determination of effect or impact required because species lacks federal and/or state listing status "*" – TPWD T&E species list indicates species could be present in identified county; however, USFWS T&E species list does not indicate a listing status for the species in the county.							

Sources: U.S. Fish & Wildlife Service (January 9, 2009), Texas Parks & Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs, County Lists of Texas Special Species (Denton and Dallas, May 6, 2009), and Field Visit (February 19, 2009).

Habitat

Potentially suitable stopover habitat is not found within the project area for the following listed migratory bird species: the bald eagle, interior least tern, piping plover, white-faced ibis, whooping crane, black-capped vireo, golden-cheeked warbler, and wood stork. For these and non-listed species, nearby Lewisville Lake, braided streams, riparian vegetation, and wetland areas provide the most likely stopover habitat in the vicinity of the project area. In a rural setting, sound could travel this distance and stand out against the backdrop of quiet, causing disturbance to species at nearby stopover locations during project construction. However, because the setting is urban, the stopover locations are already subject to urban noise. Accordingly, there would be no direct disturbance to migratory bird species at nearby stopover locations.

Potentially suitable stopover habitat is found within the project area for the American and Arctic peregrine falcons (sometimes referred to at the species level as the peregrine falcon because making a visual distinction between the two subspecies can be difficult). However, to the extent that other nearby stopover habitat is readily available and accessible for the duration of project construction, direct impacts on these species would be negligible.

Suitable habitat may exist outside of the proposed project corridor at less disturbed areas at Lewisville Lake for the bald eagle, which is included on the federal list as a delisted taxon, recovered, and being monitored for the first five years. Suitable habitat may exist outside of the proposed project corridor at less disturbed areas at Lewisville Lake for the American peregrine falcon, peregrine falcon, timber/canebrake rattlesnake, and white-faced ibis which are state listed species. Suitable habitat may exist outside of the proposed project corridor along the Elm Fork Trinity River for the interior least tern, a federally listed species. The proposed project does cross the Elm Fork Trinity River and Timber Creek, a perennial stream; however, suitable habitat for the interior least tern was not present within the proposed project limits. Suitable habitat may exist in the proposed project corridor for the alligator snapping turtle and the timber/canebrake rattlesnake, both state-listed species, as well as for the Texas garter snake (state species of concern). These species were not seen during the reconnaissance surveys by qualified biologists nor are they anticipated to utilize these areas because the areas are isolated and found primarily in urbanized metropolitan areas that have been established for some time.

Suitable habitat may exist within the proposed ROW for the state listed mollusks (Louisiana pigtoe, sandbank pocketbook, and Texas heelsplitter) and several state species of concern (fawnsfoot, little spectaclecase, pistolgrip, rock pocketbook, and Wabash pigtoe). The stream systems within the project limits have been previously modified to some extent to better manage the drainage from IH 35E and other developments. The Trinity River and perennial streams are currently bridged and the proposed design would bridge these features. Within the existing ROW, many of the streams flow through a culvert or contain concrete or riprap along the bottom of the stream channel. Temporary crossings may be utilized for the construction of the bridges. However, the temporary crossings would be removed after construction and the areas would continue to function as they do currently. If temporary fill or mats are utilized at the crossings, the areas would be returned to the pre-existing conditions once the temporary fill is removed.

Agency Coordination

Coordination letters with the USFWS and TPWD are contained in **Appendix E**. Federally listed species are protected under the Endangered Species Act of 1973. In general, this act protects both the species and the habitat. State-listed species are protected under the Texas Administrative Code, Title 31, Part 2, Chapter 65, Subchapter G, Rules 65.71 – 65.176 and under the TPWD Statutes Chapters 67 and 68 revised May 31, 2002. These regulations primarily address adverse impacts to the state-listed species only and do not include habitat.

TPWD Texas Natural Diversity Database

The TPWD was consulted through the Texas Natural Diversity Database (TXNDD) on November 6, 2009 to obtain information on rare, threatened, and endangered plants, animals, invertebrates, exemplary natural communities, and other significant features for the proposed project area. This information in conjunction with field reconnaissance was used to evaluate potential environmental effects of the proposed project.

A list of elemental occurrences was provided by TPWD for species identified in the Grapevine, Carrollton, Addison, Argyle, Lewisville West, Lewisville East, Hebron, Denton West, Denton East, Little Elm, and surrounding USGS topographic quadrangles. According to the GIS data provided by the TXNDD, the proposed project is within the polygon of occurrence (the radius of search given) within 1.5 miles for the Texas garter snake (*Thamnophis sirtalis annectens*) and the Lewisville Lake managed area. Lewisville Lake is managed by the USACE.

Other reported occurrences identified in the TXNDD include Texas oak series (*Quercus buckleyi*), rookery, little bluestem-indiangrass series (*Schizachyrium scoparium-sorghastrum nutans*), and the cedar elm-sugarberry series (*Ulmus crassifolia-celtis laevigata*). TPWD disclosed that because of the proportion of public versus private land in the state, the TXNDD does not include a representative inventory of rare resources in the state. As is the case for the proposed project, the data is dependent on the best available data and some areas of the state may appear not to have any associated data; however, this does not suggest any presence, absence, or condition of special species, natural communities, or other significant features within the parcel. It also does not substitute any onsite evaluation by a qualified biologist.

One rookery (EOID 3672), last observed in 1990, was located southeast of the project at Josey Lane and Keller Springs Road in Carrollton. One little bluestem-indiangrass series (EOID 2293), last observed in 1995, was observed west of the proposed project near the intersection of SH 2499 and SH 3040 in Flower Mound. One Texas garter snake occurrence (EOID 434) was observed near IH 35E at the north side of Lewisville Lake in Lake Dallas. Locations of other

occurrences were not provided by the TPWD; however, no evidence of the species for these occurrences was found within the proposed project area or surrounding vicinity. No impacts to these occurrences or significant features are anticipated as a result of the proposed project. **Table IV-3** lists the results of the TXNDD search and element occurrence identification (EOID) numbers for the USGS topographic quadrangles associated with the proposed project.

Table IV-3: Texas Natural Diversity Database Search Results

Common Name	EOID	Distance from the Proposed Project in miles	Species Impacts
Texas oak series (*Quercus buckleyi*)	2487	NA*	It is found on alkaline limestone and neutral to slightly acid gravels and sands of north central and central Texas west to the Pecos River. Along the White Rock Escarpment through Dallas to San Antonio there are hybrids of Texas red oak and Shumard oak. The pure Texas red oaks exist to the west. Series or suitable habitat did not happen to be observed during site visits; therefore, no impacts to the species are anticipated.
Rookery	2952	NA*	Rookeries are generally a breeding or living area for large numbers of birds, or other animals, that come together in colonies to nest or breed. These rookeries did not happen to be observed during site visits; therefore, no impacts are anticipated.
	7731	NA*	
	3672	2.7	
Little bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans*)	3741	NA*	The proposed project corridor is urbanized and the series did not happen to be observed during site visits. No impacts are anticipated.
	2293	3.8	
Texas garter snake (*Thamnophis sirtalis annectens*)	432	NA*	Species generally prefers wet or moist microhabitats, but is not necessarily restricted to them. The proposed project corridor does contain several stream crossings. The majority of these crossings are maintained primarily by mowing. The species did not happen to be observed during site visits and no impacts are anticipated.
	434	0.0	
Cedar elm-sugarberry Series (*Ulmus crassifolia-celtis laevigata*)	520	NA*	Although individual cedar elm and sugarberry species were observed along the proposed project corridor, a native community of these species did not happen to be observed. No impacts are anticipated.

Source: TPWD TXNDD (November 6, 2009)
NA*: No element of occurrence record or GIS information was available.

The federally listed species in Dallas and Denton County are all avian species that are considered migratory and as such, are also protected under the Migratory Bird Treaty Act (MBTA). Some specimens may be local residents year round but the species in general does migrate, such as the peregrine falcon and its subspecies, bald eagle, interior least tern, black-capped vireo, and the

piping plover. No nesting habitat was found within the project limits for the federally listed species and no effects are anticipated.

TPWD records indicate that the Texas garter snake has been found within the corporate limits of Hickory Creek on the west side of IH 35E. The confirmed finding indicates that this species is found within the general area of the proposed project, and a pre-construction presence/absence survey would be conducted in order to clear the area of this species prior to construction. The Texas garter snake is currently not a listed species but is considered a rare species or a species of concern by the TPWD. Though not protected by regulation, it is a species that TPWD is monitoring and could potentially be listed by the state if habitat conditions or their numbers continue to degrade. If this species is encountered during the survey, the local TPWD biologist should be contacted by TxDOT to determine an appropriate plan of action. Construction activities in the area of the sighting would not begin until authorized by TPWD. Coordination with the Texas Parks and Wildlife Department was completed on February 1, 2010.

A.6 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. 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 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.

A.7 Vegetation and Wildlife Habitat

The project limits are found within the TPWD-defined Blackland Prairie natural region of Texas, which includes approximately 23,500 square miles. Typical annual rainfall in the region is approximately 34-44 inches, with peak rainfall occurring in May or June. Rich, deep, and fertile black soils once supported the original tallgrass prairie communities. Agriculture and urban sprawl and development have threatened the remaining grassland communities in Texas.

The 1984 TPWD map of "The Vegetation Types of Texas" indicates that the project area falls within two vegetative types, "Other Native or Introduced Grasses" in the southern portion of the project, and "Post Oak Woods, Forest, and Grassland Mosaic" in the northern portion of the project. The "Other Native or Introduced Grasses" physiognomic region is described as mixed native or introduced grasses and forbs on grassland sites or mixed herbaceous communities resulting from the clearing of woody vegetation. The "Post Oak Woods, Forest and Grassland Mosaic" physiognomic region includes blackjack oak *(Quercus marilandica),* eastern red cedar (*Juniperus virginiana),* mesquite (*Prosopis* spp.*),* black hickory (*Carya texana),* live oak *(Quercus virginiana),* sandjack oak (*Quercus margaretta),* cedar elm, sugarberry, yaupon (*Ilex vomitoria),* hawthorn (*Crataegus* spp.*),* trumpet creeper *(Campsis radicans),* dewberry (*Rubus trivialis),* little bluestem, silver bluestem *(Bothriochloa saccharoides),* beaked panicum *(Panicum anceps),* three-awn grasses *(Aristida* spp.*),* and sprangletop grasses (*Leptochloa* spp.).

Most of the project area exhibits commercial and residential development with some isolated pockets of undeveloped land. The existing ROW along IH 35E is frequently mowed. A few woody species of plants consisting of mostly oaks and loblolly pine *(Pinus taeda),* that appear to have been planted for landscape purposes, also occur in the existing ROW. These trees range in diameter from 12 to 24 inches and in height to approximately 35 ft. The vegetation found within the existing ROW differs somewhat from the vegetation found in the general area, in that the ROW is composed primarily of various species of grasses and forbs that are typically found along major roadways in north central Texas.

Field observations indicate that the vegetation along the project ROW is somewhat representative of the two vegetative physiognomic regions that are indicated for this area. Field reconnaissance occurred on various days in December 2008 and February 2009 and specific dates are included on the individual data forms. A Vegetation Data Field Form was completed and is contained in **Appendix D**. **Project Vegetation Photographs** can also be found in **Appendix F**. Isolated areas of habitat or vacant fields that abut the project include plants such as cedar elm, bois d'arc (*Maclura pomifera*), little bluestem, silver bluestem, brownseed paspalum *(Paspalum plicatulum*), thin paspalum *(Paspalum setaceum*), broadleaf signal grass (*Brachiaria platyphylla*), three-awn grasses, Virginia creeper (*Parthenocissus quinquefolia),* post oak (*Quercus stellata*), live oak, American elm (*Ulmus americana),* and pecan (*Carya illinoinensis*). There are also small riparian areas associated with most of the creek crossings along the roadway. These areas are composed primarily of post oak, black willow (*Salix nigra),* and sugarberry.

Vegetation along the fence line varies. Some fence lines along the ROW are un-vegetated, while others host young oaks, hackberries, and various vines such as dewberry, mustang grape (*Vitis mustangensis)* and trumpet creeper. Some yaupon and hawthorn can also be found.

Several unusual vegetation features and special habitat features were found within the project limits. These unusual vegetation features consist of large trees and riparian vegetation, and the special habitat features consist of the delineated water and wetland features, and the three rookeries that were observed. A seasonal cormorant rookery was observed on the west side of IH 35E at Frankford Road in February 2009, approximately 130 feet from the proposed ROW. However, in June 2009 the birds were no longer observed at this location. In June 2009 a seasonal egret rookery was observed within the project area west of IH 35E and south of Highland Village Road at Lewisville Lake approximately 200 feet from the proposed ROW. However, the rookery is located outside of any proposed improvements. Therefore, no effects are anticipated. Neither rookery is the same as the one listed through the TXNDD search (EOID 3672). The rookery listed through the TXNDD search was first observed in 1990 at the intersection of Josey Lane and Keller Springs Road, approximately three miles from the proposed ROW, and has not been observed since 1990. Rookery abandonment can be attributed to a variety of factors, such as periodic droughts, loss of nearby foraging areas, or encroachment by humans. All three of the rookeries are seasonal and were most likely used as stopover habitat, thus providing temporary habitat during migration.

As previously mentioned, some fence lines do exhibit some shrub and tree growth that under more rural or open circumstances would provide functional ecotones. Most of these areas, though, are limited or surrounded either directly or indirectly by development and would probably not remain functionally intact for any substantial period of time. Urban wildlife would tend to take advantage of these areas as long as they are present.

Wildlife in the proposed project area has and would continue to be dominated by species that are better able to adapt to urban life. Major mammalian predators like the bobcat (*Lynx rufus)* have been or soon would be lost from the general project area. Other predators like the coyote *(Canis latrans)* and the raccoon *(Procyon lotor)* may adapt better to urban development and remain longer. Specimens of the eastern fox squirrel (*Sciurus niger)*, the eastern cottontail (*Sylvilagus floridanus)*, and the swamp rabbit (*Sylvilagus aquaticus)* can still be found, though probably in lesser numbers, and still serve as prey items for various species of hawks, owls, and snakes. Many rodents, like the white-footed mouse (*Peromyscus leucopus)*, deer mouse (*Peromyscus maniculatus)*, northern pygmy mouse *(Baiomys taylori)*, and the hispid cotton rat (*Sigmodon hispidus)* are likely to be found in the general project area, and some of these species may remain prolific for some time. As development occurs, though, these rodents would most likely be replaced in numbers by other rodent species like the Norway rat (*Rattus norvegicus)*, roof rat (*Rattus rattus)*, and the house mouse (*Mus musculus).*

The areas containing woody vegetation and perhaps the grassy fields still serve as foraging areas for many local species and migratory avian species. Species observed during field reconnaissance were the mallard (*Anas platyrhynchos*), orchard oriole (*Icterus spurious*), red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), northern cardinal (*Cardinalis cardinalis*), northern mockingbird (*Mimus polyglottos*), great-tailed grackle (*Quiscalus mexicanus*), mourning dove (*Zenaida macroura*), European starling (*Sturnus vulgaris*), cliff swallow (*Petrochelidon pyrrhonota*), barn swallow (*Hirundo rustica*), bluejay (*Cyanocitta cristata*), red-bellied woodpecker (*Melanerpes carolinus*), and great blue heron (*Ardea herodias*).

Losses to any of the unusual vegetation features or special habitat features would be minimized. The adverse effects to vegetation could be minimized to the extent that only those trees that would be directly impacted by construction would be removed. In areas where impervious cover is not required, TxDOT approved seeding specifications would be followed. Direct loss of vegetation from the construction of this project would be minor. It is anticipated that this loss of vegetation would contribute cumulatively to the overall loss of wildlife habitat in the general area. The loss of vegetation and thus wildlife habitat is always a concern. Vegetation provides food, cover, and habitat for wildlife species no matter where it is located. Approximately 233 acres of land would be required for this roadway reconstruction project. Of the total 233 acres of land required, the percent canopy cover is approximately 11 percent and herbaceous cover is approximately 63 percent. There are approximately 77.8 acres of herbaceous vegetation and 1.9 acres of woody vegetation within the existing ROW. Within the proposed ROW there are approximately 70.3 acres of herbaceous vegetation and 26.0 acres of woody vegetation. This includes vacant lots, wooded lots, riparian habitat, uplands, and maintained urban areas. Of the total vegetated area, the acreage of woody vegetation within the existing and proposed ROW is approximately 27.9 acres. There are approximately 176 acres of vegetated land within the existing and proposed ROW. Of the total acreage of vegetated land, approximately 84.1 percent contains herbaceous vegetation and approximately 15.9 percent contains woody vegetation. Of the total woody vegetation, approximately 22.62 acres are considered woodland areas and the remaining amount is comprised of urban landscaped areas. There are approximately 3.2 acres of woodlands that can be considered riparian woodland habitat. Nineteen Woodland Data Site Forms (**Appendix D**) were completed for this project. The Woodland Data Site Forms contain the average diameter at breast height (dbh) of the woodland site and dbh range of the individual species. **Appendix A: Figure 4** illustrates the tree removal areas. Specific potential impacts would occur at the locations identified in **Table IV-4**.

Table IV-4: Woodland Areas

Location	Acre(s)	Unusual Vegetation or Special Habitat Feature	Effect	Tree Removal Map Number
Woodland Data Site Form Area 1	0.35	Four 20-28" in dbh American elms and one 42" dbh bur oak (*Quercus macrocarpa*) were observed within a riparian area.	All trees within the area including the individual large trees would be cleared during construction.	1
*Woodland Data Site Form Area 2	0.70	Riparian woodland located within the 100-year floodplain of the Elm Fork Trinity River.	No longer impacted due to the change in the proposed ROW. Therefore, this area is not included in the total woodland acreage that would be impacted.	1
Woodland Data Site Form Area 3	0.30	Several large pecans and oaks observed with dbh greater than 20 inches within a riparian woodland. Large pond located at southern limits of area.	All trees within the area including the individual large trees would be cleared during construction.	1
Woodland Data Site Form Area 4	0.24	Approximately 12 large oaks observed with dbh greater than 20 inches within a maintained upland lot.	Large trees would be cleared during construction.	2
Woodland Data Site Form Area 5	1.90	One cedar elm observed with dbh of 24 inches within a riparian area and adjacent upland area.	All trees within the area including the large cedar elm would be cleared during construction.	3
Woodland Data Site Form Area 6	0.62	Area encompasses pond and stream segment with riparian corridor.	All trees within the area would be removed during construction.	3
Woodland Data Site Form Area 7	1.05	One pecan at dbh of 55 inches and a height of 75 ft within an upland area.	All trees within the area including the large pecan tree would be cleared during construction.	4
Woodland Data Site Form Area 8	1.52	Upland area with no unusual vegetation or special habitat features observed.	All trees within the area would be removed during construction.	4
Woodland Data Site Form Area 9	1.78	Upland area with an American elm with a 32 inch dbh and an Eastern cottonwood (*Populus deltoides*) with a 20 inch dbh.	All trees within the area including the large trees would be cleared during construction.	4
**Woodland Data Site Form Area 10	1.92	Upland area with one American elm with 26 inch dbh.	All trees within the area including the large American elm would be cleared during construction.	5
**Woodland Data Site Form Area 11	0.18	Upland area with no unusual vegetation or special habitat features observed.	All trees within the area including the large American elm would be cleared during construction.	6
**Woodland Data Site Form Area 12	0.63	Upland area with no unusual vegetation or special habitat features observed.	All trees within the area would be removed during construction.	6
**Woodland Data Site Form Area 13	3.10	Upland area with no unusual vegetation or special habitat features observed.	All trees within the area would be removed during construction.	7

Location	Acre(s)	Unusual Vegetation or Special Habitat Feature	Effect	Tree Removal Map Number
Woodland Data Site Form Area 14	1.73	Upland area with one American elm with 22 inch dbh.	All trees within the area including the large American elm would be cleared during construction.	7
Woodland Data Site Form Area 15	1.72	Upland area with three post oaks with 20-22 inch dbh.	Large trees would be cleared during construction.	7
Woodland Data Site Form Area 16	0.52	Upland area with one snag, a 20 ft tall dead pine within ROW.	All trees within the area including the snag would be cleared during construction.	7
Woodland Data Site Form Area 17	0.71	Upland area with no unusual vegetation or special habitat features observed.	All trees within the area would be removed during construction.	8
Woodland Data Site Form Area 18	3.85	Upland area with two post oaks with 20-22 inch dbh.	Large trees would be cleared during construction.	8
Woodland Data Site Form Area 19	0.50	Upland area with no unusual vegetation or special habitat features observed.	All trees within the area would be removed during construction.	9
TOTAL	22.62			

*Woodland Area 2 is no longer impacted due to a design change in the proposed ROW. Therefore, this area is not included in the woodland acreage that would be impacted.
**Denotes areas that are within the USACE property boundary.

Mitigation for the riparian habitat impacts and other unique or special habitat features (large trees and riparian corridors) would be in accordance with Provision (4)(A)(ii) of the 1998 TxDOT-TPWD Memorandum of Agreement (MOA). This states that some habitats may be given consideration for non-regulatory mitigation during project planning (at the TxDOT District's discretion). These habitats include:

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

TxDOT would compensate for the individual loss of large trees [diameter at breast height (dbh) greater than 20 inches] and for the loss of riparian woodlands. The TxDOT Dallas District Standards for Woodlands Mitigation (**Appendix D**) planting details would be used. TxDOT would mitigate for the 3.2 acres of riparian woodlands habitat impacts which consist of Woodland Data Site Form Areas 1, 3, 5, and 6 (**Table IV-4** and **Appendix A, Figure 4: Tree Removal Maps** and **Appendix D: Supplemental Data)**. Additionally, TxDOT would mitigate for the loss of large trees which were identified at Woodland Data Site Form Areas 1, 3, 4, 5, 7, 9, 10, 14, 15, 16, and 18. The total number of large individual trees and total acreage affected and thus compensated for may change during final design. TxDOT would minimize the loss by preserving as many trees as possible. Trees within the ROW, but not in the construction zone, would not be removed if possible. Coordination with the Texas Parks and Wildlife Department was completed on February 1, 2010.

Through coordination efforts with USACE staff it has been determined that the preferred mitigation approach for vegetation/habitat impacts on USACE property (Woodland Data Site Form Areas 10-13) would consist of a fee payment. Typical compensatory mitigation for the loss of vegetation/habitat according to the ratios defined in the Lewisville Lake PEA would be followed depending upon the vegetation elevation and habitat quality. A detailed assessment of the USACE property habitat, impacted vegetation and associated mitigation ratios is described in **Section V**., USACE Property.

A.8 Invasive Species and Beneficial Landscaping Practices

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

A.9 Topography and Soils

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, additional ROW would not be acquired; therefore, no impacts to topography and soils are anticipated.

Alternative B: Build Impact
According to the Natural Resources Conservation Service's (NRCS) *Soil Survey of Dallas County, Texas* (1975) and *Denton County, Texas* (1975), there are three general soil types within the project area. The *Birome-Gasil-Callisburg* type is well drained, gently sloping to moderately steep, loamy soils that have moderate to slow permeability. The *Branyon-Burleson-Heiden* type is well drained and moderately drained, nearly level to moderately steep, clayey soil that has very slow permeability. The *Frio-Ovan* type is well drained, nearly level to gently sloping, clayey soil that has moderately slow and very slow permeability. According to the soil surveys, there are no mapped hydric soils located within the proposed ROW.

Farmland Protection Policy Act
Two prime farmland soils are located within the proposed ROW. These are Callisburg fine sandy loam and Konsil fine sandy loam. The additional ROW required is urbanized and/or zoned for urban use (**Appendix H: Indirect Land Use Impacts Assessment** for zoning maps); therefore, the proposed project is exempt from the requirements of the Farmland Protection Policy Act (FPPA) and requires no coordination with the NRCS.

A.10 Air Quality Assessment

Alternative A: No-Build Impact
The No-Build Alternative would not conform to local transportation plans and programs. It would be inconsistent with the financially constrained *Mobility 2030 – 2009 Amendment*, which

contains specific projects, programs, and policies intended to improve mobility, access, and air quality in the DFW region.

Alternative B: Build Impact

Areas determined by the Environmental Protection Agency (EPA) to exceed a National Ambient Air Quality Standards (NAAQS) are designated as non-attainment areas. The NAAQS include: ozone, carbon monoxide (CO), sulfur dioxide, nitrogen dioxide, lead, and particulate matter ($PM_{2.5}$ and PM_{10}). A State Implementation Plan (SIP) is a collection of requirements that delineates how a state would reduce emissions to attain the NAAQS. This SIP must be approved by EPA. For non-attainment areas, the 1990 Clean Air Act Amendments (CAAA) required the MPOs and the state transportation departments to demonstrate that transportation plans, programs, and projects Funded under Title 23 U.S. Code (U.S.C.) or the Federal Transit Act conform to state or federal implementation plans. Under the federal CAAA all transportation projects that are subject to FHWA approval must first be found to conform with the EPA approved SIP.

The proposed North Central Texas project is located in Dallas and Denton Counties, which are part of the EPA's designated nine county moderate non-attainment area for the 8-hour standard for the pollutant ozone; therefore, the transportation conformity rule applies. All projects in the NCTCOG's TIP that are proposed for federal or state funds were initiated in a manner consistent with federal guidelines in Section 450, of Title 23 Code of Federal Regulations (C.F.R.) and Section 613.200, Subpart B, of Title 49 C.F.R. Energy, environment, air quality, cost, and mobility considerations are addressed in the programming of the TIP. The proposed IH 35E project is included in and consistent with the area's financially constrained long-range MTP (*Mobility 2030 – 2009 Amendment*) and the 2008-2011 TIP, as amended. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on June 12, 2007, and October 31, 2007, respectively. Copies of the MTP and TIP pages are included in **Appendix D: *Mobility 2030 - 2009 Amendment*: Funded Roadway Recommendations** and the **2008-2011 STIP**.

The traffic data for 2030 is estimated to be 288,000 vpd; therefore, a Traffic Air Quality Assessment (TAQA) is required.[2] This project is adding single occupancy vehicles (SOV) capacity; therefore, a CMP analysis is also required.

Topography and meteorology of the area in which the project is located would not seriously restrict dispersion of the air pollutants. CO concentrations for the proposed action were modeled using CALINE3 and MOBILE6.2 and factoring in adverse meteorological conditions and sensitive receptors at the ROW line in accordance with the TxDOT 2006 Air Quality Guidelines. The traffic volumes resulting in the highest CO emission readings for 2020, the Estimated Time of Completion (ETC) year are 240,980 vpd. The traffic volumes resulting in the highest CO emission readings for 2030, the design year, are 289,900 vpd. Local concentrations of CO are not expected to exceed national standards at anytime. The following table, **Table IV-5**, summarizes the results of the analysis.

[2] Traffic data utilized in the TAQA was obtained from the *Traffic Analysis for Highway Design* by TxDOT (February 2009) for the IH 35E section.

Table IV-5: Carbon Monoxide Concentrations

Year	Location Description	1HR CO (ppm) *	1 HR % NAAQS	8 HR CO (ppm)*	8 HR % NAAQS	App. C: Corridor Map Sheet No.
2020	Between Corporate Drive and Business SH 121	5.00	14.29	3.08	34.22	6
2030	Between Corporate Drive and Business SH 121	5.20	14.86	3.2	35.56	6

*The NAAQS for CO is 35 ppm for one hour and 9 ppm for eight-hours. The analysis includes a one-hour background concentration of 3.7 ppm and an eight-hour background concentration of 2.3 ppm.

For a complete listing of the CO concentrations modeled, refer to **Appendix D: Air Receiver Locations and CO Concentrations**.

Congestion Management Process

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 amended 23 U.S.C. 134(k)(3)) and 49 U.S.C. 5303(k)(3), amendments incorporating the transportation planning requirements of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

CMP refers to several methods of roadway management. Included in the process are Intelligent Transportation Systems (ITS), Transportation Systems Management (TSM), and Travel Demand Management (TDM). These programs seek to improve traffic flow and safety through better operation and management of transportation facilities. Additionally, these programs provide low cost solutions that can be constructed in less time and provide air quality benefits to the region. The proposed project was developed from the NCTCOG operational CMP, which meets all requirements of 23 C.F.R. § 500.109.

Operational improvements and travel demand reduction strategies are commitments made by the region at two levels: the program level and the project implementation level. Program level commitments are inventoried in the regional CMP and are included in the financially constrained MTP. The following summarizes the *Mobility 2030 – 2009 Amendment* CMP recommendations for its components:

Intelligent Transportation System

ITS aids transportation operators and emergency response personnel as they monitor traffic, detect and respond to incidents, and inform the public of traffic conditions via the internet, roadway devices, and the media. *Mobility 2030 – 2009 Amendment* includes a number of ITS improvements featuring recommendations for 22 Traffic Management Centers, and 1,142 centerline miles of ITS deployment.

Transportation Systems Management

TSM attempts to identify improvements that would enhance the capacity of the existing transportation system. Better management and operation of existing facilities improves traffic flow, air quality, movement of vehicles and goods, and enhances system accessibility and safety. TSM strategies include intersection and signal improvements, freeway bottleneck removals, special events management, and data collection to monitor system performance. *Mobility 2030 –*

2009 Amendment recommendations include a number of TSM strategies. The 2030 plan calls for 1,081 intersection improvements which would include traffic control devices, turn lanes, traffic islands, and grade separations. *Mobility 2030 – 2009 Amendment* also recommends 7,291 traffic signal improvements. These improvements would call for improved signal timing, signal optimization, signal equipment upgrades, and better system interconnectedness. Additionally, *Mobility 2030 – 2009 Amendment* would implement programs to address the removal of freeway bottlenecks, as well as, better mitigation of congestion created by special events.

Travel Demand Management

TDM addresses alternative forms of transportation to commuters. Programs seek to reduce congestion and air pollution and to increase efficiency of the transportation system. TDM programs may include carpools, vanpools, transit, telecommuting, compressed work weeks, park-and-ride facilities, bike and pedestrian transportation, and Transportation Management Associations. *Mobility 2030 – 2009 Amendment* recommendations under this category include an Employer Trip Reduction Initiative, 1,780 vanpools, 30 additional park and ride facilities, and the creation of the Transportation Management Associations.

At the project implementation level, travel demand reduction strategies and commitments would be added to the regional TIP or included in the construction plans. The regional TIP provides for programming of these projects at the appropriate time with respect to the SOV facility implementation and project specific elements.

Committed congestion reduction strategies and operational improvements considered to be beneficial would consist of bottleneck removals, addition of lanes, HOV, and ITS projects. TxDOT, under the Congestion Mitigation and Air Quality Improvement Plan (CMAQ) program, would manage these projects, which are included in the regional CMP and TIP. The IH 35E related projects are listed in **Table IV-6**.

Table IV-6: Operational Improvements in the Travel Corridor

Location	Type	Implementation Year	Funding Source	TIP #	Cost
IH 35E PNR ramp at Dickerson Parkway	HOV	2007	TxDOT	11131.0000	$6,860,980
PGBT from U.S. 75 to IH 35E	Addition of Lanes	2010	NTTA	NTT 301	$50,000,000
IH 35 from PGBT to SH 121 Bypass	Bottleneck Removal	2006	TxDOT	0196-02-101	$4,053,022
IH 35E Corridor Video Surveillance	ITS	2006	Lewisville	11081.0000	$252,498
IH 35E at S JCT FM 2181	Bottleneck Removal	2006	TxDOT	11220.0000	$4,355,555
FM 2181 from Lillian Miller Pkwy./Loop 288 to west frontage road of IH 35E in Corinth	Addition of Lanes	2007	Denton County	11432.0000	$29,000,000
NAFTA Corridor Technology Deployment Program – IH 35E from IH 35W to U.S. 377	ITS	2008	TxDOT	---	$230,000
NAFTA Corridor Technology Deployment Program – IH 35E from FM 1171 to 0.2 mile S. of Hickory Creek	ITS	2008	TxDOT	---	$165,000
FM 1171 at IH35E Eastbound	Traffic Signal Improvement	2007	Lewisville	---	$249,090

Source: NCTCOG, http://nctcog.org/, Transportation Improvement Program Information System (TIPINS).

In an effort to reduce congestion and the need for SOV lanes in the region, TxDOT and NCTCOG would continue to promote appropriate congestion reduction strategies through the CMAQ 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 (TMA) is on file and available for review at NCTCOG.

Mobile Source Air Toxics (MSAT)

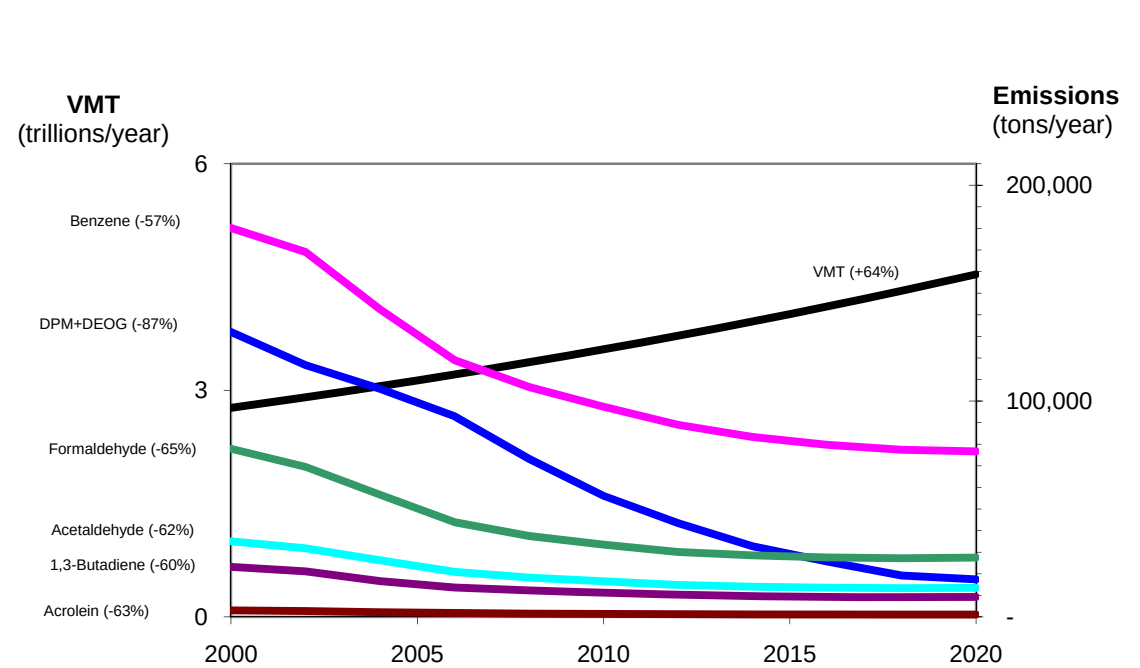
In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories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

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

The EPA is the lead Federal Agency for administering the CAA and has certain responsibilities regarding the health effects of MSAT. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 C.F.R. § 17229 (March 29, 2001). This rule was issued under the authority in § 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated

gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, acrolein, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel particulate matter and diesel organic gas emissions by 87 percent, as shown in the following graph (**Graph IV-1**.)

Graph IV-1: **U.S. Annual Vehicle Miles Traveled (VMT) vs. Mobile Source Air Toxics Emissions, 2000-2020***



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

Source: FHWA Interim Guidance on Air Toxic Analysis in NEPA Documents, February 3, 2006.
*National trend information is provided as background. For specific locations, the trend lines may be different, depending on local parameters defining vehicle mix, fuels, meteorology and other factors.

In an ongoing review of MSAT, the EPA finalized additional rules under authority of CAA Section 202(l) to further reduce MSAT emissions. The EPA issued Final Rules on Control of Hazardous Air Pollutants from Mobile Sources [72 Federal Register (F.R.) 8427, February 26, 2007] under Title 40 C.F.R. Parts 59, 80, 85 and 86. As a result of this review, EPA adopted the following new requirements to significantly lower emissions of benzene and the other MSATs by: 1) lowering the benzene content in gasoline; 2) reducing non-methane hydrocarbon (NMHC) exhaust emissions from passenger vehicles operated at cold temperatures (under 75 degrees); and 3) reducing evaporative emissions that permeate through portable fuel containers.

Beginning in 2011, petroleum refiners must meet an annual average gasoline benzene content standard of 0.62 percent by volume, for both reformulated and conventional gasoline, nationwide. Although the national benzene content of gasoline in 2007 is about 1.0 percent by volume; the DFW area ozone SIP results in benzene content of 0.48 percent in summer and 0.64 percent in winter. EPA standards to reduce NMHC exhaust emissions from new gasoline-fueled passenger vehicles will become effective in phases. Standards for light vehicles become effective during the period of 2010 to 2013, and standards for heavy vehicles during the period of 2012 to 2015. Evaporative requirements for portable gas containers become effective with containers manufactured in 2009. Evaporative emissions must be limited to 0.3 grams of hydrocarbons per day.

In addition, EPA has adopted more stringent evaporative emission standards for new passenger vehicles. The new standards are equivalent to current California state standards, and became effective in 2009 for light vehicles and in 2010 for the heavy vehicles. In addition to the reductions from the 2001 rule, the new rules significantly reduce annual national MSAT emissions. For example, EPA estimates that emissions in the year 2030, when compared to emissions in the base year prior to the rule, will show a reduction of 330,000 tons of MSATs (including 61,000 tons of benzene), reductions of more than 1,000,000 tons of volatile organic compounds (VOCs), and reductions of more than 19,000 tons of $PM_{2.5}$.[3] Please note that EPA has not updated MOBILE6.2 emission factors to capture the February 2007 Rule emission reductions; therefore, it is not possible to reflect these emission reductions in the quantitative MSAT analysis provided below.

Monitored Levels of MSATs Near the Project Area

The official monitor data is found on EPA's national air quality monitor web site (http://www.epa.gov/air/data). According to the EPA, monitoring of ambient concentrations of hazardous air pollutants is not mandated by the CAA, and monitoring is not the norm. However, EPA is in the process of developing regulations to limit hazardous air pollutant emissions, to prevent ambient hazardous air pollutant concentrations from reaching levels that would pose significant health risks (http://www.epa.gov/air/data/info.html.)

The Dallas/Denton County area monitors for various air pollutants using an established air monitoring network. This network of monitors measures air quality and determines the levels of the various pollutants in the air. Not all monitors sample for the same pollutants, and not all monitors have one year of complete data to compile an annual average for any given pollutant. For this reason, data from multiple monitors must be examined in order to analyze the pollution concentrations in the proposed project area.

A total of five monitoring sites are located near the proposed project. However, only one site: site No. 481210034, located approximately 9.2 miles from the proposed project, is active. See **Table IV-7**.

The official monitor data is found on EPA's national air quality monitor web site (http://www.epa.gov/air/data).

[3] EPA Fact Sheet/Regulatory Announcement: *Control of Hazardous Air Pollutants from Mobile Sources: Final Rule to Reduce Mobile Source Air Toxics, EPA, Office of Transportation and Air Quality*, EPA420-F-07-017, February 2007, page 4.

Table IV-7: Local Monitor Data for Air Toxics

Air Monitor Site	Activation Date	Annual Average O_3 (ppm) 2008 (Standard is a 3 year average which must be 0.08 ppm or below)	Annual Average - PM10 2008	Annual Average - PM2.5 2008	Annual Average – NO_2 2008	Annual Average - Lead 2008	Annual Average - Acetaldehyde (ppb) 2008	Annual Average - Acrolein (ppb) 2008	Annual Average - Benzene (ppb) 2008	Annual Average - 1,3 Butadiene (ppb) 2008	Annual Average - Formaldehyde (ppb) 2008	Approximate Distance (miles) from Project
481210034	2/16/1998	0.084	N/A	N/A	0.007	N/A	N/A	N/A	1.097	0.066	N/A	9.2

Source: EPA http://www.epa.gov/air/data (April 2009)

Note- EPA disclaimer regarding these data: "Readers are cautioned not to infer a qualitative ranking order of geographic areas based on Air Data reports. Air pollution levels measured in the vicinity of a particular monitoring site may not be representative of the prevailing air quality of a county or urban area. Pollutants emitted from a particular source may have little impact on the immediate geographic area and the amount of pollutants emitted does not indicate whether the source is complying with applicable regulations."

Project Specific MSAT Information

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

However, it is possible to quantitatively assess the "relative" levels of future MSAT emissions for the build and no build project alternatives. Although a quantitative assessment cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The quantitative assessment presented below is derived in part from a study conducted by the FHWA titled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:
www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

For each scenario in this EA, the amount of MSATs emitted would be proportional to the VMT assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build scenarios is higher than that for the No-Build scenario, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's

MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter, which decreases as speed increases. The extent to which these speed-related emissions decreases would offset VMT- related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under each of the scenarios is nearly the same it is expected there would be no appreciable difference in overall MSAT emissions among the various scenarios. 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 MSAT emissions by 57 to 87 percent between 2000 and 2020. Even greater reductions are expected by 2030 from EPA's 2007 MSAT rule. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives would have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under the Build scenario than under the No-Build scenario. The localized increases in MSAT concentrations would likely be most pronounced along the entire corridor. However, as discussed previously, the magnitude and the duration of these potential increases compared to the No-Build scenario cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build scenario could be higher relative to the No-Build scenario, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations coupled with fleet turnover will cause region-wide MSAT levels to be significantly lower than today in almost all cases.

MSAT Modeling

The EPA's highway vehicle emission factor model, MOBILE is a program that provides average in-use fleet emission factors for criteria pollutants [CO and nitrogen oxides (NO_X)] and also provides emission factors for VOCs. These emission factors can be estimated for any year between 1952 and 2050 and under various conditions affecting in-use emission levels. The output from the model is in the form of emissions factors expressed as grams of pollutant per VMT in grams per mile (g/mi). A quantitative analysis of the mass of air toxic emissions in the travel study area containing the proposed project was completed using the latest version of the EPA's mobile emission factor model (MOBILE6.2). The MOBILE6.2 emission factors are consistent with those used to develop the SIP and conformity determination for the DFW region. These factors do not yet reflect the EPA Final Rules on Control of Hazardous Air Pollutants from Mobile Sources (72 F.R. 8427, February 26, 2007) under Title 40 C.F.R. Parts 59, 80, 85 and 86 that when implemented, will significantly reduce emissions of benzene and other MSATs. The rule became effective on April 27, 2007.

The MSAT study area is composed of the affected transportation network as depicted in **Appendix A: Figure 6**. The IH 35E affected transportation network includes the proposed network links and other transportation model links reflecting a plus or minus five or greater

percent change in traffic volume between the Build and No-Build scenarios for the year 2030.[4] The plus or minus five percent threshold was adopted as the basis to determine the affected transportation network study area. Because the 2009 base year scenario represents the existing condition, the affected transportation network for 2009 is composed of those links determined to change plus or minus five or greater percent in 2030 and which currently exist in the 2009 network. The resulting affected transportation network for scenario year 2030 consists of those links determined to change plus or minus five or greater percent in 2030. The parameters used to characterize the travel activity utilized in the analysis included directional speeds and traffic volumes for the AM peak period, PM peak period and off-peak period.

For the purpose of this analysis three scenarios were modeled:

- "Base" or existing condition (2009);
- "Build 2030" scenario; and
- "No-Build 2030" scenario

Total Emission of MSAT for the Build and No-Build Scenarios

Specific data from the MSAT study area of the NCTCOG Regional Transportation Model were used to determine the mass of MSAT emissions associated with the Build scenario (proposed project), and No-Build scenario. In addition, the base or existing conditions mass of MSATs was also modeled. The total mass of MSATs in the year 2009 (base) was higher than either the Build or No-Build scenarios in the year 2030. This is reflective of the overall national trend in MSATs as previously described. The mass of emissions associated with the base scenario and design year are shown in **Table IV-8**.

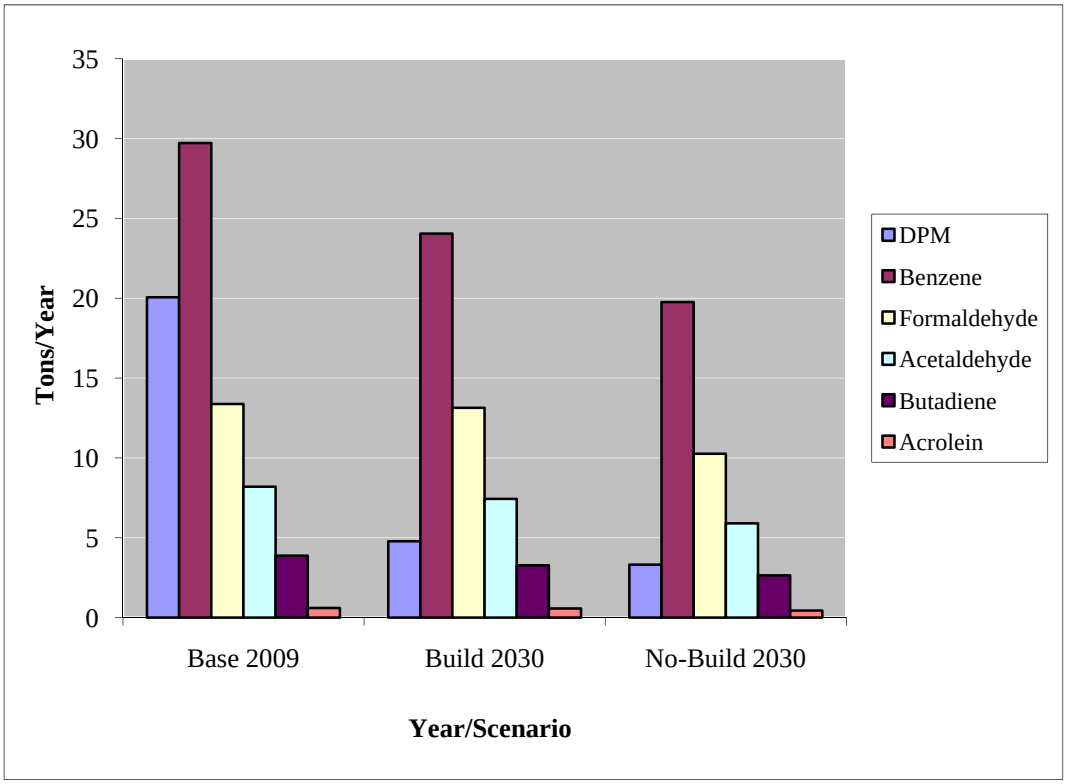
[4] See glossary for link definition.

Table IV-8: Mass of MSAT Emissions in Tons/Year and Percent Reduction Compared to the 2009 Base Scenario

Scenario	Associated VMT	Benzene	Percent Reduction of Benzene	Butadiene	Percent Reduction of Butadiene	Formaldehyde	Percent Reduction of Formaldehyde	Acetaldehyde	Percent Reduction of Acetaldehyde	Acrolein	Percent Reduction of Acrolein	DPM	Percent Reduction of DPM	Total (tons/year)	Percent Reduction of the Total MSAT
Base 2009	6,777,320	29.723	---	3.877	---	13.377	---	8.202	---	0.601	---	20.067	---	75.847	---
Build 2030	15,697,945	24.051	19%	3.282	15%	13.135	2%	7.435	9%	0.571	5%	4.788	76%	53.262	30%
No-Build 2030	12,640,048	19.764	34%	2.649	32%	10.262	23%	5.909	28%	0.446	26%	3.318	83%	42.348	44%

Source: EPA MOBILE 6.2 model and Study Team, 2010.

Graph IV-2: Total Mass of MSAT Emissions in Tons/Year



Source: EPA MOBILE 6.2 model and Study Team, 2010.

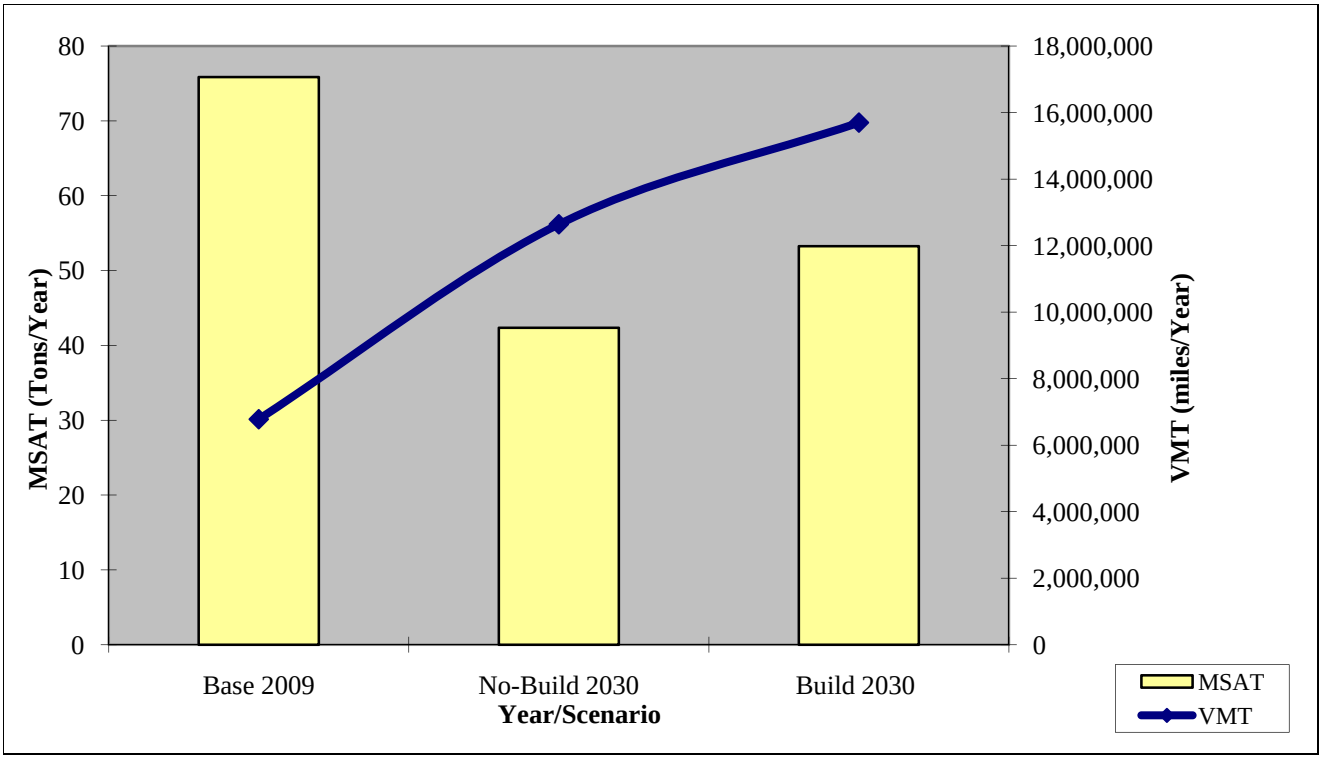
The analysis indicates that a decrease in MSAT emissions can be expected for both the Build and No-Build scenarios for the design year 2030 versus the 2009 base year. Emissions of total MSAT are predicted to decrease by 30 percent in 2030 compared with 2009 levels for the IH 35E Middle project. If emissions are plotted over time, a decreasing level of MSAT emissions can be seen on **Graph IV-3**; however, overall VMT continues to rise.

Of the six priority MSAT compounds, benzene, formaldehyde, and DPM contribute the most to the emissions total (**Table IV-8** and **Graph IV-2**). In future years a decline in benzene and formaldehyde is anticipated (34 percent reduction for benzene and 23 percent reduction for formaldehyde) from 2009 to 2030, under the No-Build scenarios. An even larger reduction in DPM emissions is predicted (83 percent decrease from 2009 to 2030, under the No-Build scenario).

Discussion

Although the VMT for the IH 35E Build scenario would increase approximately 132 percent by 2030 when compared to 2009, total MSAT emission for the same scenario would decrease at least 30 percent by 2030. In 2030, total MSAT loads for the Build scenario is 10.914 tons/year higher than the No-Build scenario. The higher level of MSAT emissions in 2030 for the Build scenario is due to a higher VMT when compared to the No-Build scenario.

Graph IV-3: IH 35E Middle Links VMT over Time per Scenario



Source: EPA MOBILE 6.2 model and Study Team, 2010.

The estimated emission levels are for all MSATs evaluated and are based on the projected total VMT. The reasons for these dramatic improvements are two fold, a change in vehicle fuels, both gasoline and diesel fuel, and a change in emission standards that both light-duty and heavy-duty on-highway motor vehicles must meet. The EPA predicts substantial future air emission reductions as the agency's new light-duty and heavy-duty on-highway fuel and vehicle rules come into effect (Tier 2, light-duty vehicle standard, Heavy-Duty Diesel Vehicle and (HDDV) standards and low sulfur diesel fuel, and the EPA's proposed Off-Road Diesel Engine and Fuel Standard). These projected air emission reductions will be realized even with the predicted continued growth in VMT. See EPA's Tier II RIA (U.S. EPA. 1999. *Regulatory Impact Analysis Control of Air Pollution from New Motor Vehicles: Tier 2Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements*. Engine Programs and Compliance Division, Office of Mobile Sources. Publication No. EPA420-R-99-24 023) and EPA's HDDV RIA; Regulatory Impact Analysis (U.S. EPA. 2001. Final Rule for Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229. March 29, 2001). The IH 35E Middle Project is estimated to emit the total amounts of the six priority air toxics included in **Table IV-8**.

Sensitive Receptor Analysis

There may be localized areas where ambient concentrations of MSATs are slightly higher in any Build scenario than in the No-Build scenario. Dispersion studies have shown that the MSAT emissions from vehicles on a "roadway" ("roadway emissions") start to drop off at about 324 ft (100 meters). By 1,640 ft (500 meters), most studies have found it very difficult to distinguish the roadway emissions from background air toxic levels in any given area. Sensitive receptors within the EA limits were identified, field verified, and the distance from the ROW to each receptor was measured and noted. The documented sensitive receptors include schools, medical facilities, elder care facilities, and licensed day care facilities. Fifteen sensitive receptors were

located along the project; from which 4 are within 328 ft (100 meters) from the proposed ROW and 11 are located between 328 ft (100 meters) and 1,640 ft (500 meters) from the proposed ROW. See **Table IV-9** below for sensitive receptor counts.

Table IV-9: Sensitive Receptors

Alternative B: Build	Length	Number of Receptors By Distance	
		Within 328 ft (100 meters) from the Proposed ROW	Between 328 ft (100 meters) from the Proposed ROW and 1,640 ft (500 meters) from the Proposed ROW
From PGBT to FM 2181	12 miles	4	11

Source: ESRI ArcMap 9.1; http://www.google.com (October, 2006); Field reconnaissance (October, 2006).

Sensitive receptors located within the EA limits are presented in **Table IV-10** and shown on **Appendix A: Figure 5**.

Table IV-10: Sensitive Receptors Along the Proposed Project Corridor

ID	Facility	Address	Municipality	Zip Code	Distance from Existing ROW in feet*	Distance from Proposed ROW in feet*
SR1	Baylor Surgicare Center	1854 Lakepoint Drive	Lewisville	75057	324	324
SR2	Winfree Academy	341 Bennett Lane	Lewisville	75057	245	235
SR3	Central Elementary School	400 High School Drive	Lewisville	75057	448	372
SR4	Central Special Education	701 S. Charles Street	Lewisville	75057	1,133	1,068
SR5	Tots Town Daycare	427 S. Cowan Avenue	Lewisville	75057	1,193	1,053
SR6	Children's Choice Learning Center	423 Elm Street	Lewisville	75057	1,301	1,179
SR7	Medical Center of Lewisville	500 W. Main Street	Lewisville	75057	180	63
SR8	Radiant Way Childcare	215 Betchan Street	Lake Dallas	75065	820	820
SR9	Lake Dallas Special Education	108 E. Hundley Drive	Lake Dallas	75065	909	909
SR10	Children's Lighthouse	1001 Point Vista	Hickory Creek	75065	445	378
SR11	Lewisville High School North	1301 Summit Avenue	Lewisville	75077	1,010	852
SR12	Lewisville Estates Retirement and Assisted Living Community	800 College Parkway	Lewisville	75077	1,225	1,090
SR13	Quail Valley Child Development Center	662 S. Edmonds Lane	Lewisville	75067	1,266	1,266
SR14	Lakeland Christian Academy	397 S. Stemmons Freeway	Lewisville	75067	100	100
SR15	Childtime	223 Oakwood Lane	Lewisville	75067	935	935

* Distance provided is an approximation and rounded to the nearest foot.
Source: ESRI ArcMap 9.1; http://www.google.com (October, 2006); Field reconnaissance (October, 2006).

Unavailable Information for Project Specific MSAT Impact Analysis

This EA includes a basic analysis of the likely MSAT emission impacts of the proposed project. However, available technical tools and lack of health-based MSAT standards do not enable one to predict the project-specific health impacts of the emission changes associated with the alternatives in this document. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality (CEQ) regulations (40 C.F.R. § 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete

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

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For PM, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE6.2 for both PM and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects such as IH 35E but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations. However, MOBILE6.2 is currently the only available tool for use by FHWA/TxDOT and so it was used for the comparison of scenarios.

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

3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude one from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near

roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions factors) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts.

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

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

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.[5]

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **Acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-Butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.
- **Diesel exhaust** also could contribute to chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and

[5] EPA Office of Research and Development, National Center for Environmental Assessment: IRIS database of human health effects that may result from exposure to various substances found in the environment. http://www.epa.gov/iris/. See glossary for "weight of evidence" definition.

could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

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

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, these studies do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project. In addition, EPA has not developed health based standard for MSATS, and instead has focused on regulation to significantly reduce on-road MSAT emissions nationwide.

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

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community.
Because of the uncertainties outlined above, an assessment of the effects of MSAT emissions impacts on human health cannot be made at the project level. While available tools do allow us to predict relative MSAT emission changes between alternatives for a proposed project of this magnitude, the amount of MSAT emissions from each of the project alternatives are presented here for consideration of alternatives and for disclosure purposes and are not intended for estimating potential human exposure or health impacts. Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on human health" as related to MSAT emissions.

In this document, a quantitative analysis of MSAT emissions relative to the various alternatives has been conducted. The analysis indicates that project alternatives 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.

Conclusion
The ability to discern differences in MSAT emissions among transportation alternatives is difficult given the uncertainties associated with forecasting travel activity and air emissions 21

years or more into the future. The main analytical tool for predicting emissions from on-road motor vehicles is the EPA's MOBILE6.2 model. The MOBILE6.2 model is regional in scope and has limited applicability to a project-level analysis. However, the effects of a major transportation project extend beyond its corridor and an evaluation within the context of an affected transportation network can be accomplished.

When evaluating the future options for upgrading a transportation corridor, the major mitigating factor in reducing MSAT emissions is the implementation of the EPA's new motor vehicle emission control standards. Decreases in MSAT emissions will be realized from the base year of completion for a planned project and its design year some 21 years in the future. Accounting for anticipated increases in VMT and varying degrees of efficiency of vehicle operation, total MSAT emissions are predicted to decline approximately 30 percent from 2009 to 2030. While benzene and formaldehyde emissions are predicted to decline 34 and 23 percent respectively, emissions of DPM are predicted to decline even more (i.e., 83 percent).

The MSATs from mobile sources, especially benzene, have dropped dramatically since 1995, and are expected to continue dropping. The introduction of RFG has lead to a substantial part of this improvement. In addition, Tier 2 automobiles introduced in model year 2004 will continue to help reduce MSATs. Diesel exhaust emissions have been falling since the early 1990s with the passage of the CAA Amendment. The CAA Amendment provided for improvement in diesel fuel through reductions in sulfur and other diesel fuel improvements. In addition, the EPA has further reduced the sulfur level in diesel fuel, effective in 2006. The EPA also has called for dramatic reductions in NO_X emissions, and particulate matter from on-road and off-road diesel engines. MSAT emissions related to IH 35E Middle are not expected to increase overall air toxics levels in the study area in the future years investigated.

MSAT emissions decreases from the base year are substantial even with the associated increase in VMT in the travel study area. Some sensitive receptors do exist, but their exposure would decrease from the base year to the design year due to improvements of vehicle technology and fuels.

B. Land Use

Surrounding land use in the project area is generally retail/commercial, light industrial, residential, public roadways, and railroad tracks. Land use adjacent to IH 35E is zoned HC Highway Commercial, C-1 Commercial, PBD Planned Business Development, C-3 Commercial District, LI Light Industrial, GB General Business District, LC Local Commercial District, MD Medical District, PU Public Use and City Parks. USACE property surrounds the existing IH 35E facility from Garden Ridge Boulevard to Denton Drive South.

It is not anticipated that this project would substantially affect current or future land uses; however, the proposed project may affect the rate of development and redevelopment along the IH 35E corridor. The proposed project may delay short and mid-term land development and investment along the IH 35E corridor, but in the long term, land development and redevelopment are anticipated to rebound and continue at an accelerated pace in accordance with the land uses planned and prescribed by cities traversed by the proposed project. The project is consistent with local planning efforts.

B.1 Impacts to Section 4(f) and 6(f) Properties

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, additional ROW would not be acquired; therefore, no impacts to Section 4(f) and 6(f) properties are anticipated.

Alternative B: Build Impact
There are three publicly-owned parks adjacent to the proposed project which would be converted from parkland for a transportation use.

Section 4(f) Properties
Future T.C. Rice Athletic Complex
The future T.C. Rice Athletic Complex is publicly-owned by the City of Carrollton and is located on the east side of IH 35E just south of the SH 121 Bypass **(Appendix C: Sheet 2 of 19)**. The City of Carrollton purchased this property for parks, recreation and other municipal uses which would include transportation improvements; therefore, a Section 4(f) Evaluation is not required (**Appendix E: Section 4(f) Determination Letter).**

USACE Property, including Copperas Branch Park
Approximately 20.7 acres of USACE property located at Lewisville Lake would be impacted by the proposed project **(Appendix C: Sheet 15 of 19)**. A portion of the USACE property includes Copperas Branch Park which is leased from the USACE and operated and maintained by the City of Highland Village. Copperas Branch Park is a 74.9-acre park adjacent to Lewisville Lake. Approximately 37 of the 74.9 acres are used for intense recreational purposes of which approximately 6.4 acres would be utilized for the proposed reconstruction of IH 35E. The park facilities include athletic fields, boat ramps, and picnic areas and access is located just off the IH 35E southbound frontage road, north of Garden Ridge Boulevard.

Highland Lakes Park
Highland Lakes Park is publicly-owned and operated by the City of Lewisville Parks and Leisure Services Department **(Appendix C: Sheet 14 of 19)**. The park is located on the west side of IH 35E, just south of Lewisville Lake in the Highland Lakes Phase II subdivision. This neighborhood park contains approximately 360 linear ft of hike and bike trail, a 5-space parking lot, 4 park benches, 4 picnic tables, 3 trash cans, and 4 barbeque grills. The proposed project would require approximately 0.5 acre of the 1.4 acre park.

Draft Programmatic Section 4(f) Net Benefit Evaluations have been prepared for USACE Property, including Copperas Branch Park and Highland Lakes Park (**Appendix G)**.

Section 6(f)
When parkland has been acquired or developed with funds provided by the Land and Water Conservation Fund (LWCF) Act of 1965 (16 USC 4601-4 to 4601-11) and this land is required for highway ROW, Section 6(f) procedures must be followed. Section 6(f) of the Land and Water Conservation Fund Act (LWCFA) concerns transportation projects that propose impacts, or the permanent conversion, of outdoor recreation property that was acquired or developed with LWCFA grant assistance which is administered by the TPWD through the Texas Recreation Park Account. Correspondence with the TPWD indicates the proposed project would not cause impacts to any LWCF or Local Parks Fund projects or sites (**Appendix E**). Consequently, Highland Lakes Park and the USACE Property including Copperas Branch Park are not subject

to a Section 6(f) Evaluation which directs the National Park Service to assure that replacement lands are of equal value, location, and usefulness as impacted lands.

C. Community Impact Assessment

Transportation investments have major influences on society and have the potential to impose economic and social consequences. Community impact assessment is a process to evaluate the effects of a transportation action on a community and its quality of life. The assessment is to examine topics of importance to people, such as socio-economic impacts, environmental justice, proposed ROW and potential displacements, impacts to public facilities and services, impacts to Section 4(f) and 6(f) properties, aesthetic considerations, air quality, traffic noise, and traffic operations.

Between the time period when the first public meeting was held in 2003 and 2008, the proposed IH 35E reconstruction project underwent schematic design modifications and coordination with the adjacent municipalities occurred. As discussed in **Section I.E**, stakeholder work group meetings have been held since August 2008 to facilitate communication between TxDOT and adjacent municipalities as well as other public agencies with interests along IH 35E. Stakeholders invited to the stakeholder work group meetings are defined as municipal, county, or other public agencies affiliated with the proposed IH 35E improvements, such as the USACE, DART, DCTA, NCTCOG, and the University of North Texas. A public meeting, held on November 13, 2008, allowed adjacent property owners and local, city, and state officials to obtain information regarding the proposed reconstruction of IH 35E and allowed a forum in which public comments could be provided in response to the proposed improvements. In addition to the stakeholder meetings and the public meeting, various meetings and/or presentations have been given to public officials associated with several municipalities within the project limits. These meetings with various community leaders provided an overview of the proposed project, initial/draft/modified IH 35E design concepts, reasons for design modifications, anticipated timeline for the construction of the proposed project, status on operations and funding, and allowed the public officials an opportunity to ask questions or communicate other potential stakeholder interests. A listing of various stakeholder, public, and project meetings is provided in **Table I-2**.

Due to the scale of the proposed project and the varying nature of community relationships within the DFW region (work, church, volunteer groups, sports groups, schools, etc.), the term "community" in the context of this community impact assessment is defined by municipality.

The following profiles describe the existing demographic make-up of the six municipalities located along the proposed project improvement limits, as well as general business trends and current major planned development.

City of Carrollton

Carrollton is described as a "vibrant corporate and residential community that has the 'home advantage' because of its prime location."[6] The City of Carrollton encompasses approximately 35 square miles and is located along the southern portion of the proposed project. According to *Census 2000*, the City of Carrollton has a total population of 109,215 and a median household income of $62,406.

[6] City of Carrollton. http://www.cityofcarrollton.com/

According to the City's website, it is apparent the businesses and neighborhoods in the City of Carrollton flourish and the surrounding major highways, three rail freight lines, and Foreign Trade Zone designation offer continued success. In 2006, the City of Carrolton was ranked 19th by *Money* magazine as the nation's "Best Small Cities" to live. The City of Carrollton is known to be a business friendly city and works to create new jobs, increase the total square footage in new development, attract new businesses, and expand current businesses. The City of Carrollton takes pride in the historic Old Downtown district that offers citizens shopping, dining, and the opportunity to experience the city's historic heritage.

The DART light rail system is proposed to travel through the City of Carrollton and connect with the future DCTA commuter rail system in northern Carrollton. The city has been coordinating with DART and preparing for this planned transportation development. The light rail system is currently under construction in the City of Carrollton and is scheduled to open in December 2010.[7]

The City of Carrollton is in the process of developing transit-oriented communities which would include higher density, mixed-use areas with an urban aesthetic. The design of these communities would encourage walking and bicycling, reduce and manage parking, and provide mixed-uses in close proximity to the light rail stations. One such community is planned for the downtown Carrollton station. A combination of City-initiated plans including a master plan and a City-sponsored infrastructure catalyst project have been established or are currently under development. The physical development of the downtown transit-oriented community is ongoing and will continue to evolve after light rail service in the City of Carrollton is scheduled to begin in December 2010.

City of Corinth

The City of Corinth identifies itself as a "city in the country."[8] According to *Census 2000*, the city has a total population of 11,424 and a median household income of $78,345. The city encompasses approximately 8.5 square miles. A small portion of the city is located at the northern most limit of the proposed project.

City officials have termed Corinth as a "gateway to success" because it offers advantages for business development as well as a high quality lifestyle for its residents. The City of Corinth finds that by providing an appealing, cooperative work and living atmosphere, combined with a superb location, the city is able to attract new business. In July of 2007, *Forbes* ranked Corinth the 30th "fastest growing suburb in the U.S." Corinth was also ranked 14th as the "Best Places to Live" in the DFW area by *D Magazine* in July 2005.

The Corinth City Council has approved three capital improvement projects which include expansion of roads, water utilities, and wastewater systems. These improvements are currently in various stages of development. Various other projects have recently been constructed. In 2008, Corinth welcomed its first hotel. The Comfort Inn and Suites hotel is located on the east side of IH 35E at Swisher Road. Corinth has also welcomed the Atrium Medical Center, a long term acute care hospital, the first of its kind in Denton County. The Atrium Medical Center is a three story, 59,000 square ft building located along the east side of IH 35E. The facility employs an estimated 150 nursing and administrative personnel and contains 60 beds.

[7] Dallas Area Transit Authority. http://www.dart.org/about/expansion/otherprojects.asp
[8] City of Corinth. http://cityofcorinth.com/

Several commercial developments have been progressing during the last few years in the City of Corinth. The Corinth Market Square retail facility is located along the west side of IH 35E adjacent to City Hall. The 80,800 square ft facility contains multi-tenant retail. Additionally, the development of a new Neighborhood Shopping Center at the corner of Robinson and Post Oak Road is proposed.

Town of Hickory Creek

The Town of Hickory Creek has a total population of 2,045 and a median household income of $69,313, according to *Census 2000*. The town encompasses approximately 15 square miles, the largest landmass of the "Lake Cities," and is located along the northern limits of the proposed project. The Lake Cities area is composed of the Cities of Corinth, Lake Dallas, Shady Shores, and the Town of Hickory Creek in Denton County.

The Town of Hickory Creek was named a "Top Ten Suburb" by *D Magazine* in 2006.[9] The town takes pride in being the "safe bet for quiet, hassle-free, safe living." The town is located on Lewisville Lake, where residents enjoy the combination of a relaxed, small town atmosphere with a thriving business district. Hickory Creek exhibits a blend of parks, nature trails, boat ramps, growing subdivisions, family farms, and businesses.

The Town of Hickory Creek is continuing to experience commercial and residential development, especially with the addition of three subdivisions. Retail growth is continuing in the form of new developments along the IH 35E corridor as well as FM 2181. The town updated its comprehensive plan in 2008; a key goal for the town's planning process is to identify the highest and best uses for remaining undeveloped land.

Several regional development projects have the potential to affect the Town of Hickory Creek. The Lewisville Lake Toll Bridge would enhance access to the town and would facilitate a greater number of people traveling through Hickory Creek. The DCTA has proposed a commuter rail system to extend from the Cities of Carrollton to Denton. Depending on the alignment chosen, the commuter rail system could potentially travel through the Town of Hickory Creek.

City of Highland Village

The City of Highland Village is termed "a quality lakeside community."[10] According to *Census 2000*, the city has a total population of 12,163, with a median household income of $102,141. The city is approximately 5.5 square miles and is located west of the proposed project, immediately south of Lake Lewisville.

The City of Highland Village takes pride in the continuing development of a quality community with a top-ranked educational system, an upper income family-oriented environment, and the planned preservation of open space throughout the lakefront community.

Several commercial developments have recently been established within the City of Highland Village. One development is the District of Highland Village, a 15-acre, mixed-use center comprised of shopping, restaurants, and town homes. The District of Highland Village broke ground in August 2008 and is located at the corner of FM 407 and Briarhill Boulevard. The Marketplace at Highland Village is a 66-acre, mixed-use retail development. This development

[9] Town of Hickory Creek. http://www.hickorycreek-tx.gov/
[10] City of Highland Village. http://www.highlandvillage.org/

consists of restaurants, retail and office space, and a storefront of the Highland Village Police Department. The Shops at Highland Village is also a planned development located at the intersection of FM 407 and FM 2499. The 45-acre lifestyle development includes connectivity to the city's trail system to provide pedestrian-friendly access to retail areas. In addition to the various retail developments, the City of Highland Village received voter approval to fund a new Municipal Service Center complex. This complex will house the Public Works and Parks Departments.

City of Lake Dallas

According to *Census 2000*, the City of Lake Dallas has a total population 5,992 with a median household income of $51,660. The city encompasses approximately 2.3 square miles and is located along the northern limits of the proposed project.

The City of Lake Dallas is a lakeside community with the vision to be a proud community with unique charm, built on strong family and community values, with exciting lakeside, recreational, and tourism assets supported by a diverse profitable business base.[11] The City of Lake Dallas continues to work to revitalize the downtown area and has recently renovated the historic 1908 Woodman of the World building which houses *The Lake Cities Sun* community newspaper.

The construction of the Lewisville Lake Toll Bridge will provide an essential link between the City of Lake Dallas and the Town of Little Elm, with the hopes of attracting people, business, and developers to the downtown area. The City of Lake Dallas plans to continue revitalizing the downtown area and assigning a new urban zoning classification. The planned development of the Main Street Square would consist of commercial and residential spaces, where Phase 1 would include 8,000 square ft of space, with another 16,000 square ft to be built.

City of Lewisville

The City of Lewisville prides itself in being a "great place to live, work, and play."[12] The City of Lewisville encompasses approximately 43 square miles and has a total population of 77,514 according to *Census 2000.* The median household income in Lewisville is $54,771. A large portion of the proposed project is located within the City of Lewisville. The city limits along the proposed project begin just south of the SH 121/IH 35E interchange and end to the north at the Lewisville Lake bridge.

Lewisville believes in creating a "community with a shared vision of being the finest place in North Texas to live and work, to raise a family and build a business, to visit for a day or stay for a lifetime." The City of Lewisville denotes the Old Town area as an asset and has worked to revitalize the area. Lewisville also prides itself in the local recreation and aesthetics of Lewisville Lake.

Development within the City of Lewisville has continued along the IH 35E corridor, surrounding the Vista Ridge Mall. In addition to the existing retail base, new commercial developments are being established around Vista Ridge Mall. Due to the shortage of land within the city limits, residential developers are turning to townhome development. In a June 2005 article in the *Dallas Business Journal*, it was estimated approximately 500 new residential units are planned for development in the City of Lewisville.[13] According to NCTCOG's Development Monitoring

[11] City of Lake Dallas. http://www.lakedallas.com/
[12] City of Lewisville. http://www.cityoflewisville.com/
[13] Dallas Business Journal, June 2005. http://dallas.bizjournals.com/dallas/stories/2005/03/28/story3.html

website, the Plaza Townhomes is under construction for 55 units. The Hebron 121 Station apartments have been announced, with a goal of more than 1,000 units, along with the Double Tree Ranch Retirement Community planned for 218 units. Large-scale residential projects in east Lewisville are expected to approach build-out in the near future.

C.1 Right-of-Way/Easements/Construction License/Displacements

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, additional ROW would not be acquired; therefore, no ROW acquisitions, easements/licenses, or displacements would occur.

Alternative B: Build Impact
The Build alternative would require the acquisition of ROW, easements (permanent and temporary), a construction license, and an estimated 180 displacements.

IH 35E Design History, Improvement Alternatives, and Minimization of Impacts
The IH 35E corridor was initially developed as a rural freeway in the 1950s. The 1950s IH 35E corridor reflected an approximate 300 ft ROW width which allowed considerable design flexibility while initially constructing the four lane freeway and segments of frontage roads to maintain local property access. The existing IH 35E corridor, from PGBT to FM 2181, has been upgraded through the years from the initial four lane freeway to a six lane freeway with discontinuous frontage roads throughout the corridor; however, these upgrades have not kept pace with the adjacent development as well as the increase in inter-regional trips. Current traffic projections show that by 2030, the IH 35E corridor from PGBT to FM 2181 will need to accommodate 288,000 vpd.

To accommodate the projected 288,000 vpd, several alternatives were evaluated during the MIS process for the mitigation of congestion within the study corridor. The MIS was initiated in 1998 (**Executive Summary, Section I.C, Section I.E, and Section III.** for additional information). Alternatives evaluated by TxDOT during the MIS process included:

Transportation Systems Management (TSM) Alternatives: This alternative seeks to mitigate traffic congestion by identifying improvements of an operational nature. TSM improvements are designed to improve traffic flow and safety through better management and operation of transportation facilities, at a much lower cost and construction time as compared to major infrastructure improvements. Operational improvements promoted include: Traffic Signal Enhancements, Intersection Improvements, Arterial Improvements, Bottleneck Removals and Intelligent Transportation System deployment.

Transportation Demand Management (TDM) Alternatives: This alternative seeks to mitigate traffic congestion and improve air quality by focusing on travel behavior. TDM improvements focus on reducing the number of vehicular demands and SOV trips on the roadway by offering alternatives to driving alone. Alternate modes of travel promoted include: Employee Trip Reduction Programs, Rail and Transit Service, Transportation Management Associations, and Bicycle and Pedestrian facilities.

Freeway/Roadway Alternatives: This alternative seeks to construct additional lane miles for travel. The alternate roadway designs include HOV and Managed/HOV facilities, Express Lanes, and addition of mainlanes, and widening. Although the non-freeway alternatives (TSM/TDM)

provide mode of travel choice and travel options for the users of the study segment, freeway alternatives have to be considered to meet the traffic demand and mitigate the congestion expected in the future.

From the MIS evaluation and subsequent iterations, a freeway corridor with four general purpose lanes and two HOV/managed lanes were proposed along the IH 35E corridor to accommodate transportation needs. Several alternatives were developed within the IH 35E corridor solution to minimize impacts. Due to the adjacent development and operational needs, at least two frontage road lanes at-grade with the adjacent properties are warranted. Options were reviewed to grade separate the managed lanes or cantilever the mainlanes over the frontage roads as well as adjusting the horizontal alignment to avoid displacements. Because of the number of ramps to and from the HOV/managed lanes, grade separating the HOV/managed lanes from the mainlanes was infeasible. Likewise, cantilevering the mainlanes over the frontage roads was infeasible due to the number of ramps to the adjacent frontage roads. The third option, to adjust the horizontal alignment of the corridor to avoid displacements was implemented throughout the corridor with substantial local stakeholder input.

As stated in **Section I.E**, the current proposed horizontal alternative has undergone substantial adjustments from the existing corridor and is supported by local stakeholder groups, which include adjacent property owners, adjacent municipalities, and other interested parties as reflected in the public comments which resulted from public meetings as well as feedback generated from the stakeholder work group meetings held for the IH 35E corridor development from PGBT to FM 2181. For example, the mainlane alignment near Main Street in the City of Lewisville was shifted to avoid displacing or adversely impacting a church, hospital, and a business. The resulting alignment minimized displacements and promoted enhancements to other properties in the form of improved access and enhanced safety due to improved sight distance. Design modifications such as this were coordinated between the local stakeholders and property owners to achieve a balanced and feasible solution for the proposed reconstruction of IH 35E.

ROW Acquisitions

The proposed IH 35E improvements between PGBT and FM 2181 would require additional ROW, and thus would result in a number of displacements. Approximately 179 acres of additional ROW would be required for the preferred alternative resulting in the displacement of 65 single family housing units, 93 business establishments, 19 vacant buildings/suites, and 3 municipal facilities (Hickory Creek Animal Services, Hickory Creek Public Works, and City of Lewisville Water Tower) for a total of 180 displacements. Copperas Branch Park (operated by the City of Highland Village) and Highland Lakes Park (operated by the City of Lewisville) would also be impacted and are further discussed in **Sections IV.B.1** and **IV.C.6**, Impacts to Section 4(f) and 6(f) Properties. Six of the 65 residential displacements are associated with the Highland Lakes Park Section 4(f) mitigation.

Easements/Construction License

The proposed improvements would require 54 acres of easements. Of this total, 33.3 acres would be required for drainage or slope easements. Construction of the proposed project would require the use of approximately 20.7 acres of USACE property at Lewisville Lake for the proposed facility. An easement request and construction license would be coordinated and processed with the USACE for the right to construct and use property at Lewisville Lake for the proposed project as it would not be possible to acquire ROW from the USACE for the proposed

construction of IH 35E. See **Section V.**, USACE Property, for more details and coordination requirements.

Uniform Relocation Assistance and Real Properties Acquisitions Act

TxDOT would be responsible for the ROW acquisitions. Acquisition and relocation assistance would be in accordance with the TxDOT Right-of-Way Acquisition and Relocation Assistance Program. Consistent with the USDOT policy, as mandated by the Uniform Relocation Assistance and Real Properties Acquisitions Act (URARPAA), as amended in 1987, TxDOT would provide relocation resources (including any applicable special provisions or programs) to all displaced persons without discrimination. The available structures must also be open to persons regardless of race, color, religion, or nationality and be within the financial means of those individuals affected. All property owners from whom property is needed are entitled to receive just compensation for their land and property. Just compensation is based upon the fair market value of the property. TxDOT also provides through its Relocation Assistance Program, payment and services to aid in movement to a new location.

Relocation assistance is available to all individuals, families, businesses, farmers, and non-profit organizations displaced as a result of a state highway project or other transportation project. Thus assistance applies to tenants as well as owners occupying the real property needed for the project. Residential replacement structures must be located in the same type of neighborhood and be equally accessible to public services and places of employment. As stated previously, assistance would be provided should the local existing housing market be insufficient for relocation. TxDOT would complete a survey of the housing market and provide housing supplements to displaced residents, if necessary. Additionally, TxDOT would relocate businesses and residents up to 50 miles. The TxDOT Relocation Office would also provide assistance to displaced businesses and non-profit organizations to aid in their satisfactory relocation with a minimum of delay and loss in earnings. The proposed project would proceed to construction only when all displaced residents have been provided the opportunity to be relocated to adequate replacement sites. The available structures must also be open to persons regardless of race, color, religion, or nationality and be within the financial means of those individuals affected. No special relocation considerations or measures to resolve relocation concerns have been identified to date.

While it would be necessary to relocate some existing utilities, the existing utility lines are not expected to pose substantial problems to the construction, operation, and maintenance of the proposed improvements. Detailed information on the utility lines would be evaluated during the design phase of the project in order to identify the need to integrate the proposed improvements and utility systems in to the design plans. All of the utilities can be either adjusted or relocated prior to the construction of the proposed project according to standard TxDOT procedures.

Displacements

Methodology

For the purpose of this assessment, a structure that was anticipated to be intersected or clipped by the proposed ROW was determined to be displaced, as well as properties with anticipated loss of substantial parking. An unknown description indicates a commercial structure lacking identification which would classify it as a particular type of business establishment.

During the design stages of the proposed project, consideration was given to reduce the total number of displacements along the corridor. The alignment for the proposed project was chosen to minimize displacements to the greatest extent possible. Other alignments considered would have resulted in a larger number of displacements.

Summary of Displacements

A summary of the displacements are listed by municipality in **Table IV-11** and in **Appendix D: Supplemental Data**.

Table IV-11: Summary of Potential Displacements

Type of Displacement	Municipality					Number of Displacements
	Carrollton	Corinth	Hickory Creek	Lake Dallas	Lewisville	
Residential	**2**	**2**	**4**	**1**	**56**	**65**
Single Family Housing Units	2	2	4	1	56	65
Business Establishments	**4**	**3**	**9**	**1**	**76**	**93**
Automotive Services	--	1	--	--	3	4
Hotel/Motel	--	--	--	--	5	5
Rental Services	--	--	--	--	7	7
Restaurants	1	1	5	--	8	15
Retail	1	--	1	--	24	26
Service Establishments	2	--	2	--	26	30
Service Stations	--	1	1	1	3	6
Vacant Buildings	**1**	**--**	**3**	**1**	**14**	**19**
Government/Municipal Facilities	**--**	**--**	**2**	**--**	**1**	**3**
Total	**7**	**5**	**18**	**3**	**147**	**180**

Source: Proposed Design Schematic (January 2009); Field observations (January 2009)

Displacements are shown in **Appendix C: Corridor Maps**. The displacement ID number corresponds to the total number of displaced structures. The total number of displacements is based on the individual business or residence. Some structures contain multiple businesses. No places of worship or manufacturing establishments would be displaced within the project corridor.

The displacement information presented is based upon the proposed ROW line as depicted in **Appendix C: Corridor Maps**.

Residential Displacements

As shown in **Table IV-11**, 65 single family housing units would potentially be displaced and are located within the Cities of Carrollton, Corinth, Lake Dallas, Lewisville, and the Town of Hickory Creek. Along the northern portion of the project limits, the proposed project would potentially displace two single family housing units in the City of Corinth, four housing units in the Town of Hickory Creek, and one housing unit in the City of Lake Dallas. A majority of the proposed improvements are located within City of Lewisville, where 56 single family housing units would potentially be displaced. Two single family housing units would potentially be displaced in Carrollton, at the southern end of the proposed project. No multi-family housing units would be displaced.

As mentioned previously, 6 of the 65 residential displacements are associated with the Highland Lakes Park Section 4(f) mitigation (**Appendix C: Corridor Maps, Sheet 14**). These six residential displacements (**Appendix D: IH 35E Displacement Data, D89 through D94**) are located in Census Tract 215.05, Block Group 1, Block 1001. The conceptual mitigation plan for the impacts to Highland Lakes Park is detailed in **Appendix G: Draft Programmatic Section 4(f) Net Benefit Evaluations**. A conceptual mitigation plan was presented to the City of Lewisville in July 2006 and was reviewed by city staff and City Council. This conceptual plan was approved in October 2006; the plan proposed utilizing the remaining parcels from six residential properties that would have been displaced as depicted in the 2006 preliminary design. The remnant parcels would have been enhanced and deeded to the City of Lewisville as part of Highland Lakes Park. Since that time, the 2009 IH 35E design changes avoided impacting the six residential parcels that were previously proposed as park mitigation in the 2006 concurrence documentation. At the request of the property owners, the City of Lewisville requested that the residential properties be acquired for park mitigation use and submitted a letter to TxDOT requesting specific mitigation elements. Formal correspondence documenting the mitigation and enhancements developed in conjunction with the City of Lewisville Parks Department, City Engineer, and City Manager can be found in **Appendix G**.

An approximate number of impacted individuals can be calculated by multiplying the average household size of occupied housing units (per municipality) by the number of potential residential displacement units (per municipality). *Census 2000* data reflects the following average household sizes by municipality: City of Carrollton – 2.77 persons; City of Corinth – 2.90 persons; Town of Hickory Creek – 2.67 persons; City of Lake Dallas – 2.74 persons; and the City of Lewisville – 2.57 persons. Based on these average household sizes, it is estimated approximately 169 persons would be impacted by the anticipated 65 single family residential displacements.

The locations and number of displacements for single family homes are:

- Between Frankford Avenue and Main Street (FM 1171) – 21 homes on the east side of IH 35 E and 21 homes on the west side (**Appendix C: Corridor Maps, Sheets 1 through 9**);
- Between Main Street (FM 1171) and Garden Ridge Boulevard – Eight homes on the east side of IH 35E and two homes on the west side (**Appendix C: Corridor Maps, Sheets 10 through 14**);
- Between Garden Ridge Boulevard and FM 2181 – Two homes on the east side of IH 35E and nine homes on the west side (**Appendix C: Corridor Maps, Sheets 14 through 19**); and
- North of FM 2181 and east of IH 35E – Two homes (**Appendix C: Corridor Maps, Sheet 19**).

The potential residential relocations would affect 15 census block groups: Census Tract (CT) 214.01 Block Group (BG) 5, CT 214.02 BG 5, CT 214.03 BG 2, CT 214.03 BG 3, CT 214.03 BG 4, CT 215.05 BG 1, CT 216.01 BG 3, CT 216.01 BG 1, CT 216.01 BG 5, CT 216.01 BG 7, CT 216.03 BG 2, CT 217.03 BG1, CT 217.11 BG1, CT 217.13 BG 1, and CT 140.02 BG 1. **Section IV.C.2** and **Appendix A: Figure 8** include more information related to environmental justice and displacements.

The current market values of the potentially displaced single family homes were identified and ranges of approximate market values were established. These ranges were used to identify the number of available homes within each municipality. **Table IV-12** below lists the number of potential single family displacements and an approximate number of available homes within each municipality as of November 2009.

Table IV-12: Available Housing for Single Family Residential Displacements

Municipality	Number of Potential Single Family Displacements	Range of Approximate Market Value[1]	Approximate Number of Available Homes[2]
City of Corinth	2	$40,000-59,999	1
	0	$60,000-79,999	0
	0	$80,000-99,999	2
	0	$100,000-119,999	2
City of Lake Dallas	1	$100,000-119,999	3
Town of Hickory Creek	1	$0-19,999	0
	1	$80,000-99,999	0
	0	$100,000-119,999	2
	1	$140,000-159,999	2
	0	$160,000-179,999	2
	1	$220,000-239,999	3
City of Lewisville	0	$50,000-59,999	2
	1	$60,000-69,999	0
	5	$70,000-79,000	3
	10	$80,000-89,999	0
	10	$90,000-99,999	4
	5	$100,000-109,999	9
	3	$110,000-119,999	10
	3	$120,000-129,999	10
	4	$130,000-139,999	9
	3	$140,000-149,000	23
	1	$150,000-159,999	17
	0	$160,000-169,999	13
	0	$170,000-179,999	21
	1	$180,000-$189,999	18
	1	$190,000-199,999	23
	2	$200,000-209,999	8
	2	$210,000-219,999	11
	1	$220,000-229,999	8
	1	$230,000-239,999	6
	1	$240,000-249,999	4
	1	$320,000-329,999	5
	1	$330,000-339,999	3
City of Carrollton	2	$80,000-99,999	9
Total	**65**	**N/A**	**233**

[1] Residential displacement values provided by Denton Central Appraisal District (DCAD) 2009 certified data.

[2] Available housing data obtained through the Ebby Halliday Realtors website http://www.ebby.com, which maintains all listings entered into the National Association of Realtors Multiple Listing Service. Site accessed November 3, 2009 and November 4, 2009. Available housing numbers given are for homes comparable in price to those being displaced. NOTE: Available home listings for the City of Highland Village range from $149,000-$3,490,000.

Approximately 65 single family homes would be displaced by the proposed project. These homes range in value from $16,000 to $332,000. According to **Table IV-12**, a total of 233 homes within comparable price ranges are currently available in the municipalities associated with the potential single family displacements. Based on current available market data, comparable housing appears to be available for a majority of the potential residential displacements. Municipalities that currently do not have comparable housing for the residential displacements for specific price ranges include:

- City of Corinth – two displacements within a range of $40,000-59,999 but only one available residence within that value range; however, there are two residences within a range of $80,000-99,999.
- Town of Hickory Creek – one displacement valued at $16,000 (vacation cabin) but no available residences within the $0-19,999 value range. One displacement within a range of $80,000-99,999 but no available residences within that value range. However, there are two available residences within a value range of $100,000-119,999.
- City of Lewisville – one displacement within a range of $60,000-69,999 but no available residences within that value range. Five displacements within a range of $70,000-79,999 but only three available residences within that range. Ten displacements within a range of $80,000-89,999 but no available residences within that range. Ten displacements within a range of $90,000-99,999 but only four residences within that range. However, there are 2 available residences within a range of $50,000-59,999 and 19 available residences within a value range of $100,000-119,999.

As mandated by the URARPAA, as amended in 1987, residential replacement structures must be located in the same type of neighborhood and be equally accessible to public services and places of employment. TxDOT would complete a survey of the housing market and provide housing supplements to displaced residents, if necessary. Additionally, TxDOT would relocate residents up to 50 miles.

Housing of Last Resort

Assistance would be provided should the local existing housing market be insufficient for relocation. This assistance could apply to the potential displacements located within the Cities of Corinth and Lewisville and the Town of Hickory Creek given the value of some potentially displaced homes are not commensurate with current available housing values. Some displaced residents may be required to relocate to a different municipality depending on availability of comparable housing at the time of acquisition.

Commercial Displacements

A total of 93 businesses would be potentially displaced by the proposed project. The following municipalities contain anticipated commercial displacements: the City of Corinth - 3 business establishments; the Town of Hickory Creek - 9 business establishments, the City of Lake Dallas - 1 business establishment, the City of Lewisville - 76 business establishments, and the City of Carrollton – 4 business displacements. Each of the six adjacent municipalities has actively participated in the setting of the proposed IH 35E alignment and the potential impacts to local businesses, as well as residences. One of these impacted municipalities, the City of Lewisville, has initiated the development of an IH 35E Corridor Development Plan to minimize impacts and assist with relocation efforts associated with the potential commercial displacements.

The **Employment Opportunities Impact Assessment** technical report provided in **Appendix I** assessed whether any adverse effects would be caused by the implementation of the proposed IH 35E improvements given the current economic climate and the potential effects to existing employment opportunities if the businesses anticipated to be displaced by the proposed IH 35E reconstruction cannot successfully re-establish. The findings of the Employment Opportunities Impact Assessment technical report (**Appendix I**) are provided below.

Employment Opportunities Impact Assessment Study Area

The study area for the Employment Opportunities Impact Assessment consists of municipalities which are adjacent to the proposed IH 35E improvements from PGBT to FM 2181. These municipalities include the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County. Municipal boundaries were chosen to delineate the EOIA study area because the availability of economic and employment data at the municipal level is the smallest scale available for analysis. It is reasonable to assume that municipalities, which depend on sales revenue to fund municipal budgets, have a vested interest in retaining the potential tax base which may be affected by the proposed IH 35E improvements. Therefore, adjacent municipalities and their associated chambers of commerce were identified as stakeholders and were interviewed in order to gain current qualitative information or quantitative data related to the potential employment impacts posed by the proposed IH 35E project.

Anticipated Commercial Displacements and Potentially Impacted Employees

Estimating the number of potentially impacted employees is a difficult task because no local agencies or organizations such as municipalities, chambers of commerce, or workforce commissions consistently track employment numbers per employer. Employment statistics likely fluctuate in varying degrees per business due to various economic elements such as turnover rates, regional growth and unemployment trends, etc. Because of the unavailability of locally produced employment information, NCTCOG provided employee data via InfoUSA to assist with the estimation of potentially impacted employees at displaced businesses. **Table IV-13** lists the potential number of impacted employees for each business. The municipality, business type, and **Appendix C: Corridor Map** identification numbers for each business are also listed. Wage information cannot be provided as data at this level of detail is not available for public use.

Table IV-13: Commercial Displacements/Potentially Impacted Employees

Municipality	Corridor Map ID Number	Business Name	Business Type	Potential Number of Impacted Employees
Carrollton	D1	La Hacienda Ranch	Restaurant	50
Carrollton	D2	Casual Living	Retail	4
Lewisville	D5	Starr Turfgrass	Services	7
Lewisville		Peregrine Development	Services	2
Lewisville	D6	Abuelo's	Restaurant	100
Lewisville	D8	Mimi's Café	Restaurant	50
Lewisville	D9	Saltgrass Steakhouse	Restaurant	50
Lewisville	D10	Auto Clinic	Automotive	3
Lewisville	D11	Pier 1 Imports	Retail	10
Lewisville	D12	Olive Garden	Restaurant	50
Lewisville	D13	Busy Body	Retail	10
Lewisville		Grif's Cycle Sports	Retail	4

Municipality	Corridor Map ID Number	Business Name	Business Type	Potential Number of Impacted Employees
Lewisville		State Farm Insurance	Services	5
Lewisville	D14	Chuck E Cheese's	Restaurant	20
Lewisville	D16	Car Toys	Retail	10
Lewisville		The Soccer Corner	Retail	5
Lewisville		Mattress Firm	Retail	4
Lewisville		Blinds & Shutter Expo	Retail	4
Lewisville		Coker Floor Co.	Retail	5
Lewisville	D18	Fred Loya Insurance	Services	5
Lewisville		A Better Tattoo	Services	4
Lewisville	D33	Family Practice Clinic	Services	5
Lewisville		General Dentistry	Services	10
Lewisville	D34	Braum's	Restaurant	10
Lewisville	D35	QWB Shell	Service Station	5
Lewisville	D36	Select Autos	Retail	4
Lewisville	D36	Sunshare RV	Rental Services	4
Lewisville		Cash Loans on Car Titles	Services	4
Lewisville	D41	Adams Exterminating Co.	Services	10
Lewisville	D46	Amason Chiropractic Center	Services	5
Lewisville	D47	Lewisville Psychic Palm Reader	Services	4
Lewisville	D48	Michael's Music	Retail	4
Lewisville	D51	A1 Home Care	Services	4
Lewisville		Varsha Shah MD	Services	5
Lewisville		Lewisville Medical Center	Services	3
Lewisville		Dilip C. Shaw	Services	3
Lewisville	D54	Lewisville Visitor Information	Services	3
Lewisville	D55	Fast Sticker Inspection & Auto	Automotive	4
Lewisville	D56	Taco Bueno	Restaurant	10
Lewisville	D57	Carlson Wagonlit Travel	Services	5
Lewisville		Law Office	Services	4
Lewisville	D58	Days Inn	Hotel	4
Lewisville		Andromeda's Income Tax & Notary	Services	4
Lewisville	D63	Bluebonnet Bicycles	Retail	5
Hickory Creek		Stitch Chicks	Retail	4
Hickory Creek	D67	Hair Expressions Salon	Services	3
Lake Dallas	D70	Circle K	Service Station	5
Corinth	D73	Discount Tire	Automotive	20
Corinth	D74	Exxon	Service Station	5
Corinth		Wendy's	Restaurant	10
Hickory Creek	D75	Tetco Chevron	Service Station	5
Hickory Creek		McDonald's	Restaurant	50
Hickory Creek	D76	IHOP	Restaurant	50
Hickory Creek	D77	Waage & Waage Law Associates	Services	4
Hickory Creek	D78	Chili's	Restaurant	55
Hickory Creek	D79	Texas Land & Cattle Steak House	Restaurant	55
Hickory Creek	D81	Doc's Hickory Creek BBQ	Restaurant	5
Lewisville	D86	Sewell Marine	Retail	4
Lewisville	D87	American Spas & Pools/Jet Ski Boat	Retail	5
Lewisville	D88	Sunny's Food Mart & Fuel 4 Texas	Service Station	4
Lewisville	D118	Pottery Shop	Retail	1
Lewisville	D98	McGoy's Toys	Retail	4
Lewisville	D99	North Texas Yamaha	Retail	10
Lewisville	D102	Lewisville Self Storage	Rental Services	4
Lewisville	D103	Harcourt	Services	100

Municipality	Corridor Map ID Number	Business Name	Business Type	Potential Number of Impacted Employees
Lewisville	D104	Home Depot	Retail	50
Lewisville	D105	Public Storage	Rental Services	4
Lewisville	D106	Uhaul Storage	Rental Services	10
Lewisville	D108	Shell	Service Station	6
Lewisville	D109	Weight Control de Peso	Services	8
Lewisville		Buckets & Bows	Services	20
Lewisville		Mind & Body	Services	4
Lewisville		Rodney D. Young Insurance	Services	4
Lewisville		Mobility Health Inc.	Retail	5
Lewisville	D110	Colonial Savings	Services	5
Lewisville	D131	Dorothy's Grass	Retail	4
Lewisville	D132	Scotland Yards	Retail	5
Lewisville	D136	Republic Gold & Diamond	Retail	4
Lewisville	D138	Waffle House	Restaurant	20
Lewisville	D139	Fina	Service Station	4
Lewisville	D140	Crossroads Inn	Hotel	5
Lewisville	D141	All State Transmissions and Auto	Automotive	4
Lewisville	D142	CSC Self Storage	Rental Services	3
Lewisville	D143	Super 8 Motel	Hotel	4
Lewisville	D144	Smith Farm & Garden	Retail	4
Lewisville	D145	Northern Tool Equipment	Retail	10
Lewisville	D146	Best Value Inn & Suites	Hotel	10
Lewisville	D147	Public Storage	Rental Services	4
Lewisville	D148	Saturn of Lewisville	Retail	20
Lewisville	D149	Enterprise Cars	Rental Services	10
Lewisville	D151	La Quinta Inn	Hotel	20
Carrollton	D152	Our Children Pediatrics	Services	5
Carrollton		Adult/Pediatric Urgent Care	Services	5
			Total	**1,181**

Source: InfoUSA, accessed June 2010 and provided by NCTCOG.

As shown in **Table IV-13**, a total of 1,181 employees would be potentially impacted by the displacement of the 93 anticipated commercial establishments. Information pertaining to wage data was not available for any municipality; therefore, wage data was not included in **Table IV-13**. Of the 1,181 anticipated employee impacts, approximately 72 percent (846 impacted employees) are associated with the 76 potentially displaced commercial entities located within the City of Lewisville. One of the objectives of the City of Lewisville's IH 35E Corridor Development Plan is to minimize the economic impact associated with the anticipated commercial displacements by promoting redevelopment along both sides of IH 35E to maintain or enhance the commercial nature of the corridor. In the long term, a majority of the commercial employment impacts may be offset by the redevelopment along IH 35E post-reconstruction in the City of Lewisville once the IH 35E Corridor Development Plan is adopted and implemented by the city.

Potential Sites for Commercial Displacements

With respect to replacement real estate for commercial/office/retail purposes, there appears to be space available for lease or sale, as well as accommodating zoning, throughout the Cities of Corinth, Lake Dallas, Lewisville, and Carrollton. The Town of Hickory Creek has witnessed recent commercial growth which has shortened the supply of existing commercial real estate according to town officials and reflected by real estate listings. According to

http://showcase.costar.com real estate listings website (June 2010), a range of commercial property was available as shown in **Table IV-14**. Note that a sale option was available for many of these properties. These listings were generally available to the public; additional listings (including sale listings) are available to private listing service subscribers.

Table IV-14: Commercial Real Estate Available in the Project Area

Municipality	Total Number of Commercial Displacements	Number of commercial/ office /retail properties available	Square footage available for lease at $4 - $8/sq. ft.	Square footage available for lease at $8 - $12/sq. ft.	Square footage available for lease at $12 - $20/sq. ft.	Square footage available for lease at $20 - $24/sq. ft.	Square footage available for lease at negotiable price
City of Corinth	3	29	150,000 sq. ft.	13,000+ sq. ft.	54,000+ sq. ft.	N/A	590,000+ sq. ft.
City of Lake Dallas	1	10	8,000+ sq. ft.	6,000+ sq. ft.	12,000+ sq. ft.	N/A	38,000+ sq. ft.
Town of Hickory Creek	9	0	N/A	N/A	N/A	N/A	Several undeveloped lots available.
City of Lewisville	76	253	209,000+ sq. ft.	383,000+ sq. ft.	879,000+ sq. ft.	$144,000+ sq. ft.	1 million+ sq. ft.
City of Carrollton	4	397	1 million+ sq. ft.	571,000+ sq. ft.	642,000+ sq. ft.	252,000+ sq. ft.	1 million+ sq. ft.

Source: http://showcase.costar.com, accessed June 2010.

As shown in **Table IV-11**, the types and number of business establishments anticipated to be displaced include: automotive services (4), hotel/motels (5), rental services (7), restaurants (15), retail (26), service establishments (30), and service stations (6). **Appendix C: Corridor Maps** illustrates the locations of the displacements along IH 35E and **Appendix D: IH 35E Displacement Data** includes a summary of displacements listed by municipality and type. Commercial entities that may require special requirements (i.e. large parcels to accommodate large commercial structures or parking areas, or specific medical/dental equipment) or unique zoning include:

- Hotel/motels (D58, D140, D143, D146, D151);
- Gas stations (D35, D70, D74, D75, D88, D108, D139);
- Large retail developments (D103, D104, D145);
- Medical/dental establishments (D33, D51, D152);
- Automotive/boat sales and services (D10, D36, D86, D99, D148, D149);
- Public storage facilities (D102, D105, D106, D142, D147); and
- Landscaping services (D5, D131, D144).

Thirty-five of the potentially displaced businesses are identified as having possible unique relocation circumstances related to site development design, access, visibility needs, or local zoning standards. Thirty-one of these businesses are located within the City of Lewisville, and are zoned Local Commercial, General Business, or Light Industrial. The City of Lewisville's Local Commercial zoning district is the most restrictive of the three zoning district and permits gas stations, minor automotive services, medical/dental establishments, and some large retail developments but does not permit hotel/motels, major automotive/boat sales and service establishments, public storage facilities, or landscaping services. The City's General Business

zoning district permits those uses permitted in the Local Commercial zoning district as well as hotel/motels, most automotive/boat sales and service establishments, and some landscaping services. The City's Light Industrial zoning district permits those uses permitted in the General Business zoning district as well as public storage facilities, all types of automotive/boat sales and service establishments, and landscaping services.

The remaining four potentially displaced businesses consist of a medical office establishment located in the City of Carrollton which provides urgent care pediatric services, and three gas stations, one each on the Cities of Corinth, Lake Dallas, and the Town of Hickory Creek. According to the zoning regulations in the City of Lake Dallas and the Town of Hickory Creek, gas stations are permitted in any non-residential zoning district that permits commercial activities as a land use. In the City of Corinth, gas stations are permitted in the city's LI-1 and LI-2 industrial districts and the C-3 commercial district. Gas stations are also permitted in the City of Corinth's C-1 and C-2 commercial districts with a specific use permit, which requires special review and approval by the city's governing body. Medical offices in the City of Carrollton are permitted in any of the city's non-residential zoning districts that permit commercial activities, providing numerous options for relocation sites.

In addition to the commercial real estate availability reflected in **Table IV-14** within the City of Lewisville, a sufficient amount of undeveloped land is located within the Local Commercial, General Business, or Light Industrial zoning districts. According to the City of Lewisville's *Land Use Assumptions (2006),* out of approximately 6,751.6 total acres of land located within the Local Commercial, General Business, or Light Industrial zoning districts, approximately 2,627.0 acres (38.9%) are undeveloped. These undeveloped areas would provide opportunity for potentially displaced businesses to relocate in similar zoning districts. Additionally, for potentially displaced businesses currently located on large parcels, which may be more difficult to secure in a business' market area, a sufficient number of undeveloped parcels with a large range of sizes exists in the City of Lewisville. According to the City of Lewisville's *Land Use Assumptions,* a total of 336 of the City's undeveloped parcels are less than three acres, which would accommodate uses generally demanding smaller parcel sizes such as gas stations, medical/dental establishments, and some automotive/boat sales and service establishments. A total of 203 of the City's undeveloped, non-residential parcels are between 3 and 10 acres, which would generally accommodate hotels/motels, some landscaping services, and some automotive/boat sales and service establishments. A total of 105 of the City's undeveloped, non-residential parcels are between 10 and 50 acres, which would generally accommodate some large retail developments, public storage facilities, and landscaping services, and a total of 20 of the City's undeveloped, non-residential parcels are larger than 50 acres, which would likely accommodate the full range of business entities with unique development or land use circumstances. Further, according to the City of Lewisville's *Existing Land Use Map* and *Developable Vacant Land Map (2006)* a number of developable parcels in the General Business and Light Industrial zoning districts abut IH 35E, providing an opportunity for many displaced businesses relying on high visibility and convenience of access to highways to reestablish their operations adjacent to IH 35E.

In the City of Lake Dallas and the Town of Hickory Creek, zoning information related to undeveloped parcels identified on aerial maps reveals that an adequate number of sufficiently-sized, undeveloped parcels zoned for non-residential commercial activities exist within each municipality. A number of undeveloped parcels are located within 1,000 ft of the existing IH 35E facility providing comparable access and highway visibility. In the City of Corinth, the vast

majority of land along IH 35E is zoned either C-1, C-2, LI-1, or LI-2, with multiple undeveloped parcels abutting the IH 35E facility providing comparable access and highway visibility.
A sufficient number of appropriately zoned, undeveloped parcels exist within the City of Carrollton, particularly in the northeastern portion of the city. Although medical establishments may have unique needs, urgent care medical offices are generally more adaptive to existing, developed sites compared to large-scale medical facilities. Much of the available commercial real estate would be sufficient for the needs of the potentially displaced medical office establishment located in the City of Carrollton which provides urgent care pediatric services.

Some commercial entities may not be able to relocate within the immediate vicinity of their present location or current service areas due to availability of commercial space, undeveloped parcels, or required zoning. However, the available commercial real estate summarized in **Table IV-14** and undeveloped sites that are currently available in commensurate zoning districts indicate the relocation of potentially displaced businesses within the immediate community should not prove difficult.

Minimization and Mitigation of Commercial Displacements

City of Lewisville's IH 35E Corridor Development Plan
The City of Lewisville proactively seeks to keep business owners engaged and is working to alleviate the effects of the proposed IH 35E project on businesses located along the corridor. Whether interested parties have questions about temporary signage or are looking to relocate their business to another property in Lewisville, the Office of Economic Development can provide assistance with these decisions. The City of Lewisville's Office of Economic Development initially developed an IH 35E "Briefing Kit," which was designed to inform and assist those with commercial interests along the IH 35E corridor. The IH 35E Briefing Kit has been replaced with the preparation of the IH 35E Corridor Development Plan. The campaign had three components: 1) inform business owners about the proposed project and potential impacts to adjacent businesses, 2) provide business owners with communication channels to stay informed, and 3) assist business owners to minimize the potential impacts and to provide relocation assistance, if necessary.

During March 2010, the City of Lewisville initiated the development of the IH 35E Corridor Development Plan, which is intended to focus on not only recapturing the lost tax revenue associated with the proposed IH 35E displacements but to also increase future tax revenue to its highest potential and will be used to assist the existing property owners in the transition from highway reconstruction to redevelopment of their properties to highest and best use. The study area for the IH 35E Corridor Development Plan is an approximate 8-mile corridor along IH 35E in the City of Lewisville, beginning at SH 121 to the south and ending at Lewisville Lake to the north. The goals of the IH 35E Corridor Development Plan are to:

- Create a corridor vision and policy that will guide development decisions along the corridor;
- Identify and prioritize market-based redevelopment opportunities along the corridor;
- Identify opportunities to improve identity along the corridor, including signage, gateways, and landmarks;
- Design community character improvements that enhance aesthetic appearance, address sustainability, and require low maintenance; and
- Achieve public support to enable elected officials to endorse the plan.

Since 2007, the Office of Economic Development has fielded questions posed by interested parties and has investigated the impact to the local economy in terms of tax revenue. The City of Lewisville plans to adopt the IH 35E Corridor Development Plan, which would address the redevelopment and preservation of commercial land use along the IH 35E corridor post-reconstruction. In 2009, the City approved funding for the first 6 phases of the 10 phase IH 35E Corridor Development Plan to address impacts of the IH 35E roadway reconstruction and take the opportunity for redevelopment into an overlay district with incentives for business retention. The initiation of the IH 35E Corridor Development Plan's development in March 2010 allowed the city to officially retire the previous IH 35E "Briefing Kit" program. Approximately 100 acres would be impacted by the anticipated 76 commercial displacements along the IH 35E corridor throughout the City of Lewisville.

The City of Lewisville's previous IH 35E Briefing Kit efforts and current development of the IH 35E Corridor Development Plan are examples of a proactive local government response to minimize potentially negative impacts associated with the anticipated commercial and residential displacements along IH 35E throughout the city's jurisdiction. The City of Lewisville is dedicated to the redevelopment of complimentary land uses along the entire length of the IH 35E corridor to maintain or improve the existing trends in residential and commercial land uses.

Texas Workforce Commission and Workforce Solutions for North Central Texas

The Texas Workforce Commission is the state government agency charged with overseeing and providing workforce development services to employers and job seekers for the state of Texas. For employers, the Texas Workforce Commission offers recruiting, retention, training and retraining, and outplacement services as well as valuable information on labor law and labor market statistics. For job seekers, the Texas Workforce Commission offers career development information, job search resources, training programs, and, as appropriate, unemployment benefits.

The Texas Workforce Commission is a part of a local/state network dedicated to developing the workforce of Texas. The network is comprised of the statewide efforts of the Commission coupled with planning and service provision on a regional level by 28 local workforce boards. This network gives customers access to local workforce solutions and statewide services in a single location – Texas Workforce Centers.

The Texas Workforce Center which serves the area potentially impacted by the proposed IH 35E improvements is the Workforce Solutions for North Central Texas. The service area for the Workforce Solutions for North Central Texas includes 14 counties: Collin, Denton, Ellis, Erath, Hood, Hunt, Johnson, Kaufman, Navarro, Palo Pinto, Parker, Rockwall, Somervell, and Wise Counties. Since 1996, Workforce Solutions for North Central Texas has partnered with the NCTCOG, who serves as its administrative entity responsible for program implementation.

The ultimate goal for the Workforce Solutions for North Central Texas is to match the most qualified candidates with the right employers. Services provided to employers include:

- Personal attention from one of the account managers;
- Recruiting assistance/placement;
- Work In Texas – internet-based job posting and matching system;
- Job fairs – on location or in one of the workforce centers;
- Fee-based customized training to meet employers needs;

- Current labor market information; and
- Outplacement services for companies who are restructuring, downsizing, or closing operations.

Services provided by the Workforce Solutions for North Central Texas to all job seekers include:

- Determination of eligibility to receive potential services;
- Initial registration and orientation to available information and services;
- Initial assessment of skill level, aptitude, abilities and supportive service needs;
- Job search and placement assistance and career counseling (as appropriate);
- Job search workshops and seminars;
- Resource room services – access to telephone, fax, copier, resource library, computer, internet, and resume assistance;
- Employment and Labor Market information;
- Job listings via Work In Texas and other on-line employment resources;
- Job referrals;
- Demand occupations – required skills and earning in those occupations;
- Eligible Training Provider and training program information;
- Performance statistics of our local area;
- Supportive Service information (e.g. child care, transportation);
- "How to" information and filing unemployment claims;
- Assistance in establishing eligibility for non-WIA-funded training and education programs; and
- Follow-up services (as appropriate).

As stated in **Appendix I: Employment Opportunities Impact Assessment**, a Workforce Development Manager was interviewed during June 2010 to discuss the potential for TxDOT to coordinate with the Workforce Solutions for North Central Texas to mitigate the potential employment impacts associated with the proposed IH 35E improvements. The Workforce Development Manager described the potential for "rapid response workshops" to be conducted on behalf of the employers. Workforce Solutions for North Central Texas can coordinate with employers identified for relocation by TxDOT via the ROW acquisition phase of project development to engage and provide 1-2 hour "rapid response workshops" if requested by the employers, regardless of the number of employees anticipated to be impacted. The rapid response workshops could be planned and conducted by the Workforce Solutions of North Central Texas to provide information to groups ranging from 5 to 500 employees regarding the programs provided by the Workforce Centers and how to apply for unemployment benefits, if necessary. Multiple rapid response workshops could be conducted by the Workforce Solutions for North Central Texas to distribute information to all employees potentially impacted by the proposed IH 35E project.

The Workforce Development Manager and appropriate staff will attend the Open House/Public Hearing for the proposed IH 35E project to answer questions or present services information on behalf of the Workforce Solutions for North Central Texas. Contact information for the Workforce Solutions for North Central Texas can also be distributed to each property owner during the ROW acquisition process. **Appendix I** contains additional information regarding the Workforce Solutions for North Central Texas.

Summary of Displacements Impacts

Approximately 65 single family homes would be displaced by the proposed project. According to **Table IV-12**, a total of 233 homes within comparable price ranges are currently available in the municipalities associated with the potential single family displacements. Based on current available market data, comparable housing appears to be available for a majority of the potential residential displacements. As mandated by the URARPAA, as amended in 1987, residential replacement structures must be located in the same type of neighborhood and be equally accessible to public services and places of employment. TxDOT would complete a survey of the housing market and provide housing supplements to displaced residents, if necessary. Additionally, TxDOT would relocate residents up to 50 miles. Assistance would be provided should the local existing housing market be insufficient for relocation. Some displaced residents may be required to relocate to a different municipality depending on availability of comparable housing at the time of acquisition.

As mentioned previously, 6 of the 65 residential displacements are associated with the Highland Lakes Park Section 4(f) mitigation. At the request of the property owners, the City of Lewisville requested that the residential properties be acquired for park mitigation use and submitted a letter to TxDOT requesting specific mitigation elements. Formal correspondence documenting the mitigation and enhancements developed in conjunction with the City of Lewisville Parks Department, City Engineer, and City Manager can be found in **Appendix G**.

Relocation of the anticipated 93 commercial entities could result in unemployment and associated financial impacts. If the businesses are able to relocate within the immediate municipality or community and remain viable, any potential unemployment effects would be temporary. A higher degree, or adverse, impact would occur if the businesses cannot relocate or must do so outside the municipalities in which the proposed IH 35E project would be constructed. While uncertainty exists in predicting the outcome of reestablishment within close proximity to the businesses' original locations, and it is unknown which of the business owners would choose or be able to continue operation, sites with suitable zoning and in close proximity are currently available in the Employment Opportunities Impact Assessment study area. Loss of key employees may occur if the businesses are displaced and employees are not willing to travel in order to remain employed at the relocation site. This could affect the business' ability to re-establish itself at the new location. However, the severity of this type of employment impact varies with the type of business, the distance to and attractiveness of the relocation site, as well as the employees' interest in continued employment with the business.

There appear to be future employment opportunities of varying skill requirement intensities identified within the Employment Opportunities Impact Assessment study area detailed in **Appendix I** based on information provided by the NCTCOG's Development Monitoring database, DART and DCTA regional rail expansions, as well as interviews with stakeholders including local chambers of commerce and economic development representatives within the EOIA study area. The addition of new businesses discussed in **Appendix I** would create additional employment opportunities throughout the Employment Opportunities Impact Assessment study area and may represent an opportunity to absorb any permanent employment effects that could result from the proposed IH 35E improvements within the affected municipalities. The expansions of the DART and DCTA transit lines also enhance future employment opportunities by providing new centers for employment at the newly developed rail stations and access to locations such as City of Denton and the Dallas Central Business District and additional regional employment centers in between.

The City of Lewisville's IH 35E Corridor Development Plan is being developed to retain the potentially displaced businesses, recapture the lost tax revenue associated with the potential displacements associated with the proposed reconstruction of IH 35E, and increase future tax revenue to its highest potential along the IH 35E corridor. Additionally, the Workforce Solutions for North Central Texas would be proactive in assisting any employees that would be affected as a result of the displacements associated with the proposed reconstruction of IH 35E. Workforce Solutions staff has agreed to attend the proposed project's Open House/Public Hearing and provide handouts and other information regarding Workforce Solutions services.

When potential effects to potentially displaced residences and commercial entities are analyzed in the context in which they are to occur, it does not appear these effects rise to the level at which significant impacts would be anticipated.

C.2 Environmental Justice

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no adverse impacts to environmental justice populations are anticipated.

Alternative B: Build Impact

Definition of Environmental Justice Populations
Environmental justice is defined by the EPA's Office of Environmental Justice as the fair treatment of all people in terms of the distribution of benefits and costs resulting from transportation projects, programs, and policies. Fair treatment means that a disproportionate share of adverse effects will not fall upon the low-income or minority populations and also promotes no denial of benefits.

In response to EO 12898, signed by President Clinton on February 11, 1994, the U.S. DOT developed an environmental justice strategy that operates within the framework of NEPA and Title VI of the Civil Rights Act of 1964 which was clarified in the Civil Rights Restoration Act of 1987. EO 12898 mandates that Federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of their programs on minority and low-income populations. FHWA Order 6640.23 defines a minority as a person who is:

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

EO 12898 further defines a minority population as any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity.

Low-income is defined as a household income at or below the Department of Health and Human Services (DHHS) poverty guidelines.[14] The poverty guidelines are provided by the DHHS. In 2010, the DHHS poverty guideline for a four-person family is $22,050.

Adverse effects are defined in the FHWA Order as the totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and soil contamination; destruction or disruption of man-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion; isolation, exclusion, or separation of minority or low-income individuals within a given community from the broader community; and the denial of, reduction in, or significant delay in the receipt of, benefits of FHWA programs, policies, or activities.

Under EO 12898, disproportionately high and adverse effects are defined as effects that "will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population."

The potential effects of the proposed IH 35E project have been evaluated in accordance with the requirements of EO 12898. Population data at the census block and census block group levels from *Census 2000* has been used in this socioeconomic analysis. Census block data provides information at the lowest scale available for race and ethnicity analysis; census block group data provides information at the lowest scale available for household income and poverty population analyses. See **Figure 7: 2000 Census Blocks** in **Appendix A**.

Definition of Low-Income and Minority Population Study Areas

The study areas for the minority and low-income population analyses differ due to the availability of census data. The area traversed by the proposed IH 35E improvements between PGBT and FM 2181 lies within 26 census block groups. The 26 census block groups comprise the direct impacts study area for household income and poverty populations, and will be referred to as the "low-income population study area." A total of 283 census blocks fall within a 1/4 mile area adjacent to the proposed project limits between PGBT to FM 2181. These census blocks comprise the "minority population study area."

Income Characteristics

Due to the lack of income data at the census block level, the census block groups containing the project area census blocks were used for this part of the analysis. These 26 census block groups comprise the low-income population study area for the household income and poverty analysis.

Median household income and poverty status for the low-income population study area is shown in **Table IV-15**. Median household income of census block groups comprising the project area ranged from $33,409 to $150,249 according to *Census 2000*. See **Figure 8: Census Block Groups and Displacements** in **Appendix A** for a location of the census block groups.

[14] *Ibid.*

Table IV-15: Median Household Income and Poverty Status

Census Tract	Census Block Group	Population*	Median Household Income	Persons Below Poverty Level	
				Number	Percent
CT 137.19	1	1,984	$37,656	322	16.2
CT 140.02	1	863	$45,446	64	7.4
CT 141.23	1	2,209	$150,249	28	1.3
CT 214.01	5	4,702	$73,864	111	2.4
CT 214.02	5	3,095	$69,469	54	1.7
CT 214.03	2	2,143	$38,323	244	11.4
CT 214.03	3	1,145	$75,552	30	2.6
CT 214.03	4	1,601	$69,250	72	4.5
CT 215.02	1	835	$61,012	22	2.6
CT 215.02	2	1,884	$37,826	225	11.9
CT 215.04	1	6,468	$120,459	36	0.6
CT 215.04	4	1,586	$87,948	1	0.1
CT 215.05	1	2,798	$74,830	11	0.4
CT 215.05	3	1,261	$81,036	31	2.5
CT 216.01	1	3,883	$45,840	577	14.9
CT 216.01	3	936	$57,857	35	3.7
CT 216.01	5	986	$34,034	236	23.9
CT 216.01	7	1,358	$44,963	146	10.8
CT 216.03	2	2,904	$82,886	67	2.3
CT 216.03	3	4,411	$94,615	15	0.3
CT 217.03	1	7,458	$78,346	179	2.4
CT 217.10	1	9,002	$49,637	437	4.9
CT 217.11	1	2,918	$33,409	321	11.0
CT 217.11	2	2,552	$41,862	180	7.1
CT 217.13	1	2,358	$45,313	163	6.9
CT 217.13	2	1,551	$48,026	76	4.9
Low-Income Population Study Area Total		**72,891**	**N/A**	**3,683**	**5.1**

*Population for whom poverty status has been determined. Source: U. S. Census Bureau. *Census 2000.*

All census block groups in the low-income population study area exhibit median household incomes greater than the poverty threshold. The percentage of the total study area population with incomes below the poverty level is 5.1 percent. The percentage of persons living below the poverty level ranges from 0.1 to 23.9 percent (CT 215.04, BG 4 and CT 216.01, BG 5, respectively) for the individual census block groups. As shown in **Table IV-15** there is considerable variation in the rate of poverty among the census block groups that comprise the low-income population study area. Windshield surveys did not result in the identification of low-income communities or neighborhoods. Refer to **Table IV-17** for Census 2000 data and anticipated displacements counts associated with the proposed reconstruction of IH 35E.

Minority Characteristics

For purposes of the analysis, an environmental justice population is present when the total minority population percentage within the proposed project limits or individual census blocks is equal to or greater than 51 percent. Data from *Census 2000* for the 283 census blocks has been used in this analysis. **Appendix D: Percent Minority Population Data** contains the percent minority population for each census block in the minority population study area.

The 283 census blocks comprising the minority direct impacts study area have a total population of 21,361. Overall, minorities account for 28.7 percent of the minority population study area.

The 283 census blocks exhibit minority percentages that range from 0.0 to 100.0 percent. Of the 283 census blocks that comprise the minority population study area, 14 exhibit a minority population equal to or greater than 51 percent. Of these 14 census blocks, 4 census blocks would contain 23 of the 180 total anticipated displacements (**Appendix D: Percent Minority Population Data** for minority population data associated with CT 215.02, BG 2 Census Block (CB) 2032; CT 216.01, BG 5, CB 5003; CT 217.03, BG 1, CB 1066; and CT 217.11, BG 1, CB 1000).

Displacements and Environmental Justice

Table IV-16 summarizes the displacement impacts by municipality along the IH 35E corridor from PGBT to FM 2181. Approximately 233 acres of additional ROW and easements would be required for the preferred alternative resulting in the displacement of 65 single family housing units, 93 business establishments, 19 vacant buildings/suites, and 3 municipal facilities (Hickory Creek Animal Services, Hickory Creek Public Works, and City of Lewisville Water Tower) for a total of 180 displacements. Copperas Branch Park (operated by the City of Highland Village) and Highland Lakes Park (operated by the City of Lewisville) would also be impacted and are further discussed in **Sections IV.B.1** and **IV.C.6**, Impacts to Section 4(f) and 6(f) Properties.

Table IV-16: Summary of Potential Displacements

Type of Displacement	Municipality					Number of Displacements
	Carrollton	Corinth	Hickory Creek	Lake Dallas	Lewisville	
Residential	**2**	**2**	**4**	**1**	**56**	**65**
Single Family Housing Units	2	2	4	1	56	65
Business Establishments	**4**	**3**	**9**	**1**	**76**	**93**
Automotive Services	--	1	--	--	3	4
Hotel/Motel	--	--	--	--	5	5
Rental Services	--	--	--	--	7	7
Restaurants	1	1	5	--	8	15
Retail	1	--	1	--	24	26
Service Establishments	2	--	2	--	26	30
Service Stations	--	1	1	1	3	6
Vacant Buildings	**1**	**--**	**3**	**1**	**14**	**19**
Government/Municipal Facilities	**--**	**--**	**2**	**--**	**1**	**3**
Total	**7**	**5**	**18**	**3**	**147**	**180**

Source: Proposed Design Schematic (January 2009); Field observations (January 2009)

Appendix A: Figure 8 depicts the census block groups adjacent to the proposed project and potential displacements. In order to identify the potential for disproportionately high and adverse effects of the anticipated displacements, environmental justice population (specifically minority and low-income), handicapped, elderly, owner/tenant, and occupied/renter housing cost data was analyzed at the *Census 2000* census block group level. The analysis sought to identify specific census geographies with high proportions of environmental justice populations (specifically low-income and/or minority populations) which are anticipated to contain displacements. The threshold for an environmental justice (EJ) census block group was defined as a census block group with an environmental justice population (specifically minority and low-income populations) equal to or greater than 51 percent of the total census geography population. A total of 15 census block groups contain the anticipated 180 displacements. **Table IV-17**

provides various *Census 2000* data and anticipated displacements counts associated with the proposed IH 35E improvements.

Table IV-17: Demographic Characteristics of the IH 35E Displacements by Census Block Group

Census Geography	Community	Total Population	Percent Minority Population	Percent Low-Income Population	Median Household Income	Percent Total Disabilities for Population 5 Years and Older[1]	Percent Elderly[2]	Housing Units: Percent Owner-Occupied	Housing Units: Percent Renter-Occupied	Median Value of Owner-Occupied Housing Units	Median Gross Rent of Renter-Occupied Housing Units	Total Environmental Justice Population Percent[3]	Total Number of Displacements
CT 140.02, BG 1	Carrollton	863	8.0%	7.4%	$45,446	41.9%	24.4%	83.4%	16.6%	$16,600	$796	15.4%	3
CT 214.01, BG 5	Corinth	4,704	11.4%	2.4%	$73,864	13.7%	3.9%	90.2%	9.8%	$136,000	$634	13.8%	2
CT 214.02, BG 5	Corinth	3,095	15.9%	1.7%	$69,469	15.3%	3.5%	93.9%	6.09%	$112,800	$1,095	17.6%	3
CT 214.03, BG 2	Lake Dallas	2,158	10.9%	11.4%	$38,323	32.5%	5.8%	53.9%	46.1%	$78,500	$636	22.3%	3
CT 214.03, BG 3	Hickory Creek	1,145	7.0%	2.6%	$75,552	20.3%	10.2%	87.0%	13.0%	$211,000	$890	9.6%	13
CT 214.03, BG 4	Hickory Creek	1,607	11.1%	4.5%	$69,250	20.5%	5.0%	90.8%	9.1%	$113,500	$678	15.6%	5
CT 215.05, BG 1	Lewisville	2,812	17.8%	0.4%	$74,830	10.9%	3.5%	89.5%	10.4%	$118,800	$1,162	18.2%	16
CT 216.01, BG 1	Lewisville	3,892	38.5%	14.9%	$45,840	19.0%	4.8%	20.1%	79.9%	$80,100	$914	**53.4%**	44
CT 216.01, BG 3	Lewisville	936	26.1%	3.7%	$57,857	27.4%	8.4%	81.0%	19.0%	$105,300	$628	29.8%	11
CT 216.01, BG 5	Lewisville	986	50.9%	23.9%	$34,034	47.7%	7.9%	29.7%	70.2%	$67,200	$569	**74.8%**	20
CT 216.01, BG 7	Lewisville	1,358	26.4%	10.8%	$44,963	50.3%	7.9%	96.3%	3.7%	$30,700	$950	37.2%	1
CT 216.03, BG 2	Carrollton	2,904	27.4%	2.3%	$82,886	13.4%	5.4%	94.6%	5.4%	$144,200	$1,321	29.7%	4
CT 217.03, BG 1	Lewisville	7,472	24.3%	2.4%	$78,346	14.1%	3.9%	81.6%	17.4%	$140,100	$822	26.7%	6
CT 217.11, BG 1	Lewisville	2,933	38.8%	11.0%	$33,409	21.1%	1.4%	0.0%	100.0%	$0	$682	49.8%	14
CT 217.13, BG 1	Lewisville	2,358	34.5%	6.9%	$45,313	26.4%	7.1%	59.3%	40.7%	$77,500	$841	41.4%	35
												Total	**180**

Source: U.S. Census Bureau, *Census 2000*; SF3 – P1 (Total Population), P7 (Minority Population), P8 (Elderly Population), P41 (Population with Disabilities), P52 (Median Household Income), P87 (Low-Income Population), H7 (Owner or Renter-Occupied Units), H63 (Median Gross Rent), H85 (Median Value of Owner-Occupied Housing Units) and Proposed Design Schematic (January 2009).

[1] Disability is defined as a long-lasting physical, mental, or emotional condition. This condition can make it difficult for a person to do activities such as walking, climbing stairs, dressing, learning, or remembering. This condition may also impede a person from being able to go outside the home alone or to work at a job or business.

[2] Elderly is defined as age 65 and older.

[3] Environmental justice is defined as minority and low-income populations.

Of the 15 total census block groups anticipated to be impacted by displacements, 2 census block groups (CT 216.01, BG 1 and CT 216.01, BG 5) meet the EJ threshold (equal to or greater than 51 percent). A comparison of 2000 census data at the census block group level revealed the following trends (**Appendix A: Figure 8** for the location of the census block groups):

- CT 216.01, BG 5 contains the highest percentage of environmental justice population (74.8%) and 20 of the anticipated 180 displacements;
- CT 216.01, BG 5 also contains the highest percentage of Limited English Proficiency (LEP) population (42.8%) – see **Section IV.C.3** for additional LEP information;
- CT 216.01, BG 7 contains the highest percentage of disabled population (50.3%) and 1 of the anticipated 180 displacements;
- CT 140.02, BG 1 contains the highest percentage of elderly population (24.4%) and 3 of the anticipated 180 displacements;
- CT 217.11, BG 1 contains only renter-occupied housing units (100.0%) and 14 of the anticipated 180 displacements;
- The median value of owner-occupied housing units ranges from $16,600 (CT 140.02, BG1) to $144,200 (CT 216.03, BG 2);
- The median gross rent of renter-occupied housing units ranges from $569 (CT 216.01, BG 5) to $1,321 (CT 216.03, BG2)

Within the 15 census block groups anticipated to be impacted by displacements, 11 census blocks have been identified as containing equal to or greater than 51 percent environmental justice populations. Three of the 11 EJ census blocks contain anticipated displacements. **Table IV-18** lists the EJ census blocks which are located within the census block groups anticipated to be impacted with displacements and identifies the three EJ census blocks anticipated to contain displacements. The limited availability of census data precludes additional information, such as low-income, disabled, and housing occupancy/value data to be compared at the census block level. As previously mentioned, only minority population data is available at the census block level.

Table IV-18: Displacements and Environmental Justice Census Blocks

Census Block Group	Census Block	Percent Minority Population	Total Number of Displacements	
			Commercial	Residential
CT 214.03, BG 2	2013	56.1%	0	0
CT 214.03, BG 4	4021	100.0%	0	0
CT 214.03, BG 4	4026	100.0%	0	0
CT 216.01, BG 1	1034	57.7%	0	0
CT 216.01, BG 1	1036	56.6%	0	0
CT 216.01, BG 5	5003	83.5%	4	14
CT 216.01, BG 7	7014	57.1%	0	0
CT 217.03, BG 1	1066	54.9%	1	0
CT 217.11, BG 1	1000	100.0%	3	0
CT 217.11, BG 1	1003	100.0%	0	0
CT 217.11, BG 1	1001	100.0%	0	0
		Total	**8**	**14**

Source: U.S. Census Bureau, *Census 2000* and Proposed Design Schematic (January 2009).

Of the 11 census blocks located within the census block groups anticipated to contain a majority EJ population, 3 contain displacements. CT 216.01, BG 5, CB 5003 contains a minority

population of approximately 83.5 percent and is anticipated to be impacted with 18 total displacements. Of these 18 displacements, 4 are commercial and 14 are residential. CT 217.03, BG 1, CB 1066 contains a minority population of approximately 54.9 percent and is anticipated to be impacted with 1 commercial displacement. CT 217.11, BG 1, CB 1000 contains a minority population of approximately 100 percent and is anticipated to be impacted with three commercial displacements.

The focus area for potential environmental justice impacts appears to be located within CT 216.01, BG 5, CB 5003 due to the number of anticipated displacements (total anticipated displacement count of 18) compared to the two other census blocks containing displacement counts ranging from 1 to 3. This census block is located east of IH 35E between SH 121 and Fox Avenue (**Appendix C: Sheets 7** and **8**) in the City of Lewisville. Four written comments were received from individuals who reside within CT 216.01, BG 5, CB 5003, specifically along Harbor Dr., a residential street which would be impacted by multiple residential displacements. All four written comments acknowledged the potential for displacement and requested that TxDOT purchase the entire residential parcels through the ROW acquisition process to avoid unusable property and reduction in property values. Three of the four written comment authors would be displaced by the proposed improvements. A *Public Meeting Summary for the IH 35E Improvements* documents the public meeting held on November 13, 2008 and the written comments which resulted from the public meeting (no verbal comments were provided during the public meeting). This separate documentation is available for public review and can be requested from the TxDOT-Dallas District. TxDOT provided responses to the four written comments that originated from this census block; essentially an evaluation would be made by appraisers regarding the value of the ROW to be acquired and the ultimate usage of the remainder of the property would be decided through coordination with the local jurisdiction and the property owner. No changes in ROW within this census block resulted from the four comments provided at the public meeting. No environmental justice concerns regarding this census block were raised during the stakeholder work group meetings.

Additional Public Comments Concerning Anticipated Displacements

As described in **Section I.E**, Project Support, TxDOT has and continues to facilitate communication with adjacent property owners, adjacent municipalities, and other public agencies with interests along the IH 35E corridor (between PGBT and FM 2181) in the form of a public meeting and stakeholder work group meetings. In addition to the public meeting held on November 13, 2008 and stakeholder meetings (**Table I-2**), various meetings and/or presentations have been given to public officials associated with several municipalities along the IH 35E corridor. Concerns involving displacements have not been raised during the stakeholder meetings or various meetings or presentations given to public officials representing the municipalities traversed by the IH 35E corridor between PGBT and FM 2181. No formal residential organizations (i.e. Home Owner Associations) are recognized by or are registered with the municipalities along the IH 35E corridor between PGBT and FM 2181. Municipal officials do not foresee any potential for community cohesion impacts because IH 35E is an existing interstate corridor. Informal community organizations were invited to attend the public meeting on November 13, 2008. The sign-in sheets from the public meeting reveal only two informal community organizations were represented at the meeting; neither of these community organizations submitted comments for inclusion in the *Public Meeting Summary for the IH 35E Improvements*.

In addition to the four written comments associated with the cluster of residential displacements located between Fox Ave. and SH 121, additional comments regarding displacement implications for adjacent communities were documented during the public meeting held on November 13, 2008. Several documented comments involved requests for TxDOT to purchase partially impacted properties and inquired as to when the ROW acquisition process would begin. A few business owners provided written comments to request TxDOT to provide status updates on potential displacements or to urge TxDOT to be sensitive to commercial concerns during the reconstruction process. No comments were provided that objected to residential displacements; a few comments requested TxDOT to avoid the displacements of existing commercial entities along the IH 35E corridor (between PGBT and FM 2181) or to minimize design implications which could result in economic impacts such as the reduction of parking areas.

Origin-Destination Analysis

Overview

Origin-destination (O&D) data secured from the NCTCOG was used for further analysis of "user impacts" of the Build scenario, which includes four proposed tolled HOV/managed lanes, on low-income and minority populations. Studying O&D data can estimate travel patterns of traffic along a transportation facility during a typical day. This form of analysis is useful in assessing "user impacts" as the number of trips associated with specific population characteristics can be studied to provide general travel assumptions of those specific populations. Trips are defined as a one-way movement from where a person starts (origin) to where the person is going (destination).

Assessing "user impacts" in the form of an O&D analysis is an integral component of the environmental justice analysis for the proposed project. As funding mechanisms evolve, the trend towards utilization of facilities in this region would, through time, create "user impacts" as access to highway systems becomes an issue to the economically disadvantaged. The O&D analysis compared the Build and No-Build scenarios' anticipated users and forecasted travel patterns in 2030. The O&D analysis also identified environmental justice populations in order to assess the intensity of use by those protected populations through comparison of the Build (includes four tolled HOV/managed lanes) and No-Build scenarios.

Traffic Serial Zones, Study Area, and Data Sources

The information associated with the O&D analysis is organized by traffic serial zones (TSZs) which are small geographic units of area that are developed as a basis for estimate of travel. TSZs may vary in size, are determined by the roadway network and homogeneity of development, and directly reflect demographic data generated by the U.S. Census Bureau. Delineated by state and/or transportation officials for tabulating traffic-related data, TSZs usually consist of one or more census blocks, block groups, or census tracts.

The study area of the O&D analysis essentially consists of the geographic extent of the MPA boundary before its expansion to a 12-county region in October 2009 which included all of Collin, Dallas, Denton, Rockwall, and Tarrant Counties, and contiguous portions of Ellis, Johnson, Kaufman, and Parker Counties. (In October 2009, the MPA was expanded to include the following 12 counties in their entirety: Collin, Dallas, Denton, Rockwall, Tarrant, Ellis, Johnson, Kaufman, Parker, Hunt, Wise, and Hood Counties.) Given regional operating characteristics of IH 35E, it is reasonable to assume the previous extent of the MPA contains the proposed projects daily users. This study area consists of 5,000 square miles and as previously

mentioned encompasses five entire counties (Collin, Dallas, Denton, Rockwall, and Tarrant Counties) and portions of four additional counties (Ellis, Johnson, Kaufman, and Parker Counties). A total of 4,813 TSZs comprise the O&D study area. Of the total number of TSZs located within the O&D study area, 3,884 TSZs are anticipated to regularly utilize IH 35E (from PGBT to FM 2181) in 2030 (originating at least one trip per day) in the Build scenario. This represents 80.6 percent of the total study area TSZs. In the No-Build scenario, 3,757 TSZs are anticipated to regularly utilize IH 35E in 2030 (originating at least one trip per day). This represents 78.0 percent of the study area TSZs.

TransCAD®, a GIS-based transportation planning software, was utilized by the NCTCOG to generate the traffic data analyzed during the O&D analysis. The NCTCOG conducted a "select-link analysis" based on 2030 AM peak period traffic in order to generate O&D data associated with the proposed project.[15] Traffic data exported directly from TransCAD® select-link matrices was then correlated with U.S. Census Bureau data in order to provide a demographic profile of users anticipated to utilize the proposed IH 35E facility in 2030.

Identification of Environmental Justice TSZs

Analysis of the O&D trip data was concentrated on those TSZs with high proportions of low-income and/or minority populations within the study area that are anticipated to utilize the proposed facility in 2030. The threshold for an environmental justice TSZ ("EJ TSZ") was defined as a TSZ with an environmental justice population (specifically low-income or minority populations) equal to or greater than 51 percent of the total TSZ population. A total of 1,624 EJ TSZs were identified within the NCTCOG study area; this represents 33.7 percent of the study area TSZs. Of the identified EJ TSZs, a total of 1,280 are anticipated to regularly utilize the proposed IH 35E facility (originating at least one trip per day) under the Build scenario. This represents 78.8 percent of the total number of EJ TSZs in the MPA. **Appendix D: IH 35E Origin-Destination Analysis Data** contains demographic profiles and number of trips associated with all TSZs anticipated to utilize IH 35E. The locations of EJ TSZs and non-EJ TSZs anticipated to use IH 35E in the Build scenario are depicted in **Appendix A: Figure 9** and **Appendix A: Figure 10** illustrates the locations of EJ TSZs and non-EJ TSZs anticipated to use IH 35E in the No-Build scenario.

Analysis Assumptions and Limitations

To clarify the intent of the O&D analysis, the analysis does not attempt to identify specific users (low-income or minority populations) but instead identifies the origins and intensity origins of trips based on collective socio-economic characteristics at the TSZ level. In other words, the O&D analysis predicts the potential users of IH 35E in 2030 by correlating the general socio-economic characteristics of the future users based on *Census 2000* data to the intensity of use quantified by the number of trips per TSZ generated by TransCAD®. The Build scenario consists of the proposed reconstruction of IH 35E (from PGBT to FM 2181). The No-Build scenario consists of leaving the transportation system in its existing state. The number of trips for the Build and No-Build scenarios were determined and compared using the No-Build scenario data as a baseline. NCTCOG conducted a "select-link analysis" based on 2030 AM peak period traffic for the Build and No-Build scenarios to generate number of trips per TSZ. Under the Build scenario, the "toll links" are assigned a cost, vehicle trips based on user cost, trip distance,

[15] "AM peak period traffic" represents the vehicles that pass a point on a highway during the time period of 6:30 AM and 8:59 AM. Note - AM peak period traffic does not reflect total ADT along SH 121. AM peak traffic is the preferred form of traffic data for O&D analysis because it is the most effective means to convey daily trips linked to TSZs.

time of day, and other factors to achieve system equilibrium in the network. The correlation of *Census 2000* and TransCAD® data is the best available method to identify which TSZs would originate trips anticipated to utilize the IH 35E facility and the general demographics of the population associated with those TSZs. However, the vehicle trip assignment process does not consider relative income differences or the differences in relative costs to potential users in the population when making trip assignments. Because no definitive data exists on the future users of IH 35E or similar transportation facilities, the O&D analysis cannot predict the specific race, ethnicity, or economic status associated with the predicted trips on non-toll or HOV/managed facilities.

Analysis Results

Data analysis indicates that of approximately 95,414 total trips which originate from TSZs anticipated to utilize IH 35E in the Build scenario; approximately 14.8 percent (14,204 trips) of the total trips originate from EJ TSZs. For the No-Build scenario, the total number of trips generated by TSZs anticipated to utilize IH 35E is approximately 68,496. Approximately 15.6 percent, or 10,710 trips, originating from EJ TSZs are projected to utilize the No-Build IH 35E facility. The moderate EJ TSZ trip percentage for the No-Build and Build scenarios suggests that a majority of trips anticipated to utilize the proposed IH 35E facility would not originate from areas identified with high concentrations of environmental justice populations within the study area. The projected EJ TSZ No-Build and Build overall trip percentages indicate environmental justice populations may utilize IH 35E in similar proportions in both scenarios. **Table IV-19** compares the No-Build and Build scenario O&D results.

Table IV-19: Comparison of IH 35E Origin-Destination Data

Scenario	Total TSZs Anticipated to Utilize IH 35E	Total TSZ Trips	Total EJ TSZs Anticipated to Utilize IH 35E	Total EJ TSZ Trips	% EJ TSZ Trips of Total Trips
IH 35E (2030 Build Scenario)	3,884	95,414	1,280	14,204	14.8%
IH 35E (2030 No-Build Scenario)	3,757	68,496	1,235	10,710	15.6%

Source: NCTCOG TransCAD® data for 2030 Build and No-Build scenarios
The study area (MPA) is composed of 4,813 total TSZs and 1,624 EJ TSZs.

Appendix A: Figure 11 illustrates the TSZs within the study area which are anticipated to use the proposed facility in the Build scenario, the number of trips anticipated to be generated from those TSZs, and those TSZs identified as areas with high concentrations of low-income and/or minority populations. **Appendix A: Figure 12** portrays the range of trips originating from TSZs containing a majority of environmental justice populations.

Summary of Environmental Justice Impacts

Based on the analysis provided above, no substantial direct environmental justice impacts would result from the proposed IH 35E project. Although 22 of the anticipated 180 displacements are located within three census blocks with majority environmental justice populations, the remaining majority of displacements would not be located within non-environmental justice census blocks. Comments received from the public meeting held on November 13, 2008 suggest residential displacements would not be contested given the number of inquiries as to when the ROW acquisition process would begin and the requests of TxDOT to purchase entire parcels to avoid unusable land or negative impacts to property values. Several business owners provided written comments requesting TxDOT to provide status updates on potential displacements and to

stress sensitivity to commercial concerns during the reconstruction process. No comments were provided during the public meeting to object to residential displacements; several comments requested TxDOT to avoid the displacements of existing commercial entities along the IH 35E corridor or to minimize design implications which could result in economic impacts such as the reduction of parking areas. As mentioned previously, one of the objectives of the City of Lewisville's IH 35E Corridor Development Plan is to minimize the economic impact associated with the anticipated commercial displacements by promoting redevelopment along both sides of IH 35E to maintain or enhance the commercial nature of the corridor. In the long term, a majority of the commercial employment impacts may be offset by the redevelopment along IH 35E post-reconstruction in the City of Lewisville once the IH 35E Corridor Development Plan is adopted and implemented. No specific environmental justice issues have been raised throughout TxDOT's communication with adjacent property owners, adjacent municipalities, and other public agencies with interests along the IH 35E corridor.

The proposed project's direct impacts associated with tolling would not be isolated within a limited number of census blocks such as the potential displacement impacts, but would be distributed among all users of the IH 35E facility (see **Section IV.C.4** for additional information regarding the economic impact of tolling). Low-income populations who elect or can only on occasional basis afford to pay tolls to access the tolled HOV/managed lanes would be impacted by toll rates, toll collection, and other matters associated with user fees. In addition, the economic impact of tolling the HOV/managed lanes would be higher for low-income users because the cost of paying tolls would represent a higher percentage of household income than for non-low-income users. However, tolled HOV/managed lane users (including environmental justice populations) might decide to reduce their personal economic or time travel impact of tolls by either utilizing the non-toll mainlanes, non-toll frontage roads, or transit options, where tolls would be waived for the transit provider. As indicated in the O&D analysis results, a majority of trips anticipated to utilize the Build scenario (includes four tolled HOV/managed lanes) would not originate from areas identified with high concentrations of environmental justice populations. O&D data based on projected trips indicates EJ TSZs would utilize the IH 35E facility under both the Build and No-Build scenarios.

Over the long term, the entire corridor and users would benefit from the proposed IH 35E project as a result of increased capacity, managed traffic congestion, and improved mobility in the area. There do not appear to be any disproportionately high and adverse impacts on minority or low-income populations associated with the proposed project because the majority of displacements (approximately 88 percent) would occur in non-environmental justice census blocks, feedback from the public meeting and other TxDOT-sponsored meetings did not indicate any environmental justice issues as a result of displacements or impacts to community cohesion, the O&D analysis indicated the majority of trips anticipated to utilize the Build scenario would not originate from areas identified with high concentrations of environmental justice populations, and non-toll options exist for those who elect or can only on occasional basis afford to pay tolls to access the tolled HOV/managed lanes.

C.3 Socio-Economic Impacts

Regional and Community Growth

Alternative A: No-Build Impact
Because traffic congestion would not be alleviated under the No-Build Alternative, access and mobility of people and goods along the corridor would continue to be limited, which would negatively affect the competitiveness of businesses and industries that depend on IH 35E.

Alternative B: Build Impact
Extensive coordination occurred between the cities and the NCTCOG regarding potential future developments along the project limits. The proposed project has taken into consideration the predicted 2030 demographics and economic developments tracked and monitored by the NCTCOG.

According to the U.S. Census Bureau *Census 2000*, the DFW Metroplex is the fifth largest metropolitan area in the U.S. The DFW Metroplex is comprised of two metropolitan divisions, Dallas to the east and Fort Worth to the west. Between 1990 and 2000, the DFW Metroplex added 1.2 million residents, fueling a growth rate of 29 percent. During that same time period, Dallas and Denton Counties were ranked second and eighth in growth, respectively, among Texas counties as measured by the increase in the number of persons. Today, the DFW Metroplex, the largest metropolitan area in Texas, is more populated than 31 states. The area is a leader in job growth and ranked first in the nation for employment growth in the 1990s, adding a total of 760,000 net new jobs.[16] The DFW Metroplex claims 26 percent of the state's population, 27 percent of the labor force, 28 percent of all wage and salary jobs, and produces 33 percent of the state's total product as measured by Gross Domestic Product (GDP).[17]

The NCTCOG developed projections in a four step process, starting with household and employment projections for the metropolitan area, as defined by the regional forecast area, which includes all of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant and Wise counties. The regional forecasts are consistent with state projections.

Dallas County, Denton County, and the project area are expected to grow dramatically through the year 2030. The NCTCOG 2030 Demographic Forecast indicates Denton County can expect to have 1,085,343 residents in 2030, representing nearly 657,263 new residents since 2000.[18] This represents an approximate population increase of 153 percent by 2030. The NCTCOG 2030 Demographic Forecast also projects Dallas County growing from a 2000 population of 2,232,500 to a population of 2,817,200 by 2030, an increase of approximately 26 percent. The 10-county urban region is projected to grow 80 percent over the 30-year period, from 5,067,400 residents in 2000 to 9,107,200 residents in 2030. The proposed project is not anticipated to affect the NCTCOG 2030 Demographic Forecast findings as the improvements to IH 35E were taken into consideration during the population forecasting process.

NCTCOG population forecasts include relationships between wage and salary, labor force participation rate, and a complete population system with endogenous migration. Because labor

[16] U.S. Bureau of Labor Statistics, http://www.bls.gov/
[17] Moody's Economy.com, http://www.economy.com
[18] North Central Texas Council of Governments. *North Central Texas 2030 Demographic Forecast*, http://www.nctcog.org

force participation is a function of economic condition, it is understood that NCTCOG takes into account economic downturns in their population forecasts.

Community Cohesion

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, a decline in community cohesion is not anticipated.

Alternative B: Build Impact
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 a continual association over time. The overall impact of the IH 35E project can be expected to result in both negative and positive impacts. Displacements may result in community members moving some distance from their present community. While a relatively large number of residential and commercial displacements are anticipated, data regarding available housing within each impacted municipality suggests vacancies exist to accommodate residential relocations within the same communities for the most part (**Section IV.C.1**), and the City of Lewisville's IH 35E Corridor Development Plan would address the redevelopment and preservation of commercial land use along the IH 35E corridor post-reconstruction.

According to conversations with local planning officials during October 2007, January 2009, and June 2010, the proposed improvements would not effect, separate, or isolate any distinct neighborhoods, ethnic groups or other specific groups as the IH 35E facility is an existing interstate highway. A local planning official with the City of Lewisville did indicate a known Hispanic community resides to the east of IH 35 in the City of Lewisville; however, direct impacts to primarily Hispanic residential or commercial centers (i.e. Huffines Plaza or St. Charles Place Apartments) associated with the proposed project are not anticipated. Specific direct impacts associated with residential and commercial displacements are discussed in **Section IV.C.1**.

As described in **Section I.E**, Project Support, TxDOT has and continues to facilitate communication with adjacent property owners, adjacent municipalities, and other public agencies with interests along the IH 35E corridor in the form of a public meeting and stakeholder work group meetings. In addition to the public meeting held on November 13, 2008 and stakeholder meetings (**Table I-2**), various meetings and/or presentations have been given to public officials associated with several municipalities along the IH 35E corridor. No concerns regarding community cohesion have been documented during the public meeting, various stakeholder work group meetings, or other various presentations associated with the proposed project.

The core of the municipalities traversed by IH 35E would remain intact with relatively minor physical disruption along the IH 35E corridor. The City of Lewisville would absorb 147 (approximately 82 percent) of the 180 anticipated displacements. As discussed in **Section IV.C.1**, this potential impact has been accounted for by the City of Lewisville through the current development of its IH 35E Corridor Development Plan. The City of Lewisville proactively seeks to keep business owners engaged and is working to alleviate the effects of the proposed IH 35E project on businesses located along the corridor.

Limited English Proficiency (LEP) Populations

Alternative A: No-Build Impact

Under the No-Build Alternative for IH 35E, LEP individuals would be afforded the opportunity to participate in the decision-making process.

Alternative B: Build Impact

Executive Order (EO) 13166 on LEP calls for all agencies to ensure that their federally conducted programs and activities are meaningfully accessible to LEP individuals. The U.S. DOT defines LEP persons as individuals with a primary or home language other than English who must, due to limited fluency in English, communicate in that primary or home language if the individuals are to have an equal opportunity to participate effectively in or benefit from any aid, service or benefit provided by the transportation provider or other U.S. DOT recipient.

Census block group data was obtained from the U.S. Census Bureau *Census 2000* database. According to the information, the "Ability to Speak English," for the population five years and older indicates approximately 4.4 percent of the population within the 26 census block groups along the proposed project limits speaks English "Not Well" or "Not at All." All of the 26 census block groups adjacent to the IH 35E corridor contain LEP populations according to *Census 2000*; LEP populations among the 26 census block groups ranged from approximately 0.4 to 42.8 percent. CT 216.01 BG 5 contains 42.8 percent LEP population. The next largest LEP population per census block group is 15.6 percent (CT 216.01 BG 3). Specific LEP languages and respective percentages represented in the LEP study area are the following: Spanish (3.5 percent), Other Indo-European (0.4 percent), Asian and Pacific Islander (0.4 percent), and Other (0.01 percent). In a windshield survey along the proposed project corridor, English was the only language observed on billboards and signs. **Table IV-20** summarizes the LEP population for the study area.

Table IV-20: Percentage LEP Population: 1999

Census Tract	Census Block Group	Total Population 5 Years and Older	Total Number Who Speak English "Not Well" or "Not at All"	% LEP
CT 137.19	1	1,818	156	8.6
CT 140.02	1	841	50	5.9
CT 141.23	1	1,929	72	3.7
CT 214.01	5	4,300	38	0.9
CT 214.02	5	2,742	12	0.4
CT 214.03	2	1,973	98	5.0
CT 214.03	3	1,060	0	0.0
CT 214.03	4	1,504	28	1.9
CT 215.02	1	822	0	0.0
CT 215.02	2	1,868	200	10.7
CT 215.04	1	6,023	7	0.1
CT 215.04	4	1,525	12	0.8
CT 215.05	1	2,471	21	0.8
CT 215.05	3	1,183	9	0.8
CT 216.01	1	3,565	346	9.7
CT 216.01	3	877	137	15.6
CT 216.01	5	919	393	42.8
CT 216.01	7	1,269	140	11.0
CT 216.03	2	2,594	118	4.5
CT 216.03	3	4,041	110	2.7
CT 217.03	1	6,584	161	2.4
CT 217.10	1	8,413	135	1.6
CT 217.11	1	2,726	252	9.2
CT 217.11	2	2,407	153	6.4
CT 217.13	1	2,144	228	10.6
CT 217.13	2	1,518	102	6.7
LEP Study Area Total		**67,116**	**2,978**	**4.4**

Source: U.S. Census Bureau, *Census 2000*.

TxDOT has included the LEP population in the planning and public involvement process. Preparation for the March 2003 and November 2008 public meetings included the publication of Bilingual (English/Spanish) announcements in local papers which informed citizens of the opportunity to request an interpreter (for language or other special communication needs) to be present at the public meetings. Reasonable steps such as the publication of Bilingual (English/Spanish) announcements in local papers, such as *Al Dia*, which inform citizens of the opportunity to request an interpreter (for language or other special communication needs) to be present at the public meetings would continue to be taken, to ensure that such persons have meaningful access to the programs, services, and information that TxDOT provides. Ten stakeholder work group meetings have been held since August 2008; no issues associated with LEP populations have been identified to date during the stakeholder work group meetings (see **Section I.E** for additional information).

Access

Access to the mainlanes of IH 35E would be available to all users. Access to the tolled HOV/managed lanes would be available to those who elect or can only on occasional basis afford to pay the toll. The IH 35E frontage roads would include a range of four to eight travel lanes (two to four in each direction) and would provide a non-toll alternative, in addition to the eight non-toll mainlanes, for motorists who do not elect or can only on occasional basis afford to travel the tolled HOV/managed lanes. Under normal operating conditions, motorists (including

emergency vehicles) using the frontage roads would experience longer travel times than motorists using either the non-toll mainlanes or the tolled HOV/managed lanes due to a lower posted speed limit and traffic signals along the frontage roads. See **Section IV.C.10** for additional analysis regarding traffic impacts.

The difference in travel times between the tolled HOV/managed lanes and the non-tolled mainlanes would be the highest during peak periods of travel when traffic congestion within the IH 35E project limits would be the greatest. RTC's managed lane policy, approved in June 2006, requires a "speed guarantee" of 50 mph; therefore, in conditions of congestion, the non-tolled mainlanes would likely operate at speeds lower than 50 mph creating longer travel times for motorists utilizing the non-tolled mainlanes compared to motorists traveling a minimum of 50 mph along the tolled HOV/managed lanes. It is anticipated that the overall added capacity the proposed project provides would relieve traffic congestion for all motorists using IH 35E whether they use the non-toll mainlanes or frontage roads compared to the existing facility. Congestion can best be described in terms of LOS and travel speeds along a roadway. The LOS is a qualitative measure of describing operational conditions within a traffic stream or at an intersection, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The proposed increase in capacity would only relieve traffic congestion (improve LOS) temporarily. Eventually, increasing traffic would increase demand and deteriorate the LOS of the facility, which would result in congestion. Refer to **Section IV.C.10** for a comparison of the number of lane-miles operating under different LOS between Build and No-Build Alternatives in 2030 during the AM peak hour. Overall, motorists would have access to a greater number of non-toll mainlanes within the project limits as currently exist (increase from six to eight non-toll mainlanes).

Non-Toll Alternatives

Although the proposed project would not distribute the benefits of time cost savings associated with the tolled HOV/managed lanes among all income groups evenly because lower income groups would pay a higher proportion of their income for tolls as compared to middle and higher income groups, alternative non-toll routes currently exist or would at the time the HOV/managed lanes would be open to traffic. Because the proposed IH 35E reconstruction would add two additional non-tolled mainlanes (one in each direction) and an additional frontage road lane to the existing facility, as well as making them continuous, reduced congestion and improved mobility along the mainlanes and frontage roads would benefit all users of IH 35E from PGBT to FM 2181, including low-income users. The additional mainlanes and frontage road lanes would provide non-tolled alternatives for motorists who do not elect or can only on an occasional basis afford to travel the tolled HOV/managed lanes. Motorists using the frontage road may experience longer travel times than motorists using the non-toll mainlanes due to a lower posted speed limit and signalization. This difference in travel times between the tolled HOV/managed lanes and the non-tolled mainlanes and frontage roads would be the highest during peak periods of travel when traffic congestion within the proposed project limits would be greatest.

Transit Usage

IH 35E from PGBT to FM 2181 is located within the DCTA service area. DCTA is a coordinated county transportation authority that serves Denton County's public transportation needs. Regularly scheduled trips service the proposed project limits.[19]

[19] Denton County Transportation Authority (DCTA), http://www.dcta.net/

Currently, DCTA provides commuter bus service, known as its Commuter Express service, that uses the existing IH 35E facility from Denton to downtown Dallas. The existing service plan for DCTA's commuter bus service along IH 35E from Denton to downtown Dallas provides three stops at park and ride facilities providing access to DCTA users along the proposed project limits from PGBT to FM 2181. According to the DCTA, when the DART Trinity Mills rail station opens in the City of Carrollton (scheduled for December 2010), DCTA's Commuter Express service will serve the rail station to offer customers DART connection opportunities. From this point southward, the Commuter Express would no longer travel directly to downtown Dallas.

According to the DCTA, the Commuter Express currently travels on HOV lanes where they exist, providing time savings for patrons. Per RTC policy, when DCTA vehicles utilize the IH 35E HOV/managed lanes, no toll charges would be applied to DCTA. As stated previously, transit vehicles would be exempt from toll charges along IH 35E. Tolled HOV/managed lanes users, including environmental justice populations (consisting of minority and/or low-income individuals), might decide to reduce their personal economic impact of tolls by using transit, where tolls would be waived for the transit provider as included in **Appendix D, Business Terms for TxDOT-Sponsored Managed Lane Facilities**.

The proposed project is not expected to adversely affect transit usage. The tolled HOV/managed lanes component of the proposed project would provide DCTA transit users from all income ranges the ability to realize travel time cost savings benefits that would assist in mitigating the unequal distribution of benefits among income groups associated with SOV use of the tolled HOV/managed lanes.

C.4 Economic Impacts of Tolling

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no adverse economic impacts are anticipated.

Alternative B: Build Impact

Toll Rate
As mentioned previously, utilizing HOV/managed lanes would require toll collection for both single occupancy and HOV users. Policies for HOV/managed lane facilities were approved by the RTC in 2006 and are included in **Appendix D, Business Terms for TxDOT-Sponsored Managed Lane Facilities**.

According to this policy, a fixed-fee schedule would be applied during the first six months of operation and dynamic-fee pricing would be applied thereafter. Toll rates would be updated monthly during the fixed-fee schedule phase. The toll rate could be set up to $0.75 per mile during the fixed-fee schedule phase in accordance with current policy; however that toll rate is not likely to be established as further discussed in the scenarios described below that correspond with the anticipated opening year of 2020. The actual established rate would be evaluated and adjusted, if warranted, with RTC approval.

Dynamic-fee pricing allows operators to set market-based toll rates based on corridor demand, and those rates could fluctuate at any time throughout the day, even in real time, in response to changing traffic conditions. The policy does include a reduced toll rate (half price) that would be applied toward HOV users (two or more occupants) and publicly operated vanpools during the

AM and PM peak periods (weekday periods from 6:30 a.m. to 9:00 a.m. and from 3:00 p.m. to 6:30 p.m., respectively). The toll rate would be established to maintain a minimum average corridor speed of 50 miles per hour. During the dynamic-pricing phase, travelers would receive rebates if the average speed drops below 35 mph, however rebates would not apply if speed reduction is out of the control of the operator. During the off-peak periods, HOV users would pay the same toll as Single Occupancy Vehicles (SOV).

Users of the tolled HOV/Managed lanes would be notified of the toll rate before entering the designated lanes by an electronic message board. Clearly posted overhead signage would designate the lane that drivers should use to enter and exit the facility. Mainlanes and frontage roads, including the proposed added capacity, would remain as non-tolled options for all users.

Express Lanes Demonstration Program Tolling Agreement

The IH 35E corridor (South, Middle and North Sections) from IH 635 to U.S. 380 has been approved as a demonstration project associated with the SAFETEA-LU Express Lanes Demonstration Program (ELDP). The ELDP agreement between TxDOT and FHWA allows TxDOT (directly or through a third party public authority or private entity) to establish a toll that varies in price according to time of day or level of traffic, as appropriate, to manage congestion or improve air quality. TxDOT must audit the records of the managed lanes annually for compliance with the provisions of the ELDP and report the results to FHWA. In accordance with SAFETEA-LU, the performance goals and monitoring/reporting program set forth in the ELDP agreement may be amended as deemed desirable. As part of the monitoring and reporting program, TxDOT will prepare a document that describes the information to be collected, the methodology for identifying baseline values and approach for developing the annual reports that will assess facility performance. An annual report will be prepared by TxDOT and submitted to FHWA by March 31st of each year that documents processes and procedures and will include 1) project information; 2) performance highlights; 3) performance summary; and 4) performance details.

Toll rates for the IH 35E HOV/managed lanes would be determined prior to opening the facility to traffic. A toll revenue study, *Draft – Level 2 Traffic and Toll Revenue Study: IH 35E Managed Lanes between IH 635 and U.S. 380,* has been prepared to represent a range of toll revenue outcomes. The results of this Level 2 study include various project scenarios with certain assumptions included that affect the results. Three scenarios presented in the Level 2 study can be utilized to illustrate the potential impacts associated with toll rates. Each scenario provides assumptions and an explanation of input variables used to arrive at a total cost impact to users of the proposed tolled HOV/managed lanes.

Anticipated toll rates and total cost impacts to users are provided for each scenario for the assumed opening year (2020). For each scenario, the average travel distance per household that would use the proposed tolled HOV/managed lanes on IH 35E from PGBT to FM 2181 would be 8 miles out of the total 12-mile section and would equate to 16 miles for a round trip. As a component of the *Draft – Level 2 Traffic and Toll Revenue Study: IH 35E Managed Lanes between IH 635 and U.S. 380,* the 8-mile assumption of average travel distance using the proposed tolled HOV/managed lanes along the 12-mile length of the proposed project limits is derived from evaluating trip distance patterns from Origin-Destination survey data collected from travelers using license plate matching methods. Users also completed surveys that allowed the study team to determine average mileage usage data reflecting average trip patterns by roadway segment along the entire IH 35E proposed reconstruction corridor from IH 635 in

Dallas to U.S. 380 in Denton. For the entire proposed 28-mile IH 35E reconstruction corridor, the average household mileage usage equals 11 miles based on the results of the Origin-Destination survey. Toll rates applied to each scenario on the proposed tolled HOV/managed lanes are calculated based on the estimated per mile toll rate from the *Draft - Level 2 Traffic and Toll Revenue Study: IH 35E Managed Lanes between IH 635 and U.S. 380* specific to this project as well as the estimated average distance traveled on the proposed tolled HOV/managed lanes, which indicates demand to travel on the tolled HOV/managed lanes. Toll rates reflect the dynamic pricing concept of the tolled HOV/managed lanes associated with the proposed project and are a function of balancing the demand to use them, the value of time cost savings of their use to users, and users' willingness to pay to use the tolled HOV/managed lanes versus the cost of congestion experienced on the non-tolled lanes.

An assumed number of round trips are provided for each scenario that reflects the likely frequency of household use during the stated period based on case study observations of similar operating projects involving high occupancy/toll (HOT) lane facilities. HOT lanes are those that give motorists in SOVs access to HOV lanes and implement a charge for their use of the lanes that varies based on the level of congestion in those lanes. The greater the level of congestion in HOT lanes, the higher the charge to use them. The goal of HOT lanes is to minimize traffic congestion by pricing the use of the lanes. From case study observations, it was revealed that most travelers only use the toll lanes when the perceived benefits of time cost savings and less congestion are equal to or exceed the toll charges. The majority of current HOT lane facilities show that those facilities or specific HOT lanes primarily cater to non-frequent users. Four case studies of HOT lane user frequency ultimately revealed that the average user traveled on HOT lanes from once or less a week to an upper limit among the case studies of 2.5 times per week. The most similar project of the four case studies reviewed was the Katy Freeway (IH 10) in the Houston region which became operational in April 2009. Based on the other similar case studies, the study team considered 2 trips per week for the mid-day peak and off-peak trip scenarios and 2.5 trips per week for the afternoon peak scenario, reasonable and indicative of the patterns shown with regard to existing HOT lane facilities.

Scenario 1 (Afternoon Peak, 4:30pm – 6:30pm)

Scenario 1 assumes that the toll rate at the time IH 35E would open to traffic in 2020 would be 47 cents per mile and reflects the highest priced period for use of the tolled HOV/managed lanes among the three scenarios. Scenario 1 also assumes the average household would make 2.5 round trips per week during this peak period or 130 round trips per year. Under this scenario, the annual cost to the user based on the stated assumptions would be approximately $977.60 per year. A user with a consumer price index (CPI)-adjusted (2.75 percent) annual household income in 2020 of $97,643 based on the 2007 median household income for Denton County ($68,624) would spend approximately 1.0 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $65,921 based on the 2007 median household income for Dallas County ($46,330) would spend approximately 1.5 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with CPI-adjusted incomes in 2020 of $29,717 based on the 2009 DHHS-established poverty level of $22,050 (for a family of four) would spend approximately 3.3 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 2.3 percent and 1.8 percent more of total household income than the median for Denton and Dallas County households, respectively.

Scenario 2 (Mid-Day Peak, 9:00am – 3:00pm)
Scenario 2 assumes that the toll rate at the time IH 35E would open to traffic in 2020 would be 13 cents per mile and reflects the second highest priced period for use of the tolled HOV/managed lanes among the three scenarios. Scenario 2 also assumes the average household would make 2 round trips per week during this period or 104 round trips per year. Under this scenario, the annual cost to the user based on the stated assumptions would be approximately $216.32 per year. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $97,643 based on the 2007 median household income for Denton County ($68,624) would spend approximately 0.2 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $65,921 based on the 2007 median household income for Dallas County ($46,330) would spend approximately 0.3 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with CPI-adjusted incomes in 2020 of $29,717 based on the 2009 DHHS-established poverty level of $22,050 (for a family of four) would spend approximately 0.7 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 0.5 percent and 0.4 percent more of total household income than the median for Denton and Dallas County households, respectively.

Scenario 3 (Off-Peak, 7:30pm – 8:00am)
Scenario 3 assumes that the toll rate at the time IH 35E would open to traffic in 2020 would be 7 cents per mile and reflects the lowest priced period for use of the tolled HOV/managed lanes among the three scenarios. Scenario 3 also assumes the average household would make 2 round trips per week during this period or 104 round trips per year. Under this scenario, the annual cost to the user based on the stated assumptions would be approximately $116.48 per year. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $97,643 based on the 2007 median household income for Denton County ($68,624) would spend approximately 0.1 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $65,921 based on the 2007 median household income for Dallas County ($46,330) would spend approximately 0.2 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with CPI-adjusted incomes in 2020 of $29,717 based on the 2009 DHHS-established poverty level of $22,050 (for a family of four) would spend approximately 0.4 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 0.3 percent and 0.2 percent more of total household income than the median for Denton and Dallas County households, respectively.

Under the 3 scenarios, all users of the tolled HOV/managed lanes at all income levels would realize a travel time savings benefit as opposed to using mainlanes along the IH 35E corridor. This travel time savings benefit would be more pronounced under the peak period scenario in which increased traffic congestion on the mainlanes during that time would more pointedly warrant the use of the tolled HOV/managed lanes, which would be less congested. Under the mid-day and off-peak scenarios, a travel time savings benefit would still exist, although the benefit would be less profound during these periods when mainlanes are less congested. Changes in the toll rate along the facility are designed to balance the toll rate with the value of travel time cost savings. Tolled HOV/managed lane users could also decide to reduce their personal financial impact of tolls by carpooling or using transit in which tolls would be divided among many travelers or waived for the transit provider. Although the proposed project would not distribute the benefits of time cost savings associated with the tolled HOV/managed lanes among all income groups evenly because lower income groups would pay a higher proportion of

their income for tolls as compared to middle and higher income groups, alternative project-specific non-toll options currently exist or would at the time the HOV/managed lanes would open. As discussed in **Section IV.C.3.**, project-specific non-toll options available to all groups, including low-income populations, would assist in offsetting the unequal distribution of travel time cost savings benefits based on income.

As previously stated, an ETC system would be implemented along the IH 35E HOV/managed lanes. The HOV/managed lanes would not offer "on-site" or automated cash payment options through toll booths, toll plazas, toll stations, or toll gates. Instead, other methods of toll collection would be implemented as described below.

Methods of Toll Charge Collection[21]

TxDOT TxTag® stickers, the NTTA TollTag® (Dallas area), and the Harris County Toll Road Authority (HCTRA) EZ TAG® (Houston area) would be accepted on the IH 35E tolled HOV/managed lanes. Toll charges could be automatically deducted from a prepaid credit account or would be mailed as a monthly statement to the driver if the video billing method is utilized. If the driver has a TxTag® or other toll transponder account, the tolls would automatically be deducted from the account when the facility is used. The account would be a prepay account which means the driver must maintain sufficient funds in his/her account to cover incurred toll charges, such as for accounts currently in use for existing toll roads.

TxTag® Account Payment Methods

With a TxTag® "AutoPay" account, the user would pay a minimum installment of $29.65 ($20 credit and a $9.65 one time fee for the TxTag®) through a credit or debit card. The account would then be established with a $20 credit, which would be reduced each time the transponder passes through an operating toll gantry. The account holder's credit or debit card would be automatically charged when the funds in the "AutoPay" account exceed a pre-set threshold value. There is no fee for this service. A user can sign up for "AutoPay" by accessing the account online and providing credit or debit card information or by calling the TxTag® Customer Service Center.

For those who choose to maintain a prepaid TxTag® "Manual Pay" account, an initial deposit of $9.65 would be required for the toll transponder, as well as a $20 payment to establish the account. The account would then be established with a $20 credit, which would be reduced each time the transponder passes through an operating toll gantry. The user would be responsible for maintaining sufficient funds in his/her account to cover incurred toll charges. Toll rates would be the same as "AutoPay" account toll rates. "Manual Pay" accounts can be replenished via credit card, debit card, cash, or check/money order. Paying by credit or debit card can be handled online (http://www.TxTag.org), via the phone (1-888-468-9824), or at the TxTag® Customer Service Center located in Austin, Texas. Cash payments must be made at the TxTag® Customer Service Center in Austin. Check or money orders can be taken or mailed to the TxTag® Customer Service Center in Austin.

[21] Costs and amounts discussed in this section are subject to change as TxDOT, NTTA, and HCTRA policies may vary.

The TxTag® sticker must be permanently placed on the windshield and cannot be moved between vehicles without damaging the toll transponder. If a user has more than one vehicle, the user can order more transponders and manage them all through one account. Regardless of the user type, TxTag® accounts may be monitored free of charge via the internet. Should the user request a monthly invoice, a $1.00 charge per five pages invoiced would be incurred each month.

TollTag® Account Payment Methods

With a NTTA TollTag® prepaid "credit user" account, the driver would pay a minimum amount of $40 installment through a credit or debit card. The account would then be established with a $40 credit, which would be reduced each time the transponder passes through an operating toll gantry. When the driver's account reaches $10 or less, the "credit user" credit or debit card would again be charged $40 to automatically increase the available balance. Should the "credit user" lose or fail to surrender the TollTag® when the account is closed, the credit or debit card would be charged $25 to cover the cost of the transponder.

Similar to the TxTag® "Manual Pay" account, the NTTA also allows cash payments. For those who choose to maintain a prepaid "cash user" account, an initial deposit of $25 would be required for the toll transponder as well as a $40 payment to establish the account. Per NTTA policy, this automatic deposit is required of "credit user" accounts. The "cash user" deposit can be refunded without interest if the user returns the transponder in good condition or if the "cash user" account is converted into a "credit user" account. The prepaid "cash user" account would require the driver to maintain sufficient funds in his/her account to cover incurred toll charges. Cash payments can be made at the NTTA's TollTag® Store in Dallas, at the TollTag®, Customer Center in Plano or at any of the ACE Cash Express, Inc. locations in the DFW area. Toll rates would be the same as "credit user" account toll rates. When passing through a toll lane equipped with a traffic signal, a yellow light on the traffic signal indicates that the account balance is at or below $10. A red light indicates that the account balance is $0. The NTTA must receive payment at one of the TollTag® locations before the account reaches $0 to avoid the incurrence of toll violations.

The TollTag® may only be displayed in the vehicle specifically assigned to that TollTag®. The license plate number of a vehicle listed on the TollTag® account can not be registered on another TollTag® account. Regardless of the user type, TollTag® accounts may be monitored free of charge via the internet. Should the user request a monthly invoice, a $1.50 charge would be incurred each month.

Video Billing Payment Methods

Through a system known as video billing, it would still be possible to drive the tolled HOV/managed lanes of IH 35E without an electronic toll transponder or prepaid user account. The user's license plate would be recorded and matched to the state's vehicle registration file, and a monthly bill would be mailed to the registered owner of the vehicle for the accumulated toll charges. The toll rates for drivers without a toll transponder would include an additional percentage toll rate premium plus an incidental administrative fee commensurate with the costs related to processing the vehicle registration information.

The owner of the vehicle may be charged a toll rate premium of up to 45 percent, which is to offset the costs related to processing license plate information. In addition to this premium, incidental administrative fees would be incurred. These include such things as costs to prepare and mail the monthly statements.

Under the video billing concept, the results of the *Draft – Level 2 Traffic and Toll Revenue Study: IH 35E Managed Lanes between IH 635 and U.S. 380* include project scenarios with certain assumptions included that affect the results. These scenarios are the same three scenarios presented in the Level 2 study related to ETC system tolling, except they account for an assumed 45 percent surcharge to cover the anticipated additional cost of processing toll transactions. These scenarios can be utilized to illustrate the potential impacts associated with toll rates under this concept. Each scenario provides assumptions and an explanation of input variables used to arrive at a total cost impact to users of the proposed tolled HOV/managed lanes. Anticipated toll rates and total cost impacts to users are provided for each scenario for the assumed opening year of 2020. For each scenario, the same assumptions related to average user travel distance on the tolled HOV/managed lanes, toll rate, and number of round trips as provided for the ETC scenarios also apply to the following three video billing scenarios.

Scenario 1 (Afternoon Peak, 4:30pm – 6:30pm)
Scenario 1 assumes that the toll rate at the time IH 35E would be open to traffic in 2020 would be 47 cents per mile and reflects the highest priced period for use of the tolled HOV/managed lanes among the three scenarios. Scenario 1 also assumes the average household would make 2.5 round trips per week during this peak period or 130 round trips per year. Under this scenario, the annual cost to the user based on the stated assumptions in addition to a 45 percent surcharge would be approximately $1,417.52 per year. A user with CPI-adjusted (2.75 percent) annual household income in 2020 of $97,643 based on the 2007 median household income for Denton County ($68,624) would spend approximately 1.5 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $65,921 based on the 2007 median household income for Dallas County ($46,330) would spend approximately 2.2 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with CPI-adjusted incomes in 2020 of $29,717 based on the 2009 DHHS-established poverty level of $22,050 (for a family of four) would spend approximately 4.8 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 3.3 percent and 2.6 percent more of total household income than the median for Denton and Dallas County households, respectively.

Scenario 2 (Mid-Day Peak, 9:00am – 3:00pm)
Scenario 2 assumes that the toll rate at the time IH 35E would open to traffic in 2020 would be 13 cents per mile and reflects the second highest priced period for use of the tolled HOV/managed lanes among the three scenarios. Scenario 2 also assumes the average household would make 2 round trips per week during this period or 104 round trips per year. Under this scenario, the annual cost to the user based on the stated assumptions in addition to a 45 percent surcharge would be approximately $313.66 per year. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $97,643 based on the 2007 median household income for Denton County ($68,624) would spend approximately 0.3 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $65,921 based on the 2007 median household income for Dallas County ($46,330) would spend approximately 0.5 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with CPI-adjusted incomes in 2020 of $29,717 based on the 2009 DHHS-established poverty level of $22,050 (for a family of four) would spend approximately 1.1 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 0.8 percent and 0.6 percent more of total household income than the median for Denton and Dallas County households,

respectively.

Scenario 3 (Off-Peak, 7:30pm – 8:00am)
Scenario 3 assumes that the toll rate at the time IH 35E would be open to traffic in 2020 would be 7 cents per mile and reflects the lowest priced period for use of the tolled HOV/managed lanes among the three scenarios. Scenario 3 also assumes the average household would make 2 round trips per week during this period or 104 round trips per year. Under this scenario, the annual cost to the user based on the stated assumptions in addition to a 45 percent surcharge would be approximately $168.90 per year. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $97,643 based on the 2007 median household income for Denton County ($68,624) would spend approximately 0.2 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a CPI-adjusted (2.75 percent) annual household income in 2020 of $65,921 based on the 2007 median household income for Dallas County ($46,330) would spend approximately 0.3 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with CPI-adjusted incomes in 2020 of $29,717 based on the 2009 DHHS-established poverty level of $22,050 (for a family of four) would spend approximately 0.6 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 0.4 percent and 0.3 percent more of total household income than the median for Denton and Dallas County households, respectively.

The scenarios above demonstrate that not maintaining a pre-paid TxTag®, TollTag® or EZ TAG® account results in higher costs for those who utilize the video billing option. There is no interest charged on unpaid tolls; however, there are delinquent penalty fees associated with an unpaid or delinquent bill. Common penalties are listed below:[22]

Returned Check (Insufficient Funds)	$25.00
Administrative Fee - Violation Notice *	$5.00
Administrative Fee - Violation in Collections *	$25.00
Administrative Fee - Violation Sworn Complaint Issued *	$100.00

* Fee amounts are pending final determination and will be adjusted annually per Texas Administrative Code.

If the registered owner does not have a toll transponder, he/she would receive a bill every month for the balance. There is no minimum threshold for video billing to occur. As with the prepaid account, video billing would allow for cash, credit or debit payments.

Comparison of Payment Methods
Not maintaining a prepaid account would impact any user, including low-income users, because the cost of paying the accumulated toll charges without an account would represent a higher toll rate than toll charges affiliated with a prepaid account. Cash payment options are available for each payment method; however, only those users who maintain automatic and manual pay prepaid accounts would benefit from reduced toll rates compared to the video billing policy. Paying for the TxTag® by credit or debit card can be handled online (http://www.TxTag.org), via the phone (1-888-468-9824), or at the TxTag® Customer Service Center located in Austin, Texas. Cash payments can be made at the TxTag® Customer Service Center in Austin. Check or money orders can be taken or mailed to the TxTag® Customer Service Center in Austin.

[22] Texas Department of Transportation, http://www.txtag.org/

On May 12, 2010 NTTA launched a partnership with ACE Cash Express, Inc. to provide additional cash service options. ACE Cash Express, Inc. is a retailer of financial services, including short-term consumer loans, check cashing, bill payment and prepaid debit card services. NTTA cash customers can now utilize 153 ACE Cash Express, Inc. locations in the DFW area to handle services such as ZipCash payments, new cash-backed TollTag® accounts and cash TollTag® account replenishment. NTTA customers who receive ZipCash invoices or ZipCash late invoices can also visit any ACE Cash Express, Inc. location to pay their bill. If users have a TollTag® account, it can be set up using credit or debit cards or cash at the NTTA's TollTag® Store in Dallas and at the TollTag® Customer Center in Plano. Additional cash option locations include all ACE Cash Express, Inc. establishments in the DFW area.

In summary, toll rates are generally 45 percent higher for drivers who do not have an electronic toll transponder to offset the costs related to processing the license plate information associated with video billing. Although certain toll transponder account holders are required to pay up-front fees or deposits for toll transponders ($9.65 fee per transponder for TxTag® accounts and $25 deposit for TollTag® "cash users" accounts), the toll transponder account holders would benefit from lower toll rates compared to the total toll rates associated with video billing. In other words, the up-front fees associated with toll transponders may be offset through time when considering the premium and processing fees affiliated with the video billing method of payment.

Although the proposed project would not distribute the benefits of time cost savings associated with the tolled HOV/managed lanes among all income groups evenly because lower income groups would pay a higher proportion of their income for tolls as compared to middle and higher income groups, alternative project-specific non-toll options currently exist or would at the time the HOV/managed lanes would open. As discussed in **Section IV.C.3.**, project-specific non-toll options available to all groups, including low-income populations, would assist in offsetting the unequal distribution of travel time cost savings benefits based on income. These alternative project-specific non-toll options would assist in offsetting the unequal distribution of travel time cost savings benefits regardless of toll collection method.

C.5 Public Facilities and Services

Alternative A: No-Build Impact

Under the No-Build Alternative for IH 35E, additional ROW and access changes would not be required; therefore, no impacts to public facilities or services are anticipated.

Alternative B: Build Impact

The proposed project would not affect public facilities or services located in the Cities of Highland Village and Lake Dallas. In the City of Lewisville, the proposed project would displace a water tower located on the east side of IH 35E just north of Main Street (**Appendix C: Corridor Maps, Sheet 10 of 19**). During discussions with the City, a site for the relocation of the water tower has not been determined. The proposed reconstruction would displace the Town of Hickory Creek Public Works and Animal Services facility located on the west side of IH 35E just north of Lewisville Lake. These facilities are located in the same building. The Town of Hickory Creek Public Works department is responsible for the maintenance of local playgroup equipment, streets, signs, and oversees animal services. The Animal Services facility is a small shelter that facilitates pet adoption and reports missing pets. The Town of Hickory Creek is working to identify sites to relocate the displaced facilities; however, potential sites have not

been determined. The location of these facilities is shown in **Appendix C: Corridor Maps, Sheet 17 of 19**. Information for these facilities is included in **Appendix D: IH 35E Displacement Data**. It is anticipated that access to these facilities and services should be enhanced after the completion of the proposed project.

C.6 Impacts to Section 4(f) and 6(f) Properties

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no impacts to Section 4(f) or 6(f) are anticipated.

Alternative B: Build Impact
As stated previously, Highland Lakes Park and the USACE Property including Copperas Branch Park are not subject to Section 6(f) Evaluation. Nationwide Programmatic Section 4(f) Evaluations, however, are required because portions of each park would be converted from parkland for a transportation use due to the proposed reconstruction of IH 35E. Because the use of the USACE Property, including Copperas Branch Park and Highland Lakes Park would result in a net benefit, Nationwide Programmatic Section 4(f) Evaluations have been prepared.

Draft Nationwide Programmatic Section 4(f) Net Benefit Evaluations have been prepared and have evaluated the following alternatives:

- Do Nothing or No-Build;
- Reconstructing IH 35E to address the Need and Purpose without the use of Section 4(f) Property; and
- Constructing IH 35E at a location does not require the use of Section 4(f) property.

The alternatives analyses presented in both Draft Nationwide Programmatic Section 4(f) Net Benefit Evaluations include findings that conclude that the alternative recommended (Build) is the only feasible and prudent alternative and results in a clear net benefit. The Draft Nationwide Programmatic Section 4(f) Net Benefit Evaluations for USACE Property, including Copperas Branch Park and Highland Lakes Park include all appropriate measures to minimize harm and subsequent mitigation necessary to preserve and enhance those features and values that originally qualified each park for Section 4(f) protection. The officials with jurisdiction over each park property have agreed in writing with the assessment of the impacts and the proposed measures to minimize harm; and the mitigation necessary to preserve, rehabilitate and enhance those features and values of the properties; and that such measures would if/when implemented result in a net benefit to the properties. The Draft Nationwide Programmatic Section 4(f) Net Benefit Evaluations are located in **Appendix G** and include documentation of the items listed above, and the results of public and agency coordination for each property. A summary of each Section 4(f) property is included below.

USACE Property, including Copperas Branch Park
The Section 4(f) property owned by the USACE is associated with Lewisville Lake. Lewisville Lake is an outdoor recreational area operated by the USACE as a multi-purpose lake with the primary purpose being flood control and water conservation. The USACE property surrounds portions of IH 35E beginning south of Garden Ridge Boulevard to just north of Denton Drive South and Lewisville Lake. The proposed reconstruction of IH 35E would convert approximately 20.7 acres of additional USACE property (including 6.4 acres from Copperas Branch Park) to a transportation use.

Copperas Branch Park is leased from the USACE by the City of Highland Village and serves the community through events such as the Lion's Club Balloon Festival and Highland Village Days. Copperas Branch Park is designated as intensive recreational use and is located on the shoreline of Lewisville Lake in the northeast corner of Highland Village at the IH 35E service road and Lewisville Lake. The park is approximately 74.9 acres in size and is open year round. The City of Highland Village, who operates Copperas Branch Park, entered into a 20-year lease with the USACE in 2001.

The majority of the proposed reconstruction of IH 35E would impact areas designated as either open water (Lewisville Lake) or intensive recreational use (Copperas Branch Park). Lewisville Lake serves several purposes including fish and wildlife management areas, hydroelectric power generation, and recreational opportunities. Lewisville Lake is primarily used for fishing and boating activities. The shoreline of Lewisville Lake provides numerous recreational opportunities, including camping, picnicking, boating activities, other water sports, swimming, and horse trails. The lake is also a major source of public drinking water for the surrounding communities.

Copperas Branch Park is used for a variety of activities that include baseball, soccer, swimming and other lake related activities. Approximately 37 acres of the 74.9 acres is used for intensive recreational purposes. Currently, the remaining acreage is only accessible by walking trails and is considered passive recreation and are outside of the maintained boundaries of the park. Copperas Branch Park offers covered and uncovered picnic tables, a swim area, boat dock, four-lane concrete ramp and parking for vehicles, restrooms with showers, baseball and soccer fields, and parking for sports participants and picnickers.

Despite the proposed impacts to the USACE property, the proposed mitigation and enhancement measures would improve the park user's experience and the community in general. The project has been designed to ensure that Copperas Branch Park remains a viable community amenity along the roadway corridor.

Highland Lakes Park

Highland Lakes Park is approximately 1.4 acres (60,984 square ft) and is located on the west side of IH 35E, just south of Lewisville Lake in the Highland Lakes Phase II subdivision. The proposed reconstruction of IH 35E would convert approximately 0.5 acre of Highland Lakes Park to a transportation use. Highland Lakes Park is publicly owned and operated by the City of Lewisville. Highland Lakes Park primarily serves as a neighborhood park within the Highland Lakes II subdivision. It is open to the public and visitation is permitted at essentially any time. This small neighborhood park contains approximately 360 linear ft of hike and bike trails, a 5-space parking lot, 4 park benches, 4 picnic tables, 3 trash cans, and 4 barbeque grills.

The proposed mitigation preserves and enhances the features and values of Highland Lakes Park that originally qualified it for Section 4(f) protection. The proposed mitigation and enhancement measures would improve the park user's experience and the community in general.

C.7 Aesthetic Considerations

Alternative A: No-Build Impact

Under the No-Build Alternative for IH 35E, no impacts to aesthetics are anticipated.

Alternative B: Build Impact

Section 136 of the Federal Aid Highway Act of 1970 (Public Law [P.L.] 91-605) requires consideration of aesthetic values in the highway planning process. Aesthetic design guidelines are being developed for IH 35E as part of a Corridor Aesthetic Master Plan that would apply to roadway and community elements, roadside elements, and landscape opportunities along the IH 35E corridor. Design guidelines associated with roadway and community elements that would be incorporated into the Corridor Master Plan include those related to enhanced pavement treatments, vehicular and pedestrian bridges, traffic barriers, sidewalks and approaches, signage, lighting, cross street medians, gateway elements, and under-bridge treatments and lighting. Guidelines associated with roadside elements include those related to retaining walls, noise barriers, and ROW fencing. Landscape opportunities generally include plant massing for the corridor, interchanges, and community gateways for areas within the ROW. The development of the Corridor Aesthetic Master Plan would incorporate context-sensitive solutions that would integrate community values, wishes, and desires into the design of the IH 35E corridor. Stakeholder comments would be considered during the aesthetic design guideline and Corridor Aesthetic Master Plan development process as well as the design process of the proposed facility to minimize the potential for adverse aesthetic impacts and to incorporate desired community-specific aesthetic features. The aesthetic design guidelines and Corridor Aesthetic Master Plan would ultimately function as a guiding tool related to context-sensitive design considerations for contractor implementation of the proposed project.

C.8 Air Quality Assessment

The proposed North Central Texas project is located in Dallas and Denton Counties, which are part of the EPA's designated nine county moderate non-attainment area for the 8-hour standard for the pollutant ozone; therefore, the transportation conformity rule applies. All projects in the NCTCOG's TIP that are proposed for federal or state funds were initiated in a manner consistent with federal guidelines in Section 450, of Title 23 C.F.R. and Section 613.200, Subpart B, of Title 49 C.F.R. Energy, environment, air quality, cost, and mobility considerations are addressed in the programming of the TIP. The proposed IH 35E project is included in and consistent with the area's financially constrained long-range MTP (*Mobility 2030 – 2009 Amendment*) and 2008-2011 TIP, as amended. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on June 12, 2007, and October 31, 2007, respectively.

On-road emissions are anticipated to decrease over time due to the implementation of EPA regulations to improve vehicle technology and fuel. Overall, MSAT, CO and precursors to ground-level ozone (NOx and VOCs) emissions are anticipated to decrease.

As documented in **Section IV.A.8,** modeling results under the worst case conditions indicate that CO concentrations would not exceed the NAAQS for the build scenario either in 2020 or 2030. It is expected, that congestion relief would result in less fuel combustion as there are less vehicles on the road for less periods of time which generally result in less emissions; however, it yields to an increase of VMT (as more roads are built to relief congestion). In addition, congestion relief that reduces idling would reduce idling emissions. Less congestion translates into less cars traveling at lower speeds or idling conditions, for shorter periods of time during peak periods (heavy traffic) and result in less fuel combustion and lower idling emissions. In addition, a quantitative MSAT analysis indicates that by 2030, although VMT increases, MSAT emissions would decrease by 30 percent when compared to 2009. Please refer to **Section IV.A.7** for further details.

Construction activities 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.

C.9 Noise Assessment

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no traffic noise impacts are anticipated to occur in relation to the reconstruction of IH 35E.

Alternative B: Build Impact
This analysis was accomplished in accordance with TxDOT's (FHWA approved) Guidelines for Analysis and Abatement of Highway Traffic Noise.

Sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dBA."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

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) (**Table IV-21**) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur.

Table IV-21: FHWA Noise Abatement Criteria

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

NOTE: primary consideration is given to exterior areas (Category A, B or C) frequently used by humans. However, interior areas (Category E) are used if exterior areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.

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 dBA below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above.

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 dBA. For example: a noise impact would occur at a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11 dBA increase).

When a traffic noise impact occurs, 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 IV-22 and Appendix C**) 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 IV-22: Traffic Noise Levels (dBA Leq)

Receiver	NAC Category	NAC dBA Leq	Existing	Predicted	*Change (+/-)	Noise Impact
R1-Residential	B	67	68	75	+7	Yes
R2-Residential	B	67	69	72	+3	Yes
R3-Residential	B	67	69	72	+3	Yes
R4-Residential	B	67	68	71	+3	Yes
R5-Residential	B	67	72	74	+2	Yes
R6-Residential	B	67	71	71	0	Yes
R7-Residential	B	67	68	68	0	Yes
R8-Residential	B	67	68	68	0	Yes
R9-Residential	B	67	71	73	+2	Yes
R10-Residential	B	67	69	73	+4	Yes
R11-Residential	B	67	70	73	+3	Yes
R12-Residential	B	67	69	73	+4	Yes
R13-Residential	B	67	72	71	-1	Yes
R14-Residential	B	67	72	71	-1	Yes
R15-Place of worship	E	52	49	47	-2	No
R16-Residential	B	67	65	66	+1	Yes
R17-Residential	B	67	71	71	0	Yes
R18-Residential	B	67	71	71	0	Yes
R19-Residential	B	67	67	75	+8	Yes
R20-Residential	B	67	64	70	+6	Yes
R21-Residential	B	67	64	69	+5	Yes
R22-Residential	B	67	63	67	+4	Yes
R23-Residential	B	67	63	66	+3	Yes
R24-Residential	B	67	62	65	+3	No
R25-Residential	B	67	62	64	+2	No
R26-Residential	B	67	61	64	+3	No
R27-Residential	B	67	66	75	+9	Yes
R28-Residential	B	67	66	75	+9	Yes
R29-Residential	B	67	63	69	+6	Yes
R30-Residential	B	67	66	68	+2	Yes
R31-Highland Lakes Park (picnic tables)	B	67	67	69	+2	Yes
R31A-Residential	B	67	59	63	+4	No
R31B-Copperas Branch Park (picnic tables)	B	67	59	63	+4	No
R32-Residential	B	67	64	67	+3	Yes
R32A-Residential	B	67	59	61	+2	No
R33-Residential	B	67	63	62	-1	No
R34-Residential	B	67	63	66	+3	Yes
R35-Residential	B	67	67	69	+2	Yes
R36-Residential	B	67	65	66	+1	Yes
R37-Residential	B	67	66	66	0	Yes
R38-Residential	B	67	66	67	+1	Yes
R39-Residential	B	67	62	62	0	No
R40-Residential	B	67	66	70	+4	Yes
R41-Residential	B	67	56	58	+2	No
R42-Residential	B	67	63	61	-2	No
R43-DeLay Middle School Track	B	67	64	62	-2	No
R44- DeLay M.S. Building	E	52	48	48	0	No

Note: ‘0’ and/or ‘-’ changes occurred as a result of changes in horizontal and vertical alignment.

As indicated in **Table IV-22**, 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 incorporated into the project, it must be both feasible and reasonable. In order to be feasible, the measure should reduce noise levels by at least five dBA at impacted receivers; and to be reasonable it should not exceed $25,000 for each benefited receiver.

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dBA 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:

R13, R14, R35, and R36: these receivers represent separate, individual residences along the IH 35E corridor. Noise barriers that would achieve the minimum feasible reduction of 5 dBA in noise at each of these receivers would exceed the reasonable, cost-effectiveness criterion of $25,000.

However, noise barriers were determined to be both feasible and reasonable along portions of the IH 35E corridor as listed in **Table IV-23** and depicted in **Appendix C**, and are proposed for incorporation into the project. The total cost of the barriers would be $3,579,048, a total of $24,514 per benefited receiver. Any subsequent project design changes may require a reevaluation of this proposal. The final decision to construct the proposed noise barriers would be made upon completion of the project design, utility evaluation and the polling of adjacent property owners. Preliminary noise barriers 5D and 6, included in **Appendix C: Corridor Maps, Sheets 14 and 16**, appear to be over water because the proposed edge of pavement/bridge is not shown on the maps.

Table IV-23: Noise Barrier Proposal (preliminary)

Barrier (s)	Limits/Location	Impacted Receivers	Total # of Benefited Structures	Length (feet)	Height (feet)
1A, 1B, and 1C	Along the proposed ROW from south of South Shore Pl. to north of North Shore Pl.	R1 through R5	15	1,702	8, 12
2A and 2B	Along the proposed ROW from south of Lakeshore Dr. to south of Fox Ave.	R6 through R9	12	1,088	8, 14
3A and 3B	Along the proposed ROW from north of Fox Ave. to south of Purnell St.	R10, R11, R12	6	800	10
4	Along the NBML from south of College St. to south of Millican Dr.	R16, R17, R18	6	1,000	12, 14
5A, 5B, 5C, and 5D	From south of Boggard Ln. to Copperas Branch Park. 5A: along the SBML; 5B: along the proposed ROW; 5C: along the SBML partially on structure; and 5D: along the SBML on structure.	R19 through R23, R27 through R31	46	5,569	10, 12
6	Along the SBML from Lewisville Lake to north of Country Ln.	R32, R34	23	2,725	12
7A and 7B	North of Hickory Creek Rd. 7A: along the SBFR and 7B: along the SBML.	R37, R38	19	2,081	8, 10, 14
8	Along the SBML from south of Northfield Cir. to just south of FM 2181.	R40	19	1,437	18

Access to the four concurrent tolled HOV/managed lanes would be limited to those who elect or can only on occasional basis afford to pay the toll. Because the proposed project would provide non-toll alternatives (eight non-toll mainlanes, four in each direction), it is expected that traffic would, for the most part continue to travel the mainlanes regardless of the HOV/managed lanes tolling. Therefore, no other traffic noise impacts to the community are anticipated in addition to those already analyzed and presented above.

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 would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

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

C.10 Traffic Operations

The reconstruction of the proposed project includes the addition of two mainlanes (one in each direction); four tolled HOV/managed lanes (two in each direction); and two and three-lane continuous frontage roads in each direction. The proposed frontage road reconstruction would result in a continuous frontage road system within the project limits. Although it is anticipated that the increased capacity and continuous frontage roads would benefit the local roadway system, a traffic study area was developed to better analyze traffic operations between the Build and No-Build scenarios. The traffic study area is a 79 square mile area that includes the study corridor TSZs.

Congestion can best be described in terms of LOS and travel speeds along a roadway. The LOS is a qualitative measure of describing operational conditions within a traffic stream or at an intersection, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The LOS are designated A through F (A being the best and F the worst) and cover the entire range of traffic operations that may occur. Descriptions of LOS A through F are presented in **Table IV-24**.

Table IV-24: Levels of Service

LOS	Flow Conditions	Technical Description
A		Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. **No Delays**
B		Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. **No Delays**
C		Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful in making lane changes. **Minimal Delays**
D		Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. **Minimal Delays**
E		Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. **Significant Delay**
F		Very congested traffic with traffic jams, especially in areas where vehicles have to merge. **Considerable Delays**

Source: California Department of Transportation (Caltrans), 2003.

The direct impacts analysis entailed the comparison of the number of lane-miles operating under different LOS between Build and No-Build Alternatives in 2030 during the AM peak hour. **Table IV-25** summarizes the anticipated number of lane-miles in 2030 for different LOS conditions during the AM peak hour for the Build and No-Build Alternatives. The LOS comparison indicates that there would be an increase in lane-miles operating under LOS A-B-C along both the mainlanes and HOV/managed lanes under the Build Alternative.

The traffic operations analysis entailed the comparison of the number of lane-miles operating under different LOS between Build and No-Build scenarios in 2030 during the AM peak hour. As summarized in **Table IV-25,** the anticipated number of lane-miles in 2030 for different LOS conditions during the AM peak hour for the Build and No-Build Alternatives indicates that there would be an increase in lane-miles operating under LOS A-B-C along both the general purpose lanes (mainlanes) and HOV/managed lanes under the Build scenario. Under the Build scenario there would be a total of 43 lane-miles of HOV/managed lanes operating under LOS A, B and C or 100 percent increase over the No-Build scenario (there would be no HOV/managed lanes

under the No-Build scenario). The analysis also indicates that under the Build scenario, there would be a total of 107 lane-miles or a 45 percent increase of general purpose/mainlanes operating under LOS A, B, and C when compared to 74 lane-miles under the No-Build scenario. Under the Build scenario there would be a total of 66 lane-miles or a 3 percent decrease of general purpose/mainlanes operating under LOS F when compared to the No-Build scenario. **Appendix D** contains a copy of the NCTCOG Complete Performance Reports performed for the analysis.

Table IV-25: 2030 Level of Service Along the IH 35E Middle Project Limits

Location	LOS No-Build Alternative	LOS Build Alternative	Percent Increase of Lane-Miles Operating under LOS A-B-C (Build versus No-Build Alternative)
HOV/Managed Lane	A-B-C (0)	A-B-C (43 lane-miles)	100
	D-E (0)	D-E (10 lane-miles)	
	F (0)	F (13 lane-miles)	
Total lane-miles	**0**	**66**	
Mainlanes	A-B-C (74 lane-miles)	A-B-C (107 lane-miles)	45
	D-E (30 lane-miles)	D-E (38 lane-miles)	
	F (68 lane-miles)	F (66 lane-miles)	
Total lane-miles	**172**	**211**	

Source: NCTCOG TransCAD® data for 2030 daily traffic Build and No-Build Alternatives (February 2009 Complete Performance Reports for the IH 35E Middle Project)

During the construction stages, traffic would follow the existing traffic patterns. It is anticipated that reconstruction of the facility would be completed without the use of detours; however, temporary lane closures may occur. All lane closures would comply with the FHWA Manual on Uniform Traffic Control Devices (MUTCD) standards. In the event that detours are required, city and local public safety officials would be notified of the proposed detours. Any detour timing and necessary rerouting of emergency vehicles would be coordinated with the proper local agencies.

C.11 Summary of Community Impact Assessment

Table IV-26 provides a summary of the anticipated community impacts assessment. The table includes a profile of the communities' demographics (based on *Census 2000* data); anticipated forecasts including population, household, and employment growth percentages; and anticipated community impacts associated with the proposed IH 35E project.

Table IV-26: Community Impact Assessment Summary

Community	Community Demographic Profile[1]				Demographic Forecast[2]			Summary of Potential Community Impacts						
	Total Population (2000) & Percentage Minority Population (2000)	**Median Household Income & Percentage Low Income Population (2000)**	**Total Housing Units & Percentage Occupied (2000)**	**Housing Tenure – Percentage Owner and Renter Occupied (2000)**	**Population Growth Percentage (2000-2030)**	**Household Growth Percentage (2000-2030)**	**Employment Growth Percentage (2000-2030)**	**Community Cohesion**	**Displacements[3]/ Potential Number of Impacted Employees**	**Public Facilities and Services**	**Section 4(f) and 6(f) Properties**	**Air Quality**	**Traffic Noise**	**Traffic Operations**
City of Carrollton	109,215; 36.8%	$62,406; 5.6%	40,533; 96.6%	65.5% owner; 34.5% renter	13.4%	13.8%	21.9%	No anticipated change to the existing social interaction of neighborhoods as IH 35E is an established interstate transportation corridor.	Residential – 2 Commercial – 4 (64 potentially impacted employees) Other – 1 **Total – 7**	No anticipated impacts.	Future T.C. Rice Athletic Complex; 4(f) not required, transportation exemption.	On-road emissions are anticipated to decrease over time. Overall, MSAT, CO, NOx, and VOC emissions are anticipated to decrease.	The project would result in a traffic noise impact with no reasonable and feasible abatement.	The LOS comparison indicates that there would be an increase of 45% in the number of lane-miles operating under the A-B-C LOS. This would translate into an improvement of LOS.
City of Corinth	11,424; 13.5%	$78,345; 1.5%	4,163; 94.6%	95.7% owner; 4.3% renter	138.1%	139.9%	45.7%	No anticipated change to the existing social interaction of neighborhoods as IH 35E is an established interstate transportation corridor.	Residential – 2 Commercial – 3 (35 potentially impacted employees) Other – 0 **Total – 5**	No anticipated impacts.	No anticipated impacts.	On-road emissions are anticipated to decrease over time. Overall, MSAT, CO, NOx, and VOC emissions are anticipated to decrease.	The project would result in a traffic noise impact with no reasonable and feasible abatement.	
Town of Hickory Creek	2,045; 8.9%	$69,313; 4.1%	802; 95.4%	90.7% owner; 9.3% renter	99.3%	101.8%	125.7%	No anticipated change to the existing social interaction of neighborhoods as IH 35E is an established interstate transportation corridor.	Residential – 4 Commercial – 9 (231 potentially impacted employees) Other – 5 **Total – 18**	The Hickory Creek Public Works and Animal Services Facility are anticipated to be displaced.	No anticipated impacts.	On-road emissions are anticipated to decrease over time. Overall, MSAT, CO, NOx, and VOC emissions are anticipated to decrease.	The project would result in a traffic noise impact. Noise barriers No. 6, 7A, 7B, and 8 were determined to be reasonable and feasible and is proposed for incorporation into the project.	

Community	Community Demographic Profile[1]				Demographic Forecast[2]			Summary of Potential Community Impacts						
	Total Population (2000) & Percentage Minority Population (2000)	**Median Household Income & Percentage Low Income Population (2000)**	**Total Housing Units & Percentage Occupied (2000)**	**Housing Tenure – Percentage Owner and Renter Occupied (2000)**	**Population Growth Percentage (2000-2030)**	**Household Growth Percentage (2000-2030)**	**Employment Growth Percentage (2000-2030)**	**Community Cohesion**	**Displacements[3]/ Potential Number of Impacted Employees**	**Public Facilities and Services**	**Section 4(f) and 6(f) Properties**	**Air Quality**	**Traffic Noise**	**Traffic Operations**
City of Highland Village	12,163; 7.3%	$102,141; 0.4%	4,008; 96.5%	96.5% owner; 3.5% renter	53.3%	49.5%	68.6%	No anticipated change to the existing social interaction of neighborhoods as IH 35E is an established interstate transportation corridor.	No anticipated displacements.	No anticipated impacts.	Leases Copperas Branch Park from USACE; 6.4 acres impacted, 4(f) prepared; conceptual mitigation plan developed to ensure park remains a viable amenity.	On-road emissions are anticipated to decrease over time. Overall, MSAT, CO, NOx, and VOC emissions are anticipated to decrease.	The project would result in a traffic noise impact. Noise barrier No. 5D was determined to be reasonable and feasible and is proposed for incorporation into the project.	The LOS comparison indicates that there would be an increase of 45% in the number of lane-miles operating under the A-B-C LOS. This would translate into an improvement of LOS.
City of Lake Dallas	5,992; 14.1%	$51,660; 6.6%	2,268; 96.3%	73.1% owner; 26.9% renter	44.3%	44.1%	41.6%	No anticipated change to the existing social interaction of neighborhoods as IH 35E is an established interstate transportation corridor.	Residential – 1 Commercial – 1 (5 potentially impacted employees) Other – 1 **Total – 3**	No anticipated impacts.	No anticipated impacts.	On-road emissions are anticipated to decrease over time. Overall, MSAT, CO, NOx, and VOC emissions are anticipated to decrease.	The project would result in a traffic noise impact with no reasonable and feasible abatement.	
City of Lewisville	77,514; 29.8%	$54,771 6.0%	31,720; 94.7%	53.8% owner; 46.2% renter	41.8%	40.8%	68.5%	No anticipated change to the existing social interaction of neighborhoods as IH 35E is an established interstate transportation corridor.	Residential – 56 Commercial – 76 (846 potentially impacted employees) Other – 15 **Total - 147**	A water tower is anticipated to be displaced.	Operates Highland Lakes Park; 0.5 acre impacted; 4(f) prepared; mitigation enhancements would result in net benefit of new parkland enhancements.	On-road emissions are anticipated to decrease over time. Overall, MSAT, CO, NOx, and VOC emissions are anticipated to decrease.	The project would result in a traffic noise impact. Noise barriers No. 1A, 1B, 1C, 2A, 2B, 3A, 3B, 4, 5A, 5B, and 5C were determined to be reasonable and feasible and are proposed for incorporation into the project.	

[1] U.S. Census Bureau, *Census 2000*, SF3 data.
[2] NCTCOG 2030 Demographic Forecast – All projections based on 2000 city boundaries.
[3] Other = Government facility or unknown use.

D. Other Resources

D.1 Historical Sites

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, additional ROW would not be acquired; therefore, no impacts to historical sites are anticipated.

Alternative B: Build Impact
NEPA requires consideration of important historic, cultural, and natural aspects of our national heritage. Important aspects of our national heritage that may be present in the project corridor have been considered under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. This act requires Federal agencies to "take into account" the "effect" that an undertaking would have on "historic properties." Historic properties are those included in or are eligible for inclusion in the National Register of Historic Places (NRHP) and may include structures, buildings/districts, objects, cemeteries, and archeological sites. In accordance with the Advisory Council on Historic Preservation (ACHP) regulations pertaining to the protection of historic properties (36 Code of Federal Regulations [CFR] 800.4), Federal agencies are required to identify and evaluate historic-age resources for NRHP eligibility and assess the effects that the undertaking would have on historic properties. These steps shall be completed under terms of the Programmatic Agreement (PA) among FHWA, the State Historic Preservation Officer (SHPO), ACHP, and TxDOT.

In March 2003, a Reconnaissance Standing Structures Survey was conducted for the proposed project in conjunction with the EA documents for the South and North sections. Repositories consulted included the NRHP, the Texas Historical Commission (THC) Historic Marker files, other readily available historical and archival sources, and state agency resources for references to identify any previously documented historic resources in the project area. In addition, historic maps were reviewed for locations of potential historic resources. A review was also made of the Dallas and Denton Central Appraisal District (CAD) online resources to obtain construction dates for the buildings included in the survey area. A total of 215 historic-age sites were identified within the project area's initial 500 ft area of potential effect (APE). No sites documented in the 2003 survey were listed or determined eligible for inclusion in the NRHP. **Appendix E** contains correspondence with the local preservation contacts for the proposed project (Denton County Historical Commission and Certified Local Government Historic Contact), as well as a concurrence letter signed by THC on November 22, 2004. The letter from THC concurs that no historical sites listed in, or determined eligible for designation in the National Register of Historic Places would be affected by the proposed project and that no further historical investigation is required.

Since that time, it has become necessary for an addendum historic resources survey to be conducted along three intersections of IH 35E due to changes in proposed ROW. The areas requiring additional research did not fall within the initial 500 ft APE; however, it has been determined in consultation with the SHPO that the APE for the addendum survey is limited to 150 feet beyond the edge of the existing or proposed ROW.

A review of the NRHP, the list of State Archeological Landmark (SAL), and the list of Recorded Texas Historic Landmark (RTHL) indicates that no properties are listed in the NRHP. No other historically significant properties have been previously documented within the APE. There are

no Official Texas Historical Markers located within the project's APE. The addendum reconnaissance survey of the project area identified four resources that appear to be at least 50 years of age (constructed before 1963). The surveyed resources are twentieth century educational, commercial, and/or residential properties. TxDOT Historians have determined and THC concurred that all four resources are not eligible for National Register listing either individually or collectively as historic districts. Please see the THC concurrence letter, dated October 16, 2007, in **Appendix E**.

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects" of the Programmatic Agreement for Transportation Undertakings between FHWA, SHPO, the ACHP, and TxDOT and the Memorandum of Understanding (MOU), TxDOT Historians have determined and THC concurred that no historic resources are present within the proposed project's APE.

D.2 Archeological Sites

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, additional ROW would not be acquired; therefore, no impacts to archeological sites are anticipated.

Alternative B: Build Impact
In August 2003 an archeological survey was conducted for the proposed project. The state archeological site files at the Texas Archeological Research Laboratory (TARL) in Austin, as well as the State Site Atlas, were consulted. A total of 28 archeological sites are recorded within one mile of the project area.

The archeological survey in 2003 was conducted on undeveloped portions of a 150-ft wide APE on either side of the proposed project area where right of entry (ROE) had been obtained. In accordance with the research design (Texas Antiquities Permit Number 3329), the area was subjected mostly to a limited reconnaissance survey, with shovel tests excavated only in those areas that appeared to retain intact deposits and that surrounded primary streams.

Sixty-five shovel tests were excavated in eight areas within the project limits. Shovel testing occurred in the following areas: west of IH 35E at FM 2181; west of IH 35E at Turbeville Road.; east and west of IH 35E at FM 407; west of IH 35E at Garden Ridge Boulevard; west of IH 35E at Valley Ridge Boulevard; and east and west of IH 35E at the Elm Fork of the Trinity River. The shovel tests varied in depth from 6 to 40 inches. Excavation was most often terminated when the subsurface B-horizon was reached, although in isolated cases it terminated when impenetrable barriers such as rocks or roots were encountered.

The survey revealed that most of the area was impacted to a point well beyond 150 ft on each side of IH 35E by factors including residential and commercial development, overhead and buried utilities, highway and bridge construction, and stream channelization. The majority of this area displays urbanization associated with the Cities of Lewisville, Hickory Creek and Lake Dallas.

A letter from THC on May 4, 2004, concurred that no archeological sites listed in, or determined eligible for designation in the National Register of Historic Places would be affected by the proposed project and that no further archeological investigation is required as documented in **Appendix E**.

A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties (36 CFR 800.16(1)). Section 106 review and consultation proceeded in accordance with the First Amended Programmatic Agreement among the FHWA, TxDOT, the TSHPO, and the ACHP Regarding the Implementation of Transportation Undertakings (PA-TU), as well as the MOU between the Texas Historical Commission and TxDOT.

Section 106 consultation with federally recognized Native American tribes with a demonstrated historic interest in the area was initiated on August 7, 2003. No objectives or expressions of concern were received within the comment period of 30 days.

In coordination with TxDOT's Cultural Resource Management staff, an additional archeological survey was conducted on August 18, 2006, along the exposed shoreline at Lewisville Lake and in the area north of Lewisville Lake and south of Country Lane on the west side of IH 35E. A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties or SAL in the APE and fieldwork did not reveal any new sites. A letter from THC on August 23, 2006, concurred that no archeological sites listed in, or determined eligible for designation in the NRHP would be affected by the proposed project and that no further archeological investigation is required (**Appendix E**).

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

D.3 Hazardous Materials

Alternative A: No-Build Impact

Under the No-Build Alternative for IH 35E, no impacts to hazardous wastes/substances are anticipated.

Alternative B: Build Impact

Visual Survey

A visual survey of the proposed project area was conducted for evidence of hazardous substances and/or contamination on January 22 and 23, 2009. This survey included a visual observation of properties located along and immediately outside of the project limits to identify the release or threatened release of petroleum products or other hazardous substances. Several additional sites were identified during the field investigations which were not identified in the database search. These sites consisted of five petroleum storage tank sites (three above-ground and two underground), two auto repair shops, one drycleaner, and one chemical storage site. Each of the sites identified in the field was assessed for the potential to encounter hazardous materials during construction and were assigned site numbers N1-N9.

Regulatory Records Review

A review of regulatory databases was conducted for the project area to determine if any known sites producing, storing, and/or disposing of toxic or hazardous materials might affect the proposed project. These databases were obtained directly from government sources and are updated on approximately quarterly intervals. This assessment was conducted in accordance with the American Society for Testing and Materials (ASTM) Practice E1528-05 (Transaction Screen Process), with exceptions to accommodate the particular situations and needs of TxDOT roadway projects. The regulatory database lists reviewed are presented in **Appendix D: Hazardous Materials Regulatory Database Summary**.

The ASTM radius search of the proposed project area was reviewed. The database search identified and located 192 sites. The sites identified consisted of 6 Resource Conservation and Recovery Act- Generator (RCRA-G) sites, 1 Department of Defense (DOD) site, 1 Spill Listings (SPILLS) site, 7 Dry Cleaner Registration (DCR) sites, 31 Industrial Hazardous Waste (IHW) sites, 70 Petroleum Storage Tanks (TXPST) sites, 2 Affected Property Assessment Reports (APAR) sites, 48 Texas Leaking Underground Storage Tanks (TXLPST) sites, 22 Tier II Chemical Reporting Program (Tier II) sites, and 4 Texas Voluntary Cleanup Program (TXVCP) sites.

Based on distance, topographic gradient, historical information, database information, and property impacts, 13 sites are categorized as high risk (**Table IV-27**). Sites considered likely to be contaminated and within the proposed ROW are categorized as "high risk". Examples of "high risk" sites include landfills and leaking underground storage tank (TXLPST) sites. Sites are categorized as "low risk" if available information indicates that some potential for contamination exists, but the site is not likely to pose a contamination problem to highway construction. Forty-one (41) sites are characterized as low risk (**Table IV-28**). The locations of these sites are shown on **Appendix C: Corridor Maps**.

Table IV-27: High Risk Sites

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient Compared to IH 35E and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
3	IH 35 S. approx ½ mile S. of Hwy 121 exit Lewisville, TX 75067	SPILLS	SPILLS (ID# 1/29/94005) - Material spilled was unknown resin. Quantity was 55 gallons.	The site is located within the existing ROW. Spill occurred in January 1994.	7
7	Shell/Star Enterprises Inc. 802 S Stemmons Fwy Lewisville, TX 75067	TXLPST, TXPST, IHW	TXLPST (ID# 091581) – (4.1) Groundwater impacted, no apparent threats or impact to receptors. (6P) Final concurrence pending documentation of well plugging. TXPST (ID# 0013423) – Four 10,000 to 12,000-gallon gasoline storage tanks have been in use since January 1983.	The site is downgrade. It is anticipated that the entire parcel (D35) would be acquired.	8

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient Compared to IH 35E and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
8	Sunny's Food Mart/Fuel 4 Texas (formerly Snap E. Jack 3) 2997/2999 Stemmons Lewisville, TX 75067	TXLPST, TXPST	TXLPST (ID# 108311) – (4.1) Groundwater impacted, no apparent threats or impact to receptors. (6A) Final concurrence issued, case closed. TXPST (ID# 0000960) – Three 4,000 to 6,000-gallon gasoline storage tanks were removed from the ground in January 1994. Two 10,000-gallon gasoline storage tanks have been in use since May 1994.	The site is at-grade. It is anticipated that the entire parcel (D88) would be acquired.	14
9	Circle K Store 2706338 660 N Stemmons Lake Dallas, TX 75065	TXLPST, TXPST	TXLPST (ID# 116103) – (4.1) Groundwater impacted, no apparent threats or impact to receptors. (2) Site assessment. TXPST (ID# 0068216) – Two 12,000-gallon tanks in use for storage of gasoline since January 1996.	The site is at-grade. It is anticipated that the entire parcel (D70) would be acquired.	19
15	Vacant (formerly Just Brakes) 400 S Stemmons Lewisville, TX 75067	IHW	IHW (ID# 031038) – Inactive non-industrial and/or municipal waste generator; type and amount of waste not reported.	The site is at-grade. It is anticipated that the entire parcel (D52) would be acquired.	9
25	Dent Doctor (formerly Massad Property) 946 S. Stemmons Fwy Lewisville, TX 75057	VCP, APAR	VCP/APAR (ID# 1427) - The site is listed as a drycleaners/ marine boat service facility. Contamination from VOCs, chlorinated solvents, total petroleum hydrocarbons (TPH), and lead has affected soil/ groundwater. Clean up methods include excavation/ disposal and HRC injection. Certificate of Completion was issued in March 2008.	The site is downgrade. It is anticipated that additional ROW would be acquired along the southwestern limit of the property. No buildings would be displaced.	8
28	Sam Packs Ford (formerly Village Ford of Lewisville Inc) 1444 N. Stemmons Lewisville, TX 75067	TXLPST, TXPST, IHW	TXLPST (ID # 095429) – (4.2) No groundwater impact, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed. TXLPST (ID# 098427) – (2A) Groundwater other than drinking water aquifer, site characterization incomplete. (6A) Final concurrence issued, case closed. TXPST (ID# 0068902) – One 2,000-gallon above-ground gasoline storage tank in use since August 1996. TXPST (ID# 0012588) – Two gasoline storage tanks removed from the ground in November 1989; capacity not reported.	The site is at-grade. It is anticipated that additional ROW would be acquired along the western limits of the property. No buildings would be displaced.	11

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient Compared to IH 35E and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
29	Huffines Dodge Inc IH35E at Hwy 121 Lewisville, TX 75067	TXLPST, TXPST, IHW, TIER II	TXLPST (ID# 100006) – (4A) Soil contamination only, requires full site assessment and remedial action plan. (6A) Final concurrence issued, case closed. TXPST (ID# 0069923) – One 4,000-gallon above-ground gasoline storage tank in use since September 1997. TXPST (ID# 0020709) – Two gasoline storage tanks were removed from the ground in October 1990; capacity not reported. Seven 40-gallon underground storage tanks have been in use since January 1981; storage contents not reported. TIER II – Facility passed all validation checks.	The site is at-grade. It is anticipated that ROW would be acquired along the southwestern limits of the property. No buildings would be displaced.	8
40	Republic Gold and Diamond (formerly Texaco/Star Enterprises Inc.) 1131 S Stemmons Fwy Lewisville, TX 75067	TXLPST, TXPST, IHW	TXLPST (ID# 108340) - (4.1) Groundwater impacted, no apparent threats or impact to receptors. (6A) Final concurrence issued, case closed. TXPST (ID# 0013496) – Four 10,000 to 12,000-gallon gasoline and diesel storage tanks were removed from the ground in November and December 2002.	The site is at-grade. It is anticipated that the entire parcel would be acquired. (D130)	7
42	Huffines Chevrolet 1400 S. Stemmons Lewisville, TX 75067	TXLPST, TXPST, IHW, TIER II	TXLPST (ID# 116339) - (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (2) Site Assessment. TXPST (ID# 0044496) – 29 55-gallon underground storage tanks have been in use since January 1987; the stored substance is not reported. TXPST (ID# 0020361) - Two 6,000-gallon diesel storage tanks were removed from the ground in August 2001. Two 500 gallon used oil storage tanks were removed from the ground in September 1994. TXPST (ID # 0071915) - One 6,000-gallon above-ground gasoline storage tank has been in use since 1999. TIER II – Facility passed all validation checks.	The site is at-grade. It is anticipated that additional ROW would be acquired along the western limit of the property. No buildings would be displaced.	7
57	Fast Sticker Inspection and Auto Mechanic (formerly Carroll Shell) 611 W. Main Lewisville, TX 75067	TXLPST, TXPST	TXLPST (ID# 115175) - (4.1) Groundwater impacted, no apparent threats or impact to receptors. (6P) Final concurrence pending documentation of well plugging. TXPST (ID# 0032126) – Three 4,000 to 6,000-gallon gasoline storage tanks were removed from the ground in August 2000; one additional tank (capacity and contents unknown) was also removed at the time.	The site is downgrade. It is anticipated that the entire property (D55) would be acquired.	9

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient Compared to IH 35E and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
N5	Shell gas station, 307 Hundley Dr., Lake Dallas, TX	Not identified in database search.	Site was identified in the field; pump island, tanks visible	The site is downgrade of proposed improvements. It is anticipated that ROW would be acquired, including pump island, from the southern limit of the property.	18
N6	Former gas station (likely site of former "Roadie's"), 1002 Hundley Dr., Lake Dallas	Not identified in database search.	This site is an old gas station which may contain underground storage tanks of unknown status. The site was identified during visual survey.	The site is downgrade. It is anticipated that the entire parcel (D68) would be acquired.	18

[1] Site No. corresponds to Map ID# listed in Database Report (2008).
[2] Displacement numbers refer to the Displacements Table in **Appendix D** and Corridor Maps in **Appendix C**.

Eight of the high risk sites have a reported LPST. Sites 8, 28, 29, and 40 are all at-grade with the proposed improvements and have received final concurrence and case closed. Sites 9 and 42 are at-grade with the proposed improvements and in the site assessment phase. Sites 7 and 57 are both down-grade of the proposed improvements and are pending documentation of well plugging. Each of the LPST sites would have a portion or the entire parcel acquired. Site 15 is inactive non-industrial and/or municipal waste generator and the entire parcel would be acquired. The visual survey identified two properties (N5 and N6) which are former gas stations. These sites and tank systems would be addressed during the ROW negotiation and acquisition process. Additional ROW would be acquired from one VCP site (Site 25) down-grade of the proposed project which contains soil /groundwater contamination from VOCs, chlorinated solvents, TPH, and lead. One SPILLS site (Site 3) is categorized as high risk due to the vague nature of the "unknown resin" that was spilled. During final design, additional investigation would be required to confirm if contamination would be encountered during construction. If contamination is confirmed, then TxDOT would develop appropriate soils and/or groundwater management plans for activities within these areas.

Table IV-28: Low Risk Sites

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
4	Old Gas Station (Lkdl Rin Lw Rptr Bldg) IH 35 & Kelton Ave Lake Dallas, TX 75065	TXPST	TXPST (ID# 0019433) – One 550-gallon diesel storage tank was removed from the ground in November 1993.	The site is at-grade and is located within the existing ROW.	17
6	Victory Management Services Attorney at Law (formerly Systems Logistics) 3000 S Stemmons Lake Dallas, TX 75065	IHW	IHW (ID# 19697) – Inactive waste transporter; type of waste not reported.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. Visual survey observed this facility is no longer a transporter of hazardous waste.	18

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
11	Denco Equipment and Trucking (formerly LTC) 802 N Stemmons Lewisville, TX 75067	TXPST	TXPST (ID# 0025520) – One 8,000-gallon diesel storage tank was removed from the ground in January 1992.	The site is downgrade from the proposed improvements. It is anticipated that additional ROW would be acquired along the western limit of the property.	10
12	Vacant lot – no building; scraped (formerly Arentco Rental & Sales) 510 S Stemmons Fwy Lewisville, TX 75067	TXPST	TXPST (ID# 0021249) – One 4,000-gallon tank was removed from the ground in February 1994; the contents of the tank are unknown.	The site is at-grade and the entire parcel would be acquired.	9
13	Lowes of Lewisville TX 0551 1051 Stemmons Fwy Lewisville, TX 75067	TXPST	TXPST (ID# 0079234) – One 1,500-gallon above-ground diesel storage tank has been in use since December 1997.	The site is at-grade. It is anticipated that additional ROW would be acquired along the east limit of the property.	11
16	State Inspections (formerly Chevron USA Inc) 797 S Stemmons Lewisville, TX 75067	TXLPST, TXPST, IHW	TXLPST (ID# 098616) – (3.5) A designated major or minor aquifer is impacted. (6A) Final concurrence issued, case closed. TXPST (ID# 0005673) – Four 9,728-gallon gasoline storage tanks were removed from the ground in April 2003.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property.	9
18	Enterprise Rent-a-Car (formerly Bobs Tire & Auto Center) 301 Huffines Plz Lewisville, TX 75067	IHW	IHW (TCEQ ID# 023901) - Small quantity non-industrial and/or municipal generator; registration inactivated due to lack of activity	The site is at-grade. It is anticipated that additional ROW would be acquired along the southwest limit of the property.	8
19	Kia Dealership (formerly Bankston Honda/Toyota of Lewisville/Jim McNatt Honda) 1653 S Stemmons Fwy Lewisville, TX 75067	TXPST, TIER II, RCRAG, IHW	TXPST (ID# 0056385) – One 6,000-gallon gasoline storage tank was removed from the ground in November 1991.	The site is downgrade. It is anticipated that additional ROW would be acquired along the northeast limit of the property. No buildings would be displaced.	6
20	Lewisville ISD Transportation Dept 601 Purnell Street Lewisville, TX 75067	TXLPST	TXLPST (ID# 113873) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed. No other tanks reported.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property.	9
22	Toyota of Lewisville 1547 S Stemmons Fwy Lewisville, TX 75067	TXPST	TXPST (ID# 0077293) – One 2,000-gallon above-ground gasoline storage tank has been in use since October 2004.	The site is upgrade. It is anticipated that additional ROW would be acquired along the northeast limit of the property. No buildings would be displaced.	6
23	Highland Lakes Chevron 877 S Stemmons Fwy Lewisville, TX 75067	TXPST	TXPST (ID# 0073535) – One 15,000-gallon gasoline underground storage tank has been in use since April 1999.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property.	8

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
27	Lewisville Beverages Shell/Lewisville Exxon RS 67199 101 S Stemmons Fwy Lewisville, TX 75067	TXPST, IHW	TXPST (ID# 0044362) – Three underground gasoline storage tanks ranging from 8,000 to 12,000 gallons and one 10,000-gallon diesel storage tank have been in use since January 1983.	The site is upgrade. It is anticipated that additional ROW would be acquired along the north and east limits of the property. (D102).	9
30	Valero/Big Jacks Groceries 1850 Stemmons Lewisville, TX 75067	TXLPST, TXPST	TXLPST (ID# 113796) - (4.1) Groundwater impacted, no apparent threats or impact to receptors. (6A) Final concurrence issued, case closed. TXPST (ID# 0008171) – Four 6,000 to 10,000-gallon gasoline and diesel storage tanks have been in use since January 1985.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property..	12
31	Floor and More (formerly Royal Tire Company/ Stemmons Phillips 66) 1844 N Stemmons Lewisville, TX 75057	TXPST, TXLPST	TXLPST (ID# 114009) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed. TXPST (ID# 0038651) – Three 4,000-gallon gasoline and two 1,500-gallon diesel storage tanks were removed from the ground in July 2001. One 500-gallon used oil storage tank was permanently filled in place in December 1993.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property.	12
33	Fina (formerly Stop and Shop 1) 1201 S Stemmons Fwy Lewisville, TX 75067	TXPST	TXPST (ID# 0057764) – Three 10,000-gallon underground gasoline storage tanks have been in use since January 1991.	The site is at-grade. It is anticipated that the entire parcel (D133) would be acquired.	7
34	Bankston Nissan Lewisville 1601 S Stemmons Fwy Lewisville, TX 75067	TIER II, TXPST	TXPST (ID# 0069582) – One 2,000-gallon above-ground gasoline storage tank has been in use since May 1997.	The site is at-grade. It is anticipated that additional ROW would be acquired along the east limit of the property. No buildings would be displaced.	6
35	Tetco 450 8300 Stemmons Fwy Lewisville, TX 75067	TXPST	TXPST (ID# 0070481) – One 14,976-gallon and one 19,703-gallon gasoline storage tank have been in use since January 1998.	The site is upgrade. It is anticipated that the entire parcel (D75) would be acquired.	19
36	Blue Bell Creameries, L.P. 1202 N. Stemmons Fwy Lewisville, TX 75067	TIER II, TXPST	TXPST (ID# 0037819) – One 4,000-gallon gasoline and one 10,000-gallon diesel storage tank have been in use since January 1982.	The site is at-grade. It is anticipated that additional ROW would be acquired along the western limit of the property.	11
37	Allstate Transmissions (formerly Aamco Service Center) 1301 S Stemmons Lewisville, TX 75067	TXPST	TXPST (ID# 0040383) – One 1,125-gallon used oil storage tank was removed from the ground in August 1987.	The site is at-grade. It is anticipated that the entire parcel (D135) would be acquired.	7

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
38	Coronado Stone Products 1120 S Texas St, Suite L Lewisville, TX 75067	TIER II	TIER II (ID# 4Z14F9002HV0) - Cement, pumice, iron oxide, sand, oxyvinyl, vicron 15-15, and DIDP are stored at the facility. This facility passed all validation checks.	The site is at-grade. Only the entrance to the plant abuts the frontage road; no ROW impact.	7
39	Service King Paint and Body Inc 2129 S Stemmons Lewisville, TX 75067	RCRAG, IHW	Site (EPA ID# TXR000022772) - The facility is a small quantity generator of non-industrial and-or municipal waste.	The site is downgradient and adjacent to the proposed project. No additional ROW would be required at this property.	5
43	Phil Dill Boats Inc 1520 N Stemmons Lewisville, TX 75067	TXLPST, TXPST, IHW	TXLPST (ID# 102016) – (6) Minor soil contamination, no remedial action required. (6A) Final concurrence issued, case closed. TXPST (ID# 0000869) – One 5,000-gallon gasoline storage tank was removed from the ground in January 1992.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property.	11
44	Oklahoma Installation Company/ Foley's Department Store 2411 S Stemmons/ 2401 S Stemmons Fwy Lewisville, TX 75067	RCRAG, LPST	TXLPST (ID# 108909) – (4.2) No groundwater impact, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.	The site is up-gradient and adjacent to the proposed project. No additional ROW would be required at this property.	4
46	Valero Food Mart and Gas Station 1886 S Stemmons Fwy Lewisville, TX 75067	TXPST	TXPST (ID# 0075480) – Two 15,000-gallon gasoline storage tanks have been in use since October 2001.	The site is downgradient. It is anticipated that ROW would be acquired from the southwest portion of the parking lot.	6
47	D&J Grocery 631 S Denton Dr Lake Dallas, TX 75065	TXPST	TXPST (ID# 0038658) – Two 4,000-gallon and one 6,000-gallon underground gasoline storage tanks have been in use since September 1975.	The site is up-grade and adjacent to the proposed project. No additional ROW would be required at this property.	17
48	Volvo of Dallas 2900 Interstate 35 Carrollton, TX 75007	TXPST	TXPST (ID# 0072978) – One 2,000-gallon above-ground gasoline storage tank was installed in 2000, but is currently out of use.	The site is at-grade. It is anticipated that additional ROW would be acquired along the southwest limit of the property. No buildings would be displaced.	1
50	Home Depot USA #524 901 NStemmons Fwy Lewisville, TX 75067	TIER II, RCRAG, IHW	Site (ID# 4WHRDE0AAM7V) - Sulfuric acid is stored on the site. This facility passed all validation checks. The site is a small quantity generator of non-industrial and/or municipal waste.	The site is at-grade. It is anticipated that a portion of the nursery on the east side of the property (D08) would be acquired.	10
52	Exxon RS 60381 8100 S Interstate 35 E Corinth, TX 76210	TXPST	TXPST (ID# 0070789) – Three 12,000-gallon underground gasoline storage tanks have been in use since January 1998.	The site is at-grade. It is anticipated that the entire parcel (D74) would be acquired.	19
65	Southwest Texaco/ Tucker Dry Cleaning 397 E Southwest Pkwy Lewisville, TX 75067	TXPST, DCR	TXPST (ID# 0050300) – Three 8,000-gallon underground gasoline storage tanks have been in use since January 1986.	The site is downgrade and adjacent to the proposed project. No additional ROW would be required at this property.	6

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
66	Kwik Mart 1235 S Highway 121 Lewisville, TX 75067	TXPST	TXPST (ID# 0042955) – Two 12,000-gallon gasoline and one 12,000-gallon diesel underground storage tanks have been in use since January 1981.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property.	7
72	Bankston Honda Dealership (formerly Lewisville Imports)	TIER II; TXPST	Tier II (ID# 4XP1HH0025CJ) - Site for liquid gasoline (34,000 gallons); TXPST (#ID 627128) – one 3,000 gallon above-ground storage tank of gasoline is currently out of use.	This site is downgrade from the proposed improvements. No additional ROW would be required at this property.	5
78	C M Cleaners 850 Valley Ridge Blvd Ste 124 Lewisville, TX 75077	DCR	DCR (Registration # rn104500855) - The site is a registered drycleaner drop-off station.	The site is at-grade and adjacent to the proposed project. No additional ROW would be required at this property.	11
84	Valley Ridge Chevron 900 Valley Ridge Blvd Lewisville, TX 75077	TXPST	TXPST (ID# 0071208) – Two 10,000-gallon gasoline and one 10,000-gallon diesel underground storage tanks have been in use since June 1998.	The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property.	11
107	Costco # 683 851 South State Hwy 121 Lewisville, TX 75067	TIER II	TIER II (ID# 48NYAA01MFQ3) - Forklift/pallet jack/floor scrubber batteries, lead acid batteries, and sulfuric acid are stored at the site. This facility passed all validation checks.	The site is downgrade and adjacent to the proposed project.	3
N1	Auto Clinic, 2428 C. North Stemmons Freeway, Lewisville TX	Not identified in database search.	This site is an auto repair (oil change) facility. Site was identified during the visual survey.	The site is downgrade. The entire property (D10) is anticipated to be acquired.	4
N2	Adams Exterminating Company, 690 Stemmons Freeway, Lewisville TX	Not identified in database search.	This site is an exterminator with on site storage of chemicals. Site was identified during the visual survey.	The site is at-grade. The entire property (D41) is anticipated to be acquired	9
N3	Buddy Gregg's Motor Home, 1206 North Stemmons Freeway, Lewisville TX	Not identified in database search.	This site may contain above-ground storage tanks. No tanks were observed within proposed ROW. Site was identified during the visual survey.	The site is at-grade. It is anticipated that ROW would be acquired along the west limit of the property.	11
N4	May's RV, 1212 North Stemmons Freeway, Lewisville TX	Not identified in database search.	This site contains above-ground storage tanks which were visible near the ROW. No visual evidence of leaks was observed. Site was identified during the visual survey.	The site is at-grade. It is anticipated that additional ROW would be acquired along the west limit of the property.	11
N7	Comet Cleaners, 7700 South IH 35 E., Suite 130, Corinth TX	Not identified in database search.	This site is a drycleaner facility and may be a RCRA small quantity generator. Site was identified during the visual survey.	The site is downgrade. It is anticipated that additional ROW would be acquired along the northeast limit of the property.	19
N8	U-haul, 525 Stemmons Freeway, Lewisville, TX	Not identified in database search.	This site contains above-ground storage tanks (propane). No visual evidence of leaks was observed. Site was identified during the visual survey.	The site is downgrade. It is anticipated that additional ROW along the east and southeast limits of the property would be acquired. An above-ground storage tank and building (D100) would be displaced.	10

Site No.[1]	Site Name/Site Information	Database Listing	Regulatory Status	Gradient and Anticipated Property Impact (Displacement #[2])	Corridor Map Sheet No.
N9	Volkswagon Dealership and Service, 893 South Stemmons Freeway, Lewisville, TX	Not identified in database search.	This site is an auto service, repair facility. Site was identified during the visual survey.	The site is at-gradient. It is anticipated that additional ROW would be acquired along the northeast limit of the property. No buildings would be displaced.	8

[1] Site No. corresponds to Map ID# listed in Database Report (2008).
[2] Displacement numbers refer to the Displacements Table in **Appendix D** and Corridor Maps in **Appendix C**.

Twenty-four of the total low-risk sites within or adjacent to the proposed project contain registered petroleum storage tanks (PSTs). Sites 16, 30, and 43 also contain an LPST and are at-grade with the proposed project. No additional ROW is needed from these two sites. Sites 4, 11, 12, and 37 have had the PSTs removed from the ground. The tank at Site 48 is not currently in use. The remaining PST sites contain tanks utilized for the storage of gasoline, diesel, or used oil. Because the sites are impacted by or adjacent to the proposed project, they are considered low risk due to the possibility of encountering contamination as a result of unreported leaks. Sites N4 and N8, identified during the visual survey, and do contain above-ground storage tank sites. Site N3 may contain an above-ground storage tank; however, none was observed during the visual survey. The remaining sites were identified as small quantity generators or dry cleaners. Coordination with property owners, tank owners, operators, and TCEQ on these sites would be an ongoing process up to and during construction.

At this time, utility adjustment requirements are anticipated, but have not yet been determined. There is a potential for contamination to be encountered during utility adjustments. Coordination with utility companies concerning this contamination would be addressed during the ROW stage of project development. It is anticipated that all utility adjustments or relocation would be completed prior to construction.

No oil or gas wells exist within the proposed ROW. Two natural gas pipelines cross the proposed project area, near the northern project terminus. The Atmos Pipeline is an active gas transmission line. The Goldfield Gathering, Limited line is an active gas gathering line. These natural gas pipelines would be addressed during the utility adjustment phase of the proposed project.

The proposed project includes the demolition of building structures. The buildings may contain asbestos materials. Asbestos inspections, specification, notification, license, accreditation, abatement and disposal, as applicable, would comply with federal and state regulations. Asbestos issues would be addressed during the ROW process prior to construction.

Any unanticipated hazardous materials encountered during construction would be handled according to applicable federal, state, and local regulations per TxDOT Standard Specifications. The contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area. The use of construction equipment within sensitive areas would be minimized or eliminated entirely. All construction materials used for this project would be removed as soon as work schedules permit.

D.4 Items of a Special Nature

Coastal Zone Management Plan
The proposed project is not located within the Texas Coastal Zone Management Program boundary; therefore, the proposed project is not subject to the guidelines of the associated plan.

Wild and Scenic Rivers
There are no wild and scenic rivers in the project area; therefore, there would be no impacts to a river designated as a component or proposed for inclusion in the national system of Wild and Scenic Rivers.

Airway-Highway Clearance
The Lakeview Airport located in Lake Dallas, Texas, is located approximately 7,000 feet to the east of the project corridor. The airport is adjacent to Lewisville Lake. The airport's runway is approximately 2,800 feet in length and lies parallel to IH 35E. The proposed improvements would not exceed the 50:1 horizontal slope from the nearest point of the nearest runway as the proposed roadway would be at grade at this location. Therefore, airway-highway clearance is not required.

V. USACE PROPERTY

Introduction

In addition to the 77.8 acres of existing easements on USACE property, the proposed project would also impact approximately 20.7 acres of USACE property. Extensive coordination has occurred with USACE staff throughout the project development process over the past several years as listed in **Table V-I** below. USACE Fort Worth District and Lewisville Lake (Elm Fork Project Office) staff have participated in the project development process. In May 2004, FHWA invited USACE to serve as a cooperating agency and was accepted in July 2006 (**Appendix E**). Through coordination with USACE, the proposed project's preliminary design alternatives and associated impacts were reviewed and discussed to determine mitigation and measures to minimize harm as well as enhancement opportunities. This section of the EA has been prepared to address the impacts associated with the proposed construction of IH 35E on USACE property.

Table V-1: USACE Property Stakeholder Meetings

Meeting Date/Location	Agencies Represented	Topics Discussed
June 24, 2003 City of Highland Village	City of Highland Village, TxDOT, HNTB	Impacts to Copperas Branch Park and the Section 4(f) evaluation process.
July 14, 2003 HNTB Downtown office	City of Highland Village, TxDOT, HNTB	Impacts to Copperas Branch Park and the Section 4(f) evaluation process.
March 23, 2004 USACE Elm Fork Lake Office	USACE, City of Highland Village, TxDOT, HDR, HNTB	Initial coordination meeting with USACE Elm Fork Lake Office and Regulatory staff regarding the status of the EA, Section 4(f) and preliminary schematic.
May 11, 2004 City of Highland Village	City of Highland Village, HNTB	Presentation of Section 4(f) mitigation to city council.
February 28, 2006 USACE Elm Fork Lake Office	USACE, City of Highland Village, TxDOT, HDR, ITS, HNTB	Updates that have occurred to the EA, Section 4(f) and preliminary schematic since the March 2004 meeting.
April 6, 2006 USACE Elm Fork Lake Office	USACE, TxDOT, HNTB	Mitigation options for impacts to Copperas Branch Park and mitigation/requirements for other impacts to USACE property.
June 7, 2006 City of Highland Village	USACE, City of Highland Village, TxDOT, HDR, Mesa, HNTB	Mitigation options for impacts to Copperas Branch Park and mitigation/requirements for other impacts to USACE property.
November 14, 2006 USACE Elm Fork Lake Office	USACE, City of Highland Village, TxDOT, HDR, ITS, HNTB	EA, Section 4(f) and preliminary schematic updates and Cooperating Agency agreement/role.
August 30, 2007 USACE Elm Fork Lake Office	USACE, City of Highland Village, TxDOT, HDR, ITS, HNTB	EA, Section 4(f) and preliminary schematic updates and review of pedestrian sidewalk design including access to Copperas Branch East Park.

Meeting Date/Location	Agencies Represented	Topics Discussed
October 16, 2008 USACE Elm Fork Lake Office	USACE, FHWA, TxDOT, HDR, Halff, HNTB	EA, Section 4(f) and preliminary schematic updates and review of all mitigation items requested by USACE, including Fair Market Value, Natural Resources, Recreation, Water Quality, pedestrian sidewalk design including access to Copperas Branch East Park.
October 31, 2008 USACE Elm Fork Lake Office	USACE, TxDOT, City of Highland Village, HDR, Halff, HNTB	Copperas Branch Park circulation, layout and access.
May 5, 2009 USACE Elm Fork Lake Office	USACE, TxDOT, HDR, Halff, HNTB	Proposed mitigation elements and continued Section 4(f) coordination.

The limits of USACE property within the proposed project area and associated land classifications are described below. The classifications were derived from the 2004 *Lewisville Lake Master Plan Supplement #1 to Lewisville Lake Master Plan.* Following the property limits and land classification discussion is the assessment of impacts and associated conceptual mitigation, enhancement and commitments that would be finalized further along in the project development process.

USACE Property Limits and Existing Use

The USACE property along the proposed project corridor begins south of Garden Ridge Boulevard and continues to just north of Lewisville Lake near Denton Drive South as depicted in **Appendix A, Figure 13: USACE Property Boundary Maps**. The existing IH 35E facility utilizes approximately 77.8 acres of USACE property within the proposed project limits. The proposed improvements would require approximately 20.7 acres of additional USACE property. This would result in a total of approximately 98.6 acres becoming utilized via permanent easement for the IH 35E facility.

A portion of the current TxDOT easement from south of Garden Ridge Boulevard to approximately 800 ft north of Garden Ridge Boulevard is not classified. From this point north of Garden Ridge Boulevard to north of Lewisville Lake, a utility corridor is present along the IH 35E corridor. North of Lewisville Lake and west of the existing roadway, a small area of Fish and Wildlife Management land is located within the existing easement. **Table V-2** details the USACE property utilized by the existing IH 35E facility as well as the additional 20.7 acres that would be affected by the proposed reconstruction of IH 35E.

Table V-2: USACE Property within Existing Easement & Additional Areas Affected

Impacted USACE Property	Total Acreage Within Existing Easement (Approximate)	Additional Acres Affected by Proposed Improvements (Approximate)	Type	USACE Classification
South of Garden Ridge Boulevard to 800 ft north of Garden Ridge Boulevard	25.0	0.2	Highway	Not classified
800 ft north of Garden Ridge Boulevard to Denton Drive South	42.2	0.0	Utility/Highway	Utility Corridor
South of Highland Village Road west of IH 35E	2.2	3.9	Water	Fish and Wildlife Management
North of Highland Village Road to south of Copperas Branch Park	0.0	1.2	Upland	Flowage Easement
Copperas Branch Park	0.0	6.4	Park	Intensive Recreation
Lewisville Lake	7.8	8.9	Water	Lake (Open Water)
North of Lewisville Lake west of IH 35E	0.6	0.1	Upland	Fish and Wildlife Management
Total Acreage	**77.8**	**20.7**		

USACE Property Affected by Proposed Improvements
USACE property which would be affected by the proposed improvements is classified as Fish and Wildlife Management, Intensive Recreation, Flowage Easement, and Open Water. Each area affected by the proposed improvements is detailed below.

Fish and Wildlife Management: Fish and wildlife management lands are designated as habitat for fish and wildlife or for propagation of such species and where fish and wildlife habitat maintenance or improvement is appropriate. There are two locations containing this classification.

The first begins south of Highland Village Road west of IH 35E. This is an isolated lake which connects under Highland Village Road to a USACE drainage channel which flows to the main body of the lake. During periods of high precipitation and elevated lake levels, the channel conveys water south into the isolated lake, which appears to be utilized as an overflow storage area. When lake levels recede, the isolated lake would drain back into the main lake until the lake level falls below the culvert level. Once below the culvert level, it appears that subsurface flows from the isolated lake continue to feed into the channel under Highland Village Road.

The second area is located north of Lewisville Lake on the west side of IH 35E. It is a somewhat isolated parcel of land bordered by IH 35E to the east and Lewisville Lake to the south and west. It contains primarily upland vegetative species. A few residential properties are located to the north and west of the parcel.

Intensive Recreation: The additional acreage affected by the proposed improvements would affect Copperas Branch Park which is designated as intensive recreational use by the USACE and leased to the City of Highland Village for recreational use. The City of Highland Village has developed the park to include covered picnic tables, restroom facilities, four baseball fields, a swim area, and a boat dock and ramp.

The park is typical of urban parklands with trees interspersed among maintained grasses. Live oak trees dominate the canopy cover around the picnic areas. Sparsely located post oak, blackjack oak, sycamore (*Plantanus occidentalis*), eastern cottonwood, common persimmon (*Diospyros virginiana*), and other tree species border the roadways and provide shade in other areas of the park. The herbaceous vegetation within the park is dominated by Bermudagrass (*Cynodon dactylon*), Texas wintergrass (*Nassella* leucotricha), crabgrass (*Digitaria ciliaris*), cheatgrass (*Bromus tectorum*), sensitivebriar (*Mimosa nuttallii*), Texas storksbill (*Erodium texanum*), spotted sandmat (*Chamaesyce maculata*), and burclover (*Medicago polymorpha*).

Open Water: This is where the proposed IH 35E would cross the Hickory Creek Arm of Lewisville Lake.

Flowage Easement: The land between Highland Village Road and Copperas Branch Park on the west side of IH 35E is classified as Fish and Wildlife Management lands. However, according to maps contained in earlier Master Plans, this area is classified as a flowage easement. The 1972 *Revised Master Plan for Development and Management of Lewisville Dam* designated the land as flowage easement. The *Lewisville Lake Master Plan, Design Memorandum No. 1C, June 1985* proposed a change in designation of a limited number of flowage easement areas to Fish and Wildlife Management lands. It did not state which areas would be converted to wildlife management lands. The 2004 *Master Plan Supplement #1 for Lewisville Lake Master Plan* depicts the flowage easement adjacent to Highland Village Road as wildlife management land. The document does not contain a description of why a change in classification occurred, however, field visits and coordination with USACE staff confirm that this area should have remained classified as a flowage easement. Three distinct habitats comprise the area and the following paragraphs provide details on each.

Immediately west of IH 35E the area consists of herbaceous vegetation and is routinely maintained. It is mowed to a height of 2 to 3 inches. Herbaceous species occurring within the maintained area include Bermudagrass, Texas wintergrass, crabgrass, cheatgrass, sensitivebriar, Texas storksbill, sandmat, and burclover. The short, uniform grass height and species composition of the vegetation provide very little cover or food for most wildlife species. This area is of limited use to wildlife.

Two ponds are located north of Highland Village Road between the maintained grassland area and the drainage channel. Each pond is surrounded by a thin riparian zone. The riparian vegetation is dominated by buttonbush (*Cephalanthus occidentalis*), black willow, trumpet creeper, and common persimmon growing along the banks of the ponds. The herbaceous vegetation within and adjacent to the riparian habitat consists of giant ragweed (*Ambrosia trifida*), western ragweed (*Ambrosia psilostchya*), Canada goldenrod (*Solidago canadensis*), beggar's ticks (*Torilis arvensis*), annual sunflower (*Helianthus annuus*), cheatgrass, curly dock (*Rumex cripus*), coreopsis (*Coreopsis tinctoria*), and fragrant flatsedge (*Cyperus odoratus)* and crowfoot caric sedge (*Carex crus-corvi*). The smaller, southern pond has a much deeper, riparian habitat dominated by buttonbush and common persimmon surrounding the perimeter of the pond. This riparian vegetation is consistent around this pond feature with very few openings in the riparian vegetation. The riparian vegetation surrounding the larger, northern pond is more open with buttonbush, black willow, and common persimmon spread more thinly around the perimeter. Both ponds are connected to the USACE drainage channel to the west by two small channels. The aquatic habitat provided by these ponds provides valuable habitat for migrating water birds and waterfowl as well as amphibians, water snakes, and turtles.

The USACE drainage channel connects the south side of Lewisville Lake west of Copperas Branch Park to the isolated lake discussed previously. The channel and isolated lake connect under Highland Village Road with two corrugated black plastic culverts.

Signs of beaver (*Castor canadensis*) activity exist along the southern half of the channel and a beaver dam has backed up water to the Highland Village Road embankment. Over time, the beaver dam has created substantial wetland habitat associated with the open water of the beaver pond. The diverse wetland vegetation associated with this feature includes buttonbush, switchgrass (*Panicum virgatum*), black willow, green ash (*Fraxinus pennsylvanica*), rattlebox (*Sesbania punicea*), smartweed (*Polygonum hydropiperoides*), water primrose (*Ludwigia peploides*), crimsoneyed rosemallow (*Hibiscus moscheutos*), obedient plant (*Physostegia virginiana*), duckweed (*Lemna minor*), *Cyperus* spp., *Carex* spp., and common rush (*Juncus effusus*).

Below the beaver dam, the USACE channel becomes incised and the fringe wetlands associated with the channel narrow substantially. Several compromised beaver check dams occur below the main beaver dam and have established a pool/riffle stream habitat throughout the middle section of the channel. Further downstream, the trapezoidal shape of the originally designed channel becomes prominent and the incised nature of the stream channel disappears. In this section, the entire bottom of the channel is dominated by mesic plant species surrounding the narrow stream channel. The riparian vegetation associated with the middle portion of the channel continues to be dominated by buttonbush and common persimmon; however, the width of the riparian vegetation continually decreases downstream. As the channel enters the lake towards the northern end, the stream channel becomes incised again within the trapezoidal drainage channel. Towards the northern end of the channel, the woody riparian vegetation is limited to the top of the bank on each side of the trapezoidal channel. During normal precipitation years, the rim of the trapezoidal channel in the northern section would be the banks of Lewisville Lake.

The USACE drainage channel at the western edge of the property has become a viable riparian corridor. It serves as a barrier between the intensive recreational use at the developed park land and the natural, undeveloped area of Copperas Branch Park. The drainage channel and undeveloped area of Copperas Branch would not be affected by the proposed IH 35E project.

As stated earlier, Fish and Wildlife Management lands are designated as habitat for fish and wildlife or for propagation of such species and where fish and wildlife habitat maintenance or improvement is appropriate. The land between Highland Village Road and Copperas Branch Park is not being managed as fish and wildlife habitat. Through coordination with USACE – Lewisville Lake staff, it was determined that the Fish and Wildlife Management classification was inadvertently applied to this land between 1985 and 2004 during Master Plan Updates. The land currently functions as a flowage easement. The grassland area is of limited use to wildlife because the short, uniform grass height and species composition of the vegetation provide very little cover or food for most wildlife species. The ponds and drainage channel have become a viable riparian corridor. The herbaceous vegetation and emergent wetland within and adjacent to the drainage channel is not stable and would change as the lake rises to its normal level and the drainage channel holds more water.

Impacts to USACE Property, including Mitigation/Enhancements

Impacts and mitigation/enhancements to USACE property have been documented and categorized based on fair market value, recreation, and natural resources. **Appendix G** contains

the complete Draft Programmatic Section 4(f) Net Benefit Evaluation. Below is a summary of the impacts and proposed mitigation/enhancements for impacts to USACE Property, including Copperas Branch Park. In a letter dated November 6, 2009, the USACE provided conditional concurrence regarding the assessment and impacts to USACE property resulting from the proposed project (**Appendix E: Agency Coordination**).

Fair Market Value

Fair market value (FMV) consists of the value of the actual land and water areas impacted by the proposed project, which totals 20.7 acres (11.94 land, and 8.72 open water). All existing facilities such as the park roads, signage, and baseball fields are considered under the Recreation section below as NEPA recreation mitigation per USACE requirements. Although FMV costs were estimated for impacts to USACE Land/Open Water based on an independent appraisal conducted by TxDOT, the FMV costs may be waived by the USACE because pedestrian sidewalks have been proposed that would benefit the general public. The proposed pedestrian sidewalks over Lewisville Lake have recreational value as further described in the *Other Mitigation/Enhancements section below*, but are not considered Section 4(f) mitigation.

Recreation

Recreation elements are the existing recreation facilities and activities conducted on USACE property. Recreation mitigation is not identified as a dollar amount but as a commitment of items to be replaced and/or constructed because of a loss of recreational facilities, use, areas, both on land and water. The existing Copperas Branch Park elements that would be impacted by the proposed reconstruction of IH 35E include:

- Gatehouse Complex (2 buildings)
- Park Roads (approximately 1,000 LF)
- Signage (2)
- Parking (67,500 SF)
- Baseball Backstops with hood and Baseball Diamond (2)
- Soccer Goals (2)
- Precast Picnic Tables with Grills (6)
- Metal Rail Fencing (1,728 LF), Barrier Posts (100), and Gates (2)
- Landscaping (stand of hardwoods in picnic area)

As part of the mitigation for impacts to recreation elements, the park facilities listed above would be replaced and a parking area under the Lewisville Lake bridge (68,000 SF/180 spaces) would be constructed by TxDOT. A Multiple Use Agreement is required for the parking under the IH 35E bridge over Lewisville Lake in accordance with 23 CFR 710.405 and FHWA Airspace Guidelines and would be prepared by the Office of General Counsel and obtained prior to the start of construction.

Additionally, the beach complex would be restored to meet USACE guidelines, minimum sanitary facilities would be provided and additional buoys would be provided and maintained by TxDOT.

In addition to the mitigation provided at Copperas Branch Park, facilities are proposed at Copperas Branch East Park to ensure no net loss of recreation classified lands. Copperas Branch East Park, as depicted in **Appendix C: Sheet 15 of 19**, is a 38.0-acre property east of IH 35E and DCTA/DART ROW that currently has no public access. Copperas Branch East Park is an

undeveloped area designated for recreation use by the USACE. There are no impacts to Copperas Branch East Park due to the proposed reconstruction of IH 35E; however mitigation for impacts to Copperas Branch Park would occur at Copperas Branch East Park. Proposed mitigation includes providing pedestrian access from Copperas Branch Park to Copperas Branch East Park so that passive recreation activities are available. The following basic amenities are proposed at Copperas Branch East Park as part of the conceptual mitigation plan:

- New park road providing access to Copperas Branch East Park (requiring grade separation) to be constructed by TxDOT (1,200 LF);
- Railroad crossing and gates to accommodate at grade design for park road access to Copperas Branch East Park;
- Primary trail head to connect Copperas Branch Park with Copperas Branch East Park;
- Minimum sanitary facilities (drinking fountain pad, restroom);
- Parking access at sanitary facilities and trailhead parking lot (approximately 15 to 20 spaces);
- New trail approximately 10-ft wide trail and 1-mile long; and
- Buoys to be provided and maintained by TxDOT.

Copperas Branch East Park is described in greater detail in the *Description of USACE Property, Copperas Branch East Park Existing Conditions* section of **Appendix G**. In addition to the amenities described above, a maintenance agreement would be developed in coordination with the USACE for the installation and long-term maintenance of buoys placed in Lewisville Lake adjacent to the IH 35E bridge. **Appendix A: Figure 14** depicts the conceptual layout of the buoys.

Natural Resources

The Natural Resources Mitigation has been divided in to four areas: 1) existing ROW, 2) additional ROW/easement, 3) construction easement and 4) Copperas Branch East Park.

1) Existing ROW: Consists of wooded areas within the existing ROW north of Lewisville Lake on the west side of IH 35E that would be permanently impacted. The natural resources impacted within the existing ROW are approximately 1.9 acres.

2) Additional ROW/easement: Directly correlates to the FMV acreage listed previously and account for the areas that would be permanently impacted (10.5 acres) due to the proposed reconstruction of IH 35E.

3) Construction easement: Although the precise location of construction activity that would occur on USACE property has not yet been identified at this stage of project development. For planning purposes, a 300-ft wide construction easement has been assumed that would begin at the proposed ROW/easement and extend approximately 300 ft westerly and constitutes approximately 13.3 acres.

4) Copperas Branch East Park: Due to the construction of amenities at Copperas Branch East Park, (trail, access road, and parking lot, minimum sanitary facilities), 6.5 acres of natural resources are anticipated to be impacted.

Per coordination with the USACE, mitigation for permanent impacts to natural resources on USACE property consists of a direct payment to the Lewisville Lake Environmental Learning

Area (LLELA) or onsite mitigation at Copperas Branch East Park to control non-native and or invasive species. Temporary impacts to the mowed/maintained herbaceous vegetation would be mitigated by permanently revegetating the area(s) after construction is complete. The USACE has concurred with the above mentioned mitigation/enhancements and encouraged the consideration of a design charrette and workshop to jointly formulate a design solution in order to finalize the proposed conceptual mitigation **Appendix G.**

Other Mitigation/Enhancements

Waters of the U.S., including Wetlands

Coordination with the USACE Fort Worth District Regulatory Branch would continue throughout the project development process. See **Section IV.A.2.**, Waters of the U.S., including Wetlands for a detailed summary of the delineated areas and potential impacts on USACE Property.

Floodplains

The cut and fill amounts located within the current USACE easement are anticipated to result in an overall positive benefit to flood storage of Lewisville Lake. There would be no net loss of flood storage at Lewisville Lake. As stated in Section K., the Trinity River ROD and Lewisville Lake PEA floodplain requirements apply to this project. The proposed project would be in accordance with the conditions of the CDC and final design plans would be submitted to CDC constituent agencies before letting.

Water Quality

BMPs would be designed to ensure that runoff from the first flush of storm water off the Lewisville Lake bridge would be treated properly. Prior to construction, detailed design plans would require USACE approval to ensure storm water runoff meets applicable USACE guidelines. Additionally, outfall velocities would remain within the accepted range set by the USACE and where velocities exceed this range; velocity control measures would be utilized.

Pedestrian Sidewalks

TxDOT proposes pedestrian sidewalks over Lewisville Lake as part of the reconstruction of IH 35E. Although not part of the Section 4(f) mitigation, the proposed sidewalks are an enhancement that add recreational value and connectivity to the Trinity Trail system. Continuous pedestrian sidewalks are proposed along each side of the Lewisville Lake bridge. The proposed northbound sidewalk would be 14-ft wide and approximately 1.4 miles in length. This sidewalk would begin at Highland Village Road and end at Hickory Hills Boulevard. The proposed southbound sidewalk would be 8-ft wide and approximately 1.5 miles in length. This sidewalk would begin at Denton Drive South and end at Hickory Hills Boulevard. Trail head connection(s) would be provided at Copperas Branch East and Arrowhead Park as discussed in **Appendix G.**

Other Coordination

Right-of-Way/Displacements
No displacements would occur on USACE property. There are impacts to recreational resources and amenities (located within Copperas Branch park) that are further discussed in **Appendix G.** Additional acreage would be acquired in the form of easements and actual ROW would not be obtained from the USACE.

Easements
An easement request would be coordinated and processed with the USACE for the right to construct and use property for the proposed project. This would include the permanent area required for the proposed IH 35E improvements on fee simple property. The easement boundaries and application process would be coordinated further along in the project development process.

Construction License
A construction license would be required for activity outside of the approved easement required for the proposed IH 35E improvements on USACE fee simple property, exclusive of the flowage easement (537 ft). Any activity occurring outside of the approved easement would be part of the construction license. Because the precise location of construction activity that would occur on USACE property has not yet been identified at this stage of project development, a 300-ft wide construction easement has been assumed and mitigation has been proposed as described in the natural resources section above. Per USACE guidelines, noise generating activities are to be coordinated with USACE staff to determine the allowable actions from 10 p.m. to 6 a.m.

Summary
TxDOT has conducted extensive coordination for the proposed project with the USACE and the City of Highland Village through a series of coordination letters, meetings, and development of conceptual plans. TxDOT, in cooperation with the USACE, and City of Highland Village, have formulated solutions that minimize harm to USACE property, including appropriate mitigation measures. The USACE has requested that a design charatte be conducted. TxDOT shall conduct a design charette as requested to continue refining the mitigation plan and to further develop the conceptual plans identified in **Appendix G**.

Throughout the planning process of the proposed project, the USACE has performed reviews and provided comments for the EA and Section 4(f) Evaluation for USACE Property, including Copperas Branch Park. TxDOT has worked in close coordination with the USACE to address all comments. In September 2010, the USACE submitted a coordination letter to TxDOT and provided five comments on the September 2010 version of the EA and Section 4(f) Evaluation and requested that the comments be addressed before the EA is released for public review. In response to this request, TxDOT addressed the five USACE comments and included the USACE letter (dated September 27, 2010) in **Appendix E** for reference.

The USACE intends to continue their role as a cooperating agency to ensure that the NEPA process provides adequate consideration and public disclosure of potential impacts to USACE property, including the Section 404 permitting process. As stated in **Section IV.A.2,** compensatory mitigation for Section 404 impacts would be coordinated with the USACE and performed in accordance with the terms of the approved permit. The USACE would address Section 404 impacts during the permitting process of the proposed project.

VI. INDIRECT IMPACTS

The purpose of this chapter is to assess the indirect effects related to the proposed improvements to IH 35E from PGBT to FM 2181. The CEQ defines indirect effects as:

> *"effects, which are 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 C.F.R. § 1508.8).

This indirect effects analysis was conducted in accordance with TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (June 2009). The *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* specifies a seven-step process (**Table VI-1)** for determining indirect effects. This seven-step process is adapted from the method set forth in the *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*, Report 466, NCHRP, 2002 (NCHRP Report 466).

Table VI-1: Seven Step Approach to Estimate Indirect Impacts

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

All indirect effects would occur outside of the proposed ROW. As to the cause and effect relationship between the proposed improvements and the indirect impact, CEQ states that indirect effects may include induced changes to land use resulting in resource impacts (40 C.F.R. § 1508.8). Indirect effects can be linked to direct effects in a causal chain (NCHRP Report 466). The chain can be extended as indirect effects produce further consequences. Examples of direct and indirect effects of several types of transportation projects are summarized in **Table VI-2**.

Table VI-2: Examples of Indirect Effects

Project Action	Direct Effect	Indirect Effect
Bypass Highway	Improved Access	Farmland converted to residential use. New residences produce new labor force attracting new businesses.
New Light Rail	Improved Access	New businesses open producing jobs/taxes. Traditional businesses/residents priced out.
New Highway	Improved Access	Development alters character of historic area. Visitors increase to historic area

Source: NCHRP Report 466, *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (2002).

Probability also helps distinguish indirect effects from direct effects; direct effects are often inevitable while indirect effects are merely probable.

A. Project Level Indirect Impact Analysis

Each step of the seven-step process has been applied to the proposed project and the findings documented in this EA. The proposed action, or Build Alternative, is the reconstruction of approximately 12 miles of IH 35E from PGBT to FM 2181. The proposed project would generally follow the existing alignment. See **Section I.A.** for a description of the proposed action.

Step 1: Scoping

The purpose of Step 1 is to establish the context for the indirect impacts analysis. The geographic study area, or area of influence (AOI), for the indirect impacts analysis consists of a 1,200 ft buffer extending from the proposed ROW which falls within the municipalities located adjacent to the proposed project: the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County. The AOI was established based on stakeholder input from adjacent municipalities; it is assumed any indirect impacts associated with the proposed project would be absorbed within a 1,200 ft buffer adjacent to the proposed IH 35E facility.

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. Because indirect impacts are commonly related to land use changes, the adjacent municipalities are considered the appropriate AOI because these municipalities have jurisdiction over the various land use controls that govern development patterns. The AOI encompasses approximately 3,704 acres and is shown in **Appendix A, Figure 15: Indirect Impacts Area of Influence (Sheets 1 and 2).**

The temporal boundary for the indirect impacts analysis is 2030; the year 2030 was chosen to correlate with NCTCOG's *Mobility 2030 – 2009 Amendment,* the City of Carrollton's *Comprehensive Plan* (2003), the City of Lewisville's *2010 Plan* and *2006 Land Use Assumptions*, the Town of Hickory Creek's Comprehensive Plan (2008), and Highland Village's *Comprehensive Plan* (2002).

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

Study Area Goals

Appendix H: Indirect Land Use Impacts Assessment provides a thorough assessment of the various plans and policies that exist within the AOI that promote, guide, and monitor different types of development activity ranging from regional transportation infrastructure to commercial development aesthetics. The following is a summary of the information provided in **Appendix H**.

Mobility 2030 – 2009 Amendment: The Metropolitan Transportation Plan
This plan defines transportation systems and services in the DFW metropolitan area. It serves as a guide for the expenditure of state and federal funds through the year 2030. The plan 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 IH 35E project (from PGBT to FM 2181) is included in this plan.

Park-and-Ride Facilities
According to NCTCOG's *Mobility 2030 – 2009 Amendment*, a number of park and ride facilities are planned for construction in the Cities of Carrollton, Lewisville, and Highland Village in conjunction with the regional rail station locations.

Bicycle and Pedestrian Facilities
The purpose of the veloweb routes is to provide regional routes, as well as connectivity to interregional routes, which would encourage the use of bicycles for utilitarian trip purposes. The veloweb is also designed to encourage concurrent pedestrian transportation use. Projects with high exposure levels, linkages to transit, and service provision to bicycle transportation districts justify priority investment in transportation funds and are recommended by NCTCOG. The *Mobility 2030 – 2009 Amendment* recommends construction of the North Elm Fork veloweb route, which crosses the proposed IH 35E project twice, in the central and southern portions of the project area.

City of Carrollton
On February 18, 2003, the Carrollton City Council adopted an updated *Comprehensive Plan*. The City of Carrollton's *Comprehensive Plan* is a statement of community values, ideals and aspirations about Carrollton's future environment, and serves as the official policy of the City regarding physical development. The Plan is used to help set priorities for capital improvement expenditures, as a guide for the acquisition and development of sites for community facilities, as a guide for the acquisition and protection of major open space, as a basis for zoning and subdivision regulations, as a guide for reparation of detailed physical plans for sub-areas of the City, and to help guide the establishment of programs and policies by which the City would achieve the type of development reflected in this Plan.

The City of Carrollton's current *Transportation Plan* and *Future Land Use Plan* were adopted on February 18, 2003 and were last amended on December 6, 2007. The existing IH 35E facility is included in the City of Carrollton's *Thoroughfare Plan* (2003) and is classified as a "controlled access highway." Land use designations along the IH 35E corridor presented in the City of Carrollton's *Future Land Use Plan* include medium intensity commercial, mixed use transit, and

public park/recreation. **Appendix H: Indirect Land Use Impacts Assessment** contains additional information and various maps.

City of Corinth

The City of Corinth began the process of developing a Comprehensive Plan in January 2009. The City of Corinth's *Thoroughfare Plan* was last updated on April 5, 2006. The existing IH 35E facility is shown in the City's *Thoroughfare Plan*; however, it is not classified. It is crossed by two city thoroughfares and one collector. The City of Corinth's current *Existing Land Use Plan* was updated in January 2009. Land use designations along the IH 35E corridor presented in the City of Corinth *Existing Land Use Plan* include industrial, undeveloped, commercial, and some multi-family uses. The City of Corinth *Buildout Land Use Plan*, dated February 2006, shows all land uses adjacent to IH 35E as commercial with the exception of one area of ¼ acre residential.

Town of Hickory Creek

The Town of Hickory Creek has prepared a *Comprehensive Plan* which includes the *Updated Strategic Plan, Existing and Future Land Use Plans, Thoroughfare Plan, Park Plan*, Town Sections, a zoning map, and implementation suggestions as of 2008. A key goal for the town's planning process is to identify the highest and best uses for remaining raw acreage of undeveloped land before the Town matures. The current (2008) estimated population is 3,700 persons, and the town anticipates maintaining planning and zoning policies that would limit growth to a maximum of just over 5,000 persons. With the additional visibility provided to the town by improvements to IH 35E, the Town of Hickory Creek seeks to foster additional business growth, recognizing the increased travel into and out of Dallas and Denton Counties that would accompany improvements to the highway. Other road construction projects that would have an effect on land use development for the Town of Hickory Creek include the Lewisville Lake Toll Bridge. Construction of the toll bridge would bring more traffic through Hickory Creek along FM 2181 (Swisher Road). In addition, FM 2181 is proposed for expansion through Hickory Creek.

City of Highland Village

The City of Highland Village Comprehensive Plan was adopted on February 25, 1992 and was last amended on December 10, 2002. The plan provides the guidelines, administrative objectives, and structure necessary for maintaining the public welfare, ensuring the reasonable use of land and existing infrastructure, providing facilities and services, and protecting the land and other natural resources. Assumptions of the plan include physical limitations to growth (IH 35E, Lewisville Lake, etc.); presumed future development primarily in residential and commercial sectors; and water/wastewater service limitations.

The City of Highland Village *Thoroughfare Plan* was approved by the City Council on February 11, 1992, was updated in August 2008, and is incorporated by reference in the City's *Comprehensive Plan*. IH 35E is depicted as a highway on the Thoroughfare Plan.

The City of Highland Village current *Future Land Use Plan* was adopted on February 25, 1992 and the *Future Land Use* map was last updated in June 2007. The City's *Future Land Use Plan* is included in the City's *Comprehensive Plan* that provides anticipated future use of undeveloped land. Land use designations along the IH 35E corridor presented in the City of Highland Village Future Land Use Plan include residential, parks and open space (public) uses, highway commercial, and proposed transit oriented development.

City of Lake Dallas

The City of Lake Dallas does not have a Comprehensive Plan that is available on-line, nor was one provided when requested from city staff. The City does have a Zoning Map which designates all land uses within the city limits and adjacent to IH 35E as C-3 Commercial and IH 35E Business Corridor. The City of Lake Dallas does not have a *Thoroughfare Plan* that is available on-line nor was one provided when requested from city staff.

City of Lewisville

The City of Lewisville's current Comprehensive Plan was adopted in December 1994. The *Comprehensive Plan* is also known as the *Lewisville 2010 Plan*, which reports the findings of this planning process. The report is also divided into three parts: a Community Profile, Lewisville 2010 Goals, and an Action Plan. The City of Lewisville's current *Thoroughfare Plan* was recommended by the Transportation Board on July 17, 2003, and adopted by the City Council on August 4, 2003. It was updated in June 2007. The existing IH 35E facility is included in the City of Lewisville's *Thoroughfare Plan* (2003) and is classified as a "major traffic carrier." The City of Lewisville is undertaking a Master Plan Process for the IH 35E corridor within its boundaries, which includes the development of the IH 35E Corridor Development Plan.

The City of Lewisville's current *Future Land Use Plan* was published in the July 2006 *Land Use Assumption Report*. The purpose of this report is to update the City of Lewisville's *Comprehensive Plan* as part of an evaluation of land use assumptions that would provide input into the City's Impact Fee Program. The City of Lewisville is approaching full development for low-density single family uses. Regional employment centers have supported residential growth in Lewisville. Future land use designations along the IH 35E corridor include commercial and office uses with some multi-family or medium density residential use. Large-scale residential projects in eastern Lewisville are expected to build out in the near future.

Study Area Trends

Following World War II, American cities began a great suburban expansion that continues today. Land use adjacent to IH 35E is no exception as the primary area of growth in the DFW metropolitan area has occurred in the northern suburban sector. IH 35E has been a transportation corridor in Dallas and Denton Counties for over 55 years. The indirect effects study area (containing portions of Dallas and Denton Counties) is expected to maintain a rapid pattern of growth through the year 2030. NCTCOG 2030 population forecasts indicate the combined population of the 12 municipalities located within the indirect impacts study area would experience a 64.2 percent growth rate between 2000 and 2030.[23] The historic trends and projected growth have caused a need for a higher-capacity infrastructure.

The proposed project lies within the limits of the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek. Existing zoning and Future Land Use Plans (FLUPs) produced by municipalities adjacent to the proposed project reveal undeveloped areas within the indirect effects study area would likely be developed primarily for commercial/industrial (mixed intensities), residential (single and multi-family) and general business development by 2030. Existing land use controls portray IH 35E as an existing interstate highway. The land use controls established along the corridor (both future land use

[23] NCTCOG, North Central Texas 2030 Demographic Forecast, http://www.nctcog.org/ris/demographics/forecast.asp

plans and zoning regulations) generally preserve the corridor as a transportation facility with a mix of commercial/residential/industrial intensities and open space adjacent land uses. The associated land use plans are contained in **Appendix H: Indirect Land Use Impacts Assessment**.

The proposed improvements are compatible with the future land use plans provided by the adjacent municipalities. The City of Carrollton proposes public park/recreation, low intensity office, and high intensity commercial land uses along IH 35E. The City of Corinth proposes mixed intensities of commercial, light industrial, and planned development land uses adjacent to IH 35E. The City of Highland Village proposes highway commercial and public parks/open space land uses along IH 35E. The City of Lake Dallas proposes intense commercial land use along the IH 35E facility. The City of Lewisville proposes light industrial, general business, medical district, public use/open space, and multi-family land uses along the IH 35E facility.

Undeveloped areas surrounding the proposed project would likely continue to develop primarily for commercial and industrial uses compatible with national and international commercial activities. Most of the developable land adjacent to or near IH 35E would likely be utilized in the future according to the FLUPs. The proposed project is not expected to result in substantial induced changes in the pattern of land use or population density within the project area.

Of the 3,704 acres of land mass within the indirect impacts AOI, approximately 49.9 percent is currently developed. An additional 257 acres (approximately 6.9 percent) is undevelopable. The remaining approximate 490 acres (approximately 13.2 percent) is undeveloped. The Cities of Lewisville, Highland Village, and Corinth expect to reach build-out by the year 2015, and the Cities of Lake Dallas and Carrollton expect to reach build-out by 2020 and 2025, respectively. These build-out dates were provided by city planners based on their adopted planning documents and professional opinions about development trends. **Appendix H: Indirect Land Use Impacts Assessment** contains additional information pertaining to the build-out analysis based on data provided by the municipalities within the AOI. It can be assumed the study area would reach build-out by 2025.

Other Indicators of Growth

Residential growth, specifically home construction, was utilized as an indicator of historical growth in the indirect effects study area. Research indicates that prior to 1939, 36,107 homes were constructed in Dallas County. A large increase occurred in Dallas County as 161,513 new homes were constructed through 1959. In the 1960s, 1970s and 1980s there followed a boost in new home construction. During the 1990s, new housing construction showed no substantial growth, yet remained steady.

Prior to 1939, 2,802 homes were constructed in Denton County. After that, development was gradual in Denton County as 7,078 new homes were constructed by 1959. Construction in the 1960s slightly increased as the number of new homes constructed reached 8,947 in Denton County. Throughout the following decades, a boost in new home construction resulted during the 1970s and 1980s with 28,308 new homes built in Denton County by 1979, and 53,405 new homes built by 1989. During the 1990s, 53,518 new homes were built.

These past development trends defined the construction of public facilities and implementation

of public services as well as commercial/retail land uses that occurred after the 1990s.[24] See **Table VI-3** for historic Dallas and Denton Counties housing characteristics.

Table VI-3: Housing Characteristics for Dallas and Denton Counties

Year Built	Number of New Homes Built	
	Dallas County	Denton County
1999-March 2000	18,772	14,011
1995-1998	52,586	33,278
1990-1994	50,643	20,240
1980-1989	192,391	53,405
1970-1979	189,073	28,308
1960-1969	153,034	8,947
1940-1959	161,513	7,078
1939 or Earlier	36,107	2,802

Source: NCTCOG, http://www.nctcog.org; accessed April 2009.

Real Estate Center

Single-family building permit information was collected for Dallas and Denton Counties from 1980 to 2008. The number of building permits has fluctuated during the past 29 years as shown in **Table VI-4**. The year 2000 is documented as the peak year for single-family building permits during this timeframe; this trend is attributed to the rise in population growth the region experienced.

Table VI-4: Dallas and Denton Counties Building Permits (1980 – 2008)

Year Built	Number of New Homes Built	
	Dallas County	Denton County
2000-2008	75,110	39,660
1990-1999	69,302	32,574
1980-1989	95,918	16,660

Source: Texas A&M Real Estate Center, http://recenter.tamu.edu/; accessed June 2009.

Texas Education Agency

Four school districts are located within the AOI. Lewisville ISD was identified as the fastest-growing school district within the AOI with a 10.7 percent enrollment change from the 2004-05 to 2007-08 school years. The four school districts located within the AOI are listed in **Table VI-5**.

Table VI-5: School District Enrollment Totals

District Name	2004-2005 Enrollment	2007-2008 Enrollment	4-year Growth	% Growth
Carrollton-Farmers Branch ISD	25,470	26,257	787	3.0%
Coppell ISD	10,119	9,948	-171	-1.6%
Lake Dallas ISD	3,749	3,978	229	6.1%
Lewisville ISD	45,335	50,216	4,881	10.7%

Source: Texas Education Agency, http://www.tea.state.tx.us/; accessed April 2009.

[24] NCTCOG, http://www.nctcog.org

Mobility 2030 – 2009 Amendment Projects

Mobility 2030 – 2009 Amendment defines transportation systems and services in the DFW metropolitan area. The plan 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. Several added capacity projects within Dallas and Denton Counties were identified in NCTCOG's *Mobility 2030 – 2009 Amendment* within the boundary of the AOI.

Summary of Study Area's Goals and Trends

As reflected above, the AOI is maintaining a transition toward more intense urbanization. This pattern of urbanization, which is consistent with the goals and objectives of the local municipalities within the AOI, has intensified during the last few decades and is expected to continue until the anticipated build-out in 2025.

Step 3. Inventory of Study Area's Notable Features

Most of the AOI is generally developed with retail/commercial, light industrial, residential, public roadways, and railroad tracks. USACE property surrounds the existing IH 35E facility from Garden Ridge Boulevard to Denton Drive South. Historically, the land within the AOI has been primarily developed for commercial use. Currently, there are residential areas adjacent to the project and within the AOI. There are three publicly-owned parks adjacent to the proposed project portions of which would be converted from parkland to transportation use.

Notable features that could be indirectly impacted within the study area are listed in **Table VI-6.** These notable features are composed of sensitive habitats (e.g. rookeries)**,** valued environmental components (e.g. lakes and community parks), and vulnerable elements of the population (e.g. regional medical centers and elementary schools). See **Figure 15: Indirect Impacts Area of Influence (Sheets 1 and 2)** for the locations of the notable features within the AOI.

Table VI-6: Notable Feature Inventory

ID	Notable Feature
NF 1	Rookery at IH 35E and Frankford Road (west of IH 35E)
NF 2	Central Elementary School
NF 3	Medical Center of Lewisville
NF 4	Highland Lakes Park
NF 5	Rookery at IH 35E and Highland Village Road (west of IH 35E)
NF 6	Copperas Branch Park
NF 7	Copperas Branch East Park
NF 8	Lewisville Lake

NF 1 - Rookery at IH 35E and Frankford Road (west of IH 35E). Rookeries are generally a breeding or living area for large numbers of birds, or other animals, that come together in colonies to nest or breed. A cormorant rookery was observed on the west side of IH 35E at Frankford Road in February 2009; however, in June 2009 the birds were not observed at this location.

NF 2 - Central Elementary School. Central Elementary School, located approximately 140 ft from IH 35E, serves Pre-K through 5th Grade Students from the City of Lewisville. This school is eligible for participation in state and federal U.S. Department of Education Title I Programs. Title I Programs provides financial assistance to local education agencies and schools with high numbers or high percentages of poor children to help ensure that all children meet challenging state academic standards. Some or all students from this school participate in free or reduced lunch programs.

NF 3 - Medical Center of Lewisville. The Medical Center of Lewisville is a hospital located in Lewisville approximately 230 ft from the proposed project. The hospital has two specialty units, including Adult and Pediatric and Intensive Care.

NF 4 - Highland Lakes Park. Highland Lakes Park is a publicly-owned park serving primarily the Highland Lakes II subdivision neighborhood. The park is operated by the City of Lewisville Parks and Leisure Services Department. Highland Lakes Park is located on the west side of IH 35E, just south of Lewisville Lake. This neighborhood park contains approximately 360 linear ft of hike and bike trail, a 5-space parking lot, 4 park benches, 4 picnic tables, 3 trash cans, and 4 barbeque grills. The proposed project would require approximately 0.5 acre of the 1.4 acre park.

NF 5 - Rookery at IH 35E and Highland Village Road (west of IH 35E). In June 2009 an egret rookery was observed within the project area west of IH 35E and south of Highland Village Road at Lewisville Lake. However, the rookery is located outside of any proposed improvements.

NF 6 - Copperas Branch Park. Copperas Branch Park is a 74.9-acre park adjacent to Lewisville Lake, located within USACE property. Approximately 37 of the 74.9 acres are used for intense recreational purposes of which approximately 6.4 acres would be utilized for the proposed reconstruction of IH 35E. The park facilities include athletic fields, boat ramps, and picnic areas and access is located just off the IH 35E southbound frontage road, north of Garden Ridge Boulevard.

NF 7 - Copperas Branch East Park. Copperas Branch East Park is a 38.0-acre property east of IH 35E and DCTA/DART ROW that currently has no public access. Copperas Branch East Park is an undeveloped area designated for recreation use by the USACE. There are no impacts to Copperas Branch East Park due to the proposed reconstruction of IH 35E; however mitigation for impacts to Copperas Branch Park would occur at Copperas Branch East Park. Proposed mitigation includes providing pedestrian access from Copperas Branch Park to Copperas Branch East Park so that passive recreation activities are available.

NF 8 - Lewisville Lake: Lewisville Lake is a 29,592-acre lake which is located on the Elm Fork of the Trinity River, near Lewisville. Lewisville Lake reaches a depth of 67 ft at normal elevation and has generally murky water clarity with the water level fluctuation anywhere from 4 to 8 ft annually in normal years. Average depth of Lewisville Lake is about 25 ft deep at normal elevation. The USACE is Lewisville Lake's controlling authority. Lewisville Lake is surrounded by 9,000 protected acres of nature and has approximately 230 miles of shoreline. Approximately 20.7 acres of USACE property located at Lewisville Lake would be impacted by the proposed project. A portion of the USACE property includes Copperas Branch Park (NF 6) which is leased from the USACE and operated and maintained by the City of Highland Village.

Step 4. Identify Impact-Causing Activities of the Proposed Improvements

Transportation projects such as the proposed reconstruction of IH 35E can involve a number of impact-causing activities. This step is intended to conceptualize, not quantify, potential indirect impacts that would occur because of the proposed project. The general types of project impact-causing activities include the following (NCHRP Report 466):

- **Modification of regime effects** – Approximately 70.3 acres of herbaceous vegetation and 26.0 acres of woody vegetation within proposed ROW would be impacted during construction. Of the total woody vegetation, approximately 22.62 acres are considered woodland areas and the remaining amount is comprised of urban landscaped areas. Drainage would also be modified.
- **Land transformation and construction** – The proposed project would widen the mainlanes from six to eight lanes, and include four additional HOV/managed lanes along the center median of IH 35E. Frontage roads would consist of two, three, and four lanes in each direction. The overall width of the facility would widen by an approximate range of 80 to 256 ft.
- **Resource extraction** – The cut and fill amounts located within the current USACE easement are anticipated to result in an overall positive benefit to flood storage of Lewisville Lake. No reduction in storage capacity and no impacts to the floodplain elevation are anticipated from the proposed project.
- **Processing – Storage of materials** would occur off-site. The proposed improvements would require an additional 54 acres of easements. The USACE owns property adjacent to Lewisville Lake within the IH 35E corridor. Construction of the proposed project would require the use of approximately 20.7 acres of USACE property for the proposed facility. An easement request and construction license would be coordinated and processed with the USACE for the right to construct and use property for the proposed project as it would not be possible to acquire ROW from the USACE for the proposed construction of IH 35E. A 300 ft construction easement has been assumed along USACE property.
- **Land alteration** – Land alteration as a result of the proposed project would largely be limited to the increase in paved area. Vegetated areas within the ROW would be restored to their current condition with similar vegetation.
- **Resource renewal** – The total number of large individual trees and total acreage affected and thus compensated for may change during final design. TxDOT would minimize the loss by preserving as many trees as possible. Trees within the ROW, but not in the construction zone, would not be removed if possible. Through coordination efforts with USACE staff it has been determined that the preferred mitigation approach for vegetation/habitat impacts on USACE property (Woodland Data Site Form Areas 10-13) would consist of a fee payment. Typical compensatory mitigation for the loss of vegetation/habitat according to the ratios defined in the Lewisville Lake PEA would be followed depending upon the vegetation elevation and habitat quality. In accordance with EO 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping, seeding and replanting with TxDOT approved seeding specifications that is in compliance with EO 13112 would be done where possible. Moreover, abutting turf grasses within the ROW are expected to re-establish throughout the project length. Soil disturbance would be minimized to ensure that invasive species would not establish in the ROW.

- **Changes in traffic** – The proposed project is expected to increase capacity, manage traffic congestion, improve mobility, and improve roadway deficiencies within the DFW metropolitan area. It is anticipated that the increased capacity and continuous frontage roads would benefit the local roadway system.
- **Waste emplacement and treatment** – Soil excavated from the project area would likely be stockpiled in upland areas for use on another project or sold for other uses, depending on the results of soil testing. The contractor, when selected, may chose to provide portable sanitary facilities for employees at the field office. No other sanitary waste discharge is anticipated.
- **Chemical treatment** – No use of fertilizer is anticipated during revegetation. Periodic applications of herbicide may occur during the maintenance phase of the proposed project.
- **Access alteration** – The proposed project would incorporate continuous pedestrian sidewalks along each side of the Lewisville Lake bridge. The proposed northbound sidewalk would would begin at Highland Village Road and end at Hickory Hills Boulevard. The proposed southbound sidewalk would would begin at Denton Drive South and end at Hickory Hills Boulevard. The proposed sidewalks would allow for the continuation of public-access to recreational amenities along the Trinity Trail hike and bike facility across Lewisville Lake. As part of the proposed Section 4(f) mitigation, a new park entrance and access road is proposed for Copperas Branch Park. A parking area under the IH 35E bridge over Lewisville Lake (68,000 SF/180 spaces) is anticipated to be provided by TxDOT per the USACE mitigation agreement.

Step 5. Identify Potentially Significant Indirect Effects

Step 5 examines the potential for significant indirect impacts potentially associated with the proposed project. The objective of this step is to compare project impact-causing actions with the list of goals and notable features to explore potential cause-effect relationships and establish which effects are potentially substantial and merit subsequent detailed analysis (or conversely, which effects are not potentially substantial and require no further assessment).

Encroachment-Alteration Effects

Ecological Effects

A team of biologists have determined that ecological encroachment-alteration effects have no potential to be substantial. The land within the AOI totals 3,704 acres and consists of approximately 1,900 acres of mowed and maintained vegetation (landscape plantings), 178 acres of riparian woodlands, 69 acres of upland woodlands, 42 acres of herbaceous vegetation with scattered woody species, and 105 acres of Lewisville Lake. The remaining area within the AOI is paved or a structure is present. Regarding vegetated areas adjacent to Lewisville Lake, coordination with USACE would need to occur; potential impacts would need to be reviewed and discussed to determine mitigation and measures to minimize harm as well as enhancement opportunities. Potential loss of habitat would occur along the boundaries of habitat already fragmented by the original construction of IH 35E, construction of surrounding commercial and residential properties, and clearing of crops and improvements from former farmland, and would not lead to further fragmentation of habitat. The proposed project would not alter the hydric regime or reduce diversity within the ecosystem.

Waters of the U.S. and wetlands in the AOI could potentially be impacted by land use changes; however, the proposed project would not result in indirect land use changes. Accordingly, no indirect effects on waters of the U.S. and wetlands would result from the proposed project as the proposed improvements would impart a "none to very weak" potential for land use changes (**Appendix H: Indirect Land Use Impacts Assessment**). Indirect effects on waters of the U.S., including wetlands, will not be evaluated in Steps 6 – 7.

Encroachment-alteration indirect impacts were considered in relation to air quality. The AOI is part of the EPA designated nine-county moderate nonattainment area for ozone. The air emissions considered in this analysis include the air pollutants for which there are NAAQS and the six priority mobile source air toxics for which there are no air quality standards but are regulated by the EPA (MSATs). The pollutants with most potential to increase due to the transportation projects within the AOI include those which main sources are attributed to transportation and construction activities (i.e., ozone, CO, particulate matter, and MSAT).

For the indirect air quality assessment, it was assumed that the potential indirect impacts resulting from the construction of the proposed reconstruction of IH 35E would be related to the transportation projects for which construction would be accelerated as additional funding becomes available due to the implementation of the Excess toll Revenue Sharing Policy for Managed Lanes, changes in land use, and an increase in population. It was also assumed that these projects could result in an increase of vehicular traffic, construction activities, and in new non-point (i.e., bakeries, dry cleaners, gas stations) or point (i.e., industry and manufacturing) sources of emissions within the AOI.

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. Assuming compliance with the SIP and the results of Steps 1 through 4, which evaluated the possible project-related actions that can indirectly impact air quality, it was determined that the proposed reconstruction of IH 35E would not be anticipated to cause indirect air quality impacts in the AOI. No changes to the NAAQS are anticipated.

MSATs are compounds emitted from highway vehicles (i.e., cars, trucks, buses) and off-road equipment (e.g. construction equipment, lawn and garden equipment, recreational equipment, marine vessels, locomotives and aircraft). Although MSAT emissions at the sensitive receptor within or near the AOI could temporarily increase due to increased construction activities, over time these emissions are anticipated to decrease with the implementation of the EPA's national vehicle and fuel control regulations. For these reasons no MSAT indirect impacts are anticipated. In addition, no indirect air quality impacts to the adjacent communities are expected as no traffic redistribution into the existing arterial network is anticipated.

MSAT 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, including CO, MSATs, and the ozone precursors VOC and NOx.

Socio-economic Effects

Encroachment-alteration effects to socio-economic resources were identified as potentially substantial due to the 180 anticipated displacements that would occur as a direct result of the approximate 233 acres of proposed ROW and easements. Note indirect impacts related to potential tolling impacts are discussed in **Section VIII**. Two broad forms of socio-economic impacts include 1) changes in travel patterns and access, and 2) direct relocation of homes and businesses. These direct impacts may lead to indirect effects on neighborhood cohesion, neighborhood stability, travel patterns, changes in the local economy, changes in access to specific services, recreation patterns at public facilities, pedestrian dependency and mobility, perceived quality of the natural environment, among others. Changes in access can include driveway changes, relocations of ramps, introduction of raised medians, alterations of intersections that restrict access to local streets, or the addition of a toll. These may result in changes in travel patterns throughout an area. For example, introducing a toll may redistribute traffic onto other local streets with easier access.

The direct impacts of the proposed project that may lead to indirect socio-economic effects include:

1. Potential Section 4(f) issues that would result in relation to three publicly-owned facilities (parks) adjacent to the proposed project for which parkland would be converted to a transportation use. The facilities include the future T.C. Rice Athletic Complex, USACE property including Copperas Branch Park, and Highland Lakes Park.
2. The anticipated 180 displacements consisting of 93 commercial businesses, 65 residences, 19 vacant buildings, and 3 government/municipal facilities. The structures potentially displaced are currently located within the Cities of Carrollton, Corinth, Lake Dallas, Lewisville, and the Town of Hickory Creek. The City of Lewisville would absorb most of the relocations or 147 displacements (approximately 82 percent of the total).
3. No substantial direct environmental justice impacts would result from the proposed IH 35E project. Although 22 of the anticipated 180 displacements are located within 3 census blocks with majority environmental justice populations, comments received from the public meeting held on November 13, 2008 suggest residential displacements would not be contested given the number of inquiries as to when the ROW acquisition process would begin and the requests of TxDOT to purchase entire parcels to avoid unusable land or negative impacts to property values.
4. The proposed project's direct impacts associated with tolling would not be isolated within a limited number of census blocks such as the potential displacement impacts, but would be distributed among all users of the IH 35E facility. Low-income populations who elect or can only on occasional basis afford to pay tolls to access the tolled HOV/managed lanes would be impacted by toll rates, toll collection, and other matters associated with user fees.
5. The economic impact of tolling the HOV/managed lanes would be higher for low-income users because the cost of paying tolls would represent a higher percentage of household income than for non-low-income users.
6. O&D data based on projected trips indicates EJ TSZs would utilize the IH 35E facility under both the Build and No-Build scenarios.
7. The traffic operations analysis entailed the comparison of the number of lane-miles operating under different LOS between Build and No-Build Alternatives in 2030 during the AM peak hour. The comparison indicates that there would be an increase in lane-miles operating under LOS A-B-C along both the mainlanes and HOV/managed lanes

under the Build Alternative.

8. During the construction stages, traffic would follow the existing traffic patterns. It is anticipated that reconstruction of the facility would be completed without the use of detours; however, temporary lane closures may occur. In the event that detours are required, city and local public safety officials would be notified of the proposed detours. Any detour timing and necessary rerouting of emergency vehicles would be coordinated with the proper local agencies.

Induced Growth Effects

The AOI contains approximately 747 acres of undeveloped land (approximately 20.1 percent of the total AOI acreage). Of the approximate 747 acres of undeveloped land within the AOI, approximately 257 acres are considered undevelopable. Recent development trends and local government land use controls indicate that further development is likely because the anticipated build-out date for the AOI is 2025.

Effects Related to Induced Growth

Induced growth is not anticipated to result in substantial ecological effects, based on the reasons previously provided. Habitat throughout the AOI is fragmented and human activity is common throughout this urban area. Additional development would serve to further reduce the amount of habitat available, but species composition in the AOI is already consistent with that of an urbanized area. Socio-economic effects related to induced growth may be substantial and therefore will be studied further. **Appendix H: Indirect Land Use Impacts Assessment** identifies and analyzes the potential for indirect land use impacts related to the proposed improvements to IH 35E from PGBT to FM 2181. The analysis of indirect land use impacts is intended to describe how land use will be different under two alternatives: one with the proposed transportation improvement, and one without it.

Step 6. Analyze Indirect Effects and Evaluate Results

Several potentially substantial indirect impacts have been identified. Each of these is further analyzed below.

Encroachment-Alteration Effects

Changes in Travel Patterns

In terms of traffic operations, the improvements to IH 35E from PGBT to FM 2181 are expected to decrease congestion along the local transportation system as vehicles begin utilizing the newly constructed lanes. IH 35E is also expected to carry regional through traffic and meet future traffic demand. The presence of continuous frontage roads will also allow for improved local circulation within the indirect impact study area. Thus, the improved roadway is expected to reduce congestion and delays along the local system by adding needed capacity.

<u>Traffic Operations</u>

In terms of traffic operations, the proposed IH 35E project (from PGBT to FM 2181) would generally be realized as direct effects (described in **Section IV.C.10**); the only indirect effects analyzed in this section would be those related to the potential increase in congestion along the local transportation system due to vehicles redirecting off the HOV/managed lanes to avoid paying the toll.

A system level comparison was conducted to determine the impact of the Build Alternative on the traffic network within the traffic analysis study area. Results of the analysis are reported in terms of LOS to describe the anticipated change in traffic flow conditions along the IH 35E corridor from PGBT to FM 2181.

System Level Analysis

A system level analysis was conducted using the Complete Performance Reports for the IH 35E project, provided by NCTCOG (**Appendix D: NCTCOG Complete Performance Reports**.) NCTCOG Complete Performance Reports are designed to document the performance of the regional traffic model, reporting items such as total miles of roadway within a defined area, number of trips generated, average time to make the trip, and the LOS of all major roadway classifications. The Complete Performance Reports modeled the 2030 Build and No-Build Alternatives. The traffic analysis study area for the IH 35E Middle Project Complete Performance Reports includes the TAZs within a distance of 1 mile along the corridor. The traffic analysis study area is approximately 79 square miles.

According to the Complete Performance Reports, the Build Alternative of the IH 35E project would improve LOS on the local arterials, collectors, and frontage roads. As shown in **Table VI-7**, the percent of lane-miles operating under most favorable conditions (LOS A-B-C) increases under the Build Alternative when compared to the No-Build Alternative. Results of the analysis also show that under the Build Alternative, the number of lane-miles of:

- Frontage roads operating under LOS F stay the same;
- Local arterials and local collectors operating under LOS F decreases;
- Local arterials operating under LOS D-E increases; and
- Local collectors operating under LOS D-E and F decreases.

Table VI-7: Level of Service for Indirect Impacts Study Area (2030)

Location	LOS No-Build Alternative	LOS Build Alternative	Percent Increase of Lane-Miles Operating under LOS A-B-C (Build versus No-Build Alternative)
Frontage Roads	A-B-C (54 lane-miles)	A-B-C (74 lane-miles)	37
	D-E (6 lane-miles)	D-E (15 lane-miles)	
	F (31 lane-miles)	F (31 lane-miles)	
Total lane-miles	**91**	**120**	
Local Arterials	A-B-C (128 lane-miles)	A-B-C (131 lane-miles)	2
	D-E (22 lane-miles)	D-E (81 lane-miles)	
	F (48 lane-miles)	F (39 lane-miles)	
Total lane-miles	**198**	**251**	
Local Collectors	A-B-C (163 lane-miles)	A-B-C (185 lane-miles)	13
	D-E (28 lane-miles)	D-E (18 lane-miles)	
	F (28 lane-miles)	F (18 lane-miles)	
Total lane-miles	**219**	**221**	

Source: NCTCOG TransCAD® data for 2030 daily traffic Build and No-Build Alternatives (February 2009 Complete Performance Reports for the IH 35E Middle Project)

According to the Complete Performance Reports provided by NCTCOG, vehicle hours of total delay (signalized delays and congestion delays) within the traffic analysis study area decreases 23 percent under the Build Alternative (15,860 hours of delay/day under the No-Build Alternative versus 12,855 hours of delay/day under the Build Alternative). **Table VI-8**

illustrates the anticipated change in free speed for the Build and No-Build Alternatives. The Complete Performance Reports indicated the average free speed of local roadways [major arterials and minor arterials (in mph)] is virtually unchanged and that the average free speed along the frontage roads would increase approximately 2.5 percent or close to 1 mph when compared to the No-Build Alternative. Overall, the percent change in average free speed would result in a non-perceptible effect to users of the major/minor arterials and frontage roads in the traffic analysis study area.

Cost of Travel Delay

According to the TTI, the most recent value of travel delay (2005 dollars) is $14.60/hour of delay for non-commercial vehicles and $77.10/hour for commercial vehicles.[25] Using the cost for non-commercial vehicles, there would be a cost of travel delay of $187,683 under the Build Alternative and a cost of $231,556 per day (2005 dollars) to the users within the traffic analysis study area under the No-Build Alternative.[26] The difference in user cost between Build and No-Build Alternatives is $43,873 per day.

Table VI-8: 2030 Average Free Speed of Roadway (MPH)

Roadway Classification	No-Build Alternative			Build Alternative			Percent Change in Average Free Speed		
	AM	PM	Daily	AM	PM	Daily	AM	PM	Daily
Major Arterials	35.61	35.64	35.58	35.49	35.60	35.38	-0.34%	-0.11%	-0.56%
Minor Arterials	31.55	34.65	31.65	31.23	31.31	31.13	-1.01%	-9.64%	-1.64%
Frontage Roads	37.76	38.41	38.27	38.69	38.85	38.71	2.46%	1.15%	1.15%

Source: NCTCOG TransCAD® data for 2030 daily traffic Build and No-Build Alternatives (February 2009 Complete Performance Reports for the IH 35E Middle Project)

The Excess toll Revenue Sharing Policy for Managed Lanes outlines the circumstances under which excess toll revenue would become available and distributed in the region. In the foreseeable future, the proposed IH 35E project could benefit communities in the project area by generating revenue for additional transportation projects that could also increase capacity, manage traffic congestion, improve mobility, and improve roadway deficiencies within the region. These projects could include roadway, transit, bicycle, intersection improvement, ITS, regional/innovative, and park-and-ride projects.

Traffic Operations Summary

The LOS comparison derived from the Complete Performance Reports reflecting the IH 35E Build and No-Build Alternatives reveal that there would be less delay [percent increase of lane-miles operating under most favorable LOS conditions (LOS A-B-C)] under the Build Alternative along the frontage roads, local arterials, and collectors. The analysis also concludes that under the Build Alternative, vehicle hours of total delay (signalized delays and congestion delays) would decrease 23 percent within the traffic analysis study area in comparison to the No-Build Alternative. Additionally, the analysis reveals the average free speed of local roadways (in mph) is virtually unchanged between the 2030 Build and No-Build Alternatives. Overall, the percent change in average free speed would result in a non-perceptible effect to users of the major arterials, minor arterials, and frontage roads within the traffic analysis study area. The difference

[25] *2007 Annual Urban Mobility Report*, Texas Transportation Institute, the Texas A&M University System, 2007.
[26] The Annual Urban report was released on September 7, 2007.

in user cost between the Build and No-Build Alternatives is estimated to be lower for the Build Alternative than for the No-Build Alternative by $43,873 per day.

Socio-economic Indirect Impacts

With respect to relocations and displacements, indirect impacts would be driven by the relocation of the residential, commercial, and local government properties anticipated to be displaced by the proposed IH 35E improvements between PGBT and FM 2181. Examples of indirect impacts due to relocations and displacements include a potential reduction in the supply of affordable housing for the 65 potentially displaced households, changes in residential and commercial property values due to the proposed improvements, changes in local tax base due to the anticipated displacements, and impacts to the employees (such as increased commuting time) who could be displaced by the proposed improvements. Local school district attendance could also be indirectly impacted by the relocation of residential displacements; however, this is expected to be a minimal impact due to the current size of the existing school districts within the indirect impacts study area.

In terms of residential indirect impacts, the proposed project's impact on affordable housing along the IH 35E facility may decrease the stock of affordable housing supply in the immediate area. However, current Multiple Listing Service (MLS) data indicates comparable housing supply is available throughout the municipalities which anticipate residential displacements. Residential properties located near IH 35E which are not physically impacted by the proposed improvements may experience a change in market value, either positive or negative. The potential absorption of 65 relocated households could affect changes in local school district attendance; however, considering an average of one school-age child per household would result in 65 individuals to be absorbed by other school districts. Even if one school district were to absorb all relocated school-age individuals, **Table VI-5** indicates the school districts located within the indirect impacts study area could absorb this number without straining available resources.

According to conversations with an economic development specialist with the City of Lewisville, construction of the proposed improvements is anticipated to delay new development and investment along the IH 35E corridor in the short to mid-term. However, commercial development and re-development activity would rebound and continue at an accelerated pace along the entire IH 35E corridor in the long-term because interstate locations are favorable with regard to most commercial real estate preferences. As discussed in **Section IV.C.1**, the City of Lewisville's IH 35E Corridor Development Plan is an example of a proactive local government response to reduce potentially negative impacts associated with the anticipated commercial and residential displacements along IH 35E throughout the city's jurisdiction. The City of Lewisville is working to promote redevelopment and complimentary land uses along IH 35E from SH 121 to Lewisville Lake (an approximate 8-mile corridor) to maintain or improve the existing trends in residential and commercial land uses in the long-term. Additionally, the proposed project could influence developers to seek tracts of land that would not be impacted by construction activities.

The indirect effects to public facilities and services adjacent to the proposed project would be beneficial and would result from the reconstruction of IH 35E between PGBT and FM 2181. The beneficial effects of the proposed improvements include increased capacity, managed traffic congestion, improved mobility and improved design for the users of the Medical Center of Lewisville (Notable Feature 3) and other public facilities in the study area. As of July 2009, the three public facilities that would be directly impacted and displaced (City of Lewisville water

tower and Town of Hickory Creek Public Works and Animal Services facility) have yet to be relocated. Relocating the Town of Hickory Creek Public Works and Animal Services facility may indirectly impact the community as employees associated with the public facility may encounter increased travel time to work depending on the new location. As stated previously in **Section IV.C.1**, acquisition and relocation assistance would be in accordance with the TxDOT Right-of-Way Acquisition and Relocation Assistance Program.

The improvement or addition of roadways usually improves the local economic situation within the immediate and indirect study area by increasing access to existing or future commercial, residential, or other land uses. Because the IH 35E improvements include HOV/managed lanes from PGBT to FM 2181, the potential indirect effects of tolling, both negative and positive, were also examined. According to a 2006 technical report entitled *Impacts of Toll Projects: Simplified Methodology for Candidate Evaluation Road,* the potential impacts imposed by tolled facilities in the U.S. and abroad indicate higher prices of housing units near toll nodes because of increased access to services and opportunities. [27]The report also indicates that industries and businesses that value mobility and reliability tend to locate at nodes and along connectors, which in turn attract high-income developments and leisure businesses. Economic indirect effects of tolling may therefore include increase in employment and tax revenues.

Regarding the potential for increased pedestrian access as an indirect impact of the proposed improvements, the proposed project would incorporate continuous pedestrian sidewalks along each side of the Lewisville Lake bridge. The proposed northbound sidewalk would begin at Highland Village Road and end at Hickory Hills Boulevard. The proposed sidewalks would allow for the continuation of public-access to recreational amenities along the Trinity Trail hike and bike facility across Lewisville Lake (Notable Feature 8).

In terms of increased public park amenities as an indirect impact of the propose improvements, the proposed mitigation and enhancement measures associated with Copperas Branch Park (Notable Feature 6) would improve the park user's experience and the community in general. The project has been designed to ensure that Copperas Branch Park remains a viable community amenity along the roadway corridor. As part of the proposed Section 4(f) mitigation, a new park entrance and access road is proposed for Copperas Branch Park and access would be provided for Copperas Branch East Park (Notable Feature 7). A parking area under the IH 35E bridge over Lewisville Lake (68,000 SF/180 spaces) is anticipated to be provided by TxDOT per the USACE mitigation agreement. A second park proposed to be impacted along IH 35E, Highland Lakes Park (Notable Feature 4), primarily serves as a neighborhood park within the Highland Lakes II subdivision. The proposed mitigation preserves and enhances the features and values of Highland Lakes Park that originally qualified it for Section 4(f) protection. The proposed mitigation and enhancement measures would improve the park user's experience and the community in general.

Induced Growth Effects

Interviews with planning professionals were assessed to measure the potential indirect land use impacts from induced development. An *Indirect Land Use Impacts Assessment* located in **Appendix H** contains the indirect land use impacts analysis related to the proposed improvements to IH 35E. The study area for the assessment consists of the municipalities

[27] Center for Transportation Research, The University of Texas at Austin, *Guidebook for Identifying, Measuring and Mitigation Environmental Justice Impacts of Toll Roads*, 2006. http://www.utexas.edu/research/ctr/pdf_reports/0_5208_P2.pdf

located adjacent to the proposed project: the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County. The adjacent municipalities' population and employment is anticipated to increase by approximately 33 and 39 percent, respectively, from 2000 to 2030. The City of Corinth is expected to experience the highest population growth through 2030. The Town of Hickory Creek is expected to experience the highest employment growth through 2030.

The forecasted developments embodied in the various plans and policy documents previously discussed in Step 2 assume that the proposed IH 35E facility will be reconstructed. The basic land use patterns surrounding the anticipated improvements to the IH 35E facility are reflected in the comprehensive plans of the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek. The proposed IH 35E facility has existed for many decades, and land use planning for the region reflects the presence of the facility. The comprehensive plans and associated zoning would likely not change, as the proposed IH 35E facility is a planned transportation corridor that would benefit from coordinated design, infrastructure, and compatibility of land uses set forth by the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek. If the No-Build alternative were to be adopted, land use development patterns would still continue toward build-out, though possibly at a slower rate, because IH 35E (from PGBT to FM 2181) is already a major interstate and would continue to facilitate the transportation of goods and services throughout the region

After initial coordination with planners in the study area during January 2009, it was determined that a more narrow investigation of specific areas where induced land use development may occur was needed. Therefore, additional coordination with planning professionals in the various jurisdictions traversed by IH 35E was conducted in July 2009. The following questions were asked:

- As a planner, do you think that a 1,200 ft buffer is reasonable for an assessment of induced land use development? If not, how large or small of a buffer would you suggest for this type of assessment?
- What parcels (if any) do you think would likely be developed as a result of the proposed transportation improvements to IH 35E?
- In your opinion, will transportation improvements to IH 35E induce land use development in your jurisdiction, alone or in conjunction with other factors?
- Would improvements to IH 35E affect the rate of land use development in your jurisdiction?
- Please draw on the maps provided to indicate areas you think are likely to develop. Please indicate whether or not they are currently platted for development.

The resulting mapped information provided by the planners was digitized and each parcel was measured to provide an approximate acreage. A total of approximately 700.4 acres within the 1,200 ft buffer along either side of the IH 35E proposed ROW were determined to be potentially impacted at least in part as a result of the proposed roadway improvements. Many of these areas are currently platted, or are anticipated to be redeveloped, and therefore already committed to developed land uses. The areas of potential induced development (approximate 700.4 acres) are shown on **Figure 15: Indirect Impacts Area of Influence (Sheets 1 and 2)**.

Effects Related to Induced Growth

The areas of potential induced development identified through stakeholder input (approximately 700.4 acres) contains approximately 358.2 acres of mowed and maintained vegetation (landscape plantings), 6.5 acres of riparian woodlands, 31.7 acres of upland woodlands, and 105.7 acres of herbaceous vegetation with scattered woody species. Potentially induced development is not anticipated to result in substantial ecological effects because habitat throughout the AOI is fragmented and human activity is common throughout this urban area. The potentially induced development would serve to further reduce the amount of habitat available, but species composition in the AOI is already consistent with that of an urbanized area.

The indirect land use impacts detailed in **Appendix H** result in a "none to very weak" potential for land use change as a result of the proposed improvements. The updated comprehensive plans that guide land use development in the study area presume the amount of growth and the level of services to remain consistent with the improvements to the IH 35E facility. The comprehensive plans of the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek assume the IH 35E facility will continue to support the achievement of the development patterns the plans outline. The proposed improvements, deemed necessary to accommodate forecasted growth, are implicit in the planned land use forecasts for the study area and are anticipated by planners in the jurisdictions that would be affected. Although some induced land use development is anticipated by local planners, many of them welcome completion of the proposed improvements to help move their development and redevelopment plans forward. The proposed improvements to the IH 35E facility should minimally alter the future land use patterns in the study area as none of the change indicators analyzed in **Appendix H** indicate a significant change between the Build and No-Build alternatives.

Step 7. Assess Consequences and Consider/Develop Mitigation (when appropriate)

None of the eight notable features are anticipated to be negatively impacted by the proposed improvements to IH35E from PGBT to FM 2181. Three of the eight notable features (Highland Lakes Park, Copperas Branch Park, and Copperas Branch East Park) would be indirectly enhanced due to the Section 4(f) mitigation associated with the proposed improvements. Access to Copperas Branch East Park currently does not exist; therefore, the mitigation associated with the Section 4(f) impacts would include a new park road providing access; railroad crossing and gates to accommodate the at-grade design for park road access; primary trail head to connect Copperas Branch East Park with Copperas Branch Park; sanitary facilities; parking; and approximately 1 mile of new trail. Approximately 20.7 acres of USACE property, including Copperas Branch Park would be converted to a transportation use. Approximately 38 acres of undeveloped and inaccessible USACE property (Copperas Branch East Park) would be developed/enhanced for public use. Additionally, Copperas Branch Park would be enhanced.

The proposed sidewalks along the Lewisville Lake bridge would allow for the continuation of public-access to recreational amenities along the Trinity Trail hike and bike facility across Lewisville Lake (Notable Feature 8). The beneficial effects of the proposed IH 35E improvements include increased capacity, managed traffic congestion, improved mobility and improved design for the users of the Medical Center of Lewisville (Notable Feature 3) and other public facilities in the study area.

The City of Lewisville's IH 35E Corridor Development Plan is an example of a proactive local government response to mitigate the potentially negative impacts associated with the anticipated

commercial and residential displacements along IH 35E throughout the city's jurisdiction. The City of Lewisville would promote redevelopment and complimentary land uses along IH 35E from SH 121 to Lewisville Lake (an approximate 8 mile corridor) to maintain or improve the existing trends in residential and commercial land uses in the long-term. Although new development and investment along the IH 35E corridor are anticipated to be delayed in the short to mid-term, with the proactive approach taken by the City of Lewisville, improvements to mobility associated with the proposed project, and the land value premium realized by businesses adjacent to interstate highways, redevelopment and investment are anticipated to rebound at an accelerated pace in the long-term.

The mitigation of the potential 700.4 acres of induced development within the AOI considered for this assessment would rest with the agencies with the authority to implement such controls. This authority rests with the municipal governments and to a lesser extent, the county governments. Examples of municipal government regulations include tree ordinances and land 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 or development controls currently in place. As demonstrated in this indirect impacts analysis, all the affected municipalities have planning staff and land use controls in place. Based on interviews with planners representing the six jurisdictions traversed by the proposed improvements, the municipalities are prepared to address direct impacts, redevelopment effects, and even land use development induced in part by the IH 35E improvements. None of the planners interviewed communicated that they were unprepared to address land use changes that would occur as a result of the proposed highway improvements; they would prefer for the construction project to take place rather than remain "in limbo."

VII. CUMULATIVE IMPACTS

A. Project Level Cumulative Impact Analysis

Introduction and Methodology

CEQ regulations (40 C.F.R. § 1508.7) define cumulative impacts (i.e., effects) as "the impact on the environment which results from the incremental impact of the proposed action when added to other past, present and reasonably foreseeable future actions." The purpose of cumulative impacts analysis is to view the direct and indirect impacts of the proposed project within the larger context of past, present, and future activities that are independent of the proposed project, but which are likely to affect the same resources in the future. This approach allows the decision maker to evaluate the incremental impacts of the proposed Build alternative in light of the overall health and abundance of selected resources. The evaluation process for each resource considered may be expressed in shorthand form as follows:

BASELINE CONDITION + FUTURE EFFECTS + PROJECT IMPACTS = CUMULATIVE EFFECTS
(historical and current) (expected projects) (direct and indirect)

The following eight-step approach as described in TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses* (June 2009), was utilized to assess the potential cumulative impacts of the past, present, and reasonably foreseeable actions to the resources in the project area:

1. Identify the resources to consider in the analysis.
2. Define the study area for each affected resource. Cumulative impacts are considered within spatial and temporal boundaries. Each resource has its own resource study area (RSA) to best assess the impacts to that individual resource. Each RSA was defined by professionals experienced in the study and analysis of each resource.
3. Describe the current health and historical context for each resource. The examination of the current health and historical context of each resource is necessary to establish a baseline for determining the effects of the proposed action and other reasonably foreseeable actions on the resource.
4. Identify direct and indirect impacts that may contribute to a cumulative impact. The analysis of cumulative impacts must look at the impacts of the proposed action in combination with the impacts of other past, present, or reasonably foreseeable actions within the RSAs. Identification of the direct and indirect impacts of the proposed action will also assist in determining the project's contribution to the cumulative impact on the resource.
5. Identify other reasonably foreseeable action that may affect the resources.
6. Assess potential cumulative impacts to the resources.
7. Report the results.
8. Assess and discuss mitigation issues for all adverse impacts.

Steps 1 through 6 will be applied to each resource. Once each resource is analyzed, Steps 7 and 8 will follow and address all identified resources.

In order to have a cumulative impact on the resource, the proposed action must have either a direct or indirect impact on that resource. Additionally, the cumulative impact analysis focuses

on those resources substantially impacted by the proposed action and resources currently in poor or declining health, even if the direct and indirect impacts resulting from the project are relatively small (less than significant). All of the resource categories considered in this EA were candidates for analysis with regard to cumulative impacts. As documented in **Sections IV** and **VI** in this document, it was determined that the proposed action would not have considerable direct or indirect impacts on the following resources or in the study area: Lakes, Rivers and Streams; Floodplains; Water Quality; Land Use; Section 4(f) Properties; Public Facilities, and Services; Cultural Resources; Hazardous Materials; and Items of a Special Nature (which include Coastal Zone Management Plan, Wild and Scenic Rivers, and Airway-Highway Clearance).

Cumulative impacts are analyzed in terms of the specific resource being affected. The resources to consider in this analysis are air quality, community, and natural resource related:

Air Quality (Resource)
- NAAQS
- CO
- MSAT

Community (Resource)
- Socio-Economic Impacts/Environmental Justice
- Traffic Noise
- Traffic Operations

Natural Resources (Resource)
- Waters of the U.S., including Wetlands
- Threatened/Endangered Species and Wildlife Habitat

The goal is to determine whether the proposed action's direct and indirect impacts, considered with other reasonably foreseeable actions, would result in substantial degradation of a resource that would not result from the proposed action considered alone. TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses* (June 2009) 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 substantially 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)."

Cumulative impacts were evaluated using the following factors: the historical context of each resource, current condition and trend, future land use and zoning plans, and the pertinent regulations and standards associated with each resource. These factors capture the influences that have shaped and are shaping the amount and quality of each resource, and which would continue to shape the resources into the future. Implicit in the approach to predicting the future condition of resources are several key assumptions:

- All reasonably foreseeable actions would be completed as currently planned.
- The relationships between the resources, ecosystems, and human communities that have been identified from historical experience would continue into the future.

- The sponsors of government and private projects would comply with relevant federal, state, and local laws designed to protect each resource. Regulatory agencies would perform their duties in accordance with legal requirements and internal guidelines.

Of particular importance is the assumption concerning compliance with relevant environmental laws designed to ensure the sustainability of resources. Over the past several decades federal, state, and local lawmaking bodies have enacted statutes, regulations, and ordinances designed to preserve and enhance the abundance and quality of natural resources by requiring project sponsors to avoid, minimize, and mitigate the environmental impacts of their projects or actions. Cumulative impacts analysis focuses on the "net effects" on each resource that remain after full compliance with the regulatory requirements at all levels.

Other reasonably foreseeable effects include additional transportation projects associated with *Mobility 2030 – 2009 Amendment*, commercial development, and residential development – primarily master planned developments dominated by single-family residential uses.

The resources or environmental issues related to the proposed project with the potential for cumulative effects are listed in **Table VII-1**. As recommended by the CEQ guidance, specific indicators of each resource's condition have been identified as shown in **Table VII-1** and the associated RSAs are depicted in **Appendix A, Figure 16: Cumulative Impacts Analysis Study Areas**. The use of indicators of a resource's health, abundance, and/or integrity are helpful tools in formulating quantitative or qualitative metrics for characterizing overall effects to resources. These indicators are also key aspects of each resource that have already been evaluated in terms of the project's direct and indirect impacts, and facilitate greater consistency and objectivity in the analysis of cumulative effects.

Table VII-1: Resource Indicators and Study Areas for the Cumulative Impacts Analysis

Resource Category	Indicators of Resource Condition and Potential Impacts	Resource Study Area (RSA)
Air Quality	8-Hour Ozone Standard: ability of the region to meet this air quality standard	9-county moderate non-attainment area for the DFW Metropolitan Area (includes Dallas and Denton Counties)
	Carbon Monoxide: carbon monoxide concentrations modeled along the ROW under worst meteorological conditions	
	MSAT: trend of emissions over time	
Community	Socio-Economic Impacts, Environmental Justice, Traffic Noise, and Traffic Operations	Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek.
Natural Resources	Waters of the U.S., including Wetlands; Threatened/Endangered Species and Wildlife Habitat	Portions of local watersheds consisting of Lewisville Lake Dam, Elm Fork above Denton Creek, and portions of Denton Creek, and Hickory Creek.

Air Quality

Step 1: Resource Identification - Air Quality

Ozone and Carbon Monoxide
In order to protect human health and the environment, the CAA of 1970 mandated the establishment of the NAAQS and regulations to reduce air pollutants. When the pollutant level within an area exceeds the NAAQS, EPA designates the area as "non-attainment" for the pollutant.

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

Step 2: Resource Study Area - Air Quality

The RSA for evaluating air quality associated with the NAAQS and transportation conformity was designated as the nine-county DFW non-attainment area for the eight-hour ozone standard, which includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties as depicted in **Appendix A, Figure 16: Cumulative Impacts Analysis Study Areas**. This area represents the management unit for mobile source pollutants as regulated by federal, state, and local government agencies. The NAAQS criteria pollutants include ozone, carbon monoxide, particulate matter, nitrogen dioxide, sulfur dioxide, and lead. Unlike the other resources evaluated, air quality impacts from mobile sources are evaluated and managed on a regional basis primarily through the NCTCOG, in coordination with the EPA, TCEQ, TxDOT, and FHWA.

Ozone
The RSA for evaluating the ozone NAAQS was designated as the DFW 8-hour ozone moderate non-attainment area, which includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties.

Carbon Monoxide
The RSA for CO was based on the hot spot analysis along the ROW representing the worst case scenario that would result in the highest potential CO concentrations. The RSA for CO includes specific locations along the IH 35E ROW line at the following roadway sections:

1) Between Corporate Drive and Business SH 121; and
2) Between Hickory Creek Road and Turbeville Road

As stated previously, analyses for other motor vehicle pollutants such as VOCs, NOx (both precursors to ground-level ozone), ozone, and PM concentrations are regional in nature, and, accordingly, concentrations of these pollutants for the purpose of comparing the results with the NAAQS are modeled by the TCEQ or by the regional air quality planning agency for the SIP with oversight provided by TCEQ.

MSAT
The MSAT RSA is specified by an affected transportation network. The MSAT study area is composed of the affected transportation network. The IH 35E affected transportation network

includes the proposed network links and other transportation model links reflecting a plus or minus five or greater percent change in traffic volume between the Build and No-Build scenarios for the year 2030. The plus or minus five percent threshold was adopted as the basis to determine the affected transportation network study area. Because the 2009 base year scenario represents the existing condition, the affected transportation network for 2009 is composed of those links determined to change plus or minus five or greater percent in 2030 and which currently exist in the 2009 network. The resulting affected transportation network for scenario year 2030 consists of those links determined to change plus or minus five or greater percent in 2030.

The application of the threshold was adopted as the basis to determine the affected transportation network RSA and located within the MPA. The MPA in reference consists of the geographic extent of the MPA boundary before its expansion to a 12-county region in October 2009 which included all of Collin, Dallas, Denton, Rockwall, and Tarrant Counties, and contiguous portions of Ellis, Johnson, Kaufman, and Parker Counties. This large area represents the management unit for mobile source pollutants as regulated by federal, state, and local government agencies. Unlike the other resources evaluated, air quality impacts from mobile sources are evaluated and managed on a regional basis primarily through the NCTCOG, in coordination with the EPA, TCEQ, TxDOT, and FHWA.

Step 3: Resource Health and Historical Context - Air Quality

Health

According to NCTCOG, the DFW metropolitan area has been one of the fastest growing areas in the U.S., and it is expected to continue to grow. Growth often results in an increase of development, increase in vehicles, and an increase in VMT. Traffic congestion has become one of the greatest challenges in the DFW metropolitan area, as on-road mobile sources (such as cars and trucks) contribute to air pollution. This challenge is evidenced as the DFW metropolitan area was ranked the ninth most congested area in the nation.[28]

Throughout recent decades, multiple regional and local initiatives have been planned and implemented in an effort to reduce air pollution from mobile sources. Several of these initiatives specific to the area's transportation system included increased capacity highways and roadways (through construction of additional travel lanes and bottleneck improvements), construction of high-occupancy vehicle lanes, and the promotion of alternative transportation (e.g., hike and bike trails, bus, and light/commuter rail).

National Ambient Air Quality Standards

Currently, the project is located within an attainment area for CO and in a moderate non-attainment area for ozone. Ozone is formed in the presence of light, NOx, and VOCs. Nitrogen oxides are usually a by-product of high-temperature combustion. Common sources are cars and power plants. VOCs include organic chemicals that vaporize easily, such as gasoline. The NCTCOG has developed a broad range of air quality programs that focus on reducing ozone-causing emissions. In order to reduce ozone and come into compliance with NAAQS, the formulation of a SIP is required for all non-attainment areas. NCTCOG works in cooperation with federal, state, and local partners to ensure that all air quality requirements are met.

[28] Traffic Engineering, Third Edition. Roger P. Roess, Elana S. Prassas, and William R. McShane

NCTCOG's air quality strategies seek to reduce emissions in a variety of ways, from energy and fuel efficiency to advancing clean technologies to encouraging changes in daily behavior. Such strategies are being implemented throughout the region to reduce emissions from different types of sources; however, many of the programs implemented through NCTCOG target transportation-related emissions due to the fact that on-road mobile sources (such as cars and trucks) account for nearly one-half of all ozone precursor emissions in North Central Texas.

Although no NAAQS for MSAT exist, EPA has certain responsibilities regarding the health effects of MSATs. The EPA controls emissions of air pollutants through one of two major strategies: NAAQS or regulatory controls that result in specific emission reductions. Both strategies provide for increased protection of human health and the environment. For MSATs, in order to more quickly implement emission reductions, the EPA has focused efforts on nationwide regulatory controls.

Historic Context

Ozone
Under the CAAA of 1990, the EPA was authorized to designate areas in "non-attainment" for failing to meet established air quality standards (known as the NAAQS). In July 1997, the EPA announced a new NAAQS for ground-level ozone. The EPA phased out and replaced the previous 1-hour standard with an 8-hour standard to protect public health against longer exposure to this air pollutant.

In 2004, the EPA designated nine counties in North Central Texas as moderate non-attainment for the 8-hour ozone in accordance with the NAAQS. As previously mentioned, Dallas and Denton Counties are located within the designated moderate non-attainment area for ozone. Although there have been year-to-year fluctuations in ozone concentrations, these concentrations demonstrate a reduction over time, which indicates improvements to air quality over time. Ozone trend continues to show improvement as the number of daily exceedances of the federal standards for ozone has decreased within the past decade. This trend of air quality improvement in the DFW region is attributable in part to the effective integration of highway and alternative modes of transportation, cleaner fuels, improved emission control technologies, and NCTCOG's regional clean air initiatives.

Carbon Monoxide
According to EPA studies, approximately 95 percent of the CO in typical U.S. cities results from mobile sources. However, according to TCEQ, as of May 17, 2007, the 1-hour standard for CO has never been exceeded in Texas. Air quality monitors measure concentrations of CO throughout the country. EPA, state, tribal and local agencies use that data to ensure that CO remains at levels that protect public health and the environment. Nationally, average CO concentrations have decreased substantially over the years.

MSAT
On March 29, 2001 the EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, (66 FR 17229, March 29, 2001). This rule was issued under the authority in § 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its RFG program, its NLEV standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control

requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, acrolein, and acetaldehyde between 57 percent and 65 percent, and will reduce on-highway diesel particulate matter and diesel organic gas emissions by 87 percent, as shown in **Graph IV-1**.

On February 26, 2007 the EPA finalized additional rules under authority of CAA Section 202(l) to further reduce MSAT emissions. The EPA issued Final Rules on Control of Hazardous Air Pollutants from Mobile Sources (72 FR 8427) under Title 40 C.F.R. Parts 59, 80, 85 and 86. EPA adopted the following new requirements to significantly lower emissions of benzene and the other MSATs by: 1) lowering the benzene content in gasoline; 2) reducing NMHC exhaust emissions from passenger vehicles operated at cold temperatures (under 75 degrees); and 3) reducing evaporative emissions that permeate through portable fuel containers.

Step 4: Direct and Indirect Impacts - Air Quality

Direct Impacts

The proposed North Central Texas project is located in Dallas and Denton Counties, which are part of the EPA's designated nine county moderate non-attainment area for the 8-hour standard for the pollutant ozone; therefore, the transportation conformity rule applies. The proposed project is consistent with the Mobility 2030 – *2009 Amendment* and the 2008-2011 TIP, revised in February 2010, as proposed by the NCTCOG.

Traffic Air Quality Analysis

CO concentrations for the proposed action were modeled using CALINE3 and MOBILE6.2 and factoring in adverse meteorological conditions and sensitive receptors at the ROW line. CO concentrations for the proposed project were modeled using the worst-case scenario (adverse meteorological conditions and sensitive receptors at the ROW line) in accordance with the TxDOT *2006 Air Quality Guidelines*. The air quality was modeled at two locations along the project. The topography and meteorological conditions of the area in which the project is located would not seriously restrict dispersion of the air pollutants. CO did not exceed the NAAQS at any of these locations.

CO background ambient concentrations of 3.7 PPM for a 1-hour average and 2.3 ppm for an 8-hour average were used in all alternatives analyzed. The air receiver located between Corporate Drive and Business SH 121 had the highest percent NAAQS for both the ETC (2020) and the design year (2030) (**Table IV-5)**. For a complete listing of the percent CO concentrations modeled, refer to **Appendix D: Air Receiver Locations and CO Concentrations**.

Congestion Management Process

Committed congestion reduction strategies and operational improvements considered to be beneficial to the project within the EA limits would consist of committed congestion reduction strategies and operational improvements within the study boundary will consist of bottleneck removals, addition of lanes, HOV, and ITS projects. TxDOT, under the CMAQ program, would manage these projects, which are included in the regional CMP and TIP. The related projects are listed in **Table IV-6**.

In an effort to reduce congestion and the need for SOV lanes in the region, TxDOT and NCTCOG would continue to promote appropriate congestion reduction strategies through the CMAQ program, the CMP, and the MTP.

Mobile Source Air Toxics

The EPA is the lead Federal Agency for administering the CAA and has certain responsibilities regarding the health effects of MSAT. The EPA controls emissions of air pollutants through one of two major strategies: NAAQS or regulatory controls that result in specific emission reductions. Both strategies provide for increased protection of human health and the environment. For MSAT, in order to more quickly implement emission reductions, EPA has focused efforts on nationwide regulatory controls. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, (66 F.R. 17229, March 29, 2001). This rule was issued under the authority in § 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its RFG program, its NLEV standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, acrolein, and acetaldehyde between 57 percent and 65 percent, and will reduce on-highway diesel particulate matter and diesel organic gas emissions by 87 percent, as shown in **Graph IV-1**.

Sensitive Receptor Assessment

Sensitive receptors include those facilities most likely to contain large concentrations of the more sensitive population (hospitals, schools, licensed day care facilities, and elder care facilities). Sensitive receptors along the project between PGBT and FM 2181 were identified, field verified, and the distance from the ROW to each receptor was measured and noted. The documented sensitive receptors include schools, medical facilities, elder care facilities, and licensed daycare facilities. As shown in **Table IV-8,** a total of 15 sensitive receptors were identified within 500 m (1,640 ft) from the ROW.

MSAT Environmental Consequences

MSAT Modeling

A quantitative analysis of the mass of air toxic emissions in the MSAT study area containing the project was completed using the latest version of the EPA's mobile emission factor model (MOBILE6.2). The MSAT study area is composed of the affected transportation network as depicted in **Appendix A: Figure 6**. The IH 35E affected transportation network includes the proposed network links and other transportation model links reflecting a plus or minus five or greater percent change in traffic volume between the Build and No-Build scenarios for the year 2030. The plus or minus five percent threshold was adopted as the basis to determine the affected transportation network study area. Because the 2009 base year scenario represents the existing condition, the affected transportation network for 2009 is composed of those links determined to change plus or minus five or greater percent in 2030 and which currently exist in the 2009 network. The resulting affected transportation network for scenario year 2030 consists of those links determined to change plus or minus five or greater percent in 2030. The parameters used to characterize the travel activity utilized in the analysis included directional speeds and traffic volumes for the AM peak period, PM peak period, and off-peak period.

For the purpose of this analysis three scenarios were modeled:

- "Base" or existing condition (2009);
- "Build 2030" scenario; and
- "No-Build 2030" scenario

Total Emission of MSAT for the Build and No-Build Scenarios

Specific data from the MSAT study area of the NCTCOG Regional Transportation Model were used to determine the mass of MSAT emissions associated with the Build and No-Build scenarios for the entire IH 35E project. In addition, the base or existing conditions mass of MSAT was also modeled. The total mass of MSAT in the year 2009 (base) was higher than either the Build or No-Build scenarios in the year 2030. This is reflective of the overall national trend in MSAT as previously described. The mass of emissions associated with the base scenario and design year are shown in **Table IV-8**.

Discussion

Although the VMT for the IH 35E Build scenario would increase approximately 132 percent by 2030 when compared to 2009, total MSAT emissions for the same scenario would decrease at least 30 percent by 2030.

Regardless of the alternative chosen, emissions would likely be lower than present levels in the future year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020, and even more than these reductions when factoring in the 2007 MSAT rule. Local conditions may differ from these national projections in terms of fleet mix, vehicle turnover rates, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great that MSAT emissions in the study area are likely to be lower in the future in all cases.

When evaluating the future options for upgrading a transportation corridor, the major mitigating factor in reducing MSAT emissions is the implementation the EPA's new motor vehicle emission control standards. Substantial decreases in MSAT emissions will be realized from a current base year (2009) through the proposed project's design year. Accounting for anticipated increases in VMT and varying degrees of efficiency of vehicle operation, total MSAT emissions were predicted to decline by 30 percent from 2009 to 2030.

Indirect Impacts

The pollutants with most potential to increase due to the transportation projects include those which main sources are attributed to transportation and construction activities (i.e., ozone, CO, particulate matter, and MSAT). The potential indirect impacts resulting from the construction of the proposed reconstruction of IH 35E would be related to the transportation projects for which construction would be accelerated as additional funding becomes available, changes in land use, and an increase in population. These projects could result in an increase of vehicular traffic, construction activities, and in new non-point (i.e., bakeries, dry cleaners, gas stations) or point (i.e., industry and manufacturing) sources of emissions within the AOI.

Assuming compliance with the DFW SIP and an evaluation of the possible project-related actions that can indirectly impact air quality, it was determined that the proposed reconstruction of IH 35E would not be anticipated to cause indirect air quality impacts in the AOI. No changes to the NAAQS are anticipated.

MSAT 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, including CO, MSATs, and the ozone precursors VOC and NOx. No MSAT indirect impacts are anticipated. In addition, no indirect air quality impacts to the adjacent communities are expected as no traffic redistribution into the existing arterial network is anticipated.

Ozone

The proposed North Central Texas project is located in Denton and Dallas Counties, which are part of the EPA designated nine-county moderate non-attainment area for the 8-hour standard for the pollutant ozone. The nine county moderate non-attainment area has an attainment date of June 15, 2010. The proposed project is consistent with the *Mobility 2030 – 2009 Amendment* that was found to conform to the ozone SIP for DFW. The SIP is required by the CAA Amendment to improve regional air quality for ozone. It should be noted that the ozone moderate non-attainment SIP and two future 10-year ozone maintenance plan SIPs would require measures to prevent degradation of air quality associated with other projects within the MPA, which include those within the indirect impact study area.

On August 9, 2010, EPA proposed to determine that the DFW area moderate 8-hour ozone non-attainment area did not attain the 1997 8-hour ozone NAAQS by June 15, 2010, the attainment deadline set forth in the CAA and CFR for moderate non-attainment areas (75 F.R. 152, August 9, 2010) under Title 40 C.F.R. Part 81. Once EPA finalizes this determination, the DFW area will be reclassified as a serious 8-hour ozone non-attainment area for the 1997 8-hour standard. The serious area attainment date for the DFW area is expected to be finalized at the end of 2010. Once reclassified, Texas must submit SIP revisions for the DFW area that meet the 1997 8-hour ozone non-attainment requirements for serious areas as required by the CAA. EPA is also proposing that Texas submit the required SIP revisions for the serious area attainment demonstration, reasonable further progress (RFP), reasonably available control technology (RACT), contingency measures, and for all other serious area measures required under CAA section 182(c) to EPA no later than one year after the effective date of the final rulemaking for this reclassification.

CO, PM, and MSAT

As vehicles become more efficient and emissions are reduced, any indirect impacts associated with the reconstruction of IH 35E would be expected to decrease over time.

Off-road emissions from construction equipment may temporarily degrade air quality through dust and exhaust gases. However, since the 1990 CAA Amendments, EPA has issued 14 regulations to control air pollutants from off-road mobile sources. For example, the 2004 Nonroad Diesel Engines rule is based on a systems approach involving a combination of engine modifications, reduced sulfur content in diesel fuel, and exhaust controls.

Measures to control fugitive dust would be considered and incorporated into the final design and construction specifications as considered necessary by the project engineer.

The proposed project and other reasonably foreseeable transportation projects were included in the MTP and the TIP and have been determined to conform to the SIP. Therefore, no change in

attainment status is expected to occur as a result of the proposed project or any of the planned transportation projects.

Although access to the proposed HOV/managed lanes would be limited to those who elect or can only on an occasional basis afford to pay the toll, the proposed project would provide a comparable non-toll alternative (existing and proposed mainlanes). It is expected that traffic would, for the most part continue to travel the mainlanes regardless of the tolling (HOV/managed lanes). Therefore, no other air quality impacts to the community are anticipated. Based on population trends, traffic and on-road emissions within the existing network are expected to increase within the indirect impact study area. On a regional basis, EPA vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide criteria pollutants and MSAT levels to be significantly lower than today.

Step 5: Reasonably Foreseeable Actions - Air Quality

The states where the non-attainment areas are located are required to submit a SIP to the EPA. The SIP document is a collection of regulations that explain how the state would reduce emissions and help meet ozone standards. Nine counties are designated moderate non-attainment for ground level ozone in the DFW area, including: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Tarrant and Rockwall Counties. As such, the long-range financially constrained plan known as *Mobility 2030 – 2009 Amendment* is required to conform to the SIP. Any future widening of the facility would be required to be consistent with the MTP and TIP documents, and therefore meet conformity with the SIP.

Land use changes associated with the *Mobility 2030 – 2009 Amendment* projects could potentially result in an increase in air emissions, as the potential acceleration of land use changes associated with these projects or other land use changes may result in an increase of on-road mobile sources (e.g., cars), new area sources (e.g., dry cleaners), and new point sources (e.g., refineries). In order to reduce ozone, the SIP is implemented to reduce emissions of the ozone precursors, VOC and NOx. In summary, it is anticipated that new area sources and/or industry/manufacturing point sources would meet necessary federal and Texas CAA provisions to prevent air quality degradation.

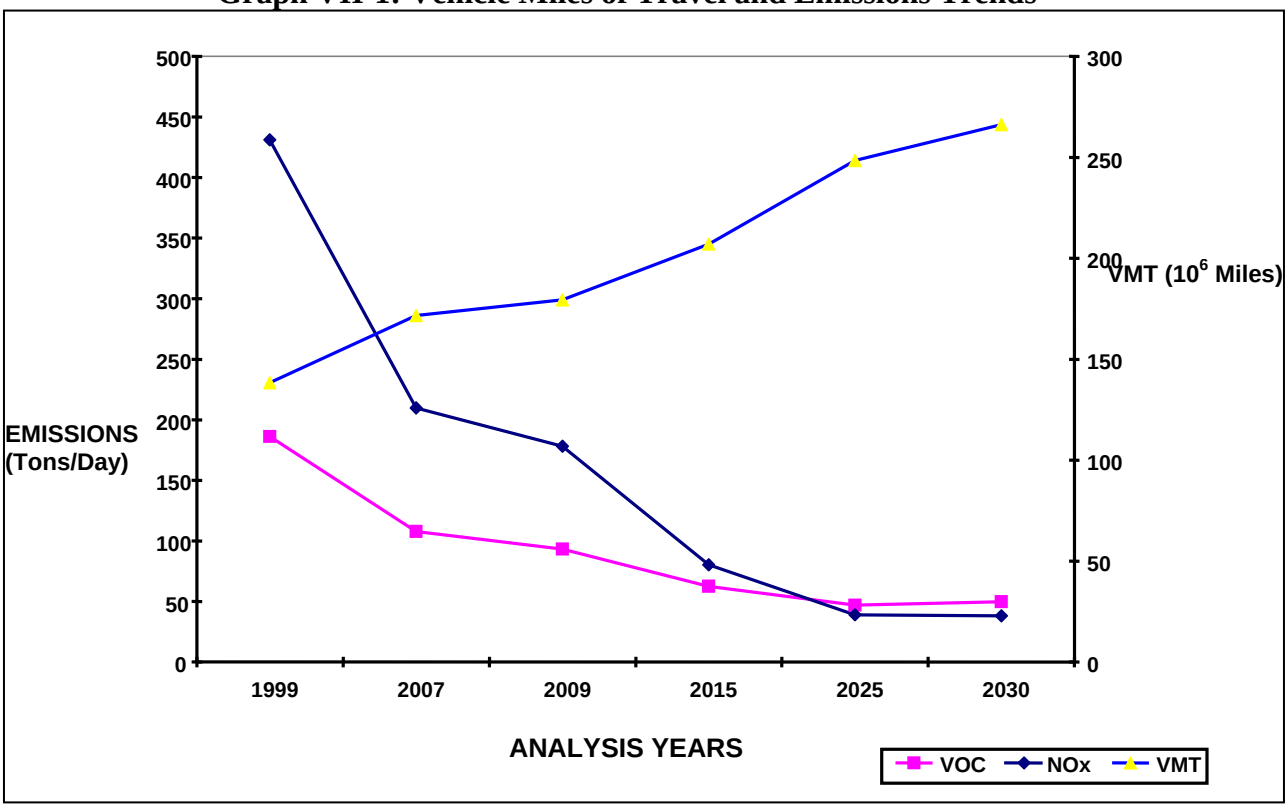
Step 6: Cumulative Impacts Assessment - Air Quality

The cumulative impact on air quality from the proposed project and other reasonably foreseeable transportation projects are addressed at the regional level by analyzing the air quality impacts of transportation projects in the MTP and the TIP. The proposed project and other reasonably foreseeable projects are included in the *Mobility 2030 – 2009 Amendment* and the 2008-2011 TIP.

The DFW region is expected to continue to experience substantial population growth, urbanization, and economic development. The cumulative impact of reasonably foreseeable future growth and urbanization on air quality would be minimized by enforcement of federal and state regulations, by the EPA and TCEQ, which are mandated to ensure that such growth and urbanization would not prevent compliance with the ozone standard or threaten the maintenance of the other air quality standards, along with regulated entities in compliance with regulations.

All throughout the region, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on-road and non-road emissions including PM, CO, MSAT and the ozone precursors (VOC and NOx). Modeling results under the worst case conditions indicate that CO concentrations would not exceed the NAAQS for the Build scenario either in 2020 or 2030. A quantitative MSAT analysis indicates that by 2030, although VMT increases, and among other things, congestion is reduced (as idling emissions are reduced) MSAT emissions would decrease by 30 percent when compared to 2009. Please refer to **Section IV.A.7** for further details. Likewise, **Graph VII-1** and **Table VII-2** show that although VMT in the DFW area is projected to increase over time, VOC and NOx on-road emission trends are expected to decrease over time.

Graph VII-1: Vehicle Miles of Travel and Emissions Trends



Source: NCTCOG Transportation Department. Graph is consistent with *Mobility 2030 – 2009 Amendment* for the nine ozone moderate non-attainment counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties).

Table VII-2: DFW Emissions and VMT Trends

Analysis Years	VOC (Tons/day)	NOx (Tons/day)	VMT (10^6 miles)
1999	186	431	138
2007	108	210	172
2009	93	178	179
2015	62	80	207
2025	47	39	248
2030	50	38	266

Source: NCTCOG Transportation Department. The emissions shown in the table do not include reductions from the transportation control measure and TERP programs. These emissions consist of the total loads in tons/day from the nine DFW moderate non-attainment counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties).

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. Increased urbanization would likely have a negative impact on air quality. Transportation improvements coupled with improvements due to regulations on vehicle emissions and fuels will likely result in a cumulatively beneficial impact on air quality.

COMMUNITY

Step 1: Resource Identification - Community

The proposed project has the potential to directly impact communities within the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek.

Step 2: Resource Study Area - Community

The RSA for community conditions is comprised of the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek, as depicted in **Appendix A, Figure 16: Cumulative Impacts Analysis Study Area**. Evaluating community as a resource consists of several elements: socio-economic impacts, environmental justice, traffic noise, and traffic operations. The temporal boundaries for the cumulative effects analysis are the years 1990 to 2030. The early date was established because the region experienced unprecedented growth between 1990 and 2000. Present actions are those actions which have occurred between 2000 and 2009. The year 2030 was chosen to correlate with NCTCOG's *Mobility 2030 – 2009 Amendment*.

Step 3: Resource Health and Historical Context - Community

According to the U.S. Census Bureau's *2008 Annual Population Estimates*, the total population of the community RSA is comprised of approximately 276,319 persons.

Socio-Economic/Environmental Justice
The thresholds used to identify areas with high concentrations of low-income and/or minority populations in the study area were set based on the definitions of low-income and minority established in the FHWA Order and by the CEQ, Environmental Justice Guidance under NEPA documentation.

Table VII-3 lists a comparative breakdown of environmental justice populations for each of the counties located within the community RSA for the years 1990 and 2000. The year 2000 is chosen in this case because it is the most current year the U.S. Census Bureau provides income data for all municipalities located within the RSA. Four of the total six municipalities' populations are too small for inclusion in the U.S. Census Bureau's most recent 2008 American Community Survey, which includes income information. The total environmental justice population percentage for the RSA increased by approximately 12.6 percent from 1990 to 2000.

Table VII-3: Community RSA Environmental Justice Populations

Municipality	1990			2000			EJ Population Percent Change 1990 to 2000 (%)
	Total Population	Percentage Minority Population (%)	Percentage Low Income Population (%)	Total Population	Percentage Minority Population (%)	Percentage Low Income Population (%)	
Carrollton	82,169	22.4	4.5	109,215	36.8	5.5	15.4
Corinth	3,944	6.0	3.2	11,424	13.5	1.6	5.9
Hickory Creek	1,893	5.3	3.2	2,045	8.9	4.1	4.5
Highland Village	7,027	4.8	1.8	12,163	7.4	0.4	1.2
Lake Dallas	3,656	6.6	4.9	5,992	14.2	6.6	9.3
Lewisville	46,521	15.8	6.0	77,514	29.8	6.0	14.0
RSA TOTAL	145,210	18.4	4.8	218,353	30.6	5.2	12.6

Source: *Census 1990* and *2000*

Of the municipalities located within the RSA, the City of Carrollton contained the largest concentration of environmental justice populations in 1990 and 2000. The City of Carrollton exhibits a minority population of approximately 36.8 percent and a low-income population (those living below the 2009 $22,050 poverty threshold for a family of four) of approximately 5.5 percent. The City of Lake Dallas contained the highest 2000 low-income population concentration, with approximately 6.6 percent of residents below the poverty threshold. The remaining RSA municipalities exhibit minority populations ranging from approximately 7.4 to 29.8 percent and low-income populations ranging from approximately 0.4 to 6.0 percent.

Traffic Noise

As stated earlier, the DFW metropolitan area has been one of the fastest growing areas in the United States, and it is expected to continue to grow. Growth often results in an increase of development, increase in vehicles, and an increase in VMT. Historically, the primary source of sound/noise in the DFW area has been highway traffic noise. As projected population growth and associated land use increases the transportation demand, it is expected that highway traffic noise will continue to be the primary source of noise in the area.

Traffic Operations

Tolling in the DFW Metroplex began in the 1950s with the construction and operation of the Dallas-Fort Worth Turnpike. In 1953, the state legislature created the Texas Turnpike Authority (TTA), which raised the funding to build the project. Constructed in 1955-1956, the Dallas-Fort Worth Turnpike was a 30-mile toll highway that connected downtown Dallas and downtown Fort Worth. On September 1, 1997, the NTTA was created to finance, construct and oversee turnpike projects in North Texas. At that time, the TTA's assets and liabilities in North Texas were transferred to NTTA. Today, the NTTA operates over 50 miles of toll roads in North Texas and has over 700 employees.

Traffic operations in the MPA experienced a decline in the 1990s due to the rapid population growth the DFW region experienced. In response to the demands on the transportation system associated with high population growth rates, the NCTCOG, in cooperation with TxDOT and local transit agencies, have worked cooperatively to maximize the use of the existing transportation network and transportation funding. In recent years, the region has utilized

innovative financing tools and has promoted the use of managed/HOV facilities to increase ridership and decrease the demand on the regional transportation system.

Step 4: Direct and Indirect Impacts - Community

Socio-Economic Impacts/Environmental Justice

Direct Impacts

Access to the mainlanes of IH 35E would be available to all users. Access to the tolled HOV/managed lanes would be limited to those who elect or can only on occasional basis afford to pay the toll. The IH 35E frontage roads would include a total of six travel lanes (three in each direction) and would provide a non-toll alternative, in addition to the eight non-toll mainlanes, for motorists who do not elect or can only on occasional basis afford to travel the tolled HOV/managed lanes. Under normal operating conditions, motorists (including emergency vehicles) using the frontage roads would experience longer travel times than motorists using either the non-toll mainlanes or the tolled HOV/managed lanes due to a lower posted speed limit and traffic signals along the frontage roads.

No substantial direct environmental justice impacts would result from the proposed IH 35E project. The project impacts associated with tolling would not be isolated within a limited number of census blocks, but would be distributed among all users of the IH 35E facility. Low-income populations who elect or can only on occasional basis afford to pay tolls to access the tolled HOV/managed lanes would be impacted by toll rates, toll collection, and other matters associated with user fees. In addition, the economic impact of tolling the HOV/managed lanes would be higher for low-income users because the cost of paying tolls would represent a higher percentage of household income than for non-low-income users. However, tolled HOV/managed lane users (including environmental justice populations) might decide to reduce their personal economic or time travel impact of tolls by either utilizing the non-toll mainlanes, non-toll frontage roads, or transit options, where tolls would be waived for the transit provider. As indicated in the O&D analysis results, a majority of trips anticipated to utilize the Build scenario (includes four tolled HOV/managed lanes) would not originate from areas identified with high concentrations of environmental justice populations. O&D data based on projected trips indicates EJ TSZs would utilize the IH 35E facility under both the Build and No-Build scenarios.

The proposed IH 35E improvements would require additional ROW, and thus would result in a number of displacements. Approximately 233 acres of additional ROW and easements would be required for the preferred alternative resulting in the displacement of 65 single family housing units, 93 business establishments, 19 vacant buildings/suites, and 3 municipal facilities (Hickory Creek Animal Services, Hickory Creek Public Works, and City of Lewisville Water Tower) for a total of 180 displacements.

Indirect Impacts

With respect to socio-economic, indirect impacts would be driven by the relocation of the 180 residential, commercial, and local government properties anticipated to be displaced by the proposed IH 35E improvements. Examples of indirect impacts due to relocations and displacements include a potential reduction in the supply of affordable housing due to the acquisition of lower market value properties, changes in residential and commercial property values due to the proposed improvements (either positive or negative), changes in local tax base

due to the anticipated displacements, and impacts to the employees (such as increased commuting time) who could be displaced by the proposed improvements. Local school district attendance could also be indirectly impacted by the relocation of residential displacements; however, this is expected to be a minimal impact due to the current size of the existing school districts within the indirect impacts study area.

Although there may be a potential reduction in the supply of affordable housing as a result of the acquisition of lower market value properties, local housing markets would likely temporarily improve because of increased demand for housing options in each municipality for replacing residential displacements. As displaced residents seek out and secure residential relocation options, local real estate inventories would likely turn over faster, improving the local housing sales market. Local commercial real estate inventories would also likely turn over faster, as displaced business establishments seek and secure the abundance of existing relocation options in each affected municipality.

Changes in residential and commercial property values and tax base due to the anticipated displacements are likely to have mixed effects. Residential properties within close proximity to the improved IH 35E facility may experience a negative change in value. However, community-wide, residential property values would likely increase as a result of displaced households looking to secure residential relocation options and, in effect, increase the demand for the respective municipalities' housing stocks. Commercial property values within close proximity to the proposed IH 35E improvements would also likely increase with improved mobility and lessened congestion associated with added capacity. The proposed improvements would likely render commercial land closer to the IH 35E facility more valuable to business interests seeking to take advantage of the increased ability to carry more vehicles near their sites. Additionally, localized commercial displacements would also likely increase community-wide commercial property values by exerting more demand on existing commercial real estate as displaced businesses look to secure relocation sites. As a result of these impacts, long-term property tax values would also likely increase as commercial and residential property tax values are largely dependent on property values. However, in each municipality, there may be a short-lived, negative consequence associated with the sacrifice of giving up taxable, commercial property before market and relocation adjustments are made that contribute to the long-term indirect benefits of increased property values and property taxes.

Impacts to employees of displaced businesses and relocated school attendees would also likely have mixed results. Employees of displaced businesses may have to travel further to work if their employer relocates a greater distance from employees' homes. Nonetheless, improved mobility and lessened congestion associated with the proposed project would likely counteract some of this potential consequence, allowing workers making use of IH 35E and nearby interchanges and intersections lower commuting times. Additionally, some employees may benefit from commercial displacements as employers may make a decision to choose a location generally closer to employees' homes. Relocated school attendees may also have to commute further to school as a result of residential relocations. However, relocated households may be influenced by distances or commuting times to schools when making relocation decisions.

According to conversations with an economic development specialist with the City of Lewisville, construction of the proposed improvements is anticipated to hinder new development and investment along the IH 35E corridor in the short to mid-term. However, commercial development and re-development activity would continue along the entire IH 35E corridor

because interstate locations are favorable with regard to most commercial real estate preferences. As discussed in **Section IV.C.1**, the City of Lewisville's IH 35E Corridor Development Plan is an example of a proactive local government response to reduce potentially negative impacts associated with the anticipated commercial and residential displacements along IH 35E throughout the city's jurisdiction. The City of Lewisville would promote redevelopment and complimentary land uses from SH 121 to Lewisville Lake (an approximate 8 mile corridor) to maintain or improve the existing trends in residential and commercial land uses. Additionally, the proposed project could influence developers to seek tracts of land that would not be impacted by construction activities.

Traffic Noise

Direct Impacts

A traffic noise analysis was accomplished in accordance with TxDOT's (FHWA approved) Guidelines for Analysis and Abatement of Highway Traffic Noise. Existing and predicted traffic noise levels were modeled at receiver locations (**Table IV-19 and Appendix C**) 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. As indicated in **Table IV-19**, 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.

Noise barriers were determined to be both feasible and reasonable along portions of the IH 35E corridor as listed in **Table IV-21**, and are proposed for incorporation into the project. The total cost of the barriers would be $3,579,048, a total of $24,514 per benefited receiver.

Indirect Impacts

No indirect traffic noise impacts are anticipated. Access to the barrier separated HOV facility would be limited to those who elect or can only on occasional basis afford to pay the toll. Because the proposed project would provide non-toll alternatives (eight non-toll mainlanes, four in each direction), it is expected that traffic would, for the most part continue to travel the mainlanes regardless of tolling. Therefore, no other traffic noise impacts to the community are anticipated in addition to those already analyzed and presented in **Section IV.C.9**.

Traffic Operations

Direct Impacts

The re-construction of the proposed project includes the addition of two mainlanes (one in each direction); four concurrent tolled HOV/managed lanes (two in each direction); and two and three-lane continuous frontage roads in each direction. The proposed frontage road re-construction would result in a continuous frontage road system within the project limits. Although it is anticipated that the increased capacity and continuous frontage roads would benefit the local roadway system, a traffic study area was developed to better analyze traffic operations between the Build and No-Build scenarios. The traffic study area is a 79 square mile area that includes the study corridor TSZs.

The direct impacts analysis entailed the comparison of the number of lane-miles operating under different LOS between Build and No-Build Alternatives in 2030 during the AM peak hour.

Table IV-22 summarizes the anticipated number of lane-miles in 2030 for different LOS conditions during the AM peak hour for the Build and No-Build Alternatives. The LOS comparison indicates that there would be an increase in lane-miles operating under LOS A-B-C along both the mainlanes and HOV/managed lanes under the Build Alternative.

During the construction stages, traffic would follow the existing traffic patterns. It is anticipated that reconstruction of the facility would be completed without the use of detours; however, temporary lane closures may occur. All lane closures would comply with the FHWA MUTCD standards. In the event that detours are required, city and local public safety officials would be notified of the proposed detours. Any detour timing and necessary rerouting of emergency vehicles would be coordinated with the proper local agencies.

Indirect Impacts

The LOS comparison derived from the Complete Performance Reports reflecting the IH 35E Build and No-Build Alternatives reveal that there would be less delay [percent increase of lane-miles operating under most favorable LOS conditions (LOS A-B-C)] under the Build Alternative along the frontage roads, local arterials, and collectors. The analysis also concludes that under the Build Alternative, vehicle hours of total delay (signalized delays and congestion delays) would decrease 23 percent within the traffic analysis study area in comparison to the No-Build Alternative. Additionally, the analysis reveals the average free speed of local roadways (in mph) is virtually unchanged between the 2030 Build and No-Build Alternatives. Overall, the percent change in average free speed would result in a non-perceptible effect to users of the major arterials, minor arterials, and frontage roads within the traffic analysis study area. The difference in user cost between the Build and No-Build Alternatives is estimated to be lower for the Build Alternative than for the No-Build Alternative by $43,873 per day.

Step 5: Reasonably Foreseeable Actions - Community

Land use changes associated with *Mobility 2030 – 2009 Amendment* projects (including the other two sections of IH 35E improvements spanning from IH 635 to U.S. 380) and other development projects may result in additional relocations and displacements throughout the community RSA. "Other development projects" include transportation projects throughout the MPA that are reflected in *Mobility 2030 – 2009 Amendment*. Planned development documented in the community profiles (**Section IV.C**) also qualify as "other reasonably foreseeable development projects." As mentioned in **Section VI**, major developments which are over 100,000 square feet and/or 100 employees within the RSA that are either under construction or announced are monitored by the NCTCOG. Examples of announced developments being monitored by NCTCOG located within the City of Lewisville include Lewisville Elementary (education), Staybridge Suites (hotel), Railroad Park (recreation), Vista Oaks (office), Hebron 121 Station Apartments (multi-family residential), Hebron 121 Station (retail), and Lakeside Office Center (office). The Double Tree Ranch (recreation) is an example announced development found within the City of Highland Village. Acreages of these announced developments were not available from the NCTCOG as of November 2009.

Step 6: Cumulative Impacts Assessment – Community

Socio-Economic Impacts/Environmental Justice

The socio-economic impacts associated with the proposed project associated with the past, present, and reasonably foreseeable future actions were considered to determine their likely cumulative effects on the communities in the study area. The combined effect of the relocations/displacements of residential and commercial properties associated with the reconstruction of IH 35E, in combination with improvements to other transportation facilities identified in *Mobility 2030 – 2009 Amendment*, as well as area population and employment growth creating new markets for business, would make the Community RSA attractive to continued residential and commercial development. There are currently low-density rural residential uses and undeveloped properties throughout the community RSA. Because of the potential for access from these properties to an improved regional transportation system providing increased mobility and access for a rapidly growing DFW region, the likelihood of continued residential and commercial development in the long-term as a cumulative effect is very high.

In the City of Lewisville, where the majority of potential residential and business displacements are located, the scale of cumulative impacts is anticipated to be more pronounced compared to the Cities of Carrollton, Corinth, and Lake Dallas as well as in the Town of Hickory Creek. Both direct and indirect impacts associated with potential displacements in conjunction with other past, present, and reasonably foreseeable actions would cumulatively provide an opportunity for the City of Lewisville to proceed with many of its long-term planning endeavors. The City of Lewisville's *Comprehensive Plan* (1994) and *Old Town Master Plan* (2003) both provide goals and recommendations related to revitalizing, redeveloping, and improving the appearance and functionality of the City's original urban core as well as how it interacts with IH 35E to the west. One overarching goal of these plans is to build value in this area by attracting and retaining business investment. As indicated in the *Old Town Master Plan,* numerous past events, development patterns, changing trends in land economics, and other factors have contributed to the slow decline of the original town core of the City of Lewisville, known as Old Town, of which IH 35E forms its western boundary. Commercial strip development on shallow lots designed and oriented almost exclusively to automobiles and convenience of access to IH 35E worked to slowly siphon substantial economic vitality away from Lewisville's original downtown business district as well as impede economic development potential along corridors connecting IH 35E and the Old Town Center.

Research conducted as part of the preparation of the *Old Town Master Plan* using measures of land value as a proportion of total property value revealed that much of the City of Lewisville's land between IH 35E and the Old Town Center, to the east, is underutilized and could be put to higher and better uses. As a result, many properties originally developed for residential uses in the western portion of the Old Town area as well as adjacent to the IH 35E ROW have been converted to uses for commercial purposes, while other properties designed for commercial use, closer to the Old Town Center further east, sit vacant, are underutilized, or are deteriorating in condition. Many existing land uses are inconsistent and incompatible with neighboring uses, and existing site design predates contemporary development codes and design standards creating mismatched existing land uses with the sites they occupy. Development over the years in the Old Town area and westward to IH 35E was heavily influenced by increasing reliance on the automobile, and sites were designed to serve such a need, largely neglecting pedestrian connectivity and the potential relationship between pedestrian travel opportunities and building a

sustainable neighborhood and unique district. In addition to these past development trends driven by changes in land economics, the Old Town area lacks an established identity, an inviting gateway leading from IH 35E, and sustainable economic activity, all of which impede the City's projection of a meaningful, viable, and unique image.

Although likely to experience some negative, short-term consequences related to reductions in market capture of businesses along IH 35E and subsequent loss of tax revenue during the construction of improvements and in the interim between construction and redevelopment of the corridor, the City of Lewisville's potential displacements in conjunction with present and reasonably foreseeable actions are also likely to contribute to the City's ability to realize the foreseen benefits of the objectives set forth in its *Comprehensive Plan* and *Old Town Master Plan*. Additionally, these current and reasonably foreseeable actions would likely tie into the City's IH 35E Corridor Development Plan, which would contain even more contemporary objectives for enhancing the use of land along the corridor to fit with the City's other goals. With many of the displacements located along IH 35E near the Old Town area, many of the more flexible, site-adaptive businesses may occupy vacant or underutilized sites in Old Town or between and continue to take advantage of highway accessibility and the market capture value that comes with highway proximity. The displacements open up new land for development closer to the original Old Town Center that would allow the City of Lewisville to exercise land use controls that could help establish a gateway and further build value along corridors leading to the Old Town Center as opposed to exclusively along shallow lots abutting IH 35E, which traditionally stripped out economic development potential from Old Town. As mentioned previously, indirect impacts related to long-term increased demand relative to supply for both commercial and residential real estate will also likely improve the Old Town area's general economic strength. Additionally, ongoing transportation improvements outlined in *Mobility 2030 – 2009 Amendment* would enhance region-wide and community mobility and access and lessen congestion in combination with the City of Lewisville's long-term planning goals. These reasonably foreseeable actions would likely contribute to the City's continued development potential along IH 35E as well as corridors leading from IH 35E to the Old Town Center and further allow the City the opportunity to realize the foreseen benefits associated with its *Comprehensive Plan* and *Old Town Master Plan*, particularly for the Old Town area and its interaction with the IH 35E corridor.

Although the 33 anticipated displacements in the Cities of Carrollton, Corinth, and Lake Dallas as well as the Town of Hickory Creek are likely to have some impact, cumulative impacts as a result of the displacements merging with other past, present, and reasonably foreseeable actions are not anticipated to be substantial. Potential displacements in conjunction with reasonably foreseeable region-wide transportation improvements in *Mobility 2030 – 2009 Amendment* as well as with municipal planning programs would likely have long-term impacts on these municipalities' achievement of their respective long-term planning goals. The Cities of Carrollton, Lake Dallas, and Corinth have enacted special overlay districts for land use and business development along IH 35E to regulate the quality and character of growth in order to protect and enhance the value of surrounding and adjacent properties in both cities. Evident from these cities' zoning ordinances is the value of the IH 35E corridor as an economic engine. With the existence of some nonconforming sites intermixed with undeveloped parcels along the IH 35E corridor, the 15 displacements anticipated in the Cities of Carrollton, Lake Dallas, and Corinth would allow them to realize development on new sites in accordance with modern codes advancing the interests set out for the corridor. Displacements and new development in accordance with modern codes that are more reflective of current municipal goals would further

contribute to protecting and enhancing the value of the corridor in both cities for newly exposed trends. The Town of Hickory Creek does not provide the same level of attention to the IH 35E corridor in its zoning ordinances. However, many of the same benefits of opening up land for new development in accordance with modern codes would better allow the Town to advance its interests along IH 35E.

A complete assessment of anticipated relocations and displacements associated with the reasonably foreseeable projects within the community RSA is not readily available. The amount of relocations and displacements associated with the IH 35E improvements, when considered collectively, are indicative of major transportation enhancements; however, the community RSA has the capacity to absorb the relocations and displacements, especially residential displacements based on MLS data. The vacancy rate range of 2.9 percent to 19.1 percent among the municipalities located within the community RSA should allow for relocation options as the amount of residences displaced are less than 0.01 percent of the RSA housing stock.

The difference in travel times between the tolled HOV/managed lanes and the non-tolled mainlanes or frontage roads would be the highest during peak periods of travel when traffic congestion within the future regional transportation network would be the greatest. However, the overall added capacity the on-going and future transportation improvements provides would relieve traffic congestion for all motorists of the regional transportation network whether they use the mainlanes or frontage roads compared to the existing network.

The anticipated increase of tolled mainlanes in the regional transportation network from 11 to 30 percent (between 2007 and 2030) is indicative of an emerging regional tolling network. Of the anticipated lane-miles accounted for in the 2030 network, the proposed tolling of the IH 35E HOV/managed lanes would contribute approximately 48 tolled lane-miles. It is reasonable to assume that there would be a cumulative effect on environmental justice populations upon build-out of the toll system; however, given the lay-out and orientation of the regional system, it is virtually inconceivable that a driver would routinely travel the entire length of the entire system during the course of normal activities. The emerging tolling network may create a net loss of free mainlane access for all motorists.

Historically, TxDOT has financed highway projects on a “pay-as-you-go” basis, using motor fuel taxes and other revenue deposited in the state highway fund. However, population increases and traffic demand have outpaced the efficiency of this traditional finance mechanism. As funding mechanisms evolve, the trend towards utilization of toll facilities in this region would through time create “user impacts” as access to highway systems becomes an issue to the economically disadvantaged.

Toll Rates and Low-Income Populations

As acknowledged in the environmental justice assessment (**Section IV.C.3**), the economic impact of tolling would be higher for low-income residents because the cost of paying tolls would represent a higher percentage of household income than for non-low-income households.

The IH 35E HOV/managed lanes, as an element of the system of toll roads now being developed for the greater-DFW area, would contribute to a cumulative impact on low-income users of the system. If one were to assume an average commute distance of 14 miles in the greater-DFW area (assumption based on the NCTCOG TransCAD® model) and applied that distance to toll facilities at the estimated toll rate of 14.5 cents per mile, the total year 2010 future value

cumulative cost for one round-trip along a toll facility would be approximately $4.06. Assuming the average household would make 250 round-trips per year, the annual cost for the average commute distance at these different rates would be approximately $1,050 per year, which equates to 4.7 percent of a household income at the 2010 DHHS poverty level for a family of four. Given the lay-out and orientation of the 2030 proposed 419 mile toll system, it is possible that many drivers would routinely travel the length of a tolled facility during the course of normal daily activities. For individuals who do not have a TollTag® account, the cost to drive the same amount of mileage, at 21.0 cents per mile (which include a 45 percent premium), would correspond to approximately $1,470, which equates to 6.6 percent of a household income at the 2010 DHHS poverty level.

Traffic Noise

The traffic noise associated with the proposed project and all other noise sources associated with past, present, and reasonably foreseeable future actions were analyzed to determine their likely cumulative impacts on the communities in the study area. The results indicated that highway traffic is, and would continue to be, the primary/dominant source of noise. As discussed in previous sections, there would be no indirect impacts associated with the proposed project, and no other reasonable and foreseeable actions are expected to substantially affect the overall noise environment; therefore, no cumulative impacts to the community due to traffic noise are anticipated.

Traffic Operations

In terms of traffic operations, the effects of the proposed project would generally be realized as direct and indirect impacts (described in **Sections IV.C.10 and VI**); the only cumulative effects would stem from implementation of the Regional Toll Revenue Funding Initiative projects. The improved mobility and reduced congestion resulting from the Regional Toll Revenue Funding Initiative projects would be positive and potentially felt throughout Collin, Dallas, Denton, and Tarrant Counties. No adverse traffic operations cumulative impacts would be anticipated.

Natural Resources

Step 1: Resource Identification - Natural Resources

Waters of the U.S., including Wetlands
Pursuant to Executive Order 11990 (Protection of Wetlands) and Section 404 of the Clean Water Act (CWA), investigations are conducted to identify Waters of the U.S. within a proposed project limits. According to the USACE, the Federal agency which possesses authority over waters of the U.S., wetlands must possess three essential characteristics. Under normal circumstances, these characteristics include the presence of hydrophytic vegetation, wetland hydrology, and hydric soils.

Determinations are made as to the potential presence of waters of the U.S., including wetlands, subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. The USACE *1987 Corps of Engineers Wetland Delineation Manual* (Technical Report Y-87-1 or *1987 Manual*) was used for identifying potential waters of the U.S. and wetlands based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. The jurisdictional determination activities typically consist of delineating and surveying identified water and wetland areas within a proposed project area. Field investigations followed the Routine Onsite Determination Method described in the *1987 Manual*.

Threatened/Endangered Species and Wildlife Habitat
Federally listed species are protected under the Endangered Species Act (ESA) of 1973, which protects both the species and the habitat. State-listed species are protected under the Texas Administrative Code, Title 31, Part 2, Chapter 65, Subchapter G, Rules 65.71 – 65.176 and under the TPWD Statutes Chapters 67 and 68 revised May 31, 2002. The USFWS is the regulatory agency which administers the ESA while TPWD is the agency responsible for the administration of the state regulations for the state-listed species. These regulations primarily address adverse impacts to the state-listed species only and do not include habitat. All avian species considered migratory are protected under the MBTA. Of the 15 total species on the federal and state lists for Dallas and Denton Counties, 11 are avian and are considered migratory.

Step 2: Resource Study Area - Natural Resources

The RSA for the waters of the U.S., including wetlands, and threatened/endangered species and wildlife habitat are the same. The RSA, approximately 68,493 acres, is comprised of portions of local watersheds consisting of Lewisville Lake Dam, Elm Fork above Denton Creek, Denton Creek, and Hickory Creek. Due to the size of the Hickory Creek, Denton Creek, and Lewisville Lake Dam watersheds and the location of the proposed project, not all of these watersheds are included in the cumulative impacts RSA. Watersheds were utilized because they form natural boundaries between habitats and contain each of the natural resources being assessed. Impacts to the watersheds themselves are not being assessed, only the impacts to the natural resources within the watersheds.

Step 3: Resource Health and Historical Context – Natural Resources

Health

The current condition of the aquatic features and wildlife habitat in the study area is described as declining. Even though some areas have remained relatively unchanged for a number of years and provide excellent habitat for wildlife and ecological benefits from water features, many areas have been developed to such an extent that little habitat exists for wildlife. As a result of a change in habitat, wildlife species in the area are shifting to species better able to adapt to an urban environment. Streams and wetlands have been altered and do not provide the same ecological benefits they once provided.

Historic Context

The study area was historically used for agricultural purposes. Livestock grazing and farming, or crops, dominated the area. Most of the developments were located in close proximity to IH 35E and other major roadways in the area. As the population has increased in the region, the study area began to become urbanized with new residential developments and associated businesses. Typical farming practices involved clearing the land as near to stream corridors as possible to maximize the amount of crops planted. This practice reduced the available habitat along the riparian corridors and reduced the ability of streams and wetlands to filter runoff and retain water. This allowed for increased erosion and degradation of the water features. In general, livestock grazing maintained the altered habitat along the riparian corridors.

Step 4: Direct and Indirect Impacts - Natural Resources

Direct Impacts

Waters of the U.S., including Wetlands

Pursuant to Executive Order 11990 (Protection of Wetlands) and Section 404 of the Clean Water Act (CWA), an investigation was conducted to identify Waters of the U.S. within the proposed project limits. According to the USACE, the Federal agency having authority over waters of the U.S., wetlands must possess three essential characteristics. Under normal circumstances, these characteristics include the presence of hydrophytic vegetation, wetland hydrology, and hydric soils.

Jurisdictional areas within the proposed project ROW and easements were identified, characterized, and delineated in order to evaluate the jurisdictional status of the sites (**Table IV-1**). The areas were further classified to determine if they were on USACE property.

Waters of the U.S. within Proposed ROW

A total of 10 wetlands were delineated totaling approximately 11.11 acres. Two wetland features, an isolated wetland associated with the upland retention/detention pond and Wetland 7 located within an upland drainage ditch, are considered potentially non-jurisdictional. The acreage amounts for the two potentially non-jurisdictional wetlands are not included in the overall impact calculations. USACE Routine Wetland Determination Data Forms are included in **Appendix D: Supplemental Data**.

Twenty water features were delineated totaling approximately 67.15 acres. One feature, an unnamed impoundment that serves as an upland detention/retention pond is considered potentially non-jurisdictional. The acreage associated with this feature is not included in the

overall impact calculations. Stream Data Forms were prepared for each stream and are included in **Appendix D: Supplemental Data**.

Water and wetland features beyond the proposed ROW and easements of the proposed project were not included in these calculations. Approximately 1.30 acres of waters of the U.S., including wetlands, would be permanently impacted and approximately 10.20 acres would be temporarily impacted by the proposed project. The delineated waters and wetlands are further described in **Table IV-1** and their locations are included on the **Corridor Maps** in **Appendix C**.

Waters of the U.S. on USACE Property within Proposed Easements

Of the 20 total waters features delineated, 5 water features are within the USACE property boundary totaling approximately 55.83 acres. Of the 10 total wetland features delineated, 1 wetland feature is located within the USACE property boundary and totals approximately 0.79 acre. Although these areas are located on USACE property beyond the proposed ROW limits needed to construct IH 35E, they are within the temporary easement limits. The additional area was delineated to assess impacts associated with the proposed construction of a park access road and new park entry point from Highland Village Road into Copperas Branch Park. As part of the proposed Section 4(f) mitigation, a new park entrance and access road is proposed and further discussed as part of the USACE Property Draft Programmatic Section 4(f) Net Benefit Evaluation in **Appendix G**.

Waters of the U.S. within Proposed ROW

The placement of temporary or permanent dredge or fill material into waters of the U.S. (including wetlands) that are determined to be jurisdictional would be authorized by NWP 14. NWP 14 authorizes temporary structures, fills, and work necessary to construct the linear transportation project. A NWP 14 PCN would be required for Areas 1, 3, 6, 8, and 10 because the permanent fill impact exceeds the NWP 14 threshold of 0.10 acre of impacts, but are less than 0.50 acre of impacts, and/or because fill would be placed in a special aquatic site (wetland). It is anticipated that temporary impacts in jurisdictional waters and wetlands would occur during construction.

Waters of the U.S. on USACE Property within Proposed Easements

The proposed project impacts USACE property and crosses Lewisville Lake. Coordination with the USACE Lewisville Lake Office and the USACE Operations Maintenance Branch would occur to address Section 404 impacts and appropriate permitting, and mitigation on USACE property for anticipated impacts to Wetland 1-Park, Waters 14-15, and Waters 1-3 (Park). Any additional impacts resulting from the construction methods utilized by the contractor would be coordinated with the USACE by the contractor and authorized by the USACE.

Proposed Mitigation

Compensatory mitigation for Section 404 impacts would be coordinated with the USACE Regulatory Branch and performed in accordance with the terms of the approved permit. Through coordination efforts with USACE Lewisville Lake staff it has been determined that the preferred compensatory mitigation for Section 404 impacts on USACE property would consist of a fee payment based upon typical compensatory mitigation ratios for loss of jurisdictional waters according to the ratios defined in the Lewisville Lake PEA.

Because the roadway design is not final at this time, impacts to potentially jurisdictional areas were approximated based on the most current schematic design. Mitigation measures that have been considered include:

- Avoidance, where practicable, by spanning potentially jurisdictional areas with bridges.
- Minimization of impacts by limiting excavation and/or fill quantities.
- Compensatory mitigation for remaining unavoidable impacts be performed in accordance with TxDOT and USACE procedures.

Threatened/Endangered Species and Wildlife Habitat

The limits for this project are situated within three U.S. Geological Survey (USGS) topographic quadrangle maps, Carrollton, Lewisville East, and Lewisville West (**Appendix A: Figure 3)**. Most of the project exhibits urban development of various kinds with some isolated pockets of undeveloped land.

The pertinent USFWS and TPWD Annotated County list of Threatened, Endangered, and Rare Species was reviewed and **Table IV-2** provides the state-listed and federal-listed threatened (T) and endangered (E) species indigenous to Dallas and Denton Counties, Texas. After reviewing habitat requirements and conducting a field visit, it was determined that this project would have no effect on any federally listed threatened or endangered species, its habitat, or designated habitat, nor would it adversely impact any state-listed species within the project limits.

The TPWD was consulted through the TXNDD in November 2009 to obtain information on rare, threatened, and endangered plants, animals, invertebrates, exemplary natural communities, and other significant features for the proposed project area. A list of elemental occurrences was provided by TPWD for species identified in the Grapevine, Carrollton, Addison, Argyle, Lewisville West, Lewisville East, Hebron, Denton West, Denton East, Little Elm, and surrounding USGS topographic quadrangles and are presented in **Table IV-3**. According to the GIS data provided by the TXNDD, the proposed project is not within the polygon of occurrence (the radius of search given) for any documented species or within 1.5 miles of a managed area. No impacts to these occurrences are anticipated as a result of the proposed project.

According to information received, there are no known occurrences of threatened or endangered species within the project limits. Prior to any construction activities a qualified biologist would survey the proposed project corridor for any listed species. The proposed project would have no effects on any federally listed threatened or endangered species.

Potential habitat may exist outside of the proposed project corridor for the bald eagle, which is included on the federal list as a delisted taxon, recovered, and being monitored for the first five years. Potential habitat may exist outside of the proposed project corridor for the American peregrine falcon, peregrine falcon, timber/canebrake rattlesnake, and white-faced ibis which are state-listed species. Potential habitat may exist in the proposed project corridor for the alligator snapping turtle and timber/canebrake, both state-listed species, as well as the Texas garter snake (state species of concern). These species were not seen during the reconnaissance surveys by qualified biologists nor are they anticipated to utilize these areas because the areas are isolated and found primarily in urbanized metropolitan areas that have been established for some time.

TPWD records indicate that the Texas garter snake has been found within the corporate limits of Hickory Creek on the west side of IH 35E. This confirmed finding indicates that this species is found within the general limits of the project and that care should be taken and a brief reconnaissance performed prior to construction clearing. The Texas garter snake is currently not a listed species but is considered a rare species or a species of concern by the TPWD. Though not protected by regulation, it is a species that TPWD is monitoring and could potentially be listed by the state if habitat conditions or their numbers continue to degrade.

Vegetation and Wildlife

The project limits are found within the TPWD-defined Blackland Prairie natural region of Texas, which includes approximately 23,500 square miles. The 1984 TPWD map of "The Vegetation Types of Texas" indicates that the project area falls within two vegetative types, "Other Native or Introduced Grasses" in the southern portion of the project, and "Post Oak Woods, Forest, and Grassland Mosaic" in the northern portion of the project.

Most of the project area exhibits commercial and residential development with some isolated pockets of undeveloped land. The existing ROW along IH 35E is frequently mowed. A few woody species of plants consisting of mostly oaks and loblolly pine, appear to have been planted for landscape purposes, also occur in the existing ROW. The vegetation found within the existing ROW differs somewhat from the vegetation found in the general area, in that the ROW is composed primarily of various species of grasses and forbs that are typically found along major roadways in central Texas.

Field observations indicate that the vegetation along the project ROW is somewhat representative of the two vegetative physiognomic regions that are indicated for this area. Isolated areas of habitat or vacant fields that about the project include plants such as cedar elm, bois d'arc, little bluestem, silver bluestem, brownseed paspalum, thin paspalum, broadleaf signal grass, three-awn grasses, Virginia creeper, post oak, live oak, American elm, and pecan. There are also small riparian areas associated with most of the creek crossings along the roadway. These areas are composed primarily of post oak, black willow, and sugarberry.

Several unusual vegetation features and special habitat features were found within the project limits. These unusual vegetation features consist of large trees and riparian vegetation, and the special habitat features consist of the delineated water and wetland features, and the three rookeries that were observed. A seasonal cormorant rookery was observed on the west side of IH 35E at Frankford Road in February 2009, approximately 130 feet from the proposed ROW; however, in June 2009 the birds were no longer observed at this location. In June 2009 a seasonal egret rookery was observed within the project area west of IH 35E and south of Highland Village Road at Lewisville Lake approximately 200 feet from the proposed ROW. However, the rookery is located outside of any proposed improvements. Therefore, no effects are anticipated. Neither rookery is the same as the one listed through the TXNDD search (EOID 3672). The rookery listed through the TXNDD search was first observed in 1990 at the intersection of Josey Lane and Keller Springs Road, approximately three miles from the proposed ROW, and has not been observed since 1990. Rookery abandonment can be attributed to a variety of factors, such as periodic droughts, loss of nearby foraging areas, or encroachment by humans. All three of the rookeries are seasonal and were most likely used as stopover habitat, thus providing temporary habitat during migration.

Wildlife in the proposed project area has and would continue to be dominated by species that are better able to adapt to urban life. The wooded lots and perhaps the grassy fields still serve as foraging areas for many local species and migrant avian species. The adverse effects to wildlife species found within the project limits would be minimal. The loss of available foraging habitat is minimal based upon the diversity and quantity of habitat that appears to be available at this time. Some wildlife species could be adversely affected from construction activities, based upon their mobility and response mechanism. Some animals, like snakes, frogs, and lizards, have limited mobility when compared to roadway construction activities. Also, some animals, like snakes and rodents, hide in burrows or under rocks when threatened. These limited responses make these particular species more vulnerable to construction activities. A brief investigation of the site immediately prior to construction by a qualified wildlife biologist would minimize any adverse effects to these species.

Approximately 233 acres of land would be required for this roadway reconstruction project. . Of the total 233 acres of land required, approximately 63.6 percent contains herbaceous vegetation and approximately 12 percent contains woody vegetation. There are approximately 77.8 acres of herbaceous vegetation and 1.9 acres of woody vegetation within the existing ROW. Within the proposed ROW there are approximately 70.3 acres of herbaceous vegetation and 26.0 acres of woody vegetation. This includes vacant lots, wooded lots, riparian habitat, uplands, and maintained urban areas. The total acreage of woody vegetation considered to be woodland areas within the proposed ROW is approximately 22.62 acres, of which approximately 3.2 acres can be considered riparian woodland habitat. Nineteen Woodland Data Site Forms (**Appendix D: Supplemental Data**) were completed for this project. **Appendix A: Figure 4** illustrates the tree removal areas. The potential impacts to woodland areas are presented in **Table IV-4**.

TxDOT would compensate for the individual loss of large trees (dbh greater than 20 inches) and for the loss of riparian woodlands. The TxDOT Dallas District Standards for Woodlands Mitigation (**Appendix D: Supplemental Data**) planting details would be used. TxDOT would mitigate for the 3.2 acres of riparian woodlands habitat impacts which consist of Woodland Data Site Form Areas 1, 3, 5, and 6 (**Table IV-4** and **Appendix A, Figure 4: Tree Removal Maps** and **Appendix D: Supplemental Data)**. Additionally, TxDOT would mitigate for the loss of large trees which were identified at Woodland Data Site Form Areas 4, 7, 9, 14, 15, and 18. The total number of large individual trees and total acreage affected and thus compensated for may change during final design. TxDOT would minimize the loss by preserving as many trees as possible. Trees within the ROW, but not in the construction zone, would not be removed if possible.

Through coordination efforts with USACE staff it has been determined that the preferred mitigation approach for vegetation/habitat impacts on USACE property (Woodland Data Site Form Areas 10-13) would consist of a fee payment. Typical compensatory mitigation for the loss of vegetation/habitat according to the ratios defined in the Lewisville Lake PEA would be followed depending upon the vegetation elevation and habitat quality. A detailed assessment of the USACE property habitat, impacted vegetation and associated mitigation ratios is described in **Section V**., USACE Property.

Indirect Impacts

The land within the AOI totals 3,704 acres and consists of approximately 1,900 acres of mowed and maintained vegetation (landscape plantings), 178 acres of riparian woodlands, 69 acres of

upland woodlands, 42 acres of herbaceous vegetation with scattered woody species, and 105 acres of Lewisville Lake. The remaining area within the AOI is paved or a structure is present. Regarding vegetated areas adjacent to Lewisville Lake, coordination with USACE would need to occur; potential impacts would need to be reviewed and discussed to determine mitigation and measures to minimize harm as well as enhancement opportunities. Potential loss of habitat would occur along the boundaries of habitat already fragmented by the original construction of IH 35E, construction of surrounding commercial and residential properties, and clearing of crops and improvements from former farmland, and would not lead to further fragmentation of habitat. The proposed project would not alter the hydric regime or reduce diversity that currently exists in an urbanizing area within the ecosystem.

The areas of potential induced development identified through stakeholder input (approximately 700.4 acres) contains approximately 358.2 acres of mowed and maintained vegetation (landscape plantings), 6.5 acres of riparian woodlands, 31.7 acres of upland woodlands, and 105.7 acres of herbaceous vegetation with scattered woody species. Potentially induced development is not anticipated to result in substantial ecological effects because habitat throughout the AOI is fragmented and human activity is common throughout this urban area. The potentially induced development would serve to further reduce the amount of habitat available, but species composition in the AOI is already consistent with that of an urbanized area.

Waters of the U.S. and wetlands in the AOI could potentially be impacted by land use changes; however, the proposed project would not result in indirect land use changes. Accordingly, no indirect effects on waters of the U.S. and wetlands would result from the proposed project as the proposed improvements would impart a "none to very weak" potential for land use changes (**Appendix H: Indirect Land Use Impacts Assessment**).

Step 5: Reasonably Foreseeable Actions - Natural Resources

Current and future land uses have been developed and are reflected in the comprehensive plans of the cities and towns which fall within the RSA. The comprehensive plans would likely not change as the proposed project is a planned transportation corridor that would benefit from coordinated design, infrastructure, and compatibility of land uses. As the remaining land adjacent to the proposed project is developed, the overall qualities of the natural resources are reduced. The approximate 700.4 acres of potentially induced development identified in **Appendix H: Indirect Land Use Impacts Assessment**, major (announced) developments monitored by the NCTCOG (over 100,000 square feet and/or 100 employees), and regionally significant arterials listed in *Mobility 2030 – 2009 Amendment* would result in additional adverse affects to the natural resources throughout the RSA.

Examples of "announced" developments being monitored by NCTCOG located within the City of Lewisville include Lewisville Elementary (education), Staybridge Suites (hotel), Railroad Park (recreation), Vista Oaks (office), Hebron 121 Station Apartments (multi-family residential), Hebron 121 Station (retail), and Lakeside Office Center (office). The Double Tree Ranch (recreation) is an example announced development found within the City of Highland Village. Acreages of these announced developments were not available from the NCTCOG as of November 2009.

Regionally significant arterials listed in *Mobility 2030 – 2009 Amendment* that are located within the natural resources RSA include:

- FM 1171/Main St. from IH 35 E to Cowan Ave.; improvement from four to six mainlane facility;
- FM 1171/Main St. from Shiloh Rd. to FM 2499; improvement from two to six mainlane facility;
- FM 407 from McMakin Rd. to Chin Chapel Rd.; improvement from two to four mainlane facility;
- FM 407 from Chin Chapel Rd. to Briarhill Rd.; improvement from two to four mainlane facility;
- FM 2181 from FM 2499 to IH 35E; improvement from two to six mainlane facility;
- FM 2499 from FM 1171 to Silveron Pkwy.; improvement from four to six mainlane facility; and
- FM 2499 from FM 2181/Swisher Rd. to FM 404; four mainlane, new location four mainlane facility.

Step 6: Cumulative Impacts Assessment - Natural Resources

Waters of the U.S., including Wetlands
The streams and wetlands in the natural resources RSA would be altered as new locations are developed. There are approximately 49 miles of streams and 231 acres of wetlands located on the undeveloped parcels within the resource study area. These natural systems would become confined and their ability to meander and provide their full ecological benefits would be limited. The water filtration and holding capacity would be reduced as a result of development due the narrowing of riparian corridors and straightening of the channels. Many of the wetlands would most likely be lost as fill is placed within them for development.

Threatened/Endangered Species and Wildlife Habitat
The result of the *Mobility 2030 – 2009 Amendment* regionally significant arterials being constructed would result in increased urbanization within the natural resources RSA. The undeveloped properties still in agricultural production would become fewer and be replaced by urban development. The available wildlife habitat within the area would most likely be altered from native vegetation to more maintained urban vegetation consisting of landscape plant species. The available habitat consisting of native species would become further reduced in the type and number of species who could utilize them. Wildlife species who can better adapt to urban areas would begin to dominate.

The cumulative impacts on wildlife habitat resulting from the direct impacts of the proposed project, plus indirect impacts of the proposed project, in combination with impacts on vegetation related to the previously described reasonably foreseeable land development, would have the potential to further reduce the amount of wildlife habitat within the RSA. **Table VII-4** summarizes these cumulative impacts.

Table VII-4: Summary of Existing Vegetation Types and Potential Impacts

Vegetation Type	Existing Habitat within Natural Resource RSA (acres)	Direct Impacts (acres)	Indirect Impacts and Reasonably Foreseeable Land Development (acres)	Habitat Remainder in Natural Resource RSA (acres)
Mowed/Maintained Vegetation	34,284.1	77.8	423.7	33,782.6
Herbaceous Vegetation	5,856.6	70.3	118.0	5,668.3
Upland Woodlands	2,167.5	24.7	31.7	2,111.1
Riparian Woodlands	8,680.1	3.2	10.0	8,666.9
Total of All Habitat Types (acres)	**50,988.3**	**176.0**	**583.4**	**50,228.9**

Step 7: Results

Table VII-5 summarizes the existing resource conditions and potential impacts.

Table VII-5: Resources included in the Cumulative Impacts Analysis

Resource Category	Indicator of Resource/Issue Condition	Direct Impacts + Indirect Impacts + Other Actions = Cumulative Impacts			
		Direct Impacts	**Indirect Impacts**	**Other Actions**	**Cumulative Impacts**
Air Quality	NAAQS	The proposed North Central Texas project is located in Dallas and Denton Counties, which are part of the EPA's designated nine county moderate non-attainment area for the 8-hour standard for the pollutant ozone; therefore, the transportation conformity rule applies. All projects in the NCTCOG's TIP that are proposed for federal or state funds were initiated in a manner consistent with federal guidelines in Section 450, of Title 23 C.F.R. and Section 613.200, Subpart B, of Title 49 C.F.R. Energy, environment, air quality, cost, and mobility considerations are addressed in the programming of the TIP. The proposed IH 35E project is included in and consistent with the financially constrained long-range MTP (*Mobility 2030 – 2009 Amendment*) and the 2008-2011 TIP, as amended. The USDOT (FHWA/FTA) found the MTP and TIP to conform to the SIP on June 12, 2007, and October 31, 2007, respectively.	The proposed project would not result in redistribution of traffic within the indirect impacts studies area; therefore, no indirect impacts are anticipated.	Regardless of the proposed project, other forms of development (i.e. transportation projects, commercial and residential development, etc.) could have an effect on air quality as non-road and on-road emission sources may result in an increase. In order to reduce ozone, the SIP is implemented to reduce emissions of the ozone precursors, VOC and NOx. Therefore, no change in attainment status is expected.	Improvement in the regional transportation system and facilities should serve to reduce congestion on a regional scale. The cumulative impact on air quality from the proposed project and other reasonably foreseeable transportation projects are addressed at the regional level by analyzing the air quality impacts of transportation projects in the MTP and the TIP. The proposed project and other reasonably foreseeable projects are included in the MTP and TIP. The proposed project is consistent with the *2030 Mobility Plan – 2009* Amendment and the 2008-2011 TIP. All throughout the region, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on-road and non-road emissions including PM, CO, MSAT and the ozone precursors (VOC and NOx). Modeling results under the worst case conditions indicate that CO concentrations would not exceed the NAAQS for the Build scenario either in 2020 or 2030. A quantitative MSAT analysis indicates that by 2030, although VMT increases, and among other things, congestion is reduced (as idling emissions are reduced) MSAT emissions would decrease by 30 percent when compared to 2009. Likewise, **Graph VII-1** and **Table VII-2** show that although VMT in the DFW area is projected to increase over time, VOC and NOx on-road emission trends are expected to decrease over time. 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. Increased in urbanization would likely have a negative impact on air quality. However planned transportation improvements in the project area, included in and consistent with a conforming MTP and TIP, are anticipated to have a cumulatively beneficial impact on air quality. The cumulative impact of reasonably foreseeable future growth and urbanization on air quality within this area would be minimized by enforcement of federal and state regulations, including the EPA and TCEQ, which are mandated to ensure that such growth and urbanization would not prevent compliance with the ozone standard or threaten the maintenance of the other air quality standards.
Air Quality	CO	The highest modeled CO concentration corresponds to the Build scenario in between Corporate Drive and Business SH 121.	The proposed project would not result in redistribution of traffic within the indirect impacts studies area; therefore, no indirect impacts are anticipated.		
Air Quality	MSAT	Regardless of the alternative chosen, emissions would likely be lower than present levels in the future year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020, and even more than these reductions when factoring in the recently approved 2007 MSAT rule. Local conditions may differ from these national projections in terms of fleet mix, vehicle turnover rates, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great that MSAT emissions in the study area are likely to be lower in the future in all cases. Although the VMT for the IH 35E Build scenario would increase approximately 132 percent by 2030 when compared to 2009, total MSAT emission for the same scenario would decrease at least 30 percent by 2030. In 2030, total MSAT loads for the Build scenario is 10.914 ton/year higher than the No-Build scenario. The higher level of MSAT emissions in 2030 for the Build scenario is due to a higher VMT when compared to the No-Build scenario. Accounting for anticipated increases in VMT and varying degrees of efficiency of vehicle operation, total MSAT emissions are predicted to decline approximately 30 percent from 2009 to 2030. While benzene and formaldehyde emissions are predicted to decline 34 and 23 percent respectively, emissions of DPM are predicted to decline even more (i.e., 83 percent).		Could potentially result in an increase of MSAT emissions, as the other transportation projects included in the MTP and the TIP and other developments that may cause potential acceleration of land use changes may result in an increase of on-road mobile, new area, and new point sources.	

Resource Category	Indicator of Resource/Issue Condition	Direct Impacts + Indirect Impacts + Other Actions = Cumulative Impacts			
		Direct Impacts	**Indirect Impacts**	**Other Actions**	**Cumulative Impacts**
Community	Socio-Economic Impacts/ Environmental Justice	The build alternative would require an estimated 180 displacements (65 single family residences, 93 business establishments, 19 vacant buildings, , and 3 government/municipal facilities). All of the 65 potential single-family residential relocations are located in census tracts with low to moderate percentages of minority population. The potential multi-family relocations are located in census tracts with low percentages of minority population. Alternative non-toll routes include the IH 35E mainlanes (total of eight mainlanes – four in each direction) and frontage roads (total of six travel lanes - three in each direction). The use of mainlanes or frontage roads would provide non-tolled alternatives for motorists who do not elect or can only on occasional basis afford to travel the HOV/managed lane facility. The economic impact of tolling would be higher for low-income users because the cost of paying tolls would represent a higher percentage of household income than for non-low-income users. Although the study area contains a total minority population of 28.7 percent, the project impacts would not be isolated within a limited number of census blocks, but would be distributed among all users of the facility. Therefore, no substantial direct environmental justice effects would result from reconstruction of IH 35E. Low-income individuals would be impacted as a result of economic impact; those who do not elect or can only on occasional basis afford to travel the tolled facility would experience difference in travel time associated with non-toll alternatives. Not maintaining a prepaid toll transponder account would impact any user, including low-income users, because the cost of paying the accumulated toll charges without an account would represent a higher toll rate than toll charges affiliated with a prepaid account.	With respect to relocations and displacements, indirect impacts would be driven by the relocation of the residential and commercial properties anticipated to be displaced by the proposed IH 35E improvements. Examples of indirect impacts due to relocations and displacements include a potential reduction in the supply of affordable housing, changes in residential and commercial property values due to the proposed improvements, changes in local tax base due to the anticipated displacements, and impacts to the employees (such as increased commuting time) who could be displaced by the proposed improvements. The environmental justice community, as a subset of the larger study area community, would experience indirect effects that mirror those of the general population.	Land use changes associated with *Mobility 2030 – 2009 Amendment* projects and other development projects may result in additional relocations and displacements throughout the community RSA. Both future and existing TxDOT turnpike projects would become ETC facilities. This system-wide change of toll collection method, in conjunction with other NTTA ETC projects that comprise the tolling system in North Central Texas, essentially abolishes the use of cash collection while traveling on the toll facility itself. Although cash payment options are available for each payment method; only those users who maintain automatic and manual pay prepaid accounts would benefit from reduced toll rates compared to the TxTAG® policy. In summary, toll rates are generally one-third (33%) more for drivers who do not have an electronic toll transponder. Impacts from using all ETC facilities would affect all users. However, the economic effects are greater for low-income populations.	The combined effect of the relocations/displacements of residential and commercial properties associated with the reconstruction of IH 35E, in combination with improvements to other transportation facilities identified in *Mobility 2030 – 2009 Amendment*, as well as area population and employment growth creating new markets for business, would make the Community RSA attractive to continued residential and commercial development. Because of the potential for access from these properties to an improved regional transportation system providing increased mobility and access for a rapidly growing DFW region, the likelihood of continued residential and commercial development as a cumulative effect is very high. Access to the mainlanes of the emerging tolling network would be limited to those who elect or can only on occasional basis afford to pay the toll. The difference in travel times between the tolled mainlanes and the non-tolled frontage roads would be the highest during peak periods of travel when traffic congestion within the future regional transportation network would be the greatest. However, the overall added capacity the on-going and future transportation improvements provides would relieve traffic congestion for all motorists of the regional transportation network whether they use the mainlanes or frontage roads compared to the existing network. The economic impact of tolling would be higher for the low-income individuals because the cost of paying tolls would represent a higher percentage of household income than for non-low-income households. Not maintaining a prepaid toll transponder account would impact any user, including low-income users, because the cost of paying the accumulated toll charges without an account would represent a higher toll rate than toll charges affiliated with a prepaid account. Should low-income populations be unable to pay the toll and/or utilize non-toll alternatives, this may result in a difference in travel time associated with using non-toll alternatives. It is reasonable to assume that there would be a cumulative effect on environmental justice populations upon build-out of the regional toll system in 2030 due to the economic impacts of tolling and the difference in travel time should non-toll alternatives be utilized by low-income populations.
Community	Traffic Noise	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. Noise barriers were determined to be both feasible and reasonable along portions of the IH 35E corridor as listed in **Table IV-21**, and are proposed for incorporation into the project. The total cost of the barriers would be $3,579,048, a total of $24,514 per benefited receiver.	No indirect effects - no perceptible increase in noise levels.	No other reasonable and foreseeable actions are expected to substantially affect the overall noise environment. Highway traffic is, and would continue to be, the primary/dominant source of noise.	It was determined there would be no indirect effects associated with the proposed project, and no other reasonable and foreseeable actions are expected to substantially affect the overall noise environment; therefore, no cumulative impacts to the community due to traffic noise are anticipated.

Resource Category	Indicator of Resource/Issue Condition	Direct Impacts + Indirect Impacts + Other Actions = Cumulative Impacts			
		Direct Impacts	**Indirect Impacts**	**Other Actions**	**Cumulative Impacts**
Community	Traffic Operations	The construction of the IH 35E facility would have positive implications - improved mobility and congestion reduction in Dallas and Denton Counties.	The LOS comparison derived from the NCTCOG 2030 traffic volumes reflecting the Build and No-Build scenarios reveals improvements to LOS within the proposed project corridor and the traffic study area due to the proposed reconstruction of IH 35E.	The implementation of the Regional Toll Revenue Funding Initiative projects and other *Mobility 2030 – 2009 Amendment* projects would have positive implications - improved mobility and congestion reduction in the MPA.	The implementation of the Regional Toll Revenue Funding Initiative projects and other *Mobility 2030 – 2009 Amendment* projects would have positive implications - improved mobility and congestion reduction in the MPA.
Natural Resources	Waters of the U.S., including Wetlands	A total of 10 wetlands were delineated and totaled approximately 11.104 acres. Two wetland features, an isolated wetland associated with the upland retention/detention pond and Wetland 7 located within an upland drainage ditch, are considered potentially non-jurisdictional. Twenty water features were delineated and totaled approximately 67.15 acres. One water feature, an unnamed impoundment that serves as an upland detention/retention pond is considered potentially non-jurisdictional. Of the 20 total waters features delineated, 5 water features are within the USACE property boundary and total approximately 55.83 acres. Of the 10 total wetland features delineated, 1wetland feature is located within the USACE property boundary and totals approximately 0.79 acre.	Waters of the U.S. and wetlands in the AOI could potentially be impacted by land use changes; however, the proposed project would not result in indirect land use changes. Accordingly, no indirect effects on waters of the U.S. and wetlands would result from the proposed project as the proposed improvements would impart a "none to very weak" potential for land use changes. The land within the AOI totals 3,704 acres and consists of approximately 1,900 acres of mowed and maintained vegetation (landscape plantings), 178 acres of riparian woodlands, 69 acres of upland woodlands, 42 acres of herbaceous vegetation with scattered woody species, and 105 acres of Lewisville Lake. The remaining area within the AOI is paved or a structure is present. Regarding vegetated areas adjacent to Lewisville Lake, coordination with USACE would need to occur; potential impacts would need to be reviewed and discussed to determine mitigation and measures to minimize harm as well as enhancement opportunities. Potential loss of habitat would occur along the boundaries of habitat already fragmented by the original construction of IH 35E, construction of surrounding commercial and residential properties, and clearing of crops and improvements from former farmland, and would not lead to further fragmentation of habitat. The proposed project would not alter the hydric regime or reduce diversity within the ecosystem. The areas of potential induced development identified through stakeholder input (approximately 700.4 acres) contains approximately 358.2 acres of mowed and maintained vegetation (landscape plantings), 6.5 acres of riparian woodlands, 31.7 acres of upland woodlands, and 105.7 acres of herbaceous vegetation with scattered woody species. Potentially induced development is not anticipated to result in substantial ecological effects because habitat throughout the AOI is fragmented and human activity is common throughout this urban area. The potentially induced development would serve to further reduce the amount of habitat available, but species composition in the AOI is already consistent with that of an urbanized area.	Could potentially result in impacts to waters of the U.S. and wetlands, as the regionally significant arterial projects included in *Mobility 2030 – 2009 Amendment* and other major developments monitored by NCTCOG may cause potential acceleration of land use changes.	The streams and wetlands in the resource study area would be altered as new areas are developed. These natural systems would become confined and their ability to meander and provide their full ecological benefits would be limited. The water filtration and holding capacity would be reduced as a result of development due the narrowing of riparian corridors and straightening of the channels. Many of the wetlands would most likely be lost as fill is placed within them for development.
Natural Resources	Threatened/ Endangered Species and Wildlife Habitat	After review of the Federally listed species and habitat requirements and conducting a field visit, it was determined that this project would have no effect on any federally listed threatened or endangered species, its habitat, or designated habitat, nor would it adversely impact any state-listed species within the project limits. According to information received, there are no known occurrences of threatened or endangered species within the project limits. Within the proposed ROW there are approximately 70.3 acres of herbaceous vegetation and 26.0 acres of woody vegetation. This includes vacant lots, wooded lots, riparian habitat, uplands, and maintained urban areas. Of the total vegetated area, the acreage of woody vegetation considered to be woodland areas within the proposed ROW is approximately 22.62 acres, of which approximately 3.2 acres can be considered riparian woodland habitat.		Could potentially result in impacts and/or effects to threatened/endangered species and wildlife habitat, as the regionally significant arterial projects included in *Mobility 2030 – 2009 Amendment* and other major developments monitored by NCTCOG may cause potential acceleration of land use changes.	The result of *Mobility 2030 - 2009 Amendment* projects and other reasonably foreseeable projects being constructed would result in increased urbanization within the natural resources RSA. The undeveloped properties still in agricultural production would become fewer and be replaced by urban development. The available wildlife habitat within the area would most likely be altered from native vegetation to more maintained urban vegetation consisting of landscape plant species. The available habitat consisting of native species would become further reduced in the type and number of species who could utilize them. The available wildlife habitat within the area would most likely be altered from native vegetation consisting of landscape plant species. Wildlife species who can better adapt to urban areas would begin to dominate.

Any cumulative impacts on the resources analyzed are a result of responding to the continued urbanization of the area. The past and reasonably foreseeable actions in the area have and would impact the resources considered in this study as a result of prosperous economic growth and development patterns adopted by municipalities. It is well documented that the area has steadily developed because the IH 35E facility's presence in the area has engendered land use designations and progressive development goals in municipalities traversed by the proposed project since the early 1960s. Although the proposed improvements to IH 35E would add capacity and improve mobility, the historic presence of IH 35E in its existing location as a major highway facility has defined the type, pace, and capacity of development in the area and along IH 35E, and development has transpired irrespective of the proposed improvements to IH 35E. This is particularly true of the proposed improvements throughout Dallas and Denton Counties. The majority of large parcels of land that are undeveloped or not subject to development plans are mainly dispersed throughout Denton County. The development of those parcels is unlikely to be influenced by the proposed action per conversations with city planners. Rather than inducing development, the proposed project is needed to keep pace with traffic demand resulting from population growth and development trends. Nonetheless, while development along the existing IH 35E facility would likely continue to occur in the absence of the proposed improvements, it is anticipated that development may occur at an accelerated pace in the long-term, after a short- to mid-term delay during project construction, as a result of the ability for the improved facility to accommodate more traffic and impart an additional access premium in the value of land along the proposed project.

Some beneficial cumulative impacts may include the addition of infrastructure improvements constructed to support the increased development and commerce associated with the IH 35E improvements and economic growth in the immediate area. Although a short- to mid-term delay in development along the proposed project may occur during project construction temporarily limiting the full mobility premium of the IH 35E facility, positive cumulative impacts to the community can reasonably be expected to occur because of the circulation of money related to construction spending; an increase in work force related to the construction; and improved access to employment opportunities, markets, goods, and services in the long term. Increased commercial property values in the community RSA could reasonably be expected to occur due to improved accessibility and mobility. The modifications proposed for the transportation network would improve the current traffic conditions within the MPA to a level greater than what currently exists and accommodate future traffic growth along the transportation network.

Step 8: Mitigation

The mitigation of the rapid development of the area considered for this study would rest with the agencies with the authority to implement such controls. This authority rests with the municipal governments and to a lesser extent, the county governments. 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 or development controls implemented.

Air Quality

Mitigation: Regulatory Controls
The evaluation for direct, indirect, and cumulative impacts from the proposed project did not result in the identification of any negative impacts for which specific mitigation actions are

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

The CAA also requires states with areas that fail to meet the NAAQS prescribed for criteria pollutants to develop a SIP. The SIP describes how the state would reduce and maintain air pollution emissions in order to comply with the federal standards. Important components of a SIP include emission inventories, motor vehicle emission budgets, control strategies, and an attainment demonstration. The TCEQ develops the Texas SIP for submittal to the EPA. One SIP is created for each state, but portions of the plan are specifically written to address each of the 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 others) 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.

EPA set two national health protection standards for CO: a 1-hour standard of 35 ppm and an 8-hour standard of 9 ppm. Across the nation, air quality stations measure the levels of CO and other pollutants in the air. These measurements are compared to the standards. Areas that have CO levels that are too high must develop and carry out plans to reduce CO emissions.

The NCTCOG has developed a broad range of air quality programs that focus on major sources of ozone-causing emissions. In order to reduce ozone and come into compliance with NAAQS, the formulation of a SIP is required for all non-attainment areas. NCTCOG works in cooperation with federal, state, and local partners to ensure all air quality requirements are met. NCTCOG's air quality strategies seek to reduce emissions in a variety of ways, from energy and fuel efficiency to advancing clean technologies to encouraging changes in daily behavior. Such strategies are being implemented throughout the region to reduce emissions from different types

of sources; however, many of the programs implemented through NCTCOG target transportation-related emissions due to the fact that on-road mobile sources (such as cars and trucks) account for nearly one-half of all ozone precursor pollution in North Central Texas. Although national air quality has improved over the last 20 years, many challenges remain in protecting public health and the environment.

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

Community

Mitigation: Regulatory Controls

Socio-Economic Impacts

As previously discussed, TxDOT would be responsible for the ROW acquisitions associated with all improvements to IH 35E or other state transportation projects. Acquisition and relocation assistance would be in accordance with the TxDOT Right-of-Way Acquisition and Relocation Assistance Program. Consistent with the USDOT policy, as mandated by the URARPAA, as amended in 1987, TxDOT provides relocation resources to all displaced persons without discrimination. All property owners from whom property is needed are entitled to receive just compensation for their land and property. Just compensation is based upon the fair market value of the property. TxDOT also provides through its Relocation Assistance Program, payment and services to aid in movement to a new location.

Relocation assistance is available to all individuals, families, businesses, farmers, and non-profit organizations displaced as a result of a state highway project or other transportation project. Thus assistance applies to tenants as well as owners occupying the real property needed for the project. Residential replacement structures must be located in the same type of neighborhood and be equally accessible to public services and places of employment. The TxDOT Relocation Office would also provide assistance to displaced businesses and non-profit organizations to aid in their satisfactory relocation with a minimum of delay and loss in earnings. The proposed project would proceed to construction only when all displaced residents have been provided the opportunity to be relocated to adequate replacement sites. The available structures must also be open to persons regardless of race, color, religion, or nationality and be within the financial means of those individuals affected.

While it may be necessary to relocate some existing utilities, the existing utility lines are not expected to pose substantial problems to the construction, operation, and maintenance of the proposed improvements. Detailed information on the utility lines would be evaluated during the design phase of the project in order to identify the need to integrate the proposed improvements and utility systems in to the design plans. All of the utilities can be either adjusted or relocated prior to the construction of the proposed project according to standard TxDOT procedures.

Environmental Justice

EO 12898 was intended to ensure that Federal departments and agencies identify and address disproportionately high and adverse human health and environmental effects of their policies,

programs, and activities on minority populations and low-income populations. It reinforced Title VI of the Civil Rights Act of 1964. It reminded all government agencies receiving Federal funding that they are required to address discrimination as well as the consequences of their decisions or actions that might result in disproportionately high and adverse environmental and health impacts on minority and low-income communities.

Subsequent to EO 12898, U.S. DOT Order 5610.2 was published in the *Federal Register* in 1997. It describes the process for incorporating environmental justice principles into all Department of Transportation programs, policies, and activities. The following year, FHWA Order 6640.23 was issued, establishing policies and procedures for the FHWA to use in complying with EO 12898 and U.S. DOT Order 5610.2.

The proposed tolling of IH 35E tolled HOV/managed lanes would not result in disproportionately high and adverse effects on minority and low-income populations; therefore, according to EO 12898 regulation, mitigation associated with environmental justice is not currently proposed. Other options, such as community outreach, could be considered to benefit the public including environmental justice populations. Through the excess toll revenue generated from the proposed project, other transportation projects, including transit, could be programmed to benefit environmental justice populations.

Traffic Noise

Traffic noise impacts that may result from reasonably foreseeable transportation projects would be determined by separate environmental studies conducted for each project. The associated traffic noise analyses would determine if the projects would result in noise impacts and if any mitigation would be warranted.

Traffic Operations

Traffic operations impacts that may result from reasonably foreseeable large transportation projects would be determined by separate environmental studies conducted for each project. The associated traffic operations analyses would determine if the projects would result in negative impacts to traffic operations and if any mitigation would be warranted.

Natural Resources

Mitigation: Regulatory Controls

Waters of the U.S., including Wetlands

Avoidance or minimization of impacts to waters of the U.S. and wetlands should be performed during the project 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. The standard mitigation ratio for no net loss is a 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.

Threatened and Endangered Species and Wildlife Habitat

Federally listed species are protected under the ESA of 1973. In general, this act protects both the species and the habitat. State-listed species are protected under the TAC, Title 31, Part 2, Chapter 65, Subchapter G, Rules 65.71 – 65.176 and under the TPWD Statutes Chapters 67 and 68 revised May 31, 2002. The USFWS is the regulatory agency which administers the ESA, while TPWD is the agency responsible for the administration of the state regulations for the state-listed species. These regulations primarily address adverse impacts to the state-listed species only and do not include habitat.

VIII. REGIONAL PRICED FACILITY SYSTEM ANALYSIS

The indirect impact section identified the need to study the impacts of proposed expansions to the regional toll/managed lane or priced facility network through 2030. Each cumulative resource is studied from a regional perspective and the impacts that the proposed priced facility network would have on each resource is addressed. Because of the availability of data resources at the regional level, the RSA for the regional study is the MPA as defined in *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment* (*Mobility 2030 – 2009 Amendment*).

At a regional level, *Mobility 2030 – 2009 Amendment*, the MTP, presents a system of transportation improvements needed to address travel demand and maintain mobility in the DFW area over the next 20 plus years. The Federal transportation act requires the MTP to be fiscally constrained, so only projects that can be constructed under reasonable funding assumptions are contained in the multi-year plan. Therefore, the MTP also serves as a guide for the expenditure of state and federal funds for the region, plans, programs, policies, projects, partnerships, and performance. The development of the MTP is led by the NCTCOG, which serves as the MPO for the North Texas region. At a minimum, the MTP must be updated every four years in nonattainment areas and must maintain a 20-year planning horizon. The MTP is coordinated with the public, local governments, transit authorities, TxDOT, FHWA, and FTA. The current MTP can be found at: http://www.nctcog.org/trans/mtp/2030/2009Amendment.asp.

The MTP must also meet other federal regulations for planning requirements and air quality. For example, the CAAA requires the transportation plans for all non-attainment areas to be in conformity with the SIP for air quality to demonstrate that projects in the MTP meet air quality goals. Moreover, the DFW region is classified as a transportation management area (population over 200,000) so the MTP must include a CMP to address congestion.

Challenged with modest transportation funding, relative to identified needs and growth, the DFW region optimizes the use of its limited transportation funds through innovative financing mechanisms. Population increases and traffic demand have outpaced traditional funding sources (e.g., gas tax, vehicle registration). Innovative funding tools were made available by Congress in Intermodal Surface Transportation Efficiency Act (ISTEA) and the Texas State Legislature (House Bills 3588 and 2702). State legislation also enables toll bonds, concession fees, and excess revenues to fund supplemental roadway projects that are either adjacent to those new corridors or of greatest need in the TxDOT districts where the corridors are constructed. Using these tools, the North Texas region is leveraging and combining federal, state, and local funding with toll funds to construct some major transportation projects. By using these alternative funding mechanisms, much-needed transportation infrastructure can be implemented faster than if the region relied solely on traditional funding sources.

Mobility 2030 – 2009 Amendment was developed amidst growing concerns regarding air quality of the DFW region and projected shortfalls in funding for many desired transportation projects and programs. Available funds are first allocated to cost-effective air quality projects and programs, and then to more traditional major capital intensive projects, if they are affordable from both a financial and air quality standpoint (see **Appendix D: *Mobility 2030 - 2009 Amendment* Prioritization of Improvements**). This is done by first investing in the maintenance and operation of existing facilities and improving efficiencies (e.g., TSM, ITS), removing trips from the system (e.g., carpool/vanpool programs, bicycle and pedestrian

facilities), inducing a switch to transit (e.g., bus and passenger rail), and increasing auto occupancy (e.g., HOV). Only after maximizing the operational capacity of the existing transportation system are additional capacity and/or new location projects such as toll roads or tax-supported highways considered.

The figures included in **Appendix D: *Mobility 2030 – 2009 Amendment* 2030 Funded Roadway Improvements** and ***Mobility 2030 – 2009 Amendment* 2030 Passenger Rail Recommendations** show the proposed roadway and passenger rail for the region in 2030. **Table VIII-1** shows a summary of the roadway and passenger rail system.

Table VIII-1: Summary Roadway and Passenger Rail System

System	**2009 Existing**		***Mobility 2030 – 2009 Amendment***	
Roadway	**Lane-Miles**	**Percentage of Lane-Miles**	**Lane-Miles**	**Percentage of Lane-Miles**
Freeways	3,931	12.8%	5,099	12.4%
Toll Roads	495	1.6%	2,556	6.2%
Major Arterials	4,197	13.7%	9,307	22.7%
Minor Arterials	9,854	32.1%	8,765	21.3%
Collectors	9,449	30.8%	10,123	24.6%
Frontage Roads	2,653	8.6%	4,377	10.7%
Managed Lanes	0	0.0%	843	2.1%
HOV Lanes	142	0.5%	0	0.0%
Total	30,721	100.0%	41,070	100.0%
Passenger Rail	**Centerline Miles**	**Percentage of Centerline Miles**	**Centerline Miles**	**Percentage of Centerline Miles**
Commuter/Regional Rail	34	41.5%	296	57.0%
Light Rail	48	58.5%	104	20.1%
Light Rail – New Technology	0	0.0%	119	22.9%
Total	82	100%	519	100.0%

Source: *Mobility 2030 – 2009 Amendment*, April 2009

For the roadway system, the 2009 transportation network for the DFW region (calculated in mainlane lane-miles) consists of 30,721 lane-miles of roadways with freeways, tollways, and HOV lanes comprising 14.9 percent of the system. Of the total 2009 system, 495 of the lane-miles are tolled (approximately 1.6 percent). The anticipated 2030 transportation network for DFW would consist of approximately 41,070 lane-miles of roadways with freeway, tollway, and managed lanes comprising 20.7 percent of the system. Of the total system in 2030, approximately 3,339 lane-miles (toll roads and managed lanes) or 8.3 percent are tolled.

The proposed roadway system for the DFW area includes priced facilities (i.e., toll roads and managed lanes). Toll roads are facilities where the driver is charged a fixed priced (toll or fee) to use the roadway. Current toll rates on toll roads operated by NTTA (i.e., DNT, the PGBT, and the Sam Rayburn Tollway) are 14.5 cents per mile using a TollTag®. Starting in 2011, small incremental rate increases will occur every two years. Rates will adjust every odd year at 5.6 percent starting in 2011 to account for inflation. For TxDOT-sponsored tollways, the RTC and TxDOT developed business terms, which set the toll rates and rate adjustments to maintain price consistency between the various toll projects.

The RTC is an independent transportation policy body of the MPO and is comprised of elected officials representing the counties, municipalities, and transportation providers [DART, the Fort Worth Transportation Authority (The T), TxDOT, NTTA, etc.] in the region. The RTC is

responsible for overseeing the development and implementation of the MTP. The RTC sets regional transportation policies for tolling, managed lanes, CDA, limits for toll rates, and toll rate adjustments to maintain equity between the various toll projects. The RTC has also established a policy on excess revenues from tolling projects.

Managed lanes are separate lanes within a highway that charge a toll but the cost varies based on time-of-day, vehicle occupancy, or other operational strategies. This type of pricing is also called value, congestion, or dynamic pricing. This pricing strategy establishes higher rates during the peak periods and lower rate during off-peak travel times. Peak toll rates would be set to maintain a minimum average speed of 50 miles per hour, thus offering motorists a reliable and congestion-free trip in exchange for the higher peak toll. This can encourage telecommuting or flexible work hours so that motorists may switch to using toll facilities more during off-peak periods. These effects are anticipated to help improve peak period LOS, reduce congestion, and improve regional air quality. Commuters who travel on the managed lanes will be able to benefit from faster and more reliable travel times through the use of value pricing.

Incentives to encourage HOV usage in the managed lanes during peak traffic periods may include a reduced toll rate, usage points redeemable for a predetermined value, or other similar incentives. Transit vehicles and certain other exempt vehicles would not be charged a toll, which would allow riders and users to take advantage of the reliability and predictability of managed lanes. This can be an incentive to facilitate increased carpool/vanpool and transit usage.

Prior to construction, a detailed traffic and revenue study will be performed on each facility. Toll rates will be determined on a facility-by-facility basis and would be established in accordance with the business terms for TxDOT-sponsored managed lane facilities as approved by the RTC. Per Senate Bill 792, TxDOT is required to release the financial information on a CDA project and conduct a public hearing to disclose the anticipated toll rates. The RTC managed lane policy sets up a two-phase process for implementing dynamic pricing on regional managed lane facilities. The first phase lasts six months and would include a fixed-schedule fee depending on the time of day that would not exceed a toll rate of 75 cents per mile. During this phase the fee schedule will be evaluated and updated on a monthly basis. After the six months fixed-schedule pricing will be replaced with market-based dynamic pricing. The toll rate will be established to ensure a minimum average corridor speed of 50 miles per hour. A toll rate cap will be established, but the dynamic price will be allowed to exceed the cap temporarily if the performance of the managed lanes deteriorates too rapidly. The fixed and variable toll rates will vary depending on the corridor. Conceptual fixed-fee schedule and dynamic pricing are shown in **Appendix D: Variable Toll Rates**. Dynamic pricing systems continuously adjust and do not need to be recalibrated to incorporate inflation adjustments, but the price cap would need to be reevaluated periodically.

The inflation factor assumed as part of the modeling process is based on the Consumer Price Index. Assuming a steady three percent inflation rate, a toll road with a rate of 14.5 cents per mile in 2010 would be adjusted to 19.5 cents per mile and 26.2 cents per mile in 2020 and 2030, respectively. The RTC toll rate policy for TxDOT sponsored toll roads on state highways calls for an inflation adjusted fixed rate of 14.5 cents per mile or variable rates of 12.5 cents per mile during off-peak periods and 17 cents per mile during peak periods on new toll facilities. The NTTA controls toll rate policies on existing facilities in their system and has established a toll rate increase schedule through 2017. The **Appendix D: Toll Rate Inflation Adjustments** exhibit shows these RTC and NTTA policies in both inflation adjusted and constant dollar terms.

Managed lanes are proposed as part of the expansion or rehabilitation of the existing non-priced roadway projects. Drivers will have the choice of paying a toll to use the managed lanes or traveling on non-tolled general purpose lanes or frontage roads. The tolls collected from managed lanes will help finance the expansion/rehabilitation and operation of existing roadways. Because of limited transportation funding, the rehabilitation and expansion of the existing facilities that include managed lanes would likely not occur without the additional/proposed managed lanes to help provide project financing.

The increase in the percentage of priced facilities is a reflection of the construction of several new location tollways and the tolling of new additional capacity on existing freeways. Existing freeway lanes would not be converted to priced lanes. **Table VIII-2** lists the major planned roadway projects included in *Mobility 2030 – 2009 Amendment* and when they are expected to be open to traffic. The **Appendix D** figures ***Mobility 2030 – 2009 Amendment* 2019 Priced Facilities, *Mobility 2030 – 2009 Amendment* 2025 Priced Facilities** and ***Mobility 2030 – 2009 Amendment* 2030 Priced Facilities** show the priced facilities listed in **Table VIII-2** for the projected years of 2019, 2025, and 2030.

Table VIII-2: Major Planned Roadway Projects

Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
Open to Traffic by 2019				
DNT	SH 121 to Royal Lane	NTTA	Expand existing toll road	Fixed
FM 2499	South of Gerault Road to SH 121	TxDOT-Fort Worth (CDA)	Add general purpose lanes	None
IH 20	IH 35E to Lancaster Road	TxDOT-Dallas	Add frontage roads	None
IH 20	Bonnie View Road to JJ Lemmon Road	TxDOT-Dallas	Add frontage roads	None
IH 20	Robinson Road to FM 1382	TxDOT-Dallas	Add frontage roads	None
IH 20	Cedar Ridge Road to Camp Wisdom Road	TxDOT-Dallas	Add frontage roads	None
IH 30	SH 121 to IH 35W	TxDOT-Fort Worth	Add general purpose lanes	None
IH 30	Henderson Street to IH 35W	TxDOT-Fort Worth	Add general purpose lanes	None
IH 30 – Dallas County	SH 161 to IH 35E	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 345	U.S. 75/Woodall Rodgers to IH 30/IH 45	TxDOT-Dallas	Add general purpose lanes	None
IH 35E	IH 635 to Loop 12	TxDOT-Dallas	Add managed lanes	Variable
IH 35E - South	Parkerville Road to U.S. 77 (north of Waxahachie)	TxDOT-Dallas	Add general purpose lanes	None
IH 35E - South	U.S. 77 (north of Waxahachie) to Bigham Road	TxDOT-Dallas	Add general purpose lanes	None
IH 35W	Eagle Parkway to SH 170	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 35W	SH 170 to IH 30	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
IH 45	IH 30 to Trinity Parkway/U.S. 175	TxDOT Dallas	Add general purpose lanes	None
IH 635	SH 121 to Royal Lane	TxDOT Fort Worth (CDA)	Add general purpose lanes	None
IH 635	Luna Road to U.S. 75	TxDOT-Dallas	Add managed lanes	Variable

Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
IH 820	SH 121/SH 10 Interchange to Randol Mill Road	TxDOT Fort Worth	Add general purpose lanes	None
IH 820	IH 35W to SH 121/SH 10	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
Loop 9	U.S. 287/Outer Loop to IH 20/SH 190	TxDOT-Dallas	New toll road	Fixed
PGBT	IH 35E to SH 78	NTTA	Expand existing toll road	Fixed
PBGT (Eastern Extension)	SH 78 to IH 30	NTTA	New toll road	Fixed
S.M. Wright Parkway	IH 45 to U.S. 175/SH 310	TxDOT-Dallas	Add general purpose lanes	None
SH 114	Kimball Avenue to SH 121 (west)	TxDOT Fort Worth (CDA)	Add general purpose lanes	None
SH 114	SH 121 (West) to International Parkway	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
SH 114 - Denton County	County Line Road to FM 156	TxDOT-Dallas	Add general purpose lanes	None
SH 121	FM 157/Mid-Cities Boulevard to SH 183	TxDOT-Fort Worth (CDA)	Add general purpose lanes	None
SH 121	Dallas County Line to SH 360	TxDOT-Fort Worth (CDA)	Add general purpose lanes	None
SH 121	SH 183 to IH 820	TxDOT-Fort Worth	Add managed lanes	Variable
SH 121 - Dallas County	Business SH 121 West to Tarrant County Line	TxDOT-Dallas	Add general purpose lanes	None
SH 121 – Sam Rayburn Tollway	U.S. 75 to Hillcrest Road	TxDOT-Dallas	New toll road	Fixed
SH 121 – Sam Rayburn Tollway	Hillcrest Road to Business SH 121	TxDOT-Dallas	Expand existing toll road	Fixed
SH 121 – Southwest Parkway	IH 30 to U.S. 67	NTTA	New toll road	Fixed
SH 161	SH 183 to IH 20	TxDOT-Dallas & NTTA	New toll road	Fixed
SH 161/SH 360 Toll Connector	SH 161 to Sublett Road (SH 360)	TxDOT-Dallas & TxDOT-Fort Worth	New toll road	Variable
SH 170	SH 114 to U.S. 81/U.S. 287	NTTA	New toll road	Fixed
SH 183	SH 121 to SH 161	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
SH 183	SH 161 to IH 35E	TxDOT-Dallas	Add general purpose and managed lanes	Variable
SH 199	FM 730 to Stewart Street	TxDOT-Fort Worth	Add general purpose lanes	None
SH 199	Denver Trail to Confederate Park Road	TxDOT-Fort Worth	Add general purpose lanes	None
SH 360	SH 121 to Stone Myers Parkway	TxDOT-Fort Worth (CDA)	Add general purpose lanes	None
SH 360	Sublett Road to U.S. 287	NTTA	New toll road	Fixed
Trinity Parkway	IH 35E to IH 45/U.S. 175	NTTA	New toll road	Fixed
U.S. 287	Business U.S. 287 to IH 45	TxDOT-Dallas	Add general purpose lanes	None
U.S. 287	Walnut Creek Drive to Broad Street	TxDOT-Fort Worth	Add frontage roads	None

Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
U.S. 287	Avondale-Haslett Road to IH 35W	TxDOT-Fort Worth	Add frontage roads	None
U.S. 377	IH 20 to SH 171	TxDOT-Fort Worth	Add general purpose lanes	None
U.S. 380 - Collin County (East)	Lake Lavon to CR 608	TxDOT-Dallas	Add general purpose lanes	None
U.S. 380 - Denton County (West)	County Line Road to IH 35	TxDOT-Dallas	Add general purpose lanes	None
U.S. 380 - Denton County (West)	IH 35 to U.S. 77/U.S. 377	TxDOT-Dallas	Add general purpose lanes	None
U.S. 380 - Denton/Collin County	FM 423 to Lake Forest Drive	TxDOT-Dallas	Add general purpose lanes	None
U.S. 67 - Cleburne Bypass	Business U.S. 67 East to FM 1434	TxDOT-Fort Worth	Add general purpose lanes	None
U.S. 75 – Collin/Dallas County	SH 121 (South) to IH 635	TxDOT-Dallas	Add general purpose and managed lanes	Variable
U.S. 75 - North Collin County	Regional Outer Loop to SH 121 South	TxDOT-Dallas	Add general purpose lanes	None
U.S. 75 – North Collin County	U.S. 380 to SH 121 (South)	TxDOT-Dallas	Add general purpose and managed lanes	Variable
Woodall Rodgers Extension	IH 35E to Beckley Avenue	TxDOT-Dallas	Add general purpose lanes	None
Open to Traffic by 2025				
DNT	FM 121 to U.S. 380	NTTA	New toll road	Fixed
IH 20 Dallas County	SH 161 to Spur 408	TxDOT-Dallas	Add general purpose lanes	None
IH 20 Parker County	U.S. 180/Lakeshore Drive to IH 30	TxDOT-Fort Worth	Add general purpose lanes	None
IH 20/U.S. 287	Forest Hill Drive to Park Springs Boulevard	TxDOT-Fort Worth	Add general purpose lanes	None
IH 20/U.S. 287	IH 20 to Sublett Road (U.S. 287)	TxDOT-Fort Worth	Add general purpose lanes	None
IH 20/U.S. 287	IH 820 to Park Springs Blvd./Sublett Road	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
IH 30	IH 45 to Bobtown Road	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 30 – Tarrant County	IH 820 to Cooper Street	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
IH 30 – Tarrant County	Cooper Street to Ballpark Way	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
IH 30 – Tarrant County	Ballpark Way to SH 161	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
IH 30 - West Freeway	IH 820 West to Spur 580	TxDOT-Fort Worth	Add general purpose lanes	None
IH 35E	SH 183 to IH 20	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 35E “Northern Link”	IH 35/IH 35W to IH 635	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 45	Trinity Parkway/U.S. 175 to IH 20	TxDOT-Dallas	Add general purpose lanes	None
IH 635	U.S. 75 to IH 30	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 820/U.S. 287	Meadowbrook Drive to IH 820/U.S. 287	TxDOT-Fort Worth	Add general purpose lanes	None

Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
IH 820/U.S. 287	U.S. 287 to IH 20	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
Loop 12	IH 35E to Spur 408	TxDOT-Dallas	Add general purpose and managed lanes	Variable
Loop 288 West	IH 35 to U.S. 377	TxDOT-Dallas	Add general purpose lanes	None
Outer Loop (Eastern Subregion)	U.S. 175 to IH 30	TxDOT-Dallas	New toll road	Fixed
Outer Loop (Eastern Subregion)	U.S. 75 to IH 35	TxDOT-Dallas/ Collin County Toll Road Authority	New toll road	Fixed
Outer Loop (Western Subregion)	SH 199 to U.S. 287/Loop 9	TxDOT-Fort Worth	New toll road	Fixed
PGBT	Belt Line Road to IH 635	NTTA	Expand existing toll road	Fixed
SH 114 - Denton County	FM 156 to Tarrant County Line	TxDOT-Dallas	Add general purpose lanes	None
SH 114 – Dallas County	SH 121 to SH 183	TxDOT-Dallas	Add general purpose and managed lanes	Variable
SH 121	FM 545 to U.S. 75	TxDOT-Dallas	Add general purpose lanes	None
SH 121	IH 820 to Minnis Road	TxDOT-Fort Worth	Add general purpose and managed lanes	Variable
SH 170	SH 199/Outer Loop to U.S. 81/U.S. 287	NTTA	New toll road	Fixed
SH 190	IH 30/PGBT to IH 20/Loop 9	NTTA	New toll road	Fixed
SH 360	Brown Boulevard/Avenue K to IH 30	TxDOT-Fort Worth	Add general purpose lanes	None
SH 360	IH 30 to IH 20	TxDOT-Fort Worth	Add general purpose lanes	None
SH 360	Outer Loop to FM 2258	TxDOT-Fort Worth	New toll road	Fixed
SH 360 (toll road)	U.S. 287 to Outer Loop/Loop 9	NTTA	New toll road	Fixed
U.S. 287	Berry Street to IH 820	TxDOT-Fort Worth	Add managed lanes	Variable
U.S. 67	IH 35E to FM 1382	TxDOT-Dallas	Add general purpose and managed lanes	Variable
U.S. 67 – Dallas/Ellis County	FM 1382 to Loop 9	TxDOT-Dallas	Add general purpose and managed lanes	Variable
U.S. 80	IH 30 to Lawson Road	TxDOT-Dallas	Add general purpose and managed lanes	Variable
Open to Traffic by 2030				
IH 20 Dallas County	Spur 408 to U.S. 175	TxDOT-Dallas	Add general purpose lanes	None
IH 30 - West Freeway	Camp Bowie Boulevard to IH 820 West	TxDOT-Fort Worth	Add general purpose lanes	None
IH 30 Rockwall County	Dalrock Road to FM 2642	TxDOT-Dallas	Add general purpose lanes	None
IH 35	FM 3002 to IH 35E/IH 35W (FM 156)	TxDOT-Dallas (CDA)	Add general purpose lanes	None
IH 35	Outer Loop (FM 156) to IH 35E/IH 35W	TxDOT-Dallas	Add general purpose and managed lanes	Variable

Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
IH 35E - Northwest Corridor	Loop 12 to SH 183	TxDOT-Dallas	Add general purpose lanes	None
IH 35W	IH 20 to SH 174	TxDOT-Fort Worth	Add general purpose lanes	None
IH 35W	IH 35/IH 35E to Eagle Parkway	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 635	U.S. 80 to IH 20	TxDOT-Dallas	Add managed lanes	Variable
Outer Loop (Eastern Subregion)	IH 30 to U.S. 75	TxDOT-Dallas/ Collin County Toll Road Authority	New toll road	Fixed
U.S. 175	SH 310 to CR 4106	TxDOT-Dallas	Add general purpose lanes	None
U.S. 380 - Denton/Collin County	U.S. 377 to FM 423	TxDOT-Dallas	Add general purpose lanes	None
U.S. 75 - North Collin County	County Line Road to Regional Outer Loop	TxDOT-Dallas	Add general purpose lanes	None
U.S. 80	FM 460 to Spur 557	TxDOT-Dallas	Add general purpose lanes	None

Source: *Mobility 2030 – 2009 Amendment*, April 2009

Of the 108 projects listed in **Table VIII-2**, over 45 percent (49 projects) of the projects listed would add general purpose lanes only and 26 projects (24 percent) would add general purpose lanes and managed lanes. Five projects (five percent) would add only managed lanes to a corridor but would reconstruct the existing non-priced general purpose lanes. Eighteen projects (17 percent) will construct new toll roads on new location and four projects (four percent) will widen existing toll roads. Six projects (five percent) will add frontage roads along existing highways.

A. Land Use

The relationships between land use, transportation, and the environment are at the heart of growth management. The emerging concern that construction of new suburban highways induces additional travel, vehicle emissions, and land development, making it implausible to build our way out of congestion has reshaped the policy context for metropolitan transportation planning. Recognizing the effects of transportation on land use and the environment, the CAAA and ISTEA mandated that MPOs integrate metropolitan land use and transportation planning. Later, the Transportation Equity Act for the 21st Century (TEA-21) succeeded ISTEA to refine this process.

The NCTCOG is promoting sustainable development as a specific objective of *Mobility 2030 – 2009 Amendment* because of the direct link between land use, transportation, and air quality. NCTCOG has defined sustainable development as:

- Land use and transportation practices that promote economic development while using limited resources in an efficient manner.
- Transportation decision making based on impacts on land use, congestion, VMT, and the viability of alternative transportation modes.
- Planning efforts which seek to balance access, finance, mobility, affordability, community cohesion, and environmental quality.

The essence of sustainable development is the wise use of scarce resources so that future generations may enjoy them. At the regional level, the key to maintaining sustainable patterns of development is to allow municipalities the option to present a variety of land use, zoning, mobility, and service packages to the development market and residents. This can be accomplished by providing planning support for a diverse range of mobility options such as rail, automobiles, bicycling, transit, and walking.

The MPA is forecasted to grow to almost 8.5 million people and 5.3 million jobs by the year 2030, producing nearly a 70 percent increase in population and a 67 percent increase in employment. If not planned for and implemented in a responsible way, this type of rapid growth would have negative impacts on the region. If development continues to grow away from the urban cores, the VMT would substantially rise per household, per person, and per employee. Higher densities, mixed-land uses, and increased transportation alternatives, which are characteristics of the urban cores, reduce overall VMT. This leads to lower emissions of VOC and NOx, improving air quality.

Mobility 2030 – 2009 Amendment land development policies were created by combining regional expectations with local city plans, including anticipated population growth and land use. NCTCOG relies on the information provided by municipalities as a basis for their land development policies. By understanding the municipalities' expectations, NCTCOG is better able to communicate with the public and municipalities on potential alternatives for regional land development.

NCTCOG conducted a series of demographic sensitivity analyses to quantitatively assess the potential impacts of alternative growth scenarios on the region in 2030. Historically, the DFW area has grown outward with new developments turning rural areas into suburban municipalities. Within the alternative growth scenarios modeled by NCTCOG, households and employment locations were redistributed throughout the region to simulate alternative market assumptions; however, the control numbers for population and employment remained the same. **Table VIII-3** shows the statistics produced through the analysis of each scenario. Brief descriptions of each scenario are as follows:

- Rail Scenario: NCTCOG redistributed population and employment growth occurring between 2010 and 2030, while maintaining the population and employment control totals for the region. Growth was taken from rural areas of the region and added primarily to passenger rail station areas.
- Infill Scenario: NCTCOG redistributed population and employment growth occurring between 2010 and 2030, while maintaining the population and employment control totals for the region. Growth was taken from rural areas of the region and added primarily to infill areas along existing freeways/tollways.
- Rail with County Control Totals (RCCT) Scenario: NCTCOG redistributed population and employment growth occurring between 2010 and 2030, while maintaining the population and employment control totals for the region and each individual county. Growth was taken from rural areas of the region and added primarily to passenger rail-oriented areas.
- Vision North Texas (VNT) Scenario: NCTCOG redistributed population and employment growth occurring between 2010 and 2030, while maintaining the population and employment control totals for the region. Growth was distributed based on overall VNT participant feedback.

- *forward Dallas!* Scenario: Created for the City of Dallas, NCTCOG redistributed population and employment growth occurring between 2010 and 2030 based on the final alternative demographic dataset created during the *forward Dallas!* Comprehensive Plan process.

Table VIII-3: Alternative Growth Scenarios Compared to Historical Growth Model

Data of Interest	Rail Scenario	Infill Scenario	RCCT Scenario	VNT Scenario	*forward Dallas!*
MPA Average of Trip Length	- 8%	+ 3%	- 0.01%	- 10.9%	- 2.9%
MPA Rail Transit Boardings	+ 52%	+ 9%	+ 8%	+ 11.1%	+ 7.4%
MPA Non-Rail Transit Boardings	+ 29%	+ 11%	+ 5%	+ 16.0%	+ 11%
MPA Vehicle Miles Traveled	- 6%	- 5%	- 1.2%	- 9.4%	- 2.2%
MPA Vehicle Hours Traveled	- 9%	- 7%	- 1.7%	- 14.3%	- 5.7%
Total Vehicle Hours of Delay	- 24.0%	- 19.0%	- 4.0%	- 32.5%	- 14.5%
Lane Miles Needs	- 13.0%	- 10.0%	- 13.3%	- 30.9%	- 32.1%
Financial Needs (billions)	- $9.5	- $6.7	- $2.9	- $15.6	- $7.0
Roadway Pavement Needs	- 8.3 sq. mi.	- 6.5 sq. mi	- 0.7 sq. mi.	- 19.8 sq. mi.	- 1.6 sq. mi.
NOx Emissions	- 4.1%	- 3.9%	- 1.2%	- 8.5%	- 2.4%
VOC Emissions	- 5.3%	- 5.2%	- 1.5%	- 11.0%	- 3.0%

Source: *Mobility 2030 – 2009 Amendment*, April 2009, Exhibits 4-6 and 4-7

The results of the analyses show a strong correlation between passenger rail and VNT scenarios, both reducing the greatest amount of ozone emissions and the amount of MPA vehicle miles traveled and hours of delay.

Mobility 2030 – 2009 Amendment does not pick, favor, or choose any alternative land use scenario. This data is provided by NCTCOG as an educational guide for the cities and municipalities that comprise the DFW metropolitan area. The alternative growth scenarios are presented as potential options municipalities could incorporate into their land use policies to improve regional transportation and environmental issues. Because NCTCOG has no power to control regional growth and land development, the MTP provides these alternatives as guidance to city planners and developers on efficient patterns of growth which could help address congestion and air quality issues.

Mobility 2030 – 2009 Amendment does not utilize any of these alternative growth scenarios as a basis for development because these regional scenarios cannot be realistically implemented. The proposed roadway system (includes priced facilities) included in the MTP is based on projected growth and land use changes that are forecasted to occur. The MTP growth model takes land use growth projections from each municipality as a basis for *Mobility 2030 – 2009 Amendment*. Each municipality has its own method of addressing development within their boundaries depending on the growth they are experiencing. This growth includes mixed use, redevelopment, new development, industrial, commercial, high density, low density, transit oriented, rural growth, etc. *Mobility 2030 – 2009 Amendment* was modeled using growth projections from each municipality and future growth patterns extrapolated from existing patterns for the region.

The RTC has taken a proactive approach to improving regional traffic congestion and air quality through its Sustainable Development Policy adopted in 2001. The RTC established basic policy directions which serve as strategies to meet finance constraints, provide transportation choice, and improve air quality. The objectives of these practices are to:

- Respond to local initiatives for town centers, mixed-use growth centers, transit-oriented developments, infill/brownfield developments, and pedestrian-oriented projects.
- Complement rail infrastructure with coordinated investments in park-and-ride, bicycle, and pedestrian facilities.
- Reduce the growth in VMT per person.

Although *Mobility 2030 – 2009 Amendment* and the RTC encourage these sustainable development practices, the local municipalities have direct jurisdiction over land use, and public agencies such as DART, The T, TxDOT, and NTTA have jurisdiction over the regional transportation system. These agencies and municipalities would need to work with NCTCOG and the RTC to implement these sustainable development policies. These policies represent an important new trend in local development patterns that are based on an increased desire for a greater variety of transportation options, mixed-use developments, and unique communities with a sense of place. This trend contributes to the increase in emphasis in the region on sustainable development and the ability to achieve federal air quality attainment. Additionally, this sustainable land use is one tool the NCTCOG uses to reduce the need for new, costly infrastructure (utilities, transportation, emergency response, government facilities, water, etc.).

Sustainable land use is only one part of the solution. Only municipalities have the power in the State of Texas to affect and implement land use zoning, codes, and enforcement. Furthermore, no government entity has the authority or power to instruct developers or people where to develop or live.

The future roadway network outlined in *Mobility 2030 – 2009 Amendment* supports the predicted land use changes and growth in the region. Current and anticipated funding from the federal government for transportation will not meet the demands for the transportation infrastructure needed to support the projected population growth and land use changes. Priced facilities are one method that the MTP employs to ensure the transportation demands from future growth are met based on limited transportation funds.

The development of a managed lane network is consistent with the land use and sustainable development policies discussed in the MTP. One component of the managed lane system is planned access to high density development areas. As more mixed-use development centers are planned in the region, managed lane facilities would connect to these centers, allowing HOV and transit vehicles access to the transportation system. This would help encourage transit and ridesharing and increase mobility, efficiency, and reliability on all traffic facilities.

The proposed 2030 priced facility network may affect land use within the MPA boundary by helping to enhance land development opportunities. However, the priced facility network is only one factor in creating favorable land development conditions; other prerequisites for growth in the region include demand for new development, favorable local and regional economic conditions, adequate utilities, and supportive local land development regulations and policies. The proposed 2030 priced facility network as currently envisioned may, with the right conditions, help influence and facilitate the planned regional land use conversion, redevelopment, and growth.

B. Environmental Justice and Protected Classes

This section analyzes potential impacts to environmental justice populations in terms of traffic analysis performance, job accessibility, travel time, and origin and destination. The job accessibility analysis also considers protected classes. Protected classes, as defined in the MTP, includes minorities and low-income populations (as specified in Title VI and EO 12898) as well as persons 65 years old and over, persons with disabilities, and female head of household.

B.1 Traffic Analysis Performance Reports

Regional traffic analysis performance reports were developed under three transportation network conditions for *Mobility 2030 – 2009 Amendment*. Three conditions used were:

- 2009 Baseline – Existing (2009) transportation network with 2009 demographics
- 2030 System No Build – Existing (2009) transportation network with 2030 demographics
- 2030 System Build – Proposed *Mobility 2030 – 2009 Amendment* improvements with 2030 demographics

The daily VMT on each roadway classification under the three conditions is shown in **Table VIII-4**. In the 2009 baseline condition there are approximately 16.7 million trips per day on the roadway system. The existing freeway network, which comprises 12.8 percent of the total roadway network carries almost half (43.8 percent) of the daily VMT (see **Table VIII-1**). The existing toll roads and HOV lanes carry 4.5 percent and 0.7 percent of all VMT, respectively.

Table VIII-4: Daily Vehicle Miles Traveled

Roadway Classification	2009 Baseline		2030 System No Build		2030 System Build	
	Daily VMT	Percent	Daily VMT	Percent	Daily VMT	Percent
Freeways	66,664,490	43.8%	84,065,652	38.8%	93,707,018	40.2%
Toll Roads	6,791,006	4.5%	9,623,974	4.4%	17,009,958	7.3%
Major Arterials	23,094,003	15.2%	32,077,691	14.8%	52,619,124	22.6%
Minor Arterials	33,605,706	22.1%	53,208,511	24.5%	31,620,646	13.6%
Collectors	12,984,113	8.5%	23,116,012	10.7%	16,433,062	7.1%
Frontage Roads	7,943,931	5.2%	13,179,122	6.1%	15,378,442	6.6%
HOV	1,133,531	0.7%	1,546,436	0.7%	0	0.0%
Managed Lanes	0	0.0%	0	0.0%	6,271,821	2.7%
Total Daily VMT	**152,216,780**	**100.0%**	**216,817,399**	**100.0%**	**233,040,071**	**100.0%**
Daily Trips	**16,666,183**		**22,666,407**		**22,835,210**	

Source: NCTCOG DFWRTM model runs for *Mobility 2030 – 2009 Amendment*

Under the 2030 system no build condition, the total number of daily trips increases to approximately 22.7 million because of projected population increases. The proportion of VMT on priced facilities holds relatively constant, but capacity constraints in the existing freeway network reduce the overall proportion of VMT on freeways by 5.0 percent. The major/minor arterials and collectors carry a greater proportion of VMT under this condition and would be much more congested than under the 2009 baseline condition.

The 2030 system build condition has approximately 22.8 million trips per day, slightly higher than under the 2030 system no build condition because of improved transportation system performance. The combined proportion of VMT on freeways and priced facilities is 50.2 percent compared to 43.9 under the 2030 system no build condition. The greater VMT on freeways and

priced facilities under the 2030 system build condition would reduce the amount of congestion on arterials and collectors compared to the 2030 system no build condition.

A comparison of the average loaded speed per roadway classification is shown in **Table VIII-5**. The average loaded speed is the average speed a vehicle is traveling along a specific roadway classification during traffic and is calculated by dividing the total VMT by the total vehicle hours traveled. The results show that the 2030 system build condition would result in daily increase in roadway speed for all roadway classifications compared to the 2030 system no build condition. The average loaded speeds for the 2030 system build condition would be similar to the 2009 baseline condition despite a population increase of over 70 percent.

Table VIII-5: Average Loaded Speed (mph)

Roadway Classification	2009 Baseline			2030 System No Build			2030 System Build		
	AM	**PM**	**Daily**	**AM**	**PM**	**Daily**	**AM**	**PM**	**Daily**
Freeways	52.9	53.7	57.1	39.4	44.6	50.4	53.3	54.2	57.3
Toll Roads	52.7	54.7	57.6	39.5	45.6	50.6	54.7	55.7	58.4
Major Arterials	27.5	28.6	31.3	20.4	21.7	26.3	27.1	28.9	31.7
Minor Arterials	24.8	26.2	27.8	20.1	21.6	24.8	24.2	25.7	27.5
Collectors	21.8	23.0	24.1	17.7	19.0	21.4	20.6	21.9	23.2
Frontage Roads	24.0	26.0	28.1	18.8	20.1	23.7	26.0	28.1	30.2
HOV Lanes	50.9	53.5	54.6	46.0	49.1	51.5	na	na	na
Managed Lanes	na	na	na	na	na	na	50.3	52.0	53.3

Source: NCTCOG DFWRTM model runs for *Mobility 2030 – 2009 Amendment*

In addition, **Table VIII-6** shows a comparison of the congestion levels during the morning peak period for the three analysis conditions. The 2030 system no build condition shows that, compared to the 2009 baseline condition, fewer lane-miles are at LOS A, B, and C and more lane-miles at LOS F for all roadway classifications. Under the 2030 system build condition the proportion of lane-miles at each LOS is similar to the 2009 baseline condition for all roadway classifications. The transportation system improvements in *Mobility 2030 – 2009 Amendment*, including the additional priced facilities, are expected to accommodate the increased travel demand created by an increasing regional population while maintaining similar LOS throughout the roadway network.

Table VIII-6: Morning Peak Period Level of Service for the Traffic Study Area (2030)

Roadway Classification	2009 Baseline			2030 System No Build			2030 System Build		
	Lane-Miles	LOS	% by Class	Lane-Miles	LOS	% by Class	Lane-Miles	LOS	% by Class
Freeways	3,931	A-B-C	64%	3,931	A-B-C	41%	5,099	A-B-C	60%
		D-E	22%		D-E	29%		D-E	27%
		F	14%		F	30%		F	13%
Toll Roads	495	A-B-C	69%	495	A-B-C	46%	2,556	A-B-C	88%
		D-E	19%		D-E	27%		D-E	7%
		F	12%		F	27%		F	5%
Major Arterials	4,197	A-B-C	75%	4,197	A-B-C	49%	9,307	A-B-C	72%
		D-E	14%		D-E	18%		D-E	15%
		F	12%		F	33%		F	13%
Minor Arterials	9,854	A-B-C	84%	9,854	A-B-C	65%	8,765	A-B-C	82%
		D-E	9%		D-E	13%		D-E	9%
		F	7%		F	22%		F	9%
Collectors	9,449	A-B-C	91%	9,449	A-B-C	74%	10,123	A-B-C	87%
		D-E	4%		D-E	9%		D-E	6%
		F	5%		F	17%		F	7%
Frontage Roads	2,649	A-B-C	84%	2,649	A-B-C	68%	4,375	A-B-C	85%
		D-E	7%		D-E	9%		D-E	6%
		F	9%		F	23%		F	8%
Managed Lanes	141	A-B-C	77%	141	A-B-C	68%	841	A-B-C	78%
		D-E	20%		D-E	10%		D-E	16%
		F	3%		F	22%		F	6%

Source: NCTCOG DFWRTM model runs for *Mobility 2030 – 2009 Amendment*

B.2 Job Accessibility

As part of the development of the *Mobility 2030 – 2009 Amendment*, NCTCOG performed an environmental justice and Title VI analysis to ensure that no person is excluded from participation in, denied benefits of, or discriminated against in planning efforts. Performance measures related to job accessibility, either by automobile or transit, and congestion levels were computed based on the travel times forecasted for the system no build and system build conditions described in **Section VIII.B.1**. In both cases, and for each performance measure, the analysis classified each TSZ as above or below the regional average (see **Table VIII-7**). A zone with a percentage of protected class population greater than the regional average was classified as protected.

Table VIII-7: Census 2000 Regional Percentages for Each Protected Class

Class	Percentage of Total Regional Population in the MPA
Under Poverty Line	11.0%
Black	14.3%
Hispanic	22.4%
Asian American	4.0%
American Indian/Alaskan Native	0.6%
Over 65 Years Old	7.7%
Persons With Disabilities	6.9%
Female Head of Household	12.1%

Source: *Mobility 2030 – 2009 Amendment*, April 2009, Exhibit 23-1

After this classification was performed for each of the travel forecast zones, the number of jobs accessible from the zones was calculated within 30 minutes by automobile and within 60 minutes

by transit. **Table VIII-8** provides a summary of the results. In this table, symbols represent the relative difference in accessibility and congestion between protected populations and unprotected populations. Black, Hispanic, low-income, and persons with disabilities would have greater than five percent more accessibility or more than a five percent decrease in congestion levels relative to the unprotected population under the system no build and build conditions. Asian American populations would have greater accessibility by auto and transit and experience similar levels of congestion as unprotected populations under the system no build and build. American Indian/Alaskan Native populations would have similar accessibility by auto and experience similar levels of congestion as unprotected populations but less accessibility by transit under the system no build and build conditions. Persons over 65 year would have more accessibility by auto and lower levels of congestion as unprotected populations but less accessibility by transit under the system no build and build. Female head of household populations would have more accessibility by auto and lower levels of congestion as unprotected populations under the system no build and build condition, but accessibility by transit would be lower than unprotected populations under the system no build and similar to unprotected populations under the system build condition.

Table VIII-8: Title VI and Environmental Justice Job Accessibility Performance Measures

		Trip Based				Link Based	
		by Auto		by Transit		Level of Service	
Protected Populations	**Census Year**	**System No Build**	**System Build**	**System No Build**	**System Build**	**System No Build**	**System Build**
Black	2000	+	+	+	+	+	+
Hispanic	2000	+	+	+	+	+	+
Asian American	2000	+	+	+	+	o	o
American Indian/Alaskan Native	2000	o	o	-	-	o	o
Under Poverty Line (Low-Income)	2000	+	+	+	+	+	+
Over 65 Years Old	2000	+	+	-	-	+	+
Persons with Disabilities	2000	+	+	+	+	+	+
Females (Head of Household)	2000	+	+	-	o	+	+

Source: *Mobility 2030 – 2009 Amendment*, April 2009, Exhibit 23-20

Explanation of Symbols:

+ indicates that the protected population has greater than five percent more accessibility or more than a five percent decrease in congestion levels relative to the unprotected population.

o indicates that there is less than five percent absolute difference in job accessibility or congestion levels between protected and unprotected population.

- indicates that the protected class has less than five percent more accessibility or experiences greater than five percent more congestion relative to unprotected population.

It was determined that the recommended transportation projects included in *Mobility 2030 – 2009 Amendment* do not adversely impact the protected class populations disproportionately when compared to the unprotected class population. In almost all cases, protected class populations would have greater job accessibility by auto and transit and would experience less congestion than the unprotected population under both the 2030 system build and 2030 system no build conditions.

B.3 Travel Time Comparison

A travel time comparison for environmental justice and non-environmental justice TSZs was performed based on the baseline, system no build, and system build conditions defined in

Section VIII.B.1. There are 4,813 total TSZs that comprise the RSA. However, 35 have zero population and employment (e.g., TSZs representing lakes, airport runways), so the total of trip producing TSZs is 4,778. Minority TSZs were identified based on the federal CEQ guidance document *Environmental Justice: Guidance Under the National Environmental Policy Act*. Based on this guidance, minority TSZs were identified where the minority population of the TSZ exceeded 50 percent because the meaningfully greater percent exceeded 50 percent [the regional minority population average of 41.3 percent (see **Table VIII-7**) so twice this regional average is 82.6 percent]. A low-income TSZ was defined as having the 1999 median household income below the 1999 poverty level established by HHS poverty guidelines. A total of 1,331 TSZ are considered environmental justice TSZs (e.g., 16 low-income, 1,240 minority, 75 both low-income and minority).

The **Environmental Justice Travel Survey Zones** figure included in **Appendix D,** shows the TSZs that contain environmental justice populations. The figure shows that the majority of environmental justice communities are located within the IH 635 and IH 820 loops in Dallas and Fort Worth, respectively.

The DFW Regional Travel Model (DFWRTM) model results indicate that trips from both environmental justice and non-environmental justice TSZs receive travel benefits under the system build condition. **Table VIII-9** shows the changes in average travel time, trip length, and trip speed between morning peak period home based work trips under the system no build and build conditions as compared to 2009 baseline condition. The increase in average trip times expected for residents of both environmental justice and non-environmental justice TSZs was much smaller under the system build condition than the system no build condition. The reduced congestion and improved travel efficiency under the system build condition allows longer average trip lengths for residents of all TSZs. Based on the small increase in trip times and longer trip lengths, the average travel speed for trips from all TSZs increased in the system build condition, while decreasing under the system no build condition.

Table VIII-9: Home Based Work Trip Characteristics

	All TSZs	Environmental Justice Status		Environmental Justice TSZ Type		
		Non-Environmental Justice TSZs	Environmental Justice TSZs	Low-Income TSZs	Minority TSZs	Both Minority and Low-Income TSZs
Average Trip Time (minutes)						
2009 Baseline Condition	23.1	24.7	18.2	15.1	18.3	15.7
2030 System No Build Condition	29.4	31.7	20.7	18.0	20.8	17.2
Percent Change from Baseline	27.3%	28.3%	13.7%	19.2%	13.7%	9.6%
2030 System Build Condition	25.2	26.8	19.0	17.4	19.1	16.0
Percent Change from Baseline	9.1%	8.5%	4.4%	15.2%	4.4%	1.9%
Average Trip Length (miles)						
2009 Baseline Condition	14.1	15.2	10.9	9.0	11.0	9.3
2030 System No Build Condition	14.5	15.4	11.0	8.9	11.1	9.4
Percent Change from Baseline	2.8%	1.3%	0.9%	-1.1%	0.9%	1.1%
2030 System Build Condition	15.9	17.1	11.6	10.6	11.7	9.6
Percent Change from Baseline	12.8%	12.5%	6.4%	17.8%	6.4%	3.2%
Average Trip Speed (mph) [including congestion and traffic control delays]						
2009 Baseline Condition	36.6	36.8	36.0	35.6	36.0	35.6
2030 System No Build Condition	29.6	29.2	32.0	29.5	32.0	32.9
Percent Change from Baseline	-19.1%	-20.7%	-11.1%	-17.1%	-11.1%	-7.6%
2030 System Build Condition	37.9	38.1	36.8	36.6	36.8	36.1
Percent Change from Baseline	3.6%	3.5%	2.2%	2.8%	2.2%	1.4%

Source: NCTCOG DFWRTM model runs for *Mobility 2030 – 2009 Amendment*

Most of the differential distribution in improvements to trip characteristics is a reflection of the more urban nature of the environmental justice TSZs as shown in **Table VIII-10**. **Table VIII-11** shows how travel performance improvements under the system build condition vary based on the land area type. The travel characteristics in suburban areas, where trip lengths and times start at a higher baseline, change by larger absolute and relative amounts than in the urban residential areas. Because the environmental justice TSZs are predominantly in urban residential areas the change in average trip times and lengths are smaller than for non-environmental justice TSZs in both the system build and no build conditions. Persons traveling to/from suburban and rural areas would see a bigger benefit because of longer travel distances.

Table VIII-10: TSZ Area Types

Area Type	All TSZs	Environmental Justice Status		Environmental Justice TSZ Type		
		Non-Environmental Justice TSZs	Environmental Justice TSZs	Low-Income TSZs	Minority TSZs	Both Minority and Low- Income TSZs
Central Business District	191	170	21	2	16	3
	4.0%	4.9%	1.6%	12.5%	1.3%	4.0%
Outer Business District	391	255	136	4	122	10
	8.2%	7.4%	10.2%	25.0%	9.8%	13.3%
Urban Residential	2,795	1,811	984	7	924	53
	58.5%	52.5%	73.9%	43.8%	74.5%	70.7%
Suburban Residential	1,171	991	180	3	168	9
	24.5%	28.7%	13.5%	18.8%	13.5%	12.0%
Rural	230	220	10	0	10	0
	4.8%	6.4%	0.8%	0.0%	0.8%	0.0%

Source: NCTCOG DFWRTM model runs for *Mobility 2030 – 2009 Amendment*

Table VIII-11: Area Type Average Morning Peak Trip Characteristics

	Central Business District	Outer Business District	Urban Residential	Suburban Residential	Rural
Average Trip Time (minutes)					
2009 Baseline Condition	11.2	14.7	20.9	28.5	35.4
2030 System No Build Condition	11.9	14.6	25.3	36.1	39.2
Percent Change from Baseline	6.3%	-0.7%	21.1%	26.7%	10.7%
2030 System Build Condition	11.6	14.4	21.9	29.9	35.2
Percent Change from Baseline	3.6%	-2.0%	4.8%	4.9%	-0.6%
Average Trip Length (miles)					
2009 Baseline Condition	6.4	7.8	12.5	17.9	24.3
2030 System No Build Condition	6.2	6.9	12.5	17.6	20.6
Percent Change from Baseline	-3.1%	-11.5%	0.0%	-1.7%	-15.2%
2030 System Build Condition	6.7	7.7	13.4	19.4	24.9
Percent Change from Baseline	4.7%	-1.3%	7.2%	8.4%	2.5%
Average Trip Speed (mph) [including congestion and traffic control delays]					
2009 Baseline Condition	34.2	31.8	35.9	37.7	41.1
2030 System No Build Condition	31.4	28.4	29.7	29.2	31.5
Percent Change from Baseline	-8.2%	-10.7%	-17.3%	-22.5%	-23.4%
2030 System Build Condition	34.8	32.2	36.6	38.8	42.4
Percent Change from Baseline	1.8%	1.3%	1.9%	2.9%	3.2%

Source: NCTCOG DFWRTM model runs for *Mobility 2030 – 2009 Amendment.*

B.4 Regional Origin-Destination Study

To further analyze the effects of the expansion of the priced facility network in the MPA, a regional origin-destination study of the morning peak period (6:30 am to 9:00 am) was performed for environmental justice populations comparing two trip-making scenarios, both under the year 2030 system build condition. Both scenarios are based on *Mobility 2030 – 2009 Amendment* build travel model network, but analyze priced facilities as detailed in the following text:

- Existing Facilities Scenario – An analysis using the 2030 build network and 2030 demographics of priced facilities that are operational by 2009.

- Future Facilities Scenario – An analysis using the 2030 build network and 2030 demographics of the future priced facilities expected to begin operation between 2009 and 2030.

The origin-destination results in **Table VIII-12** show how trips on the existing and future priced facility networks are distributed based on the environmental justice status of TSZs in the MPA. For the existing facilities scenario, approximately the same percentage of non-environmental justice TSZs and environmental justice TSZs send at least one trip per day to an existing toll facility. However, the proportion of toll trips originating from non-environmental justice TSZs is higher than environmental justice TSZs. Environmental justice TSZs represent almost 28 percent of the TSZs but only account for 11.1 percent of the trips utilizing existing toll facilities and 21.5 percent of trips on the entire transportation network. For environmental justice TSZs, approximately 0.6 percent of trips would be on existing tolled facilities compared to 1.2 percent for non-environmental justice TSZs.

Table VIII-12: 2030 Morning Peak Period (6:30 am to 9:00 am) Origin-Destination Results

Data of Interest	All Trip-Generating TSZs (Non-Zero Population and Employment)	Environmental Justice Status		Environmental Justice TSZ Type		
		Non-Environmental Justice TSZs	All Environmental Justice TSZs	Low-Income TSZs (Median Income Below Poverty Rate)	Majority Minority TSZs (>50% Minority)	Low-Income and Majority Minority TSZs
TSZs in the MPA	4,778	3,447 (72.1%)	1,331 (27.9%)	16 (0.3%)	1,240 (26.0%)	75 (1.6%)
TSZs Utilizing Priced Facilities (at least once per day)						
Existing Facilities Scenario	4,736 (99.1%)	3,414 (99.0%)	1,322 (99.3%)	16 (100.0%)	1,232 (99.4%)	74 (98.7%)
Future Facilities Scenario	4,767 (99.8%)	3,438 (99.7%)	1,329 (99.8%)	16 (100.0%)	1,238 (99.8%)	75 (100.0%)
Trips from TSZs Utilizing Priced Facilities						
Existing Facilities Scenario	265,231	235,674 (88.9%)	29,557 (11.1%)	228 (0.1%)	28,676 (10.8%)	653 (0.2%)
Future Facilities Scenario	429,921	372,290 (86.6%)	57,631 (13.4%)	459 (0.1%)	57,631 (13.4%)	2,104 (0.5%)
Trips on Entire Transportation Network from TSZs that have any Tolled Trips						
Existing Facilities Scenario	24,311,520	19,073,499 (78.5%)	5,238,021 (21.5%)	103,463 (0.4%)	4,977,473 (20.5%)	260,548 (1.1%)
Future Facilities Scenario	24,328,044	19,085,405 (78.5%)	5,242,639 (21.5%)	103,463 (0.4%)	4,981,984 (20.5%)	260,655 (1.1%)
Percent of TSZ Trips on Priced Facilities						
Existing Facilities Scenario	1.1%	1.2%	0.6%	0.2%	0.6%	0.3%
Future Facilities Scenario	1.8%	2.0%	1.1%	0.4%	1.2%	0.8%

Source: NCTCOG TransCAD® data for 2030 regional existing 2009 and future 2030 scenarios (2008 Origin-Destination data).

Under the future facilities scenario, slightly more TSZs would send trips to priced facilities because the planned facilities are distributed throughout the region. As with the existing facilities scenario, approximately the same percentage of non-environmental justice TSZs and environmental justice TSZs send at least one trip per day to a priced facility. However, the proportion of toll trips originating from non-environmental justice TSZs is higher than

environmental justice TSZs. Environmental justice TSZs represent almost 28 percent of the TSZs but only account for 13.4 percent of the trips utilizing future toll facilities and 21.5 percent of trips on the entire transportation network. For environmental justice TSZs, approximately 1.1 percent of trips would be on future priced facilities compared to 2.0 percent for non-environmental justice TSZs.

The total number of trips on priced facilities in the 2030 system build condition is 695,152 during morning peak period, the sum of the trips in the existing facilities scenario and future facilities scenario. This means that 38 percent of the total priced facility trips are on existing facilities and 62 percent are on future facilities. Similarly, the total trips on priced facilities from environmental justice TSZs is 87,188 during morning peak period, with 34 percent on existing facilities and 66 percent on future facilities. As shown in **Appendix D: Environmental Justice Travel Survey Zones** and **Environmental Justice Traffic Survey Zones: Daily Trips on Existing (2009) Priced Facilities**, existing toll roads are not adjacent to the majority of environmental justice TSZs, but future proposed priced facilities would be built closer to environmental justice populations. This would increase accessibility to these roadway facilities as shown by the slightly higher proportion of trips on future facilities from environmental justice TSZs.

Due to the increase in trips generated by environmental justice TSZs, the potential impacts to low-income populations were evaluated because low-income populations would use a greater proportion of their income for transportation expenses. As shown in **Table VIII-12**, of the 1,331 environmental justice TSZs, 91 TSZs (16 low-income only plus 75 low-income and minority TSZs) or 1.9 percent (0.3 percent plus 1.6 percent) are low-income. Under the existing facilities scenario, approximately 0.5 percent (0.2 percent plus 0.3 percent) of trips from these TSZs use priced facilities. Under the future facilities scenario, approximately 1.2 percent (0.4 percent plus 0.8 percent) of trips from these TSZs use priced facilities.

B.5 Incomplete or Unavailable Information

The traffic analysis performance report, travel time comparison, and origin-destination study were completed using the DFWRTM. This application is developed and maintained by the NCTCOG Model Development Group and consists of a collection of software components implemented on the TransCAD® 4.8 platform. The DFWRTM is a four-step trip-based travel demand model which models a 5,000 square mile area in North Central Texas. The four steps of the modeling process are: trip generation, trip distribution, mode choice, and traffic assignment. The model was validated (for the year 1999) using a variety of user surveys and traffic counts to ensure that roadway traffic volume, transit usage, peak/off-peak period conditions, and roadway speeds are accurately reproduced by the model.

The DFWRTM application was implemented to forecast travel demand within the MPA. It is not a social or economic prediction model, but it does incorporate some income data in the trip generation, mode choice, and transit trip assignment steps for home based work trips. Within each TSZ the total population, number of households, and number of jobs in several employment categories vary depending on the selected year of analysis and/or demographic scenario. The forecasted demographic datasets used in this analysis are derived from the NCTCOG 2030 demographic forecast. Median income levels for each TSZ are included as primary demographic inputs, but they are held largely static (except for inflation adjustments) for all modeled years and scenarios because no reliable forecasts of changes in the geographic distribution of income

levels are available. At no point in the modeling process is the race or ethnicity of transportation system users considered.

The ratio of the median income of a TSZ to the regional median income is used to calculate the relative proportions of households that fall into the four modeled income quartiles. The ratio of population to the number of households is used to create a frequency distribution of household sizes ranging from one-person to six- or more person households. These two statistically derived distributions along with the area type (rural, suburban residential, urban residential, central business district, and other business district) are used in trip generation calculations. The functions used to generate these statistical distributions were derived to be consistent with observed demographic characteristics within the DFW region, based on the decennial census data.

In the trip generation step of the travel model forecasting process, the socio-economic characteristics of each TSZ are used to determine the number of trips that will be generated by and attracted to each TSZ. Trip production rates are based on the 1996 DFW household survey conducted by NCTCOG. Trip attraction rates are based on a 1994 workplace survey conducted by NCTCOG. These rates do not vary between model years or demographic scenarios. The rates are used in conjunction with the socio-economic data to calculate the number of trips of a variety of types to and from each TSZ.

The mode choice step uses income distribution and household size data to estimate the number of vehicles available to members of each household. The number of vehicles available, household income and type of trip are all factored into mode choice decisions. A series of nested multinomial logit models is applied to estimate the number of person trips from each TSZ that will use each of the five-modeled modes: drive alone, two-person carpool, three-person or more carpool, transit with walk access, and transit with vehicle access.

Each vehicle trip is classified by the purpose of the trip. Each vehicle trip of a given type is treated equally by the model, so the socio-economic factors that contributed to the creation of any given vehicle trip do not factor into the trip assignment step of the modeling process. As currently implemented, the modeling process requires all vehicle trips to operate under the same value of time assumptions. No data to reliably estimate variations in the value of time based on socio-economic status is readily available. At the step in the modeling process where socio-economic variations in the value of time would need to be applied, some of the relevant socio-economic information is no longer tracked by the DFWRTM application.

Based on these characteristics of the modeling process, the environmental justice analysis performed using the DFWRTM should be understood to have the following limitations:

- Data limitations
  - The current and future year demographics were generated on a geographic scale that is not identical to the TSZ structure used in DFWRTM. Transferring demographic data from U.S. Census geographies and NCTCOG Research and Information Services traffic survey zones required the application of statistical techniques that reduce the reliability of categorizations based on race, ethnicity, and economic status at the TSZ level.
  - Income, race, and ethnicity are based on 2000 census data. Therefore, the data used does not reflect any changes to these factors.

- Model-derived production of socio-economic characteristics of vehicle trips has not been validated using any control data and should not be assumed to be accurate.
- Demographic projections to 2030 assume the same distribution of income, race, and ethnicity and does not account for any potential shifts in population types across the region.

- Model limitations
  - Model inputs do not include race or ethnicity; therefore, the model cannot identify trips based on the race or ethnicity of an individual user.
  - Income quartiles are only used in the assignment of home-based work trips, which are only 25 percent of trips. All other vehicle trips are not assigned based on income.
  - For the purposes of trip distribution, mode choice, and traffic assignment, all vehicle trips of the same type are treated identically. The DFWRTM model, as implemented, is not capable of generating results that produce outputs that differentiate vehicle trips based on the economic characteristics of transportation system users.
  - The vehicle trip assignment process does not consider relative income differences or the differences in relative cost to potential users in the population when assigning vehicle trips. All vehicle trips operate under the same value of time assumptions.
  - The DFWRTM was not designed to model the socio-economic characteristics of each trip. Model-derived reproductions of socio-economic characteristics of trips have not been validated using any control data and should not be assumed to be accurate.
  - The DFWRTM cannot replicate dynamic pricing.

B.6 Summary

Results from the performance reports prepared for the MPA showed an increase in roadway speed and an improvement in LOS for the majority of the roadway classifications in the 2030 system build condition compared to the 2030 system no build condition. The 2030 system build condition for the MPA would generally maintain the 2009 baseline roadway performance conditions throughout the NCTCOG region while accommodating the travel demands of the growing regional population.

Although environmental justice populations would see an increase in spending for priced facility usage under the future facilities scenario, it is proportional to the increased usage of the entire MPA as the priced system expands. Almost all environmental justice TSZs were identified by the NCTCOG travel demand model to potentially sending trips along priced facilities in the existing facilities and future facilities scenarios. As shown in **Table VIII-1**, 75 of the proposed 108 projects include the addition of general purpose lanes that would not be tolled. For populations (including environmental justice populations) who would opt to use non-priced facilities, the 2030 system build condition would provide a non-priced roadway network that would operate at better traffic conditions (greater speeds and an improved LOS) on all roadways and an increased benefit over the 2030 system no build condition.

Avoidance and minimization of adverse effects to environmental justice populations occurred during the development of the MTP. Impacts to environmental justice populations were one of the several issues included and considered during the MTP planning process. All corridor planning and development activities are consistent with the MTP recommendations for congestion management and multimodal opportunities which benefit all segments of populations. The region will continue its efforts to work with all communities in the planning process to

identify transportation challenges and explore and develop the appropriate strategies to respond to the issues. Example strategies could include programs and projects to improve availability and accessibility to alternate transportation options such as discounted transit fares and tolls, HOV discounts on priced facilities, better accessibility to regional transportation systems, and community level congestion management. Specific strategies and projects would be developed through discussions with local governments and community representatives, as needed.

Based on these analyses, the 2030 system build condition and the future facilities scenario for the MPA would not cause disproportionately high and adverse cumulative impacts on any minority or low-income populations as per EO 12898 regarding environmental justice. Therefore, no regional mitigation measures are proposed. This regional analysis is based on the most recent policies, programs, and projects included in *Mobility 2030 – 2009 Amendment*. These elements are subject to change in future MTPs. At the time of approval of future MTPs, a new analysis of the effects to environmental justice and protected classes would be conducted.

C. Air Quality

The NCTCOG serves as the MPO for the DFW area. As the MPO, it serves a 12-county metropolitan region centered on Dallas and Fort Worth. Since the early 1970s, MPOs have had the responsibility of developing and maintaining a MTP. The MTP is federally mandated; it serves to identify transportation needs; and guides federal, state, and local transportation expenditures.

Passed in 1991, ISTEA strengthened the role of the MTP and made it the central mechanism for the decision-making process regarding transportation investments. The passage of TEA-21 in 1998 continued this emphasis. SAFETEA-LU was signed into law on August 10, 2005. SAFETEA-LU addresses the challenges on our transportation system such as improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment. Both SAFETEA-LU and the CAAA impose certain requirements on long-range transportation plan for the urbanized area.

Transportation plans such as *Mobility 2030 – 2009 Amendment*, according to SAFETEA-LU metropolitan planning regulations, must be fiscally constrained, that is, based on reasonable assumptions about future transportation funding levels. Because the DFW area is designated as a nonattainment area for the eight-hour ozone standard, the CAAA require the transportation plan to be in conformity with the SIP for air quality to demonstrate that projects in the MTP meet air quality goals. *Mobility 2030 – 2009 Amendment* specifically addresses regional ozone in addition to its studies of general regional air quality and the final result of the studies showed that the regional roadway network (including priced facilities) would show a decrease in nitrogen oxides and emissions of volatile organic compounds, which are both precursors to ozone.

Transportation conformity is a process which ensures federal funding and approval goes to transportation activities that are consistent with air quality goals. Transportation activities that do not conform to state air quality plans cannot be approved or funded.

The CAAA established specific criteria which must be met for air quality non-attainment areas. The criteria are based on the severity of the air pollution problem. Transportation conformity is a CAAA requirement that calls for the EPA, U.S. DOT, and various regional, state, and local government agencies to integrate air quality and transportation planning development processes.

Transportation conformity supports the development of transportation plans, programs, policies, projects, partnerships, and performance that enable areas to meet and maintain national air quality standards for ozone, PM, and CO, which impact human health and the environment. Through the SIP, the air quality planning process ties transportation planning to the conformity provisions of the CAAA. This ensures that transportation investments are consistent with state and local air quality objectives. The NCTCOG is responsible for the conformity analysis in the DFW area. If the criteria are not met, EPA can then impose sanctions on all or part of the state. Sanctions include stricter industrial controls and the withholding of federal highway and transit funds.

In the DFW region, a nine-county moderate nonattainment area for eight-hour ozone has been designated by the EPA. As discussed in **Section VIII**, the metropolitan planning process must include a CMP to address congestion. The evaluation of additional transportation system improvements beyond the committed system began with a detailed assessment of transportation improvements that would not require building additional facilities for SOV.

Transportation system performance information was developed as a product of the DFWRTM throughout the MTP development process. This information guided development of the system alternatives and indicated the impact of various improvements. The improvements recommended in *Mobility 2030 – 2009 Amendment* include regional congestion management strategies, bicycle and pedestrian facilities, managed HOV lanes, light/commuter rail and bus transit improvements, ITS technology, freeway and tollway lanes, and improvements to the regional arterial and local thoroughfare system such as intersection improvements and signal timing. Because *Mobility 2030 – 2009 Amendment* is financially and air quality constrained, other more cost effective methods are reviewed before SOV lanes (freeways and toll roads) are added into the roadway system. ITS, transit, HOV lanes, and managed lanes are ways to meet regional transportation demands under the financially constrained MTP while improving regional air quality.

The additional introduction of priced facilities into the existing roadway network would not cause any cumulative impacts to air quality. The regional priced facility system would provide additional travel capacity to the roadway network which would allow a greater flow of traffic throughout the region, decreasing the amount of cars traveling at lower speeds or idling conditions. This would result in less fuel combustion and lower emissions including MSATs, CO, and ozone. As noted in the direct, indirect, and system cumulative analysis discussions, EPA vehicle and fuel regulations, coupled with fleet turnover, are expected to result in substantial reductions of on-road emissions, including MSATs, CO, and ozone precursors.

D. Water Quality

Water quality is regulated on the state level by the TCEQ. The TCEQ monitors all major water bodies (rivers, lakes, and streams) and reports the conditions of these streams in a biennial Texas Water Body Inventory report. Section 303(d) of this report details those water bodies TCEQ has identified as impaired due to water contamination.

The Section 303(d) list identifies five major water systems as impaired with pollutants and bacteria in the MPA. These major water bodies are the Upper Trinity River, the West Fork Trinity River, the East Fork Trinity River, the Elm Fork Trinity River, and the Clear Fork Trinity

River. The construction of the proposed priced facility system would cross and impact these water bodies at multiple locations and could cause water quality impacts.

As stated previously, TCEQ regulates water quality through SW3P, municipal separate storm water sewer system (MS4), and BMPs. All construction of these priced facilities would follow these water quality permits that would prevent further pollution to these impaired waters and to waters that are not impaired. Additionally any indirect land use development that would occur from the construction of these facilities would follow TCEQ regulations for water quality through SW3P and MS4. Compliance with state requirements from TCEQ for water quality is required for federal, state, local, and private developments. Therefore, the regional priced facility network would not have a cumulative impact to water quality.

E. Waters of the U.S.

The USACE regulates waters of the U.S. in the State of Texas. The MPA is under the jurisdiction of the Fort Worth District of the USACE. Fill of any jurisdictional waters of the U.S. is required to be permitted through the USACE.

While the USACE has specific guidelines for identifying waters of the U.S., several methods exist to preliminarily identify these waters. USGS topography maps and the TCEQ Water Quality Inventory database provide information for the location of larger rivers and streams that would fall under the USACE jurisdiction. The National Wetlands Inventory maps created and maintained by the USFWS attempts to identify potential wetlands through the use of infrared aerial photography (digital ortho quarter quads). The current status for the NWI maps for the MPA consists of digital formats and hard copy formats; some areas are currently not mapped.

Although this data is incomplete, it serves as a background for the identification of waters of the U.S.. Government and private developments must receive permits to fill waters of the U.S and the identification of these waters of the U.S. is completed at the project level with field surveys.

From the available data, the regional priced facility system would impact and cause fill to waters of the U.S, both streams and potential wetlands. USACE policy requires that any potential impacts to waters of the U.S be avoided or minimized before impacts are assessed. Additionally, any permit for impacts to waters of the U.S. requires statements regarding avoidance and minimization measures taken for the project as stated in 33 CFR 325.1(d)(7). These priced facility projects would be required to comply with permitting and mitigation for the fill of these waters of the U.S. Any land use change or development that would occur from this regional priced facility system would also be required to acquire a permit and provide mitigation for fill and loss of waters of the U.S.

Through the permitting and mitigation process the USACE has implemented a no net loss policy for permanent impacts to wetlands and waters of the U.S. This ensures that loss of these waters would require mitigation that is equal or greater than the loss. Because the USACE would regulate and require mitigation for loss of these waters of the U.S., the priced facility network would not cause a cumulative impact to waters of the U.S.

F. Vegetation

An inventory of regional vegetation is not available for the MPA. General vegetation descriptions identifying regions and ecological areas are available from many resources. These resources (e.g., *Vegetation Types of Texas*) vary in description of areas of regions and do not update their descriptions from the original publications. Project specific vegetation descriptions are the best method to map the vegetation that would be affected by a project.

The MPA lies in the Blackland and Cross Timbers prairies ecological regions identified by TPWD. The construction of most of the proposed priced facility system would occur in areas already developed and contain urban type vegetation. The projects outside the urban areas could impact natural vegetation and the changes in land use and development that may be caused by these facilities would impact vegetation surrounding these projects.

Under Planning and Environmental Linkages (PEL) and SAFETEA-LU Section 6001, coordination with resource agencies is encouraged to help minimize and avoid impact to the environment (both human and biological). Through different programs and grants, NCTCOG works with various supporting agencies on resource protection from the transportation system, including vegetation. Currently, NCTCOG is working to implement PEL efforts in consultation with resource agencies. Consultation efforts are conducted at Transportation Resource Agency Consultation and Environmental Streamlining (TRACES) meetings that offer both transportation and environmental planning professionals a forum to develop consensus on environmental and transportation aspects of long-range transportation plans. Other mitigation can occur through TxDOT districts for loss of vegetation based on the MOU and MOA with TPWD, which focuses on special habitat types of wildlife and protected species. Wetlands are under the jurisdiction of the USACE and mitigation for the loss of these wetlands (which includes the vegetation) would occur through the permitting process. The USFWS can regulate and require mitigation for loss of vegetation that is designated habitat for a threatened or endangered species. Finally, municipalities can implement ordinances to protect trees, natural land, or open green spaces.

Although impacts to vegetation would occur from the priced facility system, these impacts could be regulated at the project level for each individual roadway project. Regulated vegetation (i.e., wetlands, threatened, or endangered species habitat) would be protected and any impacts to these regulated vegetation areas would require mitigation. Unregulated vegetation would not receive any direct protection or mitigation through laws or regulations. Any potential protection would be done on a per project basis and would be implemented by the project owner. Because of the potential mitigation for vegetation, most impacts would be avoided or minimized; therefore, there would be no cumulative impacts to vegetation from the priced facility system.

G. Conclusion

The regional priced facility system would cause minor impacts to some of the identified resources in this section. Land use impacts cannot be mitigated at a regional level, but at a municipal level because these entities have direct control over land use. Municipalities would work with TxDOT, DART, The T, and NCTCOG to address regional infrastructure changes in their comprehensive plans.

As part of *Mobility 2030 – 2009 Amendment*, NCTCOG specifically addresses two issues – air quality and environmental justice populations. The transportation planning process, at a regional level, provides ways to avoid and minimize potential impacts that could occur. To be

implemented, priced facility projects must be included in the STIP/TIP and MTP and the TIP and MTP must conform to the SIP. Additionally, NCTCOG performed an environmental justice and Title VI analysis to ensure that no person is excluded from participation in, denied benefits of, or discriminated against in planning efforts, including the development of the MTP. This assures that each project is in compliance with the STIP/TIP and MTP for air quality under the CAAA and the MTP is consistent with Title VI of the Civil Rights Act of 1964 and EO 12898 on environmental justice, as well as the Civil Rights Restoration Act of 1987.

State and federal regulatory agencies that have direct jurisdiction over natural and cultural resources would be responsible for requiring avoidance, minimization, and mitigation from any entity whose proposed project (transportation or other type) has a direct impact to any of these resources.

IX. MITIGATION AND MONITORING COMMITMENTS

Right-of-Way/Easements/Construction License/Displacements

The proposed IH 35E improvements would require additional ROW, and thus would result in a number of displacements. Approximately 179 acres of proposed ROW, approximately 54 acres of proposed easement, and 180 displacements (including use of 20.7 acres of USACE property) would be required. All relocation efforts would be consistent with the requirements of the Civil Rights Act of 1964, the Uniform Relocation Assistance and Real Properties Acquisition Act of 1970 as amended, and the Housing and Urban Development Act of 1974.

The Workforce Solutions for North Central Texas would be proactive in assisting any employees that would be affected as a result of the displacements associated with the proposed reconstruction of IH 35E. Workforce Solutions staff has agreed to attend the proposed project's Open House/Public Hearing and provide handouts and other information regarding Workforce Solutions services. As presented in **Appendix I**, Workforce Solutions for North Central Texas can coordinate with employers identified for relocation by TxDOT via the ROW acquisition phase of project development to engage and provide 1-2 hour "rapid response workshops" if requested by the employers, regardless of the number of employees anticipated to be impacted. The rapid response workshops could be planned and conducted by the Workforce Solutions of North Central Texas to provide information to groups ranging from 5 to 500 employees regarding the programs provided by the Workforce Centers and how to apply for unemployment benefits. Multiple rapid response workshops could be conducted by the Workforce Solutions for North Central Texas to distribute information to all employees potentially impacted by the proposed IH 35E project. Efforts by Workforce Solutions' services are targeted toward assisting the individual employees and can help prepare those employees to work in other occupations if the employee is unable to find work in or chooses to leave their current field of employment.

Impacts to Section 4(f) and 6(f) Properties

Draft Programmatic Section 4(f) Net Benefit Evaluations have been prepared for impacts to Highland Lakes Park in the City of Lewisville, and USACE Property, including Copperas Branch Park around Lewisville Lake. Several Build Alternatives were considered to avoid and minimize harm to these properties. Alternatives have been assessed and the findings conclude that the Build Alternative is the only feasible and prudent alternative and results in an overall improvement and enhancement when compared to the No-Build Alternative and the present condition of the park property. The required coordination efforts are ongoing and future public involvement efforts shall be conducted and successfully completed. The most current written agreements can be reviewed in **Appendix G**.

Waters of the U.S., including Wetlands

Section 404

The placement of temporary or permanent dredge or fill material into waters of the U.S. (including wetlands) that are determined to be jurisdictional would be authorized by NWP 14 (Linear Transportation Projects) PCN would be required for Areas 1, 3, 6, 8, and 10 because the permanent fill impact exceeds the NWP 14 threshold of 0.10 acre of impacts, but are less than 0.50 acre of impacts, and/or because fill would be placed in a special aquatic site (wetland). It is anticipated that temporary impacts in jurisdictional waters and wetlands would occur during construction.

It is anticipated that temporary fills in jurisdictional waters and wetlands would occur during construction. The affected areas subjected to temporary fill activities would be returned to their pre-existing conditions. If it is necessary for heavy machinery to work in a wetland then the placement of mats would occur to minimize soil disturbance to the extent possible. An IP Application (USACE Project Number SWF-2004-00105) was submitted to the USACE Fort Worth District in April 2008 and would be modified in accordance with the appropriate Section 404 permitting requirements. Coordination with the USACE Lewisville Lake Office and the USACE Operations Maintenance Branch would occur to address Section 404 impacts and appropriate permitting, and mitigation on USACE property.

If additional jurisdictional impacts (beyond those covered in the proposed Section 404 permit application) are identified due to the construction contractor's elected construction methodologies or activities, the contractor would be responsible for obtaining the appropriate Section 404 permit from the USACE for the additional impacts.

Temporary crossings may be utilized for the construction of the bridges. However, the temporary crossings would be removed after construction and the areas would continue to function as they do currently. If temporary fill or mats are utilized at the crossings, the areas would be returned to the pre-existing conditions once the temporary fill is removed.

Section 401
The SW3P would include at least one BMP from the 401 Water Quality Certification Conditions for NWPs as published by the TCEQ.

Floodplains
Fill placed within the flood pool elevation must be compensated for by removing fill at a nearby location. The cut and fill amounts located within the current USACE easement are anticipated to result in an overall positive benefit to flood storage of Lewisville Lake. No reduction in storage capacity and no impacts to the floodplain elevation are anticipated from the proposed project.

Water Quality
Texas Pollution Discharge Elimination System (TPDES)
The proposed project would disturb more than five acres; therefore, a Notice of Intent would be filed to comply with TCEQ stating that TxDOT would have a SW3P in place during construction of proposed project.

Threatened/Endangered Species and Wildlife Habitat
TPWD records indicate that the Texas garter snake has been found within the corporate limits of Hickory Creek on the west side of IH 35E. The confirmed finding indicates that this species is found within the general area of the proposed project, and a pre-construction presence/absence survey would be conducted in order to clear the area of this species prior to construction.

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 and/or vegetation clearing. Between February 15 and October 1, the contractor would be prepared to prevent migratory birds from building nests 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. If species are present, work should

cease at that location and TxDOT personnel should be contacted. If any active nests are found, the local USFWS biologist should be contacted by TxDOT to determine an appropriate plan of action.

TPWD/TxDOT MOA

The 1998 MOA between TPWD and TxDOT provides for compensatory mitigation for impacts to certain habitat features, including large and unusual trees that result from the construction of roadway projects. TxDOT proposes to compensate for the loss of approximately 3.2 acres of riparian woodlands and individual trees with a dbh greater than 20 inches. Planting design and species selection would be based on habitat value to wildlife and would simulate wooded communities naturally occurring in the area.

Historical and Archeological Sites

If archeological or historic sites are discovered prior to or during construction, work would cease immediately. A TxDOT staff archeologist would then assess the site pursuant to the Texas Antiquities code and the site would be avoided or mitigated according to Section 106 of the National Historic Preservation Act.

Noise Assessment

Eight noise barriers were determined to be both feasible and reasonable along portions of the IH 35E corridor as listed in **Table IV-21**, as means to mitigate for anticipated traffic noise impacts. One hundred and forty-six receivers would benefit from the proposed noise barriers due to a reduction in noise levels by at least 5 dBA. The total cost of the barriers would be $3,579,048, a total of $24,514 per benefited receiver. Any subsequent project design changes may require a reevaluation of this proposal. The final decision to construct the proposed noise barriers would be made upon completion of the project design, utility evaluation and the polling of adjacent property owners.

Hazardous Materials

There are 13 High Risk hazardous materials sites that should be considered during final design. Eight of the high risk sites (Sites 7, 8, 9, 28, 29, 40, 42 and 57) have a reported LPST. Each of the LPST sites would have a portion or the entire parcel acquired. The visual survey identified two properties (N5 and N6) which are former gas stations. These sites and tank systems would be addressed during the ROW negotiation and acquisition process. Additional ROW would be acquired from one VCP site (Site 25) down-grade of the proposed project which contains soil /groundwater contamination from VOCs, chlorinated solvents, TPH, and lead. One SPILLS site (Site 3) is categorized as high risk due to the vague nature of the "unknown resin" that was spilled. During final design, additional investigation would be required to confirm if contamination would be encountered during construction. If contamination is confirmed, then TxDOT would develop appropriate soils and/or groundwater management plans for activities within these areas.

USACE Property

See **Section V**., USACE Property, Impacts to USACE Property, including Mitigation, Enhancements and Commitments**,** for a summary of commitments and requirements by resource associated with impacts to USACE property.

X. DETERMINATION OF ASSESSMENT

Based on the information in this EA and in the project's administrative record, TxDOT recommends implementation of the preferred alternative.

The construction of the preferred alternative would meet the purpose and need stated in this document. The capacity of the existing roadway would be increased by the addition of travel lanes allowing for increased people and goods-carrying capacity in the project area. The additional travel lanes would reduce the number of vehicles per lane per mile of roadway, thus reducing the concentration of heavy trucks along the route and help manage traffic congestion. The congestion management would improve the mobility within the project area and allow residents and employers access to a wider range of employment opportunities. The improved mobility would also result in reducing the time necessary to move people and goods from one point to another.

Because the preferred alternative optimally accommodates the increased capacity, reduction in traffic congestion, improved mobility, and regionally adopted transportation policy objectives of the project need and purpose in conjunction with the extensive consideration of local stakeholders' needs, goals, and concerns regarding the project's interface with their respective communities and interests, the construction of the preferred alternative would best meet the need and purpose stated in this document. As part of the MIS conducted by TxDOT in 1998, TxDOT employed the use of the NCTCOG TDM to evaluate performance measures such as person miles and hours of travel, percent lane miles at LOS E and F, person hours of congestion, and daily cost of congestion to evaluate the effectiveness of a number of alternatives' abilities to alleviate congestion and improve mobility along the entire IH 35E corridor. The results of the MIS, which considered a no-build alternative, a no-build alternative with CMS strategies (eg. ITS), widening the mainlanes of IH 35E (including ramp, interchange, and frontage road improvements), widening other facilities parallel to the IH 35E corridor, the addition of mass transit throughout the corridor, the addition of reversible managed/HOV lanes, and the addition of reversible express lanes, revealed that a combination of mainlane widening, managed/HOV lane use, and continuous and greater frontage road capacity along the IH 35E corridor would have the best potential for decreasing congestion and improving mobility. The results of the MIS also recommended an alternative that would follow the existing alignment and expand the existing facility. These recommendations, which are supported by the evaluation of numerous alternatives, provide the basic foundation and themes from which the components of the preferred alternative evolve and best satisfy the objectives of the project need and purpose.

In addition to the results of the MIS, extensive stakeholder input solicitation occurred as early as the development of the MIS through the 2008 public meeting to best incorporate the needs and goals of potentially affected property owners, communities, and other local and regional agencies. As part of the MIS process, work groups representing target audiences and all interested parties were organized to provide input at 13 coordination meetings. Between public meetings held in 2003 and 2008 as part of the EA process, the proposed IH 35E reconstruction project underwent design modifications in coordination with municipalities adjacent to the proposed project and other stakeholders. As a result of the public meetings and coordination and in order for the project to best interface with the concerns of the public, affected agencies, municipalities, and property owners, the preferred alternative's design underwent substantial adjustments from what was originally proposed to mitigate for such concerns and to optimally tie

into stakeholders' goals. Design modifications were coordinated between local stakeholders and property owners to achieve an optimally balanced and feasible solution to the corridor's transportation needs and goals based upon comments of support received at public meetings and stakeholder work group meetings. Adjustments consisted of mainlane shifts to avoid displacing or adversely impacting valued community assets and amenities and to minimize the number of displacements. Additionally, adjustments included enhancements to adjacent and nearby properties to improve access and improve safety due to sight distance. Adjustments minimized the amount of overall ROW acquisition and were made to the extent practicable to optimally mitigate and incorporate the goals of all stakeholders involved in the process and to retain the objectives of the project's need and purpose to increase capacity, manage traffic congestion, improve mobility, and incorporate local transportation policy related to the HOV/managed lane concept.

The engineering, social, economic, and environmental investigations conducted thus far on the proposed project indicate that it would result in no adverse impacts to the quality of the human or natural environment.

TxDOT requests that FHWA find that implementing the proposed project would not be a major Federal action significantly affecting the quality of the human environment and thus issue a Finding of No Significant Impact (FONSI) for this project.

XI. GLOSSARY

AASHTO –American Association of State Highways and Transportation Officials

The American Association of State Highways and Transportation Officials is a non-profit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia, and Puerto Rico. It represents all five transportation modes: air, highways, public transportation, rail, and water. Its primary goal is to foster the development, operation, and maintenance of an integrated national transportation system.

ACHP - Advisory Council on Historic Preservation

The Advisory Council on Historic Preservation is an independent United States Federal agency that promotes the preservation, enhancement, and productive use of the nation's historic resources, and advises the President and Congress on national historic preservation policy.

ADT – Average Daily Traffic

Average daily traffic is defined as the total traffic volume during a given period (from 1 to 364 days) divided by the number of days in that period. Current Average Daily Traffic volumes can be determined by continuous traffic counts or periodic counts. Where only periodic traffic counts are taken, Average Daily Traffic volume can be established by applying correction factors such as for season or day of week. For roadways having traffic in two directions, the Average Daily Traffic includes traffic in both directions unless specified otherwise.

APE – Area of Potential Effect (Related to Historic Properties)

Area of potential effect is the geographic area or areas within which an undertaking may cause changes in the character or use of historic properties, if any such properties exist there. This area always includes the actual site of the undertaking and may also include other areas where the undertaking will cause changes in land use, traffic patterns or other factors that could affect historic properties. According to the PA [IX.D(1)b] among TxDOT, THC, FHWA, and ACHP, "unless TxDOT and SHPO in consultation determine a need for a wider APE due to potential indirect and cumulative effects of a specific project, the APE for other projects shall be defined as (i) 300 ft beyond the proposed ROW for projects constructed on new location not involving an existing transportation corridor; (ii) 150 ft beyond the proposed ROW for projects constructed in existing transportation corridors, including abandoned railroad lines."

Block Group

A subdivision of a census tract (or, prior to 2000, a block numbering area), a block group is the smallest geographic unit for which the Census Bureau tabulates sample data. A block group consists of all the blocks within a census tract with the same beginning number.

BMP – Best Management Practice

A Best Management Practice is a method for preventing or reducing the pollution resulting from an activity. Examples include silt fences, rock berms, and detention/retention ponds.

CAA – Clean Air Act

The Clean Air Act of 1970 is a national policy that authorizes programs to safeguard the air resources from pollution by controlling or abating air pollution and emissions of air contaminants consistent with the protection of health, general welfare, and physical property of the people including the aesthetic enjoyment of the air resources by the people and the maintenance of adequate visibility.

CAAA – Clean Air Act Amendments of 1990

The Clean Air Act Amendments of 1990 is a set of revisions/amendments passed by congress to the Clean Air Act of 1970 (CAA). Includes procedures that apply to all transportation plans, programs, and projects as related to air quality. Reference 42 U.S.C. §7410 et. Seq. Transportation Planning and Programming Collection.

CAL3QHC

CAL3QHC estimates total air pollutant concentrations (carbon monoxide or particulate matter) near highways from both moving and idling vehicles. This model also estimates the length of queues formed idling vehicles at signalized intersections.

CALINE3

CALINE3 is a steady-state Gaussian dispersion model designed to determine air pollution concentrations at receptor locations downwind of "at-grade," "fill," "bridge," and "cut section" highways located in relatively uncomplicated terrain.

CDA – Comprehensive Development Agreements

A Comprehensive Development Agreement is a tool the Texas Department of Transportation uses to enable private investments in the Texas transportation system. It provides a competitive selection process for developing regional projects.

CDC – Corridor Development Certificate

The permit issued by the city prior to development within the Regulatory Zone of the Trinity River Corridor.

Census Block

A subdivision of a census tract (or, prior to 2000, a block numbering area), a block is the smallest geographic unit for which the Census Bureau tabulates 100-percent data. Many blocks correspond to individual city blocks bounded by streets, but blocks - especially in rural areas - may include many square miles and may have some boundaries that are not streets. The Census Bureau established blocks covering the entire nation for the first time in 1990. Previous censuses back to 1940 had blocks established only for part of the nation. Over eight million blocks are identified for *Census 2000*.

CEQ – Council on Environmental Quality

The Council on Environmental Quality coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

C.F.R. – Code of Federal Regulations

Codification of the general and permanent rules and regulations published in the Federal Register by the executive departments and agencies of the Federal Government of the United States.

CMAQ – Congestion Mitigation and Air Quality Improvement Plan

A federal program which provides funds for a project in a non-attainment area that contributes to the attainment of natural ambient air quality standards or will have certified benefits to air quality.

CMP – Congestion Management Process

A congestion management process refers to several methods of roadway management. Included in the process are Intelligent Transportation Systems, Transportation System Management, and Travel Demand Management. These programs seek to improve traffic flow and safety through better operation and management of transportation facilities.

CO – Carbon Monoxide

Carbon monoxide is a colorless, odorless, very toxic gas produced by the incomplete combustion of carbon-containing fuels, most notably by gasoline powered engines, power plants, and wood fires.

Controlled Access Freeway

A controlled access highway, in accordance with applicable state law, is a state highway on which owners or occupants of abutting lands and other persons are denied access to or from the highway except at some points only and in such manner as may be determined by the department.

CSJ – Control Section-Job Number

Identification numbers assigned to route segments on every highway route in the state.

CT – Census Tract

Census tracts are small, relatively permanent statistical subdivisions of a county. Census tracts are delineated for most metropolitan areas and other densely populated counties by local census statistical areas committees following Census Bureau guidelines.

CWA – Clean Water Act

The Clean Water Act is a national policy that authorizes programs to safeguard surface water sources, including special aquatic sites, by regulating actions which could lead to the destruction or degradation of the quality of these resources. This includes safeguards from pollution, by controlling or abating water pollution and sources of water contaminants, and from actions that may result in the discharge of storm water, dredged and fill material into these waters, consistent with the protection of health, general welfare and physical property of the people including the enjoyment of the water resources by the people and the maintenance of adequate water quality and the protection of fish, wildlife, and critical habitat.

DART – Dallas Area Rapid Transit

The Dallas Area Rapid Transit Authority is a transit agency based in Dallas, Texas that operates buses, light rail (including an underground station), commuter rail, and High Occupancy Vehicle lanes in Dallas and 12 of its suburbs. It is the largest light rail operator in the state of Texas.

dB – Decibel

The decibel is the unit of measurement used to express the magnitude of sound energy (noise).

DE – Diesel Exhaust

Diesel exhaust is a pervasive airborne contaminant in workplaces where diesel-powered equipment is used.

DFW – Dallas-Fort Worth

DFW is the title designated by the United States Census as of 2003 and encompassing 12 counties within the state of Texas. The metropolitan area is further divided into two metropolitan divisions: Dallas–Plano–Irving and Fort Worth–Arlington. Residents of this region informally refer to it as the Dallas/Fort Worth Metroplex.

DFW MSA – Dallas/Fort Worth Metropolitan Statistical Area

In the United States, the Office of Management and Budget has produced a formal definition of metropolitan areas. These are referred to as "Metropolitan Statistical Areas" and "Combined Statistical Areas." MSAs are composed of counties and are delineated on the basis of a central urbanized area—a contiguous area of relatively high population density.

DFWRTM - Dallas-Fort Worth Regional Travel Model

The Dallas-Fort Worth Regional Travel Demand Model software application is a collection of components that implements a trip-based four-step travel demand model on the TransCAD® 4.8 platform. The DFWRTM accepts the following input files: demographic data, roadway network including toll roads and high occupancy vehicles, transit supply systems including rail and park-and-ride, airport enplanements, and external stations forecasts. It produces traffic volumes and speeds on roadways and transit usage data on the transit system. In addition to flexible coding tools, a smooth menu system for performing model runs, and extensive reports, the software provides a comprehensive file management system for the organization of input and output data. The Dallas-Fort Worth Regional Travel Demand Model software is the North Central Texas Council of Governments' official travel demand model.

DHHS - Department of Health and Human Services

The Department of Health and Human Services is a Cabinet department of the United States government with the goal of protecting the health of all Americans and providing essential human services.

DNT – Dallas North Tollway

The Dallas North Tollway is a 22-mile controlled-access toll road operated by the North Texas Tollway Authority, which runs from Interstate 35E near downtown Dallas, Texas to State Highway 121 near Frisco, ending at U.S. 380.

EA – Environmental Assessment

An Environmental Assessment is the National Environmental Policy Act document performed for a project in which the significance of impacts on the environment is not clearly exhibited. The environmental assessment may lead to either a Finding of No Significant Impact or an Environmental Impact Statement.

EIS – Environmental Impact Statement

An Environmental Impact Statement is a National Environmental Policy Act document that details the results of the detailed analysis of all the project alternatives. The EIS contains all information learned about the impacts of a project and alternatives.

Electronic Toll Collection

Electronic toll collection, an adaptation of military "identification friend or foe" technology, aims to eliminate the delay on toll roads. It is a technological implementation of a road pricing concept. It determines whether the cars passing are enrolled in the program, alerts enforcers for those that are not, and debits electronically the accounts of registered cars without their stopping, or even opening a window.

ELR – Environmental Law Reporter

The Environmental Law Reporter is research tool for environmental, health and safety, toxic tort, natural resource, land use law, and litigation professionals. The ELR provides information regarding environmental regulations and litigation.

Environmental Justice

Environmental justice is a process that focuses on the development, implementation, and enforcement of environmental laws, regulations and policies, as defined by the Environmental Protection Agency, by requiring the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income.

EO – Executive Order

An Executive Order is a President's or Governor's declaration which has the force of law, usually based on existing statutory powers, and requiring no action by the Congress or state legislature.

EPA – Environmental Protection Agency

The Environmental Protection Agency is the federal agency primarily responsible for environmental protection, including air quality. The Environmental Protection Agency is also responsible for developing and administering National Pollutant Discharge Elimination System regulations.

ESRI ArcMap 9.1

ESRI ArcMap 9.1 is a version of a Geographic Information System modeling and mapping computer software.

EZ TAG

EZ TAG is an electronic toll collection system in Houston, TX, that allows motorists to pay tolls without stopping at toll booths.

FEMA - Federal Emergency Management Agency

The Federal Emergency Management Agency is an agency of the United States Department of Homeland Security. FEMA's purpose is to coordinate the response to a disaster which has occurred in the United States and which overwhelms the resources of local and state authorities. The Federal Emergency Management Agency administers programs providing for emergency and permanent repairs to facilities on the state highway system, but off the federal-aid system. In addition to the actual repairs, FEMA funds may also be used for engineering, planning, supervision, design and inspection.

FHWA – Federal Highway Administration

The Federal Highway Administration is a division of the United States Department of Transportation that specializes in highway transportation. The agency's major activities are grouped into two "programs," The Federal-aid Highway Program and the Federal Lands Highway Program. The Federal Highway Administration 's role in the Federal-aid Highway Program is to oversee federal funds used for constructing and maintaining the National Highway System (primarily Interstate Highways, United States Routes and most State Routes). This funding mostly comes from the federal gasoline tax and mostly goes to State departments of transportation. FHWA oversees projects using these funds to ensure that federal requirements for project eligibility, contract administration and construction standards are adhered to.

FLUP – Future Land Use Plans

A Future Land Use Plan is a policy document created for land use and growth management, which sets forth desired types of physical growth within a planning area.

FM – Farm to Market Road

The term Farm to Market Road indicates a road that is part of the state's system of secondary and connecting routes, built and maintained by the Texas Department of Transportation (TxDOT). This system was established in 1949 as a project to provide access to rural areas. The system consists primarily of paved, two-lane roads.

FONSI – Finding of no Significant Impact

A finding of no significant impact is a decision by the Federal Highway Administration or Environmental Affairs Division which indicates that no significant project impacts have been identified. The Finding of No Significant Impact follows approval of the environmental assessment and appropriate public involvement.

FPPA – Farmland Protection Policy Act

The Farmland Protection Policy Act of 1981 provides protection to farmland as defined in the law. Its purpose is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure the federal programs are administered in a manner that to the extent practicable will be compatible with state, local government and private programs and policies to

protect farmlands. America's private land owners and managers conserve their soil, water, and other natural resources.

F.R. – Federal Register

The Federal Register is the federal government's daily publication of final regulations, proposed regulations, funding priorities, grant applications deadlines, meetings, and other notices announced by federal agencies and offices.

ft - Foot/Feet

Foot/feet is the unit of length originally derived from the length of the human foot. It is divided into 12 inches and equal to 30.48 centimeters.

FTA – Federal Transit Administration

The Federal Transit Administration is an agency within the United States Department of Transportation that provides financial and technical assistance to local public transit systems. The Federal Transit Administration is one of eleven agencies within the United States Department of Transportation.

g/mi – Grams per Mile

Grams per Mile is a measurement used in calculating air toxics loads. It is equivalent to 0.000000621 kilograms per meter.

GIS - Geographic Information System

A Geographic Information System is a system for capturing, storing, analyzing and managing data and associated attributes which are spatially referenced to the earth. GIS is a tool that allows users to create interactive queries (user created searches), analyze the spatial information, edit data, maps, and present the results of all these operations.

H.B. – House Bill

A House Bill is a bill originating in the House of Representatives.

HCTRA – Harris County Toll Road Authority

The Harris County Toll Road Authority came into existence when, in September, 1983, Harris County voters approved a referendum by a 7-3 margin to release up to $900 million in bonds to create two tollroads - the Hardy Toll Road and the Sam Houston Tollway, to improve the regional mobility and manage traffic congestion in the Greater Houston area, an area known for rapid population growth.

HOV – High Occupancy Vehicle

A High Occupancy Vehicle is a vehicle having more than one occupant. Examples include carpools, vanpools, buses, and mini-buses. Transportation systems may encourage high occupancy vehicle use by having designated high occupancy vehicle lanes and designating a minimum number of occupants required to use these lanes.

IH – Interstate Highway

An Interstate Highway is a highway so designated by the American Association of State Highways and Transportation Officials. (Please see **AASHTO – American Association of State Highways and Transportation Officials** for more information.)

IRIS – Integrated Risk Information System

An integrated risk information system is a database of human health effects that may result from exposure to various substances found in the environment.

ISD - Independent School District

School districts are a form of special-purpose district which serves to operate the local public primary and secondary schools. A school district is a unique body corporate and politic usually with districts being coequal to that of a city or a county, and has similar powers including taxation and eminent domain.

ISTEA - Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act of 1991, signed into law by President Bush in December 1991, establishes a new vision for surface transportation in America. It represents a victory for the Nation, its citizens, and our economic vitality. The Bill embodies one of the President's top domestic agenda items: the renewal of our surface transportation programs to address the changing needs for America's will create jobs reduce congestion, and rebuild our infrastructure. it will help maintain mobility. it will help State and local governments address environmental issues. Finally, it will ensure America's ability to compete in the global marketplace of the 21st Century.

ITS – Intelligent Transportation System

An intelligent transportation system is an integrated system that uses video and other electronic detection devices to monitor traffic flows on major freeways. When problems (called "incidents") are detected, operators may use remote controls to redirect traffic, inform motorists (through the use of dynamic message signs) and notify emergency response services as appropriate. Intelligent Transportation System replaces the term intelligent vehicle highway system.

LEP – Limited English Proficiency

The term limited English proficiency applies to individuals who do not speak English as their primary language and who have a limited ability to read, speak, write, or understand English can be limited English proficient.

Link

Links represent the roadway segments within a transportation network utilized for traffic demand modeling. Each link contains, among other information, length, traffic volume, number of lanes, speed and direction of flow that characterize each link. NCTCOG provided the DFW transportation networks used in this environmental assessment.

Logical Termini

Logical termini for project development are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. The environmental assessment frequently covers a broader geographic area than the strict limits of the transportation improvements. In the past, the most common termini have been points of major traffic generation, especially intersecting roadways. This is due to the fact that in most cases traffic generators determine the size and type of facility being proposed.

LOS – Level of Service

Level of service is a measure of traffic flow and congestion. As defined in the Highway Capacity Manual - A qualitative measure describing operational conditions within a traffic stream; generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Mainlane

A mainlane is an expressway lane. Defined by NCTCOG, an expressway is a wide road built for fast moving traffic traveling long distances, with a limited number of points at which drivers can enter and exit.

Managed Lanes

The TxDOT Project Monitoring Committee agreed upon the following definition for managed lanes, which serves as the official definition of the term for TxDOT: "A managed lane facility is one that increases freeway efficiency by packaging various operational and design actions. Lane management operations may be adjusted at any time to better match regional goals."

Managed Lanes Excess Toll Revenue Sharing Policy

A policy for TxDOT managed lanes projects approved by the Regional Transportation Council. This policy outlines the circumstances under which excess toll revenue would become available and distributed in the region.

MBTA – Migratory Bird Treaty Act

The MBTA was first enacted to implement the 1916 convention between the United States and Great Britain for the protection of birds migrating between the U.S. and Canada. The most recent revisions to the Act occurred in 2006.

MIS – Major Investment Study

A major investment study is a tool for making better decisions at an early time in the transportation planning process. It provides decision-makers with information on options available for addressing problems before investment decisions are made.

MLS - Multiple Listing Service

Group of private databases which allows real estate brokers representing sellers under a listing contract to widely share information about properties with real estate brokers who may represent potential buyers or wish to cooperate with a seller's broker in finding a buyer for the property. There is no single authoritative "multiple listing service", and no universal data format. The many local and private databases some of which are controlled by single associations of realtors or groupings of associations (which represent all brokers within a given community or geographical area) or by real estate brokers are collectively referred to as the “MLS” because of their reciprocal access agreements

MOA - Memorandum of Agreement

A Memorandum of Agreement is a document written between parties to cooperatively work together on an agreed upon project or meet an agreed upon objective. The purpose of an MOA is to have a written understanding of the agreement between parties. The

MOA can also be a legal document that is binding and hold the parties responsible to their commitment or just a partnership agreement.

MOBILE6.2

MOBILE6.2 is an emission factor model for predicting gram per mile emissions of hydrocarbons, carbon monoxide, nitrogen oxides, carbon dioxide, particulate matter, and toxics from cars, trucks, and motorcycles under various conditions.

MOU – Memorandum of Understanding

A Memorandum of Understanding is a formal document which outlines the relationship between agencies or parties, including responsibilities and jurisdiction of each party, which sets forth within its provisions agreements between parties.

MPA - Metropolitan Planning Area

A metropolitan planning area is the geographic area in which the metropolitan transporation planning process is required (23 USC 134 & 49 USC 5303) to be carried out.

MPO – Metropolitan Planning Organization

A metropolitan planning organization is the policy board of an organization created and designated to carry out the metropolitan transportation planning process (Source: 23 C.F.R).

MSAT – Mobile Source Air Toxics

Mobile source air toxics are a subset of the 188 air toxics defined by the Clean Air Act. The mobile source air toxics are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned.

MTBE - methyl tertiary-butyl ether

Methyl tertiary-butyl ether is a chemical compound that is manufactured by the chemical reaction of methanol and isobutylene. MTBE is produced in very large quantities (over 200,000 barrels per day in the U.S. in 1999) and is almost exclusively used as a fuel additive in motor gasoline. It is one of a group of chemicals commonly known as "oxygenates" because they raise the oxygen content of gasoline. At room temperature, MTBE is a volatile, flammable and colorless liquid that dissolves rather easily in water.

MTP – Metropolitan Transportation Plan

The Metropolitan Transportation Plan is a comprehensive, multimodal “blueprint” for transportation systems and services aimed at meeting the mobility needs of the Dallas-Fort Worth Metropolitan Area through the next 25 years. Plans, projects, programs, and policies are proposed as transportation recommendations that reflect solutions to improve the over all quality of life for residents in the Dallas- Fort Worth area.

NAAQS – National Ambient Air Quality Standard

The United States Environmental Protection Agency has established National Ambient Air Quality Standards for six air pollutants: ozone, lead, carbon monoxide, sulfur dioxide, nitrogen dioxide, and respirable particulate matter. The standards were established to

protect the public from exposure to harmful amounts of pollutants. When the pollutant levels in an area have caused a violation of a particular standard, the area is classified as "nonattainment" for that pollutant.

NAC – Noise Abatement Criteria

Noise abatement criteria are absolute sound levels, provided by the Federal Highway Administration, used to determine when a noise impact occurs.

NAFTA – North American Agreement Free Trade Agreement

The North American Agreement Free Trade Agreement, which came into effect on January 1, 1994, eliminated the majority of tariffs between products traded among the United States, Canada and Mexico, and gradually phases out other tariffs over a 10-year period. Restrictions were to be removed from many categories, including motor vehicles, computers, textiles, and agriculture. The treaty also protects intellectual property rights (patents, copyrights, and trademarks), and outlines the removal of investment restrictions among the three countries. The agreement is trilateral in nature (that is, the terms apply equally to all countries) in all areas except agriculture, in which stipulations, tariff reduction phase-out periods and protection of selected industries, were negotiated on a bilateral basis. Provisions regarding worker and environmental protection were added later as a result of supplemental agreements signed in 1993.

NATA – National Air Toxics Assessment

The National Air Toxics Assessment is the Environmental Protection Agency's ongoing comprehensive evaluation of air toxics in the United States. The activities associated with the National Air Toxics Assessment include expansion of air toxics monitoring, improving and periodically updating emission inventories, improving national and local scale modeling, continued research on health effects and exposures to both ambient and indoor air, and improvement of assessment tools.

NCHRP - National Cooperative Highway Research Program

The National Cooperative Highway Research Program is administered by the Transportation Research Board. It was created in 1962 as a means to conduct research in acute problem areas that affect highway planning, design, construction, operation, and maintenance nationwide.

NCTCOG – North Central Texas Council of Governments

The North Central Texas Council of Governments is a voluntary association of, by and for local governments, and was established to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development.

NDD – Natural Diversity Database

The Natural Diversity Database is a compilation of Texas state endangered, threatened, and rare species/species for concern.

NHPA – National Historic Preservation Act

An act to establish a program for the preservation of additional historic properties throughout the Nation, and for other purposes, approved October 15, 1966 (Public Law

89-665; 80 STAT.915; 16 U.S.C. 470) as amended by Public Law 91-243, Public Law 93-54, Public Law 94-422, Public Law 94-458, Public Law 96-199, Public Law 96-244, Public Law 96-515, Public Law 98-483, Public Law 99-514, Public Law 100-127, and Public Law 102-575).

NEPA – National Environmental Policy Act

The National Environmental Policy Act [42 U.S.C. 4321 et seq.] was signed into law on January 1, 1970. The Act establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment, and it provides a process for implementing these goals within the federal agencies. The Act also establishes the Council on Environmental Quality.

NLEV – National Low Emission Vehicle

The National Low Emission Vehicle is a voluntary national low emission vehicle program for light-duty vehicles and light-duty trucks.

NMHC- Non-Methane Hydrocarbons

A large variety of non-methane hydrocarbons are found throughout the troposphere. They are often conveniently lumped into the categories of alkanes, alkenes, aromatics and biogenically produced compounds. Emissions of non-methane hydrocarbons derive from fossil fuel burning, industrial and evaporative sources, biomass burning emissions by plants, and oceanic sources.

Notice of Intent

A notice of intent form is required to be submitted for large construction activities which disturb five or more acres of land, including those activities which are part of a larger common plan of development that disturb five or more acres of land. The instructions detailing how to fill the notice of intent are included in the form.

NOx – Nitrogen Oxides

Nitrogen Oxides is the sum of the nitric oxide and nitrogen dioxide in the flue gas or emission point, collectively expressed as nitrogen dioxide.

NRCS – Natural Resources Conservation Service

The United States Department of Agriculture Natural Resources Conservation Service, formerly the Soil Conservation Service, is the federal agency that works hand-in-hand with the American people to conserve natural resources on private lands.

NRHP – National Register of Historic Places

The National Register of Historic Places is a catalog of historic sites and buildings, districts, structures, and objects which have been entered on the list of the nation's outstanding cultural resources. It provides an authoritative guide to federal, state and local governments, private groups and citizens to recognize the nation's cultural resources, enabling these groups to protect and sustain these resources in the process of planning for the future.

NTTA – North Texas Tollway Authority

The North Texas Tollway Authority, a political subdivision of the State of Texas under Chapter 366 of the Transportation Code, is empowered to acquire, construct, maintain, repair and operate turnpike projects; to raise capital for construction projects through the issuance of Turnpike Revenue Bonds; and to collect tolls to operate, maintain and pay debt service on those projects.

NWP – Nationwide Permit

A Nationwide Permit is a type of general permit issued by the Chief of Engineers of the United States Army Corps of Engineers (USACE) that authorize categories of activities that have minimal individual and cumulative adverse effects on the aquatic environment.

O&D – Origin-Destination Analysis

Analyzing Origin-Destination data can determine travel patterns of traffic along a transportation facility during a typical day. This form of analysis is useful in assessing "user impacts", as the number of trips associated with specific population characteristics can be studied to provide general travel assumptions of those specific populations.

Official Texas Historical Markers

Official Texas Historic Markers are markers and plaques that the Texas Historical Commission awards, approves or administers. They include centennial markers the State of Texas awarded in the 1930's; Civil War Centennial markers from the 1960's; and medallions and markers awarded by the Texas Historical Commission.

OMB- Office of Management and Budget

The Office of Management and Budget is a Cabinet level and is the largest office within the Executive Office of the President of the United States and is an important conduit by which the White House oversees the activities of federal agencies. OMB is tasked with giving expert advice to senior White House officials on a range of topics relating to federal policy, management, legislative, regulatory, and budgetary issues.

PA – Programmatic Agreement

A programmatic agreement is a document that spells out the terms of a formal, legally binding agreement between a state Department of Transportation and other state and/or federal agencies. A programmatic agreement establishes a process for consultation, review, and compliance with one or more federal laws, most often with those federal laws concerning historic preservation.

PCN – Pre-Construction Notification

Advance notification to be submitted to a district engineer of the United States Army Corps of Engineers, so that the district engineer can determine whether the proposed work qualifies for nationwide permit authorization.

Peak Period Traffic or Peak Period

The peak period traffic is the percentage of average daily traffic that occurs during the "AM peak traffic" (6:30 AM to 8:59 AM) or the "PM peak traffic" (3:00 PM to 6:29 PM) and represents the number of vehicles that pass a point on a highway during these periods.

PEL - Planning and Environmental Linkages

Planning and Environment Linkages represent an approach to transportation decision-making that considers environmental, community, and economic goals early in the planning stage and carries them through project development, design, and construction. This approach can lead to a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays in project implementation.

PGBT – President George Bush Turnpike

The President George Bush Turnpike is a 30.5-mile toll road running east-west through the Cities of Carrollton, Dallas, Plano, Richardson, and Garland Texas.

PM – Particulate Matter

Particulate matter is anything that is suspended in the air. It can be caused by natural phenomena or come from man-made sources. In high enough concentrations, particulates can aggravate existing respiratory problems or even trigger new ones.

$PM_{2.5}$

Particulate matter less than 2.5 microns in diameter (see **PM – Particulate Matter** for more information.)

PM_{10}

Particulate matter less than 10 microns in diameter (see **PM – Particulate Matter** for more information.)

ppb – Parts Per Billion

Parts per billion denote one particle of a given substance for every 999,999,999 other particles. This is roughly equivalent to one drop of ink in a lane of a public swimming pool, or one second per 32 years.

ppm – Parts Per Million

Parts per million denotes one particle of a given substance for every 999,999 other particles. This is roughly equivalent to one drop of ink in a 150 liter (40 gallon) drum of water, or one second per 280 hours (11 days, 16 hours). One part in 106, a precision of 0.0001%.

RFG – Reformulated Gasoline

Reformulated gasoline is a cleaner-burning blend of gasoline that reduces motor fuel emissions. While reformulated gasoline contains the same ingredients found in conventional gasoline, it reduces some of the more harmful, toxic compounds and adds more combustible, cleaner-burning compounds.

ROD – Record of Decision

A document required by the National Environmental Policy Act that is separate from, but associated with, an environmental impact statement. The record of decision publicly and officially discloses the responsible official's decision on which alternative assessed in the Environmental Impact Statement will be implemented.

ROE – Right-of-Entry

An agreement from the owner of a tract or parcel of land specifically authorizing the State, the right to enter upon the described tract of land for specific purposes as stated in the agreement.

ROW – Right-of-Way

Right–of-way is a general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to a highway for the construction of the roadway. It is the entire width of land between the public boundaries or property lines of a highway.

RSA – Resource Study Area

A resource study area is the geographic area within which impacts on a particular resource are analyzed.

RTC – Regional Transportation Council

The Regional Transportation Council is the independent transportation policy body of the Metropolitan Planning Organization (MPO) for the 12-county Dallas-Fort Worth (DFW) Metropolitan Planning Area (MPA), which operates as a component of the North Central Texas Council of Governments (NCTCOG). The RTC, which meets the second Thursday of each month, is comprised of 43 members: 36 local elected or appointed officials representing cities and counties and seven transportation provider representatives. The RTC is responsible for overseeing the metropolitan transportation planning process.

RTHL – Recorded Texas Historical Landmark

The Recorded Texas Historic Landmark designation is awarded to historic structures deemed worthy of preservation for their architectural integrity and historical associations. Authorized by the Texas Legislature under Texas Government Code, Chapter 442, the Recorded Texas Historic Landmark is the highest honor the state can bestow on historic structures in Texas. Properties so designated are afforded a measure of legal protection and become part of the recorded history of the state's built environment.

RVP - Reid Vapor Pressure

Reid vapor pressure is a common measure of gasoline volatility, as well as a generic term for gasoline volatility. EPA regulates the vapor pressure of all gasoline during the summer months (June 1 to September 15 at retail stations).

SAFETEA-LU – Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, which governs United States federal surface transportation spending through 2010, was signed into law by President George W. Bush in Montgomery, Illinois, on August 10, 2005. The $286.4 billion measure contains a host of provisions designed to improve and maintain the transportation infrastructure in the United States, especially the highway and interstate road system.

S.B. – Senate Bill

The initials "S.B." before the number designate a bill originating in the Senate.

Section 4(f)

Section 4(f), enacted as part of the Federal Department of Transportation Act of 1966, declares that a special effort must be made to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The use of these sites for a transportation project will not be approved unless it is determined that there is no other prudent or feasible alternative.

Section 6(f)

Section of the Land and Water Conservation Fund Act of 1965, which restricts the use of Section 6(f) properties. Section 6(f) properties are those, which have been acquired or developed with funds provided by the Land and Water Conservation Fund from which additional ROW is required.

Section 303(d) List

The Section 303(d) list is an inventory of streams and lakes identified as impaired for one or more pollutants, and which do not meet one or more water quality standards.

Section 401

Section 401 of the Clean Water Act requires that the state certify that federal licenses or permits which may result in a pollutant discharge into navigable waters (such as a Section 404 Permit) meet state water quality standards.

Section 404

Section 404 of the Clean Water Act requires a permit from the United States Army Corps of Engineers for the discharge of dredged or fill material into Waters of the United States (including wetlands). Any activity that disturbs wetlands areas can be construed as requiring a Section 404 permit.

SH – State Highway

A State Highway is a broad roadway designed for high speed traffic. A state highway is a roadway so designated by the Texas Transportation Commission.

SHPO – State Historic Preservation Officer

The State Historic Preservation Officer administers the national historic preservation program at the State level, reviews National Register of Historic Places nominations, maintains data on historic properties that have been identified but not yet nominated, and consults with federal agencies during Section 106 review. State Historic Preservation Officer is designated by the governor of his/her respective state or territory.

SIP – State Implementation Plan

The State Implementation Plan describes how the state would reduce and maintain air pollution emissions in order to comply with the federal standards. Important components of the State Implementation Plan include emission inventories, motor vehicle emission budgets, control strategies, and an attainment demonstration.

SOV – Single Occupancy Vehicle

Single occupancy vehicle is a vehicle having only one occupant.

Special flood hazard area

The land area covered by the floodwaters of the base flood is the special flood hazard area on national flood program maps. The special flood hazard area is the area where the national flood program maps' floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

STIP – Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program includes the Transportation Improvement Program documents for the 25 Metropolitan Planning Organizations in Texas, plus all the rural transportation projects that are not included in metropolitan Transportation Improvement Program documents. Projects must be consistent with the state and metropolitan long-range plans, and in non-attainment areas such as the DFW area, projects must conform to State Implementation Plan. The Statewide Transportation Improvement Program can only include projects for which full funding is reasonably anticipated to be available in order to complete the project. As is the case with the DFW Transportation Improvement Program, the Statewide Transportation Improvement Program is a short-term (four-year) planning and funding document.

SW3P – Storm Water Pollution Prevention Plan

A Storm Water Pollution Prevention Plan contains those erosion and sedimentation Best Management Practices that will be used to control wastes generated from the construction site, the stormwater management measures that will be implemented, and the plan for long-term maintenance of these measures.

T.A.C. – Texas Administrative Code

The Texas Administrative Code is a compilation of all state agency rules in Texas. There are 16 titles in the Texas Administrative Code. Each title represents a category and relating agencies are assigned to the appropriate title.

TAQA - Traffic Air Quality Analysis

A traffic air quality analysis is an analysis to determine potential effects of carbon monoxide emissions related to a proposed transportation project. This analysis is based on TxDOT approved traffic data that was obtained from NCTCOG.

TARL – Texas Archeological Research Laboratory

The Texas Archeological Research Laboratory is a nationally recognized archeological research facility and the largest archeological repository in the state. The Texas Archeological Research Laboratory is an organized research unit under the College of Liberal Arts at the University of Texas at Austin. The Texas Archeological Research Laboratory's mission is to collect, preserve, and curate archeological specimens and records, train students, conduct archeological research, and disseminate information about Texas' archeological legacy.

TCAA – Texas Clean Air Act

The Texas Clean Air Act is the clean air legislation signed in Texas in 1965 which established the Texas Air Control Board under the Department of Health.

TCEQ – Texas Commission on Environmental Quality

The Texas Commission on Environmental Quality, formerly known as Texas Natural Resource Conservation Commission, is the state agency in charge of protecting water and air resources of the state. Texas Commission on Environmental Quality also regulates hazardous material sites and is responsible for the development of the State Implementation Plan.

TDM – Travel Demand Management

Travel demand management includes actions or programs which encourage people to travel at alternative times, or with fewer vehicles to reduce congestion. Travel Demand Management reduces traffic volumes through methods including: ridesharing, park-and-ride operations, staggered work hours, and transit improvements.

TEA-21 - Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century, enacted June 9, 1998 as Public Law 105-178, authorizes the Federal surface transportation programs for highways, highway safety, and transit for the 6-year period 1998-2003. The Transportation Equity Act for the 21st Century Restoration Act, enacted July 22, 1998, provided technical corrections to the original law.

Texas Coastal Management Program

The Coastal Management Program was developed to improve the management of the state's coastal natural resource areas and to ensure the long-term ecological and economic productivity of the coast.

Texas Education Agency

The Texas Education Agency is a state agency tasked to guide and monitor activities and programs related to public education in Texas.

THC – Texas Historical Commission

The Texas Historical Commission is the state agency for historic preservation. Texas Historical Commission staff consults with citizens and organizations to preserve Texas' architectural, archeological and cultural landmarks. The agency is recognized nationally for its preservation programs.

TIP – Transportation Improvement Program

The Transportation Improvement Program is both a funding process and a funding document. Federal regulations, along with regional policies and practices, establish the process by which transportation projects are selected, modified, and implemented. The Transportation Improvement Program serves as a short-term planning document that lists four years of funded transportation projects designed to carryout the recommendations of the long-range metropolitan plan. More formally, the Transportation Improvement Program is a staged, multi-year listing of transportation projects with committed funding from federal, State, and local sources within the DFW Metropolitan Area. A new Transportation Improvement Program is developed every two to three years in accordance with the metropolitan planning requirements set forth in the Statewide and Metropolitan Planning Final Rule (23 C.F.R. Part 450, 49 CFP Part 613).

TollTag

An electronic toll collection system of the North Texas Tollway Authority that allows motorists to pay tolls without stopping at toll booths. It can be used in any tollroad in Texas.

Total Suspended Solids

Total suspended solids is a water quality measurement parameter at one time called non-filterable residue. It is a term that refers to the identical measurement: the dry-weight of particles trapped by a filter, typically of a specified pore size.

TPDES – Texas Pollutant Discharge Elimination System

Texas Pollutant Discharge Elimination System program now has federal regulatory authority over discharges of pollutants to Texas surface water, with the exception of discharges associated with oil, gas, and geothermal exploration and development activities, which are regulated by the Railroad Commission of Texas.

TPWD – Texas Parks and Wildlife Department

The Texas Parks and Wildlife Department is the state agency with primary responsibility for protecting the state's parks, fish, and wildlife resources.

TransCAD®

TransCAD® is a Geographic Information System computer program designed for use by transportation professionals to store, display, manage, and analyze transportation data.

TRACES - Transportation Resource Agency Consultation and Environmental Streamlining

The Transportation Resource Agency Consultation and Environmental Streamlining program aims to elevate environmental concerns during the transportation planning process. Currently, the Metropolitan Planning Organization is working to implement Planning and Environmental Linkages efforts in consultation with resource agencies. The consultation efforts are conducted at the Transportation Resource Agency Consultation and Environmental Streamlining meetings that offer both transportation and environmental planning professionals a forum to develop consensus on environmental and transportation aspects of long-range transportation plans.

Trip

A trip is a one-way movement, from where a person starts (origin) to where the person is going (destination).

TSM – Transportation System Management

Transportation system management involves those actions or construction measures that control or improve the movement of cars and trucks on the highway system and buses on the transit system. Transportation System Management also includes the coordination of the available transportation systems for more efficient operation. A typical Transportation System Management activity is a low-cost, short-term, high-impact transportation-related improvement. A Transportation System Management action is the use of a freeway shoulder as an added traffic lane during peak traffic flow conditions.

TSZ – Traffic Serial Zone

A traffic serial zone is a small geographic unit of area that is developed as a basis for estimate of travel. Traffic Serial Zones vary in size and are determined by the roadway network and homogeneity of development.

TxTag

An electronic toll collection system that allows motorists to pay tolls without stopping at toll booths. It can be used in any tollroad in Texas.

URARPAA – Uniform Relocation Assistance and Real Properties Acquisitions Act

On January 2, 1971, Public Law 91-646, the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970," (Uniform Act) was signed into law. The Uniform Act, provides important protections and assistance for people affected by Federally funded projects. This law was enacted by Congress to ensure that people whose real property is acquired, or who move as a result of projects receiving Federal funds, will be treated fairly and equitably and will receive assistance in moving from the property they occupy.

U.S. - United States Highway

The system of United States Numbered Highways (U.S. Highways) is an integrated system of roads and highways in the United States numbered within a nationwide grid. As these highways were coordinated among the states, they are sometimes referred to as Federal Highways, but they have always been maintained by state or local governments since their initial designation in 1926.

USACE – United States Army Corps of Engineers

The United States Army Corps of Engineers is the federal agency responsible for implementing civil projects for flood control and navigation improvements, and for regulating the discharge of dredged and fill material into waters of the United States which includes wetlands.

U.S.C. – United States Code

The United States Code is the official version of the federal statutory code.

USCG – United States Coast Guard

The United States Coast Guard is the branch of the United States armed forces involved in maritime law enforcement, mariner assistance, search and rescue, and national defense. As one of the seven uniformed services of the United States, and the smallest armed service of the United States, its stated mission is to protect the public, the environment, and the United States economic and security interests in any maritime region in which those interests may be at risk, including international waters and America's coasts, ports, and inland waterways.

U.S. DOT – United States Department of Transportation

The United States Department of Transportation is the executive department of the United States government, established by the Department of Transportation Act of 1966. Its chief executive officer, the secretary, is a member of the president's cabinet. Its mission is to serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the

quality of life of the American people, today and into the future.

USFWS – United States Fish and Wildlife Service

The United States Fish and Wildlife Service is the federal agency responsible for determining which wildlife species face extinction as a result of alteration of their habitat, protecting them from further decline and providing for their survival. The United States Fish and Wildlife Service administers the Endangered Species Act.

USGS – U.S. Geological Survey

The United States Geological Survey is a scientific agency of the United States government. The scientists of the United States Geological Survey study the landscape of the United States, its natural resources, and the natural hazards that threaten it. The organization has four major science disciplines, concerning biology, geography, geology, and hydrology. The United States Geological Survey is a fact-finding research organization with no regulatory responsibility.

VMT – Vehicle Mile Traveled

Vehicle mile traveled is a unit to measure vehicle travel made by a private vehicle, such as an automobile, van, pickup truck, or motorcycle. Each mile traveled is counted as one vehicle mile regardless of the number of persons in the vehicle.

VNT - Vision North Texas

Vision North Texas is a private-public partnership, headed by Charter Sponsors of the Urban Land Institute, the North Central Texas Council of Governments, and the University of Texas at Arlington. One of the organization's goal is to increase public awareness about important regional land use issues that affect mobility, air quality, water supply and other economic and environmental resources. It serves as a forum of discussion, education, research and decision about public and private sector actions to address these types of issues.

VOC – Volatile Organic Compound

A volatile organic compound is any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.

VPD – Vehicles Per Day

A vehicle per day is a measure of traffic volume and is used as the unit for Average Daily Traffic.