# ENVIRONMENTAL ASSESSMENT

# IH 35E:
# IH 635 TO
# PRESIDENT GEORGE BUSH TURNPIKE

CSJs: 0196-03-138, 0196-03-180, 0196-03-240

CITIES OF DALLAS, FARMERS BRANCH, AND CARROLLTON

DALLAS COUNTY, TEXAS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
TEXAS DEPARTMENT OF TRANSPORTATION

AUGUST 2011

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# EXECUTIVE SUMMARY

Corridor improvements are proposed for Interstate Highway (IH) 35E from IH 635 in Dallas, Dallas County, Texas, to United States 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 five miles of IH 35E within the Cities of Dallas, Farmers Branch, and Carrollton in Dallas County, Texas. The project limits extend from IH 635 to President George Bush Turnpike (PGBT) in Dallas County, Texas.

The Build Alternative, or proposed reconstruction of IH 35E, would consist of widening the existing facility to eight 12-foot (ft) wide lanes (four in each direction), including 10-ft outside shoulders and two to four collector distributor lanes (each direction) from north of Sandy Lake Road to PGBT. Frontage roads would mostly consist of two and three 11-ft wide lanes in each direction. The frontage roads would be continuous throughout the length of the project. Two 12-ft wide concurrent HOV/managed lanes with shoulders would be added in each direction and result in a total of four 12-ft wide concurrent (two in each direction) high occupancy vehicles (HOV)/managed lanes. The concurrent HOV/managed lanes would be separated from the mainlanes by concrete traffic barriers which would replace the interim concurrent HOV lanes which are currently separated by striping. The proposed project would be constructed within a proposed ROW width that varies from approximately 380 to 556 feet (ft).

Additionally, improvements are proposed at Dickerson Parkway and Belt Line Road. Dickerson Parkway improvements would consist of an overpass that would be constructed for the extension of Dickerson Parkway over IH 35E. The proposed facility would consist of four 12-foot (ft) wide through lanes (two in each direction) and a 16-ft wide raised concrete median. The width of the proposed ROW is approximately 102 ft. The Belt Line Road improvements would consist of grade separations at Belt Line Road and the IH 35E frontage roads at the Dallas Area Rapid Transit (DART) railroad tracks. The proposed Belt Line Road improvements would depress the existing road approximately 31 ft and consist of six 12-ft wide mainlanes with a 16-ft wide raised concrete median within a maximum proposed ROW of 126 ft.

The No-Build Alternative represents the case in which the proposed reconstruction of IH 35E from IH 635 to PGBT is not implemented. The No-Build Alternative represents the baseline condition for comparison to the Build Alternative; the Build Alternative is carried through the document as the preferred alternative.

IH 35E, from IH 635 to PGBT, 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) and two concurrent, buffer separated high occupancy vehicle (HOV) lanes. Two lane frontage roads are continuous along the corridor. There are seven arterial streets and two rail lines that cross the existing facility 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 is anticipated to continue. This would necessitate that the proposed improvements be implemented to accommodate the anticipated traffic increase within the project area. The section from IH 635 to PGBT 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.

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 ten mainlanes (five in each direction). The MIS also recommended the following design elements:

- Addition of barrier separated HOV/managed lanes to IH 35E that would operate in the direction of peak period traffic flow;
- Addition of two 12-ft wide HOV/managed lanes from PGBT to FM 407 and one 14-ft wide HOV/managed lane from Farm-to-Market (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.

The proposed improvements detailed in this EA include eight mainlanes (four in each direction); two to four-lane collector distributor lanes (each direction) from north of Sandy Lake Road to PGBT; four concurrent tolled HOV/managed lanes in the center median of IH 35E; and two to three–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.

This EA identifies and discloses potential direct impacts and applicable avoidance, minimization, and mitigation measures for various resources grouped under four main classifications (natural resources, land use, community impact assessment, and other resources) in **Sections IV.A** through **IV.D**. The potential impacts (either negative or positive) related to waters of the U.S., including wetlands; vegetation and habitat; community cohesion; economic implications of tolling; employment; aesthetics (e.g. implementation of a Corridor Aesthetic Master Plan); traffic noise; traffic operations; hazardous materials; and construction are assessed and disclosed in this EA. The potential employment impacts associated with anticipated displacements are further assessed in **Appendix H: Employment Opportunities Impact Assessment**. **Section VIII** details the mitigation and monitoring commitments that are identified in the EA.

Indirect impacts associated with the proposed reconstruction of IH 35E are assessed and evaluated in **Section V**. **Appendix G: Indirect Land Use Impacts Assessment** was prepared to supplement the analysis presented in Section V. Cumulative impacts are assessed and evaluated in **Section VI**. The resources considered in the cumulative impacts analysis include air quality,

community (socio-economic impacts/environmental justice, traffic noise, and traffic operations), and natural resources (waters of the U.S., including wetlands, threatened/endangered species and wildlife habitat). Because the Build Alternative involves the implementation of HOV/managed lanes, a Regional Priced Facility System Analysis is presented in **Section VII**.

The area adjacent to the IH 35E corridor between Dallas and Carrollton has experienced 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 project 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 5-mile portion of the 28-mile corridor that begins on the northwest side of the City of Dallas and travels through the Cities of Farmers Branch and Carrollton.

The entire project 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 project 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 South Section, which extends from IH 635 to PGBT (logical termini), 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, IH 635 and PGBT are classified as a freeway/tollway system. Both are considered major traffic generators.

The construction limits and EA account for transitions into the existing roadway and extend from approximately 0.8 mile north of IH 635 to approximately 0.7 mile north of PGBT. Each section comprises a stand-alone EA. The individual sections and their corresponding limits are:

| ***Section*** | ***Limits*** | ***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.

The extension of Dickerson Parkway (CSJ: 0196-03-180) was a break out project of the current IH 35E project (CSJ: 0196-03-138) and was intended to be an early implementation of an HOV connection to the adjacent DART North Carrollton Transit Center. However, due to interagency agreements and design changes, the implementation of the Dickerson Parkway improvements and extension now coincide with the current project and have been re-incorporated into the current document.

The proposed improvements would extend Dickerson Parkway as a four-lane, divided arterial across IH 35E to intersect PGBT (**Appendix A, Figure 2**). Ramps on either side of IH 35E would connect the adjacent service roads with the Dickerson Parkway Extension. In addition to providing a connection to the DART North Carrollton Transit Center, the project would encourage ride sharing by providing convenient access to the IH 35E HOV/managed lanes and the PGBT. The total length of the Dickerson Parkway improvements and extension are approximately one mile.

The proposed improvements to IH 35E South also include improvements to the interchange of IH 35E and Belt Line Road (CSJ: 0196-03-240). The proposed improvements consist of the grade separation of Belt Line Road, the IH 35E frontage roads, and the DART railroad tracks (**Appendix A, Figure 2**).

The analyses conducted for the proposed project was based on data and methodologies associated with the long-range metropolitan transportation plan (MTP) *Mobility 2030-2009 Amendment* adopted by the Regional Transportation Council (RTC) of the NCTCOG on April 9, 2009. On February 1, 2011, the *Mobility 2030-2009 Amendment* and the Transportation Improvement Program (TIP), *2011-2011 TIP Amendment*, were found to conform to the State Implementation Plan (SIP). On March 10, 2011, a new MTP, *Mobility 2035*, was adopted by the RTC of the NCTCOG. On July 14, 2011, this new plan and the associated TIP (*2011-2014 TIP – 2011 Amendment*) were found to conform to the SIP. This EA was prepared during the MTP transition period between *Mobility 2030-2009 Amendment* and *Mobility 2035*.

On June 22, 2011, FHWA released a guidance memorandum containing procedures to determine environmental document consistency between MTPs during an MTP transition period. The purpose of the guidance memorandum, entitled *Guidance for Metropolitan Transportation Plan Transition (between Plan years) and NEPA Document Requirements and Processing*, is to ensure that environmental documents prepared during the MTP transition period are consistent with the new MTP and are not required to be updated, thus streamlining the environmental process. In accordance with the guidance memorandum, TxDOT prepared a technical report and determined that the EA is consistent throughout the transition period between *Mobility 2030-2009 Amendment* and *Mobility 2035*; therefore, the analyses based on *Mobility 2030-2009 Amendment* remains valid. The results and conclusions of the analyses based on *Mobility 2030-2009 Amendment* are presented in this EA.

# I. DESCRIPTION OF PROPOSED ACTION

## A. Description of Proposal

TxDOT proposes the reconstruction of approximately five miles of IH 35E within the Cities of Dallas, Farmers Branch, and Carrollton in Dallas County, Texas. The project limits extend from IH 635 to PGBT. The proposed project alignment would generally shift to the west. 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 north of Sandy Lake Road to PGBT;
- four concurrent tolled HOV/managed lanes in the center median of IH 35E;
- two to three-lane continuous frontage roads in each direction along the entire project corridor including auxiliary lanes at the cross streets;
- proposed overpass and improvements/extension of Dickerson Parkway, and

- approximately 86 acres of proposed ROW and approximately 0.4 acre of proposed easements.
- Grade separation of Belt Line Road, IH 35E frontage roads, and the DART railroad tracks.

Collector distributor roads are one-way roads parallel to the mainlanes that provide access to or from more than one ramp. Collector distributor roads collect traffic from on-ramps or mainlanes, and distribute traffic to off-ramps or back to the mainlanes. Collector distributor roads minimize the number of interactions with through traffic and increase capacity and safety along the mainlanes of the facility. A collector distributor road may be short (serving two adjacent interchanges, or a single cloverleaf), or may extend for miles in congested areas.

Collector distributors are proposed along IH 35E from south of PGBT to north of SH 121. The collector distributor roadway systems would serve local access connections as well as main facility connections along IH 35E between PGBT and SH 121. The proposed collector distributors would increase main lane capacity, improve connection between PGBT and SH 121, and minimize weaving along the IH 35E mainlanes.

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**.

*HOV/Managed Lanes Concept*

HOV/managed lanes require some form of active management to be in place at the time of operation. The 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 and the reliability of a minimum guaranteed speed for paying SOV users, 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.

IH 35E would be operated as a HOV/managed facility. According to the RTC's Business Terms for TxDOT-Sponsored Managed Lane Facilities (**Appendix D: Supplemental Data**), 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 vehicles 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 if/when 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 in the managed lane would 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. If Federal-aid funds are utilized for projects implementing the aforementioned traffic management methods, the distribution of benefits and costs of such projects must be assessed to facilitate equal access and the fair treatment of all persons.

The management method for IH 35E from IH 635 to PGBT 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 would substantially benefit communities in the project area by increasing capacity, managing traffic congestion, and improving mobility within the region.

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, which is subject to change, has been prepared by TxDOT and is available for inspection at the Dallas District Office, 4777 E. Highway 80, Mesquite, Texas 75150-6643.

## B. Need and Purpose

The need of the proposed project is to address the transportation needs of the area resulting from an increase in population and the subsequent increase in travel demand, and to correct roadway deficiencies because elements of the existing highway no longer meet the current design criteria. The proposed project, which traverses Dallas County, 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 Dallas, Farmers Branch, and Carrollton, as well as neighboring developing communities.

It is projected that the population of Dallas County would increase by 26.9 percent between 2000 and 2030. Each of the cities adjacent to IH 35E in the study area is expected to increase in population. Evaluating the total population of all three cities and their projected 2030 population, this area is expected to grow by 246,430 people, or 18.5 percent. **Table 1-1** shows the population data for each city.

**Table I-1: Population Trends**

| City | Census Population Data | | | | | Growth 2000-2030 | Percent Growth 2000-2030 |
|---|---|---|---|---|---|---|---|
| | 1970 | 1980 | 1990 | 2000 | 2030 | | |
| Dallas | 844,401 | 904,078 | 1,007,618 | 1,188,580 | 1,404,847 | 216,267 | 18.1 |
| Carrollton | 13,855 | 40,595 | 82,169 | 109,576 | 124,086 | 14,510 | 13.2 |
| Farmers Branch | 9,264 | 24,273 | 28,325 | 28,325 | 43,978 | 15,653 | 55.2 |
| **County** | | | | | | | |
| Dallas County | 1,327,696 | 1,556,419 | 1,852,810 | 2,218,899 | 2,817,191 | 598,292 | 26.9 |

*Source: NCTCOG and U.S. Census Bureau

According to the *Mobility 2030 – 2009 Amendment*, the projected growth patterns will result in mobility implications as the demographic projections guide the traffic forecasting process. Greater demographics in certain areas indicate greater increase in travel for those areas in the future. As stated in the plan, "these will translate into congestion, negative air quality impacts, and an overall decrease in the quality of life unless appropriate improvements are made to the

regional transportation system."[1] NCTCOG developed strategies in the *Mobility 2030 – 2009 Amendment* that are based on the identification of current system deficiencies and an assessment of mobility conditions in the region.

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 project would also serve to enhance the regional transportation system and local area through which it traverses. Because mobility needs cannot be met by traditional funding mechanisms, the proposed tolling of the HOV/managed lanes would contribute to the necessary funding for the proposed improvements, assist with management of traffic congestion, and leverage federal-aid dollars for other transportation improvements where tolling is less practicable and feasible.

*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 up to a 55 percent population growth or more by 2030 in the areas adjacent to IH 35E since 2000. The proposed project is located within Dallas County, which is projected to grow approximately 27 percent from 2000 to 2030.

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 IH 635 to Belt Line Road and Belt Line Road to Valley Ridge Boulevard is 38 percent and 44 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 38 percent to 44 percent between IH 635 and Valley Ridge Boulevard (north of the project limits) are expected to occur from 2010 to 2030. The additional travel lanes would reduce the number of vehicles per lane per mile of roadway, thus reducing the concentration of vehicles along the route. For information on the LOS for the existing HOV lanes please refer to **Table IV-23** of the Traffic Operations section (**Section IV.C.10**).

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 [approved by Federal Highway Administration (FHWA) on October 28, 2009] provides a LOS analysis for the proposed project under the Build and No-Build scenarios for year 2030. Because the report

[1] *Mobility 2030: The Metropolitan Transportation Plan for the Dallas Fort-Worth Area 2009 Amendment,* NCTCOG, April 2009, page 48.

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) | E, F | F |
| HOV/Managed Lanes | A, B, C | --- |

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 (E and F) and that the HOV/managed lanes would operate under adequate LOS (A, B, and C). 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 C) 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.

*Correct 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, freeway 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*: *Metropolitan Transportation Plan – 2009 Amendment* (MTP). As a result, regional toll/managed lane network has been integrated into the financially constrained MTP.

The implementation of the tolled 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, both toll and non-toll, regionally significant projects.

## C. Funding

According to the 2011-2014 TIP, the total estimated project cost for IH 35E from IH 635 to PGBT (CSJ 0196-03-138) improvements is $406,817,490. The reconstruction of IH 35E from IH

635 to PGBT would be funded by federal funds. The total estimated project cost for the extension of Dickerson Parkway (CSJ: 0196-03-180) is $19,027,000 and would be funded by federal, state (Category 7), and local (Regional Toll Revenue) funds. The total estimated project cost for the grade separation of Belt Line Road (CSJ: 0196-03-240) is $50,001,625 and would be funded by federal, state (Category 10) and local funds.

## 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 US 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 managed/HOV 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 managed/HOV 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 (South Section) Build Alternative (**Section III.B**).

*Loop12/Interstate Highway 35E Major Investment Study*

The study area's southern limit was at the Spur 408/Loop 12 interchange and the northern limit was just north of the IH 635/IH 35E interchange. This MIS considered a variety of travel modes such as rail and bus transit, HOV lanes, express lanes, toll facilities, and bicycle and pedestrian paths. It also considered travel demand management, transportation systems management, and intelligent transportation systems.

*Northwest Corridor Major Investment Study*

This study evaluated the suburb to central city travel pattern, and reverse commute, in an area from downtown Dallas to the SH 121 Bypass. It focused on the fact that future committed roadway improvements are not projected to keep pace with the additional travel demand. The

goal was to evaluate and develop transportation alternatives to provide additional capacity, reduce congestion, and improve transit service.

*Project Pegasus Environmental Assessment*

The focus of this project is to relieve traffic congestion along two major interstate highways directly serving downtown Dallas. The limits include the IH 30/IH 35E interchange on the western edge of downtown Dallas known as the "Mixmaster", the depressed portion of IH 30 south of downtown, and the portion of IH 35E from Eighth Street to SH 183. A Finding of No Significant Impact (FONSI) was issued in July 2005.

*Southern Gateway Environmental Assessment*

This study involves the IH 35E/U.S. 67 corridor in southern Dallas County. The project limits along IH 35E are from IH 20 to Eighth Street, south of downtown Dallas and the Trinity River. The project limits on U.S. 67 are from Farm to Market (FM) 1382 to IH 35E. The proposed project is designed to enhance the regional and local transportation system by increasing capacity, reducing traffic congestion, improving mobility, and correct roadway deficiencies.

*IH 635W Environmental Assessment*

The study area for this project extended from Luna Road to U.S. 75, an approximate nine-mile section of IH 635 within the Cities of Dallas and Farmers Branch. The assessment considered ways to improve regional mobility, minimize time spent in congestion, improve safety, improve air quality, and improve access and circulation through the northern and western parts of Dallas County.

*PGBT Segment IV Major Investment Study/Environmental Impact Statement (EIS)*

This study evaluated an approximately 5.5 mile long route connecting Segments III and V of the PGBT. This would provide a continuous outer loop around Dallas, Texas, and improve traffic congestion and mobility in the project corridor. The study considered a no-build and five build alternatives.

*Trinity River and Tributaries Environmental Impact Statement and Record of Decision (ROD) - (Dated April 29, 1988)*

The document 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 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.

*The Metropolitan Transportation Plan*

This plan defines transportation systems and services in the DFW metropolitan area. It serves as a fiscally constrained 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 IH 635 to PGBT) is included in this plan.

*Transportation Improvement Program (TIP)*

The TIP is a staged, multi-year 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 (from IH 635 to PGBT) is included in this plan.

### E. Logical Termini

IH 35E is a north-south interstate highway that services the DFW metropolitan area. IH 35E provides access to the Dallas area for individuals living in the Cities of Dallas, Farmers Branch, and Carrollton, as well as other cities in North Central Texas. The project begins at IH 635, located in the City of Dallas, and extends north to PGBT in the City of Carrollton. According to the NCTCOG, IH 635 and PGBT are classified as freeway/tollway systems. Both are considered major traffic generators.

### F. Public Involvement

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 Hillsboro, located south of Dallas, with IH 35E traveling through Dallas and IH 35W traveling through Fort Worth. These two roadways merge again in 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 April 3, 2003, a public meeting was conducted as part of the EA process for the proposed IH 35E reconstruction project. The meeting was held at the Farmers Branch Senior Center, 14055 Dennis Lane in Farmers Branch, Texas. The meeting took place from 6:00 p.m. to 8:30 p.m. in the ballroom. 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 by TxDOT, and coordination with the adjacent municipalities occurred, which caused delays to project development and implementation.

On November 17, 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 Dr. Pepper Star Center, 12700 North Stemmons Freeway (IH 35E), Farmers Branch, Texas 75234. 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 registration table was set up outside the doorway of the designated meeting area. As meeting attendees entered the room, they were encouraged to sign in and pick up project information and comment and speaker forms. Meeting attendance consisted of 91 local residents and interested individuals. Once registered, meeting attendees could then view the displayed exhibits for the proposed project. Exhibits consisted of aerial photography, schematics, and typical sections. 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. Four 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, Denton County Transportation Authority (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 is a product of municipal stakeholder and property owner input. The decision to shift the alignment to the west, thereby focusing proposed ROW needs west of IH 35E was made by municipal officials and property owners during the initial stages of schematic development. Preliminary 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. Based on feedback received from the meetings outlined in **Table I-2**, the public is generally supportive of the incorporation of tolled HOV/managed lanes and proposed reconstruction of IH 35E from IH 635 to PGBT.

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

| Meeting Date and Location | Meeting Attendees | Topics Discussed |
|---|---|---|
| April 3, 2003<br><br>Farmers Branch Senior Center<br>14055 Dennis Lane<br>Farmers Branch, 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<br><br>Lewisville City Hall<br>151 W. Church St.<br>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, Dallas Area Rapid Transit (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<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>Lake Dallas City Hall<br>212 Main St.<br>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<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>URS Corporation<br>3010 LBJ Freeway, Suite 1300<br>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. |

| Meeting Date and Location | Meeting Attendees | Topics Discussed |
|---|---|---|
| October 17, 2008<br><br>Carrollton City Hall<br>1945 E. Jackson Rd.<br>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. |
| October 17, 2008<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>Hickory Creek Town Hall<br>1075 Ronald Reagan Ave.<br>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<br><br>DCTA<br>1660 S. Stemmons, Suite 215<br>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<br><br>Corinth City Hall<br>3300 Corinth Pkwy.<br>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<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>Carrollton City Hall<br>1945 E. Jackson Rd.<br>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. |

| Meeting Date and Location | Meeting Attendees | Topics Discussed |
|---|---|---|
| November 17, 2008<br><br>1197 W. Main St.<br>Lewisville, TX | Public Meeting – open to the public | Open house format. |
| December 3, 2008<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>Carrollton City Hall<br>1945 E. Jackson Rd.<br>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<br><br>Lewisville City Hall<br>151 W. Church St.<br>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<br><br>Lake Dallas City Hall<br>212 Main Street<br>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. |

| Meeting Date and Location | Meeting Attendees | Topics Discussed |
|---|---|---|
| June 17, 2009<br><br>Denton Civic Center<br>321 E. McKinney<br>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. |
| August 6, 2009<br><br>Lewisville City Hall<br>151 W. Church St.<br>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, University of North Texas, Town of Hickory Creek, City of Dallas, USACE, DCTA, Denton County, and various consultants | Schematic design; outcome of state legislative session; options for project financing; construction financing and phasing plan. |
| August 19, 2009 | Stakeholder Work Group #8 – 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 | Schematic design and environmental documentation; outcome of state legislative session; construction financing and phasing plan. |

*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 IH 635 to PGBT (0196-03-138) is within an urbanized area with few undeveloped areas adjacent to the ROW. See **Appendix F: General Corridor Photographs** for photographs of the project corridor. The existing facility consists of six 12-ft wide mainlanes and two (interim) concurrent, buffer separated HOV lanes. The existing ROW varies from approximately 250 to 300 ft along the corridor. Concrete traffic barriers (CTB) separate the north and southbound lanes. The outside shoulders are 10-ft wide. The frontage roads are continuous along the corridor and consist of two 12-ft wide lanes. See **Appendix B** for existing typical sections.

The existing Dickerson Parkway (0196-03-180) is a two-lane arterial roadway from Mayes Drive to PGBT on the east side of IH 35E. Dickerson Parkway terminates at Mayes Drive. The width of the existing ROW is 120 ft. The approximate widths of the existing lanes are 18 ft wide with 6-ft wide sidewalks on both sides of the existing facility. Curbs separate the roadway from the sidewalks along the current thoroughfare.

The existing interchange of IH 35E and Belt Line Road (0196-03-240) consists of an underpass (Belt Line Road going under IH 35E). Belt Line Road consists of six 12-ft wide lanes (three in each direction), separated by a median, within a variable ROW. The DART railroad tracks, Belt Line Road, and the IH 35E frontage roads are currently at grade.

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

**Table II-1: Existing Bridges Along IH 35E from IH 635 to PBGT**

| Bridges along IH 35E | Southbound Vertical Clearance | Northbound Vertical Clearance |
|---|---|---|
| Old Denton/Luna Road Overpass | 20’ | 20’ |
| PGBT Overpass | 17’ 2” | 17’ 10” |
| Valley View Lane (Low Clearance) Underpass | 14’3” | 14’3” |
| Valwood Parkway Underpass | 14’5” | 14’5” |
| Crosby Road (Low Clearance) Underpass | 14’3” | 14’3” |
| Railroad (RR) Crossing (Two Crossings) Underpass | 19.5’ | 19.5’ |
| Belt Line Road Underpass | 19.5’ | 19.5’ |
| Sandy Lake Road Underpass | 14’3” | 14’2” |

### B. Surrounding Terrain

According to the Carrollton U.S. Geological Survey (USGS) topographic map for the corridor, the elevations in the project area range from a maximum of approximately 500 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, IH 635 to Belt Line Road and Belt Line Road to Valley Ridge Boulevard, encompass the proposed IH 35E South section limits. The 2010 ADT from IH 635 to Belt Line Road is 245,800 ADT, and is projected to increase to 338,400 ADT in 2030. The 2010 ADT from Belt Line Road to Valley Ridge Boulevard is 200,300 ADT. Traffic within this segment is projected to increase to 288,000 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 | | % Increase |
|---|---|---|---|
| | 2010 | Projected (2030) | |
| From IH 635 to Belt Line Road | 245,800 | 338,400 | 38% |
| From Belt Line Road to Valley Ridge Boulevard | 200,300 | 288,000 | 44% |

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 Transportation 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 cost of maintaining the existing system increases the longer the improvements and/or reconstruction are postponed. Vehicle operating costs increase as motorists continue to utilize under designed and inadequate facilities. 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. Roadway 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.

In conclusion, Alternative A would not satisfy the 2030 transportation demand. Alternative A is carried forward throughout the document as a baseline comparison to Alternative B: Build.

## B. Alternative B: Build

Alternative B would involve following the existing alignment and 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 inside and outside shoulders and two to four collector distributor lanes (each direction) from north of Sandy Lake Road to PGBT. Frontage roads would mostly consist of two and three lanes in each direction with 2-ft wide curb offsets (to the outside) for a maximum width of 38 ft. The frontage roads would be continuous throughout the length of the project and include 11-ft wide inside lane(s) and a 14-ft wide outer lane (excluding gutter) to accommodate bicycle travel along the IH 35E corridor. The outer lane would accommodate shared use by bicycles and vehicles as depicted in the proposed typical sections exhibit in **Appendix B**.

Two 12-ft wide concurrent HOV/managed lanes with 10-ft wide outside shoulders are also proposed in each direction. The concurrent HOV/managed lanes would be separated from the mainlanes by a 10-ft wide median and concrete traffic barriers which would replace the interim concurrent HOV lanes which are currently separated by striping.

The design speed of the proposed section is 70 mph on the mainlanes, 70 mph on the HOV/managed lanes, 50 mph on the collector distributor lanes, 40 mph on the frontage roads, 40 mph on the ramps, and 30 mph on the cross streets. The proposed project would be constructed within a proposed ROW width that varies from approximately 380 to 556 ft. The proposed typical sections are presented in **Appendix B**. There would be no conversion of existing mainlanes into tolled HOV/managed lanes; the proposed four HOV/managed lanes would be tolled. Along 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**.

The proposed improvements to Dickerson Parkway would consist of constructing an overpass for the extension of Dickerson Parkway over IH 35E and improvements to the existing portion of Dickerson Parkway. The proposed Dickerson Parkway facility would consist of four through lanes in total (two in each direction) and a 16-ft wide raised concrete median. The inside lanes would be 12 ft wide, while the outside lanes would be 14 ft wide for shared use of bicycles and vehicles. A 6-ft wide sidewalk is proposed along both sides of Dickerson Parkway. The total length of the Dickerson Parkway improvements and extension, including the overpass, is approximately one mile. The width of the proposed ROW varies from approximately 98 to 259 ft. The proposed improvements to Dickerson Parkway would provide direct access from IH 35E and PGBT to the DART North Carrollton Transit Center and to the future DART Trinity Mills station associated with the Northwest Corridor expansion (Green Line). The DART North Carrollton Transit Center is currently located at 2533 Dickerson Parkway and includes free parking (1,047 spaces), indoor seating with air conditioning, restrooms, a water fountain, vending machines, and pay phones. The Trinity Mills station, located within the southeast quadrant of PGBT and IH 35E, adjacent to the proposed project, opened in December 2010.[2] The new station is part of a DART expansion linking Carrollton directly to Dallas, other DFW cities, and eventually DFW International Airport. Nearby attractions include Sandy Lake Amusement Park, Elm Fork Nature Center, McInnish Sports Complex, Ken Good Park and a connection to the DCTA A-train.

The proposed improvements to the interchange of IH 35E and Belt Line Road include the grade separation of both Belt Line Road and the IH 35E frontage roads from the DART railroad tracks. For this purpose, Belt Line would be rehabilitated for approximately 0.5 mile. The proposed improvements to Belt Line Road would be depressed approximately 31 ft from its current location. No increase in capacity is proposed for Belt Line Road. As displayed in **Appendix B**, Belt Line Road would consist of six through lanes (three in each direction) separated by a 16-ft wide raised concrete median; within a maximum proposed ROW of 122 ft. The two inside lanes would be 11 ft wide, while the outside lanes would be 14 ft wide for shared use of bicycles and vehicles. A 6-ft wide sidewalk is proposed for pedestrian use. The DART railroad tracks would

[2] Dallas Area Transit Authority. http://www.dart.org/about/expansion/otherprojects.asp

cross underneath IH 35E.

The proposed improvements would result in constructing, rebuilding, or upgrading all of the existing and proposed overpasses, bridges, and interchanges along IH 35E from IH 635 to PGBT. A proposed bridge typical section is located in **Appendix B**. The IH 635 Interchange is being modified as a separate project. Design schematics for this project would be integrated in the IH 35E reconstruction project. The proposed cross street improvements are:

| **Cross Street Improvements** | **Overpass/Underpass*** |
|---|---|
| Valley View Lane | Underpass |
| Valwood Parkway | Underpass |
| Crosby Road | Underpass |
| Belt Line Road | Underpass |
| Old Denton Road/Luna Road | Overpass |
| Sandy Lake Road | Underpass |
| Dickerson Parkway | Proposed Overpass |
| President George Bush Turnpike | Overpass |

*Underpass indicates the facility traverses under IH 35E.
Overpass indicated the facility traverses over IH 35E.

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 would be anticipated.

Alternative B: Build Impact
The waterways in the project area are associated with the Trinity River Basin. The major water features which intersect the proposed project corridor include Cooks Branch, Hutton Branch, and Furneaux Creek. IH 35E crosses Cooks Branch, an intermittent stream, between Valley View Lane and Valwood Parkway. Hutton Branch, a perennial stream, is crossed by IH 35E north of Belt Line Road. Furneaux Creek, a perennial stream, is crossed by IH 35E at the IH 35E/PGBT interchange. 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, would be 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 permitting 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 within the proposed project area. Alternatives were reviewed as required by EO 11990 on wetlands, after avoidance and minimization of impacts were considered 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 could be impacted by the proposed project. Each of the features identified were delineated and the total acreage of each feature was determined.

Two wetlands were delineated totaling approximately 0.55 acre. USACE Great Plains Regional Supplement Wetland Determination Data Forms are included in **Appendix D: Supplemental Data**. Thirteen water features were delineated totaling approximately 5.04 acres. One water feature (Water 9), which appears to be an old borrow pit, is potentially non-jurisdictional. Four mitigation areas constructed as mitigation for previous Section 404 impacts associated with a TxDOT project were delineated totaling approximately 7.74 acres. 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 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**.

The current schematic design indicates the existing culverts at Waters 1, 2, 3, 4, 5, 7, and 8 would be extended resulting in permanent fill impacts at each of these features. A drainage easement would be needed at Waters 2, 3, and 4. The approximate acreage and linear feet of permanent and temporary impacts to potentially jurisdictional features are included in **Table IV-1**.

Wetland 2; Waters 8A, 10, and 12; and Mitigation Areas 1 and 2 would have fill material permanently placed within each feature. The approximate acreage and linear feet of permanent impacts to potentially jurisdictional features are included in **Table IV-1**.

Wetland 1; Waters 6 and 11; and Mitigation Areas 3 and 4 would be bridged and minimal impacts (including temporary impacts) would result from the placement of columns within the delineated boundaries of the features. Water 6 would be bridged and no columns would be placed within the delineated boundary of this feature. Temporary impacts would result from the proposed construction activities during the construction of the proposed bridge structures. The approximate acreage and linear feet of permanent and temporary impacts to potentially jurisdictional features are included in **Table IV-1**.

Temporary impacts for stream crossings where culverts are proposed were estimated by calculating the remaining areas within the ROW of each stream that would not be permanently impacted by new construction or that was not permanently impacted by previous construction.

For water features (impoundments) and wetland features that were bridged, temporary impacts were calculated by allowing an approximately 50-foot buffer around those areas where bridge bents would be placed. If temporary fills would be needed in potential jurisdictional waters, then 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. All temporary impacts would be addressed in the Section 404 permit application. The approximate acreage and linear feet of temporary impacts to potentially jurisdictional features are included in **Table IV-1**.

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

| Area | Feature | Feature Name | Delineated Acres and/or Linear Feet | Potential 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 Map Sheet Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Water 1 | Cooks Branch | 0.50/ 386 | Yes | Culvert | Culvert Extension | 0.06/ 69 | 0.02/ 20 | Stream Data Form Water 1 | Single and complete | NWP 14 | 2 |
| 2 | Water 2 | Tributary to Cooks Branch | 0.02/ 169 | Yes | Culvert | Culvert Extension | 0.02/ 169 | 0.00/ N/A | Stream Data Form Water 2 | Single and complete | NWP 14 | 2 |
| 3 | Water 3 | Tributary to Hutton Branch | 0.33/ 488 | Yes | Culvert | Culvert Extension | 0.09/ 175 | 0.01/ 10 | Stream Data Form Water 3 | Single and complete | NWP 14 with a PCN | 3 and 4 |
| | Water 4 | Tributary to Hutton Branch | 0.08/ 248 | Yes | Culvert | Culvert Extension | 0.08/ 248 | 0.00/ N/A | Stream Data Form Water 4 | | | |
| | Water 5 | Tributary to Hutton Branch | 0.71/ 701 | Yes | Culvert | Culvert Extension | 0.18/ 246 | 0.00/ N/A | Stream Data Form Water 5 | | | |
| | Total Approximate Impacts for Area 3 | | | | | | 0.35/ 669 | 0.01/ 10 | | | | |
| 4 | Water 6 | Hutton Branch | 0.33/ 439 | Yes | Bridge | Bridge | 0.00/ N/A | 0.05/ 50 | Stream Data Form Water 6 | Single and complete | NWP 14 | 5 |
| 5 | Water 7 | Unnamed Tributary | 0.21/ 467 | Yes | Culvert | Culvert Extension | 0.04/ 165 | 0.00/ N/A | Stream Data Form Water 7 | Single and complete | NWP 14 | 6 |
| 6 | Water 8 | Unnamed Tributary of Elm Fork Trinity River | 0.46/ 759 | Yes | Culvert | Culvert Extension | 0.08/ 439 | 0.00/ N/A | Stream Data Form Water 8 | Single and complete | NWP 14 with a PCN | 6 |
| | Water 8A | Unnamed Seasonally Flooded Area | 0.06/ N/A | Yes | Culvert | Fill | 0.06/ N/A | 0.00/ N/A | N/A | | | |
| | Total Approximate Impacts for Area 6 | | | | | | 0.14/ 439 | 0.00/ N/A | | | | |
| 7 | Water 9 | Unnamed Impoundment | 0.89/ N/A | No | None | Fill | 0.89/ N/A | N/A | N/A | N/A | N/A | 7 |

| Area | Feature | Feature Name | Delineated Acres and/or Linear Feet | Potential 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 Map Sheet Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Water 10 | Unnamed Impoundment | 0.21/ N/A | Yes | None | Bridge | <0.01/ N/A | 0.08/ N/A | | Single and complete | NWP 14 with a PCN | 7 and 10 |
| | Wetland 1 | Unnamed Emergent Wetland | 0.43/ N/A | Yes | None | Bridge | 0.01/ N/A | 0.15/ N/A | OP 1 UP and OP 1 WET | | | |
| | Wetland 2 | Unnamed Emergent Wetland | 0.12/ N/A | Yes | None | Fill | 0.12/ N/A | 0.00/ N/A | OP 1 UP and OP 1 WET | | | |
| | Total Approximate Impacts for Area 8 | | | | | | 0.13/ N/A | 0.23/ N/A | | | | |
| 9 | Mitigation Area 1 | Unnamed Water Feature | 1.12/ N/A | ** | None | Fill | 0.58/ N/A | N/A | N/A | Single and complete | Permit Amendment and NWP 14 | 7, 8, and 10 |
| | Mitigation Area 2 | Unnamed Water Feature | 0.31/ N/A | ** | None | Fill | 0.31/ N/A | N/A | N/A | | | |
| | Mitigation Area 3 | Unnamed Impoundment | 5.60/ N/A | ** | None | Bridge | <0.01 N/A | N/A | N/A | | | |
| | Water 11 | Furneaux Creek | 1.19/ 1,590 | Yes | Bridge | Bridge | <0.01 N/A | 0.07/ 50 | Stream Data Form Water 11 | | | |
| | Mitigation Area 4 | Unnamed Impoundment | 0.71/ N/A | ** | None | Bridge | <0.01 N/A | N/A | N/A | | | |
| | Total Approximate Impacts for Area 9 | | | | | | 0.90 N/A | 0.07/ 50 | | | | |
| 10 | Water 12 | Unnamed Impoundment | 0.05/ N/A | Yes | None | Fill | 0.05/ N/A | 0.00/ N/A | N/A | Single and complete | NWP 14 | 12 |

Notes:
* Observation points are only associated with wetland features. No Wetland Determination Data forms were prepared for open water or ponded areas. UP=upland, WET=wetland. The associated USACE Wetland Determination Data Forms are included in **Appendix D**.
** Section 404 Mitigation Area.

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 require a Section 404 Nationwide Permit (NWP) 14 (*Linear Transportation Projects*). A NWP 14 Preconstruction Notification (PCN) would be required for Areas 3, 6, and 8 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). For Area 9, an amendment to USACE Permit Number 1994400674 would be required for the permanent impacts to the Mitigation Areas 1 through 4. USACE Permit Number 1994400674 is a TxDOT Section 404 permit. A NWP 14 would be required for the permanent impacts to Water 11, Areas 1, 2, 6, 7 and 12. It is anticipated that temporary fills in potential jurisdictional waters and wetlands would occur during construction.

Compensatory mitigation for Section 404 impacts would be coordinated with the USACE and performed in accordance with the terms of the approved NWP 14 PCN and Permit Amendment.

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 additional jurisdictional impacts (beyond those covered in the proposed Section 404 permit application) are identified after the proposed project is let for construction 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

The No-Build Alternative for IH 35E would not require the placement of any additional fill within the floodplain and no impacts to floodplains would be anticipated.

Alternative B: Build Impact

Based on a review of the FEMA Flood Insurance Rate Maps (FIRM) numbers 48113C0170J (Effective August 23, 2001) and 48113C0160J (Effective August 23, 2001) for Dallas County, Texas approximately 179.6 acres of the Build Alternative lie within the 100-year floodplains of Rawhide Creek, Cooks Branch, Hutton Branch, Furneaux Creek, and the Elm Fork Trinity River as depicted in **Appendix A: Figure 3, FEMA Floodplain and USGS Quadrangle Maps**. The floodplain of these water bodies are designated as Zone A and Zone X500. Zone A is designated as a special flood hazard area inundated by the 100-year flood with no base flood elevations determined. Zone X is designated as other flood area and are areas of the 500-year flood or areas of the 100-year flood with average depths of less than one foot or with drainage areas less than one square mile. Dallas County and the Cities of Carrollton, Dallas, and Farmers Branch are participants in the National Flood Insurance Program (NFIP).

The project is within the Trinity River Corridor Development Regulatory Zone and a Corridor Development Certificate (CDC) would be required. Coordination with the local Floodplain Administrator would be required and would occur during the detailed design phase of the proposed project.

Hydrology and hydraulic analyses (H&H) is being performed in accordance with TxDOT's Hydraulic Manual. Preliminary conclusions of the H&H analyses indicated that the structures proposed at Cooks Branch, Hutton Branch, and Furneaux Creek would result in no adverse backwater effects. Furthermore, the changes in water surface elevation were found to be insignificant. Therefore, the resulting impact to the floodplain would be minimal.

The proposed fill within the streams in the proposed project limits would not interrupt or terminate a transportation facility needed for emergency vehicles or community evacuation routes. Additionally, the amount of fill within the floodplains would not pose a significant risk, nor adversely impact natural and beneficial floodplain values. Therefore, floodplain impacts resulting from the proposed actions would not be considered significant according to 23 CFR 650.

The proposed roadway 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 Build Alternative would provide, at a minimum, at least the same flood flow capacity and therefore should not adversely increase the water surface elevation above the allowable limits.

## A.4 Water Quality

Alternative A: No-Build Impact

Under the No-Build Alternative for IH 35E, no impacts to water quality would be anticipated.

Alternative B: Build Impact

The Section 401 Water Quality Certification requirements for NWP 14 would be met by implementing approved erosion controls, sedimentation controls, and post-construction total suspended solids controls from Texas Commission on Environmental Quality (TCEQs) Section 401 Water Quality Certification Conditions for NWPs. The Section 401 Water Quality Certification requirements for the affected Section 404 mitigation areas would adhere to the terms and conditions as specified by the Permit Amendment.

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 and grassy swales. 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 into several creeks that flow into the Elm Fork Trinity River south of Lewisville Lake (Segment 0822). Segment 0822 of the Elm

Fork Trinity River is listed as impaired for bacteria in the 2008 303(d) list. Therefore, coordination with TCEQ would be required.

*Municipal Separate Storm Sewer System (MS4)*

This project is located within the boundaries of the Cities of Dallas, Farmers Branch, and Carrollton Municipal Separate Storm Sewer Systems, and would comply with the applicable MS4 requirements.

*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 Storm Water Pollution Prevention Plan (SW3P) would be implemented, and a construction site notice would be posted on the construction site. A Notice of Intent (NOI) and a Notice of Termination (NOT) would be required.

## A.5 Threatened/Endangered Species

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 or wildlife habitat would be anticipated.

Alternative B: Build Impact

The limits for this project are situated within the Carrollton USGS topographic quadrangle map (**Appendix A: Figure 3**). Most of the project exhibits urban development of various kinds 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 County, Texas. After reviewing habitat requirements and conducting multiple field visits between September 2003 and May 2009, it was determined that this project would have no effect on any federally listed threatened or endangered species, their habitat, or designated critical 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 County**

| Species | Federal Status | State Status | Description of Suitable Habitat | Habitat Present | Species Effect | Species Impact |
|---|---|---|---|---|---|---|
| **Birds** | | | | | | |
| American Peregrine Falcon *Falco peregrinus anatum* | — | T | Year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in 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 following below) |
| Arctic Peregrine Falcon *Falco peregrinus tundrius* | — | | Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands. | No | - - | No impact. No suitable open areas or bodies of water present within the proposed project ROW. (see habitat discussion following below) |
| Bald Eagle *Haliaeetus leucocephalus* | DM | T | Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds. 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 within the proposed project ROW. Suitable habitat may be present outside of the proposed project ROW along the Elm Fork Trinity River. | - - |

| Species | Federal Status | State Status | Description of Suitable Habitat | Habitat Present | Species Effect | Species Impact |
|---|---|---|---|---|---|---|
| Black-capped Vireo *Vireo atricapilla* | 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 following Table IV-2. | - - |
| Golden-cheeked Warbler *Dendroica chrysoparia* | 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 following Table IV-2. | - - |
| Henslow's Sparrow *Ammodramus henslowii* | — | | Wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking. | No | - - | No impact. No suitable habitat containing bunch grasses, vines, and brambles are present within the proposed project ROW. |
| Interior Least Tern *Sterna antillarum athalassos* | E | E | Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony. | No | No effect. No suitable habitat present within the proposed ROW. See habitat discussion following Table IV-2. | - - |

| Species | Federal Status | State Status | Description of Suitable Habitat | Habitat Present | Species Effect | Species Impact |
|---|---|---|---|---|---|---|
| Peregrine Falcon *Falco peregrinus* | — | T | Both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (*F. p. anatum*) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, *F.p. tundrius* is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat. | No | - - | No impact. No suitable open areas with high vantage points or bodies of water present within proposed ROW. (see habitat discussion following below) |
| Piping Plover *Charadrius melodus* | E, T | T | 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 proposed ROW. See habitat discussion following Table IV-2. | - - |
| Sprague's Pipit *Anthus spragueii* | — | | Species only in Texas during migration and winter from mid September to early April. Strongly tied to native upland prairie; however, it can be locally common in coastal grasslands. , uncommon to rare further west; sensitive to patch size and avoids edges. | No | - - | No impact. No suitable habitat containing native upland prairie present within the proposed project ROW. |
| Western Burrowing Owl *Athene cunicularia hypugaea* | — | | 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* | — | T | Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats. | No | - - | No impact. No suitable nesting areas are present within the proposed project ROW. (see habitat discussion following below) |

| Species | Federal Status | State Status | Description of Suitable Habitat | Habitat Present | Species Effect | Species Impact |
|---|---|---|---|---|---|---|
| Whooping Crane *Grus americana* | E, EXPN | E | Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties. | No | No effect. No suitable habitat such as estuaries, prairie marshes savannah, grasslands, croplands, and pastures present within the proposed ROW. See habitat discussion following Table IV-2. | - - |
| Wood Stork *Mycteria americana* | — | T | Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960. 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 following below) |
| **Reptiles** | | | | | | |
| Alligator snapping turtle *Macrochelys temminckii* | — | 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* | — | 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* | — | 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 following below) |

| Species | Federal Status | State Status | Description of Suitable Habitat | Habitat Present | Species Effect | Species Impact |
|---|---|---|---|---|---|---|
| Texas garter snake *Thamnophis sirtalis annectens* | — | | Wet or moist microhabitats are conducive to the species occurrence, but it 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 following below) |
| **Mammals** | | | | | | |
| Cave myotis bat *Myotis velifer* | — | | 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 present within the proposed ROW including areas dominated by creosote bush, palo verde, brittlebush, and cactus; rock crevices; old buildings; car ports; and bridges. |
| Plains spotted skunk *Spilogale putorius interrupta* | — | | Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie. | No | - - | No 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 following below) |
| **Mollusks** | | | | | | |
| Fawnsfoot *Truncilla donaciformis* | — | | Small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in still to swiftly flowing waters; Red (historic), Cypress (historic), Sabine (historic), Neches, Trinity, and San Jacinto River basins. | No | - - | No impact. No suitable habitat present such as a river system within the proposed project ROW. (see habitat discussion following below) |
| Little spectaclecase *Villosa lienosa* | — | | Creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins. | Yes | - - | No impact. Suitable habitat may be present within the perennial stream systems in the proposed project ROW which would be bridged. (see habitat discussion following below) |
| Louisiana pigtoe *Pleurobema riddellii* | — | T | Streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins. | Yes | - - | No impact. Suitable habitat may be present within the perennial stream systems in the proposed project ROW which would be bridged. (see habitat discussion following below) |

| Species | Federal Status | State Status | Description of Suitable Habitat | Habitat Present | Species Effect | Species Impact |
|---|---|---|---|---|---|---|
| Texas heelsplitter *Potamilus amphichaenus* | — | T | Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins. | Yes | - - | No impact. Suitable habitat may be present within the perennial stream systems in the proposed project ROW which would be bridged. (see habitat discussion following below) |
| Wabash pigtoe *Fusconaia flava* | — | | Creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow. | Yes | - - | No impact. Suitable habitat may be present within the perennial stream systems in the proposed project ROW which would be bridged. (see habitat discussion following below) |
| **Insects** | | | | | | |
| Black Lordithon rove beetle *Lordithon niger* | — | | 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* | — | | 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* | — | | 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. |

E – Endangered
T – Threatened
DM – Delisted taxon, recovered, being monitored first five years
EXPN – Experimental Population, Non-Essential
"–" – 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

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 (Dallas, February 28, 2011), and Field Visit (December 5, 2008).

*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.

Potential habitat could 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, Arctic Peregrine Falcon, alligator snapping turtle, 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 Furneaux Creek for the Interior Least Tern, a federally listed species. The proposed project does cross Furneaux Creek; however, suitable habitat for the Interior Least Tern was not present within the proposed project limits. Potential habitat may exist in the proposed project corridor for the timber/canebrake rattlesnake which is a state-listed species. These species were not seen during the reconnaissance surveys by qualified biologists nor would they be anticipated to utilize areas within the project limits because the areas are isolated and located primarily in urbanized metropolitan areas that have been established for some time.

Suitable habitat could exist outside of the proposed project corridor for the fawnsfoot (state species of concern). Suitable habitat may exist within the proposed ROW at the two perennial stream systems for the Louisiana pigtoe and Texas heelsplitter (both state-listed species) and for the little spectaclecase and Wabash pigtoe (both state species of concern). 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. Hutton Branch and Furneaux Creek are the two perennial streams within the project limits which could provide the stable water source and preferred substrate for the species. These two 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. Section 401 Water Quality BMPs such as approved erosion controls, sedimentation controls, and post-construction total suspended solids controls would be utilized during and after construction. If the listed mussel species are

encountered within the proposed project ROW the local TPWD biologist should be contacted by TxDOT-ENV to determine an appropriate plan of action.

*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 direct impacts to the state-listed species only and do not include habitat. In a May 20, 2010, coordination letter, TPWD recommended replacement compensatory mitigation for the impacts to the wetland mitigation areas of past projects and compensatory mitigation for the 0.45 acre of riparian habitat impacts. The impacts to the wetland mitigation areas of past projects would be addressed through coordination with the USACE as an amendment to USACE Permit Number 1994400674 (**Section IV. A.2**). The riparian woodland impacts would be mitigated for as part of the Section 404 mitigation and performed in accordance with the terms of the approved NWP (**Section IV. A.7**). As requested in the letter, a copy of the USACE-approved NWP would be provided to the TPWD to document completion of mitigation requirements.

*TPWD Texas Natural Diversity Database*

The TPWD was consulted through the Texas Natural Diversity Database (TXNDD) on October 25, 2010, 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, Lewisville West, Lewisville East, and Hebron, USGS topographic quadrangles. According to the GIS data provided by the TXNDD, the proposed project is not within the polygon of occurrence for any documented species or within 1.5 miles of a managed area.

Other reported occurrences identified in the TXNDD include Texas oak series (*Quercus buckleyi*), rookery, little bluestem-indiangrass series (*Schizachyrium scoparium-sorghastrum nutans*), Texas garter snake (*Thamnophis sirtalis annectens*), 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 (Element Occurrence Identification [EOID] 3672), last observed in 1990, was located east 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 northwest 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 would be anticipated as a result of the proposed project. **Table IV-3** lists the results of the TXNDD search and EOID numbers for the USGS topographic quadrangles associated with the proposed project. The results of the TXNDD Database search can also be found in **Appendix E**.

**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. No evidence of this occurrence was found within the project area or surrounding area. No impacts to the species would be 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. No evidence of this occurrence was found within the project area or surrounding area. No impacts to the species would be anticipated. |
| | 7731 | NA* | |
| | 3672 | 1.1 | |
| Little bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans*) | 3741 | NA* | The proposed project corridor is urbanized and no evidence of this occurrence was found within the project area or surrounding area. No impacts to the species would be anticipated. |
| | 2293 | 6.4 | |
| 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 reducing the available riparian habitat. No evidence of this occurrence was found within the project area or surrounding area and no impacts would be anticipated. However, if this species is encountered within the project limits the local TPWD biologist should be contacted by TxDOT-ENV to determine an appropriate plan of action. |
| | 434 | 4.5 | |
| Cedar elm-sugarberry Series (*Ulmus crassifolia-celtis laevigata*) | 520 | NA* | Although individual cedar elm and sugarberry species were observed along the proposed project corridor, no evidence of this occurrence was found within the project area or surrounding area. No impacts to the species would be anticipated. |

Source: TPWD TXNDD (October 25, 2010)
NA*: No element of occurrence record or GIS information was available.

### A.6 Migratory Bird Treaty Act

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no impacts to migratory birds would be anticipated.

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

Alternative A: No-Build Impact
Under the No-Build Alternative for IH 35E, no impacts to vegetation or wildlife would be anticipated.

The project area is located 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, “Urban” and “Crops”. The “Urban” physiognomic region does not address specific plant species. The “Crops” physiognomic region includes cultivated cover crops or row crops used for the purpose of producing food and/or fiber for either man or domestic animals.

Most of the project area exhibits commercial and residential development with some isolated pockets of undeveloped land. The existing ROW along IH 35E contains herbaceous vegetation and landscape plantings, both of which are routinely maintained by mowing. Some woody species dominated by live oaks (*Quercus virginiana*), have been planted for landscape purposes and are interspersed throughout the existing ROW. The vegetation found within the existing ROW differs somewhat from the vegetation found in the general area, in that the existing ROW is composed primarily of various species of grasses and forbs that are typically found along major roadways in North Central Texas. Dominant herbaceous vegetation within the existing ROW consists of primarily Bermuda grass (*Cynodon dactylon*), three-awn grass (*Aristida* spp.), and silver bluestem (*Bothriochloa saccharoides*). The landscaped oaks present within the existing ROW contain an average height of 25 feet and an average diameter at breast height (dbh) of 9 inches.

Field observations indicate that the vegetation adjacent to the project ROW is more representative of urban type vegetation, along with some species that commonly occur in the

Blackland Prairie. Field reconnaissance occurred on various days in December 2008 and May 2009 and specific dates are included on the individual field 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**. The project area no longer exhibits agricultural vegetation. Due to the expanse of urbanization, former agricultural areas have been altered by commercial development or have simply been abandoned.

The vegetated land within the proposed ROW includes isolated areas of habitat or vacant fields consisting of herbaceous vegetation and woody species. This includes vacant lots, wooded lots, riparian habitat, uplands, and maintained urban areas within the proposed ROW. The dominant herbaceous species include silver bluestem, brownseed paspalum (*Paspalum plicatulum*), thin paspalum (*Paspalum setaceum*), broadleaf signal grass (*Brachiaria platyphylla*), little bluestem (*Schizachyrium scoparium)*, and Johnsongrass (*Sorghum halepense*). The dominant woody species include cedar elm (*Ulmus crassifolia*), bois d'arc (*Maclura pomifera*), hackberry (*Celtis laevigata)*, post oak (*Quercus stellata*), live oak, American elm (*Ulmus americana*), western soapberry (*Sapindus drummondii*), Chinese privet (*Ligustrum sinense*), and pecan (*Carya illinoinensis*). The dominant vine species was Virginia creeper (*Parthenocissus quinquefolia*). The woody vegetation present within the proposed ROW has an average height of 30 feet and an average dbh of 10-14 inches. Some of the isolated tracts of land or undeveloped sites are primarily grassed lots with mixed forbs.

Several unusual vegetation features and special habitat features exist within the project limits. The unusual vegetation features consist of fence line vegetation, large trees and riparian vegetation. The special habitat features consist of the delineated water and wetland features**.**

Species composition along the fence lines varies. Some fence lines within the existing and proposed ROW or easements are not vegetated, while others host young oaks, hackberries, and various vines such as dewberry (*Rubus trivialis*), mustang grape (*Vitis mustangensis*) and trumpet creeper (*Campsis radicans*). Some yaupon (*Ilex vomitoria*) and hawthorn (*Crataegus* spp.) were also observed. The average dbh, average height, and percent dominance of the vegetation along the fence lines are shown on the Vegetation Data Field Form (**Appendix D**). Some fence lines do exhibit some shrub and tree growth. Most of these areas, though, are limited or surrounded either directly or indirectly by development and would not be considered important wildlife habitat within the proposed project area.

Several large trees were identified within the proposed ROW. These individual large trees, in addition to other trees present within the existing and proposed ROW, comprise five identified woodland areas. Of the total area comprised of woody vegetation, there is approximately 4.38 acres which are considered woodland areas. The remaining approximately 8.12 acres of woody vegetation is interspersed throughout the proposed project limits. Approximately 0.45 acres of the 4.38 acres of woodlands can be considered riparian woodland habitat and could be cleared in its entirety if the proposed project is constructed. Five Woodland Data Forms (**Appendix D**) were completed for this project. See **Table IV-4** for potential impacts to woodland areas and **Appendix A: Figure 4** for the location of the woodland areas.

The riparian vegetation (unusual vegetation feature) is associated with two wetland features and thirteen water features (special habitat features) present within the existing and proposed ROW and easements. Dominant herbaceous vegetation within the riparian zone includes narrowleaf cattail (*Typha angustifolia*), swamp smartweed (*Polygonum hydropiperoides*), Johnsongrass, and

giant ragweed (*Ambrosia trifida*). The dominant woody species within the riparian zone include black willow and American elm. The dominant vine species within the riparian zone is balloon vine (*Cardiospermum halicacabum*). The riparian corridors are not continuous through the existing ROW because all but two of the streams (water features) flow through a culvert and contain concrete or riprap along the bottom of the stream channel. Two streams are bridged and these corridors are routinely maintained by mowing and selective clearing of woody vegetation. As stated in the previous paragraph, approximately 0.45 acres of riparian woodland habitat could be removed as a result of the construction of the proposed project.

Wildlife associated with the existing habitat in the proposed project area is 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 wooded lots 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*), warblers (*Dendroica* sp.*),* orchard oriole (*Icterus spurious*), red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), northern cardinal (*Cardinalis cardinalis*), sapsucker (*Sphyrapicus* sp.), 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*), blue jay (*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. The majority of the area comprising the proposed ROW and easements has been developed and is not considered pristine habitat.

The existing ROW encompasses approximately 265.5 acres. There are approximately 148.8 acres of herbaceous vegetation and 6.9 acres of woody vegetation within the existing ROW that could potentially be impacted. The remaining approximately 109.8 acres is developed and contains structures or areas that are paved. Of the total land present within the existing ROW,

the percent canopy cover is approximately 3 percent, herbaceous cover is approximately 56 percent, and the remaining approximately 41 percent is comprised of structures or paved areas.

Approximately 86.8 acres of land could be acquired for the proposed project, including proposed ROW and easements. Of the approximately 86.8 acres, there are approximately 12.5 acres of woody vegetation and 34.6 acres of herbaceous vegetation interspersed throughout the proposed ROW and easements that could potentially be impacted. The remaining approximately 39.7 acres is developed areas and contains structures or areas that are paved. Of the total area comprised of woody vegetation, there is approximately 4.38 acres which are considered woodland areas (**Appendix A: Figure 4 Tree Removal Maps)**. The remaining approximately 8.12 acres of woody vegetation is interspersed throughout the proposed project limits. Of the total 86.8 acres of land acquired, the percent canopy cover is approximately 14 percent, herbaceous cover is approximately 40 percent, and the remaining approximately 46 percent is comprised of paved areas or contains structures within developed areas.

There are approximately 352.3 acres of land within the existing and proposed ROW and easements. Of this total acreage, approximately 52 percent (183.4 acres) contains herbaceous vegetation, approximately 6 percent (19.4 acres) contains woody vegetation, and approximately 42 percent (149.5 acres) is paved or contains structures within developed areas. Based on the current schematic design, it is anticipated that the entire existing and proposed ROW or easements would be cleared during construction of the proposed project. This could result in potential impacts to the entire approximately 183.4 acres of herbaceous vegetation and approximately 19.4 acres of woody vegetation.

**Table IV-4 : Woodland Areas**

| Area | Acres(s) | Unusual Habitat Feature | Effect* | Tree Removal Map Number |
|---|---|---|---|---|
| Woodland Data Form Area 1 | 0.45 | Riparian woodland containing three American elms with a dbh of 23, 24, and 27 inches, one sugarberry with a dbh of 23 inches, and one snag. | The trees within the area including the individual large trees would be cleared during construction. | 1 |
| Woodland Data Form Area 2 | 1.31 | Woodland area is located along a fenceline and within upland and riparian areas. One gum bumelia (24-inch dbh) and two post oaks (22-inch and 24-inch dbh) were observed. | The trees within the area including the individual large trees would be cleared during construction. | 2 |
| Woodland Data Form Area 3 | 0.53 | Woodland is primarily in an upland area with a portion of the woodland within a riparian area. Large trees observed were one American elm (35-inch dbh), one eastern cottonwood (47-inch dbh), and one post oak (24-inch dbh). | The trees within the area including the individual large trees would be cleared during construction. | 2 |
| Woodland Data Form Area 4 | 0.98 | Upland woodland located at an abandoned mobile home park. Large trees observed were two American elms (48-inch, 49-inch dbh), two eastern cottonwoods (35-inch, 48-inch dbh), five post oaks (22-inch, 23-inch, 28 inch, 30-inch, and 35-inch dbh), and four American sycamores (20-inch, 22-inch, 24-inch, and 28-inch dbh). | The trees within the area including the individual large trees would be cleared during construction. | 2 |
| Woodland Data Form Area 5 | 1.11 | Upland woodland comprised primarily of honey locust. Also includes honey mesquite and sugarberry. | The trees within the area would be cleared during construction. | 3 |

* The "Effect" to woodland areas was calculated as a "worst case" scenario where the entire proposed project ROW would be cleared during construction. During final design, the effect to each area could be minimized which would reduce the woodland impacts.

Mitigation for the unusual vegetation (large trees and riparian vegetation) and special habitat features 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 (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 0.45 acre of riparian woodlands habitat impacts, which are represented by Woodland Data Form Area 1 (See **Table IV-4** and **Appendix A, Figure 4: Tree Removal Maps** and **Appendix D)**. Riparian woodland impacts would be mitigated as part of the Section 404 mitigation and performed in accordance with the terms of the approved NWP. If Section 404 mitigation is not required, TxDOT would provide non-regulatory compensatory mitigation for the riparian woodlands habitat in accordance with the MOA and as requested in the May 20, 2010, coordination letter from TPWD. Additionally, TxDOT would mitigate for the loss of large trees which were identified at Woodland Data Form Areas 1, 2, 3, and 4. The total number of large individual trees and total acreage affected and thus compensated for could change during final design. TxDOT would minimize the loss of trees by preserving as many as possible. Trees within the proposed project ROW, but not in the construction zone, would not be removed if possible.

### A.8 Invasive Species and Beneficial Landscaping Practices

Alternative A: No-Build Impact

Under the No-Build Alternative for IH 35E, no impacts to existing vegetation resulting in an increase of invasive species would be anticipated.

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 would 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 or soils would be anticipated.

Alternative B: Build Impact

According to the Carrollton USGS topographic quadrangle, the elevations in the project study area are relatively consistent at approximately 450 ft above msl. According to the Natural Resource Conservation Service's (NRCSs) Soil Survey of *Dallas County, Texas* (1975), there are three general soil types within the study area. The *Houston Black-Heiden* is a deep, nearly level to strongly sloping clayey soil on uplands. The *Trinity-Frio* is a deep, nearly level clayey soil on the floodplains. The *Silawa-Silstid-Bastsil* is a deep, nearly level to sloping, loamy and sandy soil on stream terraces. According to the NRCS Soil Survey, two hydric soils are located within the proposed ROW. *Trinity clay, frequently flooded,* is located in the floodplains of Hutton Branch and Furneaux Creek. *Trinity clay, occasionally flooded,* is located in the floodplain of Furneaux Creek.

*Farmland Protection Policy Act*

Three prime farmland soils are located within the proposed ROW. These are *Bastsil fine sandy loam*, *Silawa fine sandy loam*, and *Trinity clay*. The additional ROW required is urbanized and/or zoned for urban use; 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 2035* 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 nonattainment 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 nonattainment areas, the 1990 Clean Air Act Amendments (CAAA) required the Metropolitan Planning Organizations (MPO) 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 County, which is part of the EPA's designated nine county serious nonattainment 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 2035*) and the 2011-2014 TIP – 2011 Amendment. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011. A map displaying MTP reference numbers and other project information is included in **Appendix D: IH 35E South MTP References, CSJs, Limits, and Locations**. Copies of the MTP and TIP pages are included in **Appendix D: *Mobility 2035* Proposed Recommendations: Corridor Fact Sheets Summary** and the **FY 2011-2014 TIP – 2011 Amendment**.

Traffic for 2030 is estimated to be 338,400 vehicles per day (vpd); therefore, a Traffic Air Quality Assessment (TAQA) is required.[3] This project is adding single occupancy vehicles (SOV) capacity; therefore, a CMP analysis is also required.

[3] 2030 traffic data obtained from the *Traffic Analysis for Highway Design* by TxDOT (February 2009) for the IH 35E section.

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 2025, the Estimated Time of Completion (ETC) year are 312,590 vpd. The traffic volumes resulting in the highest CO emission readings for 2030, the design year are 330,100 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:

**Table IV-5: Carbon Monoxide Concentrations**

| Year | Location Description | 1-HR CO (ppm) * | 1-HR % NAAQS | 8-HR CO (ppm)* | 8 HR % NAAQS | Appendix C: Corridor Map Sheet No. |
|---|---|---|---|---|---|---|
| 2025 | South of the u-turn at Valwood Parkway | 5.60 | 16.00 | 3.44 | 38.22 | 3 |
| 2030 | South of the u-turn at Valwood Parkway | 5.60 | 16.00 | 3.44 | 38.22 | 3 |

*The National Ambient Air Quality Standard (NAAQS) for CO is 35 ppm for one hour and 9 ppm for eight-hours. 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 System 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 summarize 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. 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 grade separation, traffic signal improvements, ITS, addition of lanes, HOV, and rail transit 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 35 at Belt Line Road | Grade separation | 2009 | TxDOT | 0196-03-240 | $37,000,000 |
| Various locations | Traffic signal improvement | 2007 | Carrollton | 11428.0000 | $1,100,000 |
| Belt Line Road at of IH 35E west service road | Traffic signal improvement | 2007 | Carrollton | 11428.0002 | $1,100,000 |
| Sandy Lake Road/Whitlock Lane at IH 35E | Traffic signal improvement | 2009 | Carrollton | 11428.0093 | $1,100,000 |
| Whitlock Lane at IH 35E | Traffic signal improvement | 2007 | Carrollton | 11007.0075 | $863,338 |
| IH 35E park and ride ramp at Dickerson Parkway | HOV | 2007 | TxDOT | 11131.0000 | $6,860,980 |
| PGBT from US 75 to IH 35E | Addition of lanes | 2010 | NTTA | NTT 301 | $50,000,000 |
| IH 35 from IH 635 and PGBT | Intelligent Transportation Systems | 2007 | TxDOT | 1765.1 | $3,000,000 |
| East Cottonbelt Rail Corridor from DFW to north central red line (Dallas county section) | Rail Transit | 2009 | NCTCOG | 20168 | $3,125,000 |
| IH 35E at Dickerson Parkway | New roadway | 2011 | TxDOT | 53011 | $18,590,627 |
| PGBT from US 75 to IH 35 | Addition of lanes | 2010 | NTTA | 83146 | $50,000,000 |
| Crosby Road at IH 35E south bound | Traffic signal improvement | 2007 | Carrollton | --- | $425,000 |
| Crosby Road at IH 35E west service road | Traffic signal improvement | 2007 | Carrollton | --- | $863,338 |
| Crosby Road at IH 35E west bound service road | Traffic signal improvement | 2009 | Carrollton | --- | $1,1000,000 |
| Crosby Road at IH 35E north bound | Traffic signal improvement | 2007 | Carrollton | --- | $425,000 |
| Crosby Road at IH 35E east bound service road | Traffic signal improvement | 2007 | Carrollton | --- | $863,338 |
| Crosby Road at IH 35E east bound service road | Traffic signal improvement | 2009 | Carrollton | --- | $1,1000,000 |
| Sandy Lake Road at IH 35E north bound | Traffic signal improvement | 2007 | Carrollton | --- | $425,000 |

Source: NCTCOG, http://nctcog.org/, Transportation Improvement Program Information System (TIPINS) (May 2009).

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 Metropolitan Planning Area (MPA) is on file and available for review at NCTCOG.

Mobile Source Air Toxics (MSATs)

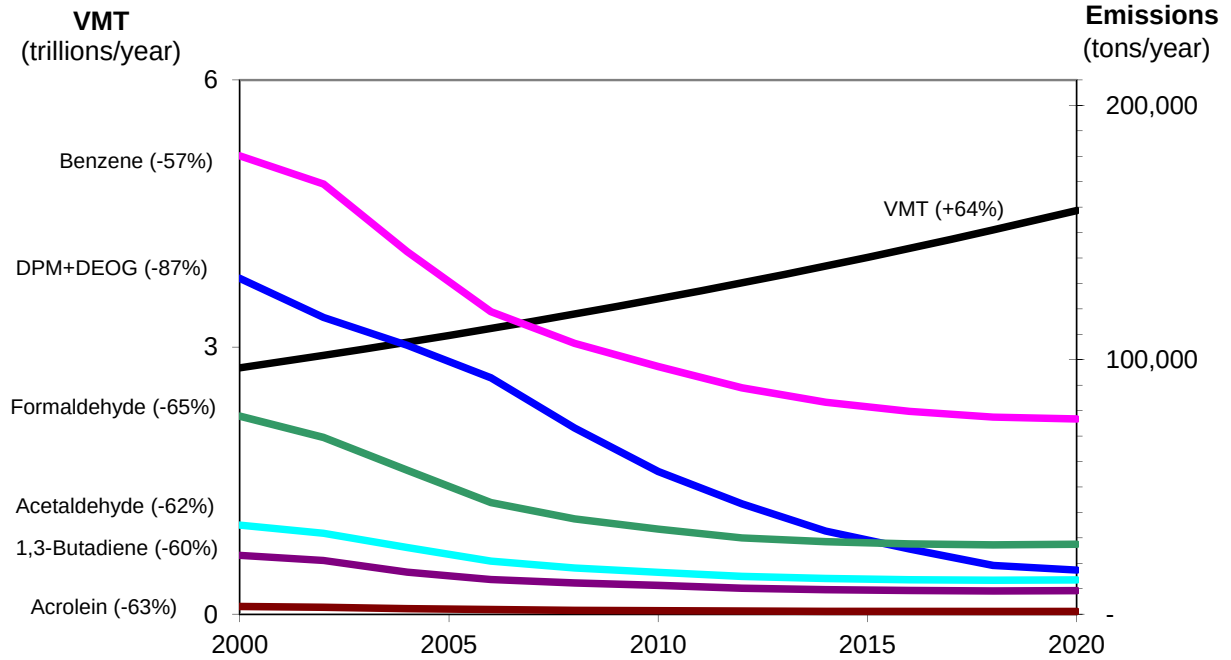
In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources,

non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

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 MSATs. 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 (see **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 MSATs, 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 $PM_{2.5}$.[4,5] 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. (See http://www.epa.gov/air/data/info.html.)

The Dallas 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.

One monitoring site is located near the project area in Dallas County; however, this monitor only contained data pertinent to criteria air pollutants. Other monitoring sites reported on air toxics including compounds listed as MSATs and were, therefore, also utilized in this report and included in **Table IV-7**. The approximate distance to each site from the proposed project is listed in **Table IV-7**.

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

[4] See glossary for PM definitions.

[5] 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 (µg/m$^3$) 2008 | Annual Average - PM2.5 (µg/m$^3$) 2008 | Annual Average – $NO_2$ (ppm) 2008 | Annual Average - Lead (µg/m$^3$) 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 (in miles) from Project |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 481130075 | 11/2/1998 | 0.076 | N/A | N/A | 0.009 | N/A | N/A | N/A | N/A | N/A | N/A | 5 |
| 481130069 | 1/1/1986 | 0.064 | N/A | 11.17 | 0.013 | N/A | 1.417 | 0.126 | 1.255 | 0.123 | 2.485 | 6 |
| 481130050 | 1/1/1979 | N/A | 25 | 11.72 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 11 |

Source: EPA http://www.epa.gov/air/data (May 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 model area. The MSAT model area is composed of the affected transportation network for the IH 35E project provided by the NCTCOG. The plus or minus five percent threshold was adopted as the basis to determine the model area. Because the

2009 base year scenario represents the existing condition, the model area 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 model area for scenario year 2030 includes 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. See **Appendix A: Figure 6** for the MSAT model area maps.

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 MSATs for the Build and No-Build Scenarios

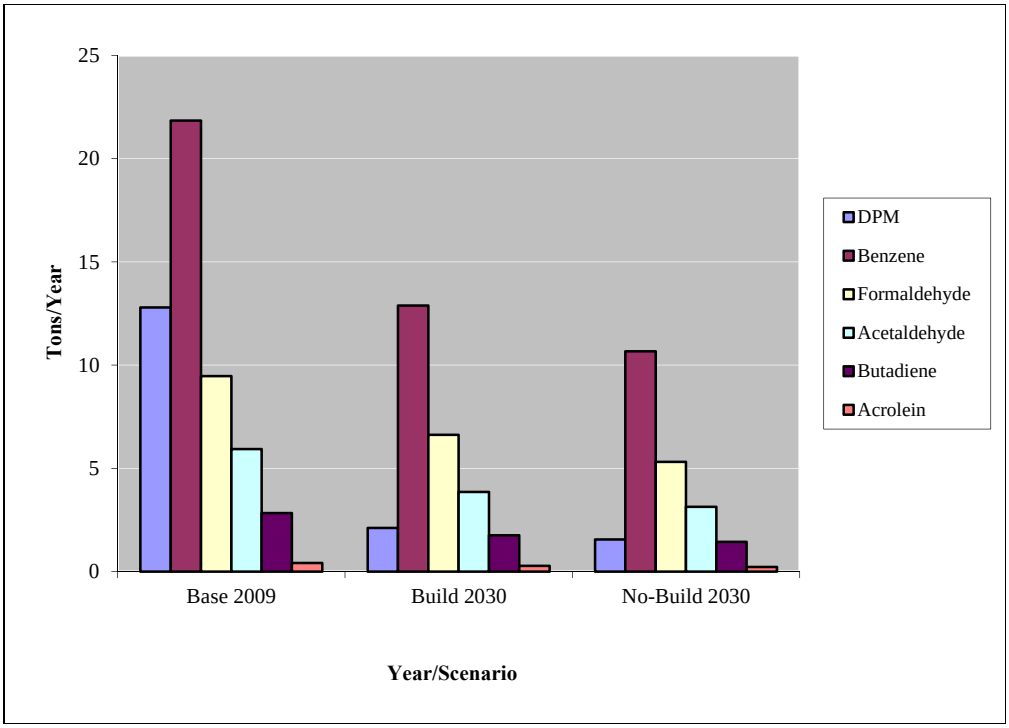
Specific data from the MSAT study area of the NCTCOG Regional Transportation Model were used to determine the mass of MSAT emissions associated with the Build (proposed project), and No-Build scenario. In addition, the base or existing conditions mass of MSATs was also modeled. The total mass of MSATs 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**.

**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 | 4,690,498 | 21.836 | --- | 2.841 | --- | 9.466 | --- | 5.941 | --- | 0.425 | --- | 12.792 | --- | 53.300 | --- |
| Build 2030 | 7,981,340 | 12.885 | 41% | 1.759 | 38% | 6.628 | 30% | 3.861 | 5% | 0.286 | 33% | 2.115 | 83% | 27.533 | 48% |
| No-Build 2030 | 6,542,659 | 10.672 | 51% | 1.442 | 49% | 5.319 | 44% | 3.137 | 19% | 0.229 | 46% | 1.559 | 88% | 22.358 | 58% |

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 48 percent in 2030 compared with 2009 levels for the IH 35E South 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 (51 percent reduction for benzene and 44 percent reduction for formaldehyde) from 2009 to 2030, under the No-Build scenarios. An even larger reduction in DPM emissions is predicted (88 percent decrease from 2009 to 2030, under the No-Build scenario).

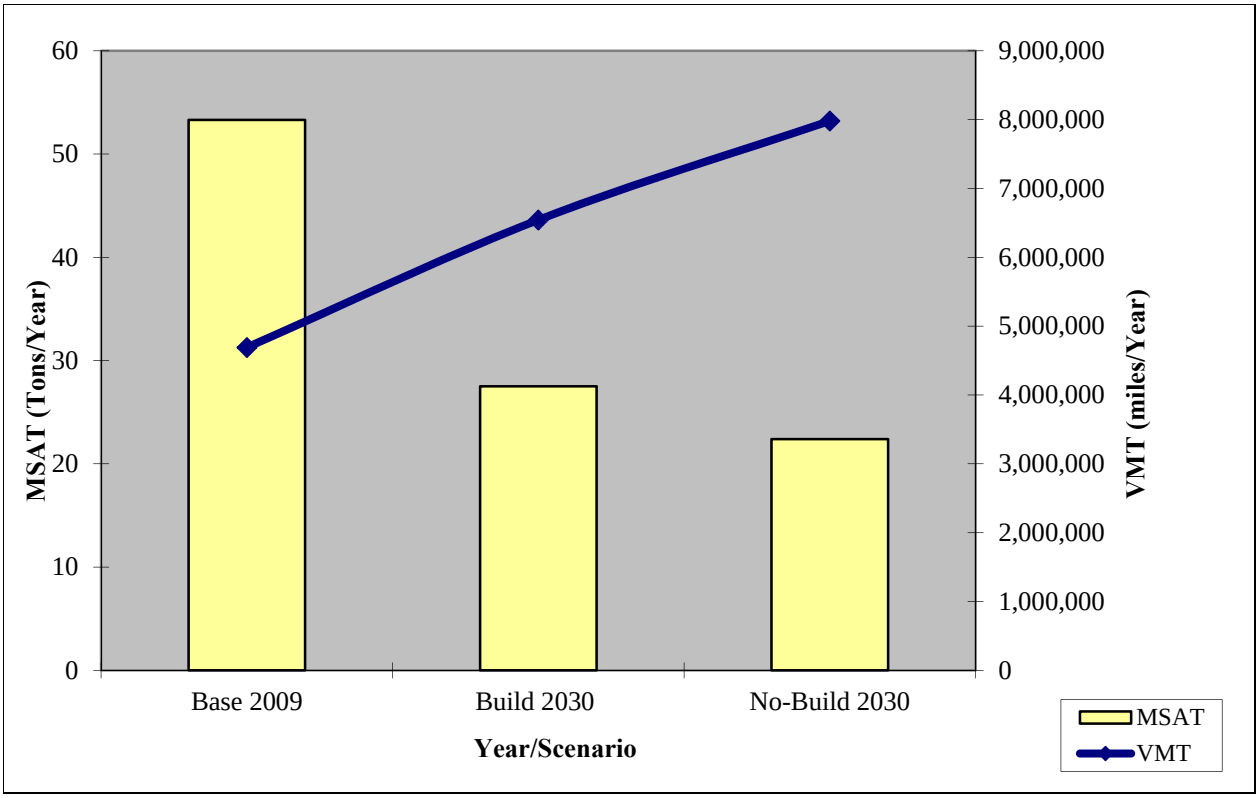
Discussion

Although the VMT for the IH 35E Build scenario would increase approximately 70 percent by 2030 when compared to 2009, total MSAT emission for the same scenario would decrease at least 48 percent by 2030. In 2030, total MSAT loads for the Build scenario is 5.175 ton/year higher than the No-Build scenario. The higher level of MSAT emissions for the Build scenarios is due to a higher VMT when compared to the No-Build scenarios.

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.

**Graph IV-3: IH 35E South 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 twofold, 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 South 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 and licensed daycare facilities. Four sensitive receptors were located along the project; all within 328 ft (100 meters) and 1,640 ft (500 meters) from the ROW. None are located within 328 ft (100 meters) of the 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 | Within 328 ft (100 meters) and 1,640 ft (500 meters) from the proposed ROW |
| From IH 635 to PGBT | 5 miles | 0 | 4 |

Source: ESRI ArcMap 9.2; http://www.google.com (March 2011); Field reconnaissance (October 2007).

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 Proposed Project Corridor**

| ID | Facility | Address | Municipality | Zip Code | Distance from the existing ROW in feet* | Distance from the proposed ROW in feet* |
|---|---|---|---|---|---|---|
| SR1 | First Baptist Church of Farmers Branch Daycare and Preschool | 13017 William Dodson Parkway | Farmers Branch | 75234 | 1,429 | 1,429 |
| SR2 | Mrs. Richardson's Nursery School and Kindergarten | 13226 Bee Street | Farmers Branch | 75234 | 1,225 | 1,225 |
| SR3 | Kiddie Kollege Child Care Center | 1501 E. Crosby Road | Carrollton | 75006 | 1,508 | 1,508 |
| SR4 | A Children's Garden Montessori School | 1935 Old Denton Road | Carrollton | 75006 | 1,285 | 1,285 |

* Distance provided is an approximation and rounded to the nearest foot.
Source: ESRI ArcMap 9.1; http://www.google.com (March 2011); Field reconnaissance (October 2007).

*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 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.[6]

- **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 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

[6] 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.

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., percent 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 a model area 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 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 48 percent from 2009 to 2030. While benzene and formaldehyde emissions are predicted to decline 51 and 44 percent respectively, emissions of DPM are predicted to decline even more (i.e., 88 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 South 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 high intensity commercial, mixed use retail, light industrial, public roadways and railroad tracks. Land use adjacent to IH 35E is zoned PD - Planned Development, LI – Light Industrial, HIC – High Intensity Commercial, HIO - High Intensity Office, and Mixed Use/Urban.

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. 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 and Farmers Branch assume the IH 35E facility will continue to support the achievement of the development patterns the plans outline.

### 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

The proposed project would not require the use of, nor substantially impair the purposes of any publicly owned land from a public park, recreational area, wildlife and waterfowl refuge lands, or historic sites of national, state, or local significance; therefore, a Section 4(f) or 6(f) Evaluation is not required.

## 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.F**, 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 17, 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 public meeting, various meetings and/or presentations have been given to public officials associated with the 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 three municipalities located along the proposed project improvement limits, as well as general business trends and current major planned development.

*City of Dallas*

The City of Dallas has a total population of 1,188,580 according to *Census 2000*. It is the third largest city in the state of Texas and the ninth largest city in the U.S. The median household income for the City of Dallas is $37,628 per year. It encompasses a total area of approximately 384.7 square miles and is located along the southern portion of the proposed project.

The City of Dallas utilizes various modes of transportation in addition to the interstate/highway systems. The DART has both a bus system and a light rail system. The M-Line Trolley provides a transportation option in the downtown area. The Trinity Railway Express (TRE) provides commuter service between Dallas and Fort Worth. Amtrak also provides railway public transportation. The DFW International Airport and Dallas Love Airfield service the Dallas area. The Dallas City Council approved *forwardDallas!*, a city-wide comprehensive plan in June of 2006 to guide the rapid growth Dallas is currently experiencing. The comprehensive plan, *forwardDallas!*, focuses on improving six core aspects of the city which include education, public safety, healthy environment, job growth, convenient transportation and residents' quality of life. This plan aims at enhancing the economy, making quality housing more accessible, creating strong and healthy neighborhoods, enhancing transportation systems, ensuring environmental sustainability, and encouraging new development patterns.[7]

Dallas acts as a cultural center with such assets as the Dallas Museum of Art, the Myerson Symphony Center, the African American Museum, and the Latino Cultural Center. In addition, the City of Dallas Park and Recreation Department recently invested $17 million on the Main Street Garden Park project in downtown Dallas, which opened in November 2009.[8] The City of Dallas is home to two professional athletic teams: the Dallas Mavericks basketball team and the Dallas Stars hockey team. Several universities are located in and around Dallas including the University of Texas-Dallas, University of Dallas, and Southern Methodist University.

*City of Carrollton*

Carrollton is described as a "vibrant corporate and residential community that has the 'home advantage' because of its prime location."[9] The City of Carrollton encompasses approximately 35 square miles, and a large portion of the proposed project is located within the City of Carrollton. According to *Census 2000*, the City of Carrollton has a total population of 109,215 and a median household income of $62,406.

Based on information provided on the City's website, it appears businesses and neighborhoods in the city flourish, and surrounding major highways, three rail freight lines, and Foreign Trade Zone designation offer continued success. In 2006, the City of Carrollton 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 of new construction, 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 currently travels through the City of Carrollton and terminates at the North Carrollton station north of PGBT, where the DART light rail system is proposed to connect with the future DCTA commuter rail system.. Throughout the planning and

[7] *forward Dallas!* Comprehensive Plan, Approved June 14, 2006.
[8] *Denton Record Chronicle* November 13, 2009.
[9] City of Carrollton. http://www.cityofcarrollton.com/

development stages of the light rail system through the City of Carrollton, the City coordinated many of its land use planning endeavors with DART to functionally accommodate and capitalize on this form of transportation development. The light rail system running through the City of Carrollton opened in December 2010.[10]

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 co-functional 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 since light rail service in the City of Carrollton began in December 2010.

*City of Farmers Branch*

The City of Farmers Branch encompasses 12 square miles and is located near the midpoint of the proposed project limits.[11] *Census 2000* reports a population of 27,508 and a median household income of $54,734 for the City of Farmers Branch.

Although the NCTCOG-estimated population of the City of Farmers Branch in 2010 is 35,424, the day-time business population is almost triple that number at an estimated 119,066 workers in 2010 as reflected by employment estimates generated by the NCTCOG. According to the NCTCOG, IBM Corporation, JP Morgan Investment Services, the Federal Government (Internal Revenue Service), and Geico Insurance Company are the four largest employers in Farmers Branch, each employing greater than 1,000 employees and collectively employing greater than 7,200 workers. The City of Farmers Branch is conveniently located within the DFW Metroplex and attracts many businesses because of its optimal central location and abundant transportation access to the surrounding region. By December 2010, Farmers Branch is anticipated to have a DART light rail, which will further facilitate economic growth.

The residents of Farmers Branch enjoy 29 parks, including the Farmers Branch Historical Park. In 2004, the Dr. Pepper Star Center opened and currently hosts 700,000 patrons per year. The Star Center allows patrons to use two ice rinks and a convention center. The Dallas Texans, a select soccer club, has also announced its plans to relocate to Farmers Branch. Additional improvements to the quality of life for residents include the installation of wireless internet, improved traffic signalization, and playground renovations in 2006.[7]

### C.1 Right-of-Way/Easements/Displacements

Alternative A: No-Build Impact

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

[10] Dallas Area Rapid Transit. http://www.dart.org/about/expansion/otherprojects.asp
[11] City of Farmers Branch http://www.ci.farmers-branch.tx.us/

Alternative B: Build Impact

The Build Alternative would require the acquisition of 86.4 acres of additional ROW and 0.4 acre of easements, which would result in an estimated 138 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 IH 635 to PGBT, 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 IH 635 to PGBT will need to accommodate over 338,000 vpd.

To accommodate the projected 338,000 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.D, Section I.F, 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 was 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 and adjust 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. 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 received from public meetings as well as feedback generated from the stakeholder work group meetings held for the IH 35E corridor development from IH 635 to PGBT.

For example, the mainlane alignment was studied and evaluated between Valwood Parkway and Belt Line Road to determine the best alignment alternative. The evaluation reviewed potential displacements and loss of parking, remaining developable land, limitations to redevelopment of existing properties, and stakeholder and municipal input at stakeholder meetings and public meetings to come to a consensus that the preferred alignment should minimize the acquisition of ROW from the east side. Public and private property owner input was actively solicited both by TxDOT and the adjacent municipalities to come to this conclusion. The consensus was that because of the location of the freight railroad line limiting development between the railroad and IH 35E, there is currently insufficient depth of property between the two facilities to accommodate substantial sustainable development/redevelopment of properties on the east side. The resulting alignment minimized displacements and adverse impacts, and residual components of properties impacted would undergo an improvement from existing conditions by enhancing ramping access to the property, improving safety due to enhanced sight distance, and increasing perceived commercial property values through drive visibility.

Both stakeholder and public input was solicited and results incorporated from stakeholder meetings and public meetings to come to a consensus regarding design redevelopment of Belt Line Road at IH 35E. Alternatives were developed and evaluated and a consensus reached that the best alternative for the interchange was to grade separate Belt Line Road from the three converging railroad corridors that intersect to the east of IH 35E near Belt Line Road. The resulting Belt Line Road alternative minimized adverse impacts and enhanced the Belt Line Road corridor from its current configuration by increasing traffic flow and safety along Belt Line Road as a result of removing the at-grade railroad crossing and increasing perceived residential and commercial property values through reduced corridor delay/congestion and reduced railroad noise.

The preliminary design decisions along IH 35E between IH 635 and PGBT were coordinated through municipal stakeholders and property owners and confirmed at various stakeholder meetings held during the development of the IH 35E project to achieve a balanced and feasible solution for the proposed reconstruction of IH 35E.

*ROW Acquisitions and Easements*

The proposed IH 35E improvements would require additional ROW, and thus would result in a number of displacements. Approximately 86.4 acres of additional ROW would be required for the preferred alternative resulting in the displacement of 111 business establishments, 24 vacant buildings/suites, and 3 places of worship for a total of 138 displacements.

Approximately 0.4 acre of easements would be required due to the proposed improvements. The easements consist of multiple drainage easements and would not result in any of the 138 anticipated displacements.

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 would be acquired 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 payment and services to aid in the movement to a new location through its Relocation Assistance Program.

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. 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 (such as places of worship) 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 would be necessary to relocate some existing utilities, the existing utility lines are not expected to pose substantial problems to the construction, operation, or 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 into the design plans. All of the utilities can be either adjusted or relocated by TxDOT prior to the construction of the proposed project according to standard TxDOT procedures.

*Displacements*

Methodology

For the purpose of identifying potential displacements, a structure that was anticipated to be intersected or clipped by the proposed ROW line or to undergo a loss of accessory parking is determined to be displaced. An unknown description indicates a commercial structure lacking identification that would otherwise 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 reflects the minimization of displacements to the greatest extent possible. Various alignments considered during the project development phase would have resulted in a greater number of displacements. Input from local stakeholders and property owners revealed that the proposed project's alignment would minimize the number of displacements associated with additional ROW requirements while achieving a balanced and feasible solution for the intent of the proposed reconstruction of IH 35E.

Summary of Displacements

A summary of the displacements are listed by municipality in **Table IV-11** and in **Appendix D: IH 35E Displacement Data**.

**Table IV-11: Summary of Potential Displacements**

| Type of Displacement | Municipality | | Number of Displacements |
|---|---|---|---|
| | Carrollton | Farmers Branch | |
| **Residential** | **0** | **0** | **0** |
| **Business Establishments** | **84** | **27** | **111** |
| Automotive Services | 3 | 3 | 6 |
| Hotel | 1 | 3 | 4 |
| Industrial | 5 | 3 | 8 |
| Rental Services | 3 | 1 | 4 |
| Restaurants | 4 | 2 | 6 |
| Retail | 13 | 9 | 22 |
| Car Dealers | 2 | 0 | 2 |
| Medical/Dental Services | 5 | 0 | 5 |
| Fitness/Athletic Services | 2 | 0 | 2 |
| Technology Services | 8 | 0 | 8 |
| Construction Services | 6 | 1 | 7 |
| Financial Services | 2 | 0 | 2 |
| Personnel Services | 1 | 0 | 1 |
| Pet Services | 1 | 0 | 1 |
| Music/Audio Services | 2 | 0 | 2 |
| Signs/Printing Services | 2 | 0 | 2 |
| Travel Services | 1 | 0 | 1 |
| Pest Control Services | 1 | 0 | 1 |
| Security Services | 1 | 0 | 1 |
| Misc. Professional Service Establishments | 18 | 1 | 19 |
| Service Stations | 1 | 3 | 4 |
| Unknown Commercial (no sign) | 2 | 1 | 3 |
| **Vacant Buildings/Suites** | **19** | **5** | **24** |
| **Places of Worship** | **1** | **2** | **3** |
| **Government/Municipal Facilities** | **0** | **0** | **0** |
| **Total** | **104** | **34** | **138** |

Source: Proposed Design Schematic (January 2009); Field observations (January 2009); ArcMap 9.2.

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.

The anticipated displacements include 111 business establishments, 24 vacant buildings/suites, and 3 places of worship. There are no anticipated residential or government/municipal facility

displacements along the proposed project corridor. The displacement information presented is based upon the current proposed ROW line as depicted in **Appendix C: Corridor Maps**. The absolute number of displacements would be determined during the plans, specification, and estimates phase of the project.

Places of Worship Displacements

Three places of worship (churches) would be displaced by the proposed project. In the City of Farmers Branch, two churches, the Hebron Pentecostal Fellowship (D7) and Machaira Bible Church (D8), would be displaced. In the City of Carrollton, one church, the Iglesia Adventista del Septimo Dia del Norte de Dallas (D26), would be displaced. See **Appendix D: IH 35E Displacement Data**. The Machaira Bible Church is located within a multi-tenant commercial center; the other two churches are housed in detached, free-standing buildings.

The impacts to Hebron Pentecostal Fellowship from the proposed IH 35E improvements include anticipated loss of substantial parking. The facilities that house the Machaira Bible Church and Iglesia Adventista del Septimo Dia del Norte de Dallas would be physically impacted by the proposed IH 35E improvements.

*Hebron Pentecostal Fellowship*

The Pastor of Hebron Pentecostal church (D7) was interviewed via telephone on November 30, 2009. According to the Pastor, the church was incorporated in 1985. There are two congregations that utilize the facility: one congregation that holds services in English and Indian, and one congregation that holds services in Spanish. The congregations alternate use of the potentially displaced facility. Each congregation is comprised of more than 100 people. The Spanish congregation is a "guest" of the English/Indian congregation. The Spanish congregation formed in 2008 and represents a Spanish background and immigrants.

The English/Indian congregation uses the facility Sunday morning, Saturday evening, Wednesday evening, Friday morning, and every second Saturday morning. The Spanish congregation uses the facility Sunday afternoon, Tuesday evening, Friday evening, and the first Saturday of the month. The church is used by appointment for pastoral counseling depending on the need. The Indian group consists primarily of Indian immigrants. Services are in both English and Indian – Malayalam language. Services for children are in English and the Malayalam services are primarily for the older members of the congregation. The Indian elders are not bilingual. In 10 to 15 years, the church plans to end the Malayalam language services because the need would not be expected to continue. The congregations offer a church school and nursery during services. The church does not offer after school programs or day care during the week. The church's members have provided assistance to Indian immigrants since 1982.

Geographically, the church's members reside in the Cities of Mesquite, Garland, Rowlett, Carrollton, Farmers Branch, Dallas, Lewisville, Denton, and Corinth. The church's current location is ideal because of the proximity to interstate highways (IH 35E and IH 635) and convenience for the members. The church's congregations do not want to move far from the existing location due to service projects that currently exist, in addition to limited finances which would be impacted by relocation. The church's members live within 5 to 50 miles from the church; no members walk to the church for English/Indian services.

The church's congregation would be able to offer their mission support and relief services at another location if it is within approximately one mile of the current facility. The church would

prefer to relocate to the east or northeast, preferably in the Cities of Farmers Branch or Dallas. It would be optimal to minimize any interruptions in service between the current facility and a relocated facility. The church's members typically reflect above-average income; however, there are members at both ends of the income spectrum. The church accommodates low-income populations through their various community services.

*Machaira Bible Church*

A representative from Machaira Bible Church (D8) was interviewed via telephone on December 1, 2009. Machaira Bible Church is a tenant at 13375 N. Stemmons Freeway, Suite 430, and had not received information regarding public meetings from the building owner. The church has been at its current location for about five years. There are approximately 80 members of the congregation, who travel up to 30 miles to attend church services. The church does not serve any particular demographic, although the majority of the members are Caucasian. Services are offered on Sundays, Wednesdays, and Thursdays. No additional on-site services are provided other than the occasional wedding or memorial service. The church representative indicated that the congregation is happy with its current location, and that given the size of the church's congregation, they could easily stay in the same building for a number of years without having to seek larger accommodation. If the church is displaced, the congregation would incur costs related to moving, time (for moving), and possible changes in rent. It is anticipated that members of the church would follow Machaira to its new location, although it should be noted that church officials prefer that the church stay in the same general area.

*Iglesia Adventista del Septimo Dia del Norte de Dallas*

Several attempts were made to contact the Iglesia Adventista del Norte de Dallas (D26). The listed phone number is out of service and there is no forwarding number. The website provides no specific contact information other than the non-working phone number (http://dallasnorthspanish22.adventistchurchconnect.org/index.php). The website provides information in both English and Spanish. General information is available about faith and the church's ministries, including Adult Sabbath School, Family Ministries, Health Ministries, Men's Ministries, Pathfinder Club, and Women's Ministries but the website does not provide information on how many people are in the congregation, where they are from, or how people travel to and from the church. A questionnaire was delivered to the church on November 25, 2009, but TxDOT has not received a completed questionnaire or other information from the church to date. Outreach efforts will be continued throughout the project development process and specific needs of the church and its congregants would be addressed during the ROW acquisition phase

<u>Commercial Displacements</u>

A total of 111 businesses would be potentially displaced by the proposed project. Three of these are unknown commercial businesses for which no sign was visible. The City of Carrollton contains 84 anticipated business displacements (82 of which were identified by means of a sign), and the City of Farmers Branch contains 27 anticipated business displacements (26 of which were identified with a sign). Both the City of Carrollton and the City of Farmers Branch have actively participated in the establishment of the proposed IH 35E alignment and provided input regarding the potential effects to local businesses.

The **Employment Opportunities Impact Assessment (EOIA)** technical report provided in **Appendix H** 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 EOIA technical report (**Appendix H**) are provided below.

*Employment Opportunities Impact Assessment Study Area*

The EOIA study area consists of municipalities that are adjacent to the proposed IH 35E improvements from IH 635 to PGBT and that are subject to potential business displacements as a result of the proposed improvements. These municipalities include the City of Carrollton in Dallas and Denton Counties, Texas, and the City of Farmers Branch in Dallas County, Texas. Although the project limits of the proposed improvements traverse a small portion of the City of Dallas, the City of Dallas is not anticipated to endure any business displacements associated with the proposed improvements from IH 635 to PGBT. As such, the City of Dallas is not included in the EOIA study area. Additionally, although the proposed IH 35E project limits from IH 635 to PGBT are confined to Dallas County, the entire City of Carrollton, which also extends into Denton County, is included in the EOIA study area.

Municipal boundaries delineate the EOIA study area because the availability of economic and employment data at the municipal level is at the most local scale available for related analyses. It is reasonable to assume that municipalities, which heavily depend on sales tax revenue to fund municipal budgets, have a vested interest in retaining their existing tax bases that may be affected by the proposed IH 35E improvements. Therefore, adjacent municipalities and chambers of commerce were identified as stakeholders and were interviewed in order to obtain and analyze 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 local agencies or organizations such as municipalities, chambers of commerce, or workforce commissions within the EOIA study area do not 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 potentially displaced businesses. **Table IV-12** 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 are not available for public use.

**Table IV-12: Commercial Displacements/Potentially Impacted Employees**

| Municipality | Corridor Map ID Number | Business Name | Business Type | Potential Number of Impacted Employees |
|---|---|---|---|---|
| Farmers Branch | D1 | Shell | Service Station | 1 |
| Farmers Branch | D2 | Chevron | Service Station | 4 |
| Farmers Branch | D3 | Michael's Restaurant | Restaurant | 50 |
| Farmers Branch | D4 | La Quinta | Hotel | 10 |
| Farmers Branch | D5 | Days Inn | Hotel | 10 |
| Farmers Branch | D6 | Vicks Sports Grill | Restaurant | 50 |
| Farmers Branch | | America Best Value Inn and Suites | Hotel | 10 |
| Farmers Branch | D8 | Scott Studios | Services | 4 |

| Municipality | Corridor Map ID Number | Business Name | Business Type | Potential Number of Impacted Employees |
|---|---|---|---|---|
| Farmers Branch | | Braxton Commercial Flooring Services | Retail | 250 |
| Farmers Branch | | Ford Audio/Video | Rental Services | 25 |
| Farmers Branch | | Hard Rock Tool | Retail | 7 |
| Farmers Branch | D9 | Oriental Accent | Retail | 50 |
| Farmers Branch | D10 | Essilor of America | Industrial | 1000 |
| Farmers Branch | D12 | World of Décor | Retail | 5 |
| Farmers Branch | D14 | Wesco Distribution | Industrial | 20 |
| Farmers Branch | D15 | Meridian Products Corporation | Industrial | 36 |
| Farmers Branch | | LA Tools | Retail | 2 |
| Farmers Branch | D16 | Discount Cycle Parts | Retail | 4 |
| Farmers Branch | | Air Rest Mattress Factory | Retail | 10 |
| Farmers Branch | | Mister Collision | Automotive Services | 4 |
| Farmers Branch | D17 | T-Shirt Outlet FB | Retail | 4 |
| Farmers Branch | | BEECO Plumbing Supply | Services | 5 |
| Farmers Branch | | Army/Navy Warehouse | Retail | 5 |
| Farmers Branch | D18 | Fina | Service Station | 3 |
| Farmers Branch | D19 | Top Lube | Automotive Services | 4 |
| Farmers Branch | D20 | American Transmission | Automotive Services | 5 |
| Carrollton | D21 | H.G. Rice and Co. | Services | 10 |
| Carrollton | | North Texas Soccer | Services | 10 |
| Carrollton | | First Choice Sign Builders | Services | 1 |
| Carrollton | | Quick Draw Printing | Services | 4 |
| Carrollton | | ComNet Communications Inc. | Services | 50 |
| Carrollton | | Trend Personnel Services | Services | 4 |
| Carrollton | D22 | Van Chevrolet | Retail | 165 |
| Carrollton | D23 | U-Haul/ Self Storage | Rental Services | 5 |
| Carrollton | D24 | Chromalloy Plant 2 | Industrial | 100 |
| Carrollton | D25 | Branch Auto Sales | Retail | 4 |
| Carrollton | D27 | North Dallas DRC | Services | 5 |
| Carrollton | D28 | R.O. Company | Services | 4 |
| Carrollton | | Elite Leasing | Services | 2 |
| Carrollton | | Pooches and Smooches | Services | 4 |
| Carrollton | D29 | Shell | Service Station | 4 |
| Carrollton | D30 | Steve's Radiator Repair B&B Muffler | Automotive Services | 4 |
| Carrollton | | Owens Corning Cultured Stone Design | Industrial | 5 |
| Carrollton | | Aztek Computers | Services | 10 |
| Carrollton | D31 | Test Adjust Balance Co. Inc. | Services | 8 |
| Carrollton | | James Genuit, D.D.S. | Services | 3 |
| Carrollton | | Alpine Home Health Care | Services | 10 |
| Carrollton | | Divine Home Healthcare | Services | 4 |
| Carrollton | D32 | United Truck Maintenance | Automotive Services | 1 |
| Carrollton | D33 | Office Resource Group | Retail | 10 |
| Carrollton | D34 | SMC Corporation of America | Services | 20 |
| Carrollton | | McCaslin-Hill Construction, Inc. | Services | 10 |
| Carrollton | | Eagle Eye | Services | 5 |
| Carrollton | | Immigration Solutions | Services | 3 |
| Carrollton | | ProLogistix | Services | 5 |
| Carrollton | | Pro Drivers | Services | 4 |
| Carrollton | | Resource Mfg | Services | 4 |
| Carrollton | | Café Matteson | Restaurant | 15 |
| Carrollton | D35 | Prestige Texas | Services | 4 |
| Carrollton | | Costacol USA | Services | 1 |
| Carrollton | | Artistic Auto Body and Paint | Automotive Services | 4 |

| Municipality | Corridor Map ID Number | Business Name | Business Type | Potential Number of Impacted Employees |
|---|---|---|---|---|
| Carrollton | D36 | Crows Martial Arts | Services | 4 |
| Carrollton | | Audio Dude Custom Music | Services | 1 |
| Carrollton | | Promotion Music | Services | 4 |
| Carrollton | D37 | Texas Granite and Tile Co. | Services | 4 |
| Carrollton | | Stars+Legends | Services | 2 |
| Carrollton | | Motek Toner and Inkjet Supply | Retail | 5 |
| Carrollton | D38 | Computer Corner | Retail | 4 |
| Carrollton | | Mike's Hobby Shop | Retail | 5 |
| Carrollton | D39 | Sendera Tile | Retail | 14 |
| Carrollton | | Lions Gate Homes | Retail | 1 |
| Carrollton | | Creative Touch Interiors | Retail | 4 |
| Carrollton | | Centurion American | Services | 20 |
| Carrollton | D40 | Grainger | Retail | 10 |
| Carrollton | D41 | Net Boundary | Services | 3 |
| Carrollton | | Makor Management | Services | 4 |
| Carrollton | | FC Lending Woodhaven Financial | Services | 4 |
| Carrollton | | America Transfers and Tours America Management | Services | 4 |
| Carrollton | | Webdex Inc. | Services | 5 |
| Carrollton | | Vested in Management | Services | 10 |
| Carrollton | | Medex North | Services | 5 |
| Carrollton | | Ad Tel America Inc. | Services | 5 |
| Carrollton | | The General Agency | Services | 5 |
| Carrollton | | Terminix | Services | 50 |
| Carrollton | D42 | Ashton Woods Homes Design Center | Retail | 4 |
| Carrollton | | BP Equipment Co | Services | 10 |
| Carrollton | | National Computer | Services | 4 |
| Carrollton | | Lite Bites Deli | Restaurant | 3 |
| Carrollton | | Speedpro Imaging | Services | 4 |
| Carrollton | | Texana Security | Services | 5 |
| Carrollton | | Home Traditions & Textiles | Retail | 5 |
| Carrollton | | Advanced Property Tax Compliance | Services | 5 |
| Carrollton | | OrderDog Inc | Services | 4 |
| Carrollton | | Worldwide Buying Alliance | Services | 5 |
| Carrollton | | Scott Technology | Services | 4 |
| Carrollton | D44 | Jetta Design Center | Industrial | 4 |
| Carrollton | D45 | EFC | Services | 10 |
| Carrollton | D46 | E Car One.com | Industrial | 4 |
| Carrollton | D47 | Delux Inn | Hotel | 4 |
| Carrollton | D48 | McDonald's #5393 | Restaurant | 20 |
| Carrollton | D49 | Starbucks | Restaurant | 10 |
| Carrollton | D53 | Roadway Solutions | Industrial | 10 |
| Carrollton | D54 | Wasco Reinforcing Steel Supply Inc. | Retail | 4 |
| Carrollton | D55 | HDS Stoneworks | Services | 2 |
| Carrollton | D59 | Andrews Gunite Inc. | Services | 35 |
| Carrollton | D60 | H20 Supply Wholesale Plumbing | Services | 10 |
| Carrollton | D61 | Lock Box Storage | Rental Services | 4 |
| Carrollton | D62 | Anderson's Furniture | Retail | 4 |
| | | | **Total** | 2,427 |

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

As shown in **Table IV-12**, a total of 2,427 employees would be potentially impacted by the displacement of the 111 anticipated commercial establishments. Information pertaining to wage data was not available for any municipality; therefore, wage data were not included in **Table IV-12**. Of the 2,427 anticipated employee impacts, approximately 65 percent (1,578 impacted employees) are associated with the 27 potentially displaced commercial entities located within the City of Farmers Branch, and approximately 35 percent (849 impacted employees) are located within the City of Carrollton. One of the objectives of the City of Farmers Branch's *Comprehensive Plan* update for the city's central area of the city, currently under development and anticipated to be adopted by the end of 2011, is to direct the efficient and orderly redevelopment of the IH 35E corridor with more compatible land uses that provide quality employment opportunities. According to the Director of Planning for the City of Farmers Branch, suggested land uses include campus-style office employment centers, retail establishments, and full-service hotel/convention uses. The Director of Planning anticipates that the proposed reconstruction of IH 35E would improve economic development along the corridor and its overall attractiveness for investment and development.

*Potential Sites for Commercial Displacement Relocations*

With respect to replacement real estate for commercial/office/retail purposes, there appears to be space available for lease or sale in the Cities of Carrollton and Farmers Branch. In addition to available space, appropriately zoned developed and undeveloped areas within the Cities of Carrollton and Farmers Branch would also accommodate potential displacements. According to http://showcase.costar.com real estate listings website (September 2010), a range of commercial property was available as shown in **Table IV-13**. 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-13: 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 Carrollton | 84 | 391 | 1 million+ sq. ft. | 787,000+ sq. ft. | 616,000+ sq. ft. | 225,000+ sq. ft. | 1 million+ sq. ft. |
| City of Farmers Branch | 27 | 178 | 902,000+ sq. ft. | 193,000+ sq. ft. | 481,000+ sq. ft. | 104,000+ sq. ft. | 1 million+ sq. ft. |

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

As shown in **Table IV-11**, the types and number of business establishments anticipated to be displaced include: automotive services (6), hotels/motels (4), industrial (8), rental services (4), restaurants (6), retail (22), car dealers (2), medical/dental services (5), fitness/athletic services (2), technology services (8), construction services (7), financial services (2), a personnel service establishment (1), a pet service establishment (1), music/audio services (2), signs/printing services (2), a travel service (1), a pest control service (1), a security service (1), miscellaneous professional service establishments (19), service stations (4), and unknown commercial (3). See **Appendix D: IH 35E Displacement Data** for a summary of displacements listed by municipality and type and **Appendix C: Corridor Maps** for geographic locations. Commercial

entities that may require special accommodations (i.e. large parcels to accommodate large commercial structures or parking areas, highway visibility, convenient highway access, or specific equipment), unique site design or travel way orientation, or unique zoning include:

- Hotels (D4, D5, D6, and D47);
- Industrial enterprises (D10, D14, D15, D24, D30, D44, D46, and D53);
- Self-storage facilities (D23 and D61);
- Gas stations (D1, D2, D18, and D29); and
- Car dealerships (D22 and D25).

Twenty 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. Eleven of these businesses are located within the City of Carrollton, and nine are located in the City of Farmers Branch. Within the City of Carrollton, 10 of the potentially displaced businesses are located in the Freeway zoning district or the Freeway zoning district with the IH 35E Overlay, while one displacement is located in the special purpose Transit Center-Urban Core zoning district. The Freeway zoning district permits car dealerships in excess of five acres and industrial wholesale and some industrial assembly uses by-right. Car dealerships less than five acres, hotels, self-storage facilities, and gas stations are permitted in the Freeway zoning district with a special use permit, which requires a special review and approval by the City of Carrollton City Council. The Transit Center-Urban Core zoning district is intended to ultimately allow only residential, retail, and office uses, but does permit hotels. Many other zoning districts within the City of Carrollton permit the identified types of potentially displaced businesses with possible unique relocation circumstances either by-right or with the approval of a special use permit. These include the Local Retail, Corporate Commercial, Light Commercial, Heavy Commercial, Commercial/Warehouse, Light Industrial, and Heavy Industrial zoning districts for hotels and gas stations; the Commercial/Warehouse, Light Industrial, and Heavy Industrial zoning districts for warehousing, assembly, and manufacturing industrial uses; and the Light Commercial, Heavy Commercial, Commercial/Warehouse, Light Industrial, and Heavy Industrial zoning districts for self-storage facilities and car dealerships.

Within the City of Farmers Branch, potentially displaced businesses with possible unique development or land use circumstances include hotels, gas stations, and industrial enterprises and are located in various Planned Development-Light Industrial zoning districts. The Planned Development-Light Industrial districts adjacent to most of the IH 35E ROW to the west in the City of Farmers Branch permit hotels and gas stations with the review and approval of a specific use permit by the City of Farmers Branch City Council. Most warehousing, assembly, and manufacturing industrial uses are either permitted by-right or with the approval of a specific use permit. The City of Farmers Branch does not contain any potential displacements of car dealerships or self-storage facilities. Other zoning districts within the City of Farmers Branch permit the identified types of potentially displaced businesses with possible unique relocation circumstances either by-right or with the approval of a specific use permit. These include the Commercial, Light Industrial, and Heavy Industrial zoning districts for hotels and gas stations and the Light Industrial and Heavy Industrial zoning districts for industrial enterprises.

In addition to the commercial real estate availability reflected in **Table IV-13** within the City of Carrollton, a sufficient amount of undeveloped land is located within zoning districts in which all of the potentially displaced businesses with possible unique circumstances would be permitted.

An inspection of the City of Carrollton's zoning map in relation to undeveloped land parcels reveals abundant appropriately zoned areas are available to be developed providing comparable site development design, access, size, and visibility needs. These undeveloped areas would provide an opportunity for potentially displaced businesses with unique needs to relocate in similar zoning districts. A total of 29 parcels of land equating to an estimated 71 acres is undeveloped within 1,000 ft of the IH 35E ROW and outside the 100-year floodplain within the City of Carrollton. Most of this undeveloped land is located in the Freeway zoning district, the Freeway zoning district with the IH 35E Overlay, or the Light Industrial zoning district, each of which permits all of the potentially displaced businesses with unique needs either by-right or with a special use permit. Of these undeveloped parcels, 10 range in size from 1.5-acre to two acres, 7 range from 2 to 5 acres, and 4 are greater than 5 acres. Available undeveloped smaller parcels less than two acres would likely accommodate uses generally demanding smaller parcel sizes such as gas stations and some hotels. Available undeveloped middle-sized parcels ranging from two to five acres would likely accommodate most hotels, most self-storage facilities, and many industrial enterprises. Larger undeveloped parcels greater than five acres would likely accommodate the full range of business entities with unique development or land use circumstances including car dealerships and all types of self-storage facilities and industrial enterprises. Further, these undeveloped parcels of land exclude those that are more distant than 1,000 ft from the IH 35E ROW, which would ultimately provide more opportunities for displaced businesses with or without possible unique circumstances to relocate and continue operations within the City of Carrollton.

The City of Farmers Branch also contains a sufficient amount of undeveloped land located in zoning districts in which all of the potentially displaced businesses with possible unique circumstances would be permitted. An inspection of the City of Farmers Branch's zoning map in relation to undeveloped land parcels reveals abundant appropriately zoned areas are available to be developed providing comparable site development design, access, size, and visibility needs. These undeveloped areas would provide an opportunity for potentially displaced businesses with unique needs to relocate in similar zoning districts. A total of 18 parcels of land equating to an estimated 86 acres is undeveloped within 1,000 ft of the IH35E ROW and outside the 100-year floodplain within the City of Farmers Branch. These undeveloped parcels are located in a variety of Planned Development zoning districts with most permitting hotels, gas stations, and some industrial uses either by-right or with the approval of a specific use permit. Of these undeveloped parcels, eight range in size from one-half an acre to two acres, five range from two to five acres, and three are greater than five acres. Available undeveloped smaller parcels less than two acres would likely accommodate uses generally demanding smaller parcel sizes such as gas stations and some hotels and industrial enterprises. Available undeveloped middle-sized parcels ranging from two to five acres would likely accommodate most hotels and industrial enterprises. Larger undeveloped parcels greater than five acres would likely accommodate the full range of business entities with unique development or land use circumstances including most industrial enterprises. Further, these undeveloped parcels of land exclude those that are more distant than 1,000 ft from the IH 35E ROW, which would ultimately provide more opportunities for displaced businesses with or without possible unique circumstances to relocate and continue operations within the City of Farmers Branch.

It is possible that some commercial entities may not be able to relocate within the immediate vicinity of their present location or current service areas due to the availability of commercial space, undeveloped parcels, or required zoning. However, the available commercial real estate summarized in **Table IV-13** and undeveloped sites that are currently available in commensurate

zoning districts indicate the relocation of potentially displaced businesses within the immediate community should be achievable.

*Minimization and Mitigation of Commercial Displacements*

**Cities of Carrollton and Farmers Branch Mitigation Efforts**

Although the Cities of Carrollton and Farmers Branch are not developing formal initiatives or plans to mitigate the impacts of business displacements as a result of the proposed IH 35E reconstruction from IH 635 to PGBT, representatives of both Cities have expressed a willingness to assist all potentially affected employers if it is practical and feasible to do so. The City of Carrollton's Director of Economic Development does not think the proposed IH 35E project warrants mitigation in the City of Carrollton unless all of the impacted businesses are unable to relocate or re-establish.

In addition to these efforts, although not directly related to the proposed reconstruction of IH 35E and its impact on businesses and employment opportunities, the City of Farmers Branch is developing a *Comprehensive Plan* update for the central area of the City that considers the economic impact of the potential displacements as well as the potential for redevelopment along the corridor. The area targeted by the *Plan* update is the City's central area that would also extend westward to approximately 150 feet west of the IH 35E ROW to include all property adjacent to the IH 35E corridor through the city. The *Plan* would focus on establishing unique gateways where IH 35E enters the city, it would introduce corridor design standards, it would focus on a different scheme of access management limiting exclusively auto-oriented access to properties, and would establish landscape features and green space along the portion of the IH 35E corridor where residual abutting land after ROW acquisition would not be deep enough to be developed. The *Plan* update would also promote land uses more compatible and complementary to the planned transit-oriented development (TOD) surrounding the proposed DART Farmers Branch Station. According to the Director of Planning, the *Plan* update is anticipated to be adopted by the Farmers Branch City Council by the end of 2011. Overall, the *Plan* would allow the City to establish economic amenities along the IH 35E corridor that more closely suit its goals and would ultimately lead to more private investment and corresponding employment opportunities in Farmers Branch.

**Texas Workforce Commission and Workforce Solutions**

The Texas Workforce Commission (TWC) is the state government agency charged with overseeing and providing workforce development services to employers and job seekers within the state of Texas. For employers, the TWC 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 TWC offers career development information, job search resources, training programs, and, as appropriate, unemployment benefits. While targeted populations receive intensive assistance to overcome barriers to employment, all Texans can benefit from the services offered by the TWC and its network of workforce partners.

The TWC 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.[12]

[12] Texas Workforce Commission, http://www.twc.state.tx.us/twcinfo/whatis.html

*Workforce Solutions for North Central Texas*

The Texas Workforce Center, which serves a portion of the Employment Opportunities Impacts Assessment study area in the City of Carrollton, is the Workforce Solutions operation 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, which 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;
- *WorkInTexas.com* – 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 *WorkInTexas.com* and other on-line employment resources;
- Job referrals;
- Demand occupations – required skills and earnings 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; and
- Assistance in establishing eligibility for non-Workforce Investment Act (WIA)-funded training and education programs; and
- Follow-up services (as appropriate).

As stated in **Appendix H: Employment Opportunities Impact Assessment**, a Workforce Development Manager was interviewed on June 16, 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. If 50 or more employees are to be laid off, employers must notify the Texas Workforce Commission regardless so that the Workforce Solutions staff is aware of employment needs and opportunities. 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.

TxDOT will commit to request that the Workforce Development Manager and appropriate staff 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 H** contains additional information regarding the role of Workforce Solutions for North Central Texas.

*Workforce Solutions Greater Dallas*

Workforce Solutions Greater Dallas, which serves the majority of the EOIA study area and the entirety of the area in which the potential business displacements would occur, is the local organization mandated to implement a system of services that complement economic development and functions as a resource for employers to access the quality employees they need. The organization also trains individuals to be successfully employed. The service area of Workforce Solutions Greater Dallas exclusively serves the labor force and employers in Dallas County.

Workforce Solutions Greater Dallas administers a broad range of programs to address local workforce issues with business-directed objectives, including job placement and referral services, job training, workplace education, child care, and educational initiatives to provide necessary support for every citizen of Dallas County to be successful at work. In implementing these programs, 10 centers throughout Dallas County provide access to both the labor force and employers. Specific programs administered by Workforce Solutions Greater Dallas include:

- Employer Services – Workforce Solutions has employer service representatives in each workforce center whose job is to outreach local employers, connect them to the workforce system, and work with them to see their employment-related needs are met.
- Employment Services – Each Workforce center has a staff of qualified employment service representatives whose job is to match and refer candidates to jobs for which they are qualified. These individuals may also counsel job seekers and assist them in meeting their employment needs.
- Workforce Investment Act (WIA) – WIA offers re-employment services for disadvantaged youths and adults, those unemployed due to downsizing, and those lacking competitive job skills. WIA also offers year-round services, short pre-vocational services, job placement assistance, and skills enhancement.
- Temporary Assistance for Needy Families (TANF) – Offers counseling, job readiness training, support services, assessment of skills and abilities, individual work readiness

training, and intensive work search for those who have utilized maximum welfare benefits under the new guidelines and time limitations.

- Food Stamp Employment and Training (FSE&T) – Assist food stamp recipients with obtaining employment by providing counseling, individual case management, job readiness training, transportation assistance, and intensive work search to assist them toward becoming employed and self-sufficient.
- Adult Basic Education for Welfare Recipients – Basic literacy, remediation, and General Education Diploma (GED) preparation to combat education deficiencies preventing individuals from becoming and remaining employed. This is carried out through collaboration with the public school system.
- Child Care Assistance – Federal, state, and local child care subsidies for children up to 10 years of age. Special funds are reserved for welfare families so parents may train and search for work.
- Transportation Services – Vouchers for transportation to and from work.
- Vision Correction – Vision screenings and necessary eyewear provided through a network of eye care specialists.

An interview on September 30, 2010, with the outplacement services manager for Workforce Solutions Greater Dallas revealed that the services it would provide for employers and employees affected by the IH 35E reconstruction project would mirror that of Workforce Solutions North Central Texas because the service provisions for both organizations under these circumstances is federally modeled and prescribed. The outplacement services manager mentioned the potential for "rapid response workshops" to be conducted on behalf of affected employers to provide information to affected employees about job search assistance, potential retraining options, and unemployment benefits. Workforce Solutions Greater Dallas representatives would also be available to attend the Open House/Public Hearing for the proposed IH 35E project, if requested by TxDOT, to answer questions or present information on provided services. **Appendix H** contains additional information regarding the role of Workforce Solutions Greater Dallas.

*Summary of Commercial Displacement Impacts*

Relocation of the anticipated 111 commercial entities can 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 re-establishment 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 EOIA 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's 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' interests in continued employment with the business.

Additionally, future employment opportunities of varying skill requirement intensities are likely to develop within the EOIA study area detailed in **Appendix H** based on information provided by the NCTCOG's Development Monitoring database, DART and DCTA regional rail

expansions, and interviews with stakeholders including local chambers of commerce as well as planning and economic development representatives within the EOIA study area. The addition of new businesses discussed in **Appendix H** would create additional employment opportunities throughout the EOIA 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 the City of Denton and the Dallas Central Business District and additional regional employment centers in between.

The City of Farmers Branch's willingness to assist all potentially affected employers if it is practical and feasible to do so may allow the City to retain a large number of potentially affected employees and further retain the benefits of the economic ripple effect associated with employees' local consumer spending, resultant tax revenue, and the provision of City services. In addition, the development of the City of Farmers Branch's *Comprehensive Plan* update for the City's central area would allow the City to establish a desired cityscape, establish economic amenities along the IH 35E corridor that more closely suit the City's goals ultimately leading to more private investment and corresponding employment opportunities, and promote land uses more compatible and complementary to the planned TOD surrounding the proposed DART Farmers Branch Station. According to the City of Carrollton's Economic Development Director, the proposed project does not warrant mitigation in the city unless the impacted businesses are unable to relocate or re-establish. In addition, both the Workforce Solutions for North Central Texas and Workforce Solutions Greater Dallas 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.

Although the aforementioned impacts to employment associated with displacements are anticipated to occur, both the Cities of Carrollton and Farmers Branch generally view the proposed improvements as a benefit to the IH 35E corridor. When potential direct effects to employment are analyzed in the context and intensity in which they are to occur, it does not appear that 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 US 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.[13] 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 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 determined by the U.S. Census Bureau. The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is low-income and follows the Office of Management and Budget's (OMB) Statistical Policy Directive 14 in establishing the thresholds. In 2011, the weighted average low-income threshold for a four person family is at or below $22,350.

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."

[13] U. S. Department of Transportation, Federal Highway Administration. *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 6640.23.* December 2, 1998.
[14] *Ibid.*

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 socio-economic 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, poverty, and LEP population analyses. See **Figure 7: 2000 Census Blocks** in **Appendix A**.

*Definition of Low-Income or Minority Population Study Areas*

The study areas for the low-income or minority population analyses differ due to the availability of census data. The area traversed by the proposed IH 35E improvements lies within 13 census block groups. The 13 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 202 census blocks fall within a ¼ mile area adjacent to the proposed project limits. A ¼ mile buffer was utilized to create a study area which identifies those populations who reside adjacent to the roadway. 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 associated with the project area census blocks were used for this part of the analysis. These 13 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-14**. Median household incomes of census block groups comprising the low-income population study area ranged from $30,326 to $62,845 according to *Census 2000*. See **Figure 8: Census Block Groups and Displacements** in **Appendix A** for a location of the census block groups.

**Table IV-14: Median Household Income and Poverty Status**

| Census Tract | Census Block Group | Population* | Median Household Income | Persons Below Poverty Level | |
|---|---|---|---|---|---|
| | | | | Number | Percent |
| CT 99.00 | 1 | 559 | $30,326 | 158 | 28.3 |
| CT 137.13 | 1 | 2,417 | $32,076 | 454 | 18.8 |
| CT 137.14 | 1 | 1,301 | $34,375 | 516 | 39.7 |
| | 3 | 1,683 | $44,531 | 251 | 14.9 |
| CT 137.16 | 1 | 1,461 | $50,536 | 115 | 7.9 |
| CT 137.17 | 1 | 2,016 | $40,208 | 174 | 8.6 |
| | 2 | 925 | $35,000 | 127 | 13.7 |
| CT 137.19 | 1 | 1,984 | $37,656 | 322 | 16.2 |
| CT 139.01 | 1 | 1,394 | $40,536 | 81 | 5.8 |
| | 3 | 880 | $48,424 | 135 | 15.3 |
| CT 140.01 | 3 | 697 | $47,109 | 20 | 2.9 |
| | 4 | 1,269 | $62,845 | 142 | 11.2 |
| CT 140.02 | 1 | 863 | $45,446 | 64 | 7.4 |
| **Low-Income Population Study Area Total** | | **17,449** | **N/A** | **2,559** | **14.7** |

*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 2011 poverty threshold. The percentage of the total study area population with incomes below the poverty level is 14.7 percent. The percentage of persons living below the poverty level ranges from 2.9 to 39.7 percent for the individual census block groups. As shown in **Table IV-14**, there is 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 within the project limits. Refer to **Table IV-16** for *Census 2000* data and anticipated displacement counts by census block group 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 minority populations study area or individual census blocks is greater than or equal to 51 percent. Data from *Census 2000* for the 202 census blocks, shown in **Appendix D**, were used in this analysis. The 202 census blocks comprising the minority population study area have a total population of 5,519. Overall, minorities account for 65.9 percent of the minority population study area. The 202 census blocks exhibit minority percentages ranging from 0.0 percent to 100.0 percent. Of the 202 census blocks that comprise the minority population study area, 22 exhibit a minority population greater than or equal to 51 percent. These 22 predominantly minority census blocks are located south of the IH 635/IH 35E interchange in the City of Dallas and east of IH 35E within the Cities of Farmers Branch and Carrollton. Windshield surveys did not result in the identification of minority communities or neighborhoods within the project limits. Of these 22 predominantly minority census blocks, 2 census blocks would contain 2 of the 138 total anticipated displacements.

**Appendix D: Percent Minority Population Data** contains the percent minority population for each census block in the minority population study area.

*Displacements and Environmental Justice*

**Table IV-15** summarizes the displacement impacts by municipality along the IH 35E corridor from IH 635 to PGBT. Approximately 86.4 acres of additional ROW would be required for the

preferred alternative resulting in the displacement of 111 business establishments, 24 vacant buildings/suites, and 3 places of worship for a total of 138 displacements.

**Table IV-15: Summary of Potential Displacements**

| Type of Displacement | Municipality | | Number of Displacements |
|---|---|---|---|
| | Carrollton | Farmers Branch | |
| Residential | 0 | 0 | 0 |
| Business Establishments | 84 | 27 | 111 |
| Vacant Buildings/Suites | 19 | 5 | 24 |
| Places of Worship | 1 | 2 | 3 |
| **Total** | **104** | **34** | **138** |

Source: Proposed Design Schematic (January 2009); Field observations (January 2009); ArcGIS 9.2.

**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 population, and elderly population data were 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) that 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. Out of a total of 13 census block groups affected by the proposed project, 2 census block groups contain the anticipated 138 displacements. **Table IV-16** provides various *Census 2000* data and anticipated displacement counts associated with the proposed IH 35E improvements.

**Table IV-16: 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] | Total Environmental Justice Population Percent[3] | Total Number of Displacements |
|---|---|---|---|---|---|---|---|---|---|
| CT 99.00, BG 1 | Farmers Branch/ Dallas | 559 | 77.1% | 28.3% | $30,326 | 53.7% | 5.0% | 100% | 0 |
| CT 137.13, BG 1 | Carrollton | 2,481 | 95.2% | 18.8% | $32,076 | 17.4% | 2.2% | 100% | 0 |
| CT 137.14, BG 1 | Carrollton | 1,301 | 65.5% | 39.7% | $34,375 | 37.4% | 10.5% | 100% | 0 |
| CT 137.14, BG 3 | Carrollton/ Farmers Branch | 1,689 | 76.7% | 14.9% | $44,531 | 19.2% | 5.3% | 91.6% | 0 |
| CT 137.16, BG 1 | Carrollton | 1,660 | 48.8% | 7.9% | $50,536 | 30.2% | 18.3% | 56.7% | 0 |
| CT 137.17, BG 1 | Carrollton | 2,016 | 64.7% | 8.6% | $40,208 | 17.4% | 2.0% | 73.3% | 0 |
| CT 137.17, BG 2 | Carrollton | 925 | 47.7% | 13.7% | $35,000 | 15.2% | 5.0% | 61.4% | 0 |
| CT 137.19, BG 1 | Carrollton | 1,996 | 68.3% | 16.2% | $37,656 | 36.3% | 5.1% | 84.5% | 12 |
| CT 139.01, BG 1 | Farmers Branch | 1,394 | 61.9% | 5.8% | $40,536 | 29.1% | 10.0% | 67.7% | 0 |
| CT 139.01, BG 3 | Farmers Branch | 880 | 75.1% | 15.3% | $48,424 | 9.7% | 5.9% | 90.4% | 0 |
| CT 140.01, BG 3 | Farmers Branch | 697 | 37.2% | 2.9% | $47,109 | 9.9% | 9.9% | 40.1% | 0 |
| CT 140.01, BG 4 | Farmers Branch/ Dallas | 1,363 | 37.9% | 11.2% | $62,845 | 23.3% | 8.0% | 49.1% | 0 |
| CT 140.02, BG 1 | Farmers Branch/ Dallas/ Carrollton | 863 | 8.6% | 7.4% | $45,446 | 41.9% | 24.4% | 16.0% | 126 |
| | | | | | | | | **Total** | **138** |

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), 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 two census block groups anticipated to be impacted by displacements, only one census block group (CT 137.19, BG 1) equals or exceeds 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):

- The only EJ census block group (CT 137.19, BG 1) with anticipated displacements contains 12 (8.7%) of the total anticipated displacements associated with the proposed project;
- The second census block group (CT 140.02, BG 1) anticipated to contain displacements, which is not considered an EJ census block group, contains 126 (91.3%) of the total anticipated displacements and contains the lowest percentage of EJ population among the 13 total census block groups affected by the proposed project;
- CT 99, BG 1; CT 137.13, BG 1; and CT 137.14, BG 1 contain the highest percentage of EJ population (100% each) and none of the anticipated 138 displacements;
- CT 99, BG 1 contains the highest percentage of disabled population (53.7%) and none of the anticipated displacements;
- Although not an EJ census block group, CT 140.02, BG 1 contains the highest percentage of elderly population (24.4%), the lowest percentage of minority population (16.0%), and 126 of the anticipated 138 displacements.

Limited Availability of U.S. Census Data for Businesses and Places of Worship

All of the anticipated displacements associated with the proposed IH 35E improvements are non-residential and involve either existing businesses or places of worship. The information provided and analyzed in **Table IV-16** relating to characteristics of census block groups with anticipated displacements does not address characteristics or provide aggregate information concerning businesses or places of worship in each of the census block groups. *Census 2000* data are exclusively residentially based information and are explicitly designed to describe the characteristics of populations residing at the respective geographic scales covered by the U.S. Census Bureau's spatial data collection methodology. Data related to business values, values of business occupant spaces, specific characteristics of business employees or owners, or business revenues are not readily available or easily accessible and therefore cannot be analyzed using the same type of information provided by *Census 2000* to describe residential populations. Demographic characteristics for place of worship congregations are also not provided by the U.S. Census Bureau. However, the three places of worship that are anticipated to be impacted were contacted during November and December 2009 in order to gain information regarding the demographic composition of the congregation, community outreach programs, typical commute distances, and ability of congregation to follow the places of worship to other locations. Two of the three places of worship responded to inquiries regarding their congregations and potential impacts of the proposed project.

Environmental Justice Effects

As acknowledged in this document, three places of worship (churches) would be displaced as a result of the proposed improvements. All three churches' congregations are comprised of varying representations of minority and low-income populations. As discussed in **Section IV.C.1**, Hebron Pentecostal Fellowship provides services in English, Spanish, and Indian (Malayalam); and Iglesia Adventista del Norte de Dallas provides services in English and Spanish.

Negative impacts anticipated to be absorbed by these three churches include the potential for longer commute times for church members to participate in services and/or community outreach programs, relocation of the churches to areas outside of the existing community service areas, and potential increases in rent for the two churches who are currently tenants of commercial properties. These examples of negative impacts will have varying degrees of effects to the individuals that comprise the three churches' congregations as individuals travel anywhere from 5 to 50 miles to attend church services. Based on the results of discussions with two of the three churches, there are no known individuals with the congregations that walk to church services. No school or daycare programs are provided during the week by the Hebron Pentecostal Fellowship or Machaira Bible Church; however, on-site services for weddings and funerals are offered by these churches. Community outreach programs (i.e. Hebron Pentecostal Fellowship's assistance to Indian immigrants) do not appear to be location-specific; in other words, the outreach programs cater to individuals who may reside outside of the immediate communities in which these churches are located. Conversations with representatives of two churches who responded were confident that their congregations would follow the churches to a new physical location.

The physical relocation of these churches would impact the congregations in varying degrees; however, TxDOT's relocation program would assist all three churches (tenants as well as property owners) with locating adequate replacement sites. As stated in **Section IV.C.1**, all property owners from whom property would be acquired are entitled to receive just compensation for their land and property. TxDOT also provides payments and services to aid in movement to a new location through its Relocation Assistance Program. The TxDOT Relocation Office would relocate these churches and would provide assistance to the churches (non-profit organizations) to aid in their satisfactory relocation.

Additional Public Comments Concerning Anticipated Displacements

As described in **Section I.F**, 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 IH 635 and PGBT) in the form of a public meeting and stakeholder work group meetings. In addition to the public meeting held on November 17, 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 IH 635 and PGBT. Municipal officials do not foresee any potential for community cohesion impacts because IH 35E is an existing interstate corridor.

A total of four written comments associated with the IH 35E corridor between IH 635 and PGBT were provided at the public meeting held on November 17, 2008. One of the comments suggested the use of five non-tolled general purpose lanes in each direction. This comment was not specific to the portion of the IH 35E improvements between IH 635 and PGBT but addressed proposed improvements associated with the Middle and South sections. One of the other comments was positive in that it suggested satisfaction that no ROW would be acquired from a particular business' property according to the latest schematic. No comments were provided that objected to any of the anticipated displacements. A *Public Meeting Summary for the IH 35E Improvements* documents the public meeting held on November 17, 2008 and the written

comments which resulted from the public meeting (no verbal comments were provided during the meeting).

*Origin-Destination Analysis*

**Overview**

Origin-destination (O&D) data secured from the NCTCOG were used for further analysis of "user impacts" of the Build scenario, which includes two proposed tolled HOV/managed lanes, on low-income and minority populations. Studying O&D 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. 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 two 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 developed as a basis for estimating travel patterns. 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 MPA boundary before its expansion to a 12-county region in October 2009. Given regional operating characteristics of IH 35E, it is reasonable to assume the MPA contains the proposed project daily users. This study area consists of 5,000 square miles and encompasses five entire counties (Collin, Dallas, Denton, Rockwall, and Tarrant Counties) and four partial 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, 3,222 TSZs are anticipated to regularly utilize the IH 35E facility (from IH 635 to PGBT) in 2030 under the Build scenario (originating at least one trip per day). This represents 66.9 percent of the total study area TSZs. In contrast, 3,231 TSZs would utilize the IH 35E facility (from IH 635 to PGBT) under the No-Build scenario. This indicates the vast majority of identified "user" TSZs would utilize the facility in 2030, regardless if the proposed reconstruction takes place.

TransCAD®, a Geographic Information System (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 (from IH 635 to PGBT) 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 1,632 EJ TSZs were identified within the NCTCOG study area. Of the identified EJ TSZs, a total of 1,185 are anticipated to regularly utilize the proposed IH 35E facility (originating at least one trip per day) according to the Build scenario results. See **Appendix D: IH 35E Origin-Destination Analysis Data** for demographic profiles and number of trips associated with all TSZs anticipated to use IH 35E (from IH 635 to PGBT) as well as census tracts affiliated with the EJ TSZs. See **Appendix A: Figure 9** for the locations of EJ TSZs and non-EJ TSZs anticipated to use IH 35E in the Build scenario (from IH 635 to PGBT), and **Appendix A: Figure 10** for 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 (from IH 635 to PGBT) 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 IH 635 to PGBT). 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, 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 (from IH 635 to PGBT) 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.

[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.

**Analysis Results**

Data analysis indicates that of approximately 56,658 total trips which originate from TSZs anticipated to utilize IH 35E in the Build scenario; approximately 21.3 percent (12,074 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 45,875. Approximately 20.9 percent, or 9,600 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-17** compares the No-Build and Build scenario O&D results.

**Table IV-17: 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) | 3,222 | 56,658 | 1,185 | 11,255 | 21.3% |
| IH 35E (2030 No-Build Scenario) | 3,231 | 45,875 | 1,632 | 9,600 | 20.9% |

Source: NCTCOG TransCAD® data for 2030 Build and No-Build scenarios
The study area (MPA) is composed of 4,813 total TSZs and 1,632 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, two environmental justice effects were identified: displacements of three places of worship (two of which confirmed provision of services to non-English speaking populations) and the economic impact of tolling. However, when considering the totality of effects of this project, the overall benefits provided for the entire community, including low-income and minority populations, outweigh the specific concerns about environmental justice that are discussed in this document. Over the long term, the entire corridor and users would benefit from the proposed IH 35E project as a result of increased capacity, reduced traffic congestion, and improved mobility in the area.

Three written comments received from the public meeting held on November 17, 2008, did not indicate displacements as a concern. No comments were provided during the November 2008 public meeting to object to displacements. However, conversations with two of the three potentially displaced places of worship held during November and December 2009 revealed that relocating the church facilities is not desired by the congregations, however the congregations would adapt to new church facility locations if necessary. Community outreach and services offered by the potentially displaced churches are not limited to the municipalities in which the churches are physically located and members of the congregations travel up to 50 miles to attend or participate in services, therefore physical relocation of the churches is not anticipated to be a detrimental impact to the congregations which are comprised of low-income or minority populations. The displacement relocation analysis presented in **Section IV.C.1** reveals available

commercial real estate summarized in **Table IV-13,** and undeveloped sites that are currently available in commensurate zoning districts indicate the relocation of potentially displaced businesses and places of worship within the immediate community should be achievable.

Acquisition and relocation assistance would be in accordance with the TxDOT Right-of-Way Acquisition and Relocation Assistance Program. The TxDOT Relocation Office would provide assistance to displaced businesses and non-profit organizations to aid in their satisfactory relocation with a minimum of delay and loss in earnings. As mentioned previously, the Cities of Carrollton and Farmers Branch are not developing formal initiatives or plans to mitigate the impacts of business displacements as a result of the proposed reconstruction of IH 35E from IH 635 to PGBT. However, the City of Farmers Branch is assisting two potentially affected employers along the corridor with mitigation that have approached the City for help. In addition to these efforts, the City of Farmers Branch is developing a *Comprehensive Plan* update for the central area of the city, which includes the IH 35E corridor, that considers the economic impact of the potential displacements as well as the potential for redevelopment along the corridor. Overall, the *Plan* update would allow the City to establish economic amenities along the IH 35E corridor that more closely suit its goals and would ultimately lead to more private investment and corresponding employment opportunities in Farmers Branch. The City of Carrollton's Economic Development Director posited that the proposed IH 35E project would not warrant specific mitigation in the City of Carrollton unless all of the impacted businesses are unable to relocate or re-establish. 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 an 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 travel time impact of tolls by either utilizing the non-tolled mainlanes, non-tolled 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 indicate 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 91 percent) would occur in non-environmental justice census block groups, 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 use 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 an 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 could continue to be limited, which could 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.

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. 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 Dallas metropolitan statistical area (MSA) is comprised of Dallas, Denton, Collin, Ellis, Kaufman, Hunt, Henderson, and Rockwall counties and experienced major growth in population during the 1990's. The eight-county Dallas MSA grew by 842,928 persons, from a population of 2,676,248 in 1990 to 3,519,176 in 2000, a 31.5 percent rate of growth. 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.

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 and the project area are expected to grow dramatically through the year 2030. The NCTCOG 2030 Demographic Forecast projects Dallas County growing from a 2000 population of 2,232,500 to a population of 2,817,200 by 2030, an increase of 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.

[16] U.S. Bureau of Labor Statistics, http://www.bls.gov/
[17] Moody's Economy.com, http://www.economy.com

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

Negative impacts that may result from the proposed improvements could require community members to travel a further distance from their present community because of the relocation of commercial facilities and places of employment. The congregations of the three potentially relocated places of worship may be required to travel a further distance to participate in worship services or community outreach programs depending on the relocation of these facilities. Positive impacts that may result from the proposed improvements include redevelopment of the IH 35E commercial frontage on the west side of IH 35E. The potential redevelopment could yield additional commercial retail or places of employment opportunities for community members. Over the long term, it is anticipated that all users of the IH 35E corridor within the adjacent community would benefit from the proposed project's increase in capacity, managed traffic congestion, and improved mobility in the area.

As described in **Section I.F**, 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 17, 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.

Cohesive communities and neighborhoods located within the municipalities traversed by IH 35E would likely remain intact even with relatively large potential short- to mid-term impacts to businesses and three places of worship along the IH 35E corridor because the communities and neighborhoods in the affected municipalities were developed with the presence of the existing IH 35E facility already functioning as a physical barrier between neighborhoods. While a relatively large number of commercial displacements are anticipated, data regarding available commercial facilities within each impacted municipality suggest vacancies exist to accommodate commercial relocations within the same communities for the most part (**Section IV.C.1**), and the City of

Farmers Branch is taking action to minimize impacts to two of the largest potentially displaced commercial establishments to allow those business entities to stay at their current locations.

*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

EO 13166 on LEP calls for all agencies to ensure that their federally conducted programs and activities are meaningfully accessible to LEP individuals. The US 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 US 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 24.9 percent of the population within the 13 census block groups along the proposed project limits speaks English "Not Well" or "Not at All." All of the 13 census block groups adjacent to the IH 35E corridor contain LEP populations according to *Census 2000*; LEP populations among the 13 census block groups ranged from approximately 5.9 to 57.6 percent. Specific LEP languages and respective percentages represented in the LEP study area are the following: Spanish (22.6 percent), Other Indo-European (0.9 percent), Asian and Pacific Islander (1.3 percent), and Other (<0.1 percent). In a windshield survey along the proposed project corridor, English and Spanish were the only languages observed on billboards and signs. **Table IV-18** summarizes the LEP population for the study area.

**Table IV-18: Percentage LEP Population**

| Census Tract | Census Block Group | Total Pop 5 Years and Older | Total Number Who Speak English "Not Well" or "Not at All" | % LEP |
|---|---|---|---|---|
| CT 99.00 | 1 | 486 | 117 | 24.1 |
| CT 137.13 | 1 | 2,192 | 1,263 | 57.6 |
| CT 137.14 | 1 | 1,190 | 286 | 24.0 |
| | 3 | 1,519 | 566 | 37.3 |
| CT 137.16 | 1 | 1,533 | 238 | 15.5 |
| CT 137.17 | 1 | 1,757 | 486 | 27.7 |
| | 2 | 785 | 146 | 18.6 |
| CT 137.19 | 1 | 1,818 | 156 | 8.6 |
| CT 139.01 | 1 | 1,291 | 253 | 19.6 |
| | 3 | 813 | 197 | 24.2 |
| CT 140.01 | 3 | 657 | 67 | 10.2 |
| | 4 | 1,264 | 189 | 15.0 |
| CT 140.02 | 1 | 841 | 50 | 5.9 |
| **LEP Study Area Total** | | **16,146** | **4,014** | **24.9** |

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

TxDOT has included the LEP population in the planning and public involvement process. Preparation for the November 2008 public meeting included the publication of Bilingual (English/Spanish) announcements in local papers, such as *Al Dia*, which informed citizens of the opportunity to request an interpreter (for language or other special communication needs) to be present at the public meetings. No requests for interpreters or other special communication needs were communicated by the public during the preparation for the previous public meeting. 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. Bilingual announcements would also be mailed to known community organizations, such as the three anticipated places of worship, that provide services to Spanish populations. Eight 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 an 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 an 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 operation impacts.

The 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 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 than currently exist (increase from six to eight non-toll mainlanes).

*Non-Toll Alternatives*

Although the proposed project would not distribute the benefits of travel 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 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 in addition to the frontage roads being made continuous, reduced congestion and improved mobility along the free mainlanes and frontage road lanes would benefit all users of IH 35E from IH 635 to PGBT, 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-tolled mainlanes due to a lower posted speed limit and signalization. This difference in travel times between the tolled HOV/managed lanes and the non-toll mainlanes and non-tolled 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 IH 635 to PGBT is partially located within the DCTA service area and partially located within the DART service area. DCTA is a coordinated county transportation authority that serves Denton County's public transportation needs. However, DCTA provides commuter bus service from locations in Denton County to locations in Dallas County. DART is a regional transportation agency that serves Dallas County's public transportation needs. However, DART service extends partially into surrounding counties, including part of Denton County. Regularly scheduled trips service the proposed project limits.[18]

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 one stop at the Trinity Mills station park-and-ride and rail transit facility located near the intersection of Dickerson Parkway and IH 35E, which offers customers DART connection opportunities. 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.

Currently, DART provides bus service that uses the existing IH 35E facility from PGBT to downtown Dallas and other locations in Dallas County. The existing service plan for DART's bus service along IH 35E from IH 635 to PGBT provides numerous stops in the Cities of Carrollton and Farmers Branch. For certain routes along the IH 35E project limits, based on access to route stops, DART uses existing HOV lanes to provide faster and more reliable service. Like DCTA vehicles, per RTC policy, when DART vehicles utilize the IH 35E HOV/managed lanes, no toll charges would be applied to DART, and transit vehicles would be exempt from toll charges along IH 35E.

[18] Dallas Area Rapid Transit (DART), http://www.dart.org/ and Denton County Transportation Authority (DCTA), http://www.dcta.net/

Tolled HOV/managed lane 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 in which tolls would be waived for the transit provider as outlined in **Appendix D: Business Terms for TxDOT-Sponsored Managed Lane Facilities**. The proposed project is not anticipated to adversely affect transit usage. The tolled HOV/managed lanes component of the proposed project would provide DCTA and DART 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. Because transit ridership is relatively high among low-income families compared to middle and high-income families, according to the American Public Transit Association's *Transit Fact Book*, it is anticipated that low-income users, by comparison, would be most likely to benefit from the time cost savings of the tolled HOV/managed lanes using public transit.

## 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 SOV and HOV users. The toll rate guidelines for regional HOV/managed lanes are the result of public outreach and decisions made by the RTC. 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 (during the first six months of operation) 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 2025. 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 mph. 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 SOVs.

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 mainlanes and frontage road lanes, 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 tolled 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,* was 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. Although the proposed project is located in Dallas County, according to NCTCOG data, a substantial number of users reside in Denton County. Therefore, economic impacts of tolling associated with the proposed project are investigated for both Dallas and Denton Counties.

Anticipated toll rates and total cost impacts to users are provided for each scenario for the assumed opening year (2025). For each scenario, the average travel distance per household that would use the proposed tolled HOV/managed lanes on IH 35E from IH 635 to PGBT would be 4.5 miles out of the total 5-mile section and would equate to 9 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 4.5-mile assumption of average travel distance using the proposed tolled HOV/managed lanes along the approximately 5-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 travel 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. For additional trip length information, see **Appendix D: Traffic and Revenue Analysis Consistency and MTP Phasing Compatibility**.

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 tolled lanes when the perceived benefits of travel 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 typical user traveled on HOT lanes from a lower limit of once or less a week to an upper limit among the case studies of 2.5 times per week. Based on these 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 2025 would be 85 cents per mile and reflects the highest priced period for use of the tolled HOV/managed lanes among the three scenarios. This 85-cent toll rate is adjusted for a 2.75 percent per year inflation rate and is based on a toll rate of 55 cents per mile in the year 2009. 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 $994.50 per year. A user with an inflation-adjusted (2.75 percent) annual household income in 2025 of $108,833 based on the 2009 median household income for Denton County ($70,510) would spend approximately 0.9 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $70,980 based on the 2009 median household income for Dallas County ($45,986) would spend approximately 1.4 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with inflation-adjusted incomes in 2025 of $32,676 based on the 2011 DHHS-established poverty level of $22,350 (for a family of four) would spend approximately 3.0 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 2.1 percent and 1.6 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 2025 would be 23 cents per mile and reflects the second highest priced period for use of the tolled

HOV/managed lanes among the three scenarios. This 23-cent toll rate is adjusted for a 2.75 percent per year inflation rate and is based on a toll rate of 15 cents per mile in the year 2009. 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 $215.28 per year. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $108,833 based on the 2009 median household income for Denton County ($70,510) would spend approximately 0.2 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $70,980 based on the 2009 median household income for Dallas County ($45,986) would spend approximately 0.3 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with inflation-adjusted incomes in 2025 of $32,676 based on the 2011 DHHS-established poverty level of $22,350 (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 2025 would be 15 cents per mile and reflects the lowest priced period for use of the tolled HOV/managed lanes among the three scenarios. This 15-cent toll rate is adjusted for a 2.75 percent per year inflation rate and is based on a toll rate of 10 cents per mile in the year 2009. 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 $140.40 per year. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $108,833 based on the 2009 median household income for Denton County ($70,510) would spend approximately 0.1 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $70,980 based on the 2009 median household income for Dallas County ($45,986) would spend approximately 0.2 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with inflation-adjusted incomes in 2025 of $32,676 based on the 2011 DHHS-established poverty level of $22,350 (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 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 HOV/managed lanes, which would be less congested. Under the mid-day and off-peak scenarios, a travel time savings benefit may 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. 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 travel 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*[19]

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.

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

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

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. Users can make cash payments 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 cannot 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 2025. 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. Although the proposed project is located in Dallas County, according to NCTCOG data, a substantial number of users reside in Denton County. Therefore, economic impacts of tolling associated with the proposed project are investigated for both Dallas and Denton Counties.

**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 2025 would be 85 cents per mile and reflects the highest priced period for use of the tolled HOV/managed lanes among the three scenarios. This 85-cent toll rate is adjusted for a 2.75 percent per year inflation rate and is based on a toll rate of 55 cents per mile in the year 2009. 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 $1,442.03 per year. A user with inflation-adjusted (2.75 percent) annual household income in 2025 of $108,833 based on the 2009 median household income for Denton County ($70,510) would spend approximately 1.3 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $70,980 based on the 2009 median household income for Dallas County ($45,986) would spend approximately 2.0 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with inflation-adjusted incomes in 2025 of $32,676 based on the 2011 DHHS-established poverty level of $22,350 (for a family of four) would spend approximately 4.4 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 3.1 percent and 2.4 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 2025 would be 23 cents per mile and reflects the second highest priced period for use of the tolled HOV/managed lanes among the three scenarios. This 23-cent toll rate is adjusted for a 2.75 percent per year inflation rate and is based on a toll rate of 15 cents per mile in the year 2009. 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 $312.16 per year. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $108,833 based on the 2009 median household income for Denton County ($70,510) would spend approximately 0.3 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $70,980 based on the 2009 median household income for Dallas County

($45,986) would spend approximately 0.4 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with inflation-adjusted incomes in 2025 of $32,676 based on the 2011 DHHS-established poverty level of $22,350 (for a family of four) would spend approximately 1.0 percent of their annual household income on IH 35E HOV/managed lane tolls, which would account for approximately 0.7 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 2025 would be 15 cents per mile and reflects the lowest priced period for use of the tolled HOV/managed lanes among the three scenarios. This 15-cent toll rate is adjusted for a 2.75 percent per year inflation rate and is based on a toll rate of 10 cents per mile in the year 2009. 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 $203.58 per year. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $108,833 based on the 2009 median household income for Denton County ($70,510) would spend approximately 0.2 percent of his or her annual household income on IH 35E HOV/managed lane tolls. A user with a inflation-adjusted (2.75 percent) annual household income in 2025 of $70,980 based on the 2009 median household income for Dallas County ($45,986) would spend approximately 0.3 percent of his or her annual household income on IH 35E HOV/managed lane tolls. However, households with inflation-adjusted incomes in 2025 of $32,676 based on the 2011 DHHS-established poverty level of $22,350 (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 EZTag® account results in higher costs for those utilizing 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:[20]

| | |
|---|---|
| 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

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

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. Users can make cash payments at the TxTag® Customer Service Center in Austin. Checks or money orders can be taken or mailed to the TxTag® Customer Service Center in Austin. Paying for the TollTag® can be handled by credit or a debit card. 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.

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 access 153 Ace Cash Express, Inc. locations in the DFW area to take advantage of services such as ZipCash payments, new cash-backed TollTag® accounts, and cash TollTag® account replenishment. NTTA customers receiving ZipCash invoices or ZipCash late invoices can also visit any Ace Cash Express, Inc. location to pay their bills. 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 more 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 travel 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 impact public facilities or services located in the Cities of

Dallas, Farmers Branch, or Carrollton. The proposed reconstruction would not prohibit access to or use of any public facility or service. It is anticipated the 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) properties are anticipated.

Alternative B: Build Impact
As stated in **Section IV.B.1.**, no use or take of any adjacent Section 4(f) or 6(f) properties would occur as a result of the proposed project. Therefore, no evaluation of Section 4(f) or 6(f) properties is required.

### 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 County, which is part of the EPA's designated nine county serious nonattainment 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 2035*) and the 2011-2014 TIP – 2011 Amendment. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011.

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.10,** modeling results under the worst case conditions indicate that CO concentrations would not exceed the NAAQS for the build scenario either in 2025 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 48 percent when compared to 2009. Please refer to **Section IV.A.10** 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.

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) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur (see **Table IV-19**).

**Table IV-19: Noise Abatement Criteria**

| Activity Category | FHWA dBA Leq | TxDOT dBA Leq | Description of Land Use Activity Areas |
|---|---|---|---|
| **A** | 57 (exterior) | **56 (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) | **66 (exterior)** | Residential. |
| **C** | 67 (exterior) | **66 (exterior)** | Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools , television studios, trails, and trail crossings. |
| **D** | 52 (interior) | **51 (interior)** | Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios. |
| **E** | 72 (exterior) | **71 (exterior)** | Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F. |
| **F** | -- | **--** | Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing. |
| **G** | -- | **--** | Undeveloped lands that are not permitted. |

NOTE: primary consideration is given to exterior areas (Category A, B, C, or E) where frequent human activity occurs. However, interior areas (Category D) 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 a receiver location (**Table IV-20** and **Appendix C: Corridor Maps, Sheets 2** and **3**) 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-20: Traffic Noise Levels (dBA Leq)**

| Receiver | NAC Category | NAC dBA Leq | Existing | Predicted (2030) | Change (+/-) | Noise Impact |
|---|---|---|---|---|---|---|
| R1-Comfort Inn Motel Pool | B | 67 | 66 | 74 | +8 | Yes |
| R2-Royal Inn Motel | D | 52 | 41 | 47 | +6 | No |
| R3-El Chico Café Restaurant | E | 72 | 66 | 76 | +10 | Yes |

As indicated in **Table IV-20**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers.

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

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dBA per five 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 the impacted receiver location with the following results:

R1 and R3: These receivers represent a motel and a restaurant with driveways facing the roadway. A noise barrier would have a detrimental effect on these receivers by restricting views and access by potential customers. Gaps in a noise barrier would satisfy access requirements but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of 5 dBA or the noise reduction design goal of 7 dBA. A noise barrier along the mainlanes would not restrict views and access by potential customers and may achieve the minimum feasible reduction of 5 dBA or the noise reduction design goal of 7 dBA at the motel and restaurant; however, it would exceed the reasonable, cost-effectiveness criterion of $25,000.

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

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2030) noise impact contours.

**Table IV-21: Traffic Noise Impact Contours**

| Land Use | Impact Contour | Distance from the Proposed ROW in ft |
|---|---|---|
| NAC Categories B & C | 66 dBA | 300 |
| NAC Category E | 71 dBA | 100 |

Access to the four 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. Traffic noise is expected to increase as the existing facility is widened and consequently would move traffic noise closer to receivers. The geometric characteristics of the proposed alignment, among other factors (i.e, traffic volume increase), were included in the traffic noise analysis performed for the project, which as indicated above, would result in a traffic noise impact. 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 will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

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

### 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 11 square mile area that includes the study corridor TSZs.

Congestion can best be described in terms of Level of Service (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-22**.

**Table IV-22: 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-23** 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-23,** 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 10 lane-miles of HOV/managed lanes operating under LOS A, B and C or 25 percent increase over the No-Build scenario. The analysis also indicates that under the Build scenario, there would be a total of 34 lane-miles or a 55 percent increase of general

purpose/mainlanes operating under LOS A, B, and C when compared to 22 lane-miles under the No-Build scenario. Under the Build scenario there would be a total of 26 lane-miles or a 24 percent increase of general purpose/mainlanes operating under LOS F when compared to the No-Build scenario. The LOS for the existing condition (2009) is provided in **Table IV-23** for comparison purposes. A copy of the NCTCOG Performance Reports pages, which contain the raw data used to perform the analysis, are included in **Appendix D**.

**Table IV-23: 2030 Level of Service Along the IH 35E South Project Limits**

| Location | LOS Existing Condition | 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 lanes | A-B-C (9 lane-miles) | A-B-C (8 lane-miles) | A-B-C ( 10 lane-miles) | 25 |
| | D-E (2 lane-miles) | D-E (2 lane-miles) | D-E (10 lane-miles) | |
| | F (0 lane-miles) | F (3 lane-miles) | F (5 lane-miles) | |
| **Total lane-miles** | **11** | **13** | **25** | |
| Mainlanes | A-B-C (26) | A-B-C (22 lane-miles) | A-B-C (34 lane-miles) | 55 |
| | D-E (10) | D-E (17 lane-miles) | D-E (8 lane-miles) | |
| | F (17) | F (21 lane-miles) | F (26 lane-miles) | |
| **Total lane-miles** | **53** | **60** | **68** | |

Source: NCTCOG TransCAD® data for the 2009 daily traffic existing condition and 2030 daily traffic Build and No-Build Alternatives (March 2009 Performance Reports for the IH 35E South 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. Lane closures would also comply with Texas 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-24** 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-24: Community Impact Assessment Summary

| Community | Community Demographic Profile[1] | | | | Demographic Forecast[2] | | | | Summary of Potential Community Impacts Related to the Build Alternative | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Population (2000) | Median Household Income & Percentage Low Income Population (2000) | Percentage Minority Population (2000) | Total Housing Units & Percentage Occupied (2000) | Population Growth Percentage (2000-2030) | Household Growth Percentage (2000-2030) | Employment Growth Percentage (2000-2030) | Displacements[3] | Public Facilities and Services | Section 4(f) and 6(f) Properties | Air Quality | Economic Impacts of Tolling | Traffic Noise | Traffic Operations |
| City of Carrollton | 109,215 | $62,406; 5.6% | 36.8% | 40,533; 96.6% | 13.4% | 13.8% | 21.9% | Commercial – 84<br>Vacant – 19<br>Places of Worship – 1<br><br>**Total - 104** | 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 proposed tolled HOV/managed lanes associated with the proposed project would result in low-income users spending a range of approximately 0.3 percent to 3.1 percent more of total household income than that of median-income users in Denton County and a range of approximately 0.2 percent to 2.4 percent more of total household income than that of median- | The project would result in a traffic noise impact with no feasible and reasonable mitigation. A noise barrier would have a detrimental effect on the impacted receivers (representing a motel and a restaurant) by restricting views and access by potential customers. In | The LOS comparison indicates that there would be an increase of 55% in the number of lane-miles operating under the A-B-C LOS. This would translate into an improvement of LOS. |
| City of Dallas | 1,188,204 | $37,628; 17.7% | 64.6% | 484,053; 93.3% | 16.8% | 18.7% | 33.8% | Commercial – 0<br>Industrial – 0<br>Other – 0<br><br>Total - 0 | 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. | | | |

| Community | Community Demographic Profile[1] | | | | Demographic Forecast[2] | | | | Summary of Potential Community Impacts Related to the Build Alternative | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Population (2000) | Median Household Income & Percentage Low Income Population (2000) | Percentage Minority Population (2000) | Total Housing Units & Percentage Occupied (2000) | Population Growth Percentage (2000-2030) | Household Growth Percentage (2000-2030) | Employment Growth Percentage (2000-2030) | Displacements[3] | Public Facilities and Services | Section 4(f) and 6(f) Properties | Air Quality | Economic Impacts of Tolling | Traffic Noise | Traffic Operations |
| City of Farmers Branch | 28,325 | $54,734; 6.3% | 44.1% | 10,220; 96.0% | 56.9% | 65.8% | 109.0% | Commercial – 27<br>Vacant – 5<br>Places of Worship – 2<br><br>**Total - 34** | 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. | income users in Dallas County. Although the benefits of travel time cost savings among different income groups would not be distributed evenly, other non-toll alternatives would be in place to offset the unequal distribution of benefits by the proposed project's opening year. All users of the tolled HOV/managed lanes would spend 45 percent more under the video billing scenarios than under the ETC scenarios. | addition, gaps in a noise barrier would satisfy access requirements but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of 5 dBA or the noise reduction design goal of 7 dBA. A noise barrier along the mainlanes would not restrict views and access by potential customers and may achieve the minimum feasible reduction of 5 dBA or the noise reduction design goal of 7 dBA at the motel and restaurant; however, it would exceed the reasonable, cost-effectiveness criterion of $25,000. | |

[1] U.S. Census Bureau, *Census 2000*, SF3 data.
[2] NCTCOG 2030 Demographic Forecast – All projections based on 2000 city boundaries.
[3]Other = Place of Worship, Medical Services, Vacant Building or unknown use.

# D. Other Resources

## D.1 Historic Resources

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.

**Previous Coordination**

This project was previously coordinated with the Texas Historical Commission (THC) in 2004. A reconnaissance survey undertaken in 2003 identified two historic properties: Site #8 and 22. TxDOT determined and THC concurred that these properties were eligible for NRHP-listing and that the proposed project posed no effect to the properties as stated in the November 18, 2004, letter in **Appendix E**).

**Current Coordination**

Due to design changes, additional reconnaissance surveys were undertaken 2009 and 2010. A review of the NRHP, the list of State Archeological Landmarks (SAL), and the list of Recorded Texas Historic Landmarks (RTHL) indicated that no historically significant resources were previously documented within the area of potential effects (APE). Consultation with the SHPO determined that the APE for the Dickerson Parkway extension is 150 ft from the existing and 300 ft from the proposed ROW and for the rest of the project, 150 ft from the existing and proposed ROW. The 2003, 2009, and 2010 surveys identified a total of 87 historic-age resources (built prior to 1966*)* located within the proposed project's APE. TxDOT historians determined that the only historic properties in the APE are the previously identified Sites #8 and 22.

**Effects to Historic Properties**

TxDOT historians re-examined the proposed project's effects to Sites #8 and 22 and maintain the original 2003 determination that the project poses **no effect** to the historic properties as documented in **Appendix E: Agency Correspondence**. As part of a separate rail project unrelated to this project, the old railroad depot (Site #8) was moved 300 ft to the east on the southwest corner of the intersection of Denton Drive and the railroad tracks. As a result, the property is even further away from the proposed project. Both properties are located on the east side of IH 35E and the widening at their locations is occurring to the west side of IH 35E. No

proposed ROW is required from the properties and the distance from the IH 35E existing ROW and pavement edge to the historic properties would remain the same. Consequently, the proposed project would not affect or diminish the character-defining features which qualify the properties for inclusion in the National Register.

Pursuant to Stipulation VI "Undertakings with the Potential to Affect Historic Resources" of the First Amended Programmatic Agreement Regarding the Implementation of Transportation Undertakings (PA-TU) between the Federal Highway Administration (FHWA), the Texas State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and the Texas Department of Transportation (TxDOT) and the Memorandum of Understanding (MOU), TxDOT historians determined and THC concurred that the proposed action has no potential to affect historic properties and that the proposed undertaking would have no reasonably foreseeable adverse effects that may occur later in time, be farther removed in distance, or be cumulative.

### D.2 Archeological Resources

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 13 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.

The project area between PGBT and IH 635 has been highly impacted by extensive and rapid urban build-up in the past few decades. Soils varied from place to place but generally consisted of a thin A-horizon one to six inches thick, composed of a dark loam, overlying a dense, dark clayey B-horizon. 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 Carrollton, Dallas, and Farmers Branch.

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. See **Appendix E**.

A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties (36 C.F.R. 800.16(1)). Section 106 review and consultation proceeded in accordance with the First Amended Programmatic Agreement among the FHWA,

TxDOT, the SHPO, and the ACHP Regarding the Implementation of Transportation Undertakings (PA-TU), as well as the MOU between the THC 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. The results of this coordination are still valid.

Pursuant to Stipulation VI of the PA-TU, TxDOT finds that the APE does not contain archeological historic properties (36 C.F.R. 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 waste/substance 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. Three additional sites were identified during the field investigations which were not identified in the database search. Based on the land use, it is likely that these sites contain either above-ground or under-ground storage tanks. Each of the sites identified in the field was assessed for the potential to encounter hazardous materials during construction and are included in **Table IV-26** as appropriate (labeled as N1-N3).

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 298 sites. The sites identified consisted of 8 Resource Conservation and Recovery Act- Generator (RCRAG) sites, 7 No Further Remedial Action Planned (NFRAP) sites, 4 Resources Conservation and Recovery Act- Corrective Action (RCRAC) sites, 6 Spills

Listing (SPILLS) sites, 2 Dry Cleaner Registration (DCR) sites, 79 Industrial Hazardous Waste (IHW) sites, 72 Petroleum Storage Tanks (TXPST) sites, 4 Affected Property Assessment Reports (APAR) sites, 1 Closed and Abandoned Landfill Inventory (CALF) site, 6 Innocent Owner/Operator Program (IOP) sites, 58 Leaking Petroleum Storage Tanks (TXLPST) sites, 2 Municipal Solid Waste Landfill (MSWLF) sites, 41 Tier II Chemical Reporting (TIER II) sites, 7 Texas Voluntary Cleanup Program (TXVCP) sites, and 1 Recycling Facility (WMRF) site.

Based on distance, topographic gradient, historical information, database information, and property impacts, 17 sites are categorized as high risk (see **Table IV-25**). 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. Thirty-five sites are characterized as low risk (see **Table IV-26**). The locations of these sites are shown on **Appendix C: Corridor Maps**.

**Table IV-25: High Risk Sites**

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 1 | Valwood Pkwy & IH 35<br>Dallas, TX 75234 | SPILLS | SPILLS (ID # 6/5/98002) – Material spilled was 200 gallons concrete additive and affected a drainage ditch.<br>SPILLS (ID# 8/1/90005) – Material spilled was 60-gallons diesel affecting Cooks Creek.<br>SPILLS (ID# 8/21/92014) – Material spilled was 46,000 pounds of calcium lignosulfate and affected unnamed tributary to Hutton Creek. | The site is located within the existing right-of-way. Spills occurred in 1998, 1990, and 1992, respectively. | 3 |
| 2 | Intersection of I-35 and Valley View<br>Dallas, TX 75234 | SPILLS | SPILLS (ID # 12/11/91015) – Material spilled was 100 gallons diesel and affected Farmers Branch Creek. | The site is located within the existing right-of-way. Spill occurred in 1991. | 1 |
| 3 | SB I35 approx 500 ft past Valley View<br>Dallas, TX 75234 | SPILLS | SPILLS (ID # 4/3/97024) – Material spilled was 30 gallons diesel. No waterways affected. | The site is located within the existing right-of-way. Spill occurred in 1997. | 1 |
| 5 | Essilor of America (formerly Omega Optical)<br>13515 N Stemmons Fwy.<br>Farmers Branch, TX 75234 | TIER II, RCRAG, IHW | TIER II (ID # 4Y8RU1002V8D, 3KLXRR002MFL) - Liquid nitrogen, sulfuric acid stored at the site. This facility passed all validation checks.<br>RCRAG, IHW (ID# TXD064114564) - Facility is a small quantity generator of industrial waste, including ignitable waste, corrosive waste, cadmium, chromium, lead, and mercury. | The site is at-grade. It is anticipated that a portion of the property along the eastern boundary of the parcel (D52) would be acquired. | 2 |

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 6 | Shell (formerly Exxon Mobil)<br>13115 Harry Hines Blvd<br>Farmers Branch, TX 75234 | TXLPST, TXPST, IHW | TXLPST (ID # 094230) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0026264) – One 550-gallon storage tank for used oil and three gasoline (one 6,000-gallon and two 8,000-gallon) storage tanks were removed from the ground in January 1987. One 1,000-gallon used oil storage tank was removed from the ground in November 1996. Three gasoline storage tanks (one 7,000-gallon, one 8,000-gallon, and one 11,000-gallon) have been in use since February 1987. | The site is downgrade. It is anticipated that the entire parcel (D61) would be acquired. | 1 |
| 7 | Chevron (formerly Mobil Oil)<br>13211 IH 35<br>Farmers Branch, TX 75234 | TXLPST, TXPST, IHW | TXLPST (ID # 094150) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0017540) – One 550-gallon tank storing used oil, one 4,000-gallon and two 10,000-gallon gasoline storage tanks were removed from the ground in April 1989. Two 10,000-gallon and one 12,000-gallon gasoline storage tanks have been in use since April 1989. | The site is at-grade. It is anticipated that the entire parcel (D60) would be acquired. | 1 |
| 11 | Structure demolished (formerly GC GasCard Services)<br>12900 Harry Hines Blvd Farmers Branch, TX 75234-5826 | TXLPST, TXVCP, TXPST | TXLPST (ID # 112564) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXVCP (ID # 637) – Facility is retail gas station. VOCs and TPH affected soil/groundwater. Remedy not reported. Certificate of completion date not reported.<br>TXPST (ID # 0047041) – Three 6,000-gallon gasoline storage tanks and one 500-gallon used oil storage tank were removed from the ground in April 2001. | The site is at-grade. It is anticipated that a portion of the property along the western boundary of the parcel would be acquired. No buildings would be displaced. | 1 |
| 12 | Fina (formerly Petro Mart/ Chevron)<br>14051 N Stemmons Fwy<br>Farmers Branch, TX 75234 | TXPST, TXLPST | TXLPST (ID # 102539) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0005589) – One 550-gallon used oil storage tank was removed from the ground in July 1986. One 1,000-gallon used oil storage tank was installed in July 1986, but has been temporarily out of use since May 1997. Underground storage tanks currently in use include one 7,632-gallon gasoline storage tank installed January 1978, one 9,728-gallon gasoline storage tank installed January 1981, one 9,728-gallon gasoline storage tank installed January 1984, and one 10,000-gallon diesel storage tank installed January 1985. | The site is at-grade. It is anticipated that the entire parcel (D44) would be acquired. | 3 |

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 26 | Harley Davidson (formerly Avis Rent A Car)<br>1845 N IH 35E<br>Carrollton, TX 75006 | TXPST, TXLPST | TXLPST (ID # 105220) – (3.1) Groundwater impact, public/domestic water supply well w/in 0.25-0.5 miles. (6A) Final concurrence issued case closed.<br>TXPST (ID # 0023809) – One 12,000-gallon diesel and one 12,000-gallon gasoline tank was removed from the ground in October 1992. | Site is at-grade with the proposed project. It is anticipated that a portion of the property along the eastern boundary of the parcel would be acquired. No buildings would be displaced. | 6 |
| 28 | Shell (formerly Paddy's One Stop Texaco)<br>1600 S Interstate 35 E<br>Carrollton, TX 75006-74 14 | TXLPST, TXPST | TXLPST (ID # 093869) - (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0049159) – Four 8,000 to 10,000-gallon gasoline and diesel storage tanks have been in use since August 1987. | The site is at-grade. It is anticipated that the entire parcel (D33) would be acquired. | 3 |
| 30 | Chevron (formerly Buddy's Texaco)<br>2360 Valwood Pkwy Dallas, TX 75234-3410 | TXLPST, TXPST | TXLPST (ID # 091418) - (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0006325) – One 4,000-gallon diesel storage tank and three 8,000-gallon gasoline storage tanks were removed from the ground in June 1995. One 560-gallon used oil storage tank was removed from the ground in March 1999. One 55-gallon tank has been in use since January 1980; the contents of the tank have not been reported. One 20,000-gallon gasoline storage tank has been in use since July 1995. | Site is at-grade with the proposed project. It is anticipated that a portion of the property western boundary of the parcel would be acquired. No buildings would be displaced. | 3 |
| 35 | Chromalloy Dallas Plant Two<br>1648 S IH 35<br>Carrollton, TX 75006 | TIER II, RCRAG, IHW | TIER II (ID # 477RU3001LCN) - Refrigerated liquid argon and hydrogen are stored on the site. This facility passed all validation checks.<br>RCRAG, IHW (ID # TXD058958265) - The site is a small quantity generator of industrial waste, including ignitable waste, corrosive waste, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and a number of halogenated and non-halogenated solvents | The site is downgrade. It is anticipated that the entire parcel (D38) would be acquired. Historic manufacturing utilizing chromium should be investigated. | 3 |
| 40 | Andrews Gunite/ A-1 Paint & Body<br>2326/2424 N IH35E<br>Carrollton, TX 75006 | TXLPST, TXPST, IHW | TXLPST (ID # 109789) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0005548) – One 1,000-gallon diesel storage tank was removed from the ground in August 1995. Two 2,000-gallon aboveground diesel storage tanks have been in use since November 2000. | The site is at-grade. It is anticipated that a portion of the property along the southwestern boundary of the parcel (D3) would be acquired. | 7 |

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 41 | Vacant (Thomas W J Family Partnership)<br>2420 N IH 35E<br>Carrollton, TX 75006 | TXLPST, TXPST | TXLPST (ID # 109791) – (3.1) Groundwater impact, public/domestic water supply well w/in 0.25-0.5 miles. (6A) – Final concurrence issued, case closed.<br>TXPST (ID # 0005550) – Three 1,000-gallon storage tanks (contents unknown) were removed from the ground in August 1995. | The site is at-grade. It is anticipated that the entire parcel (D6) would be acquired. | 7, 10, and 115 |
| 48 | Wesco (formerly Tempo Mechanical)<br>13757 N Stemmons Fwy<br>Farmers Branch, TX 75234 | TXPST, TXLPST | TXLPST (ID # 094759) – (1D) Group 1 groundwater, plume has/likely to migrate off-site. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0006025) – One 5,000-gallon diesel and one 10,000-gallon gasoline storage tanks were removed from the ground in January 1990. | The site is at-grade. It is anticipated that a portion of the property eastern boundary of the parcel (D48) would be acquired. | 2 |
| 49 | Van Chevrolet<br>1700 N IH 35<br>Carrollton, TX 75006 | TXLPST, TXPST, TIER II, IHW | TXLPST (ID # 101096) – (4A) Soil contamination only, requires full site assessment and remedial action plan. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0023614) – One 500-gallon tank storing used oil and one 4,000-gallon gasoline storage tank were removed from the ground in August 1992.<br>TIER II (ID # 4Y7J3S020344) – gasoline stored on site. | The site is downgrade. It is anticipated that the entire parcel (D40) would be acquired. | 3 |
| 137 | Weaver Construction Landfill<br>1500 ft SW IH 35 E 1500 ft N Sandy Lake Rd<br>Carrollton, TX 75019 | MSWLF | MSWLF (Permit# 2139) - 230.35 acre sanitary landfill, daily cover required. Permit status is withdrawn. | Site is at-grade with the proposed project. It is anticipated that a portion of the property along the eastern and northwestern boundaries of the parcel would be acquired. No buildings would be displaced. | 10 |

[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**.

Eleven of the high risk sites have a reported LPST (Sites 6, 7, 11, 12, 26, 28, 30, 40, 41, 48, and 49) and the stage of corrective action for each LPST site is "final concurrence issued, case closed." Sites 1, 2, and 3 are spills of diesel fuel, concrete additive, and calcium lignosulfate that occurred within the ROW limits. Site 5 is listed as a chemical storage site and small quantity generator of industrial waste, including corrosive and ignitable waste. This facility has passed all validation checks; however, it is considered a high-risk site because of anticipated property impacts at the site and the potential for encountering hazardous materials such as chromium, lead, and mercury.

Site 35 (Chromalloy) is listed as a Tier II, RCRAG, IHW site in compliance with waste generation permits. According to the database listing, "Refrigerated liquid argon and hydrogen are stored on the site. This facility passed all validation checks. The site is a small quantity generator of industrial waste." However, due to the nature of work that occurs at this site, additional research was conducted. According to the company's website, this location is part of

Chromalloy Gas Turbine Corporation (the parent corporation is Sequa Corporation). The company manufactures fan components, compressor and turbine frames and cases, rotating shaft spools and discs, sheet metal components, etc. There are onsite metallurgical and metrology laboratories. It appears that the company uses a number of chemicals and metals in their manufacturing processes. According to the website (Parent Company Sequa): "Chromalloy Gas Turbine Corporation, Sequa's largest business unit, provides the airline industry with a broad range of aftermarket services and ranks as the leading independent supplier of advanced repairs for jet engine parts. Chromalloy operates around the world and around the clock, providing airlines with timely, cost-effective, and proven repairs for turbine airfoils and other critical engine parts – repairs that extend the life of the parts and hold down airline maintenance costs. Chromalloy also serves the industrial and marine gas turbine market and the military market." See http://phx.corporate-ir.net/phoenix.zhtml?c=104229&p=irol-irhome.

Site 137, a MSWLF, is included as a high-risk site. A portion of the property would be impacted. This site is listed as "permit withdrawn" and is not currently operating as a MSWLF. 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-26: Low Risk Sites**

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 4 | Clayton Homes<br>1802 N IH 35 E<br>Lewisville, TX 75067 | IOP | IOP (ID# 192) – Contaminants were petroleum hydrocarbons which affected soils/groundwater. Phase is completed. | The site is above grade. A portion of the property along the western parcel boundary would be acquired; former mobile home park with no trailers but visible hook-ups | 7 |
| 8 | Van's Hyundai<br>1301 S IH 35E<br>Carrollton, TX 75006 | IHW, TXLPST, TXPST | TXLPST (ID # 108665) – (4.2) No groundwater impact, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed.<br>TXLPST (ID # 097902) – (4A) Soil contamination only, requires full site assessment and remedial action plan. (6A) Final concurrence issued, case closed.<br>TXPST (ID # 0032539) – One 2,000-gallon gasoline storage tank was permanently filled in place in December 1988. | The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. | 4 |
| 9 | United Truck Maintenance<br>1200 S IH 35<br>Carrollton, TX 75006 | IHW | IHW (ID # TXD055006472) - The facility is a small quantity generator of non-industrial and/or municipal waste. | The site is at-grade. It is anticipated that the entire parcel (D30) would be acquired. | 4 |
| 10 | Sam Pack's Five Star Ford Body Shop<br>1501 S IH 35 E<br>Carrollton, TX 75006 | IOP, IHW | IOP (ID # 198) - The contaminants and media affected not reported. Phase is withdrawal.<br>IHW (ID# TXR000011619) - The facility is a conditionally exempt small quantity generator of non-industrial and/or municipal waste. | The site is at-grade and adjacent to the proposed project. No additional ROW would be required at this property. | 4 |

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 14 | Russells Cleaners<br>1020 S Elm St<br>Carrollton, TX 75006 | DCR | DCR (ID # RN103959631) - The site is a registered Drycleaner Facility. | The site is at-grade and adjacent to the proposed project. No additional ROW would be required at this property. | 4 |
| 15 | Monitronics (formerly Thermall Corp/ ITW Brands)<br>12801 Stemmons Fwy<br>Farmers Branch, TX 75234 | RCRAG, IHW | RCRAG (ID # TXR000018168) - The site is a conditionally exempt small quantity generator of industrial waste. | The site is at-grade. Likely to no longer be small quantity generator; it is anticipated that a portion of the property along the northeastern parcel boundary would be acquired. | 1 |
| 16 | Crawfords Windows (formerly Paint and Body Shop)<br>13922 N Stemmons Fwy<br>Farmers Branch, TX 75234 | IHW | IHW (EPA ID# TX0000053470) - The site is a conditionally exempt small quantity generator of non-industrial and/or municipal waste. | The site is downgrade and adjacent to the proposed project. No additional ROW would be required at this property. | 2 |
| 17 | Mister Collision (formerly Dons Automotive/ Collision Masters)<br>14035/ 14011 Stemmons Fwy<br>Dallas, TX 75234 | TXPST, RCRAG, IHW | TXPST (ID # 0066609) – One 500-gallon tank for storing used oil was removed from the ground in January 1995. | The site is downgrade. It is anticipated that the entire parcel (D46) would be acquired. | 2 |
| 18 | Shell (formerly Texaco/Star Enterprises)<br>1946 IH 35E<br>Carrollton, TX | TXLPST, TXPST, IHW | TXLPST (ID # 107963) - (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed. TXPST (ID # 0013429) – Four 10,000 to 12,000-gallon gasoline and diesel storage tanks have been in use since January 1983. One 550-gallon used oil storage tank was removed from the ground in October 1983. | The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. | 6 |
| 20 | Vacant (formerly Austin Power Equipment Division)<br>2400 N IH 35 E<br>Carrollton, TX 75006 | TXPST, IHW | TXPST (ID # 0005549) – One 2,000-gallon diesel, one 1,000-gallon gasoline, and one 2,000-gallon gasoline storage tank were removed from the ground in August 1995. | The site is at-grade. It is anticipated that a portion of the property along the southwest parcel boundary (D4/D5) would be acquired. | 7, 10, and 11 |
| 21 | United Rentals (formerly Brown Equipment Rental)<br>1706 N IH 35 E<br>Carrollton, TX 75006 | TXLPST, TXPST, IHW | TXLPST (ID # 107164) – (4.1) Groundwater impacted, no apparent threats or impacts to receptors. (6A) Final concurrence issued, case closed. TXPST (ID # 0018674) –One 6,000-gallon diesel, one 4,000-gallon kerosene, one 6,000-gallon diesel, and one 500-gallon tank storing used oil were removed from the ground in October 1994. | The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. | 5 |
| 22 | Meridian Products<br>14005 N Stemmons Fwy<br>Dallas, TX 75234 | IHW | IHW (TCEQ ID# 028259) - The site is a conditionally exempt small quantity generator of waste. | The site is downgrade. It is anticipated that the entire parcel (D47) would be acquired. | 2 |

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 23 | Tickets/DFW Action.com/Motek (formerly Southwest Environmental Services) 1015 N IH 35 E Carrollton, TX 75006 | IHW | IHW (ID# TXD981046378) - The site is inactive. | The site is upgrade. It is anticipated that a portion of the property along the eastern/northeastern parcel boundary (D25) would be acquired. | 4 |
| 25 | Exacta Packaging Designs (formerly Metro Environmental Service) 1942 Stemmons Fwy Carrollton, TX 75006 | IOP | IOP (ID # 502) – Contaminants were TPH and BTEX which affected the soils/groundwater in 2005. Phase is completed. | The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. | 6 |
| 27 | Stroups Nursery (Former Gas Station, Chevron) 1908/ 1914 N IH 35 Carrollton, TX 75006 | TXLPST, TXPST | TXLPST (ID # 113914) – (3.1) Groundwater impact, public/domestic water supply well w/in 0.25-0.5 miles. (6A) Final concurrence issued, case closed. TXPST (ID # 0005732) – Three 9,528-gallon gasoline and one 9,528-gallon diesel 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. | 6 |
| 32 | B&B Radiator and Muffler (formerly Phillips 66/ Larry Boatright) 1520 S Hwy 77/ IH 35E Carrollton, TX 75006 | TXPST | TXPST (ID # 0013703) – One 560-gallon, one 6,000-gallon, and two 4,000-gallon storage tanks (contents unknown) were removed from the ground in December 1981. | The site is upgrade. It is anticipated that the entire parcel (D32) would be acquired. | 4 |
| 33 | American Transmissions 14053 N Stemmons Farmers Branch, TX 75234 | TXPST | TXPST (ID # 0065635) – One 4,000-gallon used oil storage tank was removed from the ground in January 2001. | The site is upgrade. It is anticipated that the entire parcel (D42) would be acquired. | 3 |
| 34 | City of Carrollton Stockpile 1825 IH 35E Carrollton, TX 75006 | TIER II | TIER II (ID# 55WT1W00NZDW) - Flexbase is stored on the site. This facility passed all validation checks. | The site is at-grade. It is anticipated that a portion of the property along the eastern/northeastern parcel boundary would be acquired. | 6 |
| 36 | NTB No 690 1128 N IH 35E Carrollton, TX 75006 | RCRAG | RCRAG (ID # TXR000063297) - The site is a conditionally exempt small quantity generator. | The site is downgrade and adjacent to the proposed project. No additional ROW would be required at this property. | 5 |
| 37 | Starbucks (formerly Chevron) 1941 N IH 35 Carrollton, TX 75006 | IHW | IHW (ID# TXD988045498) - The site is a small quantity generator of non-industrial and/or municipal waste. | The site is downgrade. It is anticipated that the entire parcel (D13) would be acquired. | 6 |

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 38 | American Collision, Puro Novelties (formerly A-1 Paint & Body/ Southwest Silver) 1818 N IH 35 Carrollton, TX 75006 | IHW | IHW (EPA ID# TXD074880469) - A-1 Paint & Body is an inactive conditionally exempt small quantity generator. Southwest Silver is an active waste transporter. | The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. | 5 and 6 |
| 39 | Mike's Shop and Computer Corner (formerly Telenova, Inc) 1201 N Stemmons Fwy Carrollton, TX 75006 | NFRAP, IHW | NFRAP (ID# TXD988044111) - Incident details not reported; IHW (ID# TXD982559767) - The site is an inactive waste generator. | The site is downgrade. It is anticipated that the entire parcel (D24) would be acquired. | 5 |
| 42 | Wasco Steel Inc 2500 N IH 35E Carrollton, TX 75006 | TXPST | TXPST (ID # 0061190) – One 1,000-gallon diesel and one 2,000-gallon gasoline aboveground storage tanks have been in use since January 1991. | The site is at-grade. It is anticipated that the entire parcel (D8) would be acquired. | 7, 10, and 11 |
| 43 | Roadway Solutions 2524 N Stemmons Carrollton, TX 75006 | TXPST | TXPST (ID # 0073422) – One 2,000-gallon aboveground diesel storage tank was installed in 2000, but is currently out of use. | The site is at-grade. It is anticipated that the entire parcel (D9) would be acquired. | 8 and 11 |
| 44 | Uhaul (Carrollton Center) 1682 S IH 35E Carrollton, TX 75006 | TXPST | TXPST (ID # 0018748) – Three gasoline storage tanks (one 6,000-gallon and two 3,000-gallon) were removed from the ground in July 1989. | The site is downgrade. It is anticipated that a portion of the property along the eastern/northeastern parcel boundary (D39) would be acquired. | 3 |
| 45 | Vacant Lot 2312 Havenhurst Farmers Branch, TX 75234 | TXPST | TXPST (ID # 0064458) – One 6,000-gallon gasoline storage tank was removed from the ground in February 1994. | The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. | 1 |
| 46 | Unnamed Business (formerly TD Industries) 13737 N Stemmons Farmers Branch, TX 75234 | TXPST | TXPST (ID # 0001999) – One 550-gallon used oil, one 1,000-gallon gasoline, and one 10,000-gallon gasoline storage tanks were removed from the ground in December 1989. | The site is at-grade. It is anticipated that a portion of the property along the eastern parcel boundary (D49) would be acquired. | 2 |
| 47 | Half Price Books (formerly Sanger Harris Carpenter Shop) 13400 N Stemmons Fwy Dallas, TX 75234 | IHW | IHW (ID# TXD064119837) - The site is an inactive non-industrial and/or municipal waste generator. | The site is adjacent to and at-grade with the proposed project. No additional ROW would be required at this property. | 1 |
| 53 | Artistic Auto Body and Paint (formerly A Riginal) 1225 W. College Ave. Carrollton, TX 75006 | IHW | IHW (ID# TXD987988581) - This registration was inactivated because the facility was registered prior to 1994 and no waste activity was reported in 1994, 1995, 1996. The company is a large quantity generator. | The site is downgrade. It is anticipated that a portion of the property along the eastern parcel boundary would be acquired. A building is anticipated to be displaced. (D27) | 4 |

| Site No.[1] | Site Name/ Site Information | Database Listing | Regulatory Status | Gradient and Anticipated Property Impact (Correlating Displacement #[2]) | Corridor Map Sheet No. |
|---|---|---|---|---|---|
| 54 | Sandy/ Stone Panels 1725 Sandy Lake Rd Carrollton, TX 75006 | TXPST, IHW | TXPST (ID # 0060584) – One 8,000-gallon gasoline storage tank was removed from the ground in December 1991. | Site is at-grade with the proposed project. It is anticipated that a portion of the property would be acquired along the northeastern parcel boundary. | 6 |
| 57 | Vacant Lot (formerly Mosher Industries Inc) 2604 N IH 35 Carrollton, TX 75006 | TXPST | TXPST (ID # 0040655) – One 1,500-gallon gasoline storage tank was removed from the ground in February 1992. | It is anticipated that a portion of the property along the western parcel boundary would be acquired. | 8 |
| 75 | Gladwin Paint Company (formerly Craigs Specialists of Dallas) 2330 Spring Lake Rd Farmers Branch, TX 75234 | RCRAG, IHW | RCRAG, IHW (ID# TXD980877930) - The site is an inactive conditionally exempt small quantity generator of non-industrial and/or municipal waste, including ignitable waste, cadmium, chromium, lead, benzene, chloroform, 1,2-dichloroethane, tetrachloroethylene, trichloroethylene, and non-halogenated solvents. | The site is at-grade and adjacent to the proposed project. No additional ROW would be required at this property. | 1 |
| N1 | Top Lube Oil Change 14045 IH 35 at Valwood Farmers Branch, TX | Not identified in database search. | The site is an oil change facility. Site was identified during the visual survey. | The site is downgradient. It is anticipated that the entire parcel (D43) would be acquired. | 3 |
| N2 | Five Star Ford 1635 N. IH 35 Carrollton, TX | Not identified in database search. | The site is an auto dealership and service/ repair facility that could potentially have an UST or AST. Site was identified during the visual survey. | The site is at-grade and adjacent to the proposed project. No additional ROW would be required at this property. | 3 |
| N3 | Classic Buick, Pontiac, GMC 2700 N. IH 35E Carrollton, TX | Not identified in database search. | The site is an auto dealership and service/ repair facility that could potentially have an UST or AST. Site was identified during the visual survey. | The site is at-grade. It is anticipated that a portion of the property would be acquired along the southwestern parcel boundary. | 8 |

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

Fifteen of the total 35 low-risk sites within or adjacent to the proposed roadway improvements are registered petroleum storage tanks (TXPSTs) sites. Sites 8, 18, 21 and 27 also contain an TXLPST and are at-grade with the proposed project. No additional ROW is needed from these four sites. Many of the sites contain multiple tanks; and a total of 39 tanks have been registered at the 15 sites. A total of 30 tanks have been removed from the ground, one has been permanently filled in place, one is currently out of use, and seven are currently in use. Most of the tanks are used for the storage of gasoline, although some are used for diesel, used oil, or kerosene. However, because these sites are adjacent to the proposed project or minimal impacts would occur, they have been classified as low risk due to the low possibility of encountering contamination as a result of leaks. Site N2 would not be affected by property acquisition; therefore, the risk for encountering contaminated soils or water in this area is low. Although no database information is available for Sites N1 and N3, there is a low risk of encountering soil or water contamination during construction based on gradient, anticipated ROW impacts, current land use, and field observations. 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 specifics 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 right-of-way 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, Ltd. 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. Asbestos containing materials (ACM) are not present in the existing bridge structures. However, TxDOT would notify the Department of State Health and Human Services (DSHS) of the bridge demolition 15-working days prior to the scheduled demolition.

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. All construction materials used for this project would be removed as soon as the work schedules permit.

### D.4 Construction Impacts

Alternative A: No-Build Impact

Under the No-Build Alternative for IH 35E, construction would not be required; therefore construction impacts would not be anticipated.

Alternative B: Build Impact

While this EA addresses improvements to the IH 35E corridor from IH 635 to PGBT, phased construction projects have been identified in order to enhance community cohesion and improve local mobility as the IH 35E corridor is reconstructed. These two projects include construction of Dickerson Parkway and Belt Line Road. The phased construction project for Dickerson Parkway over IH 35E is anticipated to be constructed early in the corridor reconstruction and would provide an additional east-west connection across IH 35E linking community activities. Reconstruction of Belt Line Road under IH 35E and the three rail lines which converge near IH 35E at Belt Line Road is also anticipated to be constructed early in the corridor reconstruction and would help relieve east-west congestion caused by the at-grade railroad intersections.

Due to operations normally associated with road construction, there is a possibility that noise levels would be above normal in the areas adjacent to the ROW. Construction is normally limited to daylight hours when occasional loud noises are more tolerable. Due to the relatively temporary exposure periods imposed on any one receptor, extended disruption of normal activities is not considered likely. 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.

Reconstruction of the facility would be completed without the use of detours; however, temporary lane closures may occur. Lane closures would comply with the FHWA MUTCD standards. Although lane closures may occur, during the construction phase of the proposed project, no existing mainlanes would be converted to tolled HOV/managed lanes. It is not anticipated that the proposed project would cause any impacts to pedestrians. In addition, everything possible would be done to minimize the inconvenience to pedestrians, as well as vehicles using the existing roadway.

During the construction phase of this project there can be temporary increases in air pollutant emissions from construction activities, equipment, and related vehicles. The primary construction related emissions are particulate matter (fugitive dust) from site preparation and construction and non-road MSAT from construction equipment and vehicles. The primary MSAT emission related to construction is diesel particulate matter from diesel powered construction equipment and vehicles. These emissions are temporary in nature (only occurring during actual construction) and it is not reasonably possible to estimate impacts from these emissions due to limitations of the existing models. However, the potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures such as covering or treating disturbed areas with dust suppression techniques, sprinkling, covering loaded trucks, and other dust abatement controls, as appropriate. The MSAT emissions will be minimized by measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increasing use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate. However, considering the temporary and transient nature of construction related emissions as well as the mitigation actions to be utilized, it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

## D.5 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 nearest airport to the proposed project is the Addison Airport, located in Addison, Texas. It is approximately 22,270 ft (4.2 mi) from the project area. Dallas Love Field, located in the City of Dallas, is approximately 23,000 ft (4.4 mi) from the project area. Due to the distance between the project area and the nearest runway facility (greater than 4.0 mi), no impacts to airway-highway clearance are anticipated.

# V. INDIRECT IMPACTS

The purpose of this chapter is to assess the indirect effects related to the proposed improvements to IH 35E from IH 635 to PGBT. 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* (September 2010). The *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* specifies a seven-step process (**Table V-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 V-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 Substantial 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 V-2**.

**Table V-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 five miles of IH 35E from IH 635 to PGBT. 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 generally consists of a 1,200-ft buffer extending from the proposed ROW located within two municipalities located adjacent to the proposed project: the Cities of Carrollton and Farmers Branch in Dallas County. The delineation of the AOI was the result of professional opinions from planners representing the two potentially impacted jurisdictions. 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, with the exception of the City of Dallas. Because the portion of the City of Dallas located adjacent to IH 35E within the project limits is built out, it is unlikely that the City of Dallas would absorb potential indirect impacts. The resulting AOI encompasses approximately 2,099 acres and is shown in **Appendix A, Figure 13: Indirect Impacts Area of Influence.**

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 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 Farmers Branch *Comprehensive Plan* (1990).

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

Study Area Goals

**Appendix G: 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 G**.

*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 IH 635 to PGBT) is included in this plan.

*Park-and-Ride Facilities*

According to NCTCOG's *Mobility 2030 – 2009 Amendment*, park-and-ride facilities are planned for construction in the Cities of Carrollton and Farmers Branch 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 the Cottonbelt Dallas County veloweb route, which crosses the proposed project.

*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. See **Appendix G: Indirect Land Use Impacts Assessment** for additional information and various maps.

*City of Farmers Branch*

The citywide Farmers Branch *Comprehensive Plan* (adopted May 8, 1989; amended February 1990) set the stage for the multi-faceted approach to land use planning required by the city's unique layout and history. The City of Farmers Branch has three *Comprehensive Plans* and a *Vision Plan* for different areas of the city – the *West Side Plan*, the *Station Area Plan*, and the *Four-Corners Vision Plan*. Once a major warehousing and goods distribution center for the Dallas metropolitan area, the east side of Farmers Branch (east of IH 35E) began to convert to office and office-complementary land uses that stressed roads and utilities while increasing property values. On the west side of IH 35E, the construction of levees along the Elm Fork of the Trinity River and the increased regional access provided by IH 635 and IH 35E provided prime planning opportunities for the city to shape development. City planners recognized the need to preserve existing residential areas while accommodating these changes.

As mentioned in **Appendix H: Employment Opportunities Impact Assessment**, the City of Farmers Branch is developing a *Comprehensive Plan* update for the City's central area that considers the potential economic impact of project-imposed displacements as well as the potential for redevelopment along the corridor. The target area for the *Plan* update would include the IH 35E corridor through the city as well as all abutting parcels. The *Plan* update would focus on establishing unique gateways where IH 35E enters the city, it would introduce corridor design standards, it would focus on a different scheme of access management limiting exclusively auto-oriented access to properties, and would establish landscape features and green space along the portion of the IH 35E corridor where residual abutting land after ROW acquisition would not be deep enough to be developed. The Plan update would also promote land uses more compatible and complementary to the planned TOD surrounding the proposed DART Farmers Branch Station. According to the Director of Planning for the City of Farmers Branch, the *Plan* update is anticipated to be adopted by the Farmers Branch City Council by the end of 2011. Overall, the *Plan* update's objectives are to allow the City of Farmers Branch to establish economic amenities along the IH 35E corridor that more closely suit the City's goals and would ultimately lead to more private investment and corresponding employment opportunities.

The *West Side Plan* was adopted October 13, 2003. The land use plan builds on what was established in the *Comprehensive Plan*: the unique character of the west side of Farmers Branch being highly accessible to the Dallas-Fort Worth Airport and major highways, with a large amount of undeveloped land. According to the plan: "The land use plan reflects the west side's future role as a significant employment center. The west side represents an important opportunity to create an employment base – in response to the substantial trend toward concentration of employment growth in the northern suburbs of the Metroplex. The plan attempts to create integrated communities rather than large, single-use districts." Land uses depicted on the *West Side Land Use Plan* show centers ranging from Regional Centers down to Neighborhood Centers and land uses divided primarily into Employment District and Industrial District. There are rail/bus corridors that intersect with IH 35E.

The City of Farmers Branch *Thoroughfare Plan* was adopted in 2006. The plan shows IH 35E as an interstate. The City has an adopted 2008-2009 Adopted Fiscal Year Budget including their Capital Improvement Program (CIP). The CIP is extensive and includes major projects near IH 35E. Together, these plans represent a well-orchestrated planning effort by the City of Farmers Branch to control the pace and character of development throughout the city. See **Appendix G: Indirect Land Use Impacts Assessment** for additional information and various maps.

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 two municipalities located within the AOI would experience a 22.3 percent growth rate between 2000 and 2030.[21] 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 and Farmers Branch. 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 plans and zoning regulations) generally preserve the corridor as a transportation facility with a mix of planned development, light industrial, high intensity commercial, high intensity office, and mixed-use/urban land uses. See **Appendix G: Indirect Land Use Impacts Assessment** for land use plans.

The proposed improvements are compatible with the 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 Farmers Branch proposes commercial/retail, office, industrial, and public/religious land uses along IH 35E.

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 2,099 acres of land mass within the indirect impacts AOI, approximately 66.9 percent (approximately 1,405 acres) is currently developed. An additional 400 acres (approximately 19.1 percent) are undevelopable. The remaining approximate 292 acres (approximately 13.9 percent) are undeveloped. The Cities of Carrollton and Farmers Branch are expected to reach build-out by 2025 and 2028, respectively. These build-out dates were provided by city planners based on their adopted planning documents and professional opinions about development trends. See **Appendix G: Indirect Land Use Impacts Assessment** for 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 2028.

*Other Indicators of Growth*

Residential growth, specifically home construction, was utilized as an indicator of historical

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

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.[22] See **Table V-3** for historic Dallas and Denton Counties housing characteristics.

**Table V-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 V-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 V-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 Independent School District (ISD)

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

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 V-5**.

**Table V-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.

*Mobility 2030 – 2009 Amendment Projects*

The *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 (City of Carrollton) and 2028 (City of Farmers Branch).

**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. Historically, the land within the AOI has been primarily developed for residential, commercial, industrial, and public land uses. Currently, there are no residential areas located directly adjacent to IH 35E, yet residential areas are found within the AOI.

Notable features that could be indirectly impacted within the study area are listed in **Table V-6.** These notable features are composed of valued environmental components (e.g. community centers, parks, athletic facilities). See **Figure 13: Indirect Impacts Area of Influence** for the locations of the notable features within the AOI.

**Table V-6: Notable Feature Inventory**

| ID | Notable Feature |
|---|---|
| NF 1 | Dr. Pepper Star Center |
| NF 2 | Standridge Stadium (Carrollton-Farmers Branch ISD) |
| NF 3 | Historic Downtown Carrollton |
| NF 4 | Ken Good Park |

NF 1 - Dr. Pepper Star Center. The Dr. Pepper Star Center is part of the Dallas Stars' growing network of ice skating and entertainment facilities. The facility includes two NHL-regulation ice surfaces, eight team locker rooms, a merchandise store, and a restaurant. The Dr. Pepper Star Center is located on approximately 350 feet east of IH 35E in the City of Farmers Branch.

NF 2 - Standridge Stadium (Carrollton-Farmers Branch ISD). The Tommy Standridge Stadium is a football stadium located in Carrollton, Texas, approximately 0.7 mile west of IH 35E. The stadium has 13,000 seats and hosts games for various Carrollton-Farmers Branch ISD high schools such as, R.L. Turner, Newman Smith, Creekview, and Ranchview High Schools. Other events held at the stadium include sub-varsity football contests, high school soccer, middle school and high school track meets, Elementary Field Day, and a variety of community activities.

NF 3 - Historic Downtown Carrollton. Located approximately 500 feet east of IH 35E, this historic square is a pedestrian friendly and popular destination for restaurants, shops, and various other events. Visitors can come and feel the history of a town that was established in this exact location in the 1800s.

NF 4 - Ken Good Park. Ken Good Park is a 20-acre parkland located in Carrollton, Texas, approximately 650 feet east of IH 35E. This park has two ponds and is a popular destination for fishing. Other amenities include grills and picnic tables.

**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 32.0 acres of herbaceous vegetation and 11.0 acres of woody vegetation within proposed ROW would be impacted during construction. Of the total vegetated area, the acreage of woodland areas within the proposed ROW is approximately 4.38 acres, of which approximately 0.45 acres can be considered riparian woodland habitat. 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 to three-lanes in each direction. The overall width of the facility would widen by an approximate range of 130 to 256 ft.

- **Processing** – Storage of materials would occur off-site. The proposed improvements would require one acre of easements. If the contractor chooses to use undeveloped land or another site for material storage, impacts to natural resources may increase.
- **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** – TxDOT proposes to compensate for the loss of approximately 0.45 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. 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. If temporary fills are needed in jurisdictional waters, then 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. All temporary impacts would be addressed in the Section 404 permit application. 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 correct 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. Compost is anticipated to be used instead. Periodic applications of herbicide may occur during the maintenance phase of the proposed project.
- **Access alteration** – The proposed project would incorporate pedestrian sidewalks along the proposed Dickerson Parkway extension for connection with the DART North Carrollton Transit Center. Future sidewalks would be constructed in various locations within the proposed IH 35E project limits; the exact locations of these sidewalks would be determined during the final design through coordination with TxDOT and local governments.

**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 2,099 acres and consists of approximately 929 acres of mowed and maintained vegetation (landscape plantings), approximately 67 acres of riparian woodlands, approximately 45 acres of upland woodlands, and approximately 262 acres of herbaceous vegetation with scattered woody species. The remaining area within the AOI is paved or a structure is present. 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 soil 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 G: 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 serious 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 AIO include those which main sources are attributed to transportation and construction activities (i.e., ozone, CO, particulate matter, and MSAT). As the proposed project is not anticipated to result in indirect air quality impacts, further discussion in Steps 6-7 below is not necessary.

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 (**Appendix D: Supplemental Data**), 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 138 anticipated displacements that would occur as a direct result of the approximate 86.4 acres of proposed ROW. Impacts related to the proposed regional toll/managed lane or priced facility network through 2030 are discussed in **Section VII**. 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:

- The anticipated 138 displacements consisting of 111 commercial businesses, 24 vacant buildings/suites, and 3 places of worship. The structures potentially displaced are currently located within the Cities of Carrollton and Farmers Branch.
- No substantial direct environmental justice impacts would result from the proposed IH 35E project. Although 2 of the anticipated 138 displacements are located within 1 census block with majority environmental justice populations, comments received from the public meeting held on November 17, 2008, did not include inquiries, comments, or concerns regarding commercial displacements.
- 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.
- 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 693 acres of undeveloped land (approximately 33.0 percent of the total AOI acreage). 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 (City of Carrollton) and 2028 (City of Farmers Branch).

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 G: Indirect Land Use Impacts Assessment** identifies and analyzes the potential for indirect land use impacts related to the proposed improvements to IH 35E from IH 635 to PGBT. 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 IH 635 to PGBT 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.

**Traffic Operations**

In terms of traffic operations, the proposed IH 35E project (from IH 635 to PGBT) 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 IH 635 to PGBT.

*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 South Project Complete Performance Reports includes the TAZs within a distance of 1 mile along the corridor. The traffic analysis study area is approximately 11 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 V-7**, the percent of lane-miles of frontage roads 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 D-E decrease;
- Local arterials operating under F decrease;
- Local arterials operating under LOS D-E increase; and
- Local collectors operating under LOS D-E decrease.

**Table V-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 (25 lane-miles) | A-B-C (27 lane-miles) | 8 |
| | D-E (2 lane-miles) | D-E (0 lane-miles) | |
| | F (9 lane-miles) | F (10 lane-miles) | |
| **Total lane-miles** | **36** | **37** | |
| Local Arterials | A-B-C (44 lane-miles) | A-B-C (44 lane-miles) | 0 |
| | D-E (6 lane-miles) | D-E (10 lane-miles) | |
| | F (13 lane-miles) | F (10 lane-miles) | |
| **Total lane-miles** | **63** | **64** | |
| Local Collectors | A-B-C (30 lane-miles) | A-B-C (30 lane-miles) | 0 |
| | D-E (5 lane-miles) | D-E (4 lane-miles) | |
| | F (13 lane-miles) | F (14 lane-miles) | |
| **Total lane-miles** | **48** | **48** | |

Source: NCTCOG TransCAD® data for 2030 daily traffic Build and No-Build Alternatives (March 2009 Complete Performance Reports for the IH 35E South 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 28 percent under the Build Alternative (6,524 hours of delay/day under the No-Build Alternative versus 5,115 hours of delay/day under the Build Alternative). **Table V-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 5.3 percent or close to 2 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.[23] Using the cost for non-commercial vehicles, there would be a cost of travel delay of $74,679 under the Build Alternative and a cost of $95,250 per day (2005 dollars) to the users within the traffic analysis study area under the No-Build Alternative.[24] The difference in user cost between Build and No-Build Alternatives is $20,571 per day.

**Table V-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 | 34.32 | 34.55 | 34.38 | 34.38 | 34.33 | 34.24 | 0.17% | -0.64% | -0.41% |
| Minor Arterials | 28.03 | 28.19 | 27.72 | 28.17 | 28.05 | 27.77 | 0.50% | -0.50% | 0.18% |
| Frontage Roads | 34.09 | 34.27 | 34.24 | 35.91 | 35.93 | 36.05 | 5.34% | 4.84% | 5.29% |

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

The Excess toll Revenue Sharing Policy for Managed Lanes (**Appendix D: Supplemental Data**) outlines the circumstances under which excess toll revenue would become available and distributed in the region. 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. These projects, whether toll or non-toll, 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, and no change in delay for the 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 28 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 $20,571 per day.

*Socio-economic Indirect Impacts*

With respect to relocations and displacements, indirect impacts would be driven by the relocation of the business establishments and places of worship anticipated to be displaced by the proposed

[23] *2007 Annual Urban Mobility Report*, Texas Transportation Institute, the Texas A&M University System, 2007.
[24] The Annual Urban report was released on September 7, 2007.

IH 35E improvements between IH 635 and PGBT. Examples of indirect impacts due to relocations and displacements include changes in commercial property values due to the proposed improvements, changes in local tax base due to the anticipated commercial displacements, and impacts to employees or visitors to places of worship (such as increased commuting time) who are affiliated with the potential displacements associated with the proposed improvements.

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 is anticipated to 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** and **Appendix H: Employment Opportunities Impact Assessment**, the City of Farmers Branch is assisting two of its major potentially displaced businesses with impact minimization associated with the anticipated commercial displacements along IH 35E within the City's boundaries. It is anticipated that redevelopment and complimentary land uses would be promoted along the entire length of the IH 35E corridor (from IH 635 to PGBT) to maintain or improve the existing trends in industrial 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 IH 635 and PGBT. The beneficial effects of the proposed improvements include increased capacity, managed traffic congestion, improved mobility and improved design for the users of the Dr. Pepper Star Center (Notable Feature 1), Standridge Stadium (Notable Feature 2), the Historic Downtown Carrollton Square (Notable Feature 3), Ken Good Park (Notable Feature 4), and other public facilities in the study area. According to the current proposed design, no public facilities would be physically impacted by the proposed improvements.

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 IH 635 to PGBT, 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.[25] 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 increases in employment and tax revenues if other factors are also favorable for this potential outcome.

Regarding the potential for increased pedestrian access as an indirect impact of the proposed improvements, the proposed project would incorporate pedestrian sidewalks along the north side

[25] 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

of the Dickerson Parkway improvements for connection with the DART North Carrollton Transit Center. Future sidewalks would be constructed in various locations within the proposed IH 35E project limits; the exact locations of these sidewalks would be determined during the final design through coordination with TxDOT and local governments.

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 G** contains the indirect land use impacts analysis related to the proposed improvements to IH 35E. The study area for the assessment consists of the Cities of Farmers Branch and Carrollton, both of which are adjacent to the proposed project. The population and employment of these municipalities is anticipated to increase by approximately 22 and 68 percent, respectively, from 2000 to 2030. The City of Farmers Branch is expected to experience the highest population and employment growth through 2030. Although robust employment growth is expected to occur in both municipalities during this 30-year period, the proposed project's impact on employment along the IH 35E corridor may reduce employment opportunities in the short to mid-term, but the proposed project is anticipated to spur accelerated employment growth in both municipalities and along the corridor in the long term.

The forecasted developments embodied in the various plans and policy documents previously discussed in Step 2 assumes 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 and Farmers Branch. 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 and Farmers Branch. 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 IH 635 to PGBT) is already a major interstate and would continue to facilitate the transportation of goods and services throughout the region

After initial coordination with two planners (one each from the Cities of Carrollton and Farmers Branch) 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 study area boundary was revised to take into account these suggestions from the local planners. Within the City of Carrollton, the study area boundary was changed to 1,000 ft on either side of the IH 35E facility. Within the City of Farmers Branch, the study area boundary was changed to align with the roads suggested by the planner, resulting in a buffer varying from approximately 515 to 1,450 ft on the west side of IH 35E and approximately 300 to 880 feet on the east side of IH 35E. The resulting mapped information provided by the planners was digitized and each parcel was measured to provide an approximate acreage. A total of approximately 37.7 acres within the varying 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 developed, or are anticipated to be redeveloped, and therefore already committed to developed land uses. The areas of potential induced development (approximate 37.7 acres) are shown on **Figure 13: Indirect Impacts Area of Influence**.

Effects Related to Induced Growth

The areas of potential induced development identified through stakeholder input (approximately 37.7 acres) contains approximately 33.5 acres of mowed and maintained vegetation (landscape plantings), 3.6 acres of herbaceous vegetation with scattered woody species, no riparian woodlands, and no upland woodlands. 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 G** result in a "very weak to moderate" 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 and Farmers Branch 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 G** indicate a substantial change between the Build and No-Build Alternatives.

**Step 7. Assess Consequences and Consider/Develop Mitigation (when appropriate)**

None of the four notable features are anticipated to be negatively impacted by the proposed improvements to IH35E from IH 635 to PGBT.

The proposed sidewalks associated with the Dickerson Parkway improvements would allow for the continuation of public-access to the DART North Carrollton Transit Center. Future sidewalks would be constructed in various locations within the proposed IH 35E project limits; the exact locations of these sidewalks would be determined during the final design through coordination with TxDOT and local governments. The beneficial effects of the proposed IH 35E

improvements include increased capacity, managed traffic congestion, improved mobility and improved design for the users of Notable Features 1 through 4 and other public facilities in the study area.

The City of Farmers Branch's efforts, although limited, are examples of proactive local government responses to mitigate the potentially negative impacts associated with the anticipated commercial displacements along IH 35E through the City's jurisdiction. While available undeveloped space may be limited in the City of Carrollton, the City's development policy guides prescribing higher density development in areas near IH 35E should be able to absorb many of the displaced businesses. The City of Farmers Branch is assisting two of the largest potentially affected employers with any impacts associated with the proposed project as well as with relocation, if needed, to available spaces elsewhere in the City. The City of Farmers Branch also foresees the proposed ROW expansion as an opportunity to revitalize the corridor with a better use of the land. Although new development and investment along the IH 35E corridor are anticipated to be delayed in the short to mid-term, with approaches taken by the City of Farmers Branch, the availability of commercial real estate and land development options, anticipated future employment growth in the Cities of Carrollton and Farmers Branch, 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 and may continue at an accelerated pace in the long term.

The mitigation of the potential 37.7 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 two 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 could occur as a result of the proposed highway improvements; they would prefer for the construction project to take place rather than remain "in limbo."

# VI. 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* (September 2010), 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 status/viability 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 future actions that may affect the resources.
6. Identify and assess potential cumulative impacts to the resources.
7. Report the results.
8. Assess the need for mitigation.

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 **V** 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 direct and indirect impacts documented in **Sections IV** and **V** qualify the following resources for consideration in this cumulative impacts analysis: air quality, community, and natural resources. Specific elements of these resources analyzed in the cumulative impacts analysis include:

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* (September 2010) states that 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 (either direct or indirect) are relatively small.

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 VI-1**. As recommended by the CEQ guidance, specific indicators of each resource's condition have been identified and are shown in **Table VI-1**. 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. See **Appendix A, Figure 14: Cumulative Impacts Analysis Study Areas**.

**Table VI-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 | DFW eight-hour ozone serious nonattainment area, which includes: Collin, Dallas, Denton, Tarrant, Ellis, Johnson, Kaufman, Parker, and Rockwall Counties. |
| | Carbon Monoxide: carbon monoxide concentrations modeled along the ROW under worst meteorological conditions | ROW line, which represents the locations with the highest potential for carbon monoxide concentrations. |
| | MSAT: trend of emissions over time | MSAT model area |
| Community | Socio-Economic Impacts, Environmental Justice, Traffic Noise, and Traffic Operations | Cities of Carrollton and Farmers Branch |
| Natural Resources | Waters of the U.S., including Wetlands; Threatened/Endangered Species and Wildlife Habitat | Local watersheds consisting of Elm Fork above Denton Creek, Denton Creek, Hutton Branch, Cooks Branch, Farmer's Branch, Elm Fork above Cottonwood Branch, Cottonwood Branch, and Northwest Dallas. |

## 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 "nonattainment" 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

Three distinct RSAs, as displayed in **Appendix A, Figure 14: Cumulative Impacts Analysis Study Areas,** were utilized to evaluate air quality (ozone, carbon monoxide and MSAT).

*Ozone*

The RSA for evaluating the ozone NAAQS was designated as the Dallas-Fort Worth eight-hour ozone serious nonattainment area, which includes: Collin, Dallas, Denton, Tarrant, Ellis, Johnson, Kaufman, Parker, and Rockwall Counties.

*Carbon Monoxide*

The RSA for carbon monoxide was based on the ROW line, which represents the locations with the highest potential for carbon monoxide concentrations.

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*

Unlike the other resources evaluated, air quality impacts from MSATs have been evaluated quantitatively in this proposed project by TxDOT and FHWA. MSATs are regulated by EPA on a national basis through requirements for fuels and vehicle technology. The MSAT RSA quantitatively evaluated emission changes based upon the proposed project.

The model area was derived from the 2030 No-Build scenario compared to the 2030 Build scenario to determine which roadway links in the model achieved a plus or minus five percent traffic volume change. These links were then compared to the 2009 model in order to extrapolate a baseline traffic network. The application was adopted as the basis to determine the model area RSA located within the MPA.

The MSAT RSA is specified by a model area. The MSAT model area is composed of the affected transportation network for the IH 35E project provided by the NCTCOG. The plus or

minus five percent threshold was adopted as the basis to determine the model area. Because the 2009 base year scenario represents the existing condition, the model area 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 in the model area for scenario year 2030 consist 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 model area 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 Status/Viability 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.[26]

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 rail).

*National Ambient Air Quality Standards*

Currently, the project is located within an attainment area for CO and in a serious nonattainment 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 nonattainment areas. NCTCOG works in cooperation with federal, state, and local partners to ensure that 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

[26] Traffic Engineering, Third Edition. Roger P. Roess, Elana S. Prassas, and William R. McShane

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 MSATs 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 "nonattainment" 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 nonattainment for the 8-hour ozone in accordance with the NAAQS. In 2011, the EPA reclassified the DFW area as a serious nonattainment for the 1997 8-hour ozone standard.

Because in 2011, the DFW area was reclassified from a "moderate" to a "serious" 8-hour ozone non-attainment area for the 1997 8-hour standard, 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, which occurred on February 19, 2011.

*Carbon Monoxide*

According to EPA studies, approximately 95 percent of the CO in typical U.S. cities results from mobile sources.[27] However, according to TCEQ, as of May 17, 2007, the one-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

[27] http://www.epa.gov/otaq/invntory/overview/pollutants/carbonmon.htm

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 County, which is part of the EPA's designated nine county serious nonattainment area for the 8-hour standard for the pollutant ozone; therefore, the transportation conformity rule applies.

*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. For a complete listing of the percent CO concentrations modeled, refer to **Appendix D: Air Receiver Locations and CO Concentrations**. CO did not exceed the NAAQS at any of these locations.

*Congestion Management Process*

Committed congestion reduction strategies and operational improvements considered to be beneficial to the project within the EA limits would consist of grade separation, traffic signal improvements, ITS, addition of lanes, HOV, and rail transit projects. 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*

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

*Sensitive Receptor Analysis*

A total of four sensitive receptors were identified within 500 m (1,640 ft) from the ROW between IH 635 and PGBT (**Table IV-9**). The documented sensitive receptors include schools and licensed daycare facilities.

*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 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. See **Appendix A: Figure 6** for the MSAT model area maps.

For the purpose of this analysis three scenarios were modeled:

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

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**.

Although the VMT for the IH 35E Build scenario would increase approximately 70 percent by 2030 when compared to 2009, total MSAT emissions for the same scenario would decrease at least 48 percent by 2030. 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 48 percent from 2009 to 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.

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. Any increased air pollutant or MSAT emissions resulting from the potential development of the area must meet regulatory emissions limits established by the TCEQ and EPA as well as obtain appropriate authorization from the TCEQ and therefore are not expected to result in any degradation of air quality or MSAT levels.

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.

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 Dallas County, which is part of the EPA designated nine-county non-attainment area for the eight-hour standard for the pollutant ozone. The nine county non-attainment area has an attainment date of June 15, 2010. The proposed project is consistent with the *Mobility 2035* 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 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.

Because in 2011, the DFW area was reclassified from a "moderate" to a "serious" 8-hour ozone non-attainment area for the 1997 8-hour standard, 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, which occurred on February 19, 2011.

*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/manage 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 Future 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 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, including the IH 35E Northern Link 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.

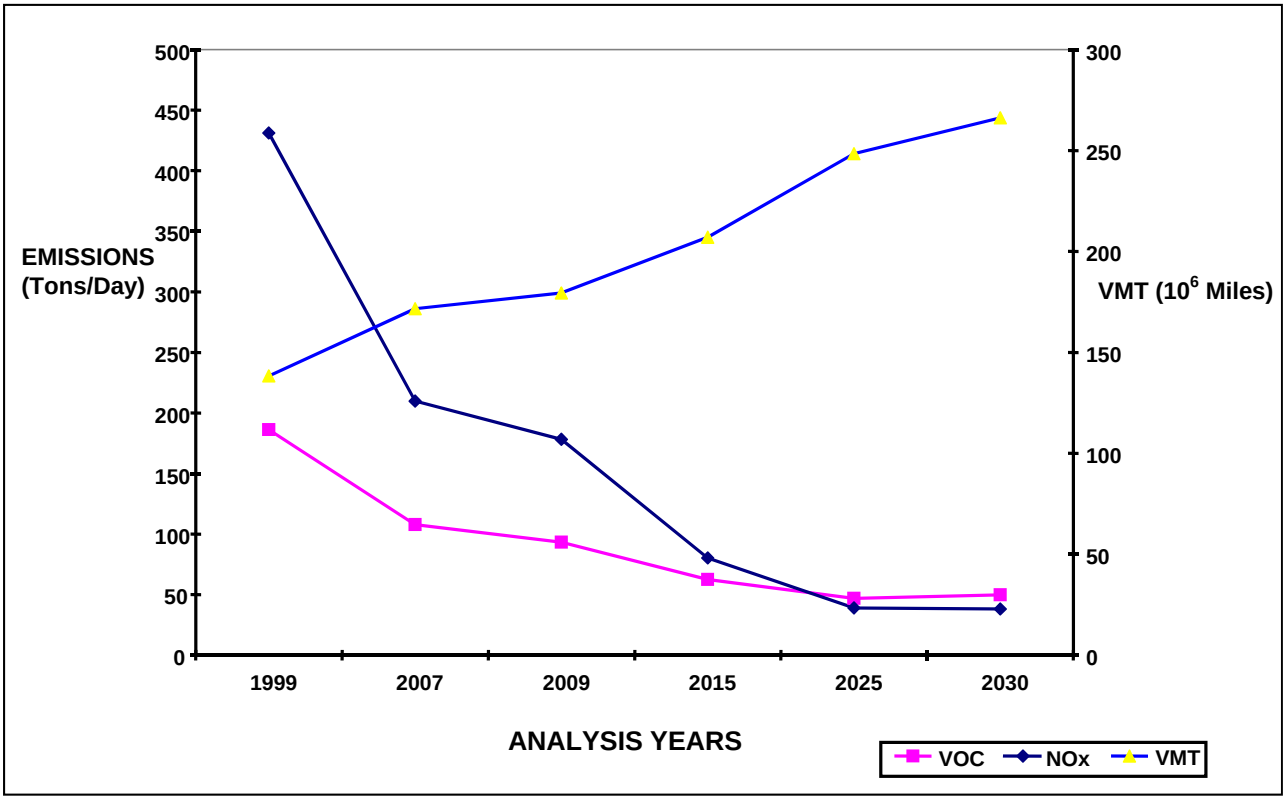
**Step 6: Cumulative Impacts Assessment - Air Quality**

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 the other reasonably foreseeable transportation projects are included in the *Mobility 2030 – 2009 Amendment* and 2011-2014 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 2025 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 48 percent when compared to 2009. Please refer to **Section IV.A.10** for further details. Likewise, **Graph VI-1** and **Table VI-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 VI-1: Vehicle Miles of Travel and Emissions Trends**




Source: NCTCOG Transportation Department. Graph is consistent with *Mobility 2030 – 2009 Amendment* for the nine ozone non-attainment counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties).

**Table VI-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 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 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 improvement 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 and Farmers Branch.

## Step 2: Resource Study Area - Community

The RSA for community conditions is comprised of the Cities of Carrollton and Farmers Branch. These municipalities were chosen due to their proximity to the proposed IH 35E improvements. Evaluating community as a resource consists of several elements: socio-economic impacts, environmental justice, traffic noise, and traffic operations. See **Appendix A, Figure 14: Cumulative Impacts Analysis Study Areas**. 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 Status/Viability and Historical Context - Community

According to the U.S. Census Bureau *2007-2009 American Community Survey*, the total population of the community RSA is comprised of approximately 152,640 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 VI-3** lists a comparative breakdown of environmental justice populations for each of the cities located within the RSA for the years 1990 and 2009. The total environmental justice population percentage for the RSA increased by approximately 109.3 percent from 1990 to 2009.

**Table VI-3: Community RSA Environmental Justice Populations**

| City | 1990 | | | 2007-2009 | | | EJ Population Percent Change 1990 to 2007-09 (%) |
|---|---|---|---|---|---|---|---|
| | Total Population | Percentage Minority Population (%) | Percentage Low-Income Population (%) | Total Population | Percentage Minority Population (%) | Percentage Low-Income Population (%) | |
| Carrollton | 82,169 | 22.3 | 4.4 | 126,122 | 49.2 | 8.9 | 117.6 |
| Farmers Branch | 24,250 | 25.6 | 6.6 | 26,518 | 53.0 | 8.6 | 91.3 |
| **RSA TOTAL** | 106,419 | 23.1 | 4.9 | 152,640 | 49.8 | 8.8 | 109.3 |

Source: *Census 1990* * and U.S. Census Bureau *2007-2009 American Community Survey*.

Of the two cities located within the RSA, the City of Farmers Branch contains the largest concentration of minority and/or low-income populations according to the 2005-2007 American

Community Survey. The City of Farmers Branch exhibits a minority population of approximately 53.0 percent and a low-income population (those living below the 2011 poverty threshold of $20,350 for a family of four) of 8.6 percent. The City of Carrollton exhibits a minority population of approximately 49.2 percent and a low-income population (those living below the 2011 poverty threshold of $20,350 for a family of four) of 8.9 percent.

*Traffic Noise*

As stated earlier, 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. 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 RSA.

*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 almost 51 miles of toll roads in North Texas and has over 700 employees.

Traffic operations in the RSA 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***

Direct Impacts

The proposed IH 35E improvements would require additional ROW, and thus would result in a number of displacements. Approximately 86.4 acres of additional ROW would be required for the preferred alternative resulting in the displacement of 111 business establishments, 24 vacant buildings/suites, and 3 places of worship for a total of 138 displacements.

Two environmental justice effects were identified: displacements of three places of worship (two of which confirmed provision of services to non-English speaking populations) and the economic impact of tolling. However, when considering the totality of effects of this project, the overall benefits provided for the entire community, including low-income and minority populations, outweigh the specific concerns about environmental justice that are discussed in this document. Over the long term, the entire corridor and users would benefit from the proposed IH 35E project as a result of increased capacity, reduced traffic congestion, and improved mobility in the area.

Access to the mainlanes of IH 35E would be available to all users. Should a user elect to not use the tolled HOV/managed lanes, 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. 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.

Indirect Impacts

With respect to relocations and displacements, indirect impacts would be driven by the relocation of the commercial and place of worship properties anticipated to be displaced by the proposed IH 35E improvements between IH 635 and PGBT. Examples of indirect impacts due to relocations and displacements include changes in commercial property values due to the proposed improvements, changes in local tax base due to the anticipated commercial displacements, and impacts to employees or visitors to the commercial or place of worship facilities (such as increased commuting time) associated with the proposed improvements.

Changes in commercial property values and tax base due to the anticipated displacements are likely to have mixed effects. Commercial property values within close proximity to the proposed IH 35E improvements may increase with improved mobility and lessened congestion associated with added capacity. The proposed improvements may 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 may also 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 may also increase as commercial property tax values are 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 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.

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. Further, 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-21 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-21**, 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.

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

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs should ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2030) noise impact contours: 300 ft from the proposed ROW for NAC B (residential) and NAC C (active sports areas, amphitheaters, auditoriums, etc.), and 100 ft from the proposed ROW for NAC E (hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in NAC A-D).

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 main-lanes 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 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-23** 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.

Indirect Impacts

In terms of traffic operations, the proposed IH 35E project 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 project level (IH 35E corridor) and system level (traffic study area) comparison of the

proposed project Build and No-Build scenarios was performed utilizing updated traffic projections and modeling based on the *Mobility 2030 – 2009 Amendment* traffic network. As shown in **Table V-7**, the percent of lane-miles of frontage roads 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 D-E decrease;
- Local arterials operating under F decrease;
- Local arterials operating under LOS D-E increase; and
- Local collectors operating under LOS D-E decrease.

The Traffic Operations analysis includes a comparison between alternatives, of vehicle hours of total delay, and the determination of the cost of travel delay within the traffic analysis study. Additionally, the analysis includes the comparison among alternatives of the average free speed of local roadways (in mph) for the same area. The results and conclusions of the analysis are summarized below.

*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, and no change in delay for the 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 28 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 $20,571 per day.

**Step 5: Reasonably Foreseeable Future Actions - Community**

Land use changes associated with *Mobility 2030 – 2009 Amendment* projects, including the IH 35E Northern Link sections, and other development projects may result in additional relocations and displacements within the community RSA. Within the Community RSA, and specifically the City of Carrollton, the proposed reconstruction of the IH 35E Middle section is anticipated to result in a total of 2 residential displacements, 4 business displacements impacting a total of approximately 64 employees, and 1 vacant building displacement. "Other development projects" include transportation projects throughout the community RSA 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." Major developments that are greater than 80,000 square feet and/or 80 employees within the RSA that are either under construction or announced are monitored by the NCTCOG.

Examples of announced developments monitored by NCTCOG located within the City of Carrollton include two education facilities (Hebron 9$^{th}$ Grade Center and 2965 Commodore) and two mixed-use developments (Carrollton Crossing and Downtown Carrollton TOD Apartments).

Examples of announced developments being monitored in the City of Farmers Branch include once medical facility (Texas Hospital for Advanced Medicine), one hotel (Mercer Crossing Marriott), two multi-family developments (Mercer Crossing Apartments and Farmers Branch TOD Apartments), three office development demolitions (Brookhaven Office Park, Mercer Crossing Office, and LBJ Business Park), and two retail developments (Provident Realty Advisors and Shops at Mercer Crossing). These announced developments would account for an additional 587,875 square feet of new development and 295 new multi-family dwelling units in the City of Carrollton and 1,126,000 square feet of new development and 720 new multi-family dwelling units in the City of Farmers Branch. Acreages of these announced developments were not available from the NCTCOG as of September 2010.

**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 commercial properties associated with the reconstruction of IH 35E, in combination with improvements to other transportation facilities identified in *Mobility 2030 – 2009 Amendment*, and area population and employment growth creating new markets for commerce 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.

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.

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.

Tolled lanes are anticipated to increase from 1.6 percent of the total lane-miles associated with the regional transportation network in 2009 to 8.3 percent in 2030. Of the anticipated lane-miles accounted for in the 2030 network, the proposed tolling of the IH 35E HOV/managed lanes would contribute approximately 20 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. For example, low-income users of the regional transportation network with incomes at the 2011 DHHS poverty threshold of $22,350 could spend an estimated 2.6 percent to 3.9 percent more of their total household income on tolls than that of users from households at the median level for the Dallas-Fort Worth-Arlington Metropolitan Area ($54,539). Therefore, in general, low-

income users would spend a higher proportion of their total income on tolls than median-income users. Further details of this comparison are provided in the toll rates and low-income populations discussion below. Nonetheless, given the layout 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.2**), 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 $1,015 per year, which equates to approximately 4.5 percent of a household income at the 2011 DHHS poverty level for a family of four. By comparison, this $1,015 per year cost would equate to approximately 1.4 percent of the 2009 median household income for Denton County ($70,510), approximately 2.2 percent of the 2009 median household income for Dallas County ($45,986), and approximately 1.9 percent of the 2009 median household income for the Dallas-Fort Worth-Arlington Metropolitan Area ($54,539). The year 2009 is the latest year for which median household income data are available for these respective geographies from the U.S. Census Bureau. This comparison reveals that low-income users would spend approximately 3.1 percent, 2.3 percent, and 2.6 percent more of total household income on tolls than that of median-income households in Denton County, Dallas County, and the Dallas-Fort Worth-Arlington Metropolitan Area, respectively. Given the lay-out and orientation of the 2030 proposed 3,339-lane-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 approximately 6.6 percent of a household income at the 2011 DHHS poverty level. By comparison, this $1,470 per year cost would equate to approximately 2.1 percent of the 2009 median household income for Denton County ($70,510), approximately 3.2 percent of the 2009 median household income for Dallas County ($45,986), and approximately 2.7 percent of the 2009 median household income for the Dallas-Fort Worth-

Arlington Metropolitan Area ($54,539). This comparison reveals that low-income users who do not have a TollTag® account would spend approximately 4.5 percent, 3.4 percent, and 3.9 percent more of total household income on tolls than that of median-income households in Denton County, Dallas County, and the Dallas-Fort Worth-Arlington Metropolitan Area, respectively.

***Traffic Noise***

Because the project is located within municipalities approaching build-out status, it is assumed that 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 V**); 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 Dallas and Denton 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., including wetlands, within a proposed project limits. According to the USACE, the Federal agency which possesses 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 within the proposed project area. The proposed project area consists of the proposed ROW and easements for IH 35E from IH 635 to PGBT. On various days in December 2008 field investigations consisted of delineating and surveying potential water and wetland areas within the proposed project area according to the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region*. Vegetation, hydrology, and soils were evaluated at representative observation points to determine the presence (or absence) of wetland characteristics. Waters, wetlands, and observation points were delineated and surveyed using a Trimble GPS Pathfinder Pro XRS receiver with a Recon Datalogger (Trimble Unit). The ordinary high water mark (OHWM) was measured and surveyed at each water feature.

*Threatened/Endangered Species and Wildlife Habitat*

Federally listed species are protected under the Endangered Species Act 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 14 total species on the federal and state lists for Dallas and Denton Counties, 10 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 is comprised of local watersheds consisting of Elm Fork above Denton Creek, Hutton Branch, Cooks Branch, Farmer's Branch, Elm Fork above Cottonwood Branch, and Northwest Dallas. Due to the size of the 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 Status/Viability 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 or fragmented 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. The land within the resource study area totals approximately 41,301 acres and consists of approximately 22,146 acres of mowed and maintained vegetation (landscape plantings), 1,675 acres of riparian woodlands, approximately 257 acres of upland woodlands, and approximately 1,666 acres of unmaintained herbaceous vegetation with scattered woody species. The remaining acreage within the resource study area is paved or occupied by a structure.

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 EO 11990 (Protection of Wetlands) and Section 404 of the CWA, an investigation was conducted to identify 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.

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**).

Two wetlands were delineated totaling approximately 0.55 acre. USACE Great Plains Regional Supplement Wetland Determination Data Forms are included in **Appendix D: Supplemental Data**. Thirteen water features were delineated totaling approximately 5.04 acres. One water feature (Water 9), which appears to be an old borrow pit, is potentially non-jurisdictional. Four mitigation areas constructed as mitigation for previous Section 404 impacts associated with a TxDOT project were delineated totaling approximately 7.74 acres. 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 were not included in these calculations. Approximately 1.68 acres of waters of the U.S., including wetlands, would be permanently impacted and approximately 0.38 acre 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**.

**Proposed Mitigation**

Compensatory mitigation for Section 404 impacts would be coordinated with the USACE and performed in accordance with the terms of the approved NWP 14 PCN and Permit Amendment.

Because the roadway design is not final at this time, impacts to jurisdictional areas were approximated based on the most current schematic design which is reflected in the **Corridor Maps** in **Appendix C** of this EA. Minimal acreage adjustments may occur to jurisdictional areas as the roadway design is finalized. Mitigation measures that have been considered include:

- Avoidance, where practicable, by spanning jurisdictional areas with bridges;
- Minimization of impacts by limiting excavation and/or fill quantities; and,
- Compensatory mitigation for impacts would occur onsite when possible.

*Threatened/Endangered Species*

The limits for this project are situated within one USGS topographic quadrangle map, Carrollton, Texas (**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 County, Texas. After reviewing habitat requirements and conducting a field visit on December 5, 2008, 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 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, Lewisville West, Lewisville East, and Hebron, USGS topographic quadrangles. According to the GIS data provided by the TXNDD, the proposed project is not within the polygon of occurrence for any documented species or within 1.5 miles of a managed area.

The federally listed species in Dallas County are all avian species that are considered migratory and as such, are also protected under the 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 would be anticipated.

Potential habitat could 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 could 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 could exist in the proposed project corridor for the alligator snapping turtle and timber/canebrake rattlesnake which are also state-listed species. These species were not seen during the reconnaissance surveys by qualified biologists nor would they be anticipated to utilize these areas because the areas are isolated and found primarily in urbanized metropolitan areas that have been established for some time.

*Vegetation and Wildlife*

The 1984 TPWD map of "The Vegetation Types of Texas" indicates that the project area falls within two classifications: Urban and Crops. The Urban physiognomic region does not address specific plant species. The Crops physiognomic region includes cultivated cover crops or row crops used for the purpose of producing food and/or fiber for either man or domestic animals.

Most of the project area exhibits commercial and industrial 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 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 adjacent to the project ROW is more representative of urban type vegetation, along with some species that commonly occur in the Blackland Prairie. The northern portion of project area no longer exhibits agricultural vegetation. Due to the expanse of urbanization, these former agricultural areas have been altered by commercial development or have simply been abandoned. Some of the isolated tracts of land or undeveloped sites are primarily grassed lots with mixed forbs. Species composition along the fence lines varies. Some fence lines along the ROW are not vegetated, while others host young trees and various vines.

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. The special habitat features consist of the delineated water and wetland features**. Table IV-4** contains more detailed information on the location and type of features observed. 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. The wooded lots and perhaps the grassy fields still serve as foraging areas for many local species and migratory avian species. The adverse effects to

wildlife species found within the project limits would be minimal. The loss of available foraging habitat would be 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 help to minimize any adverse impacts to these species.

There are approximately 352.3 acres of land within the existing and proposed ROW and easements. Of this total acreage, approximately 52 percent (183.4 acres) contains herbaceous vegetation, approximately 6 percent (19.4 acres) contains woody vegetation, and approximately 42 percent (149.5 acres) is paved or contains structures within developed areas. Based on the current schematic design, it is anticipated that all vegetation in the existing and proposed ROW or easements may be cleared during construction of the proposed project, but if possible, large individual trees within the existing and proposed ROW and easements may be preserved. This could result in potential impacts to the entire approximately 183.4 acres of herbaceous vegetation and approximately 19.4 acres of woody vegetation. Of the total vegetated area, the acreage of woodland areas within the proposed ROW is approximately 4.38 acres, of which approximately 0.45 acres can be considered riparian woodland habitat. Five Woodland Data Forms (**Appendix D**) were completed for this project. See **Table IV-4** for potential impacts to woodland areas and **Appendix A: Figure 4** for the location of the woodland areas.

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**) planting details would be used. TxDOT would mitigate for the 0.45 acre of riparian woodlands habitat impacts which are represented by Woodland Data Form Area 1 (See **Table IV-4** and **Appendix A, Figure 4: Tree Removal Maps** and **Appendix D)**. Additionally, TxDOT would mitigate for the loss of large trees which were identified at Woodland Data Form Areas 1, 2, 3, and 4. The total number of large individual trees and total acreage affected and thus compensated for could change during final design. TxDOT would minimize the loss by preserving as many trees as possible.

Indirect Impacts

The land within the AOI totals 2,099 acres and consists of approximately 929 acres of mowed and maintained vegetation (landscape plantings), 67 acres of riparian woodlands, 45 acres of upland woodlands, and approximately 262 acres of herbaceous vegetation with scattered woody species. The remaining area within the AOI is paved or a structure is present. 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. Although this potential loss of habitat would not lead to further fragmentation in already fragmented areas, potential loss of habitat may occur sooner with the implementation of the proposed project. 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 37.7 acres) contains approximately 33.5 acres of mowed and maintained vegetation (landscape

plantings), 3.6 acres of herbaceous vegetation with scattered woody species, no riparian woodlands, and no upland woodlands. 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. This potential reduction in habitat associated with potential induced development linked to the proposed project may occur sooner than in the absence of the proposed project.

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 G: Indirect Land Use Impacts Assessment**).

**Step 5: Reasonably Foreseeable Future 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 37.7 acres of potentially induced development identified in **Appendix G: 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 Carrollton include Carrollton Crossing (mixed use), Downtown TOD Apartments (multi-family residential), and Maxi-Lift (industrial). Examples of announced developments being monitored in the City of Farmers Branch include the Mercer Crossing Marriott (hotel), Shops at Mercer Crossing (mixed use), Mercer Crossing Apartments (multi-family residential), Texas Hospital for Advanced Medicine (institution), Farmers Branch TOD Apartments (multi-family residential), and Provident Realty Advisors (mixed use). Acreages of these announced developments were not available from the NCTCOG as of December 2009.

Regionally significant arterials listed in *Mobility 2030 – 2009 Amendment* that are located within the natural resources RSA include:

- Spur 348 from Riverside (Elm Fork Trinity River) to Luna Rd.; improvement from four to six mainlane facility;
- Midway Rd. from Beltline Rd. to Spring Valley; improvement from six to eight mainlane facility;
- Royal Ln. from Riverside Dr. to Luna Rd.; improvement from four to six mainlane facility;
- Luna Rd. from Spur 348 on/off ramps. to Royal Ln.; improvement from two to six 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 73 miles of streams and 512 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. This may occur sooner as a result of induced development associated with the implementation of the proposed project. 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 VI-4** summarizes these cumulative impacts.

**Table VI-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 | 22,146.4 | 148.8 | 40.2 | 21,957.4 |
| Herbaceous Vegetation | 1,666.2 | 34.6 | 7.4 | 1,624.2 |
| Upland Woodlands | 257.1 | 18.9 | 0.0 | 238.2 |
| Riparian Woodlands | 1,675.5 | 0.45 | 8.5 | 1,666.6 |
| **Total of All Habitat Types (acres)** | **25,745.2** | **202.7** | **56.1** | **25,486.4** |

**Step 7: Results**

**Table VI-5** summarizes the existing resource conditions and potential impacts.

1 **Table VI-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 County, which is part of the EPA's designated nine county serious nonattainment 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 2035*) and the 2011-2014 TIP – 2011 Amendment. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011. | 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.<br><br>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 *Mobility 2030– 2009 Amendment* and the 2011-2014 TIP.<br><br>All throughout the region, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on-road and |
| Air Quality | CO | The highest modeled CO concentration corresponds to the Build scenario south of the u-turn at Valwood Parkway. | The proposed project would not result in redistribution of traffic within the indirect impacts studies area; therefore, no indirect impacts 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** |
| 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.<br><br>Although the VMT for the IH 35E Build scenario would increase approximately 70 percent by 2030 when compared to 2009, total MSAT emission for the same scenario would decrease at least 48 percent by 2030. In 2030, total MSAT loads for the Build scenario is 5.175 ton/year higher than the No-Build scenario. The higher level of MSAT emissions 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 48 percent from 2009 to 2030. While benzene and formaldehyde emissions are predicted to decline 51 and 44 percent respectively, emissions of DPM are predicted to decline even more (i.e., 88 percent). | The proposed project would not result in redistribution of traffic within the indirect impacts studies area; therefore, no indirect impacts are anticipated. | 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. | 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 2025 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 48 percent when compared to 2009. Likewise, **Graph VI-1** and **Table VI-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.<br><br>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.<br><br>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. |

| Resource Category | Indicator of Resource/Issue Condition | Direct Impacts + Indirect Impacts + Other Actions = Cumulative Impacts | | | |
|---|---|---|---|---|---|
| | | **Direct Impacts** | **Indirect Impacts** | **Other Actions** | **Cumulative Impacts** |
| | Environmental Justice | The Build Alternative would require an estimated 138 displacements (111 business establishments, 24 vacant buildings/suites, and 3 places of worship) in the Cities of Carrollton and Farmers Branch and may result in up to 2,427 displaced employees.<br><br>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.<br><br>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.<br><br>Although the study area contains a total minority population of 65.9 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.<br><br>The proposed tolled HOV/managed lanes associated with the proposed project would result in low-income users spending approximately 0.3 percent to 3.1 percent more of total household income than that of median-income users in Denton County and approximately 0.2 percent to 2.4 percent more of total household income than that of median-income users in Dallas County. Although the benefits of travel time cost savings among different income groups would not be distributed evenly, other non-toll alternatives would be in place to offset the unequal distribution of benefits by the proposed project's opening year. All users of the tolled HOV/managed lanes would spend 45 percent more under the video billing scenarios than under the ETC scenarios.<br><br>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 changes in 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.<br><br>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.<br><br>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 45 percent 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, the likelihood of continued residential and commercial development as a cumulative effect is very high.<br><br>The difference in travel times between the tolled mainlanes and the non-tolled frontage roads would be the highest during peak periods when congestion within the future regional transportation network would be the greatest. However, the overall added capacity the on-going and future transportation improvements provide 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.<br><br>The economic impact of tolling would be more profound for low-income individuals because the cost of paying tolls would represent a higher percentage of household income than for non-low-income households. Low-income users of the regional transportation network with incomes at the 2011 DHHS poverty threshold of $22,350 could spend an estimated 2.6 percent to 3.9 percent more of their total household income on tolls than that of users from households at the median level for the Dallas-Fort Worth-Arlington Metropolitan Area ($54,539). 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.<br><br>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. |

| 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 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. None of the above noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project. To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs should ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2030) noise impact contours: 300 ft from the proposed ROW for NAC B (residential) and NAC C (active sports areas, amphitheaters, auditoriums, etc.), and 100 ft from the proposed ROW for NAC E (hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in NAC A-D). | No indirect effects - 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 main- lanes regardless of tolling. | 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. |
| Community | Traffic Operations | The construction of the IH 35E facility would have positive implications - improved mobility and congestion reduction in Dallas County. | 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 community RSA. | 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 community RSA. |
| Natural Resources | Waters of the U.S., including Wetlands | Two wetlands were delineated totaling approximately 0.55 acre. Thirteen water features were delineated totaling approximately 5.04 acres. Four mitigation areas constructed as mitigation for previous Section 404 impacts were delineated totaling approximately 7.74 acres. Approximately 1.68 acres of waters of the U.S., including wetlands, would be permanently impacted and approximately 0.38 acre would be temporarily impacted by the proposed project. | 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.<br><br>The land within the AOI totals 2,099 acres and consists of approximately 929 acres of mowed and maintained vegetation (landscape plantings), 67 acres of riparian woodlands, 45 acres of upland woodlands, and 262 | 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. |

| Resource Category | Indicator of Resource/Issue Condition | Direct Impacts + Indirect Impacts + Other Actions = Cumulative Impacts | | | |
|---|---|---|---|---|---|
| | | **Direct Impacts** | **Indirect Impacts** | **Other Actions** | **Cumulative Impacts** |
| 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.<br><br>Approximately 86.8 acres of land would be acquired for the proposed project. There are approximately 148.8 acres of herbaceous vegetation and 6.9 acres of woody vegetation within the existing ROW. Within the proposed ROW, there are approximately 34.6 acres of herbaceous vegetation and 12.5 acres of woody vegetation. Of the total vegetated area, the acreage of woodland areas within the proposed ROW is approximately 4.38 acres, of which approximately 0.45 acre can be considered riparian woodland habitat. | acres of herbaceous vegetation with scattered woody species. The remaining area within the AOI is paved or a structure is present. 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.<br><br>The areas of potential induced development identified through stakeholder input (approximately 37.7 acres) contains approximately 33.5 acres of mowed and maintained vegetation (landscape plantings), 3.6 acres of herbaceous vegetation with scattered woody species, no riparian woodlands, and no upland woodlands. 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 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.<br><br>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 County. The development of undeveloped 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.

In the short- to mid-term, a sizable number of employment displacements that may result in some job losses may occur within the community RSA. However, as discussed in **Sections IV**, **V**, and **VI** in **Appendix H**, many of the potentially displaced employees are anticipated to be retained and will likely move elsewhere or operate in a different fashion within their same respective communities depending on their employers' characteristics. **Appendix H** provides a discussion on factors contributing to how and what types of employment displacements may be absorbed by the respective communities affected by the potential employment displacements. In the long-term, employment growth is anticipated in the community RSA.

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

The CAA also requires states with areas that fail to meet the NAAQS prescribed for criteria pollutants to develop a SIP. The SIP describes how the state would reduce and maintain air pollution emissions in order to comply with the federal standards. Important components of a SIP include emission inventories, motor vehicle emission budgets, control strategies, and an attainment demonstration. The TCEQ develops the Texas SIP for submittal to the EPA. One SIP is created for each state, but portions of the plan are specifically written to address each of the 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 one-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 the IH 35E improvements 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, US 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 US DOT Order 5610.2.

The proposed tolling of IH 35E 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. (However, it should be noted that community outreach, provided in the form of Workforce Solutions Greater Dallas assistance with potential employment impacts, is being implemented to benefit the public including environmental justice populations.) Through the excess toll revenue generated from the proposed project, as the MPO for the DFW region, the NCTCOG may program other transportation projects, including transit, to serve environmental justice populations as equitably as non-environmental justice populations. According to the NCTCOG, it is the NCTCOG's policy to ensure that transportation programs in the region address the effects of all plans, programs, and policies on "disadvantaged populations" through a more comprehensive and inclusive approach during the transportation planning process.[28] The NCTCOG monitors its progress with regard to this policy through its Environmental Justice performance review and summary, which measures the impacts of planned and programmed transportation projects on environmental justice populations in terms of the balance between job accessibility and congestion.[29]

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. The traffic noise analyses may also include noise impact contours to help avoid noise impacts at properties adjacent to the projects that may result from future development.

[28] NCTCOG, http://www.nctcog.org/trans/ej/index.asp
[29] NCTCOG, http://www.nctcog.org/trans/mtp/2030/Performance_Measures-Web.pdf

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 likelihood that such projects would impose negative impacts to traffic operations would be investigated before being proposed because such projects are developed with the intent to only improve traffic conditions. Therefore, negative impacts to traffic operations are not likely to occur. Nonetheless, traffic operations analyses associated with environmental studies for other projects 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*

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 usually 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 Endangered Species Act (ESA) of 1973. In general, the ESA 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.

# VII. REGIONAL PRICED FACILITY SYSTEM ANALYSIS

The indirect impacts 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 VII-1** shows a summary of the roadway and passenger rail system.

**Table VII-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 VII-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 VII-2** for the projected years of 2019, 2025, and 2030.

**Table VII-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 |

| Roadway | Location | Responsible Agency | Work Planned | Type of Tolling |
|---|---|---|---|---|
| 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 |
| 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 |

| Roadway | Location | Responsible Agency | Work Planned | Type of Tolling |
|---|---|---|---|---|
| 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 |
| 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 |

| Roadway | Location | Responsible Agency | Work Planned | Type of Tolling |
|---|---|---|---|---|
| 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 |
| 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 |

| Roadway | Location | Responsible Agency | Work Planned | Type of Tolling |
|---|---|---|---|---|
| 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 |
| 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 VII-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 VII-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 VII-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 VII-1**). The existing toll roads and HOV lanes carry 4.5 percent and 0.7 percent of all VMT, respectively.

**Table VII-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 VII-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 VII-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 VII-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 VII-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 VII.B.1**. In both cases, and for each performance measure, the analysis classified each TSZ as above or below the regional average (see **Table VII-7**). A zone with a percentage of protected class population greater than the regional average was classified as protected.

**Table VII-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 VII-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 VII-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 VII.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 VII-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 VII-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 the 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 VII-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 VII-10**. **Table VII-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 VII-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 VII-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 VII-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 VII-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 VII-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 VII-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 serious nonattainment area for eight-hour ozone has been designated by the EPA. As discussed in **Section VII**, 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.

# VIII. MITIGATION AND MONITORING COMMITMENTS

## Right-of-Way/Easements/Displacements

The proposed IH 35E improvements would require additional ROW, and thus would result in a number of displacements. Approximately 86.4 acres of proposed ROW and approximately 0.4 acre of proposed easements, and 138 displacements 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 and Workforce Solutions Greater Dallas 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 H**, 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 and Workforce Solutions Greater Dallas 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 and Workforce Solutions Greater Dallas 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.

## Waters of the U.S., including Wetlands

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 require a Section 404 NWP 14. A NWP 14 PCN would be required for Areas 3, 6, and 8 (Waters 3, 4, 5, 8, 8A, and 10; and Wetlands 1 and 2) 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). For Area 9 (Mitigation Areas 1 through 4 and Water 11), an amendment to USACE Permit Number 1994400674 would be required for the permanent impacts. USACE Permit Number 1994400674 is a TxDOT Section 404 permit. A NWP 14 would be required for the permanent impacts to Areas 1, 2, 4, 5, and 10 (Waters 1, 2, 6, 7, 11 and 12). It is anticipated that temporary fills in potential jurisdictional waters and wetlands would occur during construction.

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. 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.

*Section 401*

The SW3P would include at least one BMP from the 401 Water Quality Certification Conditions for NWPs as published by the TCEQ. Category I (Erosion Control) would be addressed by applying temporary vegetation and mulch to disturbed areas. Category II (Sedimentation Control) would be addressed by installing silt fences combined with rock berms. Category III (Post-Construction TSS Control) would be addressed by permanent plantings according to TxDOT's approved seeding specifications to create vegetation-lined drainage ditches and grassy swales. A Tier I Water Quality Certification would be required for the proposed project.

**Floodplains**

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

**Water Quality**

*Texas Pollution Discharge Elimination System (TPDES)*

The proposed project would disturb more than five acres; therefore, a NOI would be filed to comply with TCEQ stating that TxDOT would have a SW3P in place during construction of proposed project. A NOT would also be required for the proposed project.

**Vegetation Resources**

As part of the Section 404 permit, compensation/mitigation for the loss of approx. 0.45 acres of riparian woodlands and individual trees with a diameter at breast height greater than 20 inches is proposed. Trees within the ROW, but not in the construction zone, would not be removed if possible.

**Threatened/Endangered Species and Wildlife Habitat**

Prior to any construction activities a qualified biologist shall survey the proposed project corridor for any listed species, due to the time period that would elapse between this evaluation and the start of construction activities. A brief investigation of the site immediately prior to construction by a qualified wildlife biologist would help to minimize any adverse impacts to species that have limited mobility (i.e., snakes, frogs, and lizards) during roadway construction activities. If the listed mussel species are encountered within the proposed project ROW the local TPWD biologist should be contacted by TxDOT-ENV to determine an appropriate plan of action.

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 0.45 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. The riparian woodland impacts would be mitigated for as part of the Section 404 mitigation and performed in accordance with the terms of the approved NWP (**Section IV.A.7**). As requested by TPWD, a copy of the USACE approved NWP would be provided to the TPWD to document completion of mitigation requirements.

**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.

**Hazardous Materials**

There are 17 High Risk hazardous materials sites that should be considered during final design. Eleven of the high risk sites have a reported LPST (Sites 6, 7, 11, 12, 26, 28, 30, 40, 41, 48, and 49) and the corrective action for each site is "final concurrence issued, case closed." Sites 1, 2, and 3 are spills of diesel fuel, concrete additive, and calcium lignosulfate that took occurred within the ROW limits. Site 5 is listed as a chemical storage site and small quantity generator of industrial waste, including corrosive and ignitable waste. Site 35 (Chromalloy) is listed as a Tier II, RCRAG, IHW site in compliance with waste generation permits. Site 137, a MSWLF, is included as a high-risk site as a portion of the property would be impacted.

During final design, additional investigation would be required to confirm if contamination from the high-risk sites identified 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.

*Asbestos*

The existing bridges do not contain ACM. However, TxDOT would notify the DSHS of the bridge demolition 15 working days prior to the scheduled demolition.

# IX. 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 need and purpose 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, management of 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 congestion management and improvement of 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 need for the tolling component of the proposed project and how it relates to the proposed project's need and purpose is two-fold. First, part of the RTC's policy is to manage roadway capacity by influencing travel behavior through market-based pricing and vehicle occupancy conditions, which would allow managed lanes to operate at higher speeds than parallel mainlanes during peak periods. Congestion in the managed lanes would determine the toll rate, which would be adjusted dynamically to manage demand and ensure travel time reliability for subject users, including HOV and transit users, which would further incentivize those modes' use. Second, tolling the HOV/managed lanes would provide revenue to maintain the corridor and make available and leverage traditional federal aid dollars for other needed projects throughout the region that are planned in the MTP. Mobility needs such as travel time reliability for incentivized HOV and transit use could not be met with traditional funding mechanisms because dynamic fee pricing would not be in place to encourage those modes' use and there would be no travel time guarantee. It would also be difficult to manage additional capacity in the corridor without a congestion pricing mechanism. Additionally, regional transportation needs involving mobility would not be met because federal aid funds would not be made available and leveraged to serve mobility needs and projects elsewhere in the region where tolling is not as practicable and feasible.

The engineering, social, economic, and environmental investigations conducted thus far on the proposed project indicate that it would result in no significant 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.

# X. GLOSSARY

**AASHTO –American Association of State Highways and Transportation Officials**

The American Association of State Highways and Transportation Officials is a nonprofit, 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 right-of-way for projects constructed on new location not involving an existing transportation corridor; (ii) 150 ft beyond the proposed right-of-way for projects constructed in existing transportation corridors, including abandoned railroad lines."

**ASTM – American Society for Testing and Materials**

The American Society for Testing and Materials is an international standards organization that develops and publishes voluntary technical standards for a wide range of materials, products, systems, and services.

**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). The Clean Air Act Amendments of 1990 include 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**

A Corridor Development Certificate is a permit issued by a local government 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.

**CERCLIS – Comprehensive Environmental Response, Compensation, and Liability Information System**

The Comprehensive Environmental Response, Compensation, and Liability Information System is the official database for site and non-site specific Superfund data.

**C.F.R. – Code of Federal Regulations**

The Code of Federal Regulations is the 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 Congestion Mitigation and Air Quality Improvement Plan is a federal program which provides funds for a project in a nonattainment 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.

**CORRACT – Corrective Action**

The CORRACT designation indicates that a facility is currently undergoing corrective action.

**CSJ – Control Section-Job Number**

The Control Section-Job Number is the identification number 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.

**CTB – Concrete Traffic Barrier**

A Concrete Traffic Barrier is a engineering safety device used minimize the risk to vehicle occupants from collisions with roadside hazards.

**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).

**dBA – Weighted Decibel**

A weighted decibel is a unit of sound magnitude measurement that adjusts high and low frequencies to approximate the way an average person hears traffic sounds.

**dbh – Diameter at Breast Height**

The Diameter at Breast Height is the measure of the diameter of a tree at 4.5 feet above the ground.

**DCTA – Denton County Transportation Authority**

The Denton County Transportation Authority is a coordinated county transportation authority which serves as a leader for advancing public transportation alternatives within Denton County.

**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 US 380.

**DOT Act – Department of Transportation Act**

Enacted in 1966, the Department of Transportation Act states that "special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

**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.

**ERNS – Emergency Response Notification System**

The Emergency Response Notification System is national database used to store information on releases of hazardous substances.

**ESRI ArcMap 9.1**

ESRI ArcMap 9.1 is a version of a Geographic Information System modeling and mapping computer software.

**ETC – Estimated Time of Completion**

Estimated Time of Completion is the projected date that roadway construction will be finished.

**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.

**Foreign Trade Zone**

Restricted-access site, in or adjacent to a Customs port of entry, operated pursuant to public utility principles under the sponsorship of a corporation granted authority by the Foreign Trade Zones Board and under supervision of the United States Customs Service of the Department of the Treasury.

**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.

**GDP – Gross Domestic Product**

The Gross Domestic Product is the value of all goods and services produced within a nation in a given year.

**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.

**LFUN – Unauthorized and Unpermitted Landfill Sites**

The LFUN database contains a listing of unauthorized sites have no permit and are considered abandoned.

**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.

**LPST – Leaking Petroleum Storage Tank**

A Leaking Petroleum Storage Tank is a container, located either above or below ground that has had a release of petroleum products.

**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**

Managed Lanes Excess Toll Revenue Sharing Policy is 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 US 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.

**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.

**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 overall 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.

**NHD – National Hydrography Dataset**

The National Hydrography Dataset, developed by the Environmental Protection Agency and the U.S. Geological Survey, is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells.

**NHPA – National Historic Preservation Act**

The National Historic Preservation Act is 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.

**NFRAP – No Further Remedial Action Planned**

The NFRAP designation indicates a Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) registered site that was designated "No further remedial action planned" by the Environmental Protection Agency.

**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**

Non-methane hydrocarbons are 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.

**NPL – National Priorities List**

The National Priorities List is a priority subset of the Comprehensive Environmental Response, Compensation, and Liability Information System list.

**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.

**NWI – National Wetland Inventory**

The National Wetland Inventory provides information on the characteristics, extent, and status of wetlands, deepwater habitats, and other wildlife habitats.

**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.

**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**

A Pre-Construction Notification is an 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.

**$PM_{2.5}$**

$PM_{2.5}$ is Particulate Matter less than 2.5 microns in diameter. (See **PM – Particulate Matter** for more information.)

**$PM_{10}$**

**$PM_{10}$** is 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%.

**RCRA-G – Resource Conservation And Recovery Act, Hazardous Materials Generator**

A RCRA-G is a facility that generates hazardous materials as defined by the Resource Conservation and Recovery Act,

**RCRA-TSD – Resource Conservation and Recovery Information System Treatment, Storage, and Disposal Facilities.**

The RCRA-TSD is the Environmental Protection Agency's database of sites which treat, store, dispose, or incinerate hazardous waste.

**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 Record of Decision is 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**

Right-of-Entry is 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 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 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.

**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.

**SAL – State Archeological Landmark**

State Archeological Landmarks are properties designated by the Texas Historical Commission (THC) and receive legal protection under the Antiquities Code of Texas.

**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 6(f) is the portion 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 right-of-way 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**

A Special Flood Hazard Area is 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 nonattainment 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 storm water management measures that will be implemented, and the plan for long-term maintenance of these measures.

**TAC – 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**

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 carry out 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 Dallas-Fort Worth 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®**

TollTag is 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 toll road 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.

**TPP – Transportation Planning and Programming**

The Transportation Planning and Programming Division of the Texas Department of Transportation is responsible for helping with the development of short- and long-term transportation plans for the state highway system.

**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.

**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.

**TransCAD®**

TransCAD® is a Geographic Information System computer program designed for use by transportation professionals to store, display, manage, and analyze transportation data.

**TRE – Trinity River Express**

The Trinity River Express is a commuter rail service that links downtown Dallas, downtown Fort Worth, and Dallas-Fort Worth International Airport.

**TREIS – Final Regional EIS, Trinity River and Tributaries**

The "Final Regional EIS, Trinity River and Tributaries" was an environmental impact statement prepared by the U.S. Army Corp of Engineers "in order to properly evaluate the impacts of individual permit decisions in accordance with the spirit and intent of National Environmental Policy Act (NEPA) and other applicable laws."

**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.

**TXAST – Texas Above Ground Storage Tank Registration Database**

The Texas Above Ground Storage Tank Registration Database is a listing of facilities with above ground storage tanks registered with the Texas Commission on Environmental Quality.

**TxDOT – Texas Department of Transportation**

The Texas Department of Transportation is the State that, in cooperation with local and regional officials, is responsible for planning, designing, building, operating and maintaining the state's transportation system.

**TXIOP – Texas Innocent Owner/Operator Program**

The Texas Innocent Owner/Operator, created by House Bill 2776, provides a certificate to an innocent owner or operator if their property is contaminated as a result of a release or migration of contaminants from a source or sources not located on their property, and they did not cause or contribute to the source or sources of contamination.

**TXLF – Texas Solid Waste Facilities**

Texas Solid Waste Facilities (or Texas Landfills) is a listing of solid waste facilities registered and tracked by the Texas Commission on Environmental Quality.

**TXLPST – Texas Leaking Petroleum Storage Tank Registration Database**

The Texas Leaking Petroleum Storage Tank Registration Database is a listing of facilities with leaking petroleum storage tanks registered with the Texas Commission on Environmental Quality.

**TXPST – Texas Petroleum Storage Tank Registration Database**

The Texas Petroleum Storage Tank Registration Database is a listing of facilities with petroleum storage tanks registered with the Texas Commission on Environmental Quality.

**TXSPILL – Texas Spills List**

The Texas Spills List is a database maintained by the Texas Commission on Environmental Quality containing information about incidents in which emergency response was needed for the cleanup of toxic substances.

**TXSSF – Texas Superfund Site**

The Texas State Superfund database is a list of contaminated sites that the State of Texas has identified for investigation or remediation.

**TxTag®**

An electronic toll collection system that allows motorists to pay tolls without stopping at toll booths. It can be used in any toll road in Texas.

**TXVCP – Texas Voluntary Cleanup Program**

The Texas Voluntary Cleanup Program was established to provide administrative, technical, and legal incentives to encourage the cleanup of contaminated sites 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.

**US 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**

Vehicles Per Day is a measure of traffic volume and is used as the unit for Average Daily Traffic.