ENVIRONMENTAL ASSESSMENT

FOR

IH 35E NORTH SECTION

FROM: FM 2181 TO: US 380

DENTON COUNTY, TEXAS

CSJs: 0195-03-050, 0195-03-071, 0195-03-075, 0196-01-056, and 0196-01-074

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

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- 1 EXECUTIVE SUMMARY
- 2

3 This Environmental Assessment (EA) examines the social, economic, and environmental impacts 4 associated with the proposed reconstruction of Interstate Highway (IH) 35E from Farm-to-Market Road 5 (FM) 2181 to United States Highway (US) 380 in Denton County, Texas. This project is also known as 6 the IH 35E North Section and is a portion of the larger IH 35E corridor project, which includes the planned 7 reconstruction of IH 35E spanning from IH 635 in the south to US 380 in the north. The IH 35E corridor 8 improvements span a distance of approximately 28 miles. Of this, the proposed North Section 9 improvements span the northernmost 11 miles through the Cities of Corinth and Denton; that is, from FM 10 2181 to US 380, including a small portion of IH 35W associated with the reconstruction of the IH 35E and 11 IH 35W interchange (see Appendices A, Figures A-1 and A-2). Unless otherwise defined, the project 12 study area (or 'project area') generally includes the proposed project footprint and adjacent portions of the 13 Cities of Corinth and Denton.

14

The existing design of IH 35E does not meet current urban freeway design standards, nor does it adequately accommodate current traffic demand. As population increases are predicted throughout the project area, improvements to IH 35E are necessary to provide a safe and efficient thoroughfare that affords improved mobility and roadway carrying capacity.

19

A Major Investment Study (MIS), initiated in 1998 by the Texas Department of Transportation (TxDOT), evaluated existing traffic congestion along IH 35E and identified various alternatives (e.g., congestion management systems, roadway widening, light rail construction, managed/High Occupancy Vehicle (HOV) lanes, etc.) by which to improve mobility. The study anticipated that the most productive and efficient operation of the IH 35E facility would result from the combined utilization of roadway widening and express or managed/HOV lanes.

26

27 Information gained from the MIS study aided in the development of the proposed Build Alternative 28 evaluated in this EA. These proposed improvements include the reconstruction of IH 35E to 29 accommodate the addition of mainlanes, frontage road lanes, ramps, cross street interchanges, and 30 managed/HOV concurrent flow (MHOV-C) lanes. Proposed IH 35E mainlane configurations vary from 31 three to four lanes in each direction from FM 2181 to the IH 35E and IH 35W interchange, and five lanes 32 in each direction from the IH 35E and IH 35W interchange to US 380. The portion of IH 35W included in 33 the proposed improvements has a roadway configuration of three mainlanes in each direction. MHOV-C 34 lane configurations vary from one to two lanes in each direction running along the center median and 35 frontage road lanes vary from two to four continuous lanes in each direction throughout the project 36 corridor (see Appendix A, Figure A-8 for proposed typical sections). The Build Alternative also includes 37 the reconstruction of cross streets in accordance with roadway designs set forth within city thoroughfare

plans, as well as the reconstruction of ramps to meet current TxDOT design criteria and to improve traffic
 operational performance. Approximately 106.59 acres of additional right-of-way (ROW) are necessary for
 project implementation, varying in width from approximately 325 to 613 feet.

4

5 The proposed project is consistent with the regional *Mobility 2030: The Metropolitan Transportation Plan* 6 *(MTP) for the Dallas-Fort Worth Area, 2009 Amendment (Mobility 2030 - 2009 Amendment)* and the 7 Fiscal Year (FY) 2011–2014 Transportation Improvement Program (TIP), as amended.

8

9 This EA evaluated the proposed project's direct, indirect, and cumulative impacts to natural and cultural
10 resources and community issues. A summary of findings is presented below.

11

12 Natural Resources

 Lakes, Rivers, and Streams – There are 24 locations where cross drainage of water runs through box culverts or concrete pipes. These water crossings are associated with unnamed ephemeral tributaries to Graveyard Slough, Pecan Creek, and Dry Fork Hickory Creek, all of which are tributaries to Lewisville Lake on the Elm Fork of the Trinity River. There are no navigable waters and no wild and scenic rivers in the project area, nor is a Coastal Zone Management Plan applicable to this proposed project.

19

20 • Waters of the U.S., including Wetlands - Of the 24 water crossings, 11 streams are considered to 21 be waters of the U.S., including wetlands, and within the regulatory jurisdiction of the U.S. Army 22 Corps of Engineers (USACE). Construction of the proposed project would result in permanent 23 impacts to all 11 of the jurisdictional waters crossed by the proposed project (see Appendix A, 24 Figure A-4 for water crossing locations and Appendix A, Figure A-7 for impact details). 25 Permanent impacts would include 1.47 acres to streams and a pond, of which 1.08 acres would be 26 stream segments within existing culverts, and 0.19 acre to wetlands. Impacts to the 11 water 27 crossings would be minimized by compliance with the mitigation requirements that are part of a 28 Section 404 Nationwide Permit (NWP) 14. Impacts to four of the jurisdictional waters would require 29 a NWP 14 Preconstruction Notification (PCN) due to permanent impacts exceeding the threshold of 30 0.10 acre (one of these sites also includes 0.19 acre of impacts to an adjacent wetland).

31

Floodplains – The proposed project crosses 100-year floodplains at five locations in the project corridor. These crossings are expected to impact approximately 14.92 acres of floodplains (see Appendix B, Figure B-6). The hydraulic design for the proposed improvements would be in accordance with current TxDOT and Federal Highway Administration (FHWA) design policies and procedures. Further, the proposed project would permit the conveyance of the design year flood, without causing substantial damage to the roadway, stream, or other property. The project would

also not increase the base flood elevation to a level that would violate applicable floodplain regulations or ordinances.

2 3

1

4 • Water Quality - The proposed project crosses within five miles upstream of Lewisville Lake 5 (Segment 0823); however, this segment is not designated as either threatened or impaired in the 2008 Texas 303(d) list (March 19, 2008). None of the aquatic features crossed by the proposed 6 7 project are designated as either threatened or impaired in the 2008 Texas 303(d) list (March 19, 8 2008), and the proposed project is not within five miles upstream of a threatened or impaired water 9 segment. Because this project would disturb more than one acre, TxDOT would be required to 10 comply with the Texas Commission on Environmental Quality (TCEQ) Texas Pollutant Discharge 11 Elimination System (TPDES) General Permit for Construction Activity. The project would also 12 disturb more than five acres; therefore, a Notice of Intent would be filed to comply with TCEQ 13 stating that TxDOT would have a Storm Water Pollution Prevention Plan (SW3P) in place during the 14 construction period. Construction would also comply with TCEQ's best management practices 15 (BMPs) and other erosion, sedimentation, and pollution control practices.

16

17 • Vegetation and Wildlife Habitat - The proposed project would result in permanent impacts to 18 approximately 2.03 acres of riparian forest, 9.93 acres of upland forest, 1.54 acres of fencerow vegetation, 1.24 acres of brushland, 317.79 acres of grassland, and 0.58 acre of open channel 19 20 creeks, wetlands, and ponds (see Appendix A, Figure A-7 for impact locations and details). In 21 accordance with TPWD (see **Appendix B-5**), mitigation is anticipated for six sites (approximately 22 1.20 acres) of riparian forest and 18 sites (approximately 4.25 acres) of upland forest (and 23 associated large trees), for a total of 5.45 acres. Non-regulatory mitigation would take place at the 24 Lewisville Lake Environmental Learning Area (LLELA) through fee payment. Implementing the 25 proposed project is not anticipated to affect the migration patterns of birds. Riparian areas and 26 creeks affected by the proposed improvements would be field verified for the presence of migratory 27 birds prior to project construction.

28

29 Threatened/Endangered Species - The proposed project would impact the preferred habitat for ٠ 30 one state-listed threatened species (timber/canebrake rattlesnake) and two state-listed species of 31 concern (Texas garter snake and plains spotted skunk). Preferred habitat for the timber/canebrake 32 rattlesnake includes riparian forest, upland forest, and wetlands. Preferred habitat for the Texas 33 garter snake includes riparian forest and wetlands; and preferred habitat for the plains spotted 34 skunk includes upland forest and tallgrass prairie. The proposed project is anticipated to affect 35 approximately 2.03 acres of riparian forest, 0.19 acre of wetlands, and 11.47 acres of upland forest (including fencerows). The proposed project would have no impact on the aforementioned species. 36

1 Potentially suitable stopover habitat is not found within the project area for the following listed 2 migratory bird species: the Interior Least Tern, Piping Plover, White-faced Ibis, Whooping Crane, 3 and Wood Stork. The American and Artic Peregrine Falcons are have been delisted from the 4 federal list of threatened and endangered species. Potentially suitable stopover habitat is found 5 within the project area for the American and Arctic Peregrine Falcons; however, to the extent that 6 other nearby stopover habitat is readily available and accessible for the duration of project 7 construction, direct impacts on these species would be negligible. The proposed project would 8 have no effect on the federally listed threatened or endangered species in Denton County.

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14

- Topography and Soils The project area can be characterized as gently sloping with a local topographic trend to the south and east toward Lewisville Lake. The proposed study area is located entirely within the city limits of Corinth and Denton and is exempt from the provisions of the Farmland Protection Policy Act (FPPA).
- 15 • Air Quality - An analysis of expected carbon monoxide (CO) emissions indicates the proposed 16 project would not cause or contribute to any new localized CO violations or increase the frequency 17 and severity of any existing CO violations. The proposed project is included in and is consistent 18 with the area's financially constrained long-range MTP (Mobility 2035) and the 2011-2014 TIP, as amended. The U.S. Department of Transportation (USDOT) (FHWA/Federal Transit Administration 19 20 [FTA]) found the MTP and the TIP to conform to the SIP on July 14, 2011. A quantitative mobile 21 source air toxics (MSATs) analysis was performed which indicates that by 2030 MSAT emissions 22 related to the proposed project would substantially decrease when compared to 2009 (i.e., a 54 23 percent decrease in total MSAT emissions from 2009 to 2030). A decrease in total MSAT 24 emissions is expected even with the projected increase in vehicle miles traveled (VMT). This is a 25 result of the Environmental Protection Agency's (EPA) national air emissions control programs that 26 are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020.

28 Community Impacts

- Regional and Community Growth The estimated percent change in population growth from 2000 to 2030 for the Cities within the project area (Corinth and Denton) are 138 percent and 160 percent, respectively, and 154 percent for Denton County. The Build Alternative is necessary to support the regional and community growth in Denton County and the municipalities within (Cities of Denton and Corinth) and near (City of Lake Dallas and Town of Hickory Creek) the IH 35E study area.
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Land Use – Approximately 106.59 acres of land would be converted to transportation ROW, which
 is comprised of the following types of land use: 54.87 acres undeveloped, 3.95 acres developed

residential, 46.53 acres developed commercial, 1.04 acres undeveloped easement, and 0.20 acre
 developed commercial easement. References to the proposed roadway improvements are included
 within various plans and ordinances of the municipalities within the project area (Cities of Corinth
 and Denton) and near it (City of Lake Dallas and Town of Hickory Creek).

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Section 4(f) and 6(f) Properties – The proposed project would not require the use of, nor substantially impair, the purposes of any publicly owned land from a public park, recreation area, wildlife/waterfowl refuge, or any historic sites of national, state, or local significance; therefore, a Section 4(f) evaluation would not be required. In addition, there would be no loss of park or recreation land because the proposed project does not require ROW acquisition from either land use type; therefore, consideration under Section 6(f) is not required.

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 Economic Impacts – The projected employment growth rates from 2000 to 2030 for the cities of the project area (Corinth and Denton) are 46 and 84 percent, respectively, and 171 percent for Denton County. NCTCOG employment forecasts, which account for the cyclical nature of employment changes (including economic recessions), predict future employment growth for the Cities of Corinth and Denton as these municipalities respond to increased demand spurred by forecasted population growth. The Build Alternative would provide a portion of the additional mobility necessary to support the increasing traffic associated with this projected growth.

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21 It is anticipated that a range of 372 to 784 employees could experience job relocation or loss in 22 association with the impacted businesses. However, there appear to be sufficient future 23 employment opportunities of varying skill requirement intensities within the Cities of Corinth and 24 Denton based on information provided by the NCTGOG's Development Monitoring database, 25 Denton County Transportation Authority (DCTA) regional rail expansions, and interviews with 26 Planning Officials from the municipalities of Corinth and Denton. Both the Cities of Corinth and 27 Denton are willing to coordinate with the potentially displaced entities to minimize employment and 28 economic impacts associated with the proposed reconstruction of IH 35E. Further, minimization 29 and mitigation efforts enacted by the Texas Workforce Commission (TWC) and Workforce Solutions 30 for North Central Texas (Workforce Solutions) are available to affected employers and employees. For example, appropriate staff from Workforce Solutions will attend the Public Hearing in order to 31 32 answer questions and present services information; and upon employer request, Workforce 33 Solutions can provide one to two hour "rapid response workshops" informing emplyees of their 34 programs and services. For these reasons, substantial business and employee impacts are not 35 anticipated.

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1 • Relocations and Displacements - The proposed project would require the acquisition of 57 2 properties, including 17 residential and 40 commercial. The 17 residential displacements have an 3 associated 18 residential structures (including two apartment buildings with eight apartment units 4 each); and the 40 commercial properties have an associated 60 commercial structures (including 5 buildings and canopies at gasoline service stations). There are 44 businesses associated with the anticipated 40 commercial property displacements. See Table 5-12 and Appendix A, Figure A-6 6 7 for displacement details and locations. Based on the results of the replacement residential (see 8 Table 5-13 and Section 5.2.5) and commercial property searches (see Section 5.2.5), there 9 appear to be a sufficient number of vacant and developed properties to accommodate those 10 residences and businesses impacted by the proposed project. Relocation assistance and 11 compensation would follow in accordance with applicable state and federal requirements. It is 12 anticipated that a range of 372 to 784 employees could experience job relocation or loss in 13 association with the affected businesses. However, North Central Texas Council of Government 14 (NCTCOG) employment forecasts, which account for the cyclical nature of employment changes 15 (including economic recession), predict overall future employment growth for the study area in 16 response to increased demand stimulated by forecasted population growth. Future employment 17 opportunities are also expected based on the number of future developments planned within the 18 Cities of Corinth and Denton (see Sections 5.2.5, 7.5.5 and Appendix E-3); and assistance to 19 affected employees would be available through the Texas Workforce Commission (TWC) and 20 Workforce Solutions for North Central Texas.

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• *Access* – Although the proposed project would result in additional control of access (consistent with TxDOT design criteria), alternative access routes to adjacent properties would be maintained.

25 • Community Cohesion - The presence of two universities (University of North Texas (UNT) and 26 Texas Woman's University (TWU)) has fostered a large student community within the City of 27 Denton, necessitating expansion of the universities. In fact, future UNT plans call for the expansion 28 of the University on the western side of IH 35E; and construction of a pedestrian bridge over all the 29 mainlanes and frontage road lanes to connect both UNT properties on either side of IH 35E. 30 However, in relation to the student communities, the residential status of the TWU and UNT 31 students tends to be transient in nature, typically only extending the tenure of their enrollment. 32 Because social bonds among parents and among children are oftenformed through various social 33 and athletic activities associated with elementary schools, potential communities adjacent to the 34 proposed project were delineated according to elementary school attendance zones. All of the 35 potential residential displacements would occur within the Borman Elementary School attendance 36 zone. According to 2008 enrollment records, of the approximate 600 students enrolled at Borman 37 Elementary School, approximately 19.6 percent were white, 11.8 percent were black, 66 percent were Hispanic, 2.2 percent were Asian, and 0.4 percent were Native American. The Borman
 Elementary School attendance zone covers approximately 17,740 acres and is the largest
 attendance zone adjacent to the proposed project. A loss of 16 single-family residential homes and
 two apartment buildings (with eight apartment units each) within an attendance zone of this size is
 unlikely to negatively impact the overall cohesiveness and nature of its encompassed communities.

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 Limited English Proficiency (LEP) – Of the 48,882 persons within the Census block groups located within 0.25 mile of the proposed project ROW, approximately 7.6 percent speak English less than "very well." Steps have been and would continue to be taken to ensure all LEP populations have access to programs, services, and information provided by TxDOT.

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• *Environmental Justice (EJ) and Economic Impacts of Tolling (EJ/Tolling)* – For the 198 Census blocks and 24 Census block groups within 0.25 mile of the proposed project ROW:

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- 18 Census blocks contain minority populations of 50 percent or greater (five of which have a population of less than 10);
- 137 Census blocks contain specific combined minority populations that are at least 50 percentage points higher than their respective block groups;
- Median household incomes in 1999 for the Census block groups ranged from \$13,281 to \$90,888; and
- Five block groups reported median household incomes below the Department of Human Health and Services (HHS) 2011 poverty guideline (\$22,350) for a family of four.
- 21 22

23 Although minimum wage jobs would be lost because of the proposed project, there appears to be 24 future employment opportunities with varying skill requirements within the Cities of Denton and 25 Corinth. Further analysis of impacts on the human population (e.g., changes in access/travel 26 patterns, community cohesion, etc.) determined that impacts would not be predominately borne by 27 EJ populations, but instead be shared by both EJ and non-EJ populations. Origin-Destination 28 (O&D) data analysis indicates that approximately one-sixth of the trips on the IH 35E mainlanes 29 would be from EJ TSZs and approximately one-tenth of the trips on the managed lanes would be from EJ TSZs. 30

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As demonstrated by the MHOV-C lane pricing analysis scenarios presented in **Section 5.2.10**, the proposed project would not evenly distribute the benefits of time cost savings associated with the MHOV-C lanes among all income groups because lower income groups would pay a higher proportion (approximately three to four times more) of their income for tolls as compared to middle and higher income groups for the same time savings benefit. However, alternative project-specific, non-toll options currently exist or would at the time the MHOV-C lanes open to traffic. In general,

1 such project-centric, non-tolled options include, adding one to three non-tolled mainlanes in each 2 direction, making the existing two-lane frontage roads continuous throughout the project corridor. 3 providing an additional frontage road lane at exit ramps and where traffic projections exhibited high 4 traffic volumes, and providing intersection improvements. These improvements to the existing IH 5 35E facility would improve mobility for all users (including low-income users) who do not elect or 6 can only on an occasional basis afford to travel on the MHOV-C lanes. Additionally, MHOV-C lane 7 users, (including low-income) would realize a travel-time savings and reduce their personal 8 economic impact by using transit in which tolls would be waived for the transit provider per RTC 9 policy (see Appendix G-1). In sum, the aforementioned non-toll options would assist in offsetting 10 the unequal distribution of travel time cost savings benefits based on income, regardless of the toll 11 collection method.

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Based on the totality of effects from the proposed project, disproportionately high and adverse
 impacts to minority or low-income populations are not anticipated.

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Public Facilities and Services – The proposed project would generally improve mobility to public facilities and services within the proposed project area. The Denton Baptist Temple Youth Center, one building out of three on the Denton Baptist Temple property, would be displaced due to the proposed improvements (see Appendix A-9, Photograph 6). There are approximately 2.6 acres of undeveloped land on the Denton Baptist Temple property not affected by ROW acquisition.

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26 27 Aesthetic Considerations – The proposed improvements are not anticipated to change the aesthetic character of the surrounding IH 35E communities. Aesthetic structural and landscape design considerations would be incorporated during final project design Plans, Specifications, and Estimates.

• **Noise** – The proposed project would result in traffic noise impacts. Five noise walls are considered feasible and reasonable, benefiting 169 receivers (see **Appendix C, Figure C-20**).

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Traffic Operations – Compared to the No-Build Alternative, the Build Alternative results in
 improved level of service (LOS) on both northbound and southbound mainlanes, MHOV-C lanes,
 and ramp junctions, including the proposed MHOV-C lanes operating at the highest quality of
 service (LOS A).

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1 Cultural Resources

2 • Archeological Resources and Non-Archeological Historic Resources - The proposed project 3 would not affect archeological sites listed in, or determined eligible for designation in, the National 4 Register of Historic Places (NRHP), and was included on the list of projects not warranting 5 archeological survey (see Appendix C-18). Regarding non-archeological historic resources, a 6 2009 reconnaissance survey identified 20 resources that appear to be at least 50 years of age 7 within the project area of potential effects (APE); however, none are recommended eligible for 8 listing in the NRHP. Further, there are no Official Texas Historical Markers in the project APE. See 9 Appendix C-16 for the THC concurrence letter (dated February 18, 2010).

10

11 Other Resources/Issues

12 • Hazardous Materials - A review of the TxDOT-specified federal and state environmental 13 databases (and subsequent site visit) identified the following sites which were determined to pose a 14 high risk to ROW acquisition and/or construction of the proposed project: three Texas Voluntary 15 Compliance Program (TX VCP) sites, 24 State Registered Leaking Petroleum Storage Tank (LPST) 16 sites, and two State Registered Petroleum Storage Tank (PST) sites. Refer to Section 5.4.1 for 17 detailed site descriptions and Appendix A, Figure A-6 for site locations. Some of the TX VCP, 18 LPST, and PST sites are listed in more than one database. Field reconnaissance showed no 19 surface evidence of contamination. It is recommended that subsurface investigations (soil boring 20 samples, ground water samples, etc.) be conducted within the vicinity of the listed high risk sites 21 prior to ROW acquisition and construction to determine if remediation, in accordance with federal, 22 state, and local laws, is necessary. Measures would be taken during construction to prevent, 23 minimize, and control the spill of hazardous materials and ensure workers' safety.

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25 • Airway-Highway Clearance - Denton Municipal Airport is located at a minimum distance of 26 approximately 9,000 feet of the IH 35E/IH 35W interchange. The Federal Aviation Administration's 27 (FAA) Notice Criteria Tool was used to access various lighting scenarios (e.g., high mast lighting, 28 continuous lighting, etc.) from the highest elevation of the proposed project at the IH 35E/IH 35W 29 interchange. Based on the lighting scenarios, the Notice Criteria Tool indicated that coordination 30 with the FAA was required. The TxDOT Design Division is responsible for coordinating all airway -31 highway clearance matters with the FAA. During final design of the proposed project, the Design 32 Division will determine if coordination with the FAA will be required based on the final project design 33 and lighting specifications.

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35 Indirect Impacts

The three broad categories for which indirect impacts are assessed are (1) encroachment-alteration impacts, (2) project-influenced land use change, and (3) impacts resulting from project-influenced land use change. These three types of impacts were evaluated within an established indirect impacts area of influence (AOI) (see **Appendix D**, **Figure D-1**) and in accordance with the TxDOT guidance on conducting indirect and cumulative impact analyses (i.e., TxDOT ICI Guidance),¹ the National Cooperative Highway Research Program (NCHRP) Report 466,² and NCHRP Report 25-25, Task 22.³ The indirect impacts analysis involved exploring the cause-effect relationships between impact causing actions and the goals and notable features of the AOI to determine if indirect impacts are likely; and if so, if those impacts are substantial. The results are as follows:

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9 (1) Encroachment-Alteration Impacts: Using the qualitative inference technique and various
 10 cartographic techniques (as outlined in NCHRP Report 466), it was determined that substantial ecological
 11 and socio-economic encroachment-alteration impacts are not anticipated.

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13 (2) Project-Influenced Land Use Change: Methodology from NCHRP 25-25, Task 22, as well as 14 information gained via questionnaires and interviews with representatives (i.e., Planning Officials) from all 15 the AOI municipalities were utilized in the identification of 27 potential locations of project-influenced land 16 use change (see Appendix D, Figure D-3). These 27 locations account for 3.8 percent (996.6 acres) of 17 the AOI. Improved mobility, caused by the proposed improvements, could stimulate growth near the 18 project alignment resulting in higher occupancy rates and improved accessibility to services. However, it 19 is important to note that all Planning Officials interviewed (see Appendix D-5) concurred that the 20 economy and municipal regulations governing development are the major factors affecting the rate, type, 21 and amount of development within the AOI, not solely implementation of the proposed IH 35E 22 improvements.

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24 (3) Impacts Resulting from Project-Influenced Land Use Change: A prescreening process 25 determined which notable features, goals, and other resources associated with the 27 sites of potential 26 development warranted additional analysis. Based on the results of this prescreening process (in 27 accordance with the TxDOT ICI Guidance), the magnitude of impacts was assessed for the following 28 notable features: valued habitat (i.e., water resources, riparian forest, and upland forest); valued species 29 (i.e., timber/canebrake rattlesnake, Texas garter snake, and the plains spotted skunk); and sensitive 30 elements of the population (i.e., EJ populations). Based on the amount and context of impacts assessed, 31 and assuming the continued implementation of existing local, regional, and state guidelines and 32 ordinances to ensure environmental compliance, substantial impacts are not anticipated to any of the 33 notable features analyzed.

¹ (September 2010), TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses.*

² TRB (2002), NCHRP Report 466 Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects.

³ TRB (2007), NCHRP Report 25-25, Task 22, Forecasting Indirect Land Use Effects on Transportation Projects.

Summary: No substantial encroachment-alteration impacts, project-influenced land use change impacts,
 or impacts resulting from project-influenced land use change are anticipated.

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4 Cumulative Impacts

5 Cumulative impacts were assessed for the following resources/issues: air quality, water resources 6 (waters of the U.S., including wetlands), biological resources (vegetation and threatened/endangered 7 species), land use, and tolling impacts on EJ populations (EJ/Tolling). Each resource/issue was 8 assessed within a specified Resource Study Area (RSA), as listed in **Table 7-1** and shown in **Appendix** 9 **E, Figure E-1**. A brief summary of cumulative impacts (direct impacts + indirect impacts + impacts from 10 reasonably foreseeable transportation and development projects) is provided below.

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12 • Air Quality - The proposed project is included in and is consistent with the area's financially 13 constrained long-range MTP (Mobility 2035) and the 2011-2014 TIP, as amended. The USDOT 14 (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011. Other reasonably 15 foreseeable planned transportation improvements are included in the TIP and are consistent with the MTP, which were found to conform to the SIP. Although increased development and 16 17 urbanization would likely have a negative effect on air quality, the cumulative impact of reasonably 18 foreseeable future growth and urbanization on air guality would be minimized by enforcement of 19 federal and state regulations by the EPA and TCEQ. EPA's vehicle and fuel regulations, coupled 20 with fleet turnover, will over time cause substantial reductions of on-road emissions including CO, 21 MSATs, and ozone precursors (volatile organic compounds [VOC] and nitrogen oxides [NOx]).

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 Water Resources – Cumulative impacts to water resources would affect approximately 10.3 acres of stream channels (existing open channels and existing culverts), 14.2 acres of open water, and 7.3 acres of wetlands.

Biological Resources: Vegetation and Threatened/Endangered Species – Within the RSA for
 Biological Resources (approximately 45,666.6 total acres), anticipated cumulative impacts would
 affect approximately 64.7 acres of riparian forest, 173.3 acres of upland forest, 1,768.5 acres of
 grass, 9.2 acres of stream channel (existing open channels only), 14.2 acres of open water, and 7.3
 acres of wetlands. Of the vegetation types affected, preferred habitat includes riparian forest,
 upland forest, and wetlands for the timber/canebrake rattlesnake; riparian forest and wetlands for
 the Texas garter snake; and upland forest for the plains spotted skunk.

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Land Use – Direct impacts of the proposed IH 35E improvements would involve the conversion of
 approximately 106.59 acres to transportation ROW. Approximately 996.6 acres could potentially be

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1 affected by project-influenced land use change and approximately 18,095.4 acres could potentially 2 be impacted by reasonably foreseeable development and transportation projects. A sum total of 3 approximately 19,198.8 acres of land would potentially be developed with urban or transportation 4 uses within the land use RSA, of which approximately 18,108.1 acres would be undeveloped land 5 and approximately 1,090.7 acres would be developed land. Road improvements are part of the 6 development plans for municipalities within the cumulative impacts study area and such projects are 7 necessitated by past growth and would facilitate future growth. All projects would conform to 8 municipal planning documents.

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10 • Economic Impacts of Tolling (EJ/Tolling) - Motorists using the non-tolled, general-purpose 11 mainlanes and frontage roads, including low-income populations, would experience a difference in 12 travel time during peak travel periods compared to MHOV-C lanes. Low-income populations using 13 the IH 35E MHOV-C lanes would pay a greater portion of their annual household income 14 (approximately three to four times more) on tolls compared to a non-low-income user. Overall, however, non-toll improvements to the existing IH 35E facility would improve mobility for all 15 16 populations using IH 35E, including EJ populations. In general, such non-toll improvements 17 associated with the proposed project include: the addition of one to three non-tolled mainlanes in 18 each direction, construction to make the existing two-lane, non-tolled frontage roads continuous 19 throughout the project corridor, construction of an additional non-tolled frontage road lane at exit 20 ramp locations as well as where traffic projections exhibited high traffic volumes, and improvements 21 to existing intersections. Additionally, transit options will be available as non-tolled alternatives to 22 SOV and HOV usage of the IH 35E MHOV-C lanes. Additionally, transit options will be available as 23 non-tolled alternatives to SOV and HOV usage of the IH 35E MHOV-C lanes, including the DCTA A-24 train. MHOV-C lane users, (including low-income) would realize a travel-time savings and reduce 25 their personal economic impact by using transit in which tolls would be waived for the transit 26 provider per RTC policy (see Appendix G-1). Further, excess toll revenue generated from the 27 MHOV-C lanes could be used in the construction/reconstruction and/or maintenance of other tolled and/or non-tolled roadways and other congestion reducing efforts⁴ (see Appendix G-2 for additional 28 29 information).

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By 2030, an estimated 8.3 percent of the transportation network lane miles are proposed to be tolled, which would function to increase efficiency and assist in meeting region capacity and mobility needs. Although it is reasonable to assume that there would be a cumulative effect on low-income populations upon build-out of the regional toll system, at this time it is not considered substantial. Strategies are currently under consideration for if/when the impact becomes substantial.

⁴ Regional Transportation Council (June 2005), *Excess Toll Revenue Sharing: Managed Lane Policy*.

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Implementation of regulatory control strategies and policies are assumed in relation to the proposed
project and other reasonably foreseeable projects. Potential cumulative impacts to all resources/issues
described above could be avoided or minimized by compliance with applicable local, state, and federal
requirements.

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7 Determination of Assessment

8 The engineering, social, economic, and environmental investigations conducted thus far on the proposed

9 project, and presented in this EA as well as summarized above, indicate that the proposed project would

10 result in no significant impacts to the quality of the human or natural environment.

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1 1.0 INTRODUCTION

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3 1.1 IH 35E Corridor

4 Roadway improvements are proposed to Interstate Highway (IH) 35 East (35E) from IH 635 to United 5 States Highway (US) 380 in Dallas and Denton Counties, Texas (herein referred to as the 'IH 35E 6 corridor'). IH 35 is the longest north-south interstate highway in Texas, running from Laredo near the 7 Texas-Mexico border to the Texas-Oklahoma border north of Gainesville. IH 35 stretches approximately 8 1,568 miles across the United States, continuing from the Texas-Oklahoma border northward to its 9 terminus in Duluth, Minnesota. In Hillsboro, Texas, IH 35 splits into IH 35E and IH 35 West (35W) until 10 converging into one interstate again in Denton, Texas. Construction was completed on IH 35E by the 11 mid-1960s, followed by the completion of the remaining portion of IH 35W from Fort Worth to Denton in 12 the late 1960s.

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14 The proposed reconstruction planned for the IH 35E corridor would span approximately 28 miles from IH 15 635 northward to US 380. This area is currently being evaluated for improvements in three separate sections designated South, Middle, and North. A separate EA and preliminary design is associated with 16 17 each of the three independent actions. Each section is a "segment of independent utility" and is usable 18 even if no additional transportation improvements in the area are constructed. This project would satisfy 19 identified needs and has been considered in the context of the local area socioeconomics and 20 topography, the future travel demand, and other infrastructure improvements in the area. Table 1-1 lists 21 the logical termini and approximate distances by project section and Appendix A, Figure A-1 provides a 22 visual representation of these three sections throughout the IH 35E corridor. The proposed 23 implementation timeline for these projects involves reconstructing IH 35E in multiple phases. The phased 24 construction of IH 35E may consist of both interim and ultimate improvements. Interim improvements will 25 remain in place until later phases construct the planned ultimate improvements.

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Section	South Logical Termini	North Logical Termini	Approximate Project Length		
South	IH 635	PGBT*	5 miles		
Middle	PGBT	FM 2181	12 miles		
North	FM 2181	US 380	11 miles		
lote: *PGBT = President George Bush Turnpike					

TABLE 1-1. IH 35E CORRIDOR PROJECT SECTIONS

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28 This Environmental Assessment (EA) focuses on the North Section of the IH 35E corridor improvements.

The southern limit of the North Section begins in the City of Corinth and continues northward through the City of Denton. To accommodate necessary roadway transitions, the construction limits of the proposed

31 project extend from approximately 2,400 feet north of Farm-to-Market Road (FM) 2181 to US 380.

1 The analyses conducted for the proposed project were based on data and methodologies associated with 2 the long-range metropolitan transportation plan (MTP) Mobility 2030 - 2009 Amendment adopted by the 3 Regional Transportation Council (RTC) of the NCTCOG on April 9, 2009. On February 1, 2011, the 4 Mobility 2030 - 2009 Amendment and the Transportation Improvement Program (TIP), 2011-2011 TIP 5 Amendment, were found to conform to the State Implementation Plan (SIP). On March 10, 2011, a new 6 MTP, Mobility 2035, was adopted by the RTC of the NCTCOG. On July 14, 2011, this new plan and the 7 associated TIP (2011-2014 TIP, as amended) were found to conform to the SIP. This EA was prepared 8 during the MTP transition period between Mobility 2030 - 2009 Amendment and Mobility 2035.

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10 On June 22, 2011, FHWA released a guidance memorandum containing procedures to determine 11 environmental document consistency between MTPs during an MTP transition period. The purpose of 12 the guidance memorandum, entitled Guidance for Metropolitan Transportation Plan Transition (between 13 Plan years) and NEPA Document Requirements and Processing, is to ensure that environmental 14 documents prepared during the MTP transition period are consistent with the new MTP and are not 15 required to be updated, thus streamlining the environmental process. In accordance with the guidance 16 memorandum, TxDOT prepared a technical report and determined that the EA is consistent throughout 17 the transition period between Mobility 2030 - 2009 Amendment and Mobility 2035; therefore, the analyses 18 based on Mobility 2030 - 2009 Amendment remains valid. The results and conclusions of the analyses 19 based on Mobility 2030 - 2009 Amendment are presented in this EA.

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21 **1.2 Project Definition Process: Funding Strategies**

An official decision regarding the funding mechanism(s) used to finance the reconstruction and maintenance of the IH 35E corridor improvements would occur at a later date following an iterative process evaluating both traditional and innovative finance and project delivery options amongst IH 35E stakeholders, a component of the *project definition process*.

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27 The North Central Texas Council of Governments (NCTCOG) serves as the Metropolitan Planning Organization (MPO) for the 16-county region⁵ of North Central Texas; that is, a policy board designed to 28 29 carry out the metropolitan planning process. The RTC, an independent transportation policy body of the 30 MPO responsible for overseeing the development and implementation of the MTP, has adopted local 31 policy decisions outside the scope of the National Environmental Policy Act (NEPA) that leverages 32 legislation to create local funding strategies. The Regional Toll Revenue Funding Initiative policy uses 33 up-front payments from Comprehensive Development Agreements (CDA) to fund projects sooner. In 34 accordance with the RTC's Excess Toll Revenue Sharing: Managed Lane Policy (approved June 2005), 35 local governments and transportation authorities shall have the opportunity to invest in a CDA project as a

⁵ The NCTCOG 16-county region includes Collin, Dallas, Denton, Ellis, Erath, Hood, Hunt, Johnson, Kaufman, Navarro, Palo Pint, Parker, Rockwall, Somervell, Tarrant, and Wise Counties.

means to fund the roadway and generate local revenue. See Appendix G-2 for a copy of the RTC's
 Excess Toll Revenue Sharing: Managed Lane Policy and Section 2.2 for additional discussion on the
 policy as it relates to the proposed IH 35E improvements.

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5 Challenged with modest transportation funding, relative to identified needs and growth, the Dallas-Fort 6 Worth region optimizes the use of its limited transportation funds through innovative financing 7 mechanisms. Historically, The Texas Department of Transportation (TxDOT) has financed highway 8 projects on a "pay-as-you-go" basis; however, population increases and traffic demand have outpaced 9 traditional funding sources (e.g., gas tax, vehicle registration). Innovative funding tools were made 10 available by Congress in Intermodal Surface Transportation Efficiency Act (ISTEA) and the Texas State 11 Legislature (House Bills 3588 and 2702). State legislation also enables toll bonds, concession fees, and 12 excess revenues to fund supplemental roadway projects that are either adjacent to those new corridors or 13 of greatest need in the TxDOT districts where the corridors are constructed. Using these tools, the North 14 Texas region is leveraging and combining federal, state, and local funding with toll funds to construct 15 some major transportation projects. The combination of traditional and toll funding would allow projects to 16 be completed earlier than previously programmed using traditional highway funds, thus adding 17 freeway/highway and frontage road capacity to the system earlier than originally programmed by using 18 traditional funding alone.

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The proposed IH 35E project includes the Managed/HOV Concurrent Flow Lane (MHOV-C) concept (see **Section 2.2**), which would help generate revenue to fund needed transportation projects included in the *Mobility 2030 – 2009 Amendment*. As a result, the regional toll/managed lane network has been integrated into the financially constrained MTP. The implementation of the MHOV-C 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.

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2.0 DESCRIPTION OF PROPOSED ACTION

3 2.1 Description of Proposal

4 The proposed project involves the reconstruction of approximately 10.5 miles of IH 35E from FM 2181 (southern logical termini) northward to US 380 (northern logical termini), and an approximate 0.8 mile 5 6 section of IH 35W associated with the reconstruction of the IH 35E and IH 35W interchange. The 7 proposed reconstruction accommodates for the addition of mainlanes, frontage road lanes, and 8 Managed/High Occupancy Vehicle-Concurrent Flow (MHOV-C) lanes (as detailed in Section 2.2) within 9 the project limits (hereby referred to as "reconstruction"). The proposed project is located within the Cities 10 of Denton and Corinth, Denton County, Texas. Approximately 76 percent of the proposed project is 11 located in the City of Denton, and 24 percent is located in the City of Corinth. The project study area (or 12 project area) includes the proposed project footprint and adjacent portions of the Cities of Corinth and Denton, unless otherwise defined. Two municipalities, the City of Lake Dallas and the Town of Hickory 13 Creek, are located near the southern project terminus, but do not encompass any of the project footprint; 14 15 they are hereby referred to as either surrounding or nearby municipalities, and are not considered part of 16 the project area. Maps showing the general project location and vicinity, and project location on aerial 17 photograph are provided in Appendix A, Figures A-2 and A-3.

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In addition to the aforementioned reconstruction of mainlanes, frontage road lanes, and MHOV-C lanes,
 the proposed improvements also include the reconstruction of cross-street intersections in accordance
 with local thoroughfare plans, and the reconstruction of ramps to meet current TxDOT design criteria and

- 22 to improve traffic operational performance.
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Additionally, a pedestrian bridge (CSJ: 0195-03-075) is planned to span over all mainlanes and frontage road lanes in order to provide a connection to the University of North Texas (UNT) property on either side of IH 35E (see **Appendix A, Figure A-6**). The pedestrian bridge project would be cleared separately from the proposed project as a State Categorical Exclusion.

28

Approximately 106.59 acres of additional right-of-way (ROW) would be needed for reconstruction of IH 30 35E. ROW would vary in width from approximately 325 to 613 feet and would generally be acquired from 31 both sides of the existing facility, with the exception of three locations where proposed ROW acquisition 32 would occur on primarily one side of the existing facility. These locations are:

33

Meadow Oaks Drive/Dobbs Road to Corinth Parkway in the City of Corinth (approximately 0.4 mile) – New ROW acquisition is primarily to the west of IH 35E (reduces relocation and displacement impacts on the east side of IH 35E);

- 1 • Loop 288 to US 77 in the City of Denton (approximately 0.6 mile) - New ROW acquisition is 2 primarily to the east of IH 35E (avoids impacts to Joe Skiles Park and adjacent residential 3 neighborhoods); and
 - North Texas Boulevard to Oak Street in the City of Denton (approximately 1.3 miles) New ROW acquisition is primarily to the west of IH 35E (avoids impacts to UNT and accommodates the intersection of IH 35E and IH 35W).
- 8 The proposed IH 35E project design configurations from FM 2181 to US 380 are provided in Table 2-1.
- 9

4

5

6

7

	L	Number of Lanes ³				
CSJ ¹	From	То	Main	MHOV-C	Frontage Road	Typical Sections ^{1, 4}
0196-01-056	FM 2181	Loop 288	8	4	4 to 6	Typical Section A
0196-01-074	Loop 288	US 77	8	4	6 to 8	Typical Section A
0195-03-050	US 77	US 377	8	2	4 to 6	Typical Section B
0195-03-050	US 377	IH 35E and IH 35W interchange	6	2	4 to 6	Typical Section C
0195-03-071	IH 35E and IH 35W interchange	US 380	10	4	4 to 8	Typical Section D
Notes:						

TABLE 2-1. PROJECT DESIGN FEATURES

1. Refer to Appendix A, Figure A-8 (Sheet 1) for CSJ and typical section limits.

2. Locations are approximate.

3. Variation does not include intersection approaches; Lane configurations represent the total number of lanes (northbound and southbound).

4. Refer to Appendix A, Figure A-8 (Sheets 2 – 4) for typical sections.

10

11 The proposed improvements also include the reconstruction of the IH 35E/IH 35W interchange. In 12 association with this reconstruction, a portion of IH 35W that approaches the interchange would be reconstructed to accommodate for 6 mainlanes, 2 MHOV-C lanes, and 4 to 6 frontage road lanes. 13 14 Appendix A, Figure A-8 shows the typical cross section diagram of this IH 35W design configuration 15 (see Typical Section E), as well as the design configurations listed in **Table 2-1**. A plan view of the 16 proposed project's design features is shown in Appendix A, Figure A-6. A plan view of the proposed 17 project showing the paving outline and ROW limits overlaid on an aerial photograph is shown in 18 Appendix A, Figure A-7. A map index for both the plan view of project design features and project plan 19 view on aerial photograph is provided in **Appendix A**, Figure A-5. 20

21 In order to accommodate bicycle travel along the IH 35E corridor, the frontage roads and cross streets 22 would include a 14-foot wide outer lane (excluding gutter) for shared use by bicycles and vehicles. Cross 23 streets and frontage roads would include 6-foot sidewalks of 1.5 percent slope adjacent to the roadway as 24 to accommodate for pedestrian travel. During the final design phase of the project, TxDOT will make 25 every effort to separate the sidewalks from the cross streets and frontage roads as much as possible and

- 1 all proposed sidewalks would meet Americans with Disabilities Act (ADA) design criteria. Appendix A,
- 2 Figure A-8 shows the typical cross section diagrams for the proposed frontage roads and cross streets.
- 3
- 4 The estimated cost of the proposed IH 35E improvements in current dollars, as determined in the FHWA 5 Cost Estimate Review Workshop (July 15, 2010), is \$1,298,330,000 and itemized as follows:
- Construction = \$662,940,000;
- 7 Utilities = \$89,307,000;
- Engineering (Plans, Specifications, and Estimates) = \$45,140,000;
- Engineering (Quality Assurance/Quality Control and Inspection/Engineering) = \$48,910,000; and
- 10 ROW = \$452,033,000.
- 11

12 The phasing and completion of construction for the design configurations listed in **Table 2-1** are subject to 13 the availability and mechanism of funding, to be selected at a later date following the project definition

- 14 process (see **Section 1.2**).
- 15

16 2.2 Managed/HOV Concurrent Flow Lane (MHOV-C) Concept

As previously described, the RTC is an independent transportation policy body of the MPO, which is comprised of elected or appointed officials representing cities, counties, and transportation providers. The RTC has adopted the "managed lane" concept over the "HOV concept" due to the following factors:

- The ability to provide and manage additional capacity in the corridor;
- The provision of trip reliability for HOV and transit, and reliability of a minimum guaranteed speed
 for paying SOV users
- The potential for improved air quality through encouragement of increased vehicle occupancy and
 person movements; and
- The generation of revenue to construct, operate, and maintain the facility.
- 26

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 [SOV]); or
- Managed Express Lanes (congestion priced tolling).
- 36

By utilizing the above methods of traffic management, the RTC seeks to expand and also to manage 1 2 roadway capacity by influencing travel behavior. Market-based pricing and vehicle occupancy conditions 3 allow managed lanes to operate at higher speeds than parallel mainlanes during peak periods. The level 4 of service (LOS) in the managed lane will determine the toll rate, which would be adjusted dynamically to 5 manage demand and ensure travel time reliability. Managed lanes also grant the regional authorities the 6 flexibility they need to properly manage the regional transportation network to improve, maintain, and 7 exceed air quality standards, achieve mobility goals, and provide revenue to maintain corridors; thus 8 making available and leveraging the traditional federal aid dollars for other needed projects throughout 9 the region. If Federal-aid funds are utilized for projects implementing the aforementioned traffic 10 management methods, the distribution of benefits and costs of such projects must be assessed to 11 facilitate equal access and the fair treatment of all persons.

12

13 The management method for IH 35E from FM 2181 to US 380 is proposed as barrier separated, managed HOV/express-concurrent flow⁶ lanes (or MHOV-C lanes, as referred to throughout this 14 15 document). MHOV-C lanes require some form of active management to be in place at the time of 16 operation. The MHOV-C lanes would operate in accordance with the RTC's Managed Lane Policies. 17 Consistent with these policies, both SOV and HOV users would be subject to toll collection. Toll pricing 18 for the MHOV-C lanes would use congestion pricing (toll rates that vary by time of day and level of 19 congestion) to regulate the number of vehicles on the MHOV-C lanes. SOVs would be tolled the full rate 20 at all times. HOVs of two or more occupants and publicly-operated vanpools would pay a reduced toll 21 during the morning (AM) and afternoon/evening (PM) peak congestion periods and the same rate as 22 SOVs outside of these peak traffic periods. The RTC may choose to phase out the HOV discount during 23 peak periods if/when the air quality attainment maintenance period comes to an end. The proposed 24 project's mainlanes and frontage roads would remain non-tolled. More information pertaining to the toll 25 rates that would be applied to users of the MHOV-C lanes is contained in Section 5.2.10 (Economic 26 Impacts of Tolling).

27

Public outreach was conducted in early to mid 2006 as the RTC's *Managed Lane Policies* were being developed. The RTC held three public meetings from April 24-26, 2006, and the policies were adopted by the RTC on May 11, 2006. The policies were modified in September 2007 and the final policies are detailed in **Appendix G-1**: *Business Terms for TxDOT-Sponsored Managed Lane Facilities*.

32

The RTC adopted a policy regarding excess revenue sharing in June 2005 that focused on TxDOT sponsored managed lane toll projects. The Excess Toll Revenue Sharing Policy for Managed Lanes outlines the circumstances under which excess toll revenue would become available and distributed in

⁶ Concurrent flow means that lanes of traffic designated for use by authorized motorists are going in the same direction of flow as the adjacent mainlanes, and are generally opened all day/night.

1 the region. The purpose of the Excess Toll Revenue Sharing Policy for Managed Lanes was to establish 2 a framework for the allocation of future toll revenues from projects in the North Central Texas region. 3 Excess toll revenue is defined as annual toll revenue after the annual debt service, and after annual 4 reserve funds have been set aside to cover facility operational costs, anticipated preventative 5 maintenance activities, assigned profit and related expenses, and the expected cost of rehabilitation or 6 reconstruction of the toll facility. For all TxDOT-sponsored toll facilities, this new policy put forth that 1) all 7 excess revenue generated from individual toll projects shall remain in the TxDOT district in which that 8 revenue-generating project is located; 2) excess revenue generated from individual toll projects shall be 9 placed in county-specific accounts and prorated based on the residential county of all toll payers on all 10 tollways; and 3) projects funded with excess toll revenue should be selected in a cooperative TxDOT-11 RTC selection process which considers the desires of the cities and counties where the revenue-12 generating project is located. That is, in the foreseeable future, the proposed IH 35E facility could 13 substantially benefit communities in the project area by generating revenue for additional transportation 14 projects that could also increase capacity, manage traffic congestion, improve mobility, and 15 enhance/maintain the system to current design standards. These projects could include roadway, transit, 16 bicycle, intersection improvement, ITS, regional/innovative, and park-and-ride projects. See Appendix G-17 **2** for a copy of this policy.

18

Texas Senate Bill 792 mandates that the local toll authority have the first right of refusal. That is, the local toll authority gets the first option to construct the toll or managed lane aspect of the project. If the local toll authority decides against building the facility, the project can be released for bidding by private developers. The local toll authority representing Denton County (as well as Collin, Dallas, and Tarrant Counties) is the North Texas Tollway Authority (NTTA). On September 17, 2008, the NTTA passed a motion to waive the rights to primacy on the IH 35E corridor, leaving TxDOT as the lead agency.

25

The design schematic encompassing the proposed improvements (subject to change) described above has been prepared by TxDOT and is available for inspection in the Dallas District Office, 4777 East Highway 80, Mesquite, Texas 75150.

29

30 2.3 Need and Purpose

31

32 2.3.1 Project Need

Transportation improvements are needed on IH 35E to address current and projected traffic demands and facility deficiencies, and to establish a safe and efficient thoroughfare by which to provide goods and services in the northern portion of Dallas-Fort Worth (DFW). IH 35E is a vital north-south transportation route linking Dallas and Denton Counties, and along with IH 35W, functions as a major freeway serving north-south traffic through Denton County. The corridor is utilized by commuters for local, regional, and state-wide transportation needs. In addition, as part of the North American Free Trade Agreement (NAFTA) corridor, IH 35E functions as a principle route of national and international commerce. Traffic demand on IH 35E stems from many sources, including high population growth, an increased number of daily commuters, proximity to large universities and retail centers, and a lack of alternate routes. There are insufficient lanes on IH 35E to carry the existing and projected north-south traffic demand.

6

Slower travel speeds, increased and extended hours of congestion, and increased accidents are just a
few of the negative effects resulting from the high traffic volumes currently experienced on IH 35E. The
need for the proposed project is further discussed in the sections below.

10

11 Projected Population and Employment Growth

12 Continued growth in population and employment has created a need for a more efficient transportation 13 system in the DFW Metropolitan Area. The DFW Metropolitan Area is defined as the portion of the 14 NCTCOG 16-county region expected to be contiguously urbanized during the 20-year planning horizon. 15 This area includes all of Collin, Dallas, Denton, Rockwall, and Tarrant Counties, and contiguous portions of Ellis, Johnson, Kaufman, and Parker Counties.⁷ Because this is also the aerial extent of the 16 Metropolitan Planning Area (MPA) as defined in Mobility 2030 - 2009 Amendment, the terms "DFW 17 Metropolitan Area" and "MPA" can be used interchangeably. In October 2009, the MPA was expanded to 18 a 12-county region⁸; however, unless otherwise specified, the MPA utilized for various analyses and 19 20 referenced throughout this document is the MPA prior to its October 2009 expansion.

21

According to a 2030 demographic forecast prepared by the NCTCOG, the population for the 10 counties surrounding the DFW urban core (includes Collin, Dallas, Denton, Ellis, Kaufman, Johnson, Parker, Rockwall, Tarrant, and Wise Counties) is anticipated to grow to an estimated 9.1 million persons by 2030, supporting approximately 5.4 million jobs. **Table 2-2** summarizes population, household, and employment projections for these 10 counties surrounding the DFW urban core.

27

Year	2000	2010	2020	2030	Percent Change 2000-2030	
Population	5,067,400	6,328,200	7,646,600	9,107,900	80	
Households	1,886,700	2,350,300	2,851,400	3,396,100	80	
Employment	3,158,200	3,897,000	4,658,700	5,416,700	72	
Source: NCTCOG, 2030 Demographic Forecast.						

TABLE 2-2. NORTH CENTRAL TEXAS REGIONAL PROJECTIONS

28

29 The regional development trends illustrated above are representative of the municipalities encompassing

30 (Cities of Corinth and Denton) and near (City of Lake Dallas and Town of Hickory Creek) the proposed

⁷ http://www.nctcog.org/pa/WhatIsNCTCOG.pdf, page 8.

⁸ The expanded MPA (as of October 2009) includes the following counties in their entirety: Collin, Dallas, Denton, Rockwall, Tarrant, Ellis, Johnson, Kaufman, Parker, Hunt, Wise, and Hood Counties.

project. **Table 2-3** illustrates the percent increase in population from 1990 to 2000 and the forecasted percent increase in population from 2000 to 2030 for these municipalities. The existing road network within and near the proposed project area is inadequate to handle the volume of traffic anticipated for commuters and commercial enterprises.

5

TABLE 2-3. POPULATION TRENDS WITHIN AND NEAR THE PROPOSED PROJECT AREA

Location	1990 ¹	2000²	2030 ²	Percent Increase in Population 1990-2000	Percent Increase in Population 2000-2030
Corinth ³	3,944	11,365	27,070	188	138
Denton ³	66,270	73,225	190,719	10	160
Lake Dallas ⁴	3,656	6,378	9,209	74	44
Hickory Creek ⁴	1,893	2,005	3,996	6	99
Notes:					

1. Source: Census 1990.

2. Source: NCTCOG 2000-2030 Population Projections for North Central Texas Counties, Cities,

and Forecast Districts (http://www.nctcog.org/ris/demographics/population.asp).

3. Municipalities within the proposed project area (i.e., encompassing the proposed project).

4. Municipalities near the proposed project area.

6

7 Current Condition of the Facility

8 The existing IH 35E roadway does not meet current urban freeway design standards as described in guidelines published by TxDOT⁹ and the American Association of State Highway and Transportation 9 Officials (AASHTO).¹⁰ Constructed in the late 1950s and 1960s, the original IH 35E roadway was built 10 11 with a design speed of 50 miles per hour (mph). There is also inadequate capacity for the existing and 12 projected 2030 traffic volumes. Inadequate capacity typically results in frequent starts and stops along IH 13 35E, increasing the likelihood of rear-end collisions. It is difficult to maneuver such collisions off of the 14 mainlanes due to inadequate shoulder width, which also impede emergency vehicles from easily 15 accessing traffic accidents. Portions of IH 35E do not have adequate lane width, causing congestion and creating less than desirable conditions for drivers. In addition, the distance from the ramps to the cross 16 17 street intersections is too short in some instances to accommodate the increased travel demand on IH 18 35E. This causes vehicles utilizing the exit ramps to gueue on the mainlanes and vehicles utilizing the 19 entrance ramps (ER) to queue on the frontage roads and cross-streets at an inadequate rate. Further, 20 vertical bridge clearances are less than 16.5 feet in some instances (see **Table 3-1**). These inadequate 21 bridge clearances could result in damaged bridge structures, lodged vehicles, and temporary closure of 22 the roadway for repairs. 23

24 Existing Transportation Network

In many instances, rapid growth in the DFW Metropolitan Area is surpassing the existing transportation system's ability to accommodate it, resulting in increased traffic congestion. Transportation demand for

⁹ TxDOT (October 2006), *Roadway Design Manual*.

¹⁰ AASHTO (2004), A Policy on Geometric Design of Highways and Streets 5th Edition.

1 the region was approximately 151 million vehicle miles traveled (VMT) in 2007, meaning that on a typical 2 weekday, area residents travel approximately 151 million miles on area freeways, arterials, and local 3 streets. The regional traffic demand is expected to increase to approximately 241 million VMT in 2030. 4 This is an approximate 60 percent increase in VMT from 2007 to 2030 in the DFW Metropolitan Area. As 5 previously discussed, IH 35E is critical for the transportation of people and goods as it serves as the 6 primary north-south transportation corridor through eastern Denton County and links Denton and Dallas 7 Counties. The proximity of Lewisville Lake, North Central Texas College, UNT, Texas Women's 8 University (TWU), and other large commercial developments throughout the Cities of Corinth and Denton 9 adds to the importance of IH 35E as a local and regional access facility. Further, IH 35E serves as the 10 primary commuter route linking numerous suburban communities outside the larger Cities of Denton and 11 Corinth to the City of Dallas.

12

The performance of the existing and planned future transportation system in Denton County was measured and modeled for the regional MTP, also known as *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment (Mobility 2030 - 2009 Amendment)*, prepared by NCTCOG. The DFW Regional Travel Model (DFWRTM) was used to identify and measure the extent and duration of traffic congestion. **Table 2-4** summarizes Denton County's model results for performance characteristics for the 2007 baseline transportation system and the 2030 planned transportation system as described in *Mobility 2030 - 2009 Amendment*.

20

Performance Measure	2007 Transportation System (Baseline)	2030 Transportation System (Mobility 2030 - 2009 Amendment)
Population	602,100	1,102,151
Employment	213,529	423,293
VMT (Millions)	13.7	27.7
Hourly Capacity (Millions of Miles)	2.8	5.0
Vehicle Hours Spent in Delay (Daily)	89,752	205,995
Percent Increase in Travel Time Due to Congestion ¹	34.1	40.4
Annual Cost of Congestion (Billions)	\$0.35	\$0.80
Source: NCTCOG, Mobility 2030 - 2009 Amendment – System Performance Summary (February 17, 2009)		
Note: 1. Congestion Levels: 0-19%, no congestion: 20-34%, light: 35-49%, moderate: 50% and greater, severe.		

21

Table 2-4 indicates a substantial increase in population and employment projected for Denton County from 2007 through 2030. Under the *Mobility 2030 - 2009 Amendment* scenario, the estimated population and employment increases for Denton County would cause a substantial increase in VMT, daily vehicle hours spent in delay, percent increase in travel time due to congestion, and annual cost of congestion. The proposed IH 35E project is a key element to the functioning of *Mobility 2030 - 2009 Amendment*, as it
directly affects traffic management in the project area. The proposed IH 35E improvements have been
 designed to manage existing and anticipated future congestion by increasing roadway capacity and
 improving facility design, thereby improving overall mobility throughout the region.

4

5 Capacity and Levels of Service

6 Segments of highway or roadway may be evaluated for present and/or future traffic handling capacity 7 through use of standardized Level of Service (LOS) grading systems. The LOS is a qualitative measure 8 of describing operational conditions within a traffic stream or at an intersection, generally described in 9 terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and 10 convenience, and safety. The LOS ratings are designated A through F (A being the best and F the worst) 11 and cover the entire range of traffic operations that may occur. The definitions of LOS A through F are 12 presented in **Table 2-5**.

13

TABLE 2-5.	LEVELS OF SERVICE
------------	-------------------

LOS	DEFINITION
٨	Highest quality of service. Free traffic flow, low volume, and densities. Little or no restriction on maneuverability or
A	speed. 55+ mph. No delay.
В	Stable traffic flow, speed becoming slightly restricted. Low restriction on maneuverability. 50 mph. No delay.
С	Stable traffic flow, but less freedom to select speed, change lanes or pass. Density increasing. 45 mph. Minimal
	delay.
D	Speeds tolerable, but subject to sudden and considerable variation. 40 mph. Minimal delay.
Е	Unstable traffic flows with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability, and low
	driver comfort. 35 mph. Considerable delay.
F	Forced traffic flow. Speed and flow may drop to zero with high densities. Less than 25 mph. Considerable delay.
Source:	TRB, Highway Capacity Manual, 2000.

14

Generally, when a roadway is operating below capacity during peak hours, no improvements or travel demand reductions are warranted because the roadway is considered to be operating at an acceptable LOS. When traffic volumes approach a roadway's capacity, substantial delays are experienced with stopand-go movements taking place along the roadway. When this occurs, any incident, such as a disabled car pulled onto the shoulder or inclement weather, is likely to reduce the roadway's capacity enough to produce excessive congestion and delay. When a roadway is over capacity, a breakdown in flow occurs. Traffic operations were evaluated for the year 2030 (design year) if the roadway improvements are

implemented and if the improvements are not implemented. The analysis was conducted according to procedures outlined in the Transportation Research Board's (TRB) *Highway Capacity Manual*¹¹ and using traffic volume data obtained from the TxDOT Transportation Planning and Programming (TPP) Division. The roadway configurations analyzed included three, four, or five mainlanes and one or two managed lanes in each direction for the Build Alternative and the existing two-lane configuration in each direction with no managed lanes for the No-Build Alternative. **Table 2-6** highlights the results of this analysis.

¹¹ Transportation Research Board (2000). *Highway Capacity Manual*, (SR 209).

TABLE 2-6. OVERALL LEVEL OF SERVICE¹ FOR THE BUILD AND NO-BUILD ALTERNATIVES

Boodway Type	2030 Bu	ild LOS	2030 No-Build LOS		
Roadway Type	Northbound Southbound		Northbound	Southbound	
Mainlanes	B/C/D/E	B/C/D/E	F	F	
MHOV-C ²	А	А	n/a	n/a	
Ramp Junctions	B/C/D/E	B/C/D	F ³	F³	
Source: TxDOT Dallas District Interstate Access Justification IH 35E from FM 2181 (Swisher Road) to US 380 (March 2009).					
Notes:					
1. Operations analysis conducted in multiple segments spanning from FM 2181 to US 380. LOS listed for the Build and No-					

Build Alternatives are the most common levels of service determined along the project corridor.

2. MHOV-C = Managed/HOV Concurrent Flow Lanes.

3. 2030 No-Build Ramp Junction LOS was not a part of the Operations Analysis. The anticipated ramp junction operation at LOS F is based on the direct relation between poor mainlane LOS (predicted at LOS F for the 2030 No-Build) and ramp junction LOS.

1

The operational analysis indicates that LOS improves with implementation of the proposed design mainlane improvements. The proposed MHOV-C lanes would operate at the highest quality of service (LOS A) under the Build Alternative. Ramp junction LOS also improves under the Build Alternative as compared to the predicted LOS F for ramp junctions under the No-Build Alternative. If IH 35E were to remain in its current design, all mainlanes and ramp junctions in the study area would operate at LOS F for the design year.

8

9 Traffic Projections

10 Average daily traffic (ADT) volumes along IH 35E were provided by TxDOT's TPP Division in February 2009. Table 2-7 lists the anticipated ADT volumes along the proposed project for years 2010 and 2030. 11 12 The traffic analysis divided the entire IH 35E corridor (IH 635 to US 380) into five sections. The proposed 13 project, stretching from FM 2181 to US 380, is encompassed in Section 4 (from Valley Ridge Boulevard to US 377) and Section 5 (from US 377 to US 380) of the traffic analysis. As shown in Table 2-7, ADT 14 volumes along IH 35E in the project area are anticipated to increase by 45.8 percent for Section 4 and 15 16 47.1 percent for Section 5 between the years 2010 and 2030, further illustrating the need for increased 17 roadway capacity.

18

TABLE 2-7. 2010 AND 2030 ADT VOLUMES IN THE PROPOSED PROJECT AREA

Deadway Section	ADT in Vehicle	es Per Day (vpd)¹	Percent Increase	
Roadway Section	2010	2030	2010-2030	
Section 4 – Valley Ridge Boulevard to US 377	166,000	242,100	45.8	
Section 5 – US 377 to US 380	115,700	170,200	47.1	
Source: TxDOT TPP Division (February 2009).	·	•		
Note: 1 ADT includes both northbound and southbound	d mainlanes			

19

1 2.3.2 Project Purpose

The purpose of the proposed project is to improve mobility throughout the corridor, manage existing traffic congestion, increase people and goods carrying capacity, enhance safety, exist in a compatible nature with local, county, and regional needs and plans, and to minimize social, economic, and environmental effects on the human environment. All of the above listed purposes are described in the sections below.

6

7 Improve Mobility

8 Transportation mobility is a critical need of the DFW Metropolitan Area, which includes Denton County. 9 The lack of adequate mobility causes citizens to have limited access to job opportunities and employers 10 are denied full access to the region's pool of job skills and talents. Limited mobility also results in 11 increasing amounts of unproductive time spent moving people and goods from one point to another. 12 Economic costs associated with traffic congestion have a direct effect on the competitiveness of the area 13 and its ability to create and sustain long-term employment opportunities.

14

15 Manage Traffic Congestion

16 The traffic capacity constraints of existing streets, a lack of alternate north/south highways near the 17 proposed project corridor, and a limited availability of existing transportation ROW for major roadway 18 improvements have compounded traffic congestion within the proposed project area and nearby 19 municipalities. Even with the planned transportation improvements identified in the NCTCOG's Fiscal 20 Year (FY) 2011-2014 TIP, additional transportation improvements are necessary to manage existing and 21 predicted congestion. The volume of heavy truck traffic associated with the NAFTA route is anticipated to 22 increase. The addition of travel lanes to IH 35E would reduce the number of vehicles per lane mile of 23 roadway, thus better managing the concentration of heavy trucks, as well as everyday congestion levels, 24 along the route.

25

26 Increase People and Goods-Carrying Capacity

There is a critical need to provide sufficient transportation capacity improvements which can provide increased people and goods-carrying capacity in the study corridor. As described in **Table 2-3**, the population is anticipated to increase in the Cities of Corinth (138 percent) and Denton (160 percent) from 2000 to 2030, as well as for the neighboring City of Lake Dallas (44 percent) and Town of Hickory Creek (99 percent). Increasing the number of mainlanes, frontage roads, and inclusion of MHOV-C lanes on IH 35E would accommodate such rising population estimates and their transport on both a local and regional level.

34

35 Enhance Safety

36 Transportation safety is of the utmost importance for the traveling public and the proposed project would

37 facilitate safe travel. The proposed project would provide a safer and more secure driving experience for

motorists by decreasing the amount of time spent in congestion. Roadway improvements would also
 address many of the roadway deficiencies previously described in Section 2.3.1.

3 Compatibility with Local, County, and Regional Needs and Plans

4 The proposed IH 35E project would be compatible with local, county, and regional planning. Local 5 government officials and citizens have been active in considering the potential impacts (both beneficial 6 and adverse) associated with the proposed project. A more detailed accounting of the public involvement 7 process thus far is described in Section 2.7. From a regional perspective, the proposed improvements 8 are consistent with Mobility 2030 - 2009 Amendment and the FY 2011-2014 TIP, as amended. In 9 addition, the MHOV-C lane concept would be implemented for the proposed center lane improvements to 10 IH 35E (one to two proposed MHOV-C lanes on both the north and southbound sides). In doing so, the 11 IH 35E proposed MHOV-C lanes would support the overall regional transportation system need by 12 generating revenue for the operation and maintenance of IH 35E, as well as funding additional regional 13 The regional toll/managed lane network has been integrated into Mobility 2030 - 2009 projects. 14 Amendment.

15

16 Minimize Social, Economic, and Environmental Effects on the Human Environment

17 The proposed project would avoid or minimize impacts to local communities and natural resources in the 18 project area. As previously stated, active participation has occurred among public officials and citizens in 19 the consideration of potential impacts (beneficial and/or adverse) associated with the proposed project. 20 Additional planning for the proposed project would continue to emphasize avoidance, minimization, and 21 mitigation of potential adverse impacts to both human communities and the natural environment.

22

23 2.4 ROW Requirements and Utility Adjustments

Existing ROW along IH 35E and IH 35W within the project limits varies from approximately 200 to 574 feet. The proposed ROW width varies from 325 to 613 feet. Approximately 106.59 acres of ROW would be required to construct the proposed project, of which approximately 54.87 acres are undeveloped, 3.95 acres are developed residential, and 46.53 acres are developed commercial. Required easements include 1.04 acres of undeveloped easement and 0.20 acre of developed commercial easement.

29

Other than potential temporary interruptions in service, no adverse impacts (i.e. termination of service or long-term interruptions) to utilities, such as electrical, gas, phone, water, or sewer are expected to occur from the construction of the proposed project. The proposed project may require minor adjustments to existing aerial utilities. Other utilities (e.g., subterranean utilities) may also require adjustments. Utility adjustments would be provided for by the affected utility. Schedules for any utility adjustments would be closely coordinated to minimize disruptions and inconvenience to customers.

2.5

Related Studies and Relevant Documents to the Proposed North Section Improvements

3 IH 35E Major Investment Study (MIS)

4 The IH 35E MIS, initiated by TxDOT in 1998, evaluated roadway conditions and various potential 5 alternatives for improving congestion along IH 35E from the SH 121 bypass to US 380. The IH 35E MIS 6 was a cooperative and collaborative process with interaction between the public, local governments and 7 agencies, and the Project Coordination Work Group (PCWG). The PCWG was composed of 8 representatives from TxDOT, permitting or stakeholder agencies, local city and county governments, and 9 citizens volunteering to represent specific groups or organizations. Seven meetings of the PCWG and 10 four public meetings (two in Lewisville and two in Denton) were held prior to the development of the 11 design schematics for the MIS preferred alternatives (from June 1998 to September 1999). PCWG 12 meetings continued through 2000, and an additional three public meetings were held prior to 2003. Ideas 13 and suggestions obtained from the PCWG, as well as from the public, helped shape the list of alternatives 14 modeled in the MIS.

15

16 The MIS alternatives included a no-build alternative, a no-build alternative with Congestion Management 17 System (CMS) strategies (e.g. Intelligent Transportation Systems [ITS]), widening the mainlanes of IH 18 35E (including ramp, interchange, and frontage road improvements), widening FM 2499 (parallel facility to 19 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/HOV¹² lanes. and the 20 addition of reversible express lanes. For these alternatives, the NCTCOG Travel Demand Model (TDM) 21 22 evaluated performance measures such as person miles and hours of travel, percent lane miles at LOS E 23 and F, person hours of congestion, and daily cost of congestion. Although many of the above strategies 24 helped alleviate congestion, it was a combination of mainlane widening and managed/HOV lane use that 25 had the best potential for decreasing congestion and improving mobility along the entire study corridor. Following the study, it was recommended that the reconstruction of IH 35E could occur in three sections 26 27 (South, Middle, and North). Steps taken through the MIS process aided in the identification of the 28 proposed project's (North Section) Build Alternative (see Section 4.2).

29

30 IH 35E from FM 2181 to U.S. 380 Environmental Assessment (EA)

FHWA and TxDOT completed an EA for this section of IH 35E in December of 2005. A Finding of No Significant Impact (FONSI) was issued in March 2006. The proposed project included the addition of three mainlanes in each direction and the addition of one lane on each frontage road. The center median would be approximately 38 feet and be available for future construction of reversible HOV lanes. The project included the enhancement or reconstruction to all bridges from FM 2181 to U.S. 380. This new EA for this project is warranted because of configuration, design, and capacity changes.

¹² At the time of the MIS, managed/HOV lanes were considered to be reversible flow. The configuration of the IH 35E managed/HOV lanes was later revised in the design process to be MHOV-C lanes.

2 Lewisville Lake Corridor

3 The Lewisville Lake Corridor includes approximately 13.8 miles of roadway running east-west from IH 4 35E at FM 2181/Swisher Road to the Dallas North Tollway (DNT) at Eldorado Parkway. As a portion of 5 the Lewisville Lake Corridor, the Lewisville Lake Toll Bridge (LLTB) spans approximately 1.7 miles as it 6 crosses over Lewisville Lake. The LLTB, constructed and operated by NTTA, opened to traffic on 7 August 1, 2009. The portion of roadway spanning from IH 35E/FM 2181 eastward to the LLTB was 8 constructed as a TxDOT and Denton County project and opened concurrently with the LLTB. The 9 corridor serves a critical need by providing a direct connection from the municipalities of Frisco. The 10 Colony, and Little Elm to IH 35E.

11

12 **Regional Rail Corridor Study and the Regional Transit Initiative**

13 According to NCTCOG, the proven ability of rail service to improve mobility will play a crucial role in meeting the future transportation needs of the region. The NCTCOG's Regional Rail Corridor Study¹³ 14 recommends expanding regional rail service in the DFW Metropolitan Area, including service within the 15 16 proposed project area. The Regional Rail Corridor Study and Regional Transit Initiative¹⁴ recommended the formation of a Regional Rail Authority. The proposed structure would include the continued growth of 17 18 the Denton County Transit Authority (DCTA), Dallas Area Rapid Transit (DART), and the Fort Worth 19 Transportation Authority (The T), along with a new Regional Rail Authority.

20

21 **Denton County Transit Authority Transportation Services and Plans**

22 DCTA, which serves the proposed project area, is continuing to evolve their transportation services. Bus 23 plans include the following: a "Connect" shuttle service operating in the Cities of Denton and Lewisville; a 24 "UNT Shuttle" service operating on the UNT campus and in Denton; and an "Access" service providing 25 Americans with Disabilities Act (ADA) paratransit and demand response service. DCTA also offers free 26 parking at all three of its park and ride locations (one in Denton and two in Lewisville).

27

28 In April 2008, the Federal Transit Administration (FTA), in cooperation with DCTA, initiated the Rail DCTA 29 Project Final Environmental Impact Decision. A 21-mile regional commuter rail line was proposed along 30 the former Missouri Kansas Texas (MKT) Railroad alignment linking the Cities of Carrollton and Denton. The DCTA commuter rail line, the A-train¹⁵, began full service in June 2011. The rail line runs to the east 31 of IH 35E, paralleling it for much of the proposed project's length. The A-train is comprised of five total rail 32 33 stations with two stations in the City of Lewisville (South Lewisville/Hebron Station and Downtown 34 Lewisville/Old Town Station), one in the City of Highland Village (Highland Village/ Lewisville Lake

¹³ NCTCOG (July 2005), *Regional Rail Corridor Study*, Study Report,

http://www.nctcog.org/trans/transit/planning/rrcs/index.asp. ¹⁴ NCTCOG (2004), Regional *Transit Initiative*, http://www.nctcog.org/trans/transit/planning/rti/index.asp.

¹⁵ http://www.dcta.net/TSA-train.asp

1 Station), and two in the City of Denton. Of the two City of Denton locations, one is located near the 2 Denton Regional Medical Center and is known as the South Denton/Medpark Station: the other rail station in the City of Denton is the Downtown Denton Station. The southern-most rail station of the 3 4 regional commuter rail line (the Hebron Station) provides a link between the A-train and the DART light 5 rail system at the Trinity Mills Station in the City of Carrollton, which opened in December 2010. The 6 locations of all of the above described A-train rail stations are shown in Appendix C, Figure C-22. The 7 regional commuter rail facility is designed to provide traffic relief along the IH 35E corridor and is 8 expected to provide development opportunities adjacent to the rail line. The DCTA has long-term plans 9 for the A-train to expand south of Trinity Mills, with connections to future regional rail systems.

10

11 University of North Texas Master Plan (2005)

12 The 2005 UNT Master Plan is intended to provide a framework for decision-making as the public 13 university moves forward with major new program and facilities initiatives for its largely commuter 14 campus. The main UNT campus is located to the east of IH 35E just south of the IH 35E and IH 35W 15 interchange. UNT also operates at two additional locations: the Eagle Point Campus located to the west 16 of the main campus and IH 35E, and the Research Park Campus located approximately 4.5 miles north of 17 the main campus near the corner of Loop 288 and US 77 (east of IH 35). Future plans call for the 18 expansion of the University to the western side of IH 35E to develop the Eagle Point Research Campus 19 and relocate the campus football stadium.

20

21 The 2005 UNT Master Plan includes the development strategy and vision for the University's Main, Eagle 22 Point and Research Park campuses over the next twenty years. Among the various recommendations 23 sited in the master plan is a discussion of future pedestrian and traffic circulation and parking plans to 24 handle the future target enrollment of 41,000 students. The plan entails a pedestrian bridge over IH 35E 25 allowing students and others access across IH 35E. Throughout the MIS process, the City of Denton and 26 UNT identified the need for sidewalks for future pedestrian traffic along the frontage roads of IH 35E 27 between McCormick and Bonnie Brae. The exact sidewalk locations would be determined during the final 28 design process through coordination with TxDOT and local governments.

29

The 2005 UNT Master Plan also discusses current challenges regarding the existing IH 35E roadway and a desire to improve connections to campus through enhanced entrance and exit ramps along IH 35E, as well as improve the bridge at North Texas Boulevard. According to the master plan, a majority of the trips to the campus are from the south on IH 35E (44 to 60 percent) and from the west on IH 35W (27 to 34 percent). In addition to a desire for improved roadway access, UNT seeks to provide an integrated transportation strategy, which offers various transportation options including increased numbers of transit hubs and enhanced bus service utilizing DCTA as UNT's campus bus system operator.

1 NCTCOG's Metropolitan Transportation Plan

2 As generated and maintained by the NCTCOG, there have been 10 MTPs in the DFW Metropolitan Area 3 starting in 1974. The current plan is titled Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment (Mobility 2030 - 2009 Amendment).¹⁶ A major emphasis of 4 5 Mobility 2030 - 2009 Amendment is the management of the regional transportation system. Mobility 2030 6 - 2009 Amendment is a fiscally constrained plan that presents a system of transportation improvements 7 needed to maintain mobility in the DFW Metropolitan Area through the year 2030, and serves as a guide 8 for the expenditure of state and federal funds for the region. Its development was coordinated among 9 local governments, transit authorities, NTTA, and TxDOT. The plan was formulated through a process of 10 forecasting future travel demand, evaluating system alternatives, and selecting options which best meet 11 the mobility needs of the region. The proposed project (from FM 2181 to US 380) is listed in and 12 consistent with Mobility 2030 - 2009 Amendment as a part of the IH 35E corridor improvements (see 13 Appendix G-3).

14

15 Transportation Improvement Program

The NCTCOG FY 2011-2014 TIP¹⁷ for the DFW Metropolitan Area is a staged, multi-year program of 16 projects proposed for funding by federal, state, and local sources within the DFW Metropolitan Area. The 17 18 TIP is developed by the RTC in cooperation with local governments, TxDOT, NTTA, and local 19 transportation authorities. The projects included within the FY 2011-2014 TIP, as amended, were 20 selected to implement improvements consistent with Mobility 2030 - 2009 Amendment. Roadway 21 improvement plans for the study area identified within the TIP may provide additional traffic-carrying 22 capability to respond to the projected population and employment growth. The proposed improvements 23 (from FM 2181 to US 380) are consistent with the FY 2011-2014 TIP, as amended. The appropriate TIP 24 pages are provided in Appendix G-4. See Appendix G-5 for a figure depicting MTP reference numbers 25 and limits (per the Mobility 2035 Network Listings, 2011 Transportation Confromity, Appendix 10.8: Roadway System (Capacity Staging)) as well as the FY 2011-2014 TIP within the IH 35E North project 26 27 limits. In addition, Appendix G-5 has a figure depicting MTP References and CSJs within the entire IH 28 35E corridor (South, Middle, and North sections).

29

30 2.6 Logical Termini

As previously described, IH 35E is a major north-south interstate in DFW, serving as a primary direct link connecting the Cities of Denton, Corinth, Lewisville, and other municipalities to the City of Dallas. The proposed project begins at FM 2181 (south terminus) and ends at US 380 (north terminus), spanning approximately 11 miles (see **Appendix A-9**, Photographs 1 and 2). This section of IH 35E connects the

¹⁶ The USDOT (FHWA/FTA) found the MTP to conform to the SIP on June 12, 2007, and found the FY 2011-2014 TIP to conform in February 2011.

¹⁷ The USDOT (FHWA FTA)) found the FY 2011-2014 TIP to conform to the SIP in February 2011 and found the MTP to conform on June 12, 2007.

two population centers of Corinth and Denton. Both FM 2181 in Corinth and US 380 in Denton are listed in *Mobility 2030 - 2009 Amendment* as being regionally significant arterials in the DFW Metropolitan Area. The proposed project has independent utility and would not preclude other foreseeable transportation improvements in the proposed project area. As such, the South, Middle, and North segments of the proposed improvements to the IH 35E corridor all have independent utility and could stand alone even if no additional transportation improvements are made.

7

8 2.7 Public Involvement

9 Improvements to the IH 35E corridor were initially investigated as part of the IH 35E MIS beginning in 10 As previously described, a PCWG comprised of representatives from TxDOT, stakeholder 1998. 11 agencies, local government, and local community group leaders was tasked with evaluating multimodal 12 alternatives for congestion relief along the corridor. Section 2.5 details the meetings of the PCWG. A 13 total of seven public meetings were held between 1998 and 2003 (various locations in Farmers Branch, 14 Lewisville, and Denton) to keep the public informed and obtain feedback regarding the establishment of a 15 preferred alternative, schematic design, and environmental issues. In addition, a public hearing was held 16 on July 28, 2005 which presented the EA and design schematics for IH 35E; and a FONSI was received for IH 35E from FM 2181 to US 380 on March 13, 2006. From 2006 to 2008, the proposed project (from 17 18 FM 2181 to US 380) underwent internal schematic design modifications by TxDOT which added capacity 19 and modified the reversible/managed HOV lanes to MHOV-C lanes, necessitating a new EA of IH 35E 20 from FM 2181 to US 380.

21

22 Following the above described project design changes, three additional public meetings were held in 23 November 2008 within the Cities of Denton (November 10), Lewisville (November 13), and Farmers 24 Branch (November 17). All three of these public meetings were open house format and with the same 25 agenda: to present the public with project specific information on the proposed IH 35E corridor 26 improvements (spanning from IH 635 to US 380) and to gather public comments regarding these 27 proposed improvements. Meeting attendees were able to view project schematics, typical sections, 28 constraints maps, and other exhibits. Project engineers and other project specialists (environmental, 29 ROW, etc.) were available to answer questions from the meeting attendees. A court reporter was present 30 to take verbal comments and attendees were also given the opportunity to return written comment cards 31 either at the meeting or via mail. As with all of the aforementioned public meetings, public notices were 32 sent to adjacent property owners and local, city, and state officials, and letters were sent to non-elected 33 public officials.

34

Stakeholder meetings and city project meetings have also been held to help facilitate communication and provide project updates between TxDOT and the affected municipalities along the IH 35E corridor. A more detailed description of the various public, stakeholder, and project meetings (as of 2010) relating to

- 1 the proposed improvements (FM 2181 to US 380), including locations and agendas of the meetings, is
- 2 provided in **Table 2-8**.
- 3

TABLE 2-8. PUBLIC, STAKEHOLDER, AND PROJECT MEETINGS RELATING TO THE PROPOSEDPROJECT

Meeting Date and	Attendees	Topics Discussed
1998 June 28 Center of Visual Arts, Denton	Public Meeting – Open to Public	MIS kick-off; inform public of MIS process/details.
1998 June 29 Lewisville City Hall	Public Meeting – Open to Public	MIS kick-off; inform public of MIS process/details.
1999 Sept. 16 Lewisville City Hall	Public Meeting – Open to Public	Presentation of MIS Alternatives to the public; obtain feedback from public on MIS Alternatives.
1999 Sept. 23 Denton City Hall	Public Meeting – Open to Public	Presentation of MIS Alternatives to the public; obtain feedback from public on MIS Alternatives.
2003 Mar. 18 Denton City Hall	Public Meeting – Open to Public	Discuss and present EA and Design Schematics (Note: EA version was prior to design modifications occurring between 2006 and 2008).
2003 Mar. 20 Lewisville City Hall	Public Meeting – Open to Public	Discuss and present EA and Design Schematics (Note: EA version was prior to design modifications occurring between 2006 and 2008).
2003 Apr. 3 Farmers Branch City Center	Public Meeting – Open to Public	Discuss and present EA and Design Schematics (Note: EA version was prior to design modifications).
2005 July 28 Radisson Denton Hotel and Convention Center	Public Hearing – Open to Public	Formal presentation of EA and project design; opportunity for public verbal and written comments; opportunity for public to view exhibits on project impacts and design (Note: EA version was prior to design modifications occurring between 2006 and 2008).
2008 Aug. 06 Lewisville City Hall	Stakeholder Work Group #1: TxDOT Dallas District; UNT; U.S. Army Corps of Engineers (USACE); DCTA; DART; NCTCOG; Representative for Congressman Michael Burgess; various consultants; Cities of Lewisville, Highland Village, Corinth, Carrollton, Farmers Branch, and Denton; Town of Hickory Creek	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.
2008 Aug. 28 Denton Airport	Cities of Denton and Corinth, UNT, Denton County	Project overview; stakeholder outreach; schedule; draft/initial/modified concepts; other issues/next steps.
2008 Oct. 01 Lewisville City Hall	Stakeholder Work Group #2: TxDOT Dallas District; UNT; DCTA; North Texas Rail Group; NCTCOG; various consultants; Cities of Lewisville, Highland Village, Corinth, Carrollton, Farmers Branch, and Denton; Town of Hickory Creek	Project overview; refined modified design concepts; stakeholder outreach; schedule; other issues/next steps.
2008 Oct. 15 URS Corporation, Dallas	DCTA	Status on operations and funding; reasons for design modifications; presentation of project limits, typical sections, and mainlane access locations;
2008 Oct. 21 Denton City Hall	Denton City Council Mobility Committee	stakeholder outreach; open house/public meeting schedule.

TABLE 2-8. PUBLIC, STAKEHOLDER, AND PROJECT MEETINGS RELATING TO THE PROPOSEDPROJECT

Meeting Date and Location	Attendees	Topics Discussed
2008 Oct. 23 DCTA Office, Lewisville	DCTA Board	
2008 Nov. 03 Corinth City Hall	Corinth City Council	
2008 Nov. 05 Lewisville City Hall	Stakeholder Work Group #3: TxDOT Dallas District; UNT; USACE; DCTA; NCTCOG; various consultants; Cities of Highland Village, Corinth, Carrollton, Farmers Branch, and Denton; Town of Hickory Creek	
2008 Nov. 10 UNT Gateway Center Ballroom, Denton	Public Meeting Open to Public (83 attendees)	Open house format 11 written comment cards returned; no verbal comments recorded.
2008 Nov. 13 Lewisville Municipal Annex Building	Public Meeting – Open to Public (169 attendees)	Open house format 16 written comment cards returned; no verbal comments recorded.
2008 Nov. 17 Dr. Pepper Stars Center, Farmers Branch	Public Meeting – Open to Public (91 attendees)	Open house format 3 written comment cards returned; no verbal comments recorded.
2008 Dec. 03 Lewisville City Hall	Stakeholder Work Group #4: TxDOT Dallas District; UNT; NCTCOG; various consultants; Cities of Lewisville, Highland Village, Corinth, Carrollton, Farmers Branch, and Denton; Town of Hickory Creek	Schematic design; environmental documentation;
2009 Feb. 04 Lewisville City Hall	Stakeholder Work Group #5: TxDOT Dallas District; UNT; USACE; DCTA; DART; NCTCOG; various consultants; Cities of Lewisville, Dallas, Highland Village, Corinth, Carrollton, Farmers Branch, and Denton; Town of Hickory Creek; Denton County; Lewisville Chamber of Commerce	stakeholder outreach; EA/schematic schedule; ROW; other issues/next steps.
2009 May 06 Lewisville City Hall	Stakeholder Work Group #6: TxDOT Dallas District; UNT; NCTCOG; various consultants; Cities of Lewisville, Highland Village, Corinth, Carrollton, Farmers Branch, and Denton; Town of Hickory Creek; FHWA; Denton County; County Commissioner Hugh Coleman	Schematic design; environmental documentation; stakeholder outreach; project definition process.
2009 June 17 Lake Dallas City Hall	City of Lake Dallas	Schematic design, overview of project financing and delivery options; outcome of state legislative session; construction financing and phasing plan.
2009 June 17 Denton Civic Center	City of Denton	Schematic design, overview of project financing and delivery options; outcome of state legislative session; construction financing and phasing plan.
2009 Aug. 6 Lewisville City Hall	Stakeholder Work Group #7: TxDOT Dallas District; UNT; USACE; DCTA; DART; NCTCOG; various consultants; Cities of Dallas, Lewisville, Highland Village, Corinth, Carrollton, and Farmers Branch; Town of Hickory Creek; Denton County	Schematic design; outcome of state legislative session; options for project financing; construction financing and phasing plan; corridor champion development.

TABLE 2-8. PUBLIC, STAKEHOLDER, AND PROJECT MEETINGS RELATING TO THE PROPOSEDPROJECT

Meeting Date and Location	Attendees	Topics Discussed
2009 Aug. 19	Presentation to Elected Officials: TxDOT Dallas District, Town of Hickory Creek, City of Carrollton, City of Highland Village, DCTA, Denton County, City of Denton, City of Corinth, UNT, City of Lewisville, NCTCOG, Representative for Congressman Michael Burgess, various consultants	Planning and development outcome of legislative session; and construction phasing and financing plans.
13 Jan. 2010 Lewisville City Hall	Stakeholder Work Group #8: TxDOT Dallas District; UNT; various consultants; Cities of Lewisville, Highland Village, Corinth, Carrollton, Farmers Branch, and Denton; Town of Hickory Creek; Denton County Judge Horn, Denton County Commissioners Mitchell and Coleman; Denton County	Schematic design and environmental document status; outcome of state legislative session; options for project financing; construction financing and phasing plan, corridor champion development; and stakeholder outreach.

2 Stakeholder Work Group meetings will continue throughout the project development process. Once the

3 Federal Highway Administration (FHWA) approves the EA for the proposed project as satisfactory for

4 further processing, a public hearing would be held for this project.

3.0 DESCRIPTION OF EXISTING FACILITY

3 3.1 Existing Facility

4 As previously described, the existing facility has been in full operation since the mid to late 1960s. The 5 existing ROW is heavily urbanized (see Appendix A-9, Photograph 5), with a few remaining vacant areas 6 predominantly located at the southern end of the project corridor. The existing ROW width varies from 7 200 to 574 feet. From the southern project terminus (FM 2181) to approximately 0.4 mile south of Corinth 8 Parkway, the roadway configuration is six mainlanes (three 12-foot lanes in each direction). From this 9 point, IH 35E narrows to four mainlanes (two 12-foot lanes in each direction); this configuration extends to the northern project terminus (US 380) and includes the portion of IH 35W south of the IH 35E/IH 35W 10 11 interchange. See Appendix A, Figure A-8 and Appendix A-9, Photographs 3 and 4 for depictions of the 12 existing roadway via typical section and photographs, respectively. The posted speed limit along the 13 existing facility ranges from 55 to 60 mph.

14

15 Concrete traffic barriers and grass medians separate the existing mainlanes, except for an approximate 16 0.4-mile stretch of roadway beginning north of Bonnie Brae Street that is separated by a tube rail barrier. 17 Along IH 35E, the outside mainlane shoulders are generally 10 feet wide (varies); the inside mainlane 18 shoulders generally range from four to 14 feet wide at the southern and northern ends of the project 19 corridor, and zero to four feet wide throughout the middle area of the project corridor. Along IH 35W the 20 outside shoulders are approximately 10 feet wide, and the inside shoulders generally range from four to 21 six feet wide.

22

23 The existing IH 35E facility generally consists of two 12-foot frontage road lanes running in both the north 24 and south directions. Frontage road traffic is one-way except for one segment of the southbound 25 frontage road located immediately west of the IH 35E/IH 35W interchange. Two-way travel is possible on 26 this section of the frontage road, from West Prairie Street to Airport Road; access to the southbound 27 frontage road is provided via Airport Road. In general, the north and southbound frontage roads run 28 parallel to IH 35E; however, just north of Loop 288, the northbound frontage road transitions for a short 29 distance to running parallel with US 77 (also known as Dallas Drive) before crossing US 77 and 30 continuing a parallel route along IH 35E. On IH 35W a two-way southbound frontage road exists, running 31 approximately 0.3 mile within the project corridor before dead-ending into Airport Road. There is no 32 existing northbound frontage road along IH 35W within the project area.

33

Within the project limits, the existing facility has multiple bridge crossings, all associated with either arterials, railroad lines, or roadway connectors. A description of the crossings (overpass or underpass), their locations, and posted clearances are listed in **Table 3-1**.

Existing Facility Bridge Locations	Northbound Vertical Clearance	Southbound Vertical Clearance
FM 2181 (Swisher Road) Underpass	16'6"	16'6"
Frontage Road U-Turn Underpass	17'1"	16'8"
Corinth Parkway Overpass	14'8"	14'9"
Shady Shores Drive /Post Oak Drive Overpass	15'2"	15'4"
Mayhill Road/State School Road Underpass	14'9"	14'9"
Loop 288/Lillian Miller Parkway Underpass	14'11"	14'11"
US 77 (Dallas Drive) ER to IH 35E	14'10"	At Grade
Teasley Lane Underpass	16'6"	16'6"
Union Pacific Railroad Crossing Underpass (IH 35E)	RR Crossing Only	RR Crossing Only
US 377 (Fort Worth Drive) Underpass	17'3"	17'3"
McCormick Street Underpass	16'1"	16'1"
Avenue D/North Texas Boulevard Overpass	14'6"	14'6"
IH 35E to IH 35W Overpass	18'9"	16'5"
Bonnie Brae Street Underpass	15'3"	15'3"
Oak Street Underpass	16'6"	16'6"
US 380 Underpass	16'4"	16'4"
Airport Road Overpass (IH 35W)	17'1"	16'7"
Gulf Colorado & Santa Fe Railroad Crossing Underpass (IH 35W)	RR Crossing Only	RR Crossing Only

TABLE 3-1. EXISTING BRIDGE CROSSINGS WITHIN THE PROJECT STUDY LIMITS

1

2 3.2 Surrounding Terrain and Land Use

According to the Denton East and Denton West U.S. Geological Survey (USGS) topographic maps, the elevations within the IH 35E project area range from a minimum of approximately 570 feet above mean sea level (msl) at the southern project limit to a maximum of approximately 700 feet above msl at the northern project limit (see **Appendix A, Figure A-4**). The project area can be characterized as gently sloping with a local topographic trend to the south and east toward Lewisville Lake.

8

9 The surrounding land use within the project corridor is primarily zoned and already developed for 10 commercial and industrial use (see aerial photographs in Appendix A, Figure A-7). In the southern 11 portion of the project corridor, the City of Corinth has numerous vacant parcels adjacent to IH 35E. 12 These undeveloped areas, along with almost all other areas along IH 35E in the City of Corinth are zoned 13 industrial, commercial, or planned development. In the northern portion of the project corridor, zoning 14 along IH 35E and IH 35W is predominantly industrial and commercial. Zoning within the center portion of 15 the project corridor (south of the IH 35E/IH 35W interchange) is dominated by commercial development 16 for support of the local community. These zoning categories include downtown commercial neighborhood 17 (mix of commercial and housing in downtown region), community mixed-use general (diversified commercial areas supporting nearby communities), neighborhood residential mixed-use (commercial 18 19 areas with allowances for multi-family residential living), and regional center residential (commercial areas 20 with residences). Small sections of residential neighborhoods (single-family residences) are also present 21 along the IH 35E corridor. See Section 5.2.2 for additional information on land use within the project 22 area as it relates to community impacts.

1 3.3 Traffic Projections

As described in **Section 2.3.1**, traffic volumes¹⁸ were analyzed within the project area along the following two roadway segments of IH 35E: from Valley Ridge Boulevard to US 377 and from US 377 to US 380. ADT volumes for 2010 are anticipated at 166,000 vpd from Valley Ridge Boulevard to US 377 and 115,700 vpd from US 377 to US 380. by 2030, these vpd numbers are anticipated to increase to 242,100 vpd (45.8 percent increase) from Valley Ridge Boulevard to US 377 and 170,200 vpd (47.1 percent increase) from US 377 to US 380 (see **Table 2-7**).

¹⁸ ADT volumes provided by TxDOT's TPP Division (February 2009).

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1 4.0 ALTERNATIVES

2

It was through the previously described IH 35E MIS (see Section 2.5) that a list of potential alternatives 3 4 for the IH 35E corridor was established and then thoroughly examined as to determine the best case 5 scenario for improved mobility with the fewest impacts (i.e., the preferred or Build Alternative). Strategies 6 evaluated in the MIS included the following: no-build alternative, no-build alternative with CMS strategies, 7 IH 35E mainlane widening, improvements to the parallel routes of FM 2499 and FM 423, addition of mass 8 transit options such as commuter rail, construction of reversible managed/HOV lanes, and construction of 9 reversible express lanes. A discussion of the parameters on which the above listed alternatives were 10 evaluated is provided In Section 2.5. The MIS found the widening of the IH 35E mainlanes and the 11 incorporation of managed/HOV lanes as preferred in the reduction of congestion, as compared to the 12 other alternatives studied. The MIS process aided in the ultimate identification of the preferred 13 alternative. Both the No-Build and Build (preferred) Alternatives are described further in the sections 14 below.

15

16 4.1 No-Build Alternative

17 The No-Build Alternative represents the case in which the proposed project would not be constructed. 18 Other transportation improvements, including those identified in *Mobility 2030 - 2009 Amendment*, may or 19 may not be constructed, depending on project development and funding availability issues for each such 20 improvement. Various planned roadway and transit system improvements, bicycle/pedestrian, Intelligent 21 ITS measures, and other capital improvements are assumed to be included in the baseline condition of 22 the IH 35E project area. Some of these planned major transportation improvements are identified in 23 Appendix E-3, and are further described in Section 7.5.5. In addition, Section 2.5 further discusses 24 existing DCTA transit system programs and the planned Rail DCTA line connecting the Cities of Denton, 25 Corinth, Lake Dallas, Lewisville, and Towns of Shady Shores and Hickory Creek to the City of Dallas. 26 Various planned capital improvements for the proposed IH 35E project's neighboring municipalities are 27 also discussed in Section 6.2.2. All of these improvements comprise the No-Build Alternative. There 28 are, however, costs involved with the No-Build Alternative. These include:

29

Maintenance of the existing IH 35E system - the longer improvements and/or reconstruction are
 postponed, the higher this figure becomes;

- Increased vehicle operating costs on under-designed, inadequate facilities;
- Increased costs due to higher rates of accidents and incidents on existing facilities;
- The monetary value of time lost by motorists due to lower operating speeds, congested roadway conditions, and restricted maneuverability on area roadways; and

- The intangible costs associated with the inconvenience for emergency services and annoyance
 for average motorists caused by the above deficiencies.
- 3

4 The No-Build Alternative has the advantage of avoiding any adverse impacts associated with new construction, such as relocation, land use changes, and environmental disruption. This alternative could 5 6 allow construction funds to be shifted to other projects. Although the No-Build Alternative would avoid 7 construction impacts, the existing roadway deficiencies of IH 35E (as described in Section 2.3) would 8 remain. The adverse impacts associated with the No-Build Alternative related to traffic congestion, such 9 as air pollution, noise, and decreased pedestrian and vehicular safety, could create an undesirable urban 10 environment that would have more long-term adverse impacts than the short-term construction impacts of 11 the Build Alternative.

12

For the above reasons, the No-Build Alternative would not satisfy the anticipated 2030 transportation demand; however, the No-Build Alternative has been carried forward to serve as a baseline comparison in the assessment of potential social, economic, and environmental effects of the Build Alternative, described below.

17

18 4.2 Build Alternative

The Build Alternative would involve the reconstruction of the existing facility (IH 35E and a portion of IH 19 20 35W that is associated with the IH 35E and IH 35W interchange) to accommodate the addition of 21 mainlanes, MHOV-C lanes, and frontage road lanes throughout the project limits. From the southern 22 project terminus (FM 2181), the Build Alternative would generally follow the existing project centerline to 23 the northern project terminus (US 380). The proposed ROW acquisition would generally occur on both 24 sides of the existing facility except at three locations where proposed ROW acquisition would occur on 25 predominantly one side in order to minimize adverse impacts. These locations include Meadow Oak 26 Drive/Dobbs Road to Corinth Parkway, North Texas Boulevard to Oak Street, and Loop 288 to US 77. 27 ROW acquisition for the first two referenced locations would occur predominantly to the west of IH 35E, 28 while ROW acquisition for the third referenced location would occur predominantly to the east of IH 35E. 29 See Appendix A, Figure A-2 for roadway locations.

30

The Build Alternative's typical mainlane width would be 12 feet throughout the project limits. Beginning from the southern project terminus, the proposed number of mainlanes along IH 35E varies from four in each direction (FM 2181 to US 377), to three in each direction (US 377 to the IH 35E and IH 35W interchange), and then to five in each direction (IH 35E and IH 35W interchange to US 380). The number of proposed mainlanes along IH 35W, as it approaches the IH 35E and IH 35W interchange, is three in each direction. The typical outside mainlane shoulder width would be 10 feet and the typical inside shoulder width would vary from 10 to 11 feet throughout the project limits. Typical sections of these
 various roadway configurations are shown in **Appendix A, Figure A-8**.

The proposed concurrent MHOV-C lanes would be 12 feet wide, varying from two lanes in each direction (FM 2181 to US 77 and the IH 35E and IH 35W interchange to US 380) to one in each direction (US 77 to the IH 35E and IH 35W interchange and along IH 35W), with no conversion of existing mainlanes into MHOV-C lanes,. The typical outside MHOV-C lane shoulder width would vary from 10 to 11 feet, and the typical inside shoulder width would vary from four to 10 feet throughout the project limits (see **Appendix A, Figure A-8**).

9

Frontage roads under the Build Alternative would be one-way and continuous throughout the project limits. The typical configuration would consist of an inside 11-foot wide lane and an outside 14-foot wide lane (excluding gutter) for shared use by bicycles and vehicles. Additionally, the typical sections for the frontage roads (see **Appendix A, Figure A-8**) would include 6-foot sidewalks of 1.5 percent slope adjacent to the roadway as to accommodate for pedestrian travel. 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 and all proposed sidewalks would meet ADA design criteria.

17

18 The Build Alternative would also include the reconstruction and/or upgrade of the existing entrance and 19 exit ramps along the existing facility, as well as the roadway crossings listed in **Table 3-1**. For most of the 20 cross streets, the proposed configuration would include dual left-hand turn lanes at signalized 21 intersections and match the number of mainlanes referenced in the associated city's thoroughfare plan, 22 which typically would vary from two to three lanes in each direction. Similar to the proposed frontage 23 road typical sections, cross streets would include a 14-foot wide outer lane (excluding gutter) for shared 24 use by bicycles and vehicles. Additionally, cross streets would include sidewalks for use by pedestrians 25 that would meet ADA design criteria (see **Appendix A**, Figure A-8 for cross-street typical sections).

26

All of the aforementioned proposed construction would occur within the existing and proposed ROW width varying from 325 to 613 feet. Approximately 106.59 acres of new ROW would be required. The design speed for the proposed project would be 70 mph on the mainlanes and MHOV-C lanes, 40 mph on the frontage roads, and 40 mph on the ramps. Mainlanes and frontage road lanes would remain non-tolled.

31

As previously stated, construction of a pedestrian bridge (CSJ: 0195-03-075) is planned to span IH 35E to provide a connection between the UNT main campus on the north side of IH 35E and the UNT Eagle Point Campus on the south side of IH 35E. The proposed pedestrian bridge would be located between North Texas Boulevard and Bonnie Brae Street, just south of the existing UNT football stadium (see **Appendix A, Figures A-6** and **A-7**). The total length of the crossing is expected to be approximately 870 feet, of which 355 feet would be bridge structure spanning IH 35E. The remaining length includes approaches to the bridge with 15-foot border widths. The bridge would maintain a minimum vertical clearance of 17.5 feet over IH 35E. The proposed design has been coordinated with UNT officials, and was accepted at a May 14, 2009 coordination meeting. The pedestrian bridge is currently planned as a breakout project from the proposed IH 35E North project and will be cleared separately as a State Categorical Exclusion).

5.0 POTENTIAL SOCIAL, ECONOMIC, AND ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTIONS

2 3 4

5

7

5.1 Natural Resources

6 5.1.1 Lakes, Rivers, and Streams

8 No-Build Alternative

9 No lakes, rivers, or streams would be affected by the No-Build Alternative.

10

11 Build Alternative

The proposed project is located within the Trinity River Basin, on gently rolling topography characterized by prairie soils formed over sedimentary bedrocks (i.e., limestones, shales, and sandstones). All runoff in the vicinity of the project corridor flows into Lewisville Lake, which is on the Elm Fork Trinity River. The existing IH35/35E facility generally follows a ridgetop that divides runoff that flows either into Hickory Creek to the west, or into Pecan Creek or Graveyard Slough to the east, before entering the lake. Consequently, the streams crossing the proposed project are historically ephemeral channels, many of which do not have clearly defined channels.

19

20 The existing IH 35/35E facility within the project area has 24 points where cross drainage of water flows 21 through box culverts or concrete pipes (11 jurisdictional and 13 non-jurisdictional waters of the U.S., 22 including wetlands). These crossings all involve ephemeral streams that are unnamed tributaries to 23 Graveyard Slough, Pecan Creek, and Dry Fork Hickory Creek (see USGS topographic map in Appendix 24 A, Figure A-4). In the southern portion of the IH 35E project area, cross drainage streams are all 25 unnamed tributaries that flow to Graveyard Slough in an easterly direction. The center portion of the 26 project alignment crosses eastern-flowing unnamed tributaries to Pecan Creek. Cross drainage for the 27 northern portion of the project alignment (i.e., north of Fort Worth Drive) flows in a westerly direction as 28 unnamed tributaries to Dry Fork Hickory Creek. The reconstructed and/or extended culverts for these 29 cross drainages are shown generally in the aerial photographs of Appendix A, Figure A-7. Design 30 details are shown in Appendix A, Figure A-6.

31

There are no navigable waters associated with this project; therefore, coordination and a navigational clearance under the General Bridge Act of 1946 and Section 9 of the Rivers and Harbors Act of 1899 (administered by the U.S. Coast Guard [USCG]), and Section 10 of the Rivers and Harbors Act of 1899 (administered by the United States Army Corps of Engineers [USACE]), would not be required. There are no wild and scenic rivers in the IH 35E project area, and a Coastal Zone Management Plan is not applicable to this project.

5.1.2 Waters of the U.S., including Wetlands

2

3 No-Build Alternative

4 There are no anticipated impacts to waters of the U.S., including wetlands, from the No-Build Alternative.

5

6 Build Alternative

7 The term "waters of the U.S." refers to those waterways, which potentially fall within the jurisdictional 8 authority of the USACE under the Clean Water Act (CWA), and includes wetlands that are adjacent to 9 jurisdictional waterways. The proposed project crosses 11 unnamed ephemeral stream channels that 10 ultimately drain into Lewisville Lake. These stream channel crossings are designated Site W-1 through 11 Site W-11 in the summary of jurisdictional water features in **Table 5-1**. The locations of these features 12 are shown in Appendix A, Figures A-4 and A-7, and additional stream crossing details are included in 13 stream data forms in Appendix B-1; representative photographs of project area stream channels are in 14 Appendix A-9 (Photographs 7, 8, and 10). Two channels are unnamed tributaries that flow easterly into 15 Graveyard Slough in Lewisville Lake (Sites W-1 and W-2), six channels are unnamed tributaries to Pecan 16 Creek which flow easterly (Sites W-3 through W-8), and three stream channels are unnamed tributaries to 17 Dry Fork Hickory Creek which flow in a westerly direction (Sites W-9 through W-11). All 11 unnamed 18 stream channels are waters of the U.S., including one adjacent wetland/pond area just north of Post Oak 19 Drive, and are regulated by the USACE under authority of Section 404 of the CWA.

20

21 Permanent impacts to these waters of the U.S. are anticipated due to reconstruction of the highway and 22 replacement and extension of existing culverts. In addition, temporary fill impacts are expected from 23 grading within drainage easements to ensure effective cross drainage. Table 5-1 summarizes impacts to 24 waters of the U.S. for each water feature crossing (listed from south to north within the project corridor). 25 Note that in Table 5-1 permanent impacts to jurisdictional waters have been reported in terms of impacts 26 to stream segments already within culverts as well as stream segments within existing open channels. Although the original construction of the existing culverts constitutes a "fill" of waters of the U.S., USACE 27 28 continues to have jurisdiction over the entire stream length and impacts to these previously-filled stream 29 segments are included in the total expected impacts for each water feature. However, USACE retains 30 discretionary authority as to whether impacts to a stream within an existing culvert are adverse.

	Unnamed Tributary (UT) #	Existing Culvert(s)	Proposed Culvert(s)	Culvert Replace Jurisdictional	ement Impacts to Waters within: ¹	Perman	ent Fill ²	Tempora	ary Fill ²
Site #	Body and (Nearest IH 35E Centerline Station)	(width x height, or pipe diameter)	(width x height, or pipe diameter)	Existing Culverts (acres & linear feet)	Existing Open Channels (acres & linear feet)	Total for Waters ¹ (acres & linear feet)	Wetlands (acres)	Waters (acres & linear feet)	Wetlands (acres)
W-1	UT-1 to Graveyard Slough (1589+07)	1 box (5'x3')	2 box (5'X3')	not applicable 4	0.01 acre ⁴ (43 lf)	0.01 ac. ⁴ (43 lf)	0	0.01 ac. (14 lf)	0
W-2	UT-2 to Graveyard Slough (1623+74)	2 box (6'x6')	5 box (10'X6')	0.07 acre (268 lf)	0.03 acre (127 lf)	0.10 ac. (395 lf)	0	0.04 ac. (142 lf)	0
W-3	UT-1 to Pecan Creek (1673+17)	1 box ³ (8'x4')	4 box (6'X3')	0.04 acre (191 lf)	0.03 acre (225 lf)	0.07 ac. (416 lf)	0	0.01 ac. (62 lf)	0
W-4	UT-2 to Pecan Creek (1683+31)	1 box ³ (6'x3')	3 box (6'X3')	not applicable 4	0.02 acre ⁴ (71 lf)	0.02 ac. ⁴ (71 lf)	0	0.01 ac. (31 lf)	0
W-5	UT-3 to Pecan Creek (1704+23)	1 box (7'x7')	2 box (7'X6')	0.05 acre (287 lf)	0.03 acre (153 lf)	0.08 ac. (440 lf)	0	0.0 ac. (0 lf)	0
W-6	UT-4 to Pecan Creek (1715+24)	2 box (8'x8')	4 box (10'X8')	0.10 acre (279 lf)	0.04 ac. ⁵ (137 lf)	0.14 ac. (416 lf)	0.19 ac.	0.08 ac. ⁵ (88 lf)	0.03 ac.
W-7	UT-5 to Pecan Creek (1726+20)	1 pipe (24")	2 box (5'X3')	not applicable 4	0.01 acre ⁴ (55 lf)	0.01 ac. ⁴ (55 lf)	0	0.0 ac. (0 lf)	0
W-8	UT-6 to Pecan Creek (1799+43)	1 box (6'x3')	3 box (7'X4')	not applicable ⁴	0.01 acre ⁴ (87 lf)	0.01 ac. ⁴ (87 lf)	0	0.0 ac. (0 lf)	0
W-9	UT-1 to Dry Fork Hickory Creek (2016+19)	5 box (6'x4')	5 box (8'X4')	0.29 acre (425 lf)	0.10 acre (225 lf)	0.39 ac. (650 lf)	0	0.09 ac. (223 lf)	0
W-10	UT-2 to Dry Fork Hickory Creek (2035+35)	3 box (7'x6')	3 box (7'X6')	0.43 acre (884 lf)	0.02 acre (32 lf)	0.45 ac. (916 lf)	0	0.03 ac. (40 lf)	0
W-11	UT-3 to Dry Fork Hickory Creek (2065+64)	2 box (7'x4')	3 box (7'X4')	0.10 acre (298 lf)	0.09 acre (197 lf)	0.19 ac. (495 lf)	0	0.01 ac. (33 lf)	0
			TOTALS:	1.08 acres	0.39 acre	1.47 acres	0.19 acre	0.25 acre	0.03 ac.

TABLE 5-1. IMPACTS TO WATERS OF THE U.S., INCLUDING WETLANDS

Notes:

The proposed replacement of culverts would impact jurisdictional waters that are in existing culverts as well as open channels. Impacts to these
aspects of water features have been noted separately because they reflect varying stream values considered during the Section 404 permitting
process. The information for "New Permanent Fill" is the total of both types of impacts.

2. Permanent fill refers to impacts of replacing existing culverts as well as placing existing open channels into culverts or concrete channels. Temporary fill refers to impacts (i.e., incidental fallback) from site grading primarily within drainage easements to ensure cross drainage.

The existing structures for these drainage crossings are under IH 35E mainlanes; drainage under frontage roads flows through three pipe culverts (30" to 36" in diameter).

4. The stream channels at these locations were determined to be jurisdictional beginning at the east side of IH 35E and extending downstream further eastward; west and upstream of this point, the water features do not meet the regulatory criteria for jurisdictional waters.

5. The permanent fill total for this site includes impacts to the stream channel (0.03 acre) as well as open water within a pond (0.01 acre) on the west side of IH 35E; temporary fill also includes stream channel impacts (0.03 acre) and open water impacts (0.05 acre).

1

2 As indicated in **Table 5-1**, the reconstruction of the IH 35E facility would replace and/or extend the eleven

3 existing culverts containing jurisdictional water features. For four of these features (Sites W-1, W-4, W-7,

- 4 and W-8), field examination of channel features and analysis of USGS topographic maps (Appendix A,
- 5 **Figure A-4**) and aerial photographs indicated the stream channels meet the criteria for waters of the U.S.
- 6 only on the east side of IH 35E. Similarly, cross drainage features at 13 other sites (shown in **Appendix**
- 7 **A**, Figure A-4) throughout the corridor were examined. Site conditions were determined to not meet the
- 8 USACE regulatory criteria for jurisdictional waters; most of these streams provide cross drainage for
- 9 highway-generated and other local area (e.g., commercial buildings and parking lots) runoff via bar

ditches, and none exhibit a discernable hydrologic connection to the surface tributary system (e.g., see
 Appendix A-9, Photograph 9). Thus, no impacts to these non-jurisdictional water features have been
 assessed for purposes of compliance with Section 404 of the CWA.

4

5 Each of the eleven jurisdictional water features were also field examined for potential adjacent wetlands. 6 Wetland data forms were prepared for data points in overbank areas next to each water crossing; 7 however, only one adjacent area met the criteria for jurisdictional wetlands (see data forms in Appendix 8 B-2, and wetland data point locations in Appendix A, Figure A-7). The wetland at Site W-6 is a cattail 9 (Typha latifolia) fringe around much of the perimeter of a pond which has been enlarged by a beaver dam 10 near its outfall channel (see site photograph in Appendix A-9, Photograph 11). Widening IH 35E to add 11 new mainlanes would result in permanently filling approximately 0.19 acre of the emergent wetland, and 12 grading associated with a drainage easement would result in temporary impacts to an additional 0.03 13 acre. Avoidance and minimization of impacts to wetlands were considered in the design of the proposed 14 project, but avoiding impacts was not practicable.

15

16 Expanding the existing major highway facility necessarily involves impacts to adjacent properties on both 17 sides. Impacts to this wetland feature are not extensive, and avoidance measures would require 18 redirecting the horizontal alignment of an established facility eastward. This would involve alignment-19 shifting changes for substantial distances to the north and south of the wetland. A bridging option would 20 be a less environmentally damaging alternative from a fill perspective, allowing the emergent wetlands to 21 be spanned. Thus, impacts would be associated with the placement of piers within the wetland; however, 22 it is likely that the permanent shade imposed by a bridge would still have some effect on the vegetation 23 within the footprint, and the cost would be substantially greater than the current plan, even after adding the anticipated costs for compensatory mitigation.¹⁹ From a logistic comparison, the bridge would be built 24 25 up substantially above the flat terrain, making the roadway less accessible to adjacent properties, which 26 is contrary to the need and purpose of enhanced traffic mobility in the region. Consequently, while the 27 design of the proposed project includes wetland impacts, avoidance of impacts was considered in project 28 planning and mitigation is anticipated as part of the permitting process.

29

The placement of temporary and permanent dredge or fill material into each of the eleven jurisdictional waters of the U.S., including wetlands, would meet the criteria for Nationwide Permit (NWP) 14 (Linear Transportation Projects) under Section 404 of the CWA. That is, each of the crossings would be a single and complete crossing of a separate water body, and each would affect less than 0.50 acre of jurisdictional waters. Impacts to four of the water features (Sites W-2, W-9, W-10, and W-11) would require a NWP 14 Preconstruction Notification (PCN) because the permanent fill at these sites would

¹⁹ Compensatory mitigation is defined as compensation for unavoidable adverse impacts through the restoration or creation of new habitat onsite or elsewhere (Federal Register, Volume 72, Number 47, page 11196, May 12, 2007).

1 exceed the permanent impacts threshold of 0.10 acre. Wetland impacts, in addition to total impacts in 2 excess of 0.10 acre, would also necessitate a PCN to permit construction at Site W-6. It is expected that 3 details about wetland mitigation for Site W-6 would be addressed as part of the PCN review and approval 4 process. Likewise, other compensatory mitigation for Section 404 impacts would be coordinated with 5 USACE and performed in accordance with the terms of USACE NWP 14 approval. As noted above, 6 USACE has discretion to determine whether mitigation would be necessary for impacts to stream 7 segments already enclosed within culverts. If it is determined that mitigation credits would be purchased 8 from a third party mitigation bank, TxDOT would give priority to credits from the Texas Parks and Wildlife 9 Department (TPWD) in accordance with the TxDOT-TPWD Mitigation Banking Memorandum of 10 Understanding (MOU) (December 2005).

11

12 The extent to which constructing the proposed project is expected to result in temporary fills of 13 jurisdictional waters is estimated in **Table 5-1**. During construction, appropriate measures would be taken 14 to ensure normal downstream flows and minimize flooding. Temporary fills would be entirely removed 15 and restored to pre-existing elevations after construction and the affected areas would be reseeded with 16 native species. Stream channel modifications, including bank stabilization, would be limited to the 17 minimum necessary to construct or protect the road or drainage structure, and would be restricted to the 18 immediate vicinity of the project. The proposed project would comply with all general and regional 19 conditions applicable to NWP 14.

20

21 5.1.3 Floodplains

22

23 No-Build Alternative

24 No floodplains would be affected by the No-Build Alternative.

25

26 Build Alternative

Based on a review of the Federal Emergency Management Agency (FEMA) *Flood Insurance Rate Map* (FIRM) for Denton County, Texas and Incorporated Areas Map Numbers 48121C0393F (revised December 6, 2002), 48121C0380E, 48121C0386E, 48121C0387E, 48121C0389E, and 48121C0360 E (all revised April 2, 1997), the proposed project intersects the 100-year floodplain at five locations in the project corridor. These crossings are expected to impact approximately 14.92 acres of floodplain (see **Appendix B, Figure B-6**).

33

Most of the study area falls within Zone X (not shaded), indicating areas outside the 500-year floodplain. Flood prone areas within the IH 35E project area include the following features: (1) Zone AE, special flood hazard areas inundated by the 100-year flood (base flood elevations determined); (2) Zone A, special flood hazard areas inundated by the 100-year flood (no base flood elevations determined); and, (3) Zone X (shaded), areas of 500-year (0.2 percent annual chance) flood, areas of 100-year flood with
average depths less than one foot or with drainage areas less than one square mile, and areas protected
by levees from 100-year floods. In addition, floodway areas (within Zone AE) in association with Swisher
Creek and an unnamed tributary of Graveyard Slough exist in the southern portion of the proposed
project area. These crossings include floodplains designated as Zones A and X (shaded). Denton
County and the Cities of Denton, Corinth, Hickory Creek, and Lake Dallas are participants in the National
Flood Insurance Program.

8

9 Impacts are expected as follows.

- 10
- 0.04 acre: Floodplain associated with an unnamed tributary of Hickory Creek in the northern
 portion of the proposed alignment adjacent to IH 35W. This includes Zone A.
- 0.22 acre: Floodplain associated with an unnamed tributary of Pecan Creek (identified as W-6 in
 Section 5.1.2) in the central portion of the proposed alignment in Zone AE and floodway areas
 within Zone AE;
- 6.78 acres: Floodplain associated with a tributary of Pecan Creek (identified as W-8 in
 Section 5.1.2), and the Zone A floodplain associated with it;
- 5.87 acres: Floodplain associated with a tributary of Graveyard Slough (identified as W-2 in Section 5.1.2) in the southern portion of the proposed alignment in Zones A, AE, and X; and,
- 2.01 acres: Floodplain associated with Swisher Creek which crosses IH 35E just south of the southern terminus of the project. This includes Zones A, AE, and X.
- 22

The hydraulic design for the proposed project would be prepared in accordance with current TxDOT and FHWA design policies and procedures. Furthermore, in cooperation with FEMA, TxDOT would conform to the standard for temporary and permanent fill set by the FIRM. The proposed project would provide, at a minimum, the same flow capacity, and therefore, should not adversely increase water surface elevation above allowable limits.

28

29 The protection of floodplains and floodways is required by EO 11988 Floodplain Management and is 30 implemented by FHWA through 23 CFR 650 Subpart A, Location and Hydraulic Design of 31 Encroachments on Floodplains. The facility would permit the conveyance of the design year flood without 32 causing substantial damage to the facility, stream, or other property. The proposed project would not 33 increase the base flood elevation to a level that would violate applicable floodplain regulations or 34 The proposed project would not interrupt or terminate a transportation needed for ordinances. 35 emergency vehicles or community evacuation routes, nor would it pose a significant risk, nor adversely 36 impact natural and beneficial floodplain values; therefore, floodplain impacts resulting from the proposed 37 actions would not be considered significant.

1 5.1.4 Water Quality

2

3 No-Build Alternative

4 Water quality would not be affected by the No-Build Alternative.

5

6 Build Alternative

7

8 1. Impaired Waters

9 Lewisville Lake is identified as Segment 0823 in the Texas Commission on Environmental Quality (TCEQ) 10 2008 Texas Water Quality Inventory, and is designated for aquatic life, recreation, fish consumption, 11 public water supply, and general uses; the report indicates that the lake fully supports all designated 12 uses. The proposed project crosses within five miles upstream of Lewisville Lake (Segment 0823); 13 however, this segment is not designated as either threatened or impaired in the 2008 Texas 303(d) list 14 (March 19, 2008). The water quality of waters in the state is required to be maintained in accordance with 15 all applicable provisions of the Texas Surface Water Quality Standards including the General, Narrative, 16 and Numerical Criteria. None of the aguatic features crossed by the proposed project are designated as 17 either threatened or impaired in the 2008 Texas 303(d) list (March 19, 2008), and the proposed project is 18 not within five miles upstream of a threatened or impaired water segment.

19

20 2. Texas Pollutant Discharge Elimination System

21 Because this project would disturb more than one acre, TxDOT would be required to comply with the 22 TCEQ Texas Pollutant Discharge Elimination System (TPDES) General Permit for Construction Activity. 23 The project would also disturb more than five acres; therefore, a Notice of Intent would be filed to comply 24 with TCEQ stating that TxDOT would have a Storm Water Pollution Prevention Plan (SW3P) in place 25 during the construction period. The SW3P would utilize temporary erosion control measures as outlined 26 in TxDOT's manual Standard Specifications for the Construction of Highways, Streets, and Bridges. Impacts would be minimized by avoiding construction equipment work directly in stream channels and/or 27 28 adjacent areas. No permanent water quality impacts are expected as a result of the proposed project.

29

30 3. TCEQ Section 401 Best Management Practices

Permits under Section 404 of the CWA require applicants to also obtain the appropriate level of state water quality certification under Section 401 of the CWA. In Texas, compliance with CWA Section 401 requires the use of TCEQ's best management practices (BMPs) to manage water quality on construction areas. Under the TCEQ program, the proposed project would qualify as a Tier I project, as none of the impacts to waters of the U.S. would be greater than 1,500 linear feet of stream or three acres, and would not affect any rare or ecologically important wetlands. TCEQ requirements for the proposed project would require completion of the Tier I (Small Projects) Checklist (TCEQ-20228, revised December 29, 2006), which requires at least one BMP from the Section 401 BMPs for Tier I Projects published by the
 TCEQ, April 12, 2004. These BMPs would address each of the following categories:

3

4

5

- Category I Erosion Control;
- Category II Post-construction total suspended solids control; and
- 6
- Category III Sedimentation Control.
- 7

8 Category I would be addressed by applying temporary re-seeding (native vegetation) and mulch to 9 disturbed areas. It is expected that Category II would be addressed by means of an extended detention 10 basin and/or constructed wetland. Category III would be addressed by the use of compost or mulch filter 11 socks. Other approved methods may be substituted, if necessary, using one of the BMPs from the 12 identical category.

13

14 4. Other Mitigation Measures

15 To minimize impacts to water quality during construction, the proposed project would utilize temporary 16 erosion and sedimentation control practices (i.e., silt fence, rock berm, and/or drainage swales) from 17 TxDOT's manual Standard Specifications for the Construction of Highways, Streets, and Bridges. Where 18 appropriate, these temporary erosion and sedimentation control structures would be in place prior to the 19 initiation of construction and would be maintained throughout the construction period. Clearing of 20 vegetation would be limited and/or phased to maintain a natural water quality buffer and minimize the 21 amount of erodible earth exposed at any one time. Upon completion of earthwork operations, disturbed 22 areas would be restored and reseeded according to TxDOT's specifications for Seeding for Erosion 23 Control.

24

The contractor would take appropriate measures to prevent, minimize, and control spillage of hazardous materials in the construction staging area. All materials would be removed/disposed of in accordance to applicable State and Federal laws and as not to degrade ambient water quality. All of these measures would be enforced under appropriate specifications in the plan, specification, and estimate stage of project development.

30

Permanent soil erosion control features are to be a part of the completed project to assure economical, effective, and continuous erosion control throughout the construction and post-construction periods. Moreover, efforts would be made to prevent long-term water pollution by reducing fertilizer and pesticide use during the installation and maintenance of landscaping. No excessive impacts to water from point source and non-point source pollution associated with the project is anticipated.

5.1.5 Vegetation and Wildlife Habitat

3 No-Build Alternative

4 The No-Build Alternative would not affect existing vegetation or wildlife habitat.

5

6 Build Alternative

7 The proposed project area is located within the 'Cross Timbers and Prairies' ecological region, as described by the TPWD.²⁰ This region is characterized by scattered pockets of forested habitat within 8 prairie habitats. Examination of an earlier TPWD map shows that the proposed project corridor passes 9 through three distinct vegetation cover regions.²¹ At its southern end, the first four miles of the project are 10 within the 'Post Oak Woods, Forest, and Grassland Mosaic' physiognomic subregion; this subregion 11 12 typically consists of oak forests with substantial grassland parks. The project continues for nearly one 13 and one-half miles through the 'Silver Bluestem-Texas Wintergrass Grassland' subregion, which is 14 comprised primarily of short and mid-grass prairie species with forested riparian corridors. The northern 15 five miles of the project pass through a subregion designated as 'Urban' cover, which may be expected to 16 contain remnant patches or individual plants formerly part of the grassland/forest region that surrounds it. 17 Areas within the project corridor that have not been urbanized would also be expected to exhibit remnant 18 grassland or forest vegetation despite being subject to agricultural land clearing activities and livestock 19 grazing for decades.

20

As the project area is set within a primarily urban landscape dominated by residential and commercial development, vegetation and wildlife habitat within the study area is generally isolated in patches scattered throughout the vicinity. Thus, only those species which are adapted to living within a disturbed environment and in close proximity to human activity would be expected to be successful near the IH 35E corridor.

26

Common amphibian and reptile species include the cricket frog (*Acris crepitans*), fence lizard (*Sceloporus undulatus*), Mediterranean gecko (*Hemidactylus turcicus*), Texas rat snake (*Elaphe obsolete lindheimerii*), and red-eared slider (*Trachemys scripta elegans*). These ectothermic species are readily seen basking on sunny days in urban environments including the project area. Mammal species likely to be seen in the project corridor include the common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), eastern fox squirrel (*Sciurus niger*), and Virginia opossum (*Didelphis virginiana*). Such species are commonly seen in both natural landscapes and in close proximity to human structures.

²⁰ TPWD (2008), *Plant Guidance by Ecoregions: Ecoregion 5 – The Cross Timbers and Prairies*. Ecoregion map and description at:

http://www.tpwd.state.tx.us/huntwild/wild/wildscapes/guidance/plants/ecoregions/ecoregion_5.phtml.

²¹ TPWD (1984), *The Vegetation Types of Texas* map. Map and description at:

1 A variety of avian species which reside in Denton County are commonly seen within the project area. 2 These include the killdeer (Charadius vociferous), great blue heron (Ardea herodias), mourning dove 3 (Zenaida macroura), rock dove (Columba livia), American kestrel (Falco sparverius), red-tailed hawk 4 (Buteo jamaicensis), turkey vulture (Cathartes aura), blue jay (Cyanocitta cristata), Carolina chickadee 5 (Poecile carolinensis), house finch (Carpodacus mexicanus), northern cardinal (Cardinalis cardinalis), and 6 red-bellied woodpecker (Melanerpes carolinus). In addition to these, many species migrate through the 7 area and can potentially be seen in the project area during the winter months. Examples of common 8 migratory species include the green-winged teal (Anas crecca), northern shoveler (Anas clypeata), 9 greater yellowlegs (Tringa melanoleuca), dark-eyed junco (Junco hyemalis), and yellow warbler 10 (Dendroica petechia).

11

12 Two field reconnaissance visits on February 4 and 12, 2009 indicated the vegetation in undeveloped 13 areas is generally consistent with the above description. The project corridor is predominantly influenced 14 by commercial, industrial, and residential development throughout much of the project's length. These 15 developed areas often include native tree species that have been incorporated into facility landscaping, 16 generally with a mowed lawn grass understory. Forested areas that are not part of developed sites 17 generally are dominated by native species, but invasive woody and herbaceous species are common in 18 these areas. Undeveloped areas dominated by grasses have generally been used for livestock grazing 19 or hay meadows and host primarily introduced pasture grasses, intermixed with occasional native 20 grasses and invasive species.

21

22 Most of the vegetation cover (approximately 317.79 acres) of the affected environment within the existing 23 ROW, proposed new ROW, and drainage easements is dominated by Bermuda grass (Cynodon 24 dactylon), an introduced species (shown in Appendix A-9, Photographs 1-5). Other frequently observed 25 grasses include Johnson grass (Sorghum halepense), also introduced, and silver bluestem (Bothriochloa 26 laguroides), a native prairie grass. Broadleaf herbaceous plants (i.e. forbs) are also interspersed among 27 the grasses within and adjacent to the existing and proposed ROW areas. These include plants such as 28 giant ragweed (Ambrosia trifida), western ragweed (Ambrosia psilostachya), goldenrod (Solidago sp.), 29 curly dock (Rumex crispus), annual sunflower (Helianthus annuus), and various colonizing species 30 frequently observed along roadsides such as pincushions (Scabiosa atropurpurea) (see Appendix A-9, 31 Photograph 12). Generally, these grass areas are maintained by mowing, as are many of the areas of 32 proposed new ROW. Consequently, such areas are of very limited value to wildlife as sources of food or 33 cover. Included within this area inventoried as grass-dominated vegetation are isolated occurrences of 34 trees and shrubs, which occupy areas too small to inventory separately. Areas characterized by stands 35 of brush or trees, as well as water features, within and adjacent to the project corridor were also 36 inventoried and are described in detail below. The overall context for this pervasive vegetation cover 37 within the project corridor may be seen in the aerial photographs in Appendix A, Figure A-7.

2 The proposed project is expected to have an overall footprint of construction impacts affecting 634.60 3 acres, which is a combination of 528.01 acres of existing ROW and 106.59 acres of proposed new ROW 4 (including 1.24 acres of drainage easements). Nearly half of this footprint (301.49 acres) would be 5 comprised of existing paved or other non-vegetated surfaces, with the remaining 332.91 acres made up 6 of vegetated or water surfaces. For purposes of assessing impacts to existing ground surfaces, it was 7 determined that all areas within the construction footprint would receive at least temporary impacts. The removal of most existing highway facilities and the reconstruction of IH 35E within the corridor would 8 9 create permanent impacts of 459.50 acres, with temporary impacts to existing vegetation surfaces 10 affecting the remaining 175.10 acres within the footprint. It is expected that areas of temporary impacts to 11 vegetation that are not ultimately paved would be revegetated with grass-dominated ground cover that 12 would be maintained by periodic mowing (i.e. "maintained grass").

13

14 The construction-related conversion of existing vegetation to either paved surfaces or maintained grass is 15 expected to affect 15.32 acres of vegetation or water features with particular importance as wildlife habitat. The inventory of habitat types below follows the guidelines established by TPWD²² for assessing 16 17 and mitigating impacts to wildlife habitat for transportation projects, and includes the following habitat 18 within the ROW: open stream channel and pond (0.39 acre); wetland (0.19 acres); riparian forest (2.03 19 acres); upland forest (9.93 acres); fencerows (1.54 acre); and, brush (1.24 acres). Included within the 20 inventory of woodland areas for the proposed project area are unusually large trees, or trees with a 21 diameter at breast height (dbh) of greater than 20 inches.

22

23 The bulleted paragraphs below describe special or unusual habitat features identified in TPWD guidelines 24 for inclusion in environmental impact studies. The general locations for areas of anticipated habitat 25 removal and locations of woodland data points are shown in Appendix A, Figure A-7; as the forested 26 areas are generally visible in the aerial photograph in **Figure A-7**, the polygons outlining them are not shown to avoid obscuring the aerial image. In addition, the aerial photograph in Appendix A, Figure A-7 27 28 shows vegetation cover in areas adjacent to the proposed project, and provides a larger context in which 29 to view the areas within existing and proposed ROW that are expected to be affected by the project. 30 Detailed information about impacts to forested areas may be found in the woodland data point forms in 31 Appendix B-3. Representative site photographs of these features can be found in Appendix A-9.

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- 33 34

35

 <u>Creeks, Wetlands, and Ponds</u>: Impacts to this category of habitat were discussed in Section
 5.1.2 (waters of the U.S., including wetlands) and are also summarized here for completeness. The proposed project is expected to permanently affect approximately 0.58 acre of open stream

²² *TxDOT-TPWD Memorandum of Agreement (MOA) for the Finalization of the 1998 Memorandum of Understanding (MOU) Concerning Habitat Descriptions and Mitigation.*

1 channels, wetlands, and ponds. Routing highway cross drainage through proposed culverts and 2 drainage easements would affect approximately 0.39 acre of open stream channels for 3 ephemeral creeks at 11 locations as listed in Table 5-1 and shown in Appendix A, Figures A-4 4 and A-7; this total includes 0.01 acre of fill impacts to a pond on a stream channel. Although the 5 portions of stream channels enclosed within existing culverts (1.08 acres) were included in 6 calculating the impacts to jurisdictional waters above (see Table 5-1), only stream segments that 7 are existing open channels were considered in estimating impacts to wildlife habitat. The project 8 is also estimated to have permanent fill impacts to a wetland (0.19 acre) on the west side of IH 9 35E north of Post Oak Drive Road.

10

11 Riparian Forest: Approximately 2.03 acres of riparian forest would be affected by the proposed • 12 project at 12 sites adjacent to ephemeral stream channels. These areas of expected impacts 13 vary in size from 0.046 acre to 0.346 acre. Riparian forests in the proposed project area are 14 typically dominated by American elm (Ulmus americana) and/or black willow (Salix nigra) trees, 15 and frequently include hackberry (Celtis laevigata) and green ash (Fraxinus pennsylvanica) trees 16 (see **Appendix A-9**, Photograph 7). These forested areas have canopy cover ranging from 60 to 17 90 percent and maximum tree height ranging from 40 to 60 feet. The trees range in diameter 18 from less than one to 64 inches dbh, but mature tree size is generally between 6 to 10 inches dbh. The riparian forest understory is generally dominated by woody vines such as saw 19 20 greenbrier (Smilax bona-nox), grape (Vitis sp.), poison ivy (Toxicodendron radicans), and 21 dewberry (Rubus sp.); forest understory also frequently includes shrubs such as Chinese privet 22 (Ligustrum sinense) and possumhaw (*llex decidua*), but herbaceous vegetation is generally guite 23 sparse. In some instances, the vegetation within and adjacent to riparian areas is mowed and/or 24 kept clear of woody vegetation (see Appendix A-9, Photographs 10 and 13) and offer little in 25 terms of wildlife habitat. An estimated 254 trees greater than six inches dbh would be removed 26 from these riparian woodland areas. Details about the characteristics of these riparian forest 27 sites are contained in woodlands data forms for Areas 5, 8, 11, 14, 15, 17, and 25-27 in 28 Appendix B-3.

29

<u>Unmaintained Vegetation—Upland Forest</u>: The proposed project is expected to affect a total of
 9.93 acres of forests on upland sites; this total comprises all 47 sites inventoried, which vary in
 size from 0.02 acre to 0.63 acre. These forests vary substantially in terms of the quality of habitat
 they provide for wildlife, but can generally be categorized into two groups based on understory
 characteristics described below.

- 35
- 36 37
- The first group is essentially forested landscaping for commercial, residential, or transportation facilities (see **Appendix A-9**, Photograph 14). The 26 sites in this group

total 5.29 acres and range in size from 0.02 acre to 0.63 acre. These sites offer relatively 1 2 poor guality wildlife habitat because understory vegetation is mowed and, in some cases, 3 consists almost entirely of lawn grass such as Bermuda grass or St. Augustine grass 4 (Stenotaphrum secundatum). Although scattered remnants of vines or shrubs may 5 occasionally be found near the bases of trees, these areas offer poor quality habitat for 6 most wildlife other than bird species, due to frequent mowing of the nearly monoculture 7 understory. Dominant trees in these areas include post oak (Quercus stellata), American 8 elm, pecan (Carya illinoinensis), cedar elm (Ulmus crassifolia), loblolly pine (Pinus 9 taeda), and eastern cottonwood (Populus deltoides). Forest canopy cover in these areas 10 ranges from 50 percent to 90 percent, and tree height ranges from 40 to 70 feet. Trees in 11 these forests range in size from less than one inch to 35 inches dbh, and include many 12 trees within the 10 to 20 inches dbh range. An estimated 589 trees greater than six 13 inches dbh would be removed from these areas. Details about the characteristics of 14 these landscaped forest sites are contained in woodlands data forms for Areas 1, 3, 6, 7, 15 19, 20, and 22-24 in Appendix B-3.

- 17 The second group of upland forest areas has greater variation in understory species 0 18 composition and condition, which is not maintained but is dominated by vines such as 19 saw greenbrier, dewberry, poison ivy, and grape in addition to shrubs such as Chinese 20 privet and possumhaw (see Appendix A-9, Photograph 15). The 21 sites in this group 21 total 4.64 acres and range in size from 0.05 acre to 0.55 acre. These forested areas are 22 generally dominated by post oak trees, except for one area that is predominately 23 hackberry trees and a second unusual area near a railroad ROW that is mostly China-24 berry (Melia azedarach) trees. Forest canopy cover in these areas ranges from 50 25 percent to 90 percent, and tree height ranges from 20 to 50 feet. Trees in these areas 26 range in size from less than one inch to 29 inches dbh, but most mature trees fall within a 27 range of 10 to 15 inches dbh. An estimated 527 trees greater than six inches dbh would 28 be removed from these areas. Details about the characteristics of these upland forest 29 sites are contained in woodlands data forms for Areas 4, 9, 10, 12, 13, 16, 18, and 21 in 30 Appendix B-3.
- 31

16

 <u>Unmaintained Vegetation—Brushland Areas</u>: The proposed project is expected to affect four brushland areas which are dominated by shrubs and sapling trees, none of which exceed six inches dbh. These areas are generally located within existing highway or power transmission line ROW and have apparently been cleared in recent years (see Appendix A-9, Photograph 16). Impacts to these areas would affect approximately 1.24 acres at the four locations inventoried, which range in size from 0.28 acre to 0.46 acre. A woodlands data form was completed for one

1 representative brushland area within existing IH 35E ROW (see Area 2 in Appendix B-3). The 2 overstory species in these areas include common persimmon (Diospyros virginiana), live oak 3 (Quercus virginiana), hackberry, eastern red cedar (Juniperus virginiana), rough-leaf dogwood 4 (Cornus drummondii), winged elm (Ulmus alata), bois d'arc (Maclura pomifera), and Chinaberry. 5 Tree height in these areas ranges from 10 to 25 feet, canopy cover is estimated to be 70 percent, 6 and the diameter of sapling trees averages two inches dbh. Shrubs and woody vines are 7 prominent components of these areas, including saw greenbrier at most sites; species include 8 coralberry (Symphoricarpos orbiculatus), Chinese privet, dewberry, grape, wild plum (Prunus sp.), 9 and New Deal weed (Baccharis neglecta). These areas also have herbaceous understory 10 comprised of a variety of grasses and forbs, including Bermuda grass, Japanese brome (Bromus japonicus), Johnson grass, silver bluestem, goldenrod, ironweed (Vernonia sp.), curly dock, and 11 12 western raqweed.

- 14 Fencerow Trees: The proposed project is expected to affect a total of 1.54 acres of fencerow • 15 trees at 20 sites (see Appendix A-9, Photograph 17). The trees within these linear habitat 16 features are generally 10 to 30 feet tall, and fencerows vary in width from 10 to 25 feet, averaging 17 14 feet in width. Hackberry trees are the most frequently observed trees in fencerows, which also 18 include eastern red cedar, post oak, club of Hercules (Zanthoxylum clava-herculis), honey locust 19 (Gleditsia triacanthos), green ash, blackjack oak (Quercus marilandica), American elm, and black 20 willow. Tree sizes range from saplings under one inch dbh to nearly 20 inches dbh, with average 21 size generally between four to six inches dbh. Canopy cover within fencerow areas is generally 22 80 percent, but ranges widely depending on the site. Shrubs and vines are generally associated 23 with fencerows in the proposed project area, and include New Deal weed, possumhaw, Chinese 24 privet, crape-myrtle (Lagerstroemia indica), saw greenbrier, grape, dewberry, poison ivy, and 25 Japanese honeysuckle (Lonicera japonica). Herbaceous plants associated with fencerows 26 include Bermuda grass, Johnson grass, silver bluestem, giant ragweed, western ragweed, 27 goldenrod, and pincushions. The locations of these fencerows are shown in Appendix A, Figure 28 A-7, and a table of additional descriptive information about each site is included in Appendix B-4.
- 29

13

Large Trees: A total of 47 unusually large (i.e. greater than 20 inches dbh) trees were observed
 within the proposed project area during field surveys that would likely be removed during
 construction of the proposed project (see Appendix A-9, Photograph 18). These trees range in
 size from 21 inches to 64 inches dbh, with nearly all large trees measuring between 21 and 30
 inches dbh. The height of these large trees ranges from 40 to 70 feet. The aerial extent of large
 tree canopies was not computed for each tree individually, but is part of the overall acreage for
 upland or riparian forest sites discussed previously. Details about the species, location, and size

1	of these trees are included in the woodlands data forms in Appendix B-3. A summary of the
2	large trees observed in the proposed project area follows:
3	- 26 of the large trees are post oak trees;
4	- Six of the large trees are eastern cottonwood;
5	- There are three each large trees of the following species: American elm, loblolly pine, and
6	black willow;
7	- Six tree species each had one specimen that was greater than 20 inches dbh: cedar elm,
8	eastern red cedar, live oak, red mulberry (Morus rubra), hackberry, and catalpa (Catalpa
9	speciosa).
10	
11	Based on the foregoing outline of impacts to habitat and vegetation, the reconstruction of IH 35E is
12	expected to remove approximately 1,370 trees greater than six inches dbh occurring on 11.96 acres of
13	combined riparian and upland forest habitat. In addition, additional trees greater than six inches dbh are
14	included among the 1.54 acres of fencerow trees expected to be removed. Impacts to forested areas are
15	unavoidable in light of the design constraints requiring widening IH 35E to construct the mix of mainlanes,
16	frontage roads, and ramps necessary to meet the purpose and need of the project. That is, adding the
17	needed new lanes and making the proposed changes to the horizontal and vertical alignment of the
18	existing facility necessitate removal of forested areas adjacent to IH 35E.
19	
20	During project development, TxDOT would design, use, and promote construction practices that minimize
21	adverse affects on both regulated and unregulated wildlife habitat. Existing vegetation, especially native
22	trees, would be avoided and preserved wherever practicable. Every effort would be made to preserve
23	trees within the ROW and other areas where they neither compromise safety nor substantially interfere
24	with the project's construction.
25	
26	In accordance with the IPWD guidelines for transportation projects cited previously, habitats given
27	consideration for hon-regulatory mitigation during project planning include the following:
28	. Unliket for fodered condidets encodes if withoutlon would explot in the provention of the listing of
29	Habitat for rederal candidate species if mugation would assist in the prevention of the listing of appealog:
21	species, \mathbf{P} = Bare vegetation parion (S1, S2, or S2) that also leadly provide babitat for a state listed appearance
31 20	• Rare vegetation series (31, 32, or 33) that also locally provide habitat for a state-listed species,
32 22	All vegetation communities listed as S1 or S2, regardless of whether or not the series in question provide behitst for state listed encodes:
24	provide flabitat for state-insted species,
04 25	Dottomanu naruwoou, narive prames, and npanan areas, and
30 26	 Any other habitat leature considered to be locally important.
30	

The proposed project would not substantially affect habitat required by threatened/endangered species, nor would it disturb any rare vegetation series. One factor relevant to mitigation, as it relates to all habitats potentially affected by the proposed project, is the diminished habitat quality resulting from proximity of habitat areas to existing roads and other areas of frequent human activity; and the relatively small size of the areas of impacts in relation to the generally large habitat requirements for most wildlife species other than birds. A summary of specific mitigation considerations is noted for each habitat type in the bulleted subparagraphs below.

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<u>Creeks, Wetlands, and Ponds</u>: As discussed above in Section 5.1.2 (impacts to waters of the U.S., including wetlands) mitigation related to the project crossings and drainage easements for regulated water features would be addressed through the regulatory process under Section 404 of the CWA, and further mitigation would not be warranted. Although mitigation would not be warranted for impacts from culvert installation and extension, BMPs would be implemented in an effort to minimize any impacts.

14 15

Riparian Forest: As previously discussed, approximately 2.03 acres of riparian forest would be 16 17 affected by the proposed project at 12 sites. In accordance with TPWD (see Appendix B-5), 18 mitigation would be expected for six of the 12 sites. These six sites are considered quality habitat 19 in that they are either part of an intact riparian corridor or contiguous with other habitats, such as 20 upland post oak forests. These areas comprise a total of 1.20 acres and include the following 21 sites noted in the woodland data forms in Appendix B-3: 5a, 5b, 11, 14, 15, and 17. TxDOT has 22 identified tracts located in the Lewisville Lake Environmental Learning Area (LLELA) as the 23 location for non-regulatory habitat mitigation. LLELAs mission is "To manage the fish and wildlife, 24 restore the habitat, and conduct environmental education and environmental research." The 25 mitigation is to be accomplished via fee payment. Mitigation is not proposed for the remaining 26 0.83 acres of riparian forest, as these remaining riparian forests either provide limited quality 27 habitat because of sparse or maintained understory or are located within drainage easements 28 which would be reseeded to establish ground cover and stabilize soil after grading to facilitate 29 drainage to or from the culverts. It is expected that some woody species would also become 30 established within a few years after initial revegetation efforts. The need for riparian forest mitigation was also considered in light of the abundance of riparian habitat and water features 31 32 throughout floodplains and lake areas in the general vicinity of Lewisville Lake. As riparian 33 habitat is generally protected by municipal limitations on development within 100-year floodplains 34 as well as USACE regulatory programs under Section 404 of the CWA, it is expected that most of 35 the existing riparian habitat associated with natural drainage channels in the general area would 36 remain intact despite future development.
1 Upland Forest: As previously discussed, the proposed project is expected to affect a total of 9.93 2 acres of upland forests at a total of 47 sites. In accordance with TPWD (see Appendix B-5), 3 mitigation would be expected for 18 of these sites, which are dominated by post oak trees that 4 have reasonably contiguous forest canopy and understory. These areas are adjacent to larger upland forests and therefore represent relatively valuable habitat for wildlife. These areas 5 6 comprise a total of 4.25 acres and include the following sites noted in the woodland data forms in 7 Appendix B-3: 4a-d, 9a-c, 10a-b, 13a-c, 16a-d, and 18a-b. Per the description above, LLELA 8 would be the location for non-regulatory habitat mitigation; and mitigation would be accomplished 9 via fee payment. Mitigation is not proposed for the remaining 5.68 acres of upland forest 10 because these areas are either landscape trees with mowed grass understory, small patches of 11 post oak forest that are not contiguous with larger forests, or are dominated by hackberry trees 12 (an ubiquitous species that readily establishes or reestablishes itself throughout the general area) 13 or invasive China-berry trees. The limited acreage of these scattered forest resources and the 14 limited quality of habitat represented by them would not warrant mitigation for their loss.

15

 Fencerow Trees and Brushland Areas: The loss of fencerow trees resulting from construction of the proposed project would not warrant mitigation because of the limited wildlife habitat value represented by these areas. Fencerows in the proposed project area are generally along the edge of the existing ROW that is periodically mowed; this frequent disturbance and the proximity to vehicular traffic would diminish the value of these fencerows for habitat. Likewise, brushland areas are in close proximity to IH 35E, railroad ROW, or transmission lines and are subject to periodic clearing of vegetation as well as being proximate to frequent human activity.

23

24 Migratory Bird Treaty Act (MBTA)

25 The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, 26 trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal 27 permit issued in accordance within the Act's policies and regulations. Between October 1 and February 28 15, the contractor would remove all old migratory bird nests from any structures that would be affected by 29 the proposed project, and complete any bridge work and/or vegetation clearing. In addition, the 30 contractor would be prepared to prevent migratory birds from building Nests between February 15 and 31 October 1, per the Environmental Permits, Issues, and Commitments (EPIC) plans. In the event that 32 migratory birds are encountered on-site during project construction, adverse impacts on protected birds, 33 active nests, eggs, and/or young would be avoided.

1 5.1.6 Threatened/Endangered Species

2

3 No-Build Alternative

4 No threatened or endangered species would be affected and/or impacted by the No-Build Alternative.

5

6 Build Alternative

7

8 Potential Impacts

9 The potential presence or absence of state listed threatened or endangered species was researched via 10 the TPWD website. The potential presence of federally listed species was also checked with Internet 11 information maintained by the U.S. Fish and Wildlife Service (USFWS). In addition, a database search 12 was conducted using the Texas Natural Diversity Database (TXNDD) in January and October 2009, and 13 field visits were performed on February 4 and 12, 2009. Both the USFWS and TWPD Annotated County 14 List of Threatened, Endangered, and Rare Species for Denton County were again reviewed in July 2011. 15 TPWD maintains the TXNDD to track known occurrences of special species on public land throughout 16 Texas. The TPWD and USFWS websites listed several threatened or endangered species, as well as 17 species of concern (SOC), that may occur within Denton County. The listed species for Denton County, 18 current regulatory status, and habitat requirements are presented in Table 5-2. Refer to the following 19 section for a description of federally and state listed species for the proposed project area, as well an evaluation of the TXNDD data. 20

TABLE 5-2. FEDERAL, STATE LISTED THREATENED/ENDANGERED SPECIES, AND TEXAS PARKS &WILDLIFE DEPARTMENT'S SPECIES OF CONCERN DENTON COUNTY

SPECIES	FEDERAL STATUS	STATE STATUS	DESCRIPTION OF SUITABLE HABITAT	HABITAT PRESENT	SPECIES EFFECT	SPECIES IMPACT
BIRDS						
American Peregrine Falcon <i>Falco peregrinus</i> anatum	DL	т	Year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	Yes		No impact (see below)
Arctic Peregrine Falcon <i>Falco peregrinus</i> <i>tundrius</i>	DL		Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	Yes		No impact (see below)
Bald Eagle Haliaeetus Ieucoceohalus	DL	т	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds.	No	No effect (see below)	No impact (see below)
Henslow's Sparrow <i>Ammodramus</i> <i>henslowii</i>	_		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
Interior Least Tern <i>Sterna antillarum</i> <i>athalassos</i>	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 (see below)	
Peregrine Falcon Falco peregrinus	DL	т	Both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (<i>F. p. anatum</i>) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, <i>F.p. tundrius</i> 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.	Yes		No impact (see below)
Sprague's Pipit Anthus spragueii	С	_	Only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.	No		No impact

TABLE 5-2. FEDERAL, STATE LISTED THREATENED/ENDANGERED SPECIES, AND TEXAS PARKS &WILDLIFE DEPARTMENT'S SPECIES OF CONCERN DENTON COUNTY

SPECIES	FEDERAL STATUS	STATE STATUS	DESCRIPTION OF SUITABLE HABITAT	HABITAT PRESENT	SPECIES EFFECT	SPECIES IMPACT
Piping Plover Charadrius melodus	E,T		Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats.	No	No effect (see below)	
Western Burrowing Owl Athene cunicularia hypugaea			Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows.	No		No impact
White-faced Ibis <i>Plegadis chihi</i>		т	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 (see below)
Whooping Crane Grus americana	E	E	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.	No	No effect (see below)	No impact (see below)
Wood Stork Mycteria americana		т	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960.	No		No impact (see below)
MAMMALS	1				•	
Plains spotted skunk Spilogale putorius interrupta			Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	Yes		No impact (see below)
Red Wolf <i>Canis rufus</i>	E*	E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies.	No	No effect	
MOLLUSKS						
Fawnsfoot Truncilla donaciformis			Small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in still to swiftly flowing waters; Red (historic), Cypress (historic), Sabine (historic), Neches, Trinity, and San Jacinto River basins.	No		No impact
Little spectaclecase <i>Villosa lienosa</i>			Creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins.	No		No impact
Louisiana pigtoe Pleurobema riddellii		т	Streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins.	No		No impact
Texas heelsplitter Potamilus amphichaenus		т	Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.	No		No impact

TABLE 5-2. FEDERAL, STATE LISTED THREATENED/ENDANGERED SPECIES, AND TEXAS PARKS &WILDLIFE DEPARTMENT'S SPECIES OF CONCERN DENTON COUNTY

SPECIES	FEDERAL STATUS	STATE STATUS	DESCRIPTION OF SUITABLE HABITAT	HABITAT PRESENT	SPECIES EFFECT	SPECIES IMPACT		
Wabash pigtoe <i>Fusconaia flava</i>			Creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow.	No		No impact		
REPTILES								
Texas garter snake Thamnophis sirtalis annectens			Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August.	Yes		No impact (see below)		
Texas Horned Lizard Phrynosoma cornutum		т	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September.	No		No impact		
Timber/ Canebrake Rattlesnake <i>Crotalus horridus</i>	_	т	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 (see below)		
PLANTS		-				-		
Glen Rose yucca <i>Yucca necopina</i>			Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June.	No		No impact		
Yucca necopina Imestone outcrops; flowering April-June. No No impact E - Endangered T - Threatened DL - Delisted Endangered/Threatened E C - Candidate. USFWS has substantial information on biological vulnerability and threats to support proposing to list as threatened or endangered. Data are being gathered on habitat needs and/or critical habitat designations. "-" - No designation occurring within identified county "blank" - Rare, but with no regulatory listing status " " - No determination of effect or impact required because species lacks federal and/or state listing status "**" - TPWD T&E species list indicates species could be present in identified county; however, USFWS T&E species list does not indicate a listing status for the species in the county.								
Assessment Progr	ams, County	ervice (Jani Lists of Tex	ary 9, 2009), Texas Parks & Wildlife Department, W as Special Species (Denton, January 15, 2010), and	Field Visit (Febru	versity and Hat lary 4 & 12, 200	onat)9).		

I

1 Threatened or Endangered Species

2 Preferred habitat for the timber/canebrake rattlesnake exists within forested areas with dense ground 3 cover. The distribution of the timber/canebrake rattlesnake stretches from the East Coast westward into 4 Texas, and as far north as New England. In the southern portions of its range, this species prefers to 5 make its den in somewhat swampy, wetland habitats. The DFW Metroplex represents the far western 6 edge of its range, and is characterized by drier conditions than generally preferred for this snake. 7 Populations tend to be higher in eastern Texas where greater concentrations of wetlands and humid forests are found. Forested areas located near permanent water sources are also utilized, as fallen 8 9 debris from trees can act as refugia for the rattlesnake. The timber/canebrake rattlesnake is a shy animal 10 that prefers to live in areas with high amounts of cover and available refuge. Riparian/forested habitat is 11 the most likely within the DFW Metroplex to be suitable for this species. The home range of this species 12 is large, at times encompassing in excess of 100 acres. The proposed project would not impact the 13 rattlesnake, as the amount of potential affected habitat is a small portion of its range. Further, no visual 14 sightings or evidence of the species was observed in the proposed project area during field 15 investigations. To ensure a minimization of impacts, the forested habitat in the IH 35E project area would 16 be surveyed for signs of this species prior to construction activities.

17

18 Potentially suitable stopover habitat is not found within the project area for the following listed migratory 19 bird species: Interior Least Tern, Piping Plover, White-faced Ibis, Whooping Crane, and Wood Stork. For 20 these and non-listed species, nearby Lewisville Lake (located approximately 1.5 miles from the project 21 area), braided streams, riparian vegetation, and wetland areas provide the most likely stopover habitat in 22 the vicinity of the project area. In a rural setting, sound could travel this distance and stand out against 23 the backdrop of quiet, causing disturbance to species at nearby stopover locations during project 24 construction. However, because the setting is urban, the stopover locations are already subject to urban 25 noise, and any heightened noise levels caused by construction would drown out before reaching a 26 distance of 1.5 miles. Accordingly, there would be no direct disturbance to migratory bird species at 27 nearby stopover locations.

28

The American and Artic Peregrine Falcons are have been delisted from the federal list of threatened and endangered species. 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.

2 Species of Concern

The Texas Wildlife Action Plan strives to keep "common species common" by gathering information about native species before they become rare. Species that are uncommon or exhibit declining numbers may be designated as SOC by TPWD. Often these designations are placed on species for which little is known as a precautionary measure, and in order to focus attention on gaining insight into the species' life histories. Preferred habitat determinations for the SOC shown in **Table 5-2** have been made using available data and examining habitat preferences for closely related species, and are discussed below.

9

10 The plains spotted skunk prefers forested or brushy habitats, which provide cover and potential den sites. 11 The species is sometimes seen foraging in more open areas, but utilizes abandoned burrows, brush 12 piles, or hollow logs when bearing young. Range information for this species is incomplete, but the 13 species is known throughout the Midwest. The plains spotted skunk is believed to be potentially 14 vulnerable within Texas. Little is known about the ecology of this subspecies, but the closely related 15 eastern spotted skunk (Spilogale putorius) prefers habitats with substantial cover such as forested and 16 brushy areas. The skunks utilize abandoned mammal burrows or similar crevices for den sites and 17 raising young. The proposed project area primarily consists of urban areas, with cover and potential den 18 sites being scarce throughout; and the species was not observed during field visits. The proposed project 19 would have no impact on the plains spotted skunk.

20

21 The Texas garter snake prefers marshy areas and those associated with permanent sources of water. 22 This species occurs in east through central Texas, with a second population stretching from the 23 panhandle of Texas north through Oklahoma and into Kansas. This snake is most abundant in the 24 central Texas portion of its range. Although the snake prefers marshy habitats associated with 25 permanent water bodies, it can be found in many habitats, including suburban areas, within Denton 26 County. Within the project area, potential habitat for the species includes riparian/forested areas, similar 27 to the timber/canebrake rattlesnake habitat discussed above. As this species is cosmopolitan throughout 28 the county, the project would disturb only a small fraction of the snake's potential habitat. For the above 29 reasons, the proposed project would have no impact on the Texas garter snake.

30

31 TXNDD Results

The TXNDD search included the entirety of the Denton East, Denton West, and Lewisville West USGS quadrangles, which include portions of Lewisville Lake. According to the TXNDD, one Element Occurrence Identification (EOID) number is documented near the project (i.e. within 1.5 miles). EOID 434 cites an observation of the Texas garter snake within the City of Lake Dallas. No date is included with the observation, and no specific locations are given. The City of Lake Dallas is located east of IH 35E and west of Lewisville Lake, and shares a boundary with the proposed project at its southern terminus at FM Areas near the lake and in conjunction with parks such as Willow Grove Park would be the most
 likely within the community to contain the preferred habitat for the Texas garter snake. The proposed
 project would not require land adjacent to or near the lake, and no ROW is to be acquired from the City of
 Lake Dallas. The proposed project would have no impact on the Texas garter snake.

5

6 Absence of information in the TXNDD for an area does not mean absence of occurrence. The TXNDD 7 does not include a representative inventory of rare resources in the state. Rather, TXNDD data include 8 reported records of species throughout Texas. Data from the TXNDD do not provide a definitive 9 statement as to the presence, absence, or condition of special species, natural communities, or other 10 substantial features within the project area. No evidence of the species listed in Table 5-2 was observed 11 during field visits. In addition, potential habitat in the project area would be considered less valuable due 12 to the presence of the existing IH 35E facility and surrounding urban network. The proposed project does 13 not cross Lewisville Lake, and is located over a mile from the Lake's nearest shoreline. The proposed 14 project would have no effect and/or impact on any of the species listed in Table 5-2.

15

16 Invasive Species and Beneficial Landscaping

17 All re-vegetation and landscaping activities would comply with Executive Order (EO) 13112, which 18 requires TxDOT and FHWA to prevent and control the introduction and spread of invasive (non-native) 19 plant and animal species. In consideration of the Executive Memorandum on Beneficial Landscaping, 20 landscaping activities would utilize techniques that complement and enhance the local environment and 21 seek to minimize the adverse effect that the landscaping would have on it. In particular, this means using 22 regionally native plants and employing landscaping practices and technologies that conserve water and 23 prevent pollution. Environmentally beneficial landscaping would include seeding and replanting the ROW 24 in accordance with TxDOT-approved seeding specifications. Project impacts to non-regulatory vegetation 25 and habitat would be mitigated through habitat restoration activities at LLELA.

26

27 5.1.7 Topography and Soils

28

29 No-Build Alternative

As no new ROW is required under the No-Build Alternative, impacts to topography and soils are not anticipated. In addition, no FPPA or Section 4(f) coordination would be required.

- 32
- 33

34 Build Alternative

35 As previously described in **Section 3.2**, Surrounding Terrain and Land Use, the surface topography within

36 the project limits is gently sloping with a local topographic trend to the south and east toward Lewisville

37 Lake. According to the Natural Resources Conservation Service (NRCS) Soil Survey of Denton County,

Texas (1980), there are two general soil associations within the study area. The *Birome-Gasil-Callisburg* soil association makes up the southern two-thirds of the project area and includes well drained, gently sloping to moderately steep, loamy soils that have moderate to slow permeability. The *Sanger-Somervell-Lindale* soil association makes up the northern one-third of the study area and contains well drained, gently sloping to moderately steep, clayey and loamy soils that have very slow permeability. There are no Texas hydric soils located within the proposed ROW.

7

8 Farmland Protection Policy Act

Although approximately 30 percent²³ of the proposed IH 35E project area is composed of prime farmland
soils, the IH 35E corridor is highly developed, located entirely within the municipalities of Corinth and
Denton. Further, the additional ROW required is urbanized and/or zoned for urban use (see
Section 5.2.2). For these reasons, the proposed project is exempt from the requirements of the
Farmland Protection Policy Act (FPPA) and requires no coordination with the NRCS.

14

15 5.1.8 Air Quality

16

17 No-Build Alternative

18 Implementation of the No-Build Alternative would lead to increased traffic congestion and decreased 19 mobility, resulting in decreased vehicular speed and increased stop-and-go traffic. The No-Build 20 Alternative is inconsistent with *Mobility 2035*, which contains specific projects, programs, and policies 21 intended to improve mobility, access, and air quality in the DFW Metropolitan Area.

22

23 Build Alternative

This project is located within Denton County, which is part of the Environmental Protection Agency's (EPA) designated nine-county serious²⁴ nonattainment area for the 2007 eight-hour ozone standard; therefore, the transportation conformity rule applies. The proposed project is included in and is consistent with the area's financially constrained long-range MTP (*Mobility 2035*) and the 2011-2014 TIP, as amended. The U.S. Department of Transportation (USDOT) (FHWA/Federal Transit Administration [FTA]) found the MTP and the TIP to conform to the SIP on July 14, 2011. Copies of the pages are included in **Appendices G-3** and **G-4**, respectively.

²³NRCS Web Soil Survey 2.2, Farmland Classification, 2009.

²⁴ On August 9, 2010, the EPA proposed to determine that the nine-county moderate eight-hour ozone nonattainment area for DFW did not attain the 1997 eight-hour ozone NAAQS by the June 15, 2010 attainment deadline set forth in the CAA and CFR for moderate non-attainment areas (75 F.R. 152, August 9, 2010) under Title 40 C.F.R. Part 81. On January 19, 2011, the EPA reclassified the nine-county DFW non-attainment area from moderate to serious non-attainment for the 2007 eight-hour ozone standard.

1 See Appendix G-5 for a figure depicting MTP reference numbers and limits (per the Mobility 2035 2 Network Listings, 2011 Transportation Confromity, Appendix 10.8: Roadway System (Capacity Staging)) 3 as well as the FY 2011-2014 TIP within the IH 35E North project limits. In addition, Appendix G-5 has a 4 figure depicting MTP References and CSJs within the entire IH 35E corridor (South, Middle, and North 5 sections). All projects in the NCTCOG TIP that are proposed for federal or state funds were initiated in a 6 manner consistent with federal guidelines in Section 450, of Title 23 Code of Federal Regulations (CFR) 7 and Section 613.200, Subpart B, of Title 49 CFR. Energy, environment, air quality, cost, and mobility 8 considerations are addressed in the programming of the TIP.

9

10 Traffic Air Quality Analysis

The primary pollutants from motor vehicles are volatile organic compounds (VOCs), carbon monoxide (CO), and nitrogen oxides (NOx). VOCs and NOx can combine under the right conditions in a series of photochemical reactions to form ozone. Because these reactions take place over a period of several hours, maximum concentrations of ozone are often found far downwind of the precursor sources. Thus, ozone is a regional problem and not a localized condition.

16

The modeling procedures of ozone require long-term meteorological data and detailed area wide emission rates for all potential sources (industry, business, and transportation) and are normally too complex to be performed within the scope of an environmental analysis for a highway project. Accordingly, concentrations of ozone for the purpose of comparing the results of the National Ambient Air Quality Standards (NAAQS) are modeled by the regional air quality planning agency for the SIP. However, concentrations for CO are readily modeled for highway projects and are required by federal regulations.

24

25 Topography and meteorology of the area in which the proposed project is located would not seriously 26 restrict dispersion of the air pollutants. The traffic data used in the analysis were obtained from the TxDOT TPP Division. The estimated time of completion (ETC) year 2020 (IH 35E from FM 2181 to the IH 27 28 35E/IH 35W interchange) and 2026 (IH 35E from the IH 35E/IH 35W interchange to US 380) ADTs are 29 estimated to be 204,050 vpd and 226,880 vpd, respectively. The design 2030 year ADT is estimated to 30 be 242,100 vpd. Carbon monoxide concentrations for the proposed project were modeled using the 31 worst case scenario (adverse meteorological conditions and sensitive receptors at the ROW line) in 32 accordance with the TxDOT Air Quality Guidelines. Local concentrations of carbon monoxide are not 33 expected to exceed national standards at any time. The results of the analysis are summarized in 34 Table 5-3.

35

Traffic Volume		Emission	CO Concentration ¹ % N (ppm)			AAQS ²	
ADT (vpd)	DHV (vph)	(g/mile) ³	One-Hour	Eight-Hour	One-Hour	Eight-Hour	
204,050	16,120	5.38	5.8	3.6	16.6	40.0	
226,880	17,924	5.22	5.9	3.6	16.9	40.0	
242,100	19,126	5.18	6.1	3.7	17.4	41.1	
<u>.</u>	<u>.</u>		•				
¹ Includes an ambient concentration of 3.7 ppm for the one-hour averaging time and 2.3 ppm for the eight-hour averaging time.							
² One-hour NAAQS of 35 ppm and an eight-hour NAAQS of 9 ppm.							
60 mph.	0						
	ADT (vpd) 204,050 226,880 242,100 nbient concer AQS of 35 ppr 50 mph.	ADT DHV (vpd) (vph) 204,050 16,120 226,880 17,924 242,100 19,126 nbient concentration of 3.7 AQS of 35 ppm and an eight 50 mph.	ADT DHV (vpd) Factor (g/mile) ³ 204,050 16,120 5.38 226,880 17,924 5.22 242,100 19,126 5.18 nbient concentration of 3.7 ppm for the one-hor AQS of 35 ppm and an eight-hour NAAQS of 9 60 mph. 50 mph. 50 mph.	ADT DHV Factor (g/mile) ³ One-Hour 204,050 16,120 5.38 5.8 226,880 17,924 5.22 5.9 242,100 19,126 5.18 6.1	ADT DHV (vpd) Factor (g/mile) ³ (ppm) 204,050 16,120 5.38 5.8 3.6 226,880 17,924 5.22 5.9 3.6 242,100 19,126 5.18 6.1 3.7 nbient concentration of 3.7 ppm for the one-hour averaging time and 2.3 ppm for \$400 mph\$. 3.6 3.6 AQS of 35 ppm and an eight-hour NAAQS of 9 ppm. 50 mph. 3.7	ADT DHV Factor (g/mile) ³ (ppm) 204,050 16,120 5.38 5.8 3.6 16.6 226,880 17,924 5.22 5.9 3.6 16.9 242,100 19,126 5.18 6.1 3.7 17.4 Note the one-hour averaging time and 2.3 ppm for the eight-hour averaging time averaging	

TABLE 5-3. CARBON MONOXIDE ANALYSIS

2

3 Congestion Management Process (CMP)

The CMP is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs. The proposed project was developed from NCTCOG's operational CMP which meets all requirements of amended United States Code (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). On April 9, 2009, the RTC approved the MTP, which contains elements of the CMP.

12 The CMP element of the plan would carry an inventory of all project commitments (including those 13 resulting from major investment studies) detailing type of strategy, implementing responsibilities, 14 schedules, and expected costs. The operational management and travel demand reduction strategies 15 are commitments made by the region at two levels: program level and project level implementation. 16 Program level commitments are inventoried in the regional CMP, which was adopted by the RTC. These 17 would be included in the financially constrained MTP, and future resources would be earmarked for their 18 implementation. At the project implementation level, travel demand reduction strategies and 19 commitments would be added to the regional TIP or included in the construction plans. The regional TIP 20 would provide for programming of these projects at the appropriate time with respect to the SOV facility 21 implementation and project specific elements. Individual CMP projects in the area are listed in Table 5-4. 22

TABLE 5-4. CONGESTION MANAGEMENT PROCESS PROJECTS

Project Code	Street/Name	City	County	Implementing Agency	Project Type	Year of Implementation	Total Project Cost
11217	FM 426 from 1.4 Miles West of Loop 288 to 1.1 Miles East of Loop 288	Denton	Denton	TxDOT Dallas	Addition of Lanes	2007	\$6,000,000
11225	US 380 from IH 35 to US 77/US 377	Denton	Denton	TxDOT Dallas	Addition of Lanes	2006	\$12,000,000
20150	MKT Rail Corridor from Denton CBD Just South of Intersection of Hickory and Railroad to Dart Trinity Mills Light Rail Station	Denton	Denton	DCTA	Rail Transit	2009	\$241,450,000
83003	Shady Oaks from Woodrow to Loop 288	Denton	Denton	Denton	New Roadway	2007	\$3,260,000
20137	VA From Fiber Optic Trunk Lines to at Various Locations in the City of Denton	Denton	Denton	Denton	ITS	2009	\$1,964,500
20146	Bonnie Brae Road from IH 35 East to US 377	Denton	Denton	Denton	Addition of Lanes	2010	\$57,689,189
53075	LP 288 from US 380 West of Denton to IH 35W South of Denton	Various	Denton	TxDOT Dallas	New Roadway	2030	\$17,531,100
11225.1	US 380 From West of Bonnie Brae to US 77/US 377	Denton	Denton	TxDOT Dallas	Addition of Lanes	2008	\$15,580,000
11225.2	US 380 From West of Bonnie Brae to US 77/US 377	Denton	Denton	TxDOT Dallas	Addition of Lanes	2010	\$3,702,920
20144	Mayhill Road from IH 35 East to US 380	Denton	Denton	Denton	Addition of Lanes	2010	\$56,670,566
9967	Loop 288 from Us 380 to IH 35E	Denton	Denton	TxDOT Dallas	Addition of Lanes	2006	\$22,100,000

Project Code	Street/Name	City	County	Implementing Agency	Project Type	Year of Implementation	Total Project Cost
20175	LP 288 from IH 35 to US 380 - NW Quadrant & Interchange	Denton	Denton	TxDOT Dallas	New Roadway	2009	\$25,892,966
53052	LP 288 from IH 35 to US 380 - NW Quadrant & Interchange	Denton	Denton	TxDOT Dallas	New Roadway	2009	\$22,581,389
Source: N	ICTCOG TIPINS	(June 2009).		•			

TABLE 5-4. CONGESTION MANAGEMENT PROCESS PROJECTS

In an effort to relieve traffic congestion and the need for SOV lanes in the region, TxDOT and NCTCOG
will continue to promote appropriate congestion management strategies through the Congestion
Mitigation and Air Quality program, the CMP, and the MTP. The CMP analysis for added SOV capacity
projects in the Transportation Management Area is on file and available for review at NCTCOG.

6

7 Mobile Source Air Toxics (MSATs)

8 In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. 9 Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile 10 sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or 11 refineries).

12

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

18

19 The EPA is the lead federal agency for administering the CAA and has certain responsibilities regarding 20 the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air 21 Pollutants from Mobile Sources (66 FR 17229, March 29, 2001). This rule was issued under the authority 22 in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated 23 mobile source control programs, including its reformulated gasoline (RFG) program, its national low 24 emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur 25 control requirements, and its proposed heavy duty engine and vehicle standards for on-highway diesel 26 fuel sulfur control requirements. Between 2000 and 2020, the FHWA projects that even with a 64 percent 27 increase in VMT, these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-28 butadiene, and acetaldehyde by 57 percent to 65 percent, and would reduce on-highway diesel 29 particulate matter (DPM) emissions by 87 percent, as shown in the following graph:



Source: FHWA Interim Guidance on Air Toxic Analysis in NEPA²⁵ Documents, February 3, 2006.

2 In an ongoing review of MSATs, the EPA finalized additional rules under authority of CAA Section 202(I) 3 to further reduce MSAT emissions that are not reflected in the above graph. The EPA issued Final Rules 4 on Control of Hazardous Air Pollutants from Mobile Sources (72 FR 8427, February 26, 2007) under Title 5 40 CFR Parts 59, 80, 85 and 86. The rule changes were effective April 27, 2007. As a result of this 6 review, EPA adopted the following new requirements to substantially lower emissions of benzene and the 7 other MSATs by: (1) lowering the benzene content in gasoline; (2) reducing non-methane hydrocarbon 8 (NMHC) exhaust emissions from passenger vehicles operated at cold temperatures (under 75 degrees 9 Fahrenheit); and (3) reducing evaporative emissions that permeate through portable fuel containers.

10

11 Beginning in 2011, petroleum refiners must meet an annual average gasoline benzene content standard 12 of 0.62 percent by volume, for both reformulated and conventional gasoline, nationwide. The national 13 benzene content of gasoline in 2007 was about 1.0 percent by volume. EPA standards to reduce NMHC 14 exhaust emissions from new gasoline-fueled vehicles will become effective in phases. Standards for 15 light-duty vehicles and trucks (equal to or less than 6,000 pounds [lbs]) become effective during the 16 period of 2010 to 2013, and standards for heavy light-duty trucks (6,000 to 8,000 lbs) and medium-duty 17 passenger vehicles (up to 10,000 lbs) become effective during the period of 2012 to 2015. Evaporative requirements for portable gas containers become effective with containers manufactured in 2009. 18 19 Evaporative emissions must be limited to 0.3 grams of hydrocarbons per gallon per day.

²⁵ National Environmental Policy Act of 1969.

EPA has also adopted more stringent evaporative emission standards (equivalent to current California standards) for new passenger vehicles. The new standards became effective in 2009 for light vehicles and in 2010 for heavy vehicles. In addition to the reductions from the 2001 rule, the new rules will substantially 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 VOCs, and reductions of more than 19,000 tons of PM_{2.5}.

9

10 Monitored Levels of MSATs near the Project Area

11 The Denton County area monitors various air pollutants using an established air monitoring network. This 12 network of monitors measures air quality and determines the levels of the various pollutants in the air. 13 Not all monitors sample for the same pollutants, and not all monitors have one year of complete data to 14 compile an annual average for any given pollutant. For these reasons, data from multiple monitors must 15 be examined in order to analyze the pollution concentrations in the proposed project area, as shown in 16 Table 5-5. Air quality monitors are located between approximately 1.8 miles and 18.2 miles from the 17 proposed project. The closest NO and O₃ (ozone) monitor used for compliance with the NAAQS is 18 located approximately 1.8 miles from the proposed project. The official monitor data are found on EPA's 19 national air quality monitor web site (www.epa.gov/air/data).

20

Air Monitor Site	Activation Date	Annual Average - O ₃ (ppm) 2008 (Standard is a 3 year average which must be 0.075 ppm or below)	Annual Average - PM ₁₀ 2008	Annual Average - PM _{2.5} 2008	Annual Average - NO 2008	Annual Average - Lead 2008	Annual Average - Acetaldehyde (ppbC) 2008	Annual Average - Acrolein (ppbC) 2008	Annual Average - Benzene (ppbC) 2008	Annual Average - 1,3 Butadiene (ppbC) 2008	Annual Average - Formaldehyde (ppbC) 2008	Approximate Distance (miles) from Proposed Project
481210034	2/16/1998	0.084	NA	NA	0.007	NA	NA	NA	NA	NA	NA	1.77
481211032	4/4/2006	0.080	NA	NA	NA	NA	NA	NA	NA	NA	NA	18.19
48-121-0034-43218-2	2/16/1998	NA	NA	NA	NA	NA	NA	NA	NA	0.066	NA	1.77
48-121-0034-45201-2	2/16/1998	NA	NA	NA	NA	NA	NA	NA	1.097	NA	NA	1.77

TABLE 5-5. 2008 LOCAL MONITOR DATA

Note: EPA Disclaimer regarding the data: "Readers are cautioned not to infer a qualitative ranking order of geographic areas based on AirData reports. Air pollution levels measured in the vicinity of a particular monitoring site may not be representative of the 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."

Of the dozens of air toxics monitored in the Denton County area, only two MSATs (benzene and 1,3 butadiene) were at levels detected by monitors within Denton County during 2008.

3

4 Project Specific MSAT Information

5 Numerous technical shortcomings of emissions and dispersion models and uncertain science with 6 respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this 7 project (see the section below, Unavailable Information for Project Specific MSAT Impact Analysis, for 8 more information). In Chapter 3 of its Regulatory Impact Analysis (RIA) for the 2007 MSAT rules, EPA 9 states that there are a number of additional significant uncertainties associated with the air guality. 10 exposure, and risk modeling. The modeling also has certain key limitations such as: the results are most 11 accurate for large geographic areas, exposure modeling does not fully reflect variation among individuals, 12 and non-inhalation exposure pathways and indoor sources are not taken into account. Chapter 3 of the 13 RIA is found at http://www.epa.gov/otaq/regs/toxics/fr-ria-sections.htm

14

However, it is possible to quantitatively assess the "relative" levels of future MSAT emissions under the proposed project. 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 entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives*, found at:

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

22

23 For each alternative in this EA, the amount of MSATs emitted would be proportional to the VMT assuming 24 that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build 25 Alternative is higher than that for the No-Build Alternative, because the additional capacity increases the 26 efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This 27 increase in VMT would lead to higher MSAT emissions for the Build Alternative along the highway 28 corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The 29 emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; 30 according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for DPM 31 decrease as speed increases. The extent to which these speed-related emissions decreases would 32 offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of 33 technical models.

34

Because the estimated VMT under each of the Alternatives is nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless

of the alternative chosen, emissions would likely be lower than present levels in the design year as a

result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great that MSAT emissions in the study area are likely to be lower in the future in almost all cases.

7 The additional travel lanes contemplated as part of the project alternatives would have the effect of 8 moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative 9 there may be localized areas where ambient concentrations of MSATs could be higher under the Build 10 Alternative than the No-Build Alternative. The localized increases in MSAT concentrations would likely be 11 most pronounced along the expanded roadway sections that would be built along highly developed 12 commercial and residential areas and major intersections, such as the IH 35E at FM 2181 intersection 13 and the IH 35E at US 380 intersection. In sum, when a roadway is widened and, as a result, moves 14 closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher 15 relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in 16 congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel 17 18 regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all 19 cases, will cause region-wide MSAT levels to be substantially lower than today.

20

6

21 MSAT Modeling

TxDOT 2006 Air Quality Guidelines require a project level quantitative MSAT analysis when design year traffic is equal to or greater than 140,000 Average Annual Daily Traffic (AADT). The analysis 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 North Central Texas. These factors do not yet reflect the EPA Final Rules on Control of Hazardous Air Pollutants from Mobile Sources²⁶, that when implemented, will substantially reduce emissions of benzene and other MSATs; the rule became effective on April 27, 2007.

29

The MSAT study area is composed of an "affected transportation network." The IH 35E affected transportation network includes the proposed network links and other transportation model links reflecting a plus or minus five or greater percent change in traffic volume between the Build and No-Build scenarios for the year 2030. 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

²⁶ 72 F.R. 8427 (February 26, 2007) under Title 40 C.F.R. Parts 59, 80, 85 and 86.

transportation networks used in this EA. The plus or minus five percent threshold was adopted as the
basis to determine the affected transportation network study area.

3

Because the 2009 base year scenario represents the existing condition, the affected transportation network for 2009 is composed of those links determined to change plus or minus five or greater percent in 2030 and which currently exist in the 2009 network. The 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 C**, **Figures C-3** and **C-4** for the MSAT affected transportation network maps (years 2009 and 2030, respectively).

10

11 For the purpose of this analysis, three scenarios were modeled:

- 12 "2009 base year" or existing condition in 2009;
- 13 "2030 design year" Build; and
 - "2030 design year" No-Build.
- 14 15
- 16 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 and No-Build scenario. In addition, the base case or existing conditions mass of MSATs was also modeled. The total mass of MSATs in the year 2009 (base case) 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 case and design year are summarized in **Table 5-6** and in **Figures 5-1** and **5-2** below.

24

2000			Percent Difference			
Base	2030 No-Build	2030 Build	2009 to 2030 No-Build	2009 to 2030 Build		
6.71	2.87	3.61	-57	-46		
0.50	0.22	0.29	-55	-43		
23.83	9.40	11.41	-61	-52		
3.13	1.25	1.54	-60	-51		
11.10	5.07	6.50	-54	-41		
18.38	1.83	2.64	-90	-86		
63.65	20.64	25.97	-68	-59		
2,089,060,287	2,302,657,458	2,835,367,884	10	36		
-	Base 6.71 0.50 23.83 3.13 11.10 18.38 63.65 2,089,060,287	Base No-Build 6.71 2.87 0.50 0.22 23.83 9.40 3.13 1.25 11.10 5.07 18.38 1.83 63.65 20.64 2,089,060,287 2,302,657,458	Base No-Build Build 6.71 2.87 3.61 0.50 0.22 0.29 23.83 9.40 11.41 3.13 1.25 1.54 11.10 5.07 6.50 18.38 1.83 2.64 63.65 20.64 25.97 2,089,060,287 2,302,657,458 2,835,367,884	Base No-Build Build No-Build 6.71 2.87 3.61 -57 0.50 0.22 0.29 -55 23.83 9.40 11.41 -61 3.13 1.25 1.54 -60 11.10 5.07 6.50 -54 18.38 1.83 2.64 -90 63.65 20.64 25.97 -68 2,089,060,287 2,302,657,458 2,835,367,884 10		

TABLE 5-6. MSAT EMISSIONS BY SCENARIO (TONS/YEAR)

FIGURE 5-1. PROJECTED CHANGES IN MSAT EMISSIONS BY IH 35E SCENARIO OVER TIME



2 3

4

5 The analysis indicates a decrease in MSAT emissions can be expected for both the Build and No-Build 6 scenarios for the design year of 2030 versus the 2009 base year. Emissions of total MSATs are 7 predicted to decrease by 59 percent in 2030 compared with 2009 levels for the Build scenario.

8

9 Of the six priority MSAT compounds, benzene and DPM contribute the most to the emissions total (see 10 **Table 5-6** and **Figure 5-1**). In future years, a decline in benzene is anticipated (a 52 percent reduction in 11 benzene from 2009 compared to the 2030 Build scenario), and an even larger reduction in DPM 12 emissions is predicted (86 percent decrease from 2009 compared to the 2030 Build scenario). 13

As shown in Figure 5-2, total MSAT emissions plotted over time are predicted to decrease even though
 overall VMT continue to rise.

Source: NCTCOG Data and Civil Associates, Inc. (CAI) Study Team (2009).





4

Source: NCTCOG Data and CAI Study Team (2009).

5 These estimated emission levels are for all MSATs evaluated and are based on the projected total VMT. 6 The reasons for these dramatic improvements are twofold: a change in vehicle fuels, both gasoline and 7 diesel fuel, and a change in emission standards that both light-duty and heavy-duty on-highway motor 8 vehicles must meet. The EPA predicts substantial future air emission reductions as the agency's new 9 light-duty and heavy-duty on-highway fuel and vehicle rules come into effect (Tier 2, light-duty vehicle 10 standard, Heavy-Duty Diesel Vehicle (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 11 realized even with the predicted continued growth in VMT (see EPA's Tier II RIA²⁷ and EPA's HDDV RIA; 12 Regulatory Impact Analysis²⁸). 13

14

15 The proposed IH 35E MSAT analysis estimates the total amounts of the six priority air toxics as shown in

16 **Table 5-6** and **Figure 5-2**.

 ²⁷ U.S. EPA. 1999. Regulatory Impact Analysis. Control of Air Pollution from New Motor Vehicles: Tier II Motor Vehicle Emissions Standards and Gasoline Sulfur Requirements. Engine Programs and Compliance Division, Office of Mobile Sources. Publication No. EPA420-R-99-24 023.
 ²⁸ U.S. EPA. 2001. Final Rule for Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR

^{2°} U.S. EPA. 2001. Final Rule for Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229. March 29, 2001.

1 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 "roadway" air toxics start to drop off at about 100 meters. by 500 meters, most studies have found it very difficult to distinguish roadway-related air toxic levels from background air toxic levels in any given area. An assessment of some potential sensitive receptors within both 100 and 500 meters was conducted.

7

8 Sensitive receptors are defined as schools both public and private, licensed day care facilities, hospitals,
9 and elder care facilities. Twenty-four sensitive receptors were identified (see Tables 5-7 and 5-8 and
10 Appendix C, Figure C-1), of which five are within 100 meters (328 feet) of the proposed project and 19

- 11 are within 500 meters (1,640 feet).
- 12

TABLE 5-7. SENSITIVE RECEPTORS WITHIN 100 AND/OR 500 METERS OF THE PROPOSEDPROJECT

Location	Address	Distance to Centerline meters ¹ (feet)
Presbyterian Hospital of Denton	3000 North IH 35	229 (751)
Baylor Surgicare	350 South IH 35	76 (249)
Winfree Academy Charter School	518 Acme Street	40 (131)
Denton Ballet Academy	637 Londonberry Lane	300 (984)
McMath Middle School	1900 Jason Street	430 (1,411)
The Selwyn Pre-School	3333 W. University Drive	80 (262)
Denton Hospital of Rehabilitation	2620 Scripture Street	500 (1,640)
Carriage House Assisted Living	1357 Bernard Street	187 (614)
Miss Pams Toddler Care	2119 Jacqueline DR	430 (1,411)
Monica Melissa Moreno	1900 Sam Bass Boulevard	355 (1,165)
Amanda Adamez-Daycare	1017 Fannin Street	445 (1,465)
Denton Regional Medical Center	3535 South IH 35	234 (768)
Mayhill Hospital	2809 South Mayhill Road	200 (656)
Seventh Day Adventist Church	2123 Sadau Court	470 (1,542)
Harvest Church	2104 Vintage Drive	500 (1,640)
Cynthia Chavez - Home based day care	3305 Timberview Drive	430 (1,411)
Donna Smith - Home based day care	2204 Knobhill Drive	415 (1,362)
Dora Magana - Home based day care	2913 Brighton Circle	320 (1,050)
Houses of Tykes - Home based day care	3308 Fairview Drive	190 (623)
Lori Atkins - Home based day care	2603 Timberview Drive	480 (1,575)
Marvious A. Gowans - Home based day care	2600 Mountainview Drive	490 (1,608)
Robins Nest Child Care - Home based day care	2407 Forrest Hills	360 (1,181)
Terry's Treehouse Learning Center LLC - Home based day care	5900 South IH 35	60 (197)
Corinth Montessori School	1300 East Pecan Creek Circle	85 (279)
Source: <u>http://www.google.com</u> (March 2009); Field reconnaissan Note: 1. Distance provided is an approximation.	ce (March 2009).	

13

TABLE 5-8. SENSITIVE RECEPTORS BY DISTANCE

	Number of	Receptors within:				
Scenario	100 meters (328 feet)	100 meters (328 feet) and 500 meters (1,640 feet)				
Build	5	19				
Source: http://www.google.com (March 2009); Field reconnaissance (March 2009).						

1 Unavailable Information for Project Specific MSAT Impact Analysis

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

7

8 Information that is Unavailable or Incomplete

9 Evaluating the environmental and health impacts from MSATs on a proposed highway project would 10 involve several key elements, including emissions modeling, dispersion modeling in order to estimate 11 ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate 12 human exposure to the estimated concentrations, and then final determination of health impacts based on 13 the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain 14 science that prevents a more complete determination of the MSAT health impacts of this project.

15

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to 16 17 key variables determining emissions of MSATs in the context of highway projects. While 18 MOBILE6.2 is used to predict emissions at a regional level, it has limited applicability at the 19 project level. MOBILE6.2 is a trip-based model; emission factors are projected based on a typical 20 trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE6.2 does 21 not have the ability to predict emission factors for a specific vehicle operating condition at a 22 specific location at a specific time. Because of this limitation, MOBILE6.2 can only approximate 23 the operating speeds and levels of congestion likely to be present on the largest-scale projects, 24 and cannot adequately capture emissions effects of smaller projects. For particulate matter (PM), 25 the model results are not sensitive to average trip speed, although the other MSAT emission 26 rates do change with changes in trip speed. Also, the emissions rates used in MOBILE6.2 for 27 both PM and MSATs are based on a limited number of tests of mostly older-technology vehicles. 28 Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with 29 MOBILE6.2 as an obstacle to quantitative analysis.

30

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, 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.

35

2. <u>Dispersion</u>. 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.

- 8
- 9 3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of 10 MSATs could be accurately predicted, shortcomings in current techniques for exposure 11 assessment and risk analysis preclude us from reaching meaningful conclusions about project-12 specific health impacts. Exposure assessments are difficult because it is difficult to accurately 13 calculate annual concentrations of MSATs near roadways, and to determine the portion of a year 14 that people are actually exposed to those concentrations at a specific location. These difficulties 15 are magnified for 70-year cancer assessments, particularly because unsupportable assumptions 16 would have to be made regarding changes in travel patterns and vehicle technology (which 17 affects emissions rates) over a 70-year period. There are also considerable uncertainties 18 associated with the existing estimates of toxicity of the various MSATs, because of factors such 19 as low-dose extrapolation and translation of occupational exposure data to the general 20 population. Because of these shortcomings, any calculated difference in health impacts between 21 alternatives is likely to be much smaller than the uncertainties associated with calculating the 22 impacts. Consequently, the results of such assessments would not be useful to decision makers, 23 who would need to weigh this information against other project impacts that are better suited for 24 quantitative analysis.
- 25

26 Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

27 Research into the health impacts of MSATs is ongoing. For different emission types, there are varieties 28 of studies that show that some are statistically associated with adverse health outcomes through 29 epidemiological studies (frequently based on emissions levels found in occupational settings) or that 30 animals demonstrate adverse health outcomes when exposed to large doses.

31

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 <u>http://www.epa.gov/iris</u>. 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 7
- 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.
- 13 **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. DE as reviewed in this document is the combination of DPM and DE organic gases.
 DE also represents chronic respiratory effects, possibly the primary non-cancer 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.
- 23

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

29

Some recent studies have reported that proximity to roadways is related to adverse health outcomes particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project. In the preamble to the 2007 MSAT rule, EPA summarized recent studies with the following statement: "Significant scientific uncertainties remain in our understanding of the relationship between adverse health effects and near-road exposure, including the exposures of greatest concern, the importance of chronic versus acute exposures, the role of fuel type (e.g., diesel or gasoline) and composition (e.g., 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."²⁹

7

8 Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant
9 Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or
10 Research Methods Generally Accepted in the Scientific Community

While available tools do allow us to reasonably predict relative emissions changes between alternatives for this project, the amount of MSAT emissions from the proposed project and MSAT concentrations or exposures created by the proposed project cannot be predicted with enough accuracy to be useful in estimating health impacts. As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects. Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

18

19 In this document, a quantitative analysis of MSAT emissions analysis relative to the various alternatives 20 has been conducted. The analysis indicates that project alternatives may result in increased exposure to 21 MSAT emissions in certain locations, although the concentrations and duration of exposures are 22 uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated. 23 As mentioned previously, Congress directed EPA to reduce MSAT emissions under authority of CAA 24 Section 202(I). EPA has focused efforts on developing a number of regulations specific not only to 25 reducing MSAT emissions, but also to reduce all vehicle emissions. EPA has not developed ambient air 26 standards for MSATs or health effects thresholds for MSATs.

27

28 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 12 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 projectlevel analysis. However, the effects of a major transportation project extend beyond its corridor and an evaluation within the context of an affected transportation network can be accomplished.

²⁹ Control of Hazardous Air Pollutants from Mobile Sources, Volume 73 Federal Register Page 8441 (February 26, 2007).

1 When evaluating the future options for upgrading a transportation corridor, the main mitigating factor in 2 reducing MSAT emissions is the implementation of the EPA's new motor vehicle emission control 3 standards. Decreases in MSAT emissions will be realized through an estimated time of completion for a 4 planned project and its design year some 20 years in the future. Accounting for anticipated increases in 5 VMT and varying degrees of efficiency of vehicle operation, total MSAT emissions in the Build scenario 6 are predicted to decline approximately 59 percent from 2009 to 2030. While benzene emissions are 7 predicted to decline 52 percent in the Build scenario, emissions of DPM are predicted to decline even 8 more (i.e., 86 percent). MSAT emissions decreases from the base year are substantial even with the 9 associated increase in VMT in the travel study area. Some sensitive receptors do exist, but their 10 exposure would decrease from the base year to the design year due to improvements of vehicle 11 technology and fuels.

12

13 The MSATs from mobile sources, especially benzene, have dropped dramatically since 1995, and are 14 The introduction of RFG has lead to a substantial part of this expected to continue dropping. 15 improvement. In addition, Tier 2 automobiles introduced in model year 2004 will continue to help reduce 16 MSATs. DE emissions have been falling since the early 1990s with the passage of the CAA Amendment. 17 The CAA Amendment provided for improvement in diesel fuel through reductions in sulfur and other 18 diesel fuel improvements. In addition, the EPA has further reduced the sulfur level in diesel fuel, effective 19 in 2006. The EPA also has called for dramatic reductions in NO_x emissions and PM from on-road and 20 off-road diesel engines. MSAT emissions related to the proposed IH 35E project are not expected to 21 increase overall air toxics levels in the IH 35E project area in the future years investigated.

22

23 5.2 Community Impact Assessment

24 The following assessment is an evaluation of the potential impacts of the proposed project on the 25 community and its quality of life in relation to such issues as regional and community growth, land use, 26 Section 4(f) and 6(f) properties, economic impacts, relocations and displacements, access, and 27 community cohesion. Limited English Proficiency (LEP) populations, environmental justice (EJ), tolling, 28 public facilities and services, aesthetics, noise, and traffic operations were also evaluated. As previously 29 established, the proposed project is located within the Cities of Corinth and Denton. The City of Lake 30 Dallas and the Town of Hickory Creek are both located near the project corridor. Hickory Creek is located 31 immediately to the south of the project corridor, and Lake Dallas is to the south and east of the project 32 corridor. Appendix A, Figure A-2 shows the city limits of these municipalities.

5.2.1 Regional and Community Growth

3 No-Build Alternative

The No-Build Alternative would not support the projected population growth and planned economic development in Denton County or the municipalities within and near the proposed project area, since no roadway improvements would be implemented. Mobility in the IH 35E corridor would be constrained.

7

8 Build Alternative

9 Extensive coordination occurred between the NCTCOG, Denton County, and the municipalities within and 10 near the proposed project regarding potential future developments. The proposed project has taken into 11 consideration local comprehensive plans and the predicted 2030 demographics and economic 12 developments. The following discussion includes a brief profile of the municipalities within or near the 13 proposed project as well as general business trends, current major planned development, and forecasted 14 population trends for each.

15

16 *City of Corinth*

17 The southern portion of the proposed project (from FM 2181 to just north of Post Oak Drive) is located 18 within the City of Corinth. The City encompasses approximately eight square miles and was incorporated 19 in 1960. The City of Corinth is pro-business and currently has several vacant properties located along the 20 IH 35E corridor zoned for commercial, light industrial, and planned development. In addition, the City has 21 a proactive capital improvement program (CIP) for the maintenance and improvement of its infrastructure; 22 these include improvements to roadways, drainages, water lines, sewers, and utilities. In July 2005, the City of Corinth was ranked 14th as the "Best Places to Live" in the DFW area by D Magazine. In the same 23 24 year, the City was rated the second safest city in Texas by the Federal Bureau of Investigation. The City was also ranked in July 2007 by Forbes as the 30th "fastest growing suburb in the U.S." 25

26

27 City of Denton

28 The largest portion of the proposed project (from just north of Post Oak Drive to US 380) is located within 29 the City of Denton. Established in 1857, the City of Denton serves as the county seat of Denton County 30 and encompasses an area of approximately 62 square miles. The City is home to both TWU and UNT 31 (ranked the third largest university in Texas). City planners site numerous development projects 32 occurring throughout the City, including large mixed-use developments (e.g., Rayzor Ranch and Galatyn 33 Park I and II), commercial developments (e.g., Spencer Square and Centre Place), and residential 34 developments (e.g., Kings Ridge and Ryan Road Estates). In addition, two stations of the proposed 35 DCTA A-Train rail line are planned in the City of Denton, including the Downtown Denton Transit Center 36 and the Medpark Station in south Denton near the Denton Regional Medical Center. Other planning 37 efforts include the City of Denton Economic Development Board's 2009 Economic Development Plan,

designed to increase outreach efforts on an international basis, facilitate the continued development and
 maintenance of available commercial properties and the downtown area, and recruit research-based
 companies for UNT's Discovery Park location.

4

5 City of Lake Dallas and Town of Hickory Creek

6 Both the City of Lake Dallas and Town of Hickory Creek are a part of the "Lake Cities" area, which also 7 includes the Town of Shady Shores and City of Corinth. The City of Lake Dallas has a total area of three 8 square miles and is located to the south and east of the project area. The Town of Hickory Creek 9 encompasses approximately five square miles and is located south of the IH 35E project area. Both 10 communities have experienced increased urbanization over the past few decades, and community 11 leaders are planning ahead for future residential and commercial development resulting from the 12 completion of the new location 1.7-mile LLTB in the summer of 2009. This new east-west NTTA toll 13 bridge across Lewisville Lake would serve as a link between IH 35E in the City of Lake Dallas to the DNT 14 in the City of Frisco. The Lewisville Lake Corridor is 13.8 miles in length and would connect IH 35E at FM 15 2181/Swisher Road in the City of Lake Dallas, span Lewisville Lake via the new toll bridge, continue through the Town of Little Elm along Eldorado Parkway, and intersect the DNT in the City of Frisco. 16 17 There are also planned improvements to FM 2181/Swisher Road in the City of Lake Dallas.

18

19 Regional and Community Population Trends

According to the 2000 Census, the population in the North Central Texas region increased by approximately 1.2 million residents between 1990 and 2000, accounting for nearly one-third of the total population growth in Texas. **Table 5-9** summarizes the population forecasts for Denton County and the municipalities within and near the IH 35E project area.

24

FABLE 5-9. PC	DPULATION TRENDS	FOR DENTON CO	OUNTY AND N		WITHIN AND
	NEAR	THE PROPOSED	PROJECT A	REA	

Location	2000 ¹	2010 Projected	2020 Projected	2030 Projected	Percent Change 2000 to 2030				
Corinth ²	11,365	21,164	23,540	27,070	138				
Denton ²	Denton ² 73,225 108,042 155,700 190,719 160								
Hickory Creek ³	2,005	2,556	2,471	3,996	99				
Lake Dallas ³	6,378	7,330	7,433	9,209	44				
Denton County	428,080	643,572	862,332	1,085,343	154				
Source: NCTCOC	G 2000-2030 Popula	ation Projections for	North Central Texas	s Counties, Cities, a	and Forecast				
Districts (http://www.nctcog.org/ris/demographics/population.asp).									
Notes :									
1. NCTCOG estimate adjusted from 2000 Census count.									
2. Municipalities I	ocated within the pr	oposed project area	1 .						

3. Municipalities located near the proposed project area.

As shown in **Table 5-9**, the estimated percent change in population growth from 2000 to 2030 for the cities within and near the IH 35E project area range from 44 percent to 160 percent. In Denton County, population growth is estimated to be 154 percent.

4

5 The Build Alternative would support the regional and community growth in Denton County and in the IH 6 35E project corridor. Improvements to IH 35E are included in regional, county, and municipal future 7 transportation plans. The proposed project would address the transportation needs in the corridor as well as the transportation needs of Denton County. The proposed improvements are in response to the 8 9 existing roadway's design standard deficiencies causing the inability to accommodate the existing and 10 predicted traffic load resulting from continued growth and development throughout the IH 35E corridor. 11 The proposed reconstruction, which includes the addition and/or improvement of mainlanes, MHOV-C 12 lanes, frontage road lanes, and intersections, would accommodate transportation needs by updating the 13 current facility to meet urban freeway design standards, improving safety, reducing congestion, improving 14 mobility, and increasing goods-carrying capacity.

15

The improved mobility resulting from the proposed project could indirectly attract new development, thereby influencing economic growth for the area as new residents commute within the region. The potential for the proposed improvements result in such indirect impacts is evaluated in **Section 6.0**.

19

20 5.2.2 Land Use

21

22 No-Build Alternative

Under the No-Build Alternative, land use would not be directly affected by the acquisition of land for
 transportation use. In addition, no FPPA or Section 4(f) coordination would be required.

25

26 Build Alternative

27 The proposed project is within the jurisdictions of the Cities of Denton and Corinth. Both cities have 28 active Planning and Development Departments and current zoning ordinances. Zoning protects the rights 29 of property owners while promoting the general welfare of the community. A zoning ordinance can 30 govern private land use and segregate incompatible uses by dividing land into categories according to 31 use, and setting regulations for these categories. The purpose of zoning is to locate particular land uses where they are most appropriate, considering public utilities, road access, and the established 32 33 development pattern. In addition to categorizing land by uses such as residential, commercial, and 34 industrial, a zoning ordinance also specifies such details as building setback lines, the height and bulk of 35 buildings, the size and location of open spaces, and the intensity to which the land may be developed.

Within the City of Denton, the zoned categories of land use directly adjacent to IH 35E include the following: regional and employment center commercial (RCC-N, RCC-D, EC-C), industrial center employment (IC-E), community mixed-use general (CM-G), downtown commercial general (DC-G), neighborhood residential (NR-2, NR-3, and NR-4), neighborhood residential mixed-use (NRMU), regional center residential (RCR-1 and RCR-2), downtown residential (DR-2), and planned development (PD).

6

Within the City of Corinth, the zoned categories of land use directly adjacent to IH 35E include the
following: commercial (C-1 and C-2), industrial (LI-1 and LI-2), single-family residential (S-4), and planned
development (PD-6, PD-7, PD-8, PD-18, PD-21, PD-26, and PD-28). The seven planned development
categories represent various combinations of single-family, multi-family, and commercial development.

11

Land use in the proposed project area is considered 100 percent urban land. Although there are some undeveloped parcels of land within the IH 35E corridor, none is zoned as rural or agricultural land. As described in **Section 5.1.7**, although prime farmland soils are located within the proposed project area, the proposed project is exempt from the requirements of the FPPA and requires no coordination with the NRCS.

17

18 Existing land use would be affected by the conversion of 106.59 acres to transportation use; however,

19 this conversion is not anticipated to substantially change the local and regional land use planning efforts.

- 20 **Table 5-10** shows a breakdown of proposed ROW acquisition by development type.
- 21

TABLE 5-10. PROPOSED ROW ACQUISITION BY DEVELOPMENT TYPE

Development Type	Acres	Percentage of Proposed ROW
Undeveloped Land	54.87	51.47
Developed Residential Land	3.95	3.71
Developed Commercial Land	46.53	43.65
Undeveloped Easement	1.04	0.98
Developed Commercial Easement	0.20	0.19
Total ROW Required	106.59	100.00

22

23 5.2.3 Section 4(f) and 6(f) Properties

24

25 No-Build Alternative

- 26 Implementation of the No-Build Alternative would not impact any Section 4(f) resources.
- 27

28 Build Alternative

29 Section 4(f) refers to the original section within the U.S. Department of Transportation (USDOT) Act of

30 1966, which created the requirement for consideration of park and recreational lands, wildlife and

31 waterfowl refuges, and public and private historic sites in transportation project development. Section 4(f)

1 applies to all projects that receive funding from or require approval by an agency of the USDOT, including 2 the FHWA. Section 4(f) states that the FHWA shall not approve the use of land from a public park. 3 recreation area, wildlife and waterfowl refuge, or public or private historic site unless (1) there is no 4 feasible and prudent alternative and (2) all possible planning to minimize harm from such use has 5 occurred. Section 4(f) is now implemented by FHWA through 23 CFR 774 effective March 12, 2008. 6 Under FHWA's regulations, the "use" of a Section 4(f) resource occurs when:

- 7
- 8
- 1. Land from a Section 4(f) property is permanently acquired for a transportation project;
- 9

2. When there is a temporary occupancy of land that is adverse in terms of the statute's 10 preservation purpose; or

- 11 3. When there is a constructive use of the Section 4(f) property. A constructive use occurs when the 12 transportation project does not physically incorporate land from a Section 4(f) property, but the 13 project's proximity impacts are so severe that the protected activities, features, or attributes that 14 qualify the property for protection under Section 4(f) are substantially impaired.
- 15

16 One public park, Joe Skiles Park, is located adjacent to the proposed project on the west side of IH 35E 17 at Pennsylvania Street. This City of Denton urban park has an area of approximately 6.0 acres, and the 18 majority of the park area is open space (see aerial photograph in Appendix C, Figure C-19 and 19 **Appendix A, Figure A-7**). Major amenities at the park include tennis courts, playground equipment, 20 picnic areas, and ball fields. The park is surrounded on three sides by residential streets and 21 neighborhoods that are adjacent to the southbound frontage road of IH 35E.

22

23 Based on the noise analysis (see Section 5.2.13), Joe Skiles Park has existing noise levels ranging from 24 68 to 69 dB(A) Leg due to existing traffic on IH 35E. The predicted future noise level at the park with the 25 proposed project in place is 72 dB(A) Leg, an increase of 3 to 4 dB(A) Leg. Noise walls are proposed in 26 this area for the residential neighborhoods and park (see Appendix C, Figure C-20). Because the 27 proposed noise walls would be located between the mainlanes and the frontage road, access to the park 28 would remain unchanged; that is, access would be provided from the southbound frontage road and 29 adjacent residential streets.

30

31 The proposed project would not require ROW acquisition at the park, would not change accessibility to 32 the park, would not impair aesthetic features or attributes of park, and would not substantially impair the 33 park's activities, features, or attributes; therefore, consideration under Section 4(f) for this property is not 34 required.

35 Gibson Circle is a triangular shaped parcel of land located west of IH 35E at Kendolph Street. The 36 proposed project would require ROW from this parcel. The parcel has an approximate total area of 0.43 acres and is considered to be City of Denton ROW. The City of Denton performs routine maintenance on
the parcel, which consists of Bermuda and other grasses, several trees, shrubs, and tree plantings.
Previous public involvement indicated that citizens in the area used the parcel for passive recreational
activities. In 2006, a review of deeds and correspondence by FHWA concluded with the determination
that Section 4(f) does not apply to Gibson Circle.

6

7 Section 4(f) Summary

8 In sum, the proposed project would not require the use of nor substantially impair the purposes of any 9 publicly owned land from a public park, recreation area, wildlife/waterfowl refuge, or any historic sites of 10 national, state, or local significance. Therefore, a Section 4(f) evaluation would not be required for the 11 proposed project.

12

13 Section 6(f) Properties

14 Section 6(f) of the Land and Water Conservation Fund (LWCF) Act (16 U.S.C. 460L) requires that 15 outdoor recreational facilities acquired or developed with Department of Interior financial assistance under

16 the LWCF may not be converted to non-recreational use unless approval is granted by the National Park

- 17 Service. LWCF grant funds are administered by the TPWD through the Texas Recreation Park Account.
- 18

19 Implementation of the proposed project would not require ROW from any park or recreation area.20 Therefore, consideration under Section 6(f) is not required.

21

22 5.2.4 Economic Impacts

23

24 No-Build Alternative

Implementation of the No-Build Alternative would not provide adequate mobility to support traffic associated with the projected employment growth in the IH 35E project area and Denton County.

27

28 Build Alternative

This section presents information regarding employment trends in Denton County and the municipalities within and near the proposed project area. Employment forecasts reported in this section were prepared and approved by NCTCOG, and represent the North Central Texas region's adopted employment forecasts for transportation planning purposes As summarized in **Table 5-11**, NCTCOG employment forecast data indicate that employment in Denton County and the municipalities within and near the proposed project area is anticipated to grow through 2030.

TABLE 5-11.	EMPLOYMENT	TRENDS FOR	R DENTON	COUNTY	AND MU	JNICIPAL	ITIES WITHIN
	AND	NEAR THE PI	ROPOSED	PROJECT			

Location	2000	2010 Projected	2020 Projected	2030 Projected	Percent Change 2000 to 2030
Corinth ¹	2,213	2,939	3,202	3,225	46
Denton ¹	58,581	67,857	83,082	107,572	84
Hickory Creek ²	494	1,005	1,115	1,115	126
Lake Dallas ²	1,683	2,168	2,383	2,384	42
Denton County	152,818	228,191	323,082	413,453	171
Source: NCTCOG Interactive Query of Employment Estimates Data					
(http://www.nctcog.org/ris/demographics/employment.asp).					
Notes:					
1. Municipalities located within the proposed project area.					
2. Municipalities located near the proposed project area.					

2 As shown in Table 5-11, the projected 2000 to 2030 employment growth rates for the cities within and 3 near the IH 35E project area range from 42 percent to 126 percent, and the employment growth rate for 4 Denton County is projected to be 171 percent. Based on the employment growth data shown above, 5 employment growth within the vicinity of this project and Denton County are expected to continue.

6

7 The model used by the NCTCOG for the employment forecasts shown in Table 5-11 is formulated to 8 permit the integration of relevant global, national, state, and local factors into the projection process. The 9 model accounts for the cyclical nature of employment changes including economic downturns such as the 10 current one. While the model cannot predict exactly when economic downturns will occur, the projections 11 shown in Table 5-11 are long term. Over time, the job losses incurred in the current recession would be 12 regained.

13

14 Major employers are defined by NCTCOG as those companies that employ over 250 people. According 15 to NCTCOG data, there are 26 major employers in the cities within and near the IH 35E project area. The major employers combined employ 22,748 people. None of these major employers would be impacted 16 17 by ROW acquisition (see Section 5.2.5, below).

18

19 The Build Alternative would provide a portion of the additional mobility necessary to support the 20 increasing traffic associated with the projected employment growth in the IH 35E project area.

21

22 5.2.5 **Relocations and Displacements**

23 This section describes the potential relocation and displacement impacts for the No-Build Alternative and 24 Build Alternative. Displacements were determined from project mapping and aerial photography with 25 alignment overlays. Impacts were confirmed through field inspections in the IH 35E project area.

1 No-Build Alternative

2 Implementation of the No-Build Alternative would not require ROW acquisition, relocations, or 3 displacements.

4

5 Build Alternative

6 Of the 106.59 acres of proposed ROW acquisition required for the Build Alternative, approximately 48 7 percent (50.8 acres) is developed land. **Table 5-12** provides descriptions of the potentially displaced 8 properties, property addresses, and the number of potentially impacted structures and employees, if 9 applicable. The location of each potentially displaced building is shown in **Appendix A, Figure A-6,** 10 where each displacement is identified as either residential or commercial and labeled by its 11 corresponding ID number, listed in **Table 5-12**.

12

Number of Potentially Schematic Type of Structures **Property Description Property Address** Impacted Displaced ID Employees¹ NA = not applicable City of Corinth 1 Commercial Building 6281 South Stemmons 98 Chevron Service Station 1-4* Expressway (IH 35E) 1 Gas Canopy 5855 South Stemmons **GEICO** Insurance 117 1 Commercial Building 5-9 Expressway 129 McClain's RV SuperStore 5601 IH 35E 1 Commercial Building 50-99 City of Denton Palm Harbor Movable 2 Commercial 136 5451 South Stemmons Buildings Housing Unit and Office 1-4 Expressway 1 Commercial Building 137 Palm Harbor Housing Unit Eckert Hyundai Office, 2 Commercial 3811A IH 35E 178 10-19 Garage/Shop Buildings Texaco Service Station 180 3809 South IH 35E 1 Commercial Building NA (Closed) 1 Commercial Building Exxon Service Station 3628 South IH 35E 5-9 186 1 Gas Canopy Shogun Steakhouse and 10-19 188 3606 South IH 35E 1 Commercial Building Sushi Bar Mayhill Donuts 1-4 Mi Casita Mexican 2221 South IH 35E 244 1 Commercial Building 10-19 Restaurant 247 Wendy's Restaurant 2213 South IH 35E 1 Commercial Building 10-19 1851 South IH 35E 1 Commercial Building 285 Bank of America 10-19 Cycle Center of Denton Retail 317 516 South IH 35E 1 Commercial Building 10-19 Store 323 Hooters Restaurant 985 South IH 35E 1 Commercial Building 50-99 329 Applebee's Restaurant 707 South IH 35E 1 Commercial Building 50-99 1 Commercial Building Blockbuster/Game Rush 330 721 South IH 35E 10-19 (partial) 1 Gas Canopy 331 7-Eleven 1608-1610 Teasley Lane 5-9 2 Residential 336 **Ridgecrest Apartment Units** 1300 Dallas Drive NA

TABLE 5-12. POTENTIAL DISPLACEMENTS WITHIN THE PROPOSED PROJECT AREA

Buildings

Schematic ID	Property Description	Property Address	Type of Structures Displaced	Number of Potentially Impacted Employees ¹ NA = not applicable
350	Bankers Liquidation Outlet (Car Sales)	515 IH 35E	1 Commercial Building 1 Gas Canopy	1-4
351	Johnny Joe's Service Station	915 Fort Worth Drive	1 Gas Canopy	1-4
360	U-Store-It Self Storage Units	201 South IH 35E	9 Commercial Storage Units (partial)	1-4
361	Roy Riney Insurance Meridian Bank of Texas	1600 Meadow Drive	2 Commercial Buildings	<u>1-4</u> 5-9
362	Service Station (Closed)	220 North IH 35E	1 Gas Canopy	NA
368	Ramey King Insurance	510 North IH 35E	1 Commercial Building	10-19
369	Taco Bueno Restaurant	735 Fort Worth Drive	1 Commercial Building	20-49
370	Quick Track Service Station	1724 Bernard Street	1 Gas Canopy	10-19
	Valero Service Station			1-4*
074	ZB Eagle Partners LTD		2 Commercial	1-4
374	Liberty Tax Service	718 Fort Worth Drive	Buildings	1-4
	Lightning Bear Studios		1 Gas Canopy	1-4
376	Desert Sands Motor Inn, Club	611 North IH 35E	2 Commercial Buildings (1 stand alone and a portion of a complex)	1-4
384	Denton Baptist Temple Youth Center	North IH 35E at Bernard Street	1 Commercial Building	1-4
386	Single-Family Residential	1105 Lindsey Street	1 Residential Building	NA
387	Single-Family Residential	1608 Bernard Street	1 Residential Building	NA
392	Single-Family Residential	702 North Stemmons Expressway	1 Residential Building	NA
394	Single-Family Residential	1101 Lindsey Street	1 Residential Building	NA
395	Single-Family Residential	1201 Lindsey Street	1 Residential Building	NA
398	Single-Family Residential	909 Lindsey Street	1 Residential Building	NA
399	Single-Family Residential	903 Lindsey Street	1 Residential Building	NA
400	Single-Family Residential	901 Lindsey Street	1 Residential Building	NA
403	Single-Family Residential	1202 Lindsey Street	1 Residential Building	NA
408	Single-Family Residential	1206 Lindsey Street	1 Residential Building	NA
409	Baker Distributing Company	800 North IH 35E	1 Commercial Building	1-4
432	Single-Family Residential	1501 McCormick Street	1 Residential Building	NA
436	Single-Family Residential	1502 McCormick Street	1 Residential Building	NA
438	Fina Service Station	1103 North IH 35E at McCormick (SEC)	1 Commercial Building 1 Gas Canopy	1-4*
440	Comfort Suites	1100 North IH 35E	1 Commercial Building	10-19
451	Shell/7-Eleven Service Station	1223 McCormick Street	1 Gas Canopy	5-9
457	Phillips 66 Service Station	1200 North IH 35E	1 Commercial Building 1 Gas Canopy	1-4*
458	Closed/Abandoned Property	1207 Knight Street	1 Commercial Building (canopy not included)	NA
465	Taqueria El Picante	1305 North IH 35E	2 Commercial Buildings	10-19
466	Royal Inn & Suites	1210 North IH 35E	1 Commercial Building	5-9
470	Single-Family Residential	1201 South Avenue C	1 Residential Building	NA
472	Taco Cabana Restaurant	1210 North IH 35E	1 Commercial Building	20-49
475	Single-Family Residential	1200 South Avenue C	1 Residential Building	NA
484	Single-Family Residential	1114 Kendolph Drive	1 Residential Building	NA
485	Single-Family Residential	1125 North Texas Boulevard	1 Residential Building	NA
494	McDonald's Restaurant	1600 North IH 35E	1 Commercial Building	20-49

Schematic ID	Property Description	Property Address	Type of Structures Displaced	Number of Potentially Impacted Employees ¹ NA = not applicable
496	Exxon Service Station	1011 North Texas Boulevard	1 Commercial Building	5-9
545	Chevron Service Station	3000 University Drive at IH 35E	1 Gas Canopy	1-4
		TOTAL	78	372-784

Notes:

1. Source: InfoUSA, accessed July 2010 and provided by NCTCOG.

* The exact business listing was unavailable on InfoUSA; employment data for another branch location or a similar type of business were used.

1

As shown in **Table 5-12**, 57 properties would be affected by the proposed ROW acquisition. Of these 57 properties, 17 are residential and 40 are commercial. These properties contain 78 structures, consisting of 16 single-family residences, two apartment buildings with eight apartment units each, and 60 commercial structures (including buildings and canopies at gasoline service stations) that would be displaced by the proposed project.

7

8 Residential Displacements

9 All of the potential residential displacements are located in the City of Denton. The 2008 assessed values

- 10 of these potentially displaced single-family homes range from \$26,000 to \$115,435.³⁰ The single-family
- 11 homes are broken out by assessed value as follows:
- 12 \$20,000 to \$40,000 two homes
- 13 \$40,000 to \$60,000 seven homes
- \$60,000 to \$80,000 four homes
- 15 \$100,000 to \$120,000 three homes
- 16

17 A search of homes for sale that range in price from \$20,000 to \$150,000 in the cities of Corinth, Denton,

18 Hickory Creek, and Lake Dallas was conducted using five local residential real estate websites. The 19 search results are shown in **Table 5-13**.

³⁰ Denton Central Appraisal District (DCAD) 2008 certified data.
1

Residential Real Estate		City							
	Websites	Corinth	Denton	Hickory Creek	Lake Dallas	Total			
	\$20,000-\$40,000	8	1	0	0	9			
ε	\$40,000-\$60,000	1	2	0	0	3			
00	\$60,000-\$80,000	1	8	0	0	9			
MIs.	\$80,000-\$100,000	2	31	0	5	38			
	\$100,000-\$120,000	2	44	1	2	49			
	\$120,000-\$150,000	20	98	0	1	119			
	\$20,000-\$40,000	0	3	0	0	3			
ate	\$40,000-\$60,000	0	3	0	0	3			
sta o.c	\$60,000-\$80,000	0	16	0	0	16			
ale	\$80,000-\$100,000	0	35	0	6	41			
yal Be	\$100,000-\$120,000	4	62	2	4	72			
	\$120,000-\$150,000	42	136	2	8	188			
	\$20,000-\$40,000	0	1	0	0	1			
ate	\$40,000-\$60,000	1	6	0	0	7			
st:	\$60,000-\$80,000	1	9	0	0	10			
ale	\$80,000-\$100,000	3	35	5	5	48			
Re	\$100,000-\$120,000	9	42	3	3	57			
	\$120,000-\$150,000	63	120	1	1	185			
_	\$20,000-\$40,000	1	1	0	0	2			
mo	\$40,000-\$60,000	0	12	0	0	12			
a.c	\$60,000-\$80,000	3	28	1	0	32			
il.	\$80,000-\$100,000	4	48	0	0	52			
μ	\$100,000-\$120,000	9	59	3	0	71			
	\$120,000-\$150,000	51	119	2	0	172			
ŋ	\$20,000-\$40,000	0	1	0	0	1			
-i-	\$40,000-\$60,000	1	5	0	0	6			
nt	\$60,000-\$80,000	1	9	0	0	10			
hL	\$80,000-\$100,000	2	31	0	5	38			
) Sr	\$100,000-\$120,000	2	41	1	2	46			
p P	\$120,000-\$150,000	20	92	0	1	113			
-	\$40,000-\$60,000	1	5	0	0	6			

TABLE 5-13. NUMBER OF SINGLE-FAMILY RESIDENTIAL HOMES AVAILABLE FROM \$20,000 TO\$150,000*

Note: * As of November 2009.

2

As shown in **Table 5-13**, there appears to be ample single-family homes available for sale in the City of Denton to replace those homes impacted by the proposed project. In addition, there are homes available in the Cities of Corinth, Hickory Creek, and Lake Dallas. It should be noted that while adequate replacement housing appears to be available, there is the potential that displacees might not be able to relocate near their previous residences.

8

9 All of the potentially displaced single-family homes are located within Census blocks whose reporting
10 populations had a higher percentage of renter-occupied homes compared to owner-occupied homes.
11 There is the potential that tenants reside in some of the displaced homes. In 2007, the City of Denton

reported a rental vacancy rate of 7.0 percent and a median monthly rent of \$758.³¹ Moreover, as of November 2009, 11 homes in the City of Denton are available for rent within the price range of \$500 to \$1,000 per month, varying in size from one bedroom/one bath to three bedroom/two bath.³² It should benoted that while adequate replacement rental housing appears to be available, there is the potential that tenants might not be able to relocate near their previous rental properties.

6

7 The two potentially displaced apartment buildings containing eight apartment units each are a part of the 8 Ridgecrest Apartments. The average monthly rent payments for one and two-bedroom units in the 9 displaced apartment buildings are \$678 per month and \$839 per month, respectively. Coordination with 10 the Ridgecrest Apartments indicated that as of November 2009, five one-bedroom and six two-bedroom 11 apartments were available in other buildings at the complex. Ridgecrest Apartments does not accept 12 Section 8/Housing Choice Vouchers.

13

A search of an internet apartment locater website³³ indicated that there are approximately 17 apartment complexes within a two-mile radius of the Ridgecrest Apartments that rent one-bedroom apartments ranging from \$525 to \$825 per month and 11 apartment complexes that rent two-bedroom apartments ranging from \$600 to \$1,300 per month. There are also numerous other apartment complexes in Denton outside a two-mile radius of the Ridgecrest Apartments.

19

20 Based on the above information, it appears that the potentially displaced households would be able to 21 relocate within their own community. TxDOT would work with the property owners and tenants of the 22 displaced structures to relocate to comparable housing in the immediate area. Acquisition and relocation 23 assistance would be in accordance with the TxDOT Right-of-Way Acquisitions and Relocation Assistance Program. Consistent with the USDOT policy, as mandated by the Uniform Relocation Assistance and 24 25 Real Properties Acquisitions Act (as amended in 1987), the Civil Rights Act of 1964, and the Urban 26 Development Act of 1974, TxDOT would provide relocation resources (including any applicable special 27 provisions or programs) to all displaced persons without discrimination. The available structures must be 28 open to persons regardless of race, color, religion, or nationality and be within the financial means of 29 those individuals affected.

30

TxDOT must provide a comparable replacement dwelling that places the displacee in the same ownership or tenancy status possessed before displacement. TxDOT's obligation is fulfilled when a comparable replacement dwelling is made available to the displacee in compliance with provisions for last resort housing. At the request of the displacee, TxDOT may provide a dwelling which changes the

³¹U.S. Census Bureau, 2007 American Community Survey, as detailed in the April 2009 *Statistical Trends and News* of *Denton (STAND)* report, City of Denton Economic Development Partnership.

³² www.realtor.com

³³ www.apartmentratings.com

ownership or tenancy status of the displacee if the dwelling is available and can be provided at a cost which would not exceed the amount required to relocate the displacee to a comparable dwelling in the same ownership or tenancy status possessed before displacement. Replacement housing on a reasonable cost basis would be provided by TxDOT when it is determined that comparable replacement housing cannot be made available under normal conditions and cost limitations. Any decision to provide last resort housing assistance would be adequately justified by one of the following criteria.

- 7
- 8 On an individual basis, for good cause, which means that appropriate consideration would be • 9 given to: 10 • the availability of comparable replacement housing in the project area; 11 the resources available to provide comparable housing; and 0 the individual circumstances of the displacee. 12 0 13 14 by a determination that: 15 o there is little, if any, comparable replacement housing available to the displace within an 16 entire project area and last resort housing is necessary for the entire area; 17 a project cannot proceed to completion in a timely manner without last resort housing 18 assistance: and 19 o the method selected for providing last resort housing assistance is cost effective, considering 20 all elements contributing to total project costs. 21 22 **Business Displacements** 23 The proposed project is anticipated to displace commercial properties located adjacent to IH 35E. As 24 shown in Table 5-12, of the 57 properties affected by the proposed ROW acquisition, 40 are commercial 25 (with 60 impacted structures). Because three of the 40 commercial properties house multiple business 26 establishments, there are a total of 44 businesses associated with the 40 properties anticipated to be 27 affected by the proposed project. Of these 44 businesses, all are located in the City of Denton, except for 28 three (a service/gas station, an insurance company, and a recreational vehicle dealership) that are 29 located in the City of Corinth. The 44 potentially displaced businesses include the following: 30 • 11 service stations; 31 Five sit-down restaurants; • 32 Five drive-through/sit-down restaurants; • 33 Four vehicle sale centers (two small car dealerships, a recreational vehicle superstore, and a • 34 motorcycle dealership); 35 Three hotels/motels; • 36 Three insurance companies; •
- Three closed/abandoned properties (two service stations and one auto-service center);

1 • Two banks; and

- One trust company, one tax service, one media production company, one self-storage facility,
 one youth-oriented center, one moveable housing company, one video/video game rental store,
 and one air conditioning/refrigeration sales and distributor.
- 5

A site visit traveling the project corridor on April 27, 2010 revealed that two businesses located in the City of Denton have already relocated to nearby locations prior to ROW acquisition and without TxDOT assistance. These relocated businesses include two retail establishments: a car dealership (i.e., Eckert Hyundai) and a motorcycle retail center (i.e., Cycle Center of Denton). Of additional note, three of the potentially displaced commercial properties have been closed and no longer operate as a functioning business.

12

13 <u>Potential Relocation Sites for Commercial Displacements</u>

Searches were conducted to find suitable replacements for those commercial properties impacted by the proposed project. The Corinth and Denton Economic Development Corporation websites were reviewed to identify suitable commercial replacement properties in the project area. Acreages of vacant properties within a one-mile radius of the proposed project in the City of Denton (where the majority of potentially affected commercial properties are located) were quantified by zoning classification. Commercial properties for sale in the Cities of Corinth and Denton were also identified using a real estate website.³⁴ The search results are described as follows:

- 21
- *City of Corinth* A July 2010 search of the Corinth Economic Development Corporation website³⁵ 22 listed 28 properties available. Most of these properties are shown on a map on the website. 23 24 Twenty-three of these properties are undeveloped land zoned for commercial, light industrial, and 25 residential use. Lot size varies from 0.33 acre to 25 acres; however, one property was 50 plus acres. This property is adjacent to IH 35E and is easily accessible via Corinth Parkway. New 26 27 development on this site would benefit from high visibility by passers-by and convenient access to 28 and from the interstate. The five remaining properties are developed and include a former Cattle 29 Company of Texas Steakhouse (burned down) property, storage structures (formerly Corinth Mini Storage), a former Boeing special use campus (52 acres with 59,984 square feet of office space 30 31 and extensive parking), an auto repair facility (formerly Clardy's), and land with an existing 32 structure.
- 33
- Correspondence with the Corinth Economic Development Corporation revealed that the City of Corinth is planning for increased commercial development along the IH 35E corridor where
 - ³⁴ www.loopnet.com

³⁵ www.corinthedc.com

existing tracts of land are vacant. The Corinth Economic Development Corporation reported that
 there are substantial raw land sites of various sizes along the IH 35E corridor through Corinth and
 that they can assist any business impacted by loss of property resulting from the proposed project
 in finding suitable/better locations near their existing property.

A July 2010 search of an internet real estate website³⁶ indicated that approximately 29 commercial properties are for sale in Corinth.

7 8

24

35

5

6

9 City of Denton – A July 2010 search of the Denton Economic Development Corporation website revealed 59 properties or approximately 90 spaces available within a one-mile radius of the 10 proposed project.³⁷ Of these 59 properties, 14 are undeveloped land or pad properties. These 11 properties are zoned for retail, commercial, office, residential, or industrial use and range in size 12 13 from 0.14 to 11 acres; however, one of these properties is 44 acres. This property is the Elk 14 Springs mixed-use development area located just north of the Unicorn Lake mixed-use 15 development area and adjacent to IH 35E. The proposed site plan includes office, retail, and 16 commercial sites that would provide additional available spaces and could serve as good 17 relocation options for displaced businesses. In addition to these properties, there are six pad properties located at the corner of Teasley Lane and Robinson Road, zoned to allow for drive-18 19 thru lanes. These properties could serve as potential relocation options for displaced fast-20 food/drive-thru establishments. One pad property is located at the Unicorn Lake mixed-use 21 development area, and there is also one property in Market Square at Unicorn Lake suitable for 22 Developed properties available include professional office buildings, retail sites, retail use. 23 healthcare buildings, a car wash, and industrial warehouses.

25 The City of Denton's Zoning Districts Map (October 2009) was overlaid onto a 2008 aerial 26 photograph of the project area to determine the zoning classifications of undeveloped lands within 27 a one-mile radius of the proposed project that might serve as suitable replacements for those 28 commercial properties impacted by the proposed project. The Zoning Districts Map contains 26 29 Zoning Districts, 15 of which fall within the one-mile radius. The impacted commercial properties 30 were categorized by business type, based upon the Zoning Districts described in the City of Denton's Development Code (updated May 2009). The amount of vacant land potentially 31 32 available for each business type includes the following:

- 33 o Hotels 699 acres
- 34 o Motels 418 acres
 - Retail Sales and Service 1,281 acres

³⁶ www.loopnet.com

³⁷ www.dentonsites.com

- 1 Restaurant - 852 acres 0 2 Drive-through Facility - 1,102 acres 0 3 Professional Services & Offices - 1,281 acres 0 4 Quick Vehicle Servicing – 1,102 acres 0 Vehicle Repair - 1,033 acres 5 0 6 Auto and RV Sales - 957 acres 0 7 Broadcasting or Production Studio - 1,255 acres 0 8 Heavy Manufacturing - 403 acres 0 9 Self-service Storage – 743 acres 0 10 Houses of Worship – 1,557 acres 0
- 11

12 Note that each business type might fall under more than one Zoning District; that is, the sum of 13 the above listed acreages is not equal to the total amount of vacant land available within one-mile 14 of the proposed project, which is approximately 1,557 acres. Houses of worship are the only 15 subcategory that that can be developed in all 15 Zoning Districts found within the area of focus.

16

A July 2010 search of an internet real estate website³⁸ indicated that 165 commercial properties 17 18 are for sale in Denton (including a former car dealership and a gas station). Among them is the 19 14-acre Denton Plaza property, which was the location of a former Home Depot. This property is 20 near IH 35E between Fort Worth Drive and Locust Street in close proximity to UNT and the 21 Denton Central Business District. Located off US 380 on Fulton Street is a free standing building 22 currently operating as a daycare, but was originally built/operated as a restaurant. This property 23 is in close proximity to TWU and the Denton Community Hospital. In addition, there are approximately 30 properties containing warehouses potentially suitable for light industrial and 24 25 light manufacturing uses.

26

27 Both the United States and Texas Constitutions provide that no private land may be taken for public 28 purposes without just compensation being paid. As previously described, the TxDOT Right-of-Way 29 Acquisition and Relocation Assistance Program would be conducted in accordance with the Uniform 30 Relocation Assistance and Real Property Acquisition Policy Act of 1970 as amended, with the Civil Rights 31 Act of 1964 and with the Urban Development Act of 1974. Relocation assistance is available to all 32 individuals, families, businesses, farmers, and non-profit organizations displaced as a result of a state 33 highway project or other transportation project. Thus, assistance applies to tenants as well as owners 34 occupying the real property needed for the project. TxDOT would relocate all displaced businesses up to 35 50 miles. The TxDOT relocation office would also provide assistance to displaced businesses and non-36 profit organizations to aid in their satisfactory relocation with a minimum of delay and loss in earnings.

³⁸ www.loopnet.com

1 The available structures must also be open to persons regardless of race, color, religion, or nationality 2 and be within the financial means of those individuals affected. No special relocation considerations or 3 measures to resolve relocation concerns associated with the proposed reconstruction of the proposed 4 project have been identified to date by the TxDOT ROW acquisition staff.

5

6 While the TxDOT Right-of-Way Acquisition and Relocation Assistance Program assists with the 7 relocations of businesses, there are no provisions to assist employees should their employment 8 opportunities be compromised or impacted during the relocation process. Ultimately, the TxDOT Right-of-9 Way Acquisition and Relocation Assistance Program is not considered mitigation for anticipated 10 employment impacts, but rather an entitlement because compensation for resource relocation is provided 11 regardless of impact magnitude. Potential impacts to employees resulting from the displacement of their 12 associated place of employment is discussed below.

13

Establishing the context within which the above business displacements would occur is necessary for assessing the totality of potential impacts to not only the employers, but also their respective employees.

As previously established, three businesses would potentially be displaced within the City of Corinth. The 16 City of Corinth encompasses approximately 4,300 acres and identifies itself as a "city in the country."³⁹ 17 18 Comparatively, the City of Denton, within which 41 businesses could potentially be displaced, is much 19 larger, spanning an area of at least 45,500 acres and having large areas of extraterritorial jurisdiction 20 (ETJ) available for future annexation. As detailed in Table 2-3, both the Cities of Corinth and Denton are 21 anticipated to increase in population (138 percent increase and 160 percent increase, respectively) from 22 2000 to 2030. In addition, NCTCOG employment forecasts (see Table 5-11) predict continued 23 employment growth within the Cities of Corinth and Denton from 2000 to 2030 (46 percent increase and 24 84 percent increase, respectively); and these forecasts generally account for the cyclical nature of 25 employment change, including economic recession (see Section 5.2.4).

26

27 Two state universities, UNT and TWU are located within the City of Denton. Both UNT and TWU 28 areconsidered major employers, employing over 7,500 and 1,500 individuals respectively. Both 29 universities are tightly connected with the City of Denton and its residents, fostering a university 30 community-like feel throughout the City. Many of the retail, restaurant, fast-food, and service 31 establishments (e.g., hotel/motel) within the City of Denton are somewhat dependent upon a strong 32 student, faculty, and staff presence at the universities, including several of the business establishments 33 potentially displaced by the proposed project. Founded in 1890, UNT is located immediately adjacent to 34 the proposed project and is the larger of the two universities, currently encompassing 875 acres in the 35 City of Denton. Total enrollment (undergraduate and graduate) at UNT in 2005 was over 32,000 students

³⁹ City of Corinth. http://cityofcorinth.com/

and is anticipated to increase to over 37,000 by the year 2013.⁴⁰ UNT is continually developing and redeveloping its campus in order to accommodate such enrollment growth, including the construction of a new football stadium and athletic complex on the Eagle Point Campus (adjacent to IH 35E). Although catering to a smaller group of students, TWU has experienced continued increasing enrollment numbers, citing a 19 percent increase in enrollment between 2005 (9,157 students) and 2009 (10,877 students); and this upward growth trend in enrollment is anticipated to continue over the upcoming years.⁴¹

7

8 Labor Force

9

10 • Potentially Impacted Employees

11 Estimating the number of potentially impacted employees is a difficult task because no local agencies or 12 organizations such as municipalities, chambers of commerce, or workforce commissions consistently 13 track employment numbers per employer. Employment statistics likely fluctuate in varying degrees per 14 business due to various economic elements such as turnover rates, regional growth, unemployment 15 trends, etc. Because of the unavailability of locally produced employment information, NCTCOG provided 16 employee data via InfoUSA to assist with the estimation of potentially impacted employees at displaced 17 businesses. Table 5-12 lists the potential number of impacted employees for each anticipated displaced business. Wage information cannot be provided as data at this level of detail is not available for public 18 19 use.

20

As shown in **Table 5-12**, a total range of 372 to 784 employees could be potentially affected by the proposed project, either by job relocation or job loss associated with 44 anticipated business displacements. Of these 372 to 784 potential employee impacts, approximately 15% percent (56 to 112 impacted employees) are associated with the City of Corinth and 85% percent (316 to 672 impacted employees) are associated with the City of Denton.

26

27 • Composition of Labor Force Potentially Effected

The range in labor force anticipated to be impacted by the proposed project ranges from low skill level, minimally educated, minimum wage hourly workers (e.g., retail, fast-food/restaurant, and services occupations) to high skill level, salaried workers with advanced educations (e.g., tax services, insurance, and specialized services occupations). Because no federal, state, or local agencies (e.g., U.S. Department of Labor, Bureau of Labor Statistics, Texas Workforce Commission, municipalities, chambers of commerce, or other employment-focused organizations) track specific skill level, educational attainment, experience requirements, or wage information for specific business entities, assumptions

⁴⁰ UNT Five-Year Strategic Plan (2008 – 2013), http://vpaa.unt.edu/strategicplan0813/StrategicPlan0813.pdf

⁴¹ http://www.twu.edu/downloads/ir/DenEnrlComp.pdf

1 must be established to provide the context of the range of labor force found adjacent to the IH 35E project 2 corridor spanning from FM 2181 to US 380.

3

4 According to the Bureau of Labor Statistics (BLS), roughly three out of five wage and salary workers were 5 paid hourly rates in 2002. Minimum wage workers tend to be young. About half of workers earning the 6 minimum wage in 2002 (\$5.15) were under the age of 25, and slightly more than one-fourth were 7 teenagers (ages 16 to 19). One out of every five food service workers earned less than minimum wage in 8 2002 and three-fifths of all low wage workers were employed in retail trade; however for many working in these two industries, tips and commissions might supplement the hourly wages received.⁴² 9

10

11 The BLS reported in April 2010 that the median weekly earnings of the nation's 96.8 million full-time wage 12 and salary workers was \$754 in the first quarter of 2010. This was 2.2 percent higher than a year earlier, 13 compared with a gain of 2.4 percent in the Consumer Price Index for all urban consumers over the same 14 period. As shown in Figure 5-3, among the major occupational groups, persons employed full time in 15 management, professional, and related occupations had the highest median weekly earnings (i.e., 16 \$1.068) and persons employed in service occupations had the least (i.e., \$476).

17 18

19

FIGURE 5-3. MEDIAN USUAL WEEKLY EARNINGS OF FULL-TIME WAGE AND SALARY WORKERS BY OCCUPATION. FIRST QUARTER 2010



20 21 22

Source: Bureau of Labor Statistics, News Release USDL-10-0468, April 15, 2010.

⁴² Haugen, Steven E. September 2003. "Characteristics of Minimum Wage Workers in 2002." Monthly Labor Review, http://www.bls.gov

As shown in **Figure 5-4**, by educational attainment, full-time workers age 25 and over without a high school diploma had median weekly earnings of \$448, compared to \$624 for high school graduates (no college), and \$1,140 for those holding at bachelor's degree or higher.

- 4
- 5
- 6





7 8

Source: Bureau of Labor Statistics, News Release USDL-10-0468, April 15, 2010.

9

10 Figure 5-5 outlines the median weekly earnings among the major race and ethnicity groups. Overall,

11 median earnings of Hispanics or persons of Latino ethnicity who worked full time (\$554) were lower

12 thanthose of Blacks or African Americans (\$610), Whites (\$772), and Asians (\$859).

13

1 2

FIGURE 5-5. MEDIAN USUAL WEEKLY EARNINGS OF FULL-TIME WAGE AND SALARY WORKERS BY RACE AND HISPANIC OR LATINO ETHNICITY, FIRST QUARTER 2010



³



5

Source: Bureau of Labor Statistics, News Release USDL-10-0468, April 15, 2010.

6 A Wall Street Journal article from 2005 ranked the top 10 industries for high job turnover rates. The top 7 10 "turnover" industries included low-level retail jobs, nurses, fast-food workers, hotel and restaurant 8 workers, and sales people. Lower-skilled, lower wage jobs historically have had higher turnover rates 9 than white-collar jobs; however, turnover rates in traditionally highly-skilled, white-collar jobs, especially sales, were on the rise prior to the recession which the U.S. labor market entered in 2008.⁴³ 10

11

12 As shown in Figure 5-6, of the anticipated 44 businesses potentially displaced by the proposed project, 13 approximately 23 percent are either fast food or restaurant establishments. According to People Report, 14 a Dallas-based firm that tracks human resource data for restaurant companies, the annual hourly turnover 15 of 101 percent and average annual management turnover of 27 percent was recorded for its members in 16 2005. In 2006, about 45 percent of restaurant employees were between the ages of 16 and 24, and this 17 age group is not expected to increase in size by 2016. Also according to People Report, the restaurant 18 industry is predicted to create 1.9 million more jobs by 2016. Recent restaurant operator statistics reflect 19 that restaurant operators expect to do more hiring in the second guarter of 2010, another sign that the industry is climbing its way out of the economic slump. After losing jobs in 2009, the restaurant industry 20 has started to reverse course adding 43,000 jobs within the first three months of 2010.44 Turnover is a 21

⁴³ Gerencher, Kristen. February 23, 2005. "Where the revolving door is swiftest: Job turnover high for fast-food, retail, nursing, child care." The Wall Street Journal. http://www.marketwatch.com ⁴⁴ Berta, Dina. November 20, 2006. "People Report: Worker turnover rate continues to climb." Nation's Restaurant

News, http://www.nrn.com

lagging economic indicator and is expected to remain low as the national unemployment rate remains
 high.⁴⁵

3

As shown in **Figure 5-6**, retail employers represent approximately 16 percent of the anticipated 44 businesses potentially displaced, including vehicle sales (cars, motorcycles, and recreational vehicles), air conditioning/refrigeration equipment sales, mobile home sales, and a video/video game rental/sales store. Service establishments, such as insurance companies, tax offices, banks, rental services, youthoriented services, and service/gas stations represent approximately 54 percent of the anticipated 44 businesses potentially displaced. Together, retail and service employers represent 70 percent of the total anticipated businesses to be displaced.

11

12





13

14

15 Based on the labor assumptions described above, a majority of the employment opportunities 16 (approximately 75 percent) which could be affected by either job loss or relocation due to the proposed 17 project originate from fast food/restaurant, retail, hotel/motel, automotive, rental services, and service 18 station industries which typically employ low skill, low wage employees, and reflect high turnover rates. 19 As seven percent of the businesses potentially displaced are vacant properties, the remaining 18 percent 20 of the potentially impacted employment opportunities are associated with service establishments, which 21 typically hire salaried employees with advanced educations (beyond high school) for medium to high 22 wage management or professional positions. 23

- ___
- 24

⁴⁵ Berta, Dina. April 28, 2010. "Restaurants ready to hire more workers." Nation's Restaurant News, http://www.nrn.com

1 • Future Employment Opportunities

2 3

4

5

6 7 <u>NCTCOG Development Monitoring</u> - The NCTCOG's Development Monitoring database tracks over 8,000 major developments that are either existing, under construction, or announced. Major developments are defined as being over 80,000 square feet and/or 80 employees; data is updated by NCTCOG on a continuous basis. Future development monitoring information of "announced" projects provided by the NCTCOG was available for the City of Denton; however, no "announced" developments were currently available for the City of Corinth.

8 9

As of July 2010, announced developments within the City of Denton include a business park, two hotels, a new UNT football stadium, a new shopping center, a single-family residential development, and two new mixed-use developments (residences, office park, retail, etc.). Refer to **Appendix C-21** for a listing of these announced developments and a map showing their locations.

15

Denton County Transit Authority (DCTA) - DCTA is a coordinated county transportation authority
 which currently serves Denton County's transportation needs via bus service and a university
 shuttle system, carrying approximately two million passengers a year. As previously detailed in
 Section 2.5, DCTA bus routes include fixed route services in the City of Denton, a demand response system, and a regional commuter service into the Dallas Central Business District.
 Current DCTA bus routes (Connect System) and UNT Shuttle Service Routes are shown in
 Appendix C, Figures C-23 and C-24, respectively.

23

The DCTA launched their regional commuter rail service, known as the A-train, in June 2011. The A-train connects with DART's light rail Northwest Green Line at Trinity Mills Road in the City of Carrollton. This linkage with the DART light rail system provides an alternative commuter route through Denton County and into the City of Dallas. In addition, commuters have an alternative to IH 35E during its planned reconstruction, which would help mitigate any construction related congestion.⁴⁶

30

There are five DCTA rail stations along the 21-mile A-train's commuter rail line, two of which are located within the City of Denton. The locations of these two Denton rail stations are shown in **Appendix E, Figure E-2** and include the South Denton/Medpark rail station (Map ID #44) and the Downtown Denton rail station (Map ID #24). **Section 2.5** provides a detailed accounting of the other three DCTA rail stations (two in the City of Lewisville and one in Highland Village), and a map of all five rail stations is presented in **Appendix C, Figure C-22**.

⁴⁶ DCTA, http://www.mya-train.com/about-the-a-train

2 Areas surrounding the DCTA regional commuter rail stations would likely experience transit-3 oriented development (TOD); that is, an area of mixed-use development (e.g., high-density 4 residential, retail, cultural, etc.) functioning to maximize access to public transport and the 5 amenities surrounding that transport. TOD can support the revitalization and redevelopment of older neighborhoods and businesses, and the amount and scale of TOD near rail stations is often 6 7 influenced by the presence and availability of services. The South Denton/Medpark and 8 Downtown Denton rail stations serve as transfer centers for passengers, connecting bus, UNT 9 shuttle, vehicular transport, and commuter rail. Current land use surrounding the South 10 Denton/Medpark rail station is vacant land, office, and medical land uses. Current land use 11 surrounding the Downtown Denton rail station is industrial, light-industrial, and non-residential 12 land uses. Additional residential and small-scale commercial TOD is anticipated surrounding the 13 South Denton/Medpark rail station; and in accordance with the City of Denton's Downtown Master 14 *Plan*, TOD is anticipated to result in the strengthening and revitalization of downtown Denton.⁴⁷

15

25

1

City of Corinth - Interviews with Planning Officials from the City of Corinth identified two 16 17 development projects in the City of Corinth, both of which are adjacent to the proposed project. 18 They include the recently constructed Ashton Gardens, a high end wedding venue provider 19 (includes chapel and reception services) and The Children's Courtyard, an early childhood 20 education center providing daycare services, school age programs (kindergarten through sixth 21 grade), and summer camp programs (see Appendix E-3). In addition, several hotels have 22 communicated interest in developing adjacent to the Ashton Gardens facility; however, there are 23 currently no official site plans as developers are awaiting a verified reconstruction schedule for IH 24 35E prior to committing to their respective developments.

<u>City of Denton</u> - Interviews with Planning Officials from the City of Denton identified numerous development projects located nearby the proposed project as well as throughout the City that are either planned, platted, announced, or currently under construction. These new developments are described in detail in Section 7.5.5 of this EA and in Appendix E-3. Planning Officials cited at least 61 future development/transportation projects within the City of Denton, broken down as follows:

Five industrial developments;
19 commercial developments;
11 mixed-use developments;
One large educational development (UNT Eagle Point Campus, including the UNT football stadium);

⁴⁷ RailDCTA Project, Final Environmental Impact Determination, April 2008.

1 One multi-family development; 2 15 single-family residential developments: 3 Two government/institutional developments; 4 Two commuter rail stations (DCTA): 5 One commuter rail transportation project (DCTA A-train); and Four roadway transportation projects either partially or fully within the City of 6 7 Denton. 8 9 Even in the current economic climate, the City of Denton is still maintaining a level of commercial growth. This is illustrated in that the number of commercial building permits issued in 2008 was 10 higher than the previous three years.⁴⁸ Demand for service-oriented establishments currently 11 exists and is not anticipated to decline according to Planning Officials. In fact, the City of Denton 12 was listed as one of the top 10 cities for population increase from 2000 to 2009.49 13 14 15 Minimization and Mitigation 16 17 Texas Workforce Commission 18 The Texas Workforce Commission (TWC) is the state government agency charged with overseeing and providing workforce development services to employers and job seekers for the state of Texas. For 19 20 employers, the TWC offers recruiting, retention, training and retraining, and outplacement services as well 21 as valuable information on labor law and labor market statistics. For job seekers, the TWC offers career 22 development information, job search resources, training programs, and unemployment benefits as 23 While targeted populations receive intensive assistance to overcome barriers to appropriate. 24 employment, all Texans can benefit from the services offered by the TWC and its network of workforce 25 partners. 26

The TWC is 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; that is, Texas Workforce Centers.⁵⁰

31

32 • Workforce Solutions for North Central Texas

The Texas Workforce Center which serves the area potentially impacted by the proposed IH 35E improvements is the Workforce Solutions for North Central Texas ("Workforce Solutions"). The service

⁴⁸ April 2009 *Statistical Trends and News of Denton (STAND)* report, City of Denton Economic Development Partnership.

⁴⁹ NCTCOG Population Estimates, Top 10 Cities 2000-2009 Population Increase.

⁵⁰ Texas Workforce Commission, http://www.twc.state.tx.us/twcinfor/whatis.html

area for Workforce Solutions includes 14 counties: Collin, Denton, Ellis, Erath, Hood, Hunt, Johnson,
Kaufman, Navarro, Palo Pinto, Parker, Rockwall, Somervell, and Wise Counties. This area is home to
over 2.3 million residents, 47,000 businesses, and over 1.2 million workers. Since 1996, Workforce
Solutions has partnered with the NCTCOG, who serves as its administrative entity responsible for
program implementation. As grant recipient and fiscal agent, the NCTCOG is responsible for the annual
workforce development budget in excess of \$60 million.⁵¹

7

8 During FY 2009, the Workforce Solutions provided services for over 16,071 of the 43,877 businesses 9 within the 14 county service area; served over 175,837 customers; provided child care for an average of 10 6,501 children per day; and helped approximately 63 percent of unemployment claimants to become re-11 employed.

12

13 The ultimate goal for the Workforce Solutions is to match the most qualified candidates with the right 14 employers. Services provided to employers include:

- Personal attention from one of the account managers;
- 16 Recruiting assistance/placement;
- "Work in Texas" internet-based job posting and matching system;
- 18 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.
- 22

23 Services provided by the Workforce Solutions 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, placement assistance, and career counseling (as appropriate);
- Job search workshops and seminars;

Resource room services (e.g., access to telephone, fax, copier, resource library, computer, internet, and resume assistance);

- Employment and labor market information;
- Job listings via "Work In Texas" and other on-line employment resources;
- Job referrals;
- Target occupations required skills and earnings in those occupations;
- Eligible Training Provider System and training program information;

⁵¹ Workforce Solutions of North Central Texas, https://www.dfwjobs.com/aboutus/index.asp

1 Performance statistics of our local area: • Supportive service information (e.g., child care and transportation); 2 • 3 "How to" information and filing unemployment claims; • 4 Assistance in establishing eligibility for non-Workforce Investment Act funded training and • 5 education programs; and 6 Follow-up services (as appropriate). • 7 8 Expanded services provide a more customized solution to job seekers who are enrolled in specific 9 workforce programs. The services listed below may be available to job seeking customers who are 10 unemployed and unable to obtain employment through core services, are determined by staff to need 11 these services in order to obtain employment, or are under-employed and determined by staff to need the 12 service in order to obtain or retain employment that allows for self-sufficiency. These services are 13 provided at local Workforce Centers and through contracts with public and private providers and include

- 14 the following:
- 15 In-depth individual assessment;
- 16 Development of an individual employment plan;
- Counseling; and
 - Short-term prevocational services.
- 18 19

20 A Workforce Development Manager was interviewed on June 16, 2010 to discuss the potential for TxDOT 21 to coordinate with the Workforce Solutions to mitigate the potential employment impacts associated with 22 the proposed IH 35E improvements. The Workforce Development Manager described the potential for 23 "rapid response workshops" to be conducted on behalf of the employers. Workforce Solutions can 24 coordinate with employers identified for relocation by TxDOT via the ROW acquisition phase of project 25 development to provide one- to two-hour "rapid response workshops" if requested by the employers, 26 regardless of the number of employees anticipated to be impacted. If 50 or more employees are to be 27 laid off, employers must notify the TWC regardless, so the Workforce Solutions staff is aware of 28 employment needs and opportunities. If necessary, multiple "rapid response workshops" could be 29 planned and conducted by Workforce Solutions to provide information to groups ranging from five to 500 30 employees regarding the programs provided by the Workforce Centers and how to apply for 31 unemployment benefits.

32

The Workforce Development Manager and appropriate staff will attend the Open House/Public Hearing for the proposed IH 35E project to answer questions or present services information on behalf of Workforce Solutions. Contact information for Workforce Solutions can also be distributed to each
 property owner during the ROW acquisition process.⁵²

3

4 Employment Impact Conclusions

5 Relocation of commercial entities can result in unemployment and associated financial impacts. If the 6 businesses are able to relocate within the immediate municipality or community and remain viable, any 7 potential unemployment effects would be temporary. A higher degree, or adverse, impact would occur if 8 the businesses cannot relocate or must do so outside the municipalities in which the proposed IH 35E 9 project would be constructed. It is unknown whether businesses would reestablish within close proximity 10 to their original locations, or which business owners would choose or be able to continue operation; 11 however, sites with suitable zoning and in close proximity are currently available within the Cities of 12 Corinth and Denton, as previously discussed (see Potential Relocation Sites for Commercial 13 Displacements subheading).

14

15 The Cities of Corinth and Denton are aware of the potential impacts to their respective tax bases if 16 businesses displaced by the proposed project are unable to relocate within the municipality of origin. 17 Both the Cities of Corinth and Denton are willing to coordinate with the potentially displaced entities to 18 minimize employment and economic impacts associated with the proposed reconstruction of IH 35E.

19

20 Based on the results of replacement property searches, the majority of the businesses would have 21 options to successfully relocate within their service area. There may be temporary impacts to a small 22 community of businesses that are unlikely to remain open or likely to re-establish outside of their service 23 area. However, the demand for services, driven by growth, could aid in the ability for potentially displaced 24 businesses to relocate within the project area: or the demand could shift to non-displaced businesses that 25 meet the additional demand by creating new employment opportunities. Additionally, there appear to be 26 future employment opportunities of varying skill requirement intensities within the Cities of Corinth and 27 Denton based on information provided by the NCTGOG's Development Monitoring database, DCTA 28 regional rail expansions, and interviews with Planning Officials from the municipalities of Corinth and 29 Denton. Further, the continued growth and development of UNT, as well as TWU, in the City of Denton is 30 anticipated to create future staffing positions that could accommodate multiple-skill levels (e.g., janitor, 31 maintenance, security, administrative assistants, teaching faculty, etc.).

32

The proposed reconstruction of IH 35E, along with other reasonably foreseeable transportation projects, would also contribute beneficial construction and related activities for persons in many industries throughout the economy. Jobs would be created by firms designing the proposed project, jobs to

⁵² Interview with Natalie Moffitt Johnson, Workforce Development Manager for the Workforce Solutions for North Central Texas, held on June 16, 2010.

employers supplying the materials for construction, construction labor jobs, etc. Further, as is indicated in
 Section 6.0, the proposed improvements are anticipated to influence some development along the
 project alignment, which in turn would likely create future opportunities for employment.

4

5 Relocation assistance payments and services would be provided to the displaced businesses in 6 accordance with the Uniform Relocation Assistance and Real Properties Acquisition Policies Act, as 7 Amended. Additionally, TxDOT commits to utilizing Workforce Solutions to help minimize or mitigate 8 adverse impacts to individual employees as a result of the proposed project's implementation. Beneficial 9 effects to the local economy through the management of congestion and the addition of capacity and 10 mobility along the IH 35E corridor should accrue at a level that would benefit all parties working or 11 providing services in the Cities of Corinth and Denton. Based on the above analysis of business and 12 employment impacts, and considering the context in which these impacts would occur, substantial 13 impacts to businesses and employees are not anticipated.

14

15 **5.2.6 Access**

16

17 No-Build Alternative

18 Implementation of the No-Build Alternative would not require additional control of access areas.

19

20 Build Alternative

Additional control of access areas are recommended as part of the proposed project and are consistent with TxDOT design criteria and guidance. Access to adjacent properties would be maintained. In areas where existing access would be prohibited by the proposed control of access, alternative access routes would be provided.

25

26 **5.2.7 Community Cohesion**

27

28 No-Build Alternative

Implementation of the No-Build Alternative would not separate or isolate any distinct neighborhoods,
 ethnic groups, or other specific groups.

31

32 Build Alternative

Community cohesion is a term that refers to an aggregate quality of a residential area. Cohesion is a social attribute that indicates a sense of community, common responsibility, and social interaction within a limited geographic area. It is the degree to which residents have a sense of belonging to their neighborhood or community, or a strong attachment to neighbors, groups, and institutions as continual association over time. 1

2 The presence of two universities (UNT and TWU) has fostered a large student community within the City 3 of Denton. No other distinct neighborhoods or community groups within the project area have been 4 readily identified during the project planning or public involvement process, which included three public 5 meetings, each with an opportunity for public comments (see Section 2.7). Both local and commuting 6 students from outside the project area make up the student bodies of UNT and TWU. The residential 7 status of these students tends to be transient in nature, typically only extending the tenure of their 8 enrollment. For the above reasons, elementary school attendance zones, which generally account for 9 individuals of more permanent residential status, were used as a means to determine potential 10 communities adjacent to the proposed project.

11

Elementary schools are one aspect of community and provide a known boundary of populations in similar living arrangements. The extent that an individual identifies the community as based on a specific elementary school's geographic boundaries is unknown. However, social bonds are formed through playground use, school activities, after school programs, and parent teacher association meetings, all of which are centered around elementary schools. Elementary school attendance zone data are presented in **Table 5-14**.

18

TABLE 5-14. ELEMENTARY SCHOOL ATTENDANCE ZONES ADJACENTTO THE PROPOSED PROJECT

Elementary School	School District	Attendance Zone Size (acres)	Number of Residential Displacements					
Corinth	Lake Dallas	1,600	0					
Shady Shores	Lake Dallas	1,465	0					
Olive Stephens	Denton	2,890	0					
Pecan Creek	Denton	2,730	0					
Nelson	Denton	1,540	0					
Houston	Denton	1,960	0					
Rivera	Denton	2,930	0					
Borman	Denton	17,740	32*					
Newton Rayzor	Denton	2,260	0					
Evers Park	Denton	13,700	0					
Sources: http://www.dentonisd.org/dentonisd/site/default.asp; http://www.lisd.net/								
Note: *16 single-family homes and two eight-unit apartment buildings.								

19

Enrollment and demographic data for the 10 elementary schools adjacent to the proposed project are displayed in **Table 5-15**. Average enrollment in the schools is 585 students, with a high of 744 and a low of 302. Approximately 48 percent of students are minority with 12 percent black, one percent Native American, 33 percent Hispanic, and three percent Asian. In addition, approximately 23 percent of students are LEP and 44 percent are economically disadvantaged. Olive Stephens Elementary was excluded from the demographic calculations because a report was not available due to the school being new.

27

Elementary	Enrollment	White	Black	Hispanic	Asian	Native American	LEP Student Count	Economically Disadvantaged ¹	
School				Percent	Number/Percent				
Corinth	650	74.9	7.7	12.3	4.2	0.9	35 / 5.4	125 / 9.2	
Evers Park	653	33.7	18.5	44.7	2.5	0.6	207 / 31.7	441 / 67.5	
Houston	666	63.5	14.0	13.2	8.1	1.2	62 / 9.3	148 / 22.2	
Newton Rayzor	525	42.1	5.9	49.3	2.7	0.0	202 / 38.5	324 / 61.7	
Rivera	671	22.2	15.6	61.0	0.7	0.4	333 / 49.6	536 / 79.9	
Shady Shores	744	68.1	5.9	22.7	3.0	0.3	87 / 11.7	257 / 34.5	
Pecan Creek	720	72.9	7.9	14.2	3.9	1.1	49 / 6.8	144 / 20.0	
Nelson	462	50.6	16.9	28.8	2.2	1.5	66 / 14.3	158 / 34.2	
Borman	459	19.6	11.8	66.0	2.2	0.4	236 / 51.4	333 / 72.5	
Olive Stephens	302		report not available - school opened in August 2008						

TABLE 5-15. ELEMENTARY SCHOOL ENROLLMENT/DEMOGRAPHIC DATA

Source: <u>http://deleon.tea.state.tx.us/sdl/Forms/txtSearch.aspx</u>. Note : 1. Economically disadvantaged includes the following: Students eligible for free or reduced price meals under the National School Lunch and Child Nutrition Program, students from a family with an annual income at or below the official poverty line, students eligible for Temporary Assistance to Needy Families (TANF) or other public assistance, or students that received a Pell Grant or comparable state program of need-based financial assistance.

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3 There are potentially 16 single-family residential displacements and two eight-unit apartment building 4 displacements associated with the Build Alternative. As shown in Table 5-14, these 32 residential 5 displacements would occur within the Borman Elementary School attendance zone. Enrollment at 6 Borman Elementary School is approximately 600 students. A review of the demographic data and 2008 7 school enrollment records for Borman Elementary indicated that of the students enrolled there, 19.6 8 percent were white, 11.8 percent were black, 66 percent were Hispanic, 2.2 percent were Asian, and 0.4 9 percent were Native American. The loss of up to 32 residences from a large elementary school 10 attendance zone is unlikely to negatively affect the overall cohesiveness and nature of this community.

11

12 5.2.8 Limited English Proficiency

13

14 No-Build Alternative and Build Alternative

Under both the No-Build and Build Alternatives of the proposed project, LEP individuals would beafforded the opportunity to participate in the decision-making process as discussed below.

17

EO 13166, *Improving Access to Services for Persons with Limited English Proficiency*, requires federal agencies to examine the services they provide and identify any need for services to LEP populations. This EO requires federal agencies to work to ensure that recipients of federal financial assistance provide meaningful access to their LEP applicants and beneficiaries. Failure to ensure that LEP persons can effectively participate in or benefit from federally assisted programs and activities may violate the prohibition under Title VI of the Civil Rights Restoration Act of 1987 and Title VI regulations. LEP populations were determined using Census block group level data from the 2000 Census. Census block groups were assessed within 0.25 mile of the project ROW (i.e., project area). Within the population that is five years of age and older, persons who speak English less than "very well" are considered to have a limited English proficiency. There are 24 block groups within 0.25 mile of the proposed project ROW. The populations that speak English less than "very well" according to the 2000 Census are presented in **Table 5-16**.

7

TABLE 5-16. PERCENT OF IH 35E PROJECT AREA¹ POPULATION THAT SPEAKS ENGLISH LESSTHAN "VERY WELL"

		Languages Spoken by LEP Populations						
Census	LEP	Spanish	Indo-European	Asian/Pacific	Other			
Block Group/Tract	(Percentage)	(Percentage)	(Percentage)	Island (Percentage)	(Percentage)			
Block Group 2, Census Tract 204.01	7	7	0	0	0			
Block Group 1, Census Tract 204.02	9	7	0	2	0			
Block Group 4, Census Tract 204.03	1	0	0	1	0			
Block Group 3, Census Tract 207	17	11	1	5	0			
Block Group 2, Census Tract 208	15	11	1	3	0			
Block Group 3, Census Tract 208	4	4	0	0	0			
Block Group 1, Census Tract 209	40	36	0	4	0			
Block Group 2, Census Tract 209	13	4	1	7	1			
Block Group 2, Census Tract 210	4	2	0	2	0			
Block Group 3, Census Tract 210	15	10	1	4	0			
Block Group 4, Census Tract 210	14	14	0	0	0			
Block Group 3, Census Tract 212	2	2	0	0	0			
Block Group 1, Census Tract 213.01	10	7	0	3	0			
Block Group 2, Census Tract 213.01	10	2	2	4	2			
Block Group 1, Census Tract 213.02	8	5	0	3	0			
Block Group 2, Census Tract 213.02	5	3	1	1	0			
Block Group 3, Census Tract 213.02	3	2	1	0	0			
Block Group 3, Census Tract 214.01	7	7	0	0	0			
Block Group 5, Census Tract 214.01	4	2	2	0	0			
Block Group 1, Census Tract 214.02	1	1	0	0	0			
Block Group 4, Census Tract 214.02	3	3	0	0	0			
Block Group 5, Census Tract 214.02	2	1	0	1	0			
Block Group 2, Census Tract 214.03	6	6	0	0	0			
Block Group 3, Census Tract 214.03	0	0	0	0	0			
Source: Census 2000.								
Note: 1. Project area for the purposes of the LEP analysis includes the Census block groups within 0.25 mile of the								
proposed project ROW (i.e., 24 block groups).								

8

9 As shown in **Table 5-16**, the LEP populations in the individual block groups within the project area range from zero to 40 percent. Of the 48,882 persons within all of the block groups, approximately 7.6 percent of the population (3,732 persons) speaks English less than "very well." Of this LEP population, approximately 75.7 percent speaks Spanish, 17.5 percent speaks Asian Pacific Island languages, 5.9 percent speaks Indo European languages, and 0.8 percent speaks other languages. A windshield survey of the project area revealed business signs and advertisements in Spanish. Environmental Assessment

Two churches, the Iglesia Sobre La Roca at 1100 Oakwood Drive and the Primera Inglesia Bautista at 3508 Brighton Drive were identified nearby the proposed project. The Iglesia Sobre La Roca resides within Block Group 4 of Census Tract 210. This Block Group contains a 14 percent Spanish-speaking LEP population. The Primera Inglesia Bautista at 3508 Brighton Drive resides within Block Group 2 of Census Tract 213. This Block Group contains a three percent Spanish-speaking LEP population.

6

7 Steps have been taken to ensure that LEP persons have access to the programs, services, and 8 information TxDOT provides. IH 35E Public Meetings were held on November 10, 2008 at the UNT 9 Texas Gateway Center Ballroom; on Thursday, November 13, 2008 at the City of Lewisville Community 10 Room in the Municipal Annex Building; and on Monday, November 17, 2008 at the Dr. Pepper Star 11 Center in Farmers Branch. Notices for these meetings were published in Al Día, the regional Spanish-12 language newspaper, and the public was informed that they could request a translator for the meetings, if 13 necessary. Future information released to the public concerning the proposed project would also be 14 made available in English and Spanish. For any LEP population, similar services would be provided 15 where needed.

16

17 5.2.9 Environmental Justice (EJ)

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19 No-Build Alternative

Implementation of the No-Build Alternative would not have disproportionately high and adverse human
 health or environmental effects on minority or low-income populations.

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23 Build Alternative

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25 **Project Area Demographics**

EO 12898 entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of the programs on minority or low-income populations. The EPA defines EJ as the fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies.

31

FHWA Order 6640.23 establishes the policies and procedures for the FHWA to use in complying with EO 12898 and is a key element in the EJ strategy adopted by the FHWA to implement EO 12898. The following definitions are contained in FHWA Order 6640.23 and are intended to be consistent with the draft definitions for EO 12898 that have been issued by the CEQ and the EPA:

36

- Minority: 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 Alaskan Native (having origins in any of the original people of North America and who
 maintains cultural identification through tribal affiliation or community recognition).
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- Minority Population: Any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed or transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity.
- Low-Income Population: Any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed or transient persons who would be similarly affected by a proposed FHWA program, policy, or activity.
- 16

19

- The 2011 poverty guideline is \$22,350 for a four-person family as defined by the U.S. Department
 of Health and Human Services (HHS).
- 20 Adverse Effects: The totality of substantial individual or cumulative human health or • 21 environmental effects, including interrelated social and economic effects, which may include, but 22 are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and 23 soil contamination; destruction or disruption of man-made or natural resources; destruction or 24 diminution of aesthetic values; destruction or disruption of community cohesion or a community's 25 economic vitality; destruction or disruption of the availability of public and private facilities and 26 services; vibration; adverse employment effects; displacement of persons, businesses, farms, or 27 nonprofit organizations; increased traffic congestion, isolation, exclusion or separation of minority 28 or low-income individuals within a given community or from the broader community; and the 29 denial of, reduction in, or substantial delay in the receipt of, benefits of FHWA programs, policies, 30 or activities.
- 31
- Disproportionately High and Adverse Effect on Minority or Low-Income Populations: An adverse effect that (1) is predominately borne by a minority population or a low-income population or (2) would be suffered by the minority population or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority population.
- 37

1 The project area impacts were evaluated for compliance with EO 12898. The evaluation measures 2 included identifying whether minority or low-income populations exist in the project area, identifying 3 impacts that would potentially affect minority or low-income communities of concern, determining whether 4 the proposed project would have disproportionate effects on minority or low-income groups, and 5 identifying mitigation strategies for any groups that were identified.

6

7 U.S. Census data were used to identify areas with high concentrations of minority and low-income 8 populations. For the purposes of the demographics analysis, the project area includes the Census tracts, 9 block groups, and blocks located within 0.25 mile of the proposed project ROW. There are 14 Census 10 tracts, 24 Census block groups, and 198 Census blocks that encompass this project area; all 198 Census 11 blocks are shown in Appendix C, Figure C-5. Data obtained from these Census blocks and block 12 groups were analyzed to determine race and income characteristics in the proposed project area. A total 13 of 19.072 persons were recorded within the 198 Census blocks in 1999. The race, ethnicity, and low-14 income characteristics within these blocks and associated block groups are presented in Appendix C-6. 15

Of the 19,072 persons recorded within the 198 Census blocks within 0.25 mile of the proposed project, approximately 72.74 percent are White, 13.73 percent are Hispanic or Latino, 7.49 percent are Black or African American, 4.10 percent are Asian, 1.40 percent are Two or More Races, 0.49 percent are American Indian and Alaskan Native, and 0.08 percent are classified as Some Other Race Alone. Of the 198 Census blocks within 0.25 mile of the proposed project, 18 Census blocks contain minority populations that are 50 percent or greater, as shown in **Table 5-17.** Using this method of comparison, it is concluded that an EJ population exists in the proposed project area.

23

Of these 18 Census blocks that contain minority populations that are 50 percent or greater, five have a population of 10 persons or less which leads to a high minority percentage, but is not indicative of distinct minority groups.

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Census Geography	Total	Hispanic or Latino	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Population of Two or More Races
Block 4004, Block Group 4, Census Tract 204.03	6	50%	50%	0%	0%	0%	0%	0%	0%
Block 2000, Block Group 2, Census Tract 208	372	36%	47%	13%	1%	2%	0%	0%	1%
Block 2006, Block Group 2, Census Tract 208	3	0%	0%	100%	0%	0%	0%	0%	0%
Block 3002, Block Group 3, Census Tract 208	2	50%	50%	0%	0%	0%	0%	0%	0%
Block 3018, Block Group 3, Census Tract 208	90	44%	50%	3%	3%	0%	0%	0%	0%
Block 1008, Block Group 1, Census Tract 209	302	84%	12%	2%	0%	0%	0%	0%	2%
Block 1009, Block Group 1, Census Tract 209	114	35%	38%	19%	1%	3%	0%	0%	4%
Block 1010, Block Group 1, Census Tract 209	273	83%	13%	4%	0%	0%	0%	0%	0%
Block 2004, Block Group 2, Census Tract 209	394	20%	37%	12%	1%	27%	0%	0%	3%
Block 2007, Block Group 2, Census Tract 209	234	5%	42%	47%	0%	4%	0%	0%	2%
Block 2009, Block Group 2, Census Tract 210	64	13%	43%	6%	0%	36%	0%	2%	0%
Block 2010, Block Group 2, Census Tract 210	106	32%	34%	10%	0%	21%	0%	0%	3%
Block 2015, Block Group 2, Census Tract 210	4	0%	0%	100%	0%	0%	0%	0%	0%
Block 3004, Block Group 3, Census Tract 210	75	49%	46%	1%	1%	3%	0%	0%	0%
Block 3006, Block Group 3, Census Tract 210	66	58%	35%	0%	5%	0%	0%	0%	2%
Block 3009, Block Group 3, Census Tract 210	104	19%	39%	5%	0%	37%	0%	0%	0%
Block 1001, Block Group 1, Census Tract 213.02	29	76%	24%	0%	0%	0%	0%	0%	0%
Block 3038, Block Group 3, Census Tract 213.02	5	0%	0%	100%	0%	0%	0%	0%	0%
Source: Census 2000.									

TABLE 5-17. CENSUS BLOCKS WITH MINORITY POPULATIONS OF 50 PERCENT OR GREATER

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1 Of the 198 Census blocks within 0.25 mile of the proposed project, 121 Census blocks contain specific 2 minority populations that are at least 50 percentage points higher than their respective block groups. Of 3 these specific minority populations, 62 Census blocks contain a higher Hispanic or Latino population, 47 4 blocks contain a higher Black or African American population, 29 Census blocks contain a higher Two or 5 More Races population, and 28 Census blocks contain a higher American Indian or Alaska Native 6 population. There are 16 Census blocks within 0.25 mile of the proposed project that contain combined 7 minority populations that are at least 50 percentage points higher than their respective block groups. In 8 summary, 137 Census blocks contain specific and combined minority populations that are at least 50 9 percentage points higher than their respective block groups. Using this method of comparison, it is 10 concluded that an EJ population exists in the proposed project area.

- 11
- 12 **Table 5-18** shows the median household income characteristics of the 24 Census block groups in the
- 13 project area.
- 14

Census Geography	Median Household	Percentage of Income in					
Block Group 2, Census Tract 204 01	\$55 500						
Block Group 1, Census Tract 204.01	\$71,833	1					
Block Group 4, Census Tract 204.03	\$46.341	7					
Block Group 3. Census Tract 207.00 ¹	\$21.397	23					
Block Group 2, Census Tract 208.00	\$13,281	35					
Block Group 3, Census Tract 208.00	\$32,500	21					
Block Group 1, Census Tract 209.00	\$17,647	37					
Block Group 2, Census Tract 209.00 ²	\$21,216	11					
Block Group 2, Census Tract 210.00	\$16,071	6					
Block Group 3, Census Tract 210.00	\$22,833	27					
Block Group 4, Census Tract 210.00	\$39,554	18					
Block Group 3, Census Tract 212.00	\$38,281	15					
Block Group 1, Census Tract 213.01	\$28,611	22					
Block Group 2, Census Tract 213.01	\$31,047	23					
Block Group 1, Census Tract 213.02	\$22,415	23					
Block Group 2, Census Tract 213.02	\$71,286	8					
Block Group 3, Census Tract 213.02	\$60,435	4					
Block Group 3, Census Tract 214.01	\$39,970	17					
Block Group 5, Census Tract 214.01	\$73,864	2					
Block Group 1, Census Tract 214.02	\$90,888	2					
Block Group 4, Census Tract 214.02	\$72,203	2					
Block Group 5, Census Tract 214.02	\$69,469	2					
Block Group 2, Census Tract 214.03	\$38,323	11					
Block Group 3, Census Tract 214.03	\$75,552	3					
Source: U.S. Census 2000.							
Notes:							
1. Census block groups that contain low-income populations are bolded.							
2. Contains one potentially displaced residence as a result of the proposed project.							

TABLE 5-18. CENSUS BLOCK GROUP MEDIAN HOUSEHOLD INCOME

15

As shown in **Table 5-18**, the 1999 median household income in the 24 Census block groups ranges from \$13,281 to \$90,888. There are five Census block groups containing populations whose median household incomes are less than the HHS 2011 poverty guideline of \$22,350 for a four-person family.

1 Displacements

Residential displacements associated with the proposed project would occur in five Census blocks: Block
2012 of Census Tract/Block Group 209/2 (one residence), Block 3013 of Census Tract/Block Group 210/3
(five residences), Block 4000 of Census Tract/Block Group 210/4 (eight residences), Block 4002 of
Census Tract 210/4 (two residences), and Block 2001 of Census Tract/Block Group 213.01/2 (two
residential buildings containing eight apartment units each).

7

8 Of these five Census block groups, Census tract/block group 209/2 is considered an EJ block group 9 based on the reported 1999 median household income. None of these five blocks or block groups with 10 residential displacements are considered EJ blocks/block groups based on minority population because 11 they do not contain at least a 50 percent minority population. The proposed project would potentially 12 displace seventeen residences and only one is from an identified EJ block group.

13

14 It is unknown if any EJ individuals would be displaced from the eight apartment units. Demographic data 15 on these individuals is unavailable and Section 8/Housing Choice Vouchers are not accepted by the 16 complex.

17

18 As previously discussed, a range of 372 to 784 employees could be affected by either job relocation or 19 loss in association with the proposed business displacements. The 44 anticipated business 20 displacements (associated with 40 commercial properties) consist of varied services, including sit-down 21 restaurants, drive-through/sit-down restaurants, service stations, hotels/motels, vehicle servicing centers, 22 and a self-service storage company. Specific economic and demographic data are not available for these 23 employees, but based on the types of businesses, there is the potential that minimum wage workers are 24 employed at these establishments and they might be considered low-income individuals. Other 25 businesses to be displaced (e.g., bank, tax service, media production) are more likely to have higher 26 wage earners. A detailed description of the labor force likely associated with the anticipated displaced 27 businesses, future employment opportunities within the Cities of Corinth and Denton, and minimization 28 and mitigation efforts is provided in Section 5.2.5, subheading Labor Force. In sum, although low-29 income individuals are likely employed at some of the anticipated business displacements, numerous 30 future employment opportunities of various skill level are anticipated in the Cities of Corinth and Denton, 31 and services provided by the TWC and Workforce Solutions for North Central Texas are available to 32 assist employees during their time of employment transition. Considering the context and intensity of 33 potential employment impacts established in Section 5.2.5, substantial impacts to all employees, 34 including low-income and non-low-income, are not anticipated.

1 Changes in Access and Travel Patterns

Although the proposed project would modify ramp locations within the project area, no major access changes would occur. Adjacent neighborhoods and businesses not displaced by the proposed project would retain their current access to IH 35E. Construction activities are not expected to interfere with the ability of people who live and work in the area to reach their destinations. In particular, access to adjacent residential neighborhoods and retail areas would be maintained during construction of the proposed project.

8

9 Additionally, travel patterns are not expected to change because of the proposed project. The improved 10 roadway would provide additional mainlanes plus MHOV-C lanes which would help manage congestion 11 and provide better traffic flow. Motorists may choose to use side roads for a limited time during 12 construction of the proposed project, but after construction is complete, travel patterns would remain as 13 they currently exist. Although lane closures may occur during the construction phase of the proposed 14 project, no existing mainlanes would be converted to tolled MHOV-C lanes. All lane closures due to the 15 proposed project would comply with the FHWA Manual on Uniform Traffic Control Devices (MUTCD) 16 standards.

17

No impacts to EJ populations are expected due to changes in access or travel patterns. Potential
impacts to adjacent neighborhoods from an increase of traffic during construction would not be limited to
EJ populations.

21

22 Community Cohesion

23 As established in Section 5.2.7, elementary school attendance zones serve as a logical delineation of 24 community boundaries. Several of the elementary school attendance zones surrounding the proposed 25 project have a high percentage of minority students; and several have a high percentage of economically 26 disadvantaged students (see Table 5-15). The largest elementary school attendance zone (Borman 27 Elementary) includes approximately 17,000 acres with 459 elementary school students, of which 80.4 28 percent are minority students. This is the only elementary school attendance zone that would be affected 29 by residential displacements; and the loss of up to 32 residences from such a large elementary school 30 attendance zone is unlikely to negatively affect the overall cohesiveness and nature of this community.

31

32 Origin-Destination (O&D) Analysis

33

34 <u>Overview</u>

O&D data secured from the NCTCOG were used for additional analysis of "user impacts" of the proposed IH 35E project 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 1 assessing "user impacts" as the number of trips associated with specific population characteristics can be 2 studied to provide general travel assumptions for those specific populations. A trip is defined as a one-3 way movement from where a person starts (origin) to where the person is going (destination). Assessing 4 "user impacts" in the form of an O&D analysis is an integral component of the EJ analysis for the 5 proposed tolling aspects of the proposed project.

6

As funding mechanisms for improving area roadways evolve, the trend towards tolling of facilities in this region may, through time, create "user impacts" as access to highway systems becomes an issue to the economically disadvantaged.

10

11 Traffic Survey Zones, Study Area, and Data Sources

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

18

The study area of the O&D analysis consists of the geographic extent of the MPA boundary before its expansion to a 12-county region in October 2009. The MPA (before October 2009) consisted of 5,000 square miles and included Collin, Dallas, Denton, Rockwall and Tarrant Counties, and portions of Ellis, Johnson, Kaufman, and Parker Counties.⁵³ A total of 4,813 TSZs comprise the MPA. Given the regional operating characteristics of IH 35E, it is reasonable to assume the previous extent of the MPA contains the proposed project's daily users and therefore is considered the project area.

25

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. NCTCOG conducted a "select-link analysis" based on 2030 AM peak period traffic to generate O&D data associated with the proposed project. Traffic data exported directly from TransCAD® select-link matrices were correlated with U.S. Census Bureau data to provide a demographic profile of users anticipated to utilize the proposed IH 35E facility. NCTCOG's O&D data for the IH 35E project provided data for the No-Build and Build scenarios for the year 2030.

33

⁵³ In October 2009, the MPA was expanded to include the following counties in their entirety: Collin, Dallas, Denton, Rockwall, Tarrant, Ellis, Johnson, Kaufman, Parker, Hunt, Wise, and Hood Counties.

1 Analysis Assumptions and Limitations

2 To clarify the intent of the O&D analysis, the analysis does not attempt to identify specific users (low-3 income and minority populations) but instead compares the origins and intensity of trips based on 4 collective socio-economic characteristics at the TSZ level for the project scenarios mentioned above. In 5 other words, the O&D analysis predicts the potential users of the IH 35E corridor in 2030 by correlating 6 the general socio-economic characteristics of the future users based on Census 2000 data to the intensity 7 of use quantified by the number of trips per TSZ generated by TransCAD®. The correlation of Census 8 2000 and TransCAD® data is the best available method to identify which TSZs would originate trips 9 anticipated to utilize the IH 35E facility and the general demographics of the population associated with 10 those TSZs. The model distinguishes between toll and non-toll scenarios by identifying the "toll links." 11 These "toll links" are assigned a cost per mile for the toll scenario and no cost per mile for the non-toll 12 scenario. The model then assigns vehicle trips based on user cost, trip distance, time of day, and other 13 factors to achieve system equilibrium in the network. However, the vehicle trip assignment process does 14 not consider relative income differences or the differences in relative costs to potential users in the 15 population when making trip assignments. Because no definitive data exists on the future users of IH 16 35E or similar type facilities, the O&D analysis cannot predict the specific race, ethnicity, or economic 17 status associated with the predicted trips on the toll or non-toll facilities. However, the O&D analysis can 18 identify a potential difference in trip intensity by comparing the TSZ trip percentages for the No-Build and 19 Build scenarios.

20

21 Analysis of TSZs and Number of Trips Predicted to Utilize the IH 35E facility in 2030

Analysis of the O&D data for the 2030 Build and the 2030 No-Build is discussed below and summarized in **Table 5-19**.

24

2030 Build Mainlanes - Of the total 4,813 TSZs located within the study area, 3,782 TSZs are anticipated to utilize the proposed IH 35E mainlanes with at least one trip per day. These TSZs are projected to generate 59,154 trips per day on the proposed mainlanes. The number of projected trips from these TSZs varies from a high of 1,407 trips per day to a low of one trip per day in 2030. The TSZs were color-coded and mapped based on the number of trips per day from each TSZ that are predicted to utilize the proposed mainlanes in 2030 (Appendix C, Figure C-7).

- 31
- 2030 Build Managed Lanes Of the total 4,813 TSZs located within the study area, 615 TSZs are anticipated to utilize the proposed IH 35E managed lanes with at least one trip per day. These TSZs are projected to generate 3,978 trips per day on the proposed managed lanes. The number of projected trips from these TSZs varies from a high of 139 trips per day to a low of one trip per day in 2030. The TSZs were color-coded and mapped based on the number of trips per

day from each TSZ that are predicted to utilize the proposed managed lanes in 2030 (**Appendix C, Figure C-8**).

- 2030 No-Build Of the total 4,813 TSZs located within the study area, 3,473 TSZs would utilize the existing IH 35E facility in 2030 with at least one trip per day. These TSZs would generate 43,368 trips per day on the existing facility. The number of projected trips from these TSZs varies from a high of 1,061 trips per day to a low of one trip per day in 2030. The TSZs predicted to utilize the existing facility in 2030 were color-coded and mapped based on the number of trips per day from each TSZ (Appendix C, Figure C-9).
- 10

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Data analysis indicates the majority of TSZs within the study area are expected to make at least one trip per day along the proposed IH 35E facility in 2030. The data also indicate that approximately 19,764 additional trips per day would occur under the Build scenario versus the No-Build scenario.

14

15 Identification of EJ TSZs

The threshold for an environmental justice TSZ ("EJ TSZ") was defined as a TSZ with an EJ population (specifically low-income or minority populations) equal to or greater than 51 percent of the total TSZ population. This percentage indicates a majority presence of EJ populations for that TSZ. A total of 1,624 EJ TSZs were identified within the MPA. **Appendix C, Figures C-10** and **C-11**, shows the EJ TSZs that would use the proposed IH 35E (originating at least one trip per day) per EJ type.

21

22 Analysis of EJ TSZs and Number of Trips Predicted to Utilize the IH 35E facility in 2030

Analysis of the O&D data for the 2030 Build and No-Build scenarios focused on those EJ TSZs that are anticipated to utilize IH 35E with at least one trip per day in 2030. The analysis described below is summarized in **Table 5-19**.

26

2030 Build Mainlanes - Of the total 1,624 EJ TSZs within the study area, there are 1,164 EJ TSZs anticipated to utilize the proposed IH 35E mainlanes with at least one trip per day. These EJ TSZs are projected to generate 9,021 trips per day on the mainlanes (15 percent of total trips). The number of projected trips from these EJ TSZs varies from a high of 1,372 trips per day to a low of one trip per day in 2030. The EJ TSZs predicted to utilize the proposed mainlanes in 2030 were color-coded and mapped based on the number of trips per day from each EJ TSZ (Appendix C, Figure C-12).

34

2030 Build Managed Lanes - Of the total 1,624 EJ TSZs within the study area, there are 71 EJ
 TSZs anticipated to utilize the proposed IH 35E managed lanes with at least one trip per day.
 These EJ TSZs are projected to generate 393 trips per day on the IH 35E managed lanes (10

percent of total trips). The number of projected trips from these EJ TSZs varies from a high of 52
 trips per day to a low of one trip per day in 2030. The EJ TSZs predicted to utilize the proposed
 managed lanes in 2030 were color-coded and mapped based on the number of trips per day from
 each EJ TSZ (Appendix C, Figure C-13).

2030 No-Build - Of the total 1,624 EJ TSZs located within the study area, 1,043 EJ TSZs would utilize the existing IH 35E facility in 2030 with at least one trip per day. These EJ TSZs are projected to generate 7,410 trips per day on the existing facility (17 percent of total trips). The number of projected trips from these EJ TSZs varies from a high of 1,061 trips per day to a low of one trip per day in 2030. The EJ TSZs predicted to utilize the existing facility in 2030 were color-coded and mapped based on the number of trips per day from each EJ TSZ (Appendix C, Figure C-14).

12

13 <u>Summary of O&D Analysis Results</u>

14 **Table 5-19** compares the 2030 Build and the 2030 No-Build O&D results and provides further information

- 15 regarding users of the managed lanes versus the mainlanes.
- 16

TABLE 5-19. COMPARISON OF IH 35E ORIGIN-DESTINATION (O&D) DATA

Scenario	Total TSZs Anticipated to Utilize IH 35E	Total TSZ Trips	Total EJ TSZs Anticipated to Utilize IH 35E	Total EJ TSZ Trips	Percent EJ TSZs Anticipated to Utilize IH 35E	Percent EJ TSZ Trips of Total Trips		
2030 Build Mainlanes	3,782	59,154	1,164	9,021	31	15		
2030 Build Managed Lanes	615	3,978	71	393	12	10		
2030 No-Build	3,473	43,368	1,043	7,410	30	17		
Source: NCTCOG TransCAD® data for 2030 Build and No-Build scenarios. The MPA is comprised of 4,813 total TSZs and 1,624 EJ TSZs.								

17

18 Data analysis indicates that:

- For the 2030 Build scenario, approximately 31 percent of EJ TSZs utilizing the facility would use
 the mainlanes and would account for approximately 15 percent of all trips by TSZs.
- For the 2030 Build scenario, approximately 12 percent of EJ TSZs utilizing the facility would use the managed lanes and would account for approximately 10 percent of all trips by TSZs.

• For the 2030 No-Build scenario, approximately 30 percent of EJ TSZs utilizing the facility would use the mainlanes and would account for approximately 17 percent of all trips by TSZs.

- 25
- 26 The EJ TSZ trip percentages suggest that approximately one-sixth of the trips on the IH 35E mainlanes
- 27 would be from EJ TSZs and approximately one-tenth of the trips on the managed lanes would be from EJ
- 28 TSZs.
- 29

1 Tolling Effects on EJ Populations

- 2 An understanding of tolling impacts on users is necessary prior to assessing the totality of project impacts
- 3 on EJ populations. Therefore, the determination of impacts resulting from the proposed project on EJ
- 4 populations is presented at the end of **Section 5.2.10** (subsection *Summary of EJ Findings*).
- 5 5.2.10 Economic Impacts of Tolling
- 6

7 No-Build Alternative

- 8 No adverse economic impacts would result from the No-Build Alternative in relation to tolling.
- 9

10 Build Alternative

11 Various topics relating to tolling and the resulting impacts are discussed below, including toll operation 12 and pricing, methods of toll charge collection, and payment methods.

13

14 Toll Operation and Pricing

15 As mentioned previously, utilizing MHOV-C lanes would require toll collection for both SOV and HOV

- 16 users. Policies for MHOV-C facilities were approved by the RTC in May 2006 (modified September 2007)
- 17 and are detailed in **Appendix G-1**: *Business Terms for TxDOT-Sponsored Managed Lane Facilities*.
- 18

19 According to this policy, a fixed-fee schedule would be applied during the first six months of operation and 20 dynamic-fee pricing would be applied thereafter. Toll rates would be updated monthly during the fixed-fee 21 schedule phase. The toll rate could be set up to 75 cents per mile during the fixed-fee schedule phase in 22 accordance with current policy; however that toll rate is not likely to be established as further discussed in 23 the scenarios described below that correspond with the ETC of the proposed project. Because the 24 proposed project (from FM 2181 to US 380) is anticipated to be constructed in stages, the anticipated 25 opening years are 2020 for IH 35E from FM 2181 to the IH 35E/IH 35W interchange and 2026 from the IH 26 35E/IH 35W interchange to US 380. The actual established rate would be evaluated and adjusted, if 27 warranted, with RTC approval.

28

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

3

Users of the MHOV-C lanes would be notified of the toll rate before entering the designated lanes by an electronic message board. Clearly posted overhead signage would designate the lane that drivers should use to enter and exit the facility. Mainlanes and frontage roads, including the proposed added capacity, would remain as non-tolled options for all users (additional information on non-tolled options is provided in the discussion below), and no existing mainlanes would be converted to tolled MHOV-C lanes.

9

10 Express Lanes Demonstration Program Tolling Agreement

11 The IH 35E corridor (South, Middle, and North Sections) from IH 635 to US 380 has been approved as a 12 demonstration project associated with the SAFETEA-LU Express Lanes Demonstration Program (ELDP). 13 The ELDP agreement between TxDOT and FHWA allows TxDOT (directly or through a third party public 14 authority or private entity) to establish a toll that varies in price according to time of day or level of traffic, 15 as appropriate, to manage congestion or improve air quality. TxDOT must audit the records of the 16 managed lanes annually for compliance with the provisions of the ELDP and report the results to FHWA. 17 In accordance with SAFETEA-LU, the performance goals and monitoring/reporting program set forth in 18 the ELDP agreement may be amended as deemed desirable. As part of the monitoring and reporting 19 program, TxDOT will prepare a document that describes the information to be collected, the methodology 20 for identifying baseline values, and the approach for developing the annual reports that will assess facility 21 performance. An annual report will be prepared by TxDOT and submitted to FHWA by March 31st of each 22 year that documents processes and procedures and will include 1) project information; 2) performance 23 highlights; 3) a performance summary; and 4) performance details.

24

25 <u>Analysis of Potential Toll Rate Impacts</u>

26 Toll rates for the IH 35E MHOV-C lanes would be determined prior to opening the facility to traffic. A toll 27 revenue study, Draft – Level 2 Traffic and Toll Revenue Study: IH 35E Managed Lanes between IH 635 28 and US 380 ('IH 35E Draft Level 2 T&R Study'), has been prepared to represent a range of toll revenue 29 outcomes. The results of this IH 35E Draft Level 2 T&R Study include various project scenarios with 30 certain assumptions included that affect the results. The three scenarios presented in the IH 35E Draft 31 Level 2 T&R Study (i.e., afternoon peak, mid-day peak, and off peak) can be utilized to illustrate the potential impacts associated with toll rates. Each scenario provides assumptions and an explanation of 32 33 input variables used to arrive at a total cost impact to users of the proposed MHOV-C lanes.

34

Anticipated toll rates and total cost impacts to users are provided for each scenario for the assumed opening years of 2020 (IH 35E from FM 2181 to the IH 35E/IH 35W interchange) and 2026 (IH 35E from the IH 35E/IH 35W interchange to US 380). Thus, the entire project (from FM 2181 to US 380) is

1 anticipated to be complete by 2026. For each scenario in 2026, the average travel distance per 2 household that would use the MHOV-C lanes of the proposed project would be 7 miles out of the total 11-3 mile section (from FM 2181 to US 380), equating to 14 miles for a round trip. Because the portion of the 4 project anticipated to be completed in 2020 accounts for approximately 9.5 miles of the total project 5 length (11 miles), the 7-mile average trip length was also used as a conservative estimate in the analysis 6 of total cost impacts to users of the MHOV-C lanes in 2020. As a component of the IH 35E Draft Level 2 7 T&R Study, the 7-mile assumption of average travel distance using the proposed MHOV-C lanes along 8 the 11-mile length of the proposed project limits is derived from evaluating trip distance patterns from 9 O&D survey data collected from travelers using license plate matching methods. Users also completed 10 surveys that allowed the study team to determine average mileage usage data reflecting average trip 11 patterns by roadway segment along the entire IH 35E proposed reconstruction corridor from IH 635 in 12 Dallas to US 380 in Denton. For the entire proposed 28-mile IH 35E reconstruction corridor, the average 13 household mileage usage equals 11 miles based on the results of the O&D survey. For additional 14 average trip length information, see Appendix G-6: Traffic and Revenue Analysis Consistency and MTP 15 Phasing Compatibility.

16

Toll rates applied to each scenario on the proposed MHOV-C lanes are calculated based on the estimated per mile toll rate from the *IH 35E Draft Level 2 T&R Study*, specific to this project as well as the estimated average distance traveled on the proposed MHOV-C lanes, which indicates demand to travel on the MHOV-C lanes. Toll rates reflect the dynamic pricing concept of the MHOV-C lanes associated with the proposed project and are a function of balancing the demand to use them, the value of time cost savings of their use to users, and users' willingness to pay to use the MHOV-C lanes versus the cost of congestion experienced on the non-tolled lanes.

24

25 An assumed number of round trips are provided for each scenario that reflects the likely frequency of 26 household use during the stated period, and which are based on case study observations of similar 27 operating projects involving high occupancy/toll (HOT) lane facilities. HOT lanes are those that give 28 motorists in SOVs access to HOV lanes and implement a charge for their use of the lanes that varies 29 based on the level of congestion in those lanes. The greater the level of congestion in HOT lanes, the 30 higher the charge to use them. The goal of HOT lanes is to minimize traffic congestion by pricing the use 31 of the lanes. From case study observations, it was revealed that most travelers only use the toll lanes 32 when the perceived benefits of time cost savings and less congestion are equal to or exceed the toll 33 charges. The majority of current HOT lane facilities show that those facilities or specific HOT lanes 34 primarily cater to non-frequent users. Four case studies of HOT lane user frequency ultimately revealed 35 that the average user traveled on HOT lanes from once or less a week to an upper limit of 2.5 times per 36 week. The most similar project of the four case studies reviewed was the Katy Freeway (IH 10) in the 37 Houston region, which became operational in April 2009. Based on the other similar case studies, the

1 study team considered 2 trips per week for the mid-day peak and off-peak trip scenarios and 2.5 trips per 2 week for the afternoon peak scenario, reasonable and indicative of the patterns shown with regard to 3 existing HOT lane facilities.

4

The three scenarios analyzed are detailed below. The two assumed ETC years of 2020 (IH 35E from FM 5 6 2181 to the IH 35E/IH 35W interchange) and 2026 (IH 35E from the IH 35E/IH 35W interchange to US 7 380) are addressed in each scenario, with the assumed opening year of 2020 shown in brackets.

- 8

24

9 1) Afternoon Peak Scenario (4:30 PM - 6:30 PM): The Afternoon Peak Scenario assumes that 10 the toll rate in 2026 would be 40 cents per mile [34 cents per mile in 2020] and assumes that the average household would make 2.5 trips per week during this peak period or 130 round trips per 11 12 year. The average length of an individual trip for the average household would total 7 miles out of 13 the 11-mile section of the proposed project, equating to 14 miles for a round trip. Under this 14 scenario, the annual cost to the user based on the stated assumptions would be approximately 15 \$721.61 per year in 2026 [\$613.21 per year in 2020]. A user with a consumer price index (CPI)adjusted (2.75 percent) annual household income in 2026 of \$118,419 [\$100.631 in 2020] based 16 17 on the 2009 median household income for Denton County (\$70,724) would spend approximately 18 0.6 percent of his or her annual household income on IH 35E MHOV-C lane tolls in both ETC 19 years. However, households with CPI-adjusted incomes in 2026 of \$35,446 [\$30,122 in 2020] 20 based on the 2011 HHS-established poverty level of \$22,350 (for a family of four) would spend 21 approximately 2.0 percent of their annual household income on IH 35E MHOV-C lane tolls, which 22 would account for approximately 1.4 percent more of total household income than the median for 23 Denton County households in both ETC years.

25 2) Mid-Day Peak Scenario (9:00 AM - 3:00 PM): The Mid-Day Peak Scenario assumes that the toll rate in 2026 would be 8 cents per mile [7 cents per mile in 2020] and assumes the average 26 27 household would make 2 round trips per week during this period or 104 round trips per year. The 28 average length of an individual trip for the average household would total 7 miles out of the 11-29 mile section of the proposed project, equating to 14 miles for a round trip. Under this scenario, 30 the annual cost to the user based on the stated assumptions would be approximately \$115.46 per 31 year in 2026 [\$98.11 per year in 2020]. A user with a CPI-adjusted (2.75 percent) annual 32 household income in 2026 of \$118,419 [\$100,631 in 2020] based on the 2009 median household 33 income for Denton County (\$70,724) would spend approximately 0.1 percent of his or her annual household income on IH 35E MHOV-C lane tolls in both ETC years. However, households with 34 35 CPI-adjusted incomes in 2026 of \$35,446 [\$30,122 in 2020] based on the 2011 HHS-established 36 poverty level of \$22,350 (for a family of four) would spend approximately 0.3 percent of their 37 annual household income on IH 35E MHOV-C lane tolls, which would account for approximately 0.2 percent more of total household income than the median for Denton County households in both ETC years.

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3) Off Peak Scenario (7:30 PM - 8:00 AM): The Off-Peak Scenario assumptions are identical to
the Mid-Day Peak Scenario assumptions described above. That is, an 8 cents per mile toll rate in
2026 [7 cents per mile in 2020], 2 round trips per week for the average household (104 round
trips per year), and a 7-mile average trip length (14 miles round trip). Therefore, the same
percentages spent in the Mid-Day Peak Scenario on the MHOV-C lanes by households (median
income and at the poverty level) also apply to the Off-Peak Scenario in both ETC years.

10

Under the above three scenarios, all users of the MHOV-C lanes at all income levels would realize a 11 12 travel time savings benefit as opposed to using mainlanes along the IH 35E corridor. This travel 13 timesavings benefit would be more pronounced under the peak period scenario in which, during that time, 14 increased traffic congestion on the mainlanes would more pointedly warrant the use of the less congested 15 MHOV-C lanes. Under the mid-day and off-peak scenarios, a travel time savings benefit would still exist, 16 even though the benefit would be less profound during these periods when mainlanes are less 17 congested. Changes in the toll rate along the facility are designed to balance the toll rate with the value 18 of travel time cost savings.

19

20 Non-Toll Alternatives

21 The proposed project would not evenly distribute the benefits of time cost savings associated with the 22 MHOV-C lanes among all income groups, because lower income groups would pay a higher proportion 23 (approximately three to four times more) of their income for tolls as compared to middle and higher 24 income groups for the same time savings benefit. However, alternative project-specific, non-toll options 25 currently exist or would at the time the MHOV-C lanes would be open to traffic. In general, the proposed 26 IH 35E reconstruction would add one to three additional non-tolled mainlanes in each direction, make the 27 existing two-lane non-tolled frontage roads continuous throughout the project corridor, provide an 28 additional non-tolled frontage road lane at exit ramp locations and where traffic projections exhibited high 29 traffic volumes, and provide intersection improvements. Thus, the reduced congestion and improved 30 mobility along the mainlanes and frontage roads resulting from these improvements would benefit all 31 users of IH 35E from FM 2181 to US 380, including low-income users. Because the proposed project 32 would provide non-toll alternatives (six to 10 non-toll mainlanes, three to five in each direction), it is 33 expected that traffic would, for the most part, continue to travel the mainlanes regardless of the MHOV-C 34 lanes.

35

The difference in travel times between the tolled MHOV-C lanes and the non-tolled mainlanes and frontage roads would be the highest during peak periods of travel when increased traffic congestion on

1 the mainlanes would more pointedly warrant the use of the less congested MHOV-C lanes. RTC's 2 managed lane policy, approved in June 2005, requires a "speed guarantee" of 50 mph; therefore, in 3 conditions of congestion, the non-tolled mainlanes would likely operate at speeds lower than 50 mph 4 creating longer travel times for motorists utilizing the non-tolled mainlanes compared to motorists traveling 5 a minimum of 50 mph along the tolled HOV/managed lanes. Motorists using the frontage road may 6 experience longer travel times than motorists using the non-tolled mainlanes due to a lower posted speed 7 limit and signalization. It is anticipated that the overall added capacity the proposed project would relieve 8 traffic congestion for all motorists using IH 35E whether they use the non-tolled mainlanes or frontage 9 roads compared to the existing facility. Congestion can best be described in terms of LOS and travel 10 speeds along a roadway. The LOS is a qualitative measure of describing operational conditions within a 11 traffic stream or at an intersection, generally described in terms of such factors as speed and travel time, 12 freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The proposed increase 13 in capacity would only relieve traffic congestion (improve LOS) temporarily. Eventually, increasing traffic 14 would increase demand and deteriorate the LOS of the facility, which would result in congestion. Refer to 15 Section 6.6.2 for a comparison of the number of lane-miles operating under different LOS between Build 16 and No-Build Alternatives in 2030 during the AM peak hour. Overall, motorists would have access to a 17 greater number of non-tolled mainlanes within the project limits as currently exist (an increase of one to 18 three additional non-tolled mainlanes in each direction).

19

20 Transit Usage

The proposed project is located within the DCTA service area. The DCTA is a coordinated county transportation authority that serves Denton County's public transportation needs. However, DCTA provides a rail service that connects to the Dart rail service, providing access from locations in Denton County to locations in Dallas County.

25

26 The MHOV-C lane component of the proposed project would provide transit users with the ability to 27 realize travel time cost savings that would help equalize the distribution of benefits among all income 28 groups. Currently, the DCTA provides a bus service, known as Connect, which serves the Cities of 29 Denton and Lewisville. DCTA also provides a commuter rail line service, known as the A-train, which 30 seves the Trinity Mills rail station in the City of Carrollton to offer customers DART connection 31 opportunities. Per RTC policy, when DCTA vehicles utilize the IH 35E MHOV-C lanes, no toll charges 32 would be applied to DCTA. As such, MHOV-C lane users, including EJ populations (consisting of minority 33 and/or low-income individuals), might decide to reduce their personal economic impact of tolls by using 34 transit, where tolls would be waived for the transit provider as detailed in **Appendix G-1**: Business Terms 35 for TxDOT-Sponsored Managed Lane Facilities (approved May 2006, modified September 2007).

In sum, the aforementioned project-specific, non-toll options, including transit (e.g., DCTA Connect and
 DCTA A-train), available to all groups, including low-income populations, would assist in offsetting the
 unequal distribution of travel time cost savings benefits based on income.

4

5 Methods of Toll Charge Collection

An electronic toll collection system would be implemented along the IH 35E MHOV-C lanes. The MHOVC 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.

10

11 The toll collection system for the IH 35E MHOV-C lanes would be interoperable with other toll facilities in the State. The TxDOT TxTag®, the NTTA TollTag® (Dallas area), and the Harris County Toll Road 12 Authority (HCTRA) EZ TAG® (Houston area) would be accepted.⁵⁴ Toll charges could be automatically 13 14 deducted from one of these prepaid credit accounts when the MHOV-C lanes are used. If the driver does 15 not have one of these interoperable transponders, a monthly statement of toll use charges would be 16 mailed to the driver through the video billing system. Bilingual (English and Spanish) information on 17 payment methods is available on the TxDOT (www.TxTag.org) and the NTTA (www.ntta.org) websites, 18 over the phone (Customer Service Centers), or in person at one of the store locations.

19

20 <u>TxDOT TxTag® Account Payment Methods</u>

21 With a TxTag® "AutoPay" account, the user would pay a minimum installment of \$29.65 (\$20 credit and a 22 \$9.65 one-time fee for the TxTag®) through a credit or debit card. The account would then be 23 established with a \$20 credit, which would be reduced each time the transponder passes through an 24 operating toll gantry. The account holder's credit or debit card would be automatically charged when the 25 funds in the "AutoPay" account exceed a pre-set threshold value. There is no fee for this service. A user 26 can enroll for "AutoPay" by accessing the account online (www.TxTag.org) and providing credit or debit 27 card information; or by calling the TxTag® Customer Service Center located in Austin, Texas (1-888-468-28 9824).

29

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 the account to cover incurred toll charges. Toll rates would be the same as the "AutoPay" account toll rates. "Manual Pay" accounts could be replenished via credit card, debit card, cash, or check/money order. Paying by credit or debit card could be handled online (www.TxTag.org), via the phone (1-888-

⁵⁴ The costs and amounts discussed are subject to change as TxDOT, NTTA, and HCTRA policies may vary.

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.

4

5 The TxTag® sticker must be permanently placed on the windshield and cannot be moved between 6 vehicles without damaging the toll transponder. If a user has more than one vehicle, the user can order 7 more transponders and manage them all through the same account. Regardless of the type, TxTag® 8 accounts may be monitored free of charge via the internet. Should the user request a monthly invoice, a 9 \$1.00 charge per five pages invoiced would be incurred each month.

10

11 NTTA TollTag® Account Payment Methods

With a TollTag® prepaid "Credit User" account, the driver would pay a minimum installment amount of \$40 through a credit or debit card. The account would then be activated with this 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.

18

19 Similar to the TxTag® "Manual Pay" account, the NTTA also allows cash payments. For those who 20 choose to maintain a prepaid "Cash User" account, an initial deposit of \$25 would be required for the toll 21 transponder as well as a \$40 payment to establish the account. Per NTTA policy, this automatic deposit 22 is required of "Cash User" accounts. The "Cash User" deposit can be refunded without interest if the user 23 returns the transponder in good condition or if the "Cash User" account is converted into a "Credit User" 24 account. The prepaid "Cash User" account would require the driver to maintain sufficient funds in the 25 account to cover incurred toll charges. Cash payments can be made at the NTTA's TollTag® Store in 26 Dallas, Texas, at the TollTag® Customer Center in Plano, Texas, or at any of the ACE Cash Express, Inc. 27 locations throughout DFW. Toll rates would be the same as "Credit User" account toll rates. When 28 passing through a toll lane equipped with a traffic signal, a yellow light on the traffic signal indicates that 29 the account balance is at or below \$10. A red light indicates that the account balance is zero dollars. 30 The NTTA must receive payment at one of the TollTag® locations before the account reaches zero 31 dollars to avoid the incurrence of toll violations.

32

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 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.

1 <u>Video Billing Payment Methods</u>

Through a system known as video billing, it would still be possible to utilize the MHOV-C lanes 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.

8

9 The owner of the vehicle may be charged an estimated maximum toll rate premium of 45 percent, which 10 is to offset the costs related to processing license plate information. In addition to this premium, 11 incidental administrative fees would be incurred. These would include the costs to prepare and mail the 12 monthly statements.

13

14 Under the video billing concept, the results of the IH 35E Draft Level 2 T&R Study include project 15 scenarios with certain assumptions included that affect the results. These scenarios are the same three 16 scenarios presented in the IH 35E Draft Level 2 T&R Study related to electronic toll collection system 17 tolling (as described above), except they account for an assumed 45 percent surcharge to cover the 18 anticipated additional cost of processing toll transactions. These scenarios can be utilized to illustrate the 19 potential impacts associated with toll rates under this concept. Each scenario provides assumptions and 20 an explanation of input variables used to arrive at a total cost impact to users of the proposed MHOV-C 21 lanes. Anticipated toll rates and total cost impacts to users are provided below for each scenario for the 22 assumed opening years of 2020 (IH 35E from FM 2181 to the IH 35E/IH 35W interchange) and 2026 (IH 23 35E from the IH 35E/IH 35W interchange to US 380), with the assumed opening year of 2020 shown in 24 brackets. For each scenario, the same assumptions related to average user travel distance on the 25 MHOV-C lanes, toll rate, and number of round trips as provided for the electronic toll collection scenarios 26 also apply to the following three video billing scenarios.

- 27
- 28 1) Afternoon Peak Scenario (4:30 PM - 6:30 PM): The Afternoon Peak Scenario assumes that the 29 toll rate in 2026 would be 40 cents per mile [34 cents per mile in 2020] and the average 30 household would make 2.5 round trips per week during this peak period or 130 round trips per 31 year. The average length of an individual trip for the average household would total 7 miles out of 32 the 11-mile section of the proposed project, equating to 14 miles for a round trip. Under this 33 scenario, the annual cost to the user based on the stated assumptions in addition to a 45 percent 34 surcharge would be approximately \$1,046 per year in 2026 [\$889 per year in 2020]. A user with 35 CPI-adjusted (2.75 percent) annual household income in 2026 of \$118,419 [\$100,631 in 2020] 36 based on the 2009 median household income for Denton County (\$70,724) would spend 37 approximately 0.9 percent of his or her annual household income on IH 35E MHOV-C lane tolls in

both ETC years. However, households with CPI-adjusted incomes in 2026 of \$35,446 [\$30,122 in 2020] based on the 2011 HHS-established poverty level of \$22,350 (for a family of four) would spend approximately 3.0 percent of their annual household income on MHOV-C lane tolls, which would account for approximately 2.1 percent more of total household income than the median for Denton County households in both ETC years.

- 7 2) Mid-Day Peak Scenario (9:00 AM - 3:00 PM): The Mid-Day Peak Scenario assumes that the toll 8 rate in 2026 would be 8 cents per mile [7 cents per mile in 2020] and that the average household 9 would make 2 round trips per week during this period or 104 round trips per year. The average 10 length of an individual trip for the average household would total 7 miles out of the 11-mile section 11 of the proposed project, equating to 14 miles for a round trip. Under this scenario, the annual 12 cost to the user based on the stated assumptions in addition to a 45 percent surcharge would be 13 approximately \$167.41 per year in 2026 [\$ 142.27 per year in 2020]. A user with a CPI-adjusted 14 (2.75 percent) annual household income in 2026 of \$118,419 [\$100,631 in 2020] based on the 15 2009 median household income for Denton County (\$70,724) would spend approximately 0.1 percent of his or her annual household income on IH 35E MHOV-C lane tolls in both ETC years. 16 17 However, households with CPI-adjusted incomes in 2026 of \$35.446 [\$30.122 in 2020] based on 18 the 2011 HHS-established poverty level of \$22,350 (for a family of four) would spend 19 approximately 0.5 percent of their annual household income on IH 35E MHOV-C lane tolls, which 20 would account for approximately 0.4 percent more of total household income than the median for 21 Denton County households in both ETC years.
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- 3) Off Peak Scenario (7:30 PM 8:00 AM): The Off-Peak Scenario assumptions are identical to
 the Mid-Day Peak Scenario assumptions described above. That is, an 8 cents per mile toll rate in
 2026 [7 cents per mile in 2020], 2 round trips per week for the average household (104 round
 trips per year), a 7-mile average trip length (14 miles round trip), and a 45 percent surcharge.
 Therefore, the same percentages spent in the Mid-Day Peak Scenario on the MHOV-C lanes by
 households (median income and at the poverty level) also apply to the Off-Peak Scenario in both
 ETC years.
- 30

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

I			
2	•	Returned Check (Insufficient Funds)	\$25.00
3	•	Administrative Fee - Violation Notice*	\$5.00
4	•	Administrative Fee - Violation in Collections*	\$25.00
5	•	Administrative Fee - Violation Sworn Complaint Issued*	\$100.00

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

6 7

4

8 If the registered owner does not have a toll transponder, he/she would receive a bill every month for the 9 balance. There is no minimum threshold for video billing to occur. As with the prepaid account, video 10 billing would allow for cash, credit, or debit payments.

11

12 Comparison of Payment Methods

13 Not maintaining a prepaid account would impact any user, including low-income users, because the cost 14 of paying the accumulated toll charges without an account would represent a higher toll rate than toll 15 charges affiliated with a prepaid account. Cash payment options are available for each payment method; 16 however only those users who maintain automatic and manual pay prepaid accounts would benefit from 17 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 18 19 Service Center located in Austin, Texas. Cash payments must be made at the TxTag® Customer Service 20 Center in Austin. Check or money orders can be taken or mailed to the TxTag® Customer Service 21 Center in Austin.

22

23 On May 12, 2010 NTTA launched a partnership with ACE Cash Express, Inc. to provide additional cash 24 service options. ACE Cash Express, Inc. is a retailer of financial services, including short-term consumer 25 loans, check cashing, bill payment, and prepaid debit card services. NTTA cash customers can now 26 utilize 153 ACE Cash Express, Inc. locations in DFW to handle services such as ZipCash payments, new 27 cash-backed TollTag® accounts, and cash TollTag® account replenishment. NTTA customers who 28 receive ZipCash invoices or ZipCash late invoices can also visit any ACE Cash Express, Inc. location to 29 pay their bill. If users have a TollTag® account, it can be set up using credit or debit cards or cash at the 30 NTTA's TollTag® Store in Dallas and at the TollTag® Customer Center in Plano. Additional cash option 31 locations include all ACE Cash Express, Inc. establishments in the DFW area.

32

TxDOT's website <u>www.keeptexasmoving.com</u> provides descriptions and maps of toll roads in Austin,
 Dallas, Houston, and Tyler; and descriptions of managed HOV lanes in Dallas, Fort Worth, and Houston.
 The NTTA website (<u>www.ntta.org</u>) provides information on toll roads and managed HOV lanes in the
 DFW metroplex. The NTTA's online Customer Service Center can be used to open an account, manage

the account, and pay for violations. Both TxDOT's website and NTTA's online Customer Service Centercan be viewed in Spanish.

3

4 In summary, toll rates are generally 45 percent higher for drivers who do not have an electronic toll 5 transponder to offset the costs related to processing the license plate information associated with video 6 billing. Although certain toll transponder account holders are required to pay up-front fees or deposits for 7 toll transponders (\$9.65 fee per transponder for TxTag® accounts and \$25 deposit for TollTag® "cash 8 users" accounts), the toll transponder account holders would benefit from lower toll rates compared to the 9 total toll rates associated with video billing. In other words, the up-front fees associated with toll 10 transponders may be offset through time when considering the premium and processing fees affiliated 11 with the video billing method of payment.

12

13 The proposed project would not evenly distribute the benefits of time cost savings associated with the 14 MHOV-C lanes among all income groups because lower income groups would pay a higher proportion 15 (approximately three to four times more) of their income for tolls as compared to middle and higher 16 income groups for the same time savings benefit. However, alternative project-specific, non-toll options, 17 including transit (e.g., DCTA A-train) and project-centric added capacity (on non-tolled mainlanes and 18 non-tolled frontage roads), currently exist or would at the time the MHOV-C lanes would open. As 19 discussed above in the Toll Operation and Pricing subheading of this section, these project-specific, non-20 toll options available to all groups, including low-income populations, would assist in offsetting the 21 unequal distribution of travel time cost savings benefits based on income, regardless of toll collection 22 method.

23

24 Summary of EJ Findings

The EO 12898 term "disproportionately high and adverse effect" considers the *totality* of impacts to human health and environment. As detailed in **Section 5.2.9**, Census data indicate that 18 Census blocks within 0.25 mile of the proposed project ROW contain minority populations that are 50 percent or greater and 137 Census blocks contain specific and combined minority populations that are at least 50 percentage points higher than their respective block groups. Five Census block groups located within 0.25 mile of the proposed project ROW reported medium household incomes below that of the HHS 2011 Poverty Guidelines (\$22,350) for a family of four.

32

Potential impacts to EJ communities identified in the analysis include the loss of jobs by minimum wage workers. As described in **Section 5.2.5**, the majority of jobs lost or relocated due to the proposed project originate from typically low-wage and low-skill industries (e.g., fast food/restaurant, service stations, retail, etc.). However, replacement property searches determined that the majority of businesses would have options to successfully relocate within their service area; and there appear to be future employment opportunities of varying skill requirement within the Cities of Denton and Corinth based on planned future developments. Further, in relation to other impacts on the human population, such as changes in access and travel patterns, community cohesion, noise (see **Section 5.2.13** below), etc., the proposed project's impacts would not be predominately born by EJ Census block groups and blocks. Instead, they would be shared by both EJ and non-EJ populations found within the Census blocks/block groups and the elementary school attendance zones.

7

As previously discussed in the O&D Analysis (see **Section 5.2.9**) and summarized in **Table 5-19**, of the total TSZs anticipated to utilize the IH 35E 2030 Build mainlanes, approximately 31 percent were EJ TSZs; this accounts for 15 percent of all trips by TSZs on the Build mainlanes. Of the total TSZs anticipated to utilize the IH 35E 2030 managed lanes, approximately 12 percent were EJ TSZs, and this accounts for 10 percent of all trips by TSZs on the Build managed lanes. In sum, EJ TSZ trips would account for approximately one-sixth of trips on the Build mainlanes and one-tenth of trips on the Build managed lanes.

15

16 The proposed project would not evenly distribute the benefits of time cost savings associated with the 17 MHOV-C lanes among all income groups because lower income groups would pay a higher proportion 18 (approximately three to four times more) of their income for tolls as compared to middle and higher 19 income groups for the same time savings benefit. However, alternative project-specific, non-toll options 20 currently exist or would at the time the MHOV-C lanes open to traffic. Such non-tolled options include the 21 addition of non-tolled mainlanes and frontage roads to the existing IH 35E facility, thereby improving 22 mobility for all users (including low-income users) who do not elect or only on an occasional basis can 23 afford to travel on the MHOV-C lanes. Additionally, by using transit options such as the DCTA A-train, all 24 users (including low-income) would realize a travel-time savings and reduce their personal economic 25 impact since tolls would be waived for the transit provider per RTC policy (see Appendix G-1).

26

Further, in accordance with the RTC's *Excess Toll Revenue: Managed Lane Policy* (see **Appendix G-2**), the excess toll revenue generated from the IH 35E MHOV-C lanes would remain in the county of the revenue-generating project (i.e., Denton County). This revenue could be used in the construction or maintenance of other tolled and/or non-tolled roadways and for other congestion reducing efforts (e.g., transit, ITS, etc.) that would benefit all populations from varying income levels.

32

Based on the above discussion and analysis looking at the totality of effects from the proposed IH 35E
 project (see Sections 5.2.9 and 5.2.10), including the benefits associated with non-tolled alternatives,
 disproportionately high and adverse impacts on minority or low-income populations are not anticipated.
 Therefore, the requirements of EO 12898 appear to be satisfied.

1 5.2.11 Public Facilities and Services

2

3 **No-Build Alternative**

4 Implementation of the No-Build Alternative would not adversely affect any public facilities or services;

- 5 however, the No-Build Alternative would not improve mobility to access these facilities and services.
- 6

7 Build Alternative

8 Table 5-20 lists public facilities identified within the municipalities encompassing the proposed project

9 (Cities of Corinth and Denton) and within the municipalities near the proposed project (City of Lake Dallas

10 and Town of Hickory Creek). There are 11 health care facilities, six civil service facilities, three libraries,

11 two senior living centers, 11 schools, nine worship centers, one cultural center, and one municipal

12 building located within and in the vicinity of the proposed project area.

TABLE 5-20. PUBLIC FACILITIES LOCATED WITHIN AND IN THE VICINITY OF THE PROPOSEDPROJECT AREA

Facility	Property Address		
Health Care			
Denton Regional Medical Center	3535 South IH 35E, Denton, Texas 76210		
North Texas Hospital	2801 South Mayhill Road, Denton, Texas 76208		
Mayhill Hospital	2809 South Mayhill Road, Denton, Texas 76208		
Integrity Transitional Hospital	2813 South Mayhill Road, Denton, Texas 76208		
Baylor Surgicare	350 South IH 35E, Denton, Texas 76205		
Denton State School, a Texas Department of Aging and Disability Services facility	3980 State School Road, Denton, Texas 76210		
Minor Emergency of Denton	2438 Lillian Miller Parkway, Suite 100, Denton, Texas 76205		
Cook Children's Cardiology	209 North Bonnie Brae Street, Suite 301, Denton, Texas 76201		
Denton Community Hospital	207 North Bonnie Brae Street, Denton, Texas 76201		
Rehabilitation Hospital	2620 Scripture Street, Denton, Texas 76207		
Presbyterian Hospital Denton	3000 North IH 35E, Denton, Texas 76201		
Civil Service			
Lake Dallas Police Department	212 Main Street, Lake Dallas, Texas 75065		
Hickory Creek Police Department	1075 Ronald Reagan Avenue, Hickory Creek, Texas 75065		
Corinth Police Department	2003 South Corinth Street, Corinth, Texas 76210		
Lake Cities Volunteer Fire Department	3101 Garrison Road, Denton, Texas 76210		
Denton City Fire Station, Number 6	3232 Teasley Lane, Denton, Texas 76210		
Denton City Fire Station, Number 3	1204 McCormick Street, Denton, Texas 76201		
Library			
South Library	3228 Teasley Lane, Denton, Texas 76210		
Denton Public Library	3228 Teasley Lane, Denton, Texas 76210		
University of North Texas Library	1506 West Highland Street, Denton, Texas 76201		
Senior Living			
Flow Senior Health Center	3535 South IH 35E, Denton, Texas 76210		
Sterling House of Denton	2525 Lillian Miller Parkway, Denton, Texas 76210		
School			
North Central Texas College	1500 North Corinth Street, Corinth, Texas 76208		
Corinth Montessori School	1300 East Pecan Creek Circle, Corinth, Texas 76210		
Primrose School	1011 Ronald Reagan Avenue, Hickory Creek, Texas 75065		
North Texas School of Denton	2002 South IH 35E, Suite 500, Lake Dallas, Texas 75065		
Lake Dallas Primary School	104 Swisher Road, Lake Dallas, Texas 75065		
Corinth Primary School	3501 Cliff Oaks Drive, Corinth, Texas 76210		

TABLE 5-20. PUBLIC FACILITIES LOCATED WITHIN AND IN THE VICINITY OF THE PROPOSED PROJECT AREA

Facility	Property Address	
McMath Middle School	1900 Jason Drive, Denton, Texas, 76205	
Winfrey Academy	518 Acme Street, Denton, Texas 76205	
Borman Elementary School	1201 Parvin Street, Denton, Texas 76205	
University of North Texas	801 Texas Street, Denton, Texas 76209	
Texas Woman's University – Denton Campus	303 Administration Drive, Denton, Texas 76204	
Worship		
Harvest Church	2104 Vintage Drive, Corinth, Texas 76210	
United Methodist Campus Ministries	1501 Maple Street, Denton, Texas 76201	
Catholic Campus Center	1303 Eagle Drive, Denton, Texas 76201	
Denton Baptist Temple and Youth Center	610 North IH 35E, Denton, Texas 76205	
Iglesia Sobre La Roca	1100 Oakwood Drive, Denton, Texas 76205	
Eagle Pointe Community Church	1310 Lindsey Street, Denton, Texas 76205	
Pray For the Peace of Jerusalem	111 Lexington Lane, Denton, Texas 76205	
Primera Inglesia Bautista	3508 Brighton Drive, Denton, Texas 76210	
Friendship Church	3813 West University Drive, Denton, Texas 76207	
Cultural		
Murchison Performing Arts Center	2204 West Prairie Street, Denton, Texas 76201	
Municipal		
Corinth City Hall	3300 Corinth Parkway, Corinth, Texas 76208	

¹

The proposed project would improve mobility to access the facilities and services listed in **Table 5-20**. Of the facilities listed in **Table 5-20**, implementing the proposed project would displace one building associated with Denton Baptist Temple. This building currently operates as the temple's youth center. A

5 photograph of the facility is presented in Appendix A-9, Photograph 6, for reference. There are

6 approximately 2.6 acres of undeveloped land that are not proposed for ROW acquisition on the Denton

7 Baptist Temple property.

8

9 **5.2.12 Aesthetic Considerations**

10

11 No-Build Alternative

12 Aesthetic impacts are not anticipated under the No-Build Alternative.

13

14 Build Alternative

15 The visual landscape near the IH 35E project area is characterized by a combination of land uses 16 including: existing roadways, retail/commercial, industrial, institutional, and residential developments, as 17 well as some vacant land. Because the proposed project consists of improvements to existing roadways 18 and interchanges, the aesthetic character of the communities is not anticipated to noticeably change. 19 Further, the proposed project is in compliance with local development plans. Aesthetic design guidelines 20 are being developed for IH 35E and would apply to the IH 35E mainlanes and cross street bridges. 21 Aesthetic treatments for structural components (retaining walls, bridges, etc.) and landscaping would be 22 incorporated into the proposed project during final design Plans, Specifications, and Estimates; and 23 stakeholder input would be considered during this design process so as to minimize the potential for

1	aesthetic impacts. Additional aesthetic design concepts would be dependent on additional funding from
2	local governments, interest groups, and organizations.
3	
4	5.2.13 Noise
5	
6	No-Build Alternative
7	Highway traffic is the dominant source of noise in developed areas adjacent to IH 35E. The predicted
8	increase in future traffic volumes on IH 35E would likely increase future ambient noise levels.
9	
10	Build Alternative
11	This analysis was accomplished in accordance with TxDOT's (FHWA approved) Guidelines for Analysis
12	and Abatement of Highway Traffic Noise.
13	
14	Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. It is
15	commonly measured in decibels and is expressed as "dB."
16	
17	Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the
18	human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an
19	average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."
20	
21	Also, because traffic sound levels are never constant due to the changing number, type and speed of
22	vehicles, a single value is used to represent the average or equivalent sound level and is expressed as
23	"Leq."
24	
25	The traffic noise analysis typically includes the following elements:
26	 Identification of land use activity areas that might be impacted by traffic noise.
27	Determination of existing noise levels.
28	Prediction of future noise levels.
29	Identification of possible noise impacts.
30	 Consideration and evaluation of measures to reduce noise impacts.
31	
32	The FHWA has established the following Noise Abatement Criteria (NAC) in Table 5-21 for various land
33	use activity areas that are used as one of two means to determine when a traffic noise impact would
34	occur.
35	

TABLE 5-21. FHWA NOISE ABATEMENT CRITERIA

Activity	FHWA	TxDOT			
Category	dB(A) Leq	dB(A) 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.		
В	67 (exterior)	66 (exterior)	Residential		
С	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 occu	activity occurs. However, interior areas (Category D) are used if exterior areas are physically shielded from				

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.

2

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

4

5 Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the NAC.

6 "Approach" is defined as one dB(A) below the NAC. For example, a noise impact would occur at a

7 Category B residence if the noise level is predicted to be 66 dB(A) or above.

8

9 Relative criterion: the predicted noise level substantially exceeds the existing noise level at a receiver

10 even though the predicted noise level does not approach, equal, or exceed the NAC. "Substantially

11 exceeds" is defined as more than 10 dB(A). For example, a noise impact would occur at a Category B

12 13

14 When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement

15 measure is any positive action taken to reduce the impact of traffic noise on an activity area.

residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

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.

5

6 Existing and predicted traffic noise levels were modeled at receiver locations (Table 5-22 and Appendix

7 C, Figure C-20) that represent the land use activity areas adjacent to the proposed project that might be

8 impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

9

	Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2030	Change (+/-)	Noise Impact
R1	Residential	В	67	66	67	+1	Yes
R1A	Residential	В	67	62	64	+2	No
R2	Residential	В	67	62	62	0	No
R3	Residential	В	67	62	62	0	No
R3A	Retail	F					
R3B	Medical facility	D	52	47	49	+2	No
R3C	Medical facility	D	52	48	50	+2	No
R3D	Medical facility	D	52	48	50	+2	No
R3E	Retail	F					
R3F	Medical facility	D	52	44	46	+2	No
R3G	Motels and Restaurant	E	72	66	69	+3	No
R4	Multifamily Residential	В	67	48	50	+2	No
R4A	Medical facility	D	52	46	48	+2	No
R5	Residential	В	67	70	74	+4	Yes
R6	Residential	В	67	68	72	+4	Yes
R7	Residential	В	67	69	72	+3	Yes
R8	Residential	В	67	71	73	+2	Yes
R8A	Offices	E	72	67	70	+3	No
R8B	Motel	E	72	68	70	+2	No
R9	Multifamily Residential	В	67	61	65	+4	No
R9A	Motel	E	72	68	70	+2	No
R10	Multifamily Residential	В	67	62	64	+2	No
R10A	Medical facility	D	52	47	50	+3	No
R10E	Motel	E	72	67	70	+3	No
R11	Residential	В	67	67	74	+7	Yes
R12	Residential	В	67	67	72	+5	Yes
R13	Residential	В	67	65	69	+4	Yes
R13A	Motel	E	72	66	70	+4	No
R14	Residential	В	67	61	68	+7	Yes
R15	Residential	В	67	65	73	+8	Yes

TABLE 5-22. TRAFFIC NOISE LEVELS (DB(A) LEQ)

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2030	Change (+/-)	Noise Impact
R15A Motel	E	72	65	70	+5	No
R16 Residential	В	67	64	70	+6	Yes
R17 Residential	В	67	69	75	+6	Yes
R18 Murchison Performing Arts Center ¹	B&D	67/52	63/38	66/41	+3	Yes/No
R18A Active Sports Area	С	67	61	64	+3	No
R19 Multifamily Residential	В	67	59	64	+5	No
R20 Multifamily Residential	В	67	57	65	+7	No
R20A Medical facility	D	52	40	44	+4	No
Note: 1. Category B outdoor activity area used by band students						

TABLE 5-22. TRAFFIC NOISE LEVELS (DB(A) LEQ)

As indicated in **Table 5-22**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers.

6

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% of impacted, first row receivers by at least five dB(A); and to be "reasonable," it must not exceed the cost-effectiveness criterion of \$25,000 for each receiver that would benefit by a reduction of at least five dB(A) and the abatement measure must be able to reduce the noise level at least one impacted, first row receiver by at least seven dB(A).

13

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) 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.

18

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.

- 21
- 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.
- 24
- 25 Noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated
- 26 for each of the impacted receiver locations with the following results:

A noise barrier would not be feasible and reasonable for the following impacted receiver and, therefore, is
 not proposed for incorporation into the project.

3

4 R1: This receiver represents one residence with a driveway facing the roadway. A continuous noise

barrier would restrict access to this residence. Gaps in a noise barrier would satisfy access requirements
but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum,

7 feasible reduction of five dB(A).

8

9 Five noise barriers would be feasible and reasonable for the following impacted receivers and, therefore,

10 are proposed for incorporation into the proposed project (see **Table 5-23** and **Appendix C, Figure C-20**).

11 The total cost of the barriers would be \$3,020,148 for a total of \$17,870 per benefited receiver.

12

Noise Wall(NW) Number	Approximate Location	Impacted Receivers	# of Benefited Receivers	Length (feet)	Height (feet)
NW1	Pennsylvania Drive to Conway Lane along southbound (SB) ER and the mainlanes (ML).			1,417	14
	Woodbrook Drive to Pennsylvania Drive along SB ER and ML.			1,467	14
	NW1 Total	R5 – R8	26	2,884	14
NW2	From North Texas Boulevard to 70 feet north of Underwood Street along SB ER to SB ML			635	16
	From 120 feet north of Underwood Street to 130 feet north of Lindsey along the SB ER and SB ML.			803 1,890	14 18
	From 200 feet north of Lindsey Drive to approximately 500 feet north of Bernard Street along ML.			903	10
	NW2 Total	R12 – R14, and R17	43	4,231	10 – 18
NW3	Approximately 500 feet west of Fort Worth Drive to approximately 400 feet west of Lindsey Street along the northbound (NB) ER.			726	18
	From 200 feet north of Lindsey Street to 500 feet south of Lindsey along the SB ML.			320	18
	NW3 Total	R11	26	1,046	18
NW4	From approximately 600 feet southeast of Greenlee Street to Collier Street along the NB ML and exit ramp			1,580	18
	From Avenue C to 100 feet south of Collier Street along the NB ML			618	10
	NW4 Total	R15 and R16	24	<u>2,198</u>	<u> 10 – 18</u>
NW5	From Avenue D to Eagle Drive along the NB frontage road near the ROW.	R18	50 ¹	<u>899</u>	<u>12</u>
Note: 1. 0 typically us	Dutdoor activity area of Murchison Performing Arts C se the activity area during the day.	Center. An	estimated 5	50 band s	students

TABLE 5-23. PROPOSED NOISE WALLS

Any subsequent project design changes might require a reevaluation of this preliminary noise barrier proposal. The final decision to construct the proposed noise barriers would not be made until completion of the project design, utility evaluation, and polling of adjacent property owners.

5

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 predicted (2030) noise impact contours shown in **Table 5-24**.

10

TABLE 5-24. NOISE CONTOURS

Land Use	Impact Contour	Distance from ROW (feet)
NAC category B & C	66 dB(A)	400

11

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receivers is expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

19

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.

23

- 24 5.2.14 Traffic Operations
- 25

26 No-Build Alternative and Build Alternative

As described in **Section 2.3.1**, a traffic operations analysis performed for the proposed project design year (2030) determined that LOS would improve under the proposed Build Alternative as compared to the No-Build Alternative (see **Table 2-6**). That is, mainlane LOS was predicted to be at LOS F for the No-Build Alternative and LOS B/C/D or E for the Build Alternative. Further, operation of the proposed MHOV-C lanes was predicted at LOS A, the highest quality of service. Implementation of the No-Build Alternative would result in increased congestion and poor traffic flow.

33

34 5.2.15 Summary of Community Impact Assessment

35 The following is a summary of the community impact assessment for the proposed project:

7

- Regional and Community Growth: Forecasted regional and community growth and economic conditions in the proposed project area would benefit from the implementation of the proposed project. An improved transportation corridor with added capacity to the existing mainlanes and frontage roads and the introduction of MHOV-C lanes to the corridor would better manage traffic congestion and improve mobility to a highly developing area.
- Land Use, and 4(f) and 6(f) Properties: Current land use would be impacted by the conversion of 106.59 acres to public transportation ROW. Local and regional land use planning efforts, however, are not anticipated to be substantially altered by this conversion to transportation ROW.
 There are no regulated prime farmlands or Section 4(f) properties that would be impacted by the proposed project. There is no ROW acquisition from any park or recreation area; therefore, consideration under Section 6(f) is not required.
- 15 **Relocations and Displacements:** Approximately 106.59 acres of additional ROW are required under the Build Alternative. ROW acquisition would impact a total of 57 properties, including 17 16 17 residential and 40 commercial. The 17 residential displacements have an associated 18 18 residential structures (including two apartment buildings with eight apartment units each); and the 19 40 commercial properties have an associated 60 commercial structures (including buildings and 20 canopies at gasoline service stations). There are 44 businesses associated with the anticipated 21 40 commercial property displacements. All property owners would receive just compensation for 22 their property and relocation assistance would be provided for all affected parties in accordance with applicable state and federal requirements. All potential residential displacements and all but 23 24 three potential commercial displacements are located in the City of Denton; and the other three 25 potentially displaced commercial properties are located in the City of Corinth. Based on the 26 results of replacement residential and commercial property searches, there appear to be 27 sufficient available replacement properties to accommodate those residences and businesses 28 potentially displaced by the proposed project. It is anticipated that a range of 372 to 784 29 employees could experience job relocation or loss in association with the impacted businesses; however, NCTCOG employment forecasts, which account for the cyclical nature of employment 30 31 changes (including economic recessions), predict future employment growth for the Cities of 32 Corinth and Denton (see Section 5.2.4) as these municipalities respond to increased demand 33 spurred by forecasted population growth (see Table 2-3). In addition, information gained from 34 municipal Planning Officials and NCTCOG development monitoring identified future employment 35 opportunities of varying skill level within the Cities of Corinth and Denton; and minimization and mitigation efforts enacted by the Texas Workforce Commission (TWC) and Workforce Solutions 36

for North Central Texas are available to affected employers and employees. For these reasons, substantial business and employee impacts are not anticipated.

- Access: Implementation of the Build Alternative would require additional control of access areas relative to the No-Build Alternative; however, alternative access routes to adjacent properties would be maintained.
- 8 **Community Cohesion:** The presence of two universities (UNT and TWU) has fostered a large • 9 student community within the City of Denton; however, the residential status of these students 10 tends to be transient in nature, typically only extending the tenure of their enrollment. For this 11 reason, potential communities were delineated according to elementary school attendance zones, 12 as many social activities within a community often center around elementary schools. All of the 13 potential residential displacements (16 single-family and two multi-family consisting of eight 14 apartment units each) are located within one elementary school attendance zone comprised of 15 approximately 17,740 acres. It is not anticipated that the loss of 32 total residences within an 16 attendance zone of this size would negatively affect the overall cohesiveness and nature of the 17 encompassing communities.
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- LEP: Of the 48,882 persons within all of the block groups located within 0.25 mile of the proposed project, approximately 7.6 percent of the population (3,732 persons) speaks English less than "very well." Steps have been and would continue to be taken to ensure that LEP populations have access to the programs, services, and information TxDOT provides.
- Environmental Justice (EJ) and Economic Impact of Tolling (EJ/Tolling): For the 198
 Census blocks and 24 Census block groups within 0.25 mile of the proposed project ROW:
 - 18 Census blocks contain minority populations of 50 percent or greater (five of which have a population of less than 10);
 - 137 Census blocks contain specific combined minority populations that are at least 50 percentage points higher than their respective block groups;
- 30 o Median household incomes in 1999 for the Census block groups ranged from \$13,281 to
 \$90,888; and
 - Five block groups reported median household incomes below the HHS 2011 poverty guideline (\$22,350) for a family of four.
- Although minimum wage jobs would be lost because of the proposed project, there appears to be future employment opportunities with varying skill requirements within the Cities of Denton and Corinth. Further analysis of impacts on the human population (e.g., changes in access/travel

patterns, community cohesion, etc.) determined that impacts would not be predominately borne
 by EJ populations, but instead be shared by both EJ and non-EJ populations. O&D data analysis
 indicates that approximately one-sixth of the trips on the IH 35E mainlanes would be from EJ
 TSZs and approximately one-tenth of the trips on the managed lanes would be from EJ TSZs
 (see O&D Analysis Assumption and Limitations in Section 5.2.9).

7 As was demonstrated by the MHOV-C lane total cost impact scenarios presented in Section 8 5.2.10, the proposed project would not evenly distribute the benefits of time cost savings 9 associated with the MHOV-C lanes among all income groups because lower income groups 10 would pay a higher proportion (approximately three to four times more) of their income for tolls as 11 compared to middle and higher income groups for the same time savings benefit. However, 12 alternative project-specific, non-toll options currently exist or would at the time the MHOV-C lanes 13 would be open to traffic. In general, such project-centric, non-tolled options include adding one to 14 three non-tolled mainlanes in each direction, making the existing two-lane non-tolled frontage 15 roads continuous throughout the project corridor, providing an additional frontage road lane at the 16 IH 35E exit ramps and where traffic projections exhibited high traffic volumes, and providing 17 intersection improvements. These improvements to the existing IH 35E facility would improve 18 mobility for all users (including low-income users) who do not elect or only on an occasional basis 19 can afford to travel on the MHOV-C lanes. Additionally, by using transit options such as the 20 DCTA A-train, all users (including low-income) would realize a travel-time savings and reduce 21 their personal economic impact since tolls would be waived for the transit provider per RTC policy 22 (see Appendix G-1).

- Based on the totality of effects from the proposed project, disproportionately high and adverse impacts to minority or low-income populations are not anticipated.
- Public Facilities and Services: One public facility building, the Denton Baptist Temple Youth
 Center (see Appendix A-9, Photograph 6), would be displaced by the proposed project. In
 general, the proposed project would improve mobility to the facilities and services within and near
 the proposed project area.
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- Aesthetic Considerations: The aesthetic character of the surrounding IH 35E communities is not anticipated to change, as the proposed project consists of improvements to existing roadways and interchanges and is in compliance with local development plans. Aesthetic structural and landscape design considerations would be incorporated during final design Plans, Specifications, and Estimates.
- 37

Noise: The proposed project would result in a traffic noise impact. Five noise walls would be feasible and reasonable for a total of 169 benefited receivers (see Table 5-23); the total cost for the barriers would be \$3,020,148 for a total of \$17,870 per benefited receiver. See Appendix C, Figure C-20 for noise receiver and proposed noise wall locations.

- **Traffic Operations:** Under the Build Alternative, LOS improves with the mainlane improvements and the proposed MHOV-C lanes would operate at the highest quality of service (LOS A).
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9 5.3 Cultural Resources

10 Cultural resources are structures, buildings, archeological sites, districts (a collection of related structures, buildings, and/or archeological sites), cemeteries, and objects. Both federal and state laws require 11 12 consideration of cultural resources during project planning. At the federal level, NEPA and the National 13 Historic Preservation Act (NHPA) of 1966, among others, apply to transportation projects such as this 14 one. In addition, state laws such as the Antiquities Code of Texas apply to these projects. Compliance 15 with these laws often requires consultation with the Texas Historical Commission (THC)/Texas State 16 Historic Preservation Officer (TSHPO) and/or federally recognized tribes to determine the project's effects 17 Review and coordination of this project followed approved procedures for on cultural resources. 18 compliance with federal and state laws.

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20 5.3.1 Non-Archeological Historic Resources

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22 No-Build Alternative

Under the No-Build Alternative, additional ROW would not be acquired; therefore, no impacts to historicresources are anticipated.

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26 Build Alternative

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28 **Previous Coordination**

This project was previously coordinated with THC on November 18, 2004 (see **Appendix C-15**). A reconnaissance survey undertaken in 2003 identified 189 historic-age resources (built prior to 1962) in the project area of potential effects (APE), which was determined to be any additional ROW plus 500 feet in all directions. TxDOT Historians determined and THC concurred that only one property, the Acme Brick Company, was eligible for inclusion in the National Register of Historic Places (NRHP) and that the proposed project would have no adverse effect to the property.

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1 Current Coordination

Since the 2004 coordination, the project has undergone substantial design changes. As a result of these
changes and the passage of time since the original 2004 coordination, an additional reconnaissance
survey was undertaken in February 2009 to update the survey findings and re-coordination of the project
is necessary.

6

7 The February 2009 survey included resources that had not been identified, assessed, and coordinated by 8 the 2003 survey due to the 1962 survey cut-off date. This new survey effort identified resources 9 constructed between 1962 and 1966. The record search revealed no previously recorded NRHP 10 properties, State Archeological Landmark (SAL) properties, Recorded Texas Historic Landmark (RTHL) 11 properties, or Official State Historical Markers (OTHM) located within the APE, which for this re-evaluation 12 of the project was determined to be 150 feet from the existing and proposed ROW. The 2009 survey 13 identified 20 additional historic-age resources (built prior to 1966) within the APE, but TxDOT Historians 14 evaluated these findings and determined there were only eighteen historic-age resources. Therefore, the 15 total number of resources (result of the 2003 and 2009 survey efforts) is 207 historic-age resources.

16

17 TxDOT Historians re-evaluated all 207 historic-age resources and determined that none are eligible for 18 NRHP-listing, including the previously determined eligible Acme Brick property. Since the 2004 19 coordination, several buildings on the Acme property were demolished, new buildings and structures 20 were constructed, and several other buildings experienced extensive alterations that compromised any 21 remaining integrity of the property. THC concurred with these eligibility findings on February 18, 2010 22 (see concurrence letter dated February 3, 2010 in **Appendix C-16**).

23

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 FHWA, the TSHPO, the Advisory Council on Historic Preservation, and TxDOT and the MOU, TxDOT historians determined and THC concurred that there are no historic properties in the project APE.

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30 5.3.2 Archeological Resources

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32 No-Build Alternative

Under the No-Build Alternative, additional ROW would not be acquired; therefore, no impacts toarcheological sites are anticipated.

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36 Build Alternative

In August 2003, an archeological survey was conducted for the proposed project. Archival research,
 conducted through the Texas Archeological Research Laboratory, identified four archeological sites

previously recorded within one mile of the proposed project. None of these sites are located within the 150-foot wide APE, established on either side of the proposed project. In addition, field surveys were conducted on undeveloped areas located within the 150-foot wide APE where right of entry had been obtained. Fieldwork within these areas included an intensive pedestrian survey and shovel testing.

5

From FM 2181 to US 380, 167 shovel tests, varying from five to 64 inches deep, were excavated at 16 survey areas. During the course of the shovel testing, seven properties were recorded within the proposed project APE. All seven properties are considered historic in nature, but in poor condition (heavily impacted by construction or clearing, deliberately demolished, or lacking substantial integrity) such that their research value is considered minimal. Therefore, all seven properties were determined ineligible for inclusion in the NRHP and for SAL designation.

12

Following the completion of the above archeological survey, changes were made to the project ROW in early 2004, necessitating additional archeological investigation. Four new areas exceeded the 150-foot APE. Based on the new areas being previously disturbed, the small addition of ROW width, and the low probability of these new locations containing archeological resources, it was determined that no further work was needed. These results, as well as the August 2003 survey results, were included as part of the completed April 2004 archeological evaluation report for the IH 35E corridor project (IH 635 to US 380).

19

TxDOT and the THC/TSHPO were consulted regarding potential project impacts and concurred on May 4, 2004 that no archeological sites listed in, or determined eligible for designation in, the NRHP would be affected by the proposed project and that no further archeological investigation was required (see **Appendix C-17**).

24

25 Further project design changes have occurred since the August 2003 archeological survey and 2004 26 revisions, resulting in proposed new areas of ROW acquisition and, therefore, prompting additional 27 coordination with a TxDOT archeologist. Any area where the revised ROW differed from that evaluated in 28 the previous surveys (2003 and 2004) was further analyzed in relation to the 150-foot APE. TxDOT 29 archeologists completed their review of the proposed project in relation to these newly surveyed areas on 30 April 22, 2010. It is determined that the project would have no effect or no adverse effect on 31 archeological resources that would be afforded further consideration under cultural resource laws (see 32 Appendix C-18). No consultation with the THC/TSHPO was required.

33

Consultation with federally recognized Native American tribes with a demonstrated historic interest in the area was initiated on April 22, 2010. No objections or expressions of concern were received within the comment period.

1 In the event that unanticipated archeological deposits are encountered during construction, work in the

2 immediate area would cease, and TxDOT archeological staff would be contacted to initiate post-review

3 discovery procedures.

5.4.1

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5 5.4 Other Resources/Issues

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Hazardous Materials

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9 No-Build Alternative

10 Under the No-Build Alternative, additional ROW would not be acquired; therefore, no impacts from11 hazardous materials sites are anticipated.

12

13 Build Alternative

Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA), a preliminary investigation was conducted to identify sites within the project area which are "at risk" of environmental contamination by hazardous wastes and substances.

18

19 Sites considered likely to be contaminated and within the proposed ROW or sites which have the 20 potential to pose a hazard to construction of the proposed project are categorized as "high risk." 21 Examples of "high risk" sites include landfills, sites that have a subsurface plume of contamination with 22 the potential to have migrated within the project limits, and sites with a history of contamination where the 23 proposed project would require ROW acquisition or where project excavation/trenching would occur 24 during construction. Sites are categorized as "low risk" if available information indicates that some 25 potential for contamination exists, but the site is not likely to pose a contamination problem to highway 26 construction.

27

The TxDOT Dallas District has procedures intended to minimize cost and construction delays when petroleum-contaminated soils are encountered during roadway construction. The Dallas District has a contractor to remove underground tanks, and a contractor to excavate and haul petroleum-contaminated soils. This procedure has reduced the degree of impact that underground storage tanks could have on TxDOT construction activities. If this or any other type of encounter with hazardous substances does occur, it would be handled according to all applicable state, federal, and local regulations.

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The project area includes vacant land and developed land consisting of residential neighborhoods, institutional facilities, places of worship, office buildings, retail establishments, hotels, rental car facilities, light-industrial facilities, and UNT.

Sections of the proposed project would require excavation and would be depressed relative to the existing roadway. Other sections of the proposed project would require deep excavations for the installation of columns supporting elevated ramps and bridge structures. The sections of the roadway where excavations are required are listed below in **Table 5-25**.

5 6

TABLE 5-25. LOCATIONS OF THE PROPOSED PROJECT REQUIRING EXCAVATION

Location	Type of Excavation
From approximately 225 feet to 1,075 feet and 1,275	Proposed IH 35E mainlanes depressed relative to the
to 2,075 feet north of Meadowview Drive.	existing IH 35E mainlanes.
From approximately 210 feet south of Meadow Oak	Bridge columns associated with the proposed IH 35E
to 230 feet north of Meadow Oak.	mainlane bridge over Meadow Oak.
From approximately 170 feet south of Corinth	Bridge columns associated with the proposed IH 35E
Parkway to 170 feet north of Corinth Parkway.	mainlane bridge over Corinth Parkway.
From approximately 2,100 to 3,000 feet north of	Proposed IH 35E mainlanes depressed relative to the
Corinth Parkway.	existing IH 35E mainlanes.
From approximately 860 feet south of Post Oak Drive	Proposed IH 35E mainlanes depressed relative to the
to 750 feet north of Post Oak Drive.	existing IH 35E mainlanes.
From energy impately 100 feet equila of Deet Ook Drive	Bridge columns associated with the proposed Post Oak
From approximately 100 leet south of Post Oak Drive	Drive over the proposed IH 35E mainlanes and frontage
to 100 feet north of Post Oak Drive.	roads.
From approximately 1,000 feet to 1,870 feet north of	Proposed IH 35E mainlanes depressed relative to the
Post Oak Drive.	existing IH 35E mainlanes.
From approximately 200 feet south of State School	Bridge columns associated with the proposed IH 35E
Road to 200 feet north of State School Road.	mainlane bridge over State School Road.
From approximately 900 feet south of Wind River	Proposed IH 35E mainlanes depressed relative to the
Lane to 350 feet north of Wind River Lane.	existing IH 35E mainlanes.
	Bridge columns associated with the proposed IH 35E
From approximately 1,580 feet to 1,800 feet north of	mainlane bridge over the northbound to southbound IH 35E
Wind River Lane.	frontage road U-turn and the southbound to northbound IH
	35E frontage road U-turn.
From approximately 1,000 feet to 2,000 feet north of	Proposed IH 35E mainlanes depressed relative to the
Brinker Road.	existing IH 35E mainlanes.
From approximately 175 feet south of Loop 288 to	Bridge columns associated with the proposed IH 35E
175 feet north of Loop 288.	mainlane bridge over Loop 288.
From approximately 500 feet to 1,200 feet north of	Proposed IH 35E mainlanes depressed relative to the
Loop 288.	existing IH 35E mainlanes.
From approximately 150 feet south of Pennsylvania	Bridge columns associated with the proposed IH 35E
Drive/San Jacinto Boulevard to 1,400 feet north of	mainlane bridge over Pennsylvania Drive/San Jacinto
Pennsylvania Drive/San Jacinto Boulevard.	Boulevard.
From approximately 175 feet south of Teasley Lane	Bridge columns associated with the proposed IH 35E
to 175 feet north of Teasley Lane.	mainlane bridge over Teasley Lane.
From approximately 1,025 feet to 2,250 feet north of	Proposed IH 35E mainlanes depressed relative to the
Teasley Lane.	existing IH 35E mainlanes.
From approximately 1,250 feet to 125 feet south of	Proposed IH 35E mainlanes depressed relative to the
the UPRR.	existing IH 35E mainlanes.
From approximately 105 feet south of the UPRR to	Bridge columns associated with the proposed IH 35E
110 feet north of the UPRR.	mainlane bridge over the UPRR.
From approximately 175 feet south of Fort Worth	Bridge columns associated with the proposed IH 35E
Drive to 170 feet north of Fort Worth Drive.	mainlane bridge over Fort Worth Drive.
From approximately 280 feet south of McCormick	Bridge columns associated with the proposed IH 35E
Drive to 280 feet north of McCormick Drive.	mainlane bridge over McCormick Drive.
From approximately 1,000 feet south of North Texas	Proposed IH 35E mainlanes depressed relative to the
Boulevard to 1,100 feet north of North Texas	existing IH 35E mainlanes
Boulevard.	
From approximately 110 feet south of North Texas	Bridge columns associated with the proposed IH 35E

Location	Type of Excavation
Boulevard to 90 feet north of North Texas Boulevard.	mainlane bridge over North Texas Boulevard.
From approximately 240 feet south of the GC & SFRR to 270 feet north of the GC & SFRR.	Bridge columns associated with the proposed IH 35W mainlane bridge over the GC & SFRR.
From approximately 185 feet south of Bonnie Brae Street at IH 35W to 2,075 feet south of Oak Street at IH 35E.	Bridge columns for overpasses and direct connector ramps associated with the merging of IH 35E and IH 35W.
From approximately 185 feet south of Oak Street to 185 feet north of Oak Street.	Bridge columns associated with the proposed IH 35 mainlane bridge over Oak Street.
From approximately 180 feet south of US 380 to 200 feet north of US 380.	Bridge columns associated with the proposed IH 35 mainlane bridge over US 380.
Source: TxDOT 2008.	

TABLE 5-25. LOCATIONS OF THE PROPOSED PROJECT REQUIRING EXCAVATION

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2 The scope of the preliminary investigation consisted of a review of the TxDOT-specified federal and state

- 3 environmental databases and the performance of a site visit to confirm information from the databases
- 4 and note additional field observations. No land use history searches, title searches, records/historic aerial
- 5 photographs/historic maps review, interviews, or consultation with local/state/federal authorities were
- 6 conducted. A hazardous materials regulatory database search was conducted in February 2009. The
- 7 databases and specified search distances are shown in **Table 5-26**.
- 8

TABLE 5-26. FEDERAL AND STATE ENVIRONMENTAL DATABASE SEARCH RADII

Database	Search Radius
Federal National Priorities List (NPL)	1.0 mile
Federal RCRA Corrective Action Report (CORRACTS) facilities list	1.0 mile
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list	0.5 mile
Federal RCRA Treatment, Storage, and Disposal (TSD) facilities list	0.5 mile
Federal RCRA Generators RCRA (G)	Proposed project limits (existing and proposed ROW)
Federal Emergency Response Notification System (ERNS) list	Proposed project limits (existing and proposed ROW)
State-equivalent NPL	1.0 mile
State-equivalent CERCLIS list	0.5 mile
State landfill and/or solid waste disposal site list	0.5 mile
Texas Voluntary Compliance Program (TX VCP) list	0.5 mile
State Registered Leaking Petroleum Storage Tanks (LPST) list	0.5 mile
State Registered Petroleum PST list	0.25 mile
Spills list	Proposed project limits (existing and proposed ROW)
Source: TxDOT Hazardous Materials Manual, September 2007.	

- 10 The database identified 129 facilities within the specified distance parameters. Table 5-27 provides a
- 11 summary of the database search results. Only six of the 13 databases are shown in the table because no
- 12 entries or listings were discovered for the federal NPL, federal CERCLIS, federal RCRA TSD, federal
- 13 ERNS, state-equivalent NPL, state-equivalent CERCLIS, or state landfill and/or solid waste disposal site
- 14 databases.
- 15

Database	Search Distance (miles)	Facilities Within Search Distance	No. of High Risk Sites	Date Database Updated
Federal RCRA CORRACTS facilities list	1.0 mile	1	0	8/08
Federal RCRA Generators RCRA (G)	Proposed project limits (existing and proposed ROW)	8	0	8/08
TX VCP list	0.5 mile	3	3	11/08
State Registered LPST list	0.5 mile	39	24	11/08
State Registered PST list	0.25 mile	71	2 ¹	10/08
Spills list	Proposed project limits (existing and proposed ROW)	7	0	1/08
Note: 1. PST sites that are also listed as LPST sites are not included in this category and are not discussed in the PST discussion of the PST Sites contion				

TABLE 5-27. HAZARDOUS MATERIALS SITES IN THE PROJECT AREA

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As shown in **Table 5-27** and described below, three TX VCP sites, 24 LPST sites, and two PST sites were deemed to pose a high risk to ROW acquisition and/or construction of the proposed project. Note that some of the sites are listed on more than one database. The sites are discussed below, and their locations are illustrated in **Appendix A, Figure A-6**.

7

8 TX VCP Sites

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10 Sack N Save, 1500 IH 35E at Avenue C, Denton, Texas (Map ID, VCP- 11): This site is a gas station located approximately 0.03 mile (158 feet) north of the proposed project on adjacent 11 12 property and at the same gradient as the project. This site is also known as EZ Serve and is 13 reported as an LPST facility. Additional information is provided in the LPST Sites section below. 14 Deep excavation activities associated with construction of the proposed project would occur within the vicinity of this site and ROW would be required from this site. According to the TX VCP 15 16 database, the subsurface soil and groundwater beneath this site were contaminated with total 17 petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, and xylenes, and methyl tert-18 butyl ether. The site was issued a Certificate of Completion for voluntary cleanup on August 9, 2002. Based on the proximity of the VCP/LPST site relative to the proposed project ROW 19 20 requirements, this site poses a high risk to ROW acquisition and construction of the project.

21

Texas Blue Saddle, Ltd., southwest corner of US 380 at IH 35, Denton, Texas (Map ID, VCP- 25):
 This site consists of vacant property located approximately 0.04 mile (211 feet) west of the
 proposed project on adjacent property and at the same gradient as the project. Deep excavation
 activities associated with construction of the project would occur within the vicinity of this site;
 however, no ROW acquisition is expected at this site. According to the database, the subsurface
 soil and groundwater beneath this site were contaminated with semi-VOCs, metals, and TPH.

The Certificate of Completion date for voluntary cleanup was not reported. Based on the proximity of the VCP site relative to the proposed project, this site poses a high risk to construction of the project.

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5 Southridge Plaza – Star Cleaners, 2416 Lillian Miller Parkway, Denton, Texas (Map ID, VCP- 62): 6 This site consists of a dry cleaning facility located approximately 0.01 mile (53 feet) southwest of 7 the proposed project on adjacent property and at the same gradient as the project. Deep 8 excavation activities associated with construction of the project would occur within the vicinity of 9 this site and ROW would be required from the site. According to the database, the subsurface 10 soil and groundwater beneath this site were contaminated with perchloroethylene. The Certificate 11 of Completion date for voluntary cleanup was not reported. Based on the proximity of the VCP 12 site relative to the proposed project, this site poses a high risk to proposed project ROW 13 acquisition and construction of the project.

- 15 LPST Sites
- 16

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17 Howdy Doody C Store, IH 35 at McCormick Street, Denton, Texas (Map ID, LPST-1): This site is 18 approximately 0.01 mile (53 feet) southeast of the proposed project. The Howdy Doody facility no 19 longer exists at this location and the site has been redeveloped. This property is a proposed 20 displacement. Deep excavation activities associated with construction of the proposed project 21 would occur within the vicinity of this site and project ROW would be required from this site. 22 According to the database, a subsurface release of petroleum hydrocarbons from this site was 23 reported on July 21, 1994. No groundwater was impacted and there were no apparent threats or 24 impacts to receptors; however, there is the potential that perched water (w ater contained in the 25 soil matrix above bedrock) was contaminated by petroleum hydrocarbons. The TCEQ has issued 26 "Final Concurrence, Case Closed." Based on database information and project ROW 27 requirements, this site poses a high risk to proposed project ROW acquisition and construction of 28 the project.

29

30 Jesses Service Center (EZ Cars and Repairs), 801 North IH 35E, Denton, Texas (Map ID, LPST-• 31 10): This site is approximately 0.02 mile (106 feet) southwest of the proposed project on adjacent 32 property and at the same gradient as the project. Deep excavation activities associated with 33 construction of the proposed project would occur within the vicinity of this site and project ROW 34 would be required from this site. According to the database, gasoline vapors from this facility 35 occurred in an underground utility conduit and were reported on December 22, 1998. The site is 36 undergoing a corrective action plan and the USTs were removed from the ground on 37 February 15, 2004. Based on the proximity of the LPST site relative to the project and project ROW requirements, this site poses a high risk to proposed project ROW acquisition and construction of the project.

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4 EZ Serve, 1500 IH 35E at Avenue C, Denton, Texas (Map ID, VCP-11): This site is a grocery store located approximately 0.02 mile (106 feet) north of the proposed project on adjacent 5 6 property and at the same gradient as the project. This site is also known as Sack N Save and is 7 reported as a VCP facility, as previously discussed. Deep excavation activities associated with 8 construction of the project would occur within the vicinity of this site and ROW would be required 9 from the site. According to the database, a subsurface release of petroleum hydrocarbons 10 occurred at this site, but the date is not reported. Groundwater was impacted, but there were no 11 apparent threats or impacts to receptors. The TCEQ has issued "Final Concurrence, Case 12 Closed." Based on the proximity of the LPST/VCP site relative to the project and project ROW 13 requirements, this site poses a high risk for proposed ROW acquisition and construction of the 14 project.

Caruthers Fina, 1100 North IH 35E, Denton, Texas (Map ID, LPST-12b): This site is 16 17 approximately 0.02 mile (106 feet) northeast of the proposed project on adjacent property and at 18 the same gradient as the project. The Fina facility no longer exists at this location and the site 19 has been redeveloped. This property is a proposed displacement. Deep excavation activities 20 associated with construction of the proposed project would occur within the vicinity of this site and 21 ROW would be required from this site. According to the database, a subsurface release of 22 petroleum hydrocarbons from this site was reported on April 21, 1992. No groundwater was 23 impacted and there were no apparent threats or impacts to receptors; however, there is the 24 potential that perched water was contaminated by petroleum hydrocarbons. The TCEQ has 25 issued "Final Concurrence, Case Closed." Based on database information and project ROW 26 requirements, this site poses a high risk to proposed project ROW acquisition and construction of 27 the project.

29 Texaco (7-11/Shell), 1223 McCormick Street, Denton, Texas (Map ID, LPST-12a): This site is 30 approximately 0.02 mile (106 feet) northeast of the proposed project and is a proposed 31 displacement. Deep excavation activities associated with construction of the proposed project 32 would occur within the vicinity of this site and ROW would be required from the site. According to 33 the database, a subsurface release of petroleum hydrocarbons from this site was reported on 34 September 9, 1993. Groundwater was impacted, but there were no apparent threats or impacts 35 to receptors. The TCEQ has issued "Final Concurrence, Case Closed." Based on database 36 information and ROW requirements, this site poses a high risk to proposed project ROW 37 acquisition and construction of the project.

2 James Wood Auto Dealership (Huffines Chrysler, Jeep, Kia), 5150 South IH 35E, Denton, Texas 3 (Map ID, LPST-13): This site is approximately 0.04 mile (211 feet) west of the proposed project 4 on adjacent property and at the same gradient as the project. The proposed project would require ROW from this site. According to the database, a subsurface release of petroleum 5 6 hydrocarbons from this site was reported on March 7, 1994. Soil contamination occurred, and a 7 full site assessment and remedial action plan were required. The TCEQ has issued "Final 8 Concurrence, Case Closed." Based on the proximity of the LPST site relative to the project and project ROW requirements, this site poses a high risk to proposed project ROW acquisition. 9

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Bernard Street Store, 1724 Bernard Street, Denton, Texas (Map ID, LPST-15): This site is 11 • 12 approximately 0.03 mile (158 feet) southwest of the proposed project and is a proposed 13 displacement. Deep excavation activities associated with construction of the proposed project 14 would occur within the vicinity of this site and ROW would be required from the site. According to 15 the database, gasoline vapors from this facility occurred in an underground utility conduit and were reported on November 25, 1998. The site is undergoing monitoring. Based on database 16 17 information and project ROW requirements, this site poses a high risk to proposed project ROW 18 acquisition and construction of the project.

- 20 Ben E. Keith Denton Facility, 2801 North IH 35, Denton, Texas (Map ID, LPST-16): This site is • 21 approximately 0.02 mile (106 feet) southwest of the proposed project on adjacent property and at 22 the same gradient as the project. Deep excavation activities associated with construction of the proposed project would occur within the vicinity of this site and ROW would be required from the 23 24 site. According to the database, a subsurface release of petroleum hydrocarbons from this site 25 was reported on April 11, 1994. No groundwater was impacted and there were no apparent threats or impacts to receptors; however, there is the potential that perched water was 26 27 contaminated by petroleum hydrocarbons. The TCEQ has issued "Final Concurrence, Case 28 Closed." Based on the proximity of the LPST site relative to the project and project ROW 29 requirements, this site poses a high risk to proposed project ROW acquisition and construction of 30 the project.
- 31
- Total Store 4497 (Eagle Motors), 501 North IH 35E, Denton, Texas (Map ID, LPST-17a): This site is approximately 0.02 mile (106 feet) southwest of the proposed project on adjacent property and at the same gradient as the project. Deep excavation activities associated with construction of the proposed project would occur within the vicinity of this site and ROW would be required from the site. According to the database, a subsurface release of petroleum hydrocarbons from this site was reported on June 12, 1996. Groundwater was impacted and affected a non-public/non-

domestic water supply well. The TCEQ has issued "Final Concurrence, Case Closed." Based on the proximity of the LPST site relative to the project and project ROW requirements, this site poses a high risk to proposed project ROW acquisition and construction of the project.

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 Mobil Mart 2 (Bankers Liquidation Outlet), 515 North IH 35E, Denton, Texas (Map ID, LPST-17b): This site is approximately 0.02 mile (106 feet) southwest of the proposed project and is a proposed displacement. Deep excavation activities associated with construction of the proposed project would occur within the vicinity of this site and ROW would be required from the site. According to the database, a subsurface release of petroleum hydrocarbons from this site was reported on August 17, 1993. Groundwater was impacted and affected a public/domestic water supply well. The facility is being monitored. Based on the database information and ROW requirements, this site poses a high risk to proposed project ROW acquisition and construction of the project.

- 13 14
- 15 Corinth Grocery, 6279 South IH 35E, Denton, Texas (Map ID, LPST-28): This site is approximately 0.02 mile (106 feet) southwest of the proposed project and is a proposed 16 17 displacement. Deep excavation activities associated with construction of the proposed project 18 would occur within the vicinity of this site and ROW would be required from the site. According to the database, a subsurface release of petroleum hydrocarbons occurred at this site, but the date 19 20 is not reported. Groundwater was impacted and affected a public/domestic water supply well. 21 The TCEQ will issue "Final Concurrence" pending the receipt of documentation of monitor well 22 plugging. Based on the database information and project ROW requirements, this site poses a 23 high risk to proposed project ROW acquisition and construction of the project.
- 25 Hilltop Convenience Store, 220 North IH 35E, Denton, Texas (Map ID, LPST-29): This site is • 26 approximately 0.02 mile (106 feet) north of the proposed project and is a proposed displacement. 27 This facility has gone out of business. Deep excavation activities associated with construction of 28 the proposed project would occur within the vicinity of this site and ROW would be required from 29 the site. According to the database, a subsurface release of petroleum hydrocarbons was 30 reported on December 31, 1998. Groundwater was impacted and affected a public/domestic 31 water supply well. The facility is being monitored. Based on the database information and 32 project ROW requirements, this site poses a high risk to proposed project ROW acquisition and 33 construction of the project.
- 34

24

Briarcliff Fina (Exxon), 3628 South IH 35E, Denton, Texas (Map ID, LPST-30): This site is approximately 0.02 mile (106 feet) southwest of the proposed project and is a proposed displacement. Deep excavation activities associated with construction of the proposed project

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would occur within the vicinity of this site and ROW would be required from the site. According to
the database, a subsurface release of petroleum hydrocarbons from this site was reported on
June 29, 1990. Groundwater was impacted, but there were no apparent threats or impacts to
receptors. The TCEQ has issued "Final Concurrence, Case Closed." Based on the database
information and project ROW requirements, this site poses a high risk to proposed project ROW
acquisition and construction of the project.

- 8 7-Eleven Store 26575, 1610 Teasley Lane, Denton, Texas (Map ID, LPST-31): This site is • 9 approximately 0.02 mile (106 feet) north of the proposed project and is a proposed displacement. 10 Deep excavation activities associated with construction of the proposed project would occur 11 within the vicinity of this site and ROW would be required from the site. According to the 12 database, a subsurface release of petroleum hydrocarbons from this site was reported on 13 January 10, 2008. Groundwater was impacted, but there were no apparent threats or impacts to 14 receptors. The TCEQ is conducting a pre-assessment and release determination. Based on the 15 database information and project ROW requirements, this site poses a high risk to proposed 16 project ROW acquisition and construction of the project.
- 18 Mobil 12127 (Chevron Tetco), 2400 South IH 35E, Denton, Texas (Map ID, LPST-38): This site is 19 approximately 0.02 mile (106 feet) southwest of the proposed project on adjacent property and at 20 the same gradient as the project. Deep excavation activities associated with construction of the 21 proposed project would occur within the vicinity of this site and ROW would be required from the 22 site. According to the database, a subsurface release of petroleum hydrocarbons from this site 23 was reported on April 10, 1989. Groundwater was impacted, but there were no apparent threats 24 or impacts to receptors. The TCEQ has issued "Final Concurrence, Case Closed." Based on the 25 proximity of the LPST site relative to the project and project ROW requirements, this site poses a 26 high risk to proposed project ROW acquisition and construction of the project.
- Johnny Joes 3, 915 Fort Worth Drive, Denton, Texas (Map ID, LPST-39): This site is 28 • 29 approximately 0.02 mile (106 feet) south of the proposed project and is a proposed displacement. 30 Deep excavation activities associated with construction of the proposed project would occur 31 within the vicinity of this site and ROW would be required from the site. According to the 32 database, a subsurface release of petroleum hydrocarbons from this site was reported on 33 November 10, 1998. Groundwater was impacted and affected a public/domestic water supply 34 well. The facility is being monitored. Based on the database information and project ROW 35 requirements, this site poses a high risk to proposed project ROW acquisition and construction of 36 the project.
- 37

1 Exxon, 700 South IH 35E, Denton, Texas (Map ID, LPST-40): This site is approximately 0.02 mile 2 (106 feet) south of the proposed project on adjacent property and at the same gradient as the 3 project. Deep excavation activities associated with construction of the proposed project would 4 occur within the vicinity of this site and ROW would be required from the site. According to the 5 database, a subsurface release of petroleum hydrocarbons from this site was reported on June 13, 1998. A designated major or minor aquifer was impacted. The TCEQ has issued "Final 6 7 Concurrence, Case Closed." Based on the proximity of the LPST site relative to the project and 8 project ROW requirements, this site poses a high risk to proposed project ROW acquisition and 9 construction of the project.

10 AAMCO Service Center (Candy Haven), 301 North IH 35E, Denton, Texas (Map ID, LPST-41): 11 This site is approximately 0.02 mile (106 feet) south of the proposed project on adjacent property 12 and at the same gradient as the project. Deep excavation activities associated with construction 13 of the proposed project would occur within the vicinity of this site and ROW would be required 14 from the site. According to the database, a subsurface release of petroleum hydrocarbons from 15 this site was reported on January 22, 1990. No groundwater was impacted and there were no apparent threats or impacts to receptors; however, there is the potential that perched water was 16 17 contaminated by petroleum hydrocarbons. The TCEQ has issued "Final Concurrence, Case 18 Closed." Based on the proximity of the LPST site relative to the project, this site poses a high risk 19 to proposed project ROW acquisition and construction of the project.

- 20
- 21 Frank's Service Station, 3801 North IH 35, Denton, Texas (Map ID, LPST-46): This site is 22 approximately 0.02 mile (106 feet) west of the proposed project on adjacent property and at the 23 same gradient as the project. Based on a field visit, this address is currently occupied by a 24 commercial office warehouse. Deep excavation activities associated with construction of the 25 proposed project would occur within the vicinity of this site and ROW would be required from the 26 site. According to the database, a subsurface release of petroleum hydrocarbons from this site 27 was reported on May 29, 1991. A designated major or minor aguifer was impacted. The TCEQ 28 has issued "Final Concurrence, Case Closed." Based on the proximity of the LPST site relative to 29 the project and project ROW requirements, this site poses a high risk to proposed project ROW 30 acquisition and construction of the project.
- 31

Stemmons 12JWW (Shell), 4001 North IH 35, Denton, Texas (Map ID, LPST-50): This site is at the northwest corner of IH 35 and US 380 on adjacent property and at the same gradient as the project. The building occupying this site has an address listed as 4005 IH 35. Deep excavation activities associated with construction of the proposed project would occur within the vicinity of this site and ROW would be required from the site. According to the database, a subsurface
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release of petroleum hydrocarbons from this site was reported on April 27, 1988. Groundwater was impacted, but there were no apparent threats or impacts to receptors. The TCEQ has issued "Final Concurrence, Case Closed." Based on the proximity of the LPST site relative to the project and project ROW requirements, this site poses a high risk to proposed project ROW acquisition and construction of the project.

- 7 Lassiter Shell, 1700 Teasley Lane, Denton, Texas (Map ID, LPST-51): This site is approximately 8 0.02 mile (106 feet) south of the proposed project on adjacent property and at the same gradient 9 as the project. Deep excavation activities associated with construction of the proposed project 10 would occur within the vicinity of this site and ROW would be required from the site. According to 11 the database, a subsurface release of petroleum hydrocarbons from this site was reported on 12 September 1, 1992. A designated major or minor aguifer was impacted. The TCEQ has issued 13 "Final Concurrence, Case Closed." Based on the proximity of the LPST site relative to the project 14 and project ROW requirements, this site poses a high risk to proposed project ROW acquisition 15 and construction of the project. 16
- 17 Vehicle Maintenance, 733 Fort Worth Drive, Denton, Texas (Map ID, LPST-52): This site is • 18 approximately 0.08 mile (422 feet) northeast of the proposed project at the same gradient as the 19 project. The facility is no longer exists at this location and the site has been redeveloped. Deep 20 excavation activities associated with construction of the proposed project would occur within the 21 vicinity of this site; however, no ROW would be required from the site. According to the 22 database, a subsurface release of petroleum hydrocarbons was reported on February 15, 1990. 23 Groundwater was impacted and affected a public/domestic water supply well. The TCEQ has 24 issued "Final Concurrence, Case Closed." Based on the proximity of the LPST site relative to the 25 project, this site poses a high risk to the construction of the project.
- North Texas Auto Plex (James Wood Auto Park), 3906 South IH 35E, Denton, Texas (Map ID, LPST-58): This site is approximately 0.02 mile (106 feet) southwest of the proposed project at the same gradient as the project. The proposed project would require ROW from this site. According to the database, a subsurface release of petroleum hydrocarbons was reported on April 27, 1994. Groundwater was impacted, but there were no apparent threats or impacts to receptors. The TCEQ has issued "Final Concurrence, Case Closed." Based on the proximity of the LPST site relative to the project, this site poses a high risk to proposed project ROW acquisition.
- 34

26

12Gen Former (Color Customs), 936 Fort Worth Drive, Denton, Texas (Map ID, LPST-59): This
 site is approximately 0.07 mile (370 feet) south of the proposed project on adjacent property and
 at the same gradient as the project. Deep excavation activities associated with construction of

the proposed project would occur within the vicinity of this site; however, no ROW would be required from this site. According to the database, a subsurface release of petroleum hydrocarbons from this site was reported on May 31, 1994. Groundwater was impacted, but there were no apparent threats or impacts to receptors. The TCEQ has issued "Final Concurrence, Case Closed." Based on the proximity of the LPST site relative to the project, this site poses a high risk to construction of the project.

8 PST Sites

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7

10 Fina Express, 1103 North IH 35E, Denton, Texas (Map ID, PST-24): This site is approximately 11 0.02 mile (106 feet) south of the proposed project on the southwest corner of McCormick Street 12 and IH 35E. The site is a proposed displacement. Deep excavation activities associated with 13 construction of the proposed project would occur within the vicinity of this site and ROW would be 14 required from the site. According to the database, two 4,000-gallon PSTs and one 6,000-gallon 15 PST were installed at this facility in 1977. All of the USTs contain gasoline and are in use. The 16 PST tank material/containment is reported as steel/single wall. The pipe material is reported as 17 non-metallic flexible piping. The tank and pipe release detection are reported as statistical 18 inventory reconciliation and inventory control, tank/pipe corrosion protection, Spill and overflow 19 protection is reported as auto delivery shut-off valve/spill container/bucket/sump. Based on the 20 ROW acquisition and the age and materials of the PSTs, there is the potential for a subsurface release of petroleum hydrocarbons from the Fina Express facility. This site poses a high risk to 21 22 proposed project ROW acquisition and construction of the project.

23

24 Fort Worth Drive Shamrock (Valero), 736 Fort Worth Drive, Denton, Texas (Map ID, PST-32): ٠ 25 This site is approximately 0.02 mile (106 feet) north of the proposed project and is a proposed 26 displacement. Deep excavation activities associated with construction of the proposed project 27 would occur within the vicinity of this site and ROW would be required from the site. According to 28 the database, three 12,000-gallon PSTs were installed at this facility in 1981. All of the USTs 29 contain gasoline and are in use. The PST tank material/containment is reported as steel/single 30 wall. The pipe material is reported as fiberglass-reinforced plastic. The tank release detection method is reported as vapor monitoring. The pipe release detection method is reported as 31 32 annual piping tightness test at one gallon per hour/vapor monitoring. Spill and overflow protection 33 is reported as auto delivery shut-off valve/spill container/bucket/sump/tight fill fitting. Based on 34 the ROW acquisition and the age and materials of the PSTs, there is the potential for a 35 subsurface release of petroleum hydrocarbons from the Forth Worth Drive Shamrock (Valero) 36 facility. This site poses a high risk to proposed project ROW acquisition and construction of the 37 project.

1 2 Prior to ROW acquisition and construction of the project, subsurface investigations would be conducted 3 and groundwater management plans would be developed for the high risk sites described above. 4 Subsurface investigations would determine if hazardous materials from any of these facilities have 5 adversely affected the subsurface conditions of the proposed project. The subsurface investigations 6 would consist of the sampling of one or more soil borings and associated groundwater or perched water 7 (if applicable) at appropriate location(s), and laboratory analysis of the cuttings/groundwater. Based on 8 the results of the subsurface investigation, remediation might be required. The subsurface investigation 9 and resulting remediation (if required) would be conducted in a manner complying with applicable federal, 10 state, and local laws.

11

A visual survey of the project limits and surrounding area was performed by qualified personnel to identify
 possible hazardous materials within the proposed project ROW. No surface evidence of contamination

- 14 was observed. Documentation of the initial site assessment is maintained in the project files.
- 15

Additionally, the contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area. The use of construction equipment within sensitive areas would be minimized or eliminated entirely. All construction materials used for this project would be removed as soon as work schedules permit.

20

21 5.4.2 Airway-Highway Clearance

22

23 No-Build Alternative

- 24 The No-Build Alternative would result in no change in airway-highway clearance.
- 25

26 Build Alternative

27 Denton Municipal Airport is located west of the City of Denton. Along the project corridor, the airport is 28 located at a minimum distance of approximately 9,000 feet from the IH 35E/IH 35W interchange. The 29 airport runway is 5,999 feet in length, oriented parallel to the project corridor, and is at an elevation of 30 approximately 642 feet. The highest bridge location at the IH 35E/IH 35W interchange is the northbound 31 IH 35E direct connect ramp to southbound IH 35W. This location is at an elevation of approximately 711 32 feet (including rail and super elevation). Using the Federal Aviation Administration's (FAA) Notice Criteria Tool⁵⁵, three lighting scenarios for the bridge were analyzed to preliminarily determine if coordination with 33 34 FAA would be required. The three scenarios were as follows:

³⁵

⁵⁵ https://oeaaa.faa.gov/oeaaa/external/portal.jsp

1			
2	1.	With high mast lighting (highest);	
3	2.	With continuous lighting along the direct connect; and	
4	3.	No lighting along the direct connect.	
5			
6	The Notice	e Criteria Tool indicated that coordination with the FAA was required because the height(s)	
7	exceeded the criteria set forth in 14 CFR Part 77.13; or, that the bridge is located in an instrument		
8	approach area and may exceed the standard of subpart C of 14 CFR Part 77.		
9			
10	The TxDO	Γ Design Division is responsible for coordinating all airway-highway clearance matters with the	
11	FAA. Duri	ng final design of the proposed project, the Design Division will determine if coordination with	
12	the FAA will be required based on the final project design and lighting specifications. Coordination, if		
13	required, w	ould be the preparation and submission of the latest version of Form 7460-1 to the FAA.	

6.0 PROJECT LEVEL INDIRECT IMPACTS

1

This section presents a project level analysis of the potential indirect impacts (or effects) related to the proposed improvements to IH 35E from US 380 to FM 2181 in Denton County. A system level analysis on the potential impacts of the regional toll and managed/HOV system is provided in **Section 8.0**.

5

6 CEQ regulations define a project's direct impacts as those "which are caused by the action and occur at 7 the same time and place."⁵⁶ Accordingly, the discussion of direct impacts in **Section 5.0** of this document 8 focuses on impacts within the project construction footprint (i.e., existing ROW and proposed new ROW 9 and easements), as well as subsequent operation of the facility within that same footprint. In contrast, the 10 CEQ defines indirect impacts as:

"... effects, which are caused by the action and are later in time or farther removed in
distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing
effects and other effects related to induced changes in the pattern of land use, population
density or growth rate, and related effects on air and water and other natural systems,
including ecosystems.⁶⁷

16

As the CEQ definitions indicate, both direct and indirect impacts are caused by project activities, but
indirect impacts extend beyond the construction/operation footprint and may occur at some future time.

19

The analysis of indirect impacts discussed in this document follows the seven step process outlined in TxDOT guidance on conducting indirect and cumulative impact analyses ('TxDOT ICI Guidance').⁵⁸ In keeping with the TxDOT ICI Guidance, the National Cooperative Highway Research Program (NCHRP) Report 466⁵⁹ and the adjunct NCHRP Report 25-25, Task 22⁶⁰ were also used to prescreen and/or analyze potential indirect impacts associated with the proposed project. The TxDOT ICI Guidance and the NCHRP Report 466 suggest indirect impacts can occur in three broad categories:

26

Encroachment-Alteration Impacts – Alteration of the behavior and functioning of the physical
 environment expected as a result of project design features (e.g., stream channel modifications
 that produce impacts downstream beyond the limits of the project ROW);

Project-Influenced Land Use Change – Alteration of traffic, access, and mobility that induces
 change in land use through new development (including redevelopment of already developed
 land), or accelerates the rate of new development; and,

⁵⁶ CEQ 40 CFR 1508.8(a).

⁵⁷ CEQ 40 CFR 1508.8(b).

 ⁵⁸ TxDOT (September 2010). TxDOT's Guidance on Preparing Indirect and Cumulative Impact Analyses, Revised.
 ⁵⁹ Transportation Review Board (TRB) (2002), NCHRP Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects.

⁶⁰ TRB (2007), NCHRP Report 25-25, Task 22, *Forecasting Indirect Land Use Effects on Transportation Projects.*

- 1 2
- 3. Impacts Resulting from Project-Influenced Land Use Change Impacts to the human and natural environment expected when project-influenced development occurs.
- 3

4 For transportation projects, examples of Category 1 impacts could include fragmentation of habitat by a 5 roadway or dispersal of pollutants onto adjacent lands. Indirect impacts from Categories 2 and 3 are 6 typically encountered outside of the project ROW, and may result from actions taken by other parties, 7 such as private land developers not directly associated with the project. Indirect impacts are therefore 8 subject to some level of conjecture as to the extent of changes that may be expected in the project 9 corridor, with and without the project in place. The CEQ definition above indicates the analysis of indirect 10 impacts should identify impacts that are "reasonably foreseeable," and CEQ has issued guidance that equates "reasonably foreseeable" with "probable."⁶¹ In its guidance, CEQ explains that whether a future 11 estimate is speculative, as opposed to probable, should be evaluated in the same manner that an 12 13 informed land developer would approach the purchase of a parcel of real estate (i.e., based on market 14 trends and other relevant economic information). The TxDOT ICI Guidance elaborates on this topic by 15 suggesting that information such as development trends and local government plans should be used to 16 ensure that judgments about future impacts are based on a logical analysis of reasonably available and 17 relevant information, and that a person of ordinary prudence would consider this information.

18

With regard to encroachment-alteration impacts (Category 1), it is important to note that the direct impacts analysis of some resources/issues extends beyond the project construction/operation footprint. This is true for air quality impacts, noise impacts, hazardous material impacts, and some aspects of community impacts (e.g., O&D analysis, traffic operations, economic impact of tolling, etc.). Thus, the cause-effect relationships between the impact causing activities of the proposed improvements and these resources/issues once they extend beyond the project footprint (i.e., indirect encroachment-alteration impacts) are addressed at various scales (depending on the resource/issue), in **Section 5.0**.

26

The indirect impacts analysis was conducted in accordance with the seven-step process described in the TxDOT ICI Guidance for assessing indirect impacts. This approach, which is adapted from the NCHRP

- 29 Report 466, is outlined in **Table 6-1**.
- 30

⁶¹ 46 FR 18026 (March 23, 1981), *Forty Most Asked Questions Concerning CEQ's NEPA Regulations* (see Question 18, re Uncertainties about Indirect Effects of a Proposal).

TABLE 6-1. SEVEN STEP APPROACH TO ESTIMATE INDIRECT IMPACTS

Step 1 – Initial Scoping: Determine the basic approach and level of effort expected for the analysis by examining
the scope of key issues, and establish the geographical boundaries of the extent of anticipated indirect
impacts.
Step 2 – Identify the Study Area's Goals and Trends: Assemble information on the community goals and
general trends regarding demographic, economic, social, and ecological aspects of the study area.
Step 3 - Inventory the Study Area's Notable Features: Highlight the baseline environmental conditions in the
study area, emphasizing its notable features including sensitive species and habitats, environmental
components of value to the community, unusual landscape features, and vulnerable elements of the
population.
Step 4 – Identify Impact-Causing Activities of Proposed Action and Alternatives: Describe the impact-causing
activities of the proposed project based on anticipated construction, operation, and maintenance activities.
Step 5 - Identify Potentially Substantial Indirect Impacts for Analysis: Compare the expected impact-causing
activities (Step 4) with the study area's goals, trends, and notable features (Steps 2 and 3) to determine
which impacts are potentially substantial and therefore merit further analysis in Step 6 .
Step 6 - Analyze Indirect Impacts and Evaluate Results: Qualitative and quantitative techniques are employed
to estimate the magnitude of the potentially substantial impacts identified in Step 5 and describe future
conditions with and without the proposed transportation improvement. This step also includes a discussion
of the assumptions used in the analysis, and the uncertainty of the results based on the limitations of
available information.
Step 7 - Assess Consequences and Consider/Develop Mitigation, as Appropriate: The consequences of
indirect impacts are evaluated in the context of the full range of project effects. Strategies to avoid or
lessen any impacts found to be unacceptable are developed. Impacts are reevaluated in the context of
those mitigation strategies.
Sources: TxDOT (2010) Revised Guidance on Preparing Indirect and Cumulative Impact Analyses; and, TRB
(2002), NCHRP Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation
Projects.

2

3 6.1 Step 1 – Indirect Impacts Analysis: Scoping and Determination of a Study Area

4 The first objective of **Step 1** is to define the scope of the analysis by considering the types of potential 5 indirect impacts and the possible range of those impacts. This is done by considering the attributes and 6 context of the proposed project, and leads to a general assessment of the level of impacts anticipated. In 7 addition, the assessment considers the distance necessary for the impacts to attenuate from the project 8 footprint. This approach helps determine the level of effort and approach needed to complete the 9 analysis, and is also vital in achieving the second objective of determining the geographic extent of the 10 indirect impacts study area or Area of Influence (AOI). The scoping process continues in Steps 2 through 11 5 to identify and eliminate from detailed study (Step 6) those resources or issues which do not have the 12 potential for creating substantial indirect impacts.

13

14 6.1.1 Project Attributes and Context

As previously described, IH 35E has been a major north-south transportation corridor since the late 1960s and is the only direct connection between north Denton County and Dallas County. The proposed project extends approximately 11 miles, and has been planned and designed to manage traffic congestion and promote traffic flow throughout the travel corridor. IH 35E has multiple entrance and exit ramps to the adjacent frontage roads, which in turn connect with multiple city arterial cross-streets and intersections. The proposed project would involve the reconstruction of all cross street interchanges in accordance with design plans set forth by local municipalities within their associated local thoroughfare plans. In addition,
the project would reconstruct all ramps to meet current design criteria and to improve traffic operational
performance. Examples of project design changes include the following: reverse orientation of some
ramps to provide better access, providing full freeway shoulders for vehicle breakdown and emergencies,
providing adequate lane widths for freeway mainlanes, and providing adequate ramp lengths including
acceleration and deceleration lanes so that entering/exiting traffic is traveling at freeway speed.⁶²

7

8 The proposed project extends through generally urbanized areas within the Cities of Corinth and Denton 9 and would affect approximately 634.60 acres (459.50 acres permanent impacts and 175.10 acres 10 temporary impacts). This includes approximately 106.59 acres of new ROW. The entire project area has 11 gently rolling topography, which was initially characterized by prairie and savannah cover, and then was 12 largely converted to crop and pasture use before undergoing urbanization in recent decades. The density 13 of urban development varies throughout the project corridor with higher density near the UNT campus in 14 the northernmost section of the corridor. Development within the project area includes land uses such as 15 retail/commercial, residential, and parks. Continued urban growth and land development are anticipated 16 throughout the corridor, and a major purpose for the proposed project is to help meet the travel demand 17 generated by this growth. Equally so, improved mobility access and congestion management make this 18 area more attractive to growth as well, perhaps accelerating it, if other factors exist.

19

20 6.1.2 Geographic Boundary of the AOI

The basic objective in creating an AOI is to delineate a study area within which all substantial projectrelated impacts are expected to occur. As the assessment of direct project impacts stops at the project ROW/easement boundary ('project footprint'), establishing an AOI extends the area of consideration to the point where all impacts are expected to attenuate.

25

26 Access-controlled roadways, such as IH 35E, would be unlikely to affect changes in land use other than 27 near access points (see NCHRP Report 466, Page 27). Consequently, the most probable type of indirect 28 impacts would be transportation-related development (including redevelopment) at or near interchanges. 29 Keeping this in mind, a combined methodology was used to set an indirect study boundary that would 30 consider a full range of potential indirect impacts while avoiding the potential for assigning indirect impacts that would not apply to IH 35E. First, five, 10, and 15 commutesheds to IH 35E from the 31 surrounding roadway network under free speed conditions⁶³ were assessed using ArcGIS 9.2 and ArcGIS 32 33 Network Analyst. Both the 10 and 15 commutesheds extended into areas that would generally be better 34 served by other area roadways; therefore, the 5-minute commuteshed was utilized in the delineation of 35 the indirect impacts AOI. Next, TSZ's were overlaid with the 5-minute commuteshed. Incorporating TSZs

⁶² TxDOT (March 2009), TxDOT IH 35E Interstate Access Justification Report from FM 2181 to US 380.

⁶³ Free speed is the speed on roadways with no traffic on the road; measured in mph.

1 into the indirect impacts analysis is useful because TSZs are used in the NCTCOG transportation O&D 2 studies to encompass the roadway network and homogeneity of development. In addition, TSZs directly 3 reflect demographic data generated by the U.S. Census Bureau (Census blocks, block groups, or Census 4 tracts). The indirect impacts AOI boundary was established as a best-fit line (for ease of analysis) along 5 the outside edge of the 5-minute commuteshed and the overlapping TSZs within this 5-minute 6 commuteshed. Input gathered from planners and other representatives from the municipalities of Denton, 7 Corinth, Lake Dallas, Shady Shores, and Hickory Creek (See Appendix D, Figure D-5) verified this 8 boundary as appropriate for assessing indirect impacts. Defining the study area using commutesheds, 9 TSZs, and planner input are three of several acceptable methods identified in the TxDOT ICI Guidance 10 and the NCHRP Report 466. The AOI boundary, as shown in Appendix D, Figure D-1, includes 11 approximately 26,201.5 acres.

12

13 It is anticipated that any potential encroachment-alteration indirect impacts would occur within the AOI 14 boundary described above. For example, it is not expected that the proposed project would cause any fill 15 to jurisdictional waters beyond the project footprint and impacts to floodplains would likely be limited to 16 the areas where IH 35E crosses the 100-year floodplain. Based on the ephemeral nature of streams and 17 gently sloping topography of the project area, it is also anticipated that most heavy construction-related 18 sediment would be deposited near the construction site and that after construction, the quality of the 19 water leaving the IH 35E facility would be similar to the quality of runoff from the existing facility. Further, 20 only narrow riparian corridors and small-forested areas remain in the project vicinity due to the substantial 21 urbanization of the Corinth-Denton area occurring since the original construction of IH 35E over 50 years 22 ago. Consequently, the widening of the IH 35E facility is not expected to have encroachment effects to 23 vegetation, habitat, or wildlife beyond the direct impacts of the project. In conclusion, the AOI boundary 24 shown in Appendix D, Figure D-1 serves as the outermost limit for all anticipated indirect impacts (both 25 encroachment-alteration and induced land use impacts).

26

27 6.1.3 Time Frame for Assessing Indirect Impacts

A temporal frame of reference is necessary in addressing the range of impacts that may be caused by the proposed project in the future. The discussion below considers indirect impacts that may occur between the time of project construction and 2030, the project's design horizon year.

31

32 6.2 Step 2 – Indirect Impacts Analysis: Development Trends and Community Goals in the AOI

This step presents information on general demographic, economic, social, and ecological trends within the AOI, in addition to goals of the community as reflected in local plans.

1 6.2.1 Regional and Local Trend Data

- 2 As indicated in Table 6-2, Denton County is predicted to have increased growth in population,
- 3 households, and employment through 2030.
- 4

TABLE 6-2. 2000-2030 DENTON COUNTY POPULATION, HOUSEHOLD AND EMPLOYMENT
GROWTH

Demographic	2000	2030	Growth	Percent ¹
Population ²	428,080	1,085,343	657,263	154%
Households ³	161,390	406,614	245,224	152%
Employment	152,818	413,453	260,635	171%
Source: NCTCOG North Central Texas Demographic Forecast (<u>www.NCTCOG.org</u>). Notes: All projections based on 2000 city boundaries. 1. Percent change from 2000 to 2030. 2. NCTCOG estimate adjusted from 2000 Census count. 3. Population in Households does not include group quarters.				

5 6

7

8

The indirect impacts AOI extends through the City of Denton and the Lake Cities. The Lake Cities are comprised of the Cities of Corinth and Lake Dallas and the Towns of Hickory Creek and Shady Shores in Denton County. As indicated in **Table 6-3**, each of the municipalities is predicted to have increased

9 growth in population, households, and employment from 2000 to 2030.

- 10
- 11

12

TABLE 6-3. 2000-2030 POPULATION, HOUSEHOLD AND EMPLOYMENT GROWTH FOR CITIES

AND TOWNS WITHIN THE INDIRECT IMPACTS AOI

City/Town	Category	2000	2030	Percent'
	Population ²	73,225	190,719	160%
City of Denton	Households ³	31,174	76,397	145%
-	Employment	58,581	107,572	84%
	Population ²	11,365	27,070	138%
City of Corinth	Households ³	3,879	9,307	140%
-	Employment	2,213	3,225	46%
	Population ²	6,378	9,209	44%
City of Lake Dallas	Households ³	2,388	3,443	44%
-	Employment	1,683	2,384	42%
	Population ²	2,005	3,996	99%
Town of Hickory Creek	Households ³	776	1,566	102%
-	Employment	494	1,115	126%
	Population ²	1,500	3,849	157%
Town of Shady Shores	Households ³	532	1,386	161%
-	Employment	188	889	373%
Source: NCTCOG Demographic Foreca	st for Selected Cities			

Source: NCTCOG Demographic Forecast for Selected Cities.

1. Percent change from 2000 to 2030.

3. Population in Households does not include group quarters.

- 15 2005, as shown below in **Table 6-4**. Of the 26,201.5 acres within the AOI, approximately 41 percent was
- 16 undeveloped and the remaining 59 percent was in use. Approximately 1,353.4 acres within the AOI

Notes: All projections based on 2000 city boundaries.

^{2.} NCTCOG estimate adjusted from 2000 Census counts.

¹⁴ GIS mapping was used to identify land use categories and their quantities (in acres) within the AOI for

1 consist of reasonably foreseeable projects that have already been planned and platted for future

- 2 development (see **Appendix E, Figure E-2** and **Appendix E-3**).
- 3

Land Use Type	Acreage	Percent (%)
Airport	61.2	0.2
Commercial	1,383.6	5.3
Dedicated ¹	1,341.3	5.1
Government/Education	1,132.6	4.3
Industrial	897.8	3.4
Infrastructure ²	3,519.8	13.4
Residential	6,611.4	25.2
Undeveloped ³	10,767.3	41.1
Water	486.5	1.9
Total	26,201.5	100%
Source: NCTCOG Land Use 2005. Notes: 1. Includes parks. 2. Includes transportation and utilities.		

TABLE 6-4.	LAND USE	WITHIN TH	E INDIRECT	IMPACTS AOI
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3. Includes undeveloped vacant, undeveloped under construction, and undeveloped parking.

4

5 6.2.2 Regional and Local Plans

A variety of plans exists to promote, guide, and monitor various development activities ranging from
regional transportation infrastructure to residential, commercial, or industrial activities. Section 2.5 of this
EA provides brief descriptions of the following plans related to the proposed project area: the IH 35E MIS,
the Lewisville Lake Corridor Study, the Regional Rail Corridor Study and the Regional Transit Initiative,
plans and services associated with the DCTA, UNT Master Plan, *Mobility 2030 – 2009 Amendment*, and

11 the TIP.

12

All municipalities included within the AOI have long range planning documents and regulations providing for future development and the protection of lands from arbitrary development. These documents emphasize the capital improvements and transportation infrastructure necessary to support future population within each jurisdiction. The majority of the Comprehensive Land Use Plans (CLUPs) and Future Land Use Plans (FLUPs) are accompanied by transportation thoroughfare plans which assume construction of the proposed IH 35E improvements, and include plans to improve east/west arterial road access to IH 35E. Brief descriptions of these plans are provided below.

20

21 City of Denton

The Denton Plan is the City's comprehensive plan adopted by the Denton City Council in 1999, and is a guide for making decisions about growth and development through 2020. The plan sets forth provisions on land use, transportation, and public facilities and is the City's guide for the establishment of strong development codes (updated in 2007). The Denton development code describes in detail requirements for a variety of different land use purposes including transportation, infill development, site development, and protection of environmentally sensitive areas. The *Denton Plan* assumes improvement of IH 35E to

1 accommodate the City's development plans. Within the AOI, the FLUP calls for regional mixed-use 2 centers, employment centers, neighborhood centers, and a downtown university core. According to the 3 growth management strategy, "The community should establish development rules that are clearly stated, 4 administered efficiently, and enforced consistently. If development is proposed that does not satisfy all the rules, it should not be allowed."⁶⁴ The City of Denton has developed safeguards in the comprehensive 5 6 plan that commit to strong enforcement of development codes. Such safeguards offer incentives to 7 provide for the quantity and quality of growth that meets community standards and maintains the quality 8 of life. Of additional note, the City of Denton is planning for the construction of the DCTA A-train rail line 9 (see Appendix E, Figure E-2, Map ID #33), rail stations (Medpark and Downtown Denton stations; see 10 Appendix E, Figure E-2, Map ID #44 and #24, respectively), and associated transit oriented 11 development (TOD). Such TOD is characteristic of the continued push towards mixed-use and 12 commercial development throughout much of the City's urban core.

13

14 City of Corinth

15 The most recent version of the City of Corinth Comprehensive Plan was updated in May 2010. The long-16 range plan guides policy, investment programs, and land use decisions for the City. The forecasted land 17 use for the City at build-out projects that all parcels immediately adjacent to IH 35E be zoned commercial. 18 Parcels within the larger AOI would likely remain predominantly residential. Many large tracts of land 19 throughout the City are owned as single homesteads and it is anticipated this ownership would continue 20 in the foreseeable future. The density of development projected in the City's FLUP indicates 21 improvements are needed for the transportation system to adequately serve the needs of residents. 22 Accordingly, the City of Corinth accounts for the proposed project in their Thoroughfare Plan as a "major 23 thoroughfare." A description of the City's planned capital improvements in anticipation of addressing 24 such needs is provided in the CIP subsection below.

25

26 City of Lake Dallas

Primary goals of the Lake Dallas comprehensive plan, last updated in January 2000, include minimizing conflict between land uses, guiding future zoning decisions, and providing a basis for future capital expenditures. The transportation component of the comprehensive plan updates the thoroughfare plan calling attention to the need for improved mobility to and from IH 35E for better traffic flow within the City and improved access to commerce.

32

33 Town of Hickory Creek

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In September 2008, the Town of Hickory Creek issued an update to the existing 1986 comprehensive plan. Among the many facets of the plan (guiding and managing infrastructure needs, capital improvements, community resources, and annual fiscal year budgets), special attention was given to

⁶⁴ City of Denton (December 1999), *The Denton Plan*.

minimizing urban sprawl or uncontrolled development. In order to keep a small town atmosphere, the Town seeks to maintain planning and zoning policies that would limit growth to the desired maximum of just over 5,000 people. Future land use along IH 35E calls for mixed-use development zoning with tracts of commercial office zoning, and commercial retail land use designated toward small box retail serving local neighborhoods.

6

7 Town of Shady Shores

8 Plans for the Town of Shady Shores are incorporated into the Town's zoning ordinance, last updated in 9 1999. The purpose of the ordinance is to prevent adverse effects of urbanization by providing for the 10 orderly and safe development of the area, and to promote the general welfare of the community. As part 11 of this effort, the ordinance provides detailed subdivision controls. Local officials state that the zoning 12 ordinance, as written, has been sufficient thus far in addressing long range planning preferences and 13 acknowledge that local land use controls are easy to enforce due to the small size of the Town and the 14 limited availability of unconstrained areas for development. The Town has been consistently zoned 15 residential since it was first incorporated in 1960.

16

17 Capital Improvement Programs (CIPs)

18 The Cities of Denton, Corinth, and Lake Dallas have established CIPs, with planned capital improvements 19 currently set and/or approved through the years of 2013, 2011, and 2014, respectively. Capital 20 improvements planned in the Cities of Denton and Corinth primarily include improvements to sewers, 21 waterlines, drainages, sidewalks, and arterial roadways. For the City of Lake Dallas, capital 22 improvements primarily include improvements to parks, roadways, storm drainages, and civil service 23 supplies (e.g., police cars). The Towns of Hickory Creek and Shady Shores do not currently have active 24 CIPs; however, the Town of Hickory Creek is in the process of establishing a CIP and improvements thus 25 far have been addressed within their CLUP. Capital improvements for the Town of Shady Shores are 26 either addressed within the planning regulations or contracted out on an as-needed basis.

27

In general, areas within the AOI possess the infrastructure necessary to further development. In locations where such infrastructure is currently unavailable, it can be provided and programmed via the above described CIPs and other planning ordinances. This is the case within the City of Corinth, where proper infrastructure is currently lacking for commercial development immediately adjacent to IH 35E, but it is within the planning horizon of the City to provide the necessary infrastructure for the ultimate development of these locations.

34

35 Zoning/Development Regulations

As previously described within the various planning documents of the AOI municipalities, areas adjacent to IH 35E have a variety of zoning classifications, which primarily include commercial, light industrial, and mixed-use. Near the outer limits of the AOI, residential land uses are more frequently observed. Land
 development regulations also affect the natural resources of the area by regulating such activities as the
 removal of large trees and by restricting construction within floodplains.

4 5

6.3 Step 3 – Indirect Impacts Analysis - Inventory the Notable Features within the AOI

6 The third step in the indirect impacts assessment framework involves conducting an inventory of notable 7 Notable features include sensitive habitats and species, environmental features within the AOI. 8 components of value to the community, relatively unique or sensitive landscape features, and vulnerable 9 elements of the population. The TxDOT ICI Guidance indicates that identifying notable features is 10 important in assessing whether potential indirect impacts are substantial because such features may be 11 more vulnerable or highly valued. The absence of mentioning a notable feature within the AOI does not 12 indicate an absence of indirect impacts; it simply means there is less potential for the impacts to be 13 substantial.

14

15 6.3.1 Sensitive Habitats and Species

16 Past agricultural land use, followed by widespread urbanization within the AOI, has rendered the 17 scattered remnants of riparian and upland forest habitat somewhat rare. Although the guality of much of 18 this habitat has been degraded with the advent of introduced agricultural or invasive plant species, it is 19 nevertheless important within the surrounding urban landscape. As most of the AOI is in the upper 20 reaches of local watersheds, perennial streams and wetland habitats within the AOI are uncommon 21 features. The pockets of forested or water-related habitat that remain should therefore be considered 22 sensitive and important features. Local governments have set aside several parks that preserve upland 23 forest habitat (e.g., Corinth Community Park, Thousand Oaks Park in Lake Dallas, etc.) and forested or 24 wetland areas near Lewisville Lake (e.g., Hickory Creek Park in Hickory Creek, Willow Grove Park in 25 Lake Dallas, etc.). Although remnant habitat should be considered valuable to animal species common 26 within the AOI, the quantity and quality of habitat needed by rare animal species has diminished to the 27 point that it is unlikely that rare species would be present.

28

29 6.3.2 Valued Environmental Components

As noted in **Step 2**, civic management of the AOI is partitioned among five municipalities, each with its own set of development regulations and land use plans. It is clear from a review of relevant municipal plans that the AOI municipalities anticipate continued managed growth and development in accordance with zoning plans. The zoning designations indicate community values in terms of the particular mix and locations of existing and future land uses. Examples of features that have particular importance to these communities are parks, floodplains, and public facilities (e.g., education facilities, fire and police departments, medical facilities, etc.) (see **Appendix D, Figure D-2**). In general, Planning Officials for the 1 AOI municipalities acknowledge that these valued environmental components are equally important to 2 maintaining a balance among land uses and services to residents.

3 4

6.3.3 Relatively Unique or Sensitive Landscape Features

5 UNT operates one large (main campus) and one smaller campus (Eagle Point campus) within the AOI. 6 Both campuses are located near the IH 35E and IH 35W interchange; the main campus to the east of IH 7 35E and the Eagle Point campus to the west of IH 35E. UNT structures are visible from the highway and 8 both campuses utilize frontage with IH 35E as major entryways to the campuses. The Denton State 9 School on State School Road is unique to the area as it provides specialized education for students with 10 mental and/or physical disabilities from its 18-county service region.

11

12 6.3.4 Vulnerable Elements of the Population

13 Certain groups of people may find it more difficult to bear the impacts of a transportation project than 14 other groups. These sensitive elements of the population include the elderly, children, persons with 15 disabilities, minority groups, and low-income groups. The Denton State School has over 600 students 16 with mental and/or physical disabilities that both live and study/work at the facility. Likewise, patients of 17 hospitals, students in elementary schools, and residents of senior living centers (see Table 5-20) should 18 be considered particularly sensitive to potential indirect impacts. Based on the demographic analysis 19 presented in Section 5.2.9, minority and low-income populations are known to be present within 0.25 20 mile of IH 35E, and therefore, within the AOI.

21

22 6.4 Step 4 – Indirect Impacts Analysis - Identify Impact-Causing Activities of Proposed Action

This step summarizes the impact-causing activities of the proposed project from the beginning of construction to maintaining the operating facility. The purpose of this step is to identify the anticipated project-related activities that may come into conflict with the community goals and notable features discussed above in **Step 2** and **Step 3**, respectively.

27

28 The proposed project would remove and reconstruct IH 35E within the project design limits. lt is 29 estimated that existing pavement and vegetation ground cover would be removed to create new 30 pavement and bridges, and that vegetation would be removed within a 20-foot construction zone 31 extending from the outer edge of proposed paved surfaces. Earth grading equipment would alter the 32 existing facility's vertical alignment according to design specifications, and perform other grading activity 33 within existing and proposed ROW. The project design calls for removal of all existing drainage 34 structures, installation of extended culverts with enlarged flow capacity, and grading within drainage 35 easements to ensure efficient cross drainage of storm runoff.

1 Based on the foregoing summary of expected construction activity, descriptions of potential impact-2 causing activities are summarized in Table 6-5. The items in the table are presented in the same order 3 they appear in Section 5.0 to facilitate cross-referencing with the corresponding discussion of direct 4 impacts. This assessment of impact-causing activities is based on the assumption that construction and 5 operation of the proposed facility would be in accordance with current industry standards and practices, 6 and consistent with the experience from previous transportation projects. The various types of activities 7 noted in Table 6-5 are based on the examples provided in the TxDOT ICI Guidance and NCHRP Report 8 466, and have been tailored to fit the design and environmental context of the proposed project. 9

_

TABLE 6-5. IMPACT-CAUSING ACTIVITIES OF THE PROPOSED PROJECT - - -

Type of Activity – Project	Relevant Details about Project Specific Activity
Specific Activity	nelevant Details about Project Specific Activity
	Natural Resources (see Section 5.1)
Modification of Regime – Culvert Construction	 Throughout the length of the project there are 24 places where storm water drains across the existing facility. The proposed project would replace the existing culverts with new culverts of equal or greater size to allow continued unimpeded flow under the highway; the length of the culverts would be extended to accommodate widening of the highway. Of these 24 ephemeral water features, 13 streams provide local drainage and are not considered jurisdictional under Section 404 of the CWA. The remaining 11 streams are waters of the U.S. and permanent fill to these features (shown in Table 5-1) is summarized below: Fill within seven channels would not exceed 0.10 acre, and Section 404 permitting of the fill would be through NWP 14, without PCN; Fill within four channels would exceed 0.10 acre but would be less than 0.50 acre, and Section 404 permitting would be through NWP 14 after PCN is accomplished (one of these sites also includes 0.19 acre of impacts to an adjacent wetland). The replacement of project culverts has been designed to ensure storm runoff would be conveyed during construction. In most cases, the capacity of existing culverts would be increased by adding one or more box culverts next to the existing culvert or culverts. Excavation for and placement of the added culvert would occur before removing an existing culvert, thus ensuring that existing capacity is maintained throughout construction. It is expected that mitigation for the loss of functions and values of affected streams would be addressed during the permitting process, and that the USACE may not require mitigation for the povintion of fill affecting stream segments that were previously placed within the avisting a whore. Uson Section 5.1.1 and 5.1.21
Modification of Regime – Floodplain Intersection	A total of 14.92 acres of the existing and new ROW for the project would lie within the 100-year floodplains of five separate streams. The hydraulic design of the project would permit conveyance of the 100-year flood, without causing substantial damage to the facility, streams, or other property. [See Section 5.1.3]
Modification of Regime – Soil Disturbance	Ground disturbance during site grading to create cut and fill to meet design specifications would create the potential for increased erosion of soil, which could lead to sedimentation in local streams. During construction, BMPs would be in place (e.g., SW3P) to minimize erosion through temporary reseeding activity, detention facilities, and various approved soil stabilization methods. After construction, herbaceous ground cover would be reestablished with seeding mixtures and techniques that meet TxDOT specifications. [See Section 5.1.4]

TABLE 6-5. IMPACT-0	CAUSING ACTIVITIES OF	F THE PROPOSED PF	ROJECT
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Type of Activity – Project Specific Activity	Relevant Details about Project Specific Activity	
Modification of Regime – Vegetation Removal	 The clearing of existing vegetation cover (333.11 acres) would be necessary for earth grading for cut and fill needed to construct the project. Impacts from clearing activities are summarized below by vegetation type: 317.79 acres – maintained grass (primarily Bermuda grass); 0.58 acre – water features (stream channels, wetland, and pond); 2.03 acres – riparian forest (e.g., American elm and black willow); 5.29 acres – upland forest that is landscaping for developed areas; 4.64 acres – upland forest with unmaintained understory plants; 1.24 acres – brushland areas (i.e., shrubs and sapling trees); and 1.54 acres – fencerow trees (predominantly hackberry trees). Within the forest areas that would be removed, there are 47 trees greater than 20 inches dbh, most of which are post oak trees. The estimated total number of trees greater than six inches dbh to be removed is 1,370 trees. Permanent herbaceous ground cover would be created for cleared areas that are not used for the new facility (175.10 acres total). [See Section 5.1.5] The removal of the 11.96 acres of upland and riparian forest vegetation noted above may affect wildlife habitat available for animal species that commonly occur in the project area. In light of the quantity and quality of this habitat, and its proximity to the human urban environment, no adverse effects are expected to any threatened or endangered species that are thought to occur within Denton 	
Modification of Regime – Loss of Prime Farmland	The project is located within the city limits of Corinth and Denton, and all areas identified for new ROW are zoned for urban uses. Consequently, impacts that might otherwise occur to prime farmland soils are exempt from the provisions of the FPPA. [See Section 5.1.7]	
Type of Activity – Alter Air Quality	The current and future operation of IH 35E produces air pollution from the mobile sources that use it. The traffic volume for the design year and accompanying air emissions that contribute to the creation of atmospheric ozone are consistent with the MTP and TIP. A modeling study of CO emissions from the project in its design year indicates that air quality standards would not be exceeded. Modeling of MSAT emissions expected from the project indicates that MSAT emissions in the design year would be substantially less than at present; quantitative modeling analysis indicates that, despite an increase in VMT expected for the project, the implementation of EPA's vehicle emission control standards would outpace the effects of increased traffic in terms of MSAT emissions. [See Section 5.1.8]	
Community Impact Assessment (see Section 5.2)		
Changes in Traffic – Influence on Growth	The estimated changes in population growth from 2000 to 2030 for Corinth and Denton are 138 percent and 160 percent, respectively, and 154 percent for Denton County. The projected employment growth rates from 2000 to 2030 for Corinth and Denton are 46 and 84 percent, respectively, and 171 percent for Denton County. Reconstruction of IH 35E would improve mobility in support of expected regional and community growth by facilitating the movement of goods and commuters. [See Sections 5.2.1 and 5.2.4]	

Type of Activity – Project Specific Activity	Relevant Details about Project Specific Activity
Land Alteration – Conversion to ROW	Approximately 106.59 acres of additional ROW would be converted to transportation ROW. This figure is comprised of the following existing types of land uses: 54.87 acres undeveloped; 3.95 acres developed residential; 46.53 acres developed commercial; 1.04 acres undeveloped easement; and 0.20 acre developed commercial easement. The proposed roadway improvements have been coordinated with planning officials within affected communities and are included in municipal planning documents. Conversion of land to ROW and construction of the project would require adjustments to existing utilities, but only temporary interruptions in service are anticipated. [See Sections 5.2.2 and 2.4] The project would likely displace 57 properties (17 residential and 40 commercial). These properties contain 78 structures, consisting of 16 single-family residences, two apartment buildings (with eight apartment units each), and 60 commercial structures (including buildings and canopies at gasoline service stations). The project would displace one public facility, the Denton Baptist Temple Property; there are approximately 2.6 acres of undeveloped land on the same property that would not be affected by ROW acquisition. [See Sections 5.2.5 and 5.2.11, and Appendix A, Figure A-6] The changes in land use associated with the project are not anticipated to change the aesthetic character of the surrounding IH 35E communities. [See Section 5.2.12]
Land Alteration – Alter Section 4(f) Land	A survey of the project area indicates there is one Section 4(f) resource, Joe Skiles Park, located adjacent to the project. The design of the proposed project, including noise abatement walls, would not require the use of, nor substantially impair the purposes of this park. [See Section 5.2.3]
Access Alteration – Alter Travel Circulation	Attrough the proposed project would result in additional control of access (consistent with TxDOT design criteria) to adjacent properties, alternative access routes to abutting properties would be maintained. [See Section 5.2.6] The proposed improvements would generally follow the existing project alignment. The proposed project is not anticipated to negatively affect the overall cohesiveness and nature of the various communities surrounding the project area (as delineated within elementary school attendance zones) [See Section 5.2.7] Of the 48,882 persons within the Census block groups located within 0.25 mile of the proposed project ROW, approximately 7.6 percent speak English less than "very well." Steps have been and would continue to be taken to ensure all LEP populations have access to programs, services, and information provided by TxDOT. [See Section 5.2.8] Eighteen of the 198 Census blocks within 0.25 mile of the proposed project ROW contain minority populations of 50 percent or greater (five of which have a population of less than 10 people), and 137 Census blocks contain specific combined minority populations that are at least 50 percentage points higher than their respective block groups. The 24 Census block groups within 0.25 mile of the proposed project ROW reported 1999 median household incomes ranging from \$13,281 to \$90,888; and five of the 24 Census block groups contain populations that make less than the HHS 2011 poverty guideline of \$22,350 for a family of four. Based on the totality of effects from the proposed project (impacts not borne by only LJ populations), disproportionately high and adverse impacts on minority or low-income populations are not anticipated. An O&D analysis revealed that the majority of TSZs within the MPA are expected to make at least one trip per day along the proposed IH 35E facility in 2030 and that approximately 19,764 additional trips per day are anticipated if the project is built. EJ TSZ trip data indicate that one-sixth of the trips on the proposed mainlanes w

TABLE 6-5. IMPACT-CAUSING ACTIVITIES OF THE PROPOSED PROJECT

Type of Activity – Project Specific Activity	Relevant Details about Project Specific Activity		
Changes in Traffic – Addition of Tolled Lanes	All motorists on IH 35E, including low-income populations, would benefit from capacity and mobility improvements on the IH 35E non-tolled general purpose mainlanes and non-tolled frontage roads. Because the proposed project would provide non-toll alternatives (six to 10 non-toll mainlanes, three to five in each direction), it is expected that traffic would, for the most part continue to travel the mainlanes regardless of the MHOV-C lanes. Therefore, traffic diversions to side streets are not anticipated. Low-income motorists who use the MHOV-C lanes would pay a greater portion of household income on tolls, compared to non-low-income motorists. [See Section 5.2.10]		
Modification of Regime – Traffic Noise	The project would result in traffic noise impacts. Five noise walls are considered feasible and reasonable, benefiting 169 receivers. [See Section 5.2.13]		
Changes in Traffic – Alter Traffic Operations	The project would result in improved LOS on both northbound and southbound mainlanes, MHOV-C lanes, and ramp junctions, including the proposed MHOV-C lanes operating at the highest quality of service (LOS A). [See Section 5.2.14; see also Section 2.3.1]		
	Cultural Resources (see Section 5.3)		
Modification of Regime – Non-Archeological Historic Structures	A 2009 reconnaissance survey identified 20 resources that appear to be at least 50 years of age within the project APE, but none are recommended eligible for listing in the NRHP. Further, there are no Official Texas Historical Markers in the project APE. [See Section 5.3.1]		
Modification of Regime – Archeological Sites	The proposed project would affect no archeological sites listed in, or determined eligible for designation in, the NRHP. [See Section 5.3.2]		
	Other Resources/Issues (see Section 5.4)		
Modification of Regime – Hazardous Wastes	The following sites were determined to pose a high risk to ROW acquisition and/or construction of the project: three TX VCP sites; 24 LPST sites; and two PST sites. Field reconnaissance showed no surface evidence of contamination. It is expected that subsurface investigations (soil boring samples, ground water samples, etc.) would be conducted within the vicinity of the identified high risk sites prior to ROW acquisition and construction to determine if site remediation is necessary. Measures would be taken during construction to prevent, minimize, and control the spill of hazardous materials and ensure workers' safety. [See Section 5.4.1]		
Modification of Regime – Airway-Highway Issues	Denton Municipal Airport is located at a minimum distance of approximately 9,000 feet of the IH 35E/IH 35W interchange. An assessment of various lighting scenarios using the FAA Notice Criteria Tool (e.g., high mast lighting, continuous lighting, etc.) from the highest elevation of the proposed project at the IH 35E/IH 35W interchange indicated that coordination with the FAA was required. The TxDOT Design Division is responsible for coordinating all airway – highway clearance matters with the FAA. During final design of the proposed project, the Design Division will determine if coordination with the FAA will be required based on the final project design and lighting specifications. [See Section 5.4.2]		
Carinity Operation Issues			
Chemical Treatment – Road Maintenance	project, including grass mowing and use of chemicals, as necessary, for weed or pest control. It is also expected that sand, salt, or a mixture of both would be applied to road surfaces to prevent icing during cold weather. These activities would be conducted in accordance with standard TxDOT practices and are not expected to effect any change from the activities currently applied to the existing facility.		

1 6.5 Step 5 – Indirect Impacts Analysis: Identify Potential Indirect Impacts for Analysis

2 The objective of this step is to screen potential indirect impacts for those impacts considered substantial. 3 which are then examined in greater detail in Step 6. This approach applies the understanding of impact-4 causing activities summarized in Step 4 to explore cause-effect relationships with the study area's goals 5 and notable features (Steps 2 and 3). As noted in TxDOT ICI Guidance, "Whether an impact is 6 substantial is a function of the context, the likelihood of the impact, and the reversibility of the impact." 7 The guidance also points out that evaluating impacts in light of area goals is important because impacts 8 that conflict with area goals would likely be considered substantial. Impacts affecting any of the notable 9 features within an AOI would also likely be considered substantial. This step builds upon the initial 10 screening of potential indirect impacts examined in Step 1 to define the AOI.

11

12 In the discussion that follows, relevant aspects of area goals and notable features are reviewed for each 13 of the three categories of indirect impacts. These goals and notable features were evaluated in terms of 14 whether the impact-causing activities outlined in Table 6-5 would likely extend beyond the project 15 construction footprint and, if so, the magnitude of the expected impacts. The method for this screening step applied the gualitative inference technique discussed in NCHRP Report 466 (Page 66) which uses 16 17 "professional judgment of the possible changes that the proposed project would entail." This approach 18 draws heavily upon an understanding of ecological, economic, demographic, and social information developed during the analysis of direct impacts. The results and rationale for indirect impacts that 19 20 warrant further analysis in **Step 6** are then discussed.

- 21
- 22 6.5.1 Encroachment-Alteration Impacts
- 23

24 Ecological Impacts

25

26 **Goals**

27 Local governments in the AOI have addressed community ecological values through several policies that 28 target the preservation of specific ecological resources. The greatest level of preservation is afforded to 29 those areas designated as municipal parks. Local governments also seek to preserve trees through 30 special ordinances that generally require the replacement of certain types and/or sizes of trees removed 31 during construction. Restrictions on development within floodplains, enacted to promote community 32 safety, generally produce the collateral benefit of preserving riparian forests and water features within 33 those floodplains. Accepting these guidelines, municipal zoning plans and FLUPs in the AOI reflect an 34 expectation that various types of urban development will eventually replace the existing vegetation and 35 habitat on currently undeveloped land. The management of air quality is addressed directly at the 36 regional level through various policies and regulations.

1 Notable Features

2 Riparian and upland forest habitat is relatively rare in the AOI, and continues to be a diminishing 3 resource. The quality of forest habitat in the AOI has been largely compromised by the proximity to 4 frequent human activity, fragmentation by past and ongoing urban development, and the ubiquitous 5 occurrence of invasive species such as Chinese privet and Japanese honeysuckle. Perennial water 6 features are uncommon in the AOI as it is located in the upper reaches of local watersheds, and the 7 quality of habitat in local streams and ponds is diminished by the trash and debris that characterize these 8 features. Despite the limited quantity and quality of forest and water habitat in the AOI, these types of 9 habitat remain a valuable part of the landscape if only in terms of biodiversity as compared to urban 10 developments. Given the limited size and quality of habitat in the AOI, only animal species adapted to 11 survival in proximity to urban areas are expected to be present.

12

13 Indirect Impacts

14 As suggested in the discussion in Step 1, impacts to water resources are not expected to result in 15 substantial impacts that would reach beyond the project footprint. The proposed project would increase 16 the capacity of IH 35E to facilitate cross drainage of storm runoff from surrounding areas. Fill impacts to 17 waters of the U.S., including wetlands, would be limited to the project footprint, as would floodplain 18 encroachments. Although the amount of eroded soil that could be transported offsite would be expected 19 to increase during project construction, local regulation of construction (i.e., SW3P) would require erosion 20 and sediment control measures. No local goals or notable features in the AOI suggest this temporary and 21 limited condition should be considered a substantial impact. The loss of forest habitat within existing and 22 proposed ROW is not expected to be substantial in light of the lengthy history and widespread extent of 23 habitat fragmentation and loss over the past 50 years. Local government goals focus on preservation of 24 forest resources in city parks, but do not specifically preserve wildlife habitat other than through tree 25 preservation ordinances. Although not an articulated objective of municipal regulation of floodplains, local 26 policies that prevent development in floodplains also effectively preserve riparian habitat. Otherwise, 27 local goals anticipate continued urbanization of remaining undeveloped land in the AOI and do not seek 28 to preserve wildlife habitat in the area. No substantial indirect impacts are expected in terms of air 29 quality, as air pollutants of concern either attenuate quickly as they move away from the highway (e.g., 30 CO and MSATs) or are included in air emission budgets that are part of regional ozone abatement plans.

31

32 Socioeconomic Impacts

33

34 *Goals*

Socioeconomic goals of the AOI governments are mainly reflected within the patterns of land use shown in zoning ordinances and FLUPs. All such plans indicate that the municipalities expect continued urban development of remaining undeveloped areas in the AOI. Local cities also address ongoing and future

CSJs: 0195-03-050, -071, -075, 0196-01-056, -074

1 growth through various development ordinances that specify the procedures, as well as substantive 2 requirements, for platting and permitting land development. A goal common to every municipality is the 3 socioeconomic viability of the community, and local plans invariably address the requirements needed for 4 success.

5

6 Notable Features

7 Municipalities in the AOI have designated areas for special uses of general interest including parks, 8 floodplains, and public facilities. Individuals both inside and outside the AOI are served by the UNT 9 campuses located near the proposed project alignment. The municipalities of the AOI have plans in 10 place that account for existing road networks and future transportation components. These plans provide 11 a fundamental part of each community's vision of its future socioeconomic vitality. This is also the case 12 on a regional level, where plans are in place to help guide and facilitate future transportation projects. In 13 relation to vulnerable elements of the population, sensitive groups within the AOI include the elderly, 14 children, persons with disabilities, minority groups, and low-income groups.

15

16 Indirect Impacts

17 As identified in Section 2.3 (Need and Purpose), the proposed IH 35E improvements are designed to 18 improve mobility and enhance safety. To accomplish these objectives, the proposed design 19 improvements include the reconstruction of IH 35E to accommodate for the addition of lanes (general 20 purpose, MHOV-C, and frontage road), and the modification of ramps (location and design) and cross 21 streets along the project alignment. The design improvements also include updating all frontage road and 22 cross-street intersections to meet design specifications, as outlined within the various comprehensive 23 and/or thoroughfare plans of the associated municipalities. As described in greater detail in 24 Section 6.6.2, changes in accessibility were analyzed within a NCTCOG defined traffic study area (23.8 25 square miles) for the proposed IH 35E improvements. Daily, AM, and PM average loaded speeds⁶⁵ increased for all roadway classifications⁶⁶ under the Build Alternative when compared to the No-Build 26 27 Alternative. In addition, the Build Alternative resulted in a 162.5 percent decrease in lane-miles operating at the LOS F and a 40.3 percent increase in the number lane miles operating at LOS A-B-C.⁶⁷ 28

29

The above combination of improved travel speeds and improved LOS would positively impact local transit, emergency, and other public services, as time spent in congestion is anticipated to decrease with the overall improvement in roadway operational conditions. Improved access to these services is a benefit to all populations, including sensitive elements such as the elderly, minority groups, and lowincome groups. Increased speed and improved LOS could also stimulate economic growth near the

⁶⁵ The average loaded speed is the average speed on roadways with traffic on the road; it is the volume-weighted average of loaded speed.

⁶⁶ Roadway Classifications included freeways, principal arterials, minor arterials, collectors, freeway ramps, frontage roads, and managed HOV lanes.

⁶⁷ LOS A represents the best operating conditions and LOS F represents the worst operating conditions.

1 proposed alignment, thereby resulting in higher occupancy rates of vacant office buildings and 2 apartments. Such infill of existing vacant properties is consistent with development goals as outlined 3 within the respective comprehensive plans and ordinances of the AOI municipalities. Improved mobility 4 could also increase enrollment numbers at UNT as motorists originating their travel from both inside and 5 outside the AOI experience decreased congestion levels on IH 35E. UNT has outlined a development 6 strategy to accommodate anticipated growth over the next 20 years in their master plan (see 7 Section 2.5). An additional indirect impact of the proposed improvements relates to excess toll revenue 8 generated from the MHOV-C lanes. This excess revenue would remain in Denton County and could be used to help fund other tolled and/or non-tolled transportation projects⁶⁸ within the AOI to the benefit of all 9 10 populations, including minority and low-income.

11

12 Potential negative impacts to minority and low-income populations are generally associated with 13 relocation/displacement impacts and the economic impacts of tolling. In relation to encroachment-14 alteration impacts, no relocations and displacements are anticipated outside those taken for ROW 15 acquisition. These impacts are addressed in Section 5.2.5 (Relocations and Displacements) and 16 Section 5.2.9 (Environmental Justice, subsection Residential Displacements) of the EA. Likewise, the 17 economic impacts of tolling are assessed as part of the direct impacts analysis in Section 5.2.10; 18 however, current plans indicate that when the proposed project opens, the IH 35E Middle section (project 19 limits: from PGBT to FM 2181) will be operational. This could potentially allow a longer trip for users, if 20 desired. For additional trip length information, see Appendix G-6: Traffic and Revenue Analysis 21 Consistency and MTP Phasing Compatibility.

- 22 .
- 23

24 As the above impacts are either consistent with the objectives of the AOI municipalities or with regional 25 plans, and do not adversely impact notable features, none are anticipated to result in substantial 26 encroachment-alteration impacts. For these reasons, additional analysis is not necessary in Step 6. 27 These impacts could, however, increase demand on the existing available land of the AOI. That is, as 28 mobility along IH 35E is improved and as growth continues, infill (e.g., higher enrollment at UNT could 29 lead to higher apartment occupancy rates) could reach a maximum, thus decreasing supply such that the 30 demand for new developments increases. The aforementioned impacts could serve as contributing 31 factors to project-influenced land use change, which is further discussed in Section 6.5.2 below.

⁶⁸ RTC's *Excess Toll Revenue Sharing: Managed Lane Policy* (approved June 2005; see **Appendix G-2**).

6.5.2 Project-Influenced Land Use Change

3 Goals

As outlined in **Section 6.2.2**, the AOI municipalities have plans, ordinances, and/or programs (e.g., CIPs) in place to guide and monitor development. Planning documents support the continued development of commercial and light-industrial properties adjacent to IH 35E. Municipalities also site a strong commitment to the maintenance of existing single-family residential communities, while also planning for mixed-use and commercial developments in response to housing and service demands generated from continued population growth.

10

11 Notable Features

Project-influenced land use change has the potential to impact any notable feature associated with the respective site of identified land use conversion. As described in **Section 6.3**, these notable features within the AOI include scattered remnants of riparian and upland forest habitat, water related habitat, parklands and floodplains, and other unique features and elements of the population such as UNT, public facilities, minority populations, and low-income populations.

17

18 Indirect Impacts

Undeveloped land and potential sites for redevelopment are present within the AOI. The proposed project is anticipated to result in improvements to mobility that, along with forecasted growth, could influence property values and the overall supply and demand for goods and services within the AOI. The proposed improvements could result in a change to the type, amount, or timing of development within the AOI; therefore, additional analysis is necessary. Methodology outlined in NCHRP Report 25-25, Task 22 was utilized to determine the locations of potential project-induced land use change. This stepwise analysis is presented in **Step 6** (see **Section 6.6.2**) of the indirect impacts assessment.

26

27 6.5.3 Impacts Resulting from Project-Influenced Land Use Change

28

29 **Goals**

30 Goals relating to land use and development are described in **Section 6.5.2**. These same goals are 31 considered in the identification of impacts resulting from project-influenced land use change.

32

33 Notable Features

Notable features associated with locations of project-influenced land use change are described in Section 6.5.2. These same notable features are considered in the identification of impacts resulting from project-influenced land use change.

1 Indirect Impacts

Impacts to the natural and human environment resulting from project influenced land use change are unquantifiable until the specific locations of project-induced land use conversion are identified in **Step 6** of the indirect analysis. As such, the probability of occurrence and magnitude of such resulting impacts are also analyzed in **Step 6** (see **Section 6.6.3**).

- 6
- 7

6.6 Step 6 - Analyze Indirect Impacts and Evaluate Results

The purpose of this step is to determine if the indirect impacts identified in **Step 5** have the potential to be substantial by assessing the magnitude, probability of occurrence, timing and duration, and degree to which the impact can be controlled or mitigated (Step 6 of NCHRP Report 466, page 71). An integral component to this step is to reconsider key assumptions used in the indirect impacts analysis and evaluate the extent to which uncertainty associated with these assumptions may affect the results of the analysis.

14

15 6.6.1 Encroachment-Alteration Impacts

As determined in **Step 5** of the indirect impacts analysis (see **Section 6.5.1**), substantial ecological or socioeconomic encroachment-alteration impacts are not anticipated, necessitating no additional analysis.

18

19 6.6.2 Project-Influenced Land Use Change

20 The evaluation of whether the proposed project is likely to result in project-influenced land use change 21 follows the NCHRP Report 25-25, Task 22. Project-influenced land use change can include project-22 induced development, the redevelopment of already developed land, or a change in the rate of 23 development/redevelopment. Of the six land use forecasting tools introduced in the report, the "planning 24 judgment" forecasting tool was used as the framework for the analysis. The planning judgment method 25 requires the use of a stepwise methodology that comes from A Guidebook for Evaluating the Indirect Land Use and Growth Impacts on Highway Improvements.⁶⁹ The planning judgment methodology seeks 26 27 to make reasonable judgments about potential project-induced impacts based on information gained from 28 the opinions and experience of professionals, through literature review, and through an assessment of 29 existing and forecasted local conditions. To this end, input from local planners was obtained via 30 questionnaires and/or interviews in an effort to assess the potential for project-induced land use impacts. 31 As described in the NCHRP Report 25-25, Task 22, Table 6-6 summarizes key variables that might

32 contribute to measurable changes in local development patterns in response to a transportation 33 improvement project.

⁶⁹ ECONorthwest and Portland State University for the Oregon Department of Transportation (2001), A Guidebook for Evaluating the Indirect Land Use and Growth Impacts on Highway Improvements.

-	

TABLE 6-6. KEY VARIABLES CONTRIBUTING TO INDUCED LAND USE CHANGE
--

Key Variable	Standards of Assessment	Assumption				
Change in accessibility	Measured in travel time or delay, if available; or ratio of volume/capacity (v/c) or change in access.	The larger the travel time savings or greater the change in LOS, the stronger the potential for induced land use change.				
Change in property value	Likelihood of changes in land price that would influence development.	The greater the change in property values, the stronger the potential for induced land use change.				
Forecasted growth	Measured as population, employment, and land development for a region, city, or sub- area; forecasted population and employment trends may indicate the demand for land development where access and other public services may be available.	If a proposed transportation project improves access and the average annual population/employment growth rate is relatively high, then the stronger the potential for induced land use change.				
Relationship between supply and demand	Measured as population, employment, and land development; determine how much vacant, buildable land is available within a reasonable sub-area.	The more limited the supply is relative to demand, the more likely improved access would increase the probability of development.				
Availability of non- transportation services and other market factors	Do details exist (i.e. favorable market conditions, utilities, etc.) that would promote or limit development or possible barriers to service?	Access alone is not sufficient to trigger development; favorable market conditions as well as other key public facilities often must be available in the study area at a reasonable cost. If they are, improvements in access are more likely to facilitate land use change.				
Public Policy	Are land use plans closely followed and enforced such that development pressures can be resisted?	If there are no policies or weak enforcement, then the potential for land use change would be strong.				
Source: NCHRP Project 25-25, Task 22, Forecasting Indirect Land Use Effects on Transportation Projects (TRB, 2007).						

3 The assessment of these key variables relating to indirect land use change should take into consideration

4 two questions:

5 (1) How likely is it that a transportation project would be followed by some noticeable change in

6 land use that would not have occurred in the absence of the project or sooner than anticipated?;

- 7 and
- 8 (2) If such changes did occur, would they be consistent with the comprehensive plans and other 9 future planning efforts?

10

The evaluation of project-influenced land use change, in accordance with the NCHRP Report 25-25, Task methodology, is described below and is broken down into two major parts. The first evaluates the existing and forecasted conditions of the indirect impacts AOI (**Section A**, below). Then, based on these evaluations, the second part generates an overall conclusion relating to project-influenced land use change (**Section B**, below). It is through this methodology that specific locations of potential projectinduced land use change within the AOI are identified. Subsequently, the impacts resulting from projectinfluenced land use change are assessed.

- A. Project-Influenced Land Use Change Assessment Part 1 (NCHRP Report 25-25, Task 22):
 Big Evaluation of Existing and Forecasted Conditions
- 4

5 AOI and Time Frame

A detailed description of the methodology used to delineate the indirect impacts AOI in relation to projectinfluenced land use change is presented in **Section 6.1.2** and the AOI is shown in **Appendix D**, **Figure D-1**. In summary, the AOI was established as a function of assessing travel time (via a 5-minute commuteshed), travel volumes (via TSZs), and planner input. The time frame for assessing projectinduced land use change (see **Section 6.1.3**) is from the time of the proposed project's construction to 2030. The future year 2030 correlates with *Mobility 2030 - 2009 Amendment* and establishes a reasonable timeframe to assess local planning documents.

13

14 Basic Demand Drivers

Land use and transportation planning is driven by population and employment forecasts. As such, forecasted growth tends to help provide an understanding as to the demand for development on a regional and city level. In turn, these regional and city forecasts provide insight as to growth and development trends within the AOI.

19

20 The NCTCOG demographic forecast provides long-range, small area population, household, and 21 employment projections for use in intra-regional infrastructure planning and resource allocation in North 22 Central Texas. The forecast is conducted for the counties surrounding the DFW urban core (Collin, 23 Dallas, Denton, Rockwall, Tarrant, Ellis, Johnson, Kaufman, Parker, and Wise Counties). by 2030, this 24 area is expected to surpass 9.0 million persons and approximately 5.4 million jobs. Local municipalities 25 worked with NCTCOG staff to ensure that local government land use and comprehensive plans were 26 included in the 2030 demographic forecast. A task force of local officials from city, county, and 27 transportation entities acted as a governing body for the process and endorsed the forecast for approval 28 by the NCTCOG's Executive Board.

29

Table 6-7 summarizes the demographic forecast from 2000 to 2030 for the AOI municipalities and for the above described DFW urban core. The combined population and employment estimates are anticipated to increase annually on average by approximately 4.95 and 2.75 percent, respectively. Likewise, all AOI municipalities are anticipated to increase in population and employment from 2000 to 2030. For the municipalities of Hickory Creek and Shady Shores, employment growth rates are anticipated to be higher than population growth rates. In contrast, population growth rates are anticipated to be higher than employment growth rates for the municipalities of Denton, Corinth, and Lake Dallas, a trend also

- 1 observed for the DFW urban core. It is important to note that current economic conditions could slow the
- 2 anticipated growth rate of the AOI municipalities, but that the overall trend is for continued growth.
- 3

	Population					Employment					
Area	2000	2030	Percent Population Increase	Average Annual Percent Population Growth Rate from 2000 to 20301	2000	2030	Percent Employment Increase	Average Annual Percent Employment Growth Rate from 2000 to 2030 ¹			
DFW Urban Core ²	5,067,400	9,107,900	79.74	2.66	3,158,200	5,416,700	71.51	2.38			
City of Denton	73,225	190,719	160.46	5.35	58,581	107,572	83.63	2.79			
City of Corinth	11,365	27,070	138.19	4.61	2,213	3,225	45.73	1.52			
City of Lake Dallas	6,378	9,,209	44.37	1.48	1,683	2,384	41.65	1.39			
Town of Hickory Creek	2,005	3,996	99.30	3.31	494	1,115	125.71	4.19			
Town of Shady Shores	1,500	3,849	156.60	5.22	188	889	372.87	12.43			
Municipality Total	94,473	234,843	148.58	4.95	63,159	115,185	82.37	2.75			

TABLE 6-7. 2000-2030 POPULATION AND EMPLOYMENT GROWTH

Source: NCTCOG Demographic Forecast for Selected Cities.

Notes:

1. Calculated as the percent growth rate over the 30-year period (2000 to 2030).

2. The 10 counties surrounding the DFW urban core include Collin, Dallas, Denton, Ellis, Kaufman, Johnson, Parker, Rockwall, Tarrant, and Wise.

4

5 Relevant Plans and Conditions of the Study Area: Correspondence with the AOI Municipalities

6 A key element to identifying the potential for indirect land use impacts involves reviewing of local 7 comprehensive plans and related documents in order to provide a general indication of what land use 8 patterns and densities are desired, expected, and allowed within the AOI. Another key aspect involves 9 gathering data, including opinions, from representatives of the AOI municipalities. These representatives 10 have first-hand knowledge regarding property values, forecasted growth, supply and demand, other market factors affecting their jurisdictions, and the most applicable public policies that would promote and 11 12 protect future development. A description of the regional and local planning documents in relation to the 13 AOI is provided in Section 2.5 and Section 6.2.2 of this EA. A description of the interview process with 14 local planners is presented below.

15

16 Beginning in late 2008 and continuing into 2009, representatives from the Cities of Denton, Corinth, and

17 Lake Dallas, and the Towns of Hickory Creek and Shady Shores were contacted for their assistance in

18 ascertaining the potential for indirect impacts resulting from the proposed project. Representatives from

the municipalities were first interviewed via a mail-out questionnaire about factors influencing
 development within the AOI. These factors included:

- 3
- The economy (growth, strength of regional economy, employment centers nearby, other
 economic factors, etc.);
- Travel time to places of interest (employment, services, retail, medical, entertainment, education,
 etc.);
- Infrastructure (transportation network, water, wastewater, electric, etc.);
- 9 Development advantages (low land cost, good availability, natural amenities, etc.);
- Development constraints (high land cost, low availability, terrain, soils, floodplains, regulatory constraints, environmental regulations, local ordinances, etc.); and
- Social considerations (proximity to schools, churches, neighborhoods, parks, etc.).
- 13

The questionnaire also included inquiries relating to areas likely to be developed under both the Build and No-Build Alternatives. This included questions relating to the amount, type, location, and timing of potential land use change. A copy of the questionnaire mailed to the AOI municipalities is presented in **Appendix D-4**.

18

19 Following the issuance of the questionnaires, meetings were set up with representatives from each of the 20 AOI municipalities to further discuss the potential for induced growth impacts. Depending on the 21 municipality, these representatives (hereby collectively referred to as 'Planning Officials') consisted of city 22 managers, planners, directors of economic development, and elected officials. Representatives from 23 UNT were also present in the meeting with the City of Denton. A list of the meeting dates and attendees 24 (by title) is presented in Appendix D-5. Two municipalities (the Cities of Corinth and Lake Dallas) 25 answered and returned the mail-out questionnaires prior to their respective meetings, where the 26 information on the questionnaires was further discussed. For the remaining three municipalities (City of 27 Denton, and Towns of Hickory Creek and Shady Shores), completed questionnaires were not returned; 28 however, the questionnaires were discussed during their respective meetings.

29

30 Planning Officials acknowledge that the improved mobility, generated by the proposed improvements, 31 could stimulate growth near the project alignment, resulting in higher occupancy rates of vacant buildings 32 and improved accessibility to services, both of which are objectives outlined by all of the AOI 33 municipalities in their respective planning documents. However, it was the overwhelming consensus 34 among Planning Officials that, even with the improved mobility generated by the proposed improvements, 35 economic forces and municipal regulations governing development would ultimately serve as the major 36 influences on development within the AOI. In fact, Planning Officials cited the current economic downturn 37 as the driving force behind the slowing of some development projects within their associated

1 municipalities. The City of Corinth also cited a lack of proper infrastructure adjacent to IH 35E as an 2 important factor influencing potential development within the AOI. The City of Lake Dallas, Town of 3 Hickory Creek, and Town of Shady Shores all ranked the presence of land use constraints (dedicated 4 parkland, land owned and operated by USACE, and/or heavy residential zoning) as important factors 5 influencing potential development

6

As mentioned above, Planning Officials were also asked to describe both existing and anticipated land use trends within their associated municipalities. This included the identification of specific areas anticipated to undergo project-induced land use change or areas where the rate of land use conversion could be affected. These descriptions, along with information collected through spatial analysis techniques, are detailed further in the next two sections.

12

13 Land Use Capacity and Development Potential

An assessment of land use capacity can provide a municipality with information that helps to monitor the acreage of developed versus undeveloped land supply, growth pressures, demographic trends, and development patterns. A closer examination of land use capacity for all AOI municipalities using 2005 land use data is provided in **Table 6-8**. These data provide a benchmark, but do not account for other market factors affecting the rate of development or other changes to the comprehensive plans of the affected municipalities.

20

City/Town	Total Acreage	Percent Developed Land ¹	Percent Developable Land ²	Percent Undevelopable Land ³	Build- out Acreage ⁴	Annual Growth Rate⁵	Build-Out Year ⁶
Denton	45,699	27.80%	68.08%	4.11%	31,111	5.35%	2030
Corinth	4,308	50.10%	42.94%	6.96%	1,850	4.61%	2014
Lake Dallas	979	73.34%	25.95%	0.71%	254	1.48%	2015
Hickory Creek	2,624	30.60%	21.11%	48.29%	554	3.31%	2020
Shady Shores	1,730	32.95%	62.60%	4.45%	1,083	5.22%	2014

TABLE 6-8. FUTURE LAND USE CAPACITY WITHIN THE AFFECTED MUNICIPALITIES OF THE AOI

Source: NCTCOG 2005 Land Use.

Notes:

1. Includes the following land use types: airports, commercial, government/education, industrial, infrastructure, and residential.

2. Land classified by NCTCOG 2005 Land Use as undeveloped.

3. Undevelopable Land = Total Acreage – Developed Land – Developable Land; includes parkland, landfill, and water.

4. Build-out Acreage = Total amount of developable land.

5. See **Table 6-7**. Annual growth rate calculated over a 30 year period (2000 to 2030) using NCTCOG Demographic Forecast Estimates for Selected Cities.

6. Based on best available straight-line projection estimates. Does not take into account future land annexations.

Data obtained from planning departments of the associated municipalities.

21

Interviews with Planning Officials provided a qualitative assessment of current land use capacity and
 development trends (as of January/February 2009) within the municipalities of the AOI, as summarized
 below.

- 4
- City of Denton Development potential primarily infill within the City; more vacant land available
 for development in the northern portion of the City; due to the large area of ETJ to the north and
 west of the City, build out year is difficult to estimate. According to representatives from UNT, the
 future growth and development of UNT over the next 20 years is acknowledged and accounted
 for within UNT's master plan.
- City of Corinth Approximately 75 percent built-out; heavy density of residential developments;
 vacant areas exist along IH 35E that are available for commercial/light industrial development
 only.
- City of Lake Dallas Heavily zoned for residential development; development greatly constrained by the large amount of dedicated parkland and USACE land; planners foresee development surrounding FM 2181 following the completion of the LLTB.
- Town of Hickory Creek Heavily zoned for residential development; development greatly constrained by the large amount of dedicated parkland, USACE land, and the fact that much of the Town's western portion is under the private ownership of one individual; planners foresee development surrounding FM 2181 following the completion of the LLTB.
- Town of Shady Shores Approximately 96 percent built-out; zoned completely residential;
 development greatly constrained by the large amount of dedicated land, USACE land, and zoning
 restrictions.
- 23

Planning Officials confirmed that most of the heavy urbanization of the AOI has occurred over the last 20 years. Planning Officials also made note that the projected build-out years shown in **Table 6-8** are based on generally stable market conditions and that the build-out year projections are subject to change based on market forces.

28

29 Future Development Patterns of the AOI

The approach for assessing future development patterns within the AOI involves identifying areas where it would be reasonable to expect shifts in development. In order to identify areas within the AOI where potential future impacts could occur, GIS mapping and analytical techniques were first used to identify and map areas where natural, governmental, or other constraints would make a future change in land use unlikely.

35

GIS analysis determined that of the 26,201.5 acres within the AOI, approximately 9,131.5 acres (34.9 percent) remains undeveloped. Approximately 1654.5 acres of this undeveloped land are located within

1 100-year floodplain, which are generally regulated from future development by municipal floodplain 2 preservation ordinances. Thus, there remains approximately 7,477.0 acres (28.5 percent) of 3 undeveloped, non-100-year floodplain land available for future development within the AOI. There are 4 other areas in addition to floodplains within the AOI that would be unsuitable or unlikely for future 5 development activities. These areas are shown in **Appendix D, Figure D-2** and include the following:

- 6 7
- Existing public facilities (e.g., TxDOT ROW, schools, hospitals, civil service, municipal, etc.);
- Dedicated areas (e.g., public parks, recreation facilities, etc.);
- Parcels owned and/or used for major utilities (e.g., electric substations);
- 10 Historic properties or districts and known archeological sites;
- Areas currently developed and zoned for single-family residential use, and which are reflected as
 remaining residential in the CLUPs and/or FLUPs of the AOI municipalities; and
- 13
- Areas already planned and platted for reasonably foreseeable developments (see Appendix E, Figure E-2 and Appendix E-3).
- 14 15

What is left following the above identification of land use constraints are those areas to be assessed for potential project-induced land use change. As previously described, it was a goal of the Planning Official interviews to identify the specific areas within the AOI likely to experience land use change that would not or could not occur without the proposed project. Planning Officials were asked to specifically identify, by drawing on a map, areas where the amount, type (commercial, residential, industrial, etc.), location, or timing of development would be different as a result of the proposed improvements.

22

Taking into consideration current/future zoning and land use, access issues, the presence of constraining factors (e.g., the 100-year floodplain), and current market factors, Planning Officials from the AOI municipalities collectively identified 27 locations of anticipated project-induced land use change (labeled Sites 1-27 in **Appendix D**, **Figure D-3**). These 27 locations account for approximately 996.6 acres (3.8 percent) of the AOI. Based on their first-hand knowledge of the AOI, Planning Officials divided these 27 locations into the following two categories:

- 29
- 30 (1) Areas of anticipated induced development that would not or could not occur without the 31 proposed improvements; and
- 32 (2) Areas where the proposed improvements could influence the rate or pace of development, but
 33 where the land use conversion would not be dependent upon the proposed improvements.
- 34

35 Sixteen locations were identified under category (1) and 11 locations were identified under category (2).

- All of the 27 identified sites are located adjacent to the proposed project alignment. None of the locations are located on UNT property.
 - Page 188

The No-Build Alternative is inconsistent with the planning documents for the AOI municipalities. The proposed project is included in the future development plans (CLUPS, FLUPS, and/or general planning efforts) for the AOI municipalities. In fact, all proposed frontage and arterial roadway intersections have been designed to correspond with design elements outlined within each of the associated municipality's thoroughfare plans. The proposed improvements to IH 35E are consistent with the regional *Mobility 2030* - 2009 Amendment and the FY 2011-2014 TIP, as amended.

8

9 It is possible that the implementation of the No-Build Alternative could result in less development or a 10 slowing of development within the AOI. Further, land use change could also occur in different areas than 11 what has been planned for by the municipalities of the AOI as a result of increased congestion 12 experienced under the No-Build Alternative. It is important to note, however, that even under the Build 13 Alternative, potential development would be more heavily influenced by market forces and planning 14 regulations than the proposed IH 35E improvements, an opinion iterated by all Planning Officials 15 consulted.

16

Other Relevant Impacts of the Proposed Project: Summary of NCTCOG Travel Performance Estimates

19 Travel time and traffic volumes are key transportation measures for estimating impacts on residential and 20 commercial development. The larger volumes that result from transportation improvements could support 21 an increase of demand, and prices bid for, retail and commercial properties along a corridor, which in turn 22 could contribute to the potential for land use changes. Key questions are whether (1) that potential is 23 sufficient to cause property owners and developers to build faster and differently than they would have, 24 and (2) whether the comprehensive plan would have to be changed in any substantial way (e.g. zoning, 25 comprehensive plan designations, city limits, urban growth boundaries) to allow that change in 26 development.

27

28 Changes in accessibility are most readily analyzed by comparing differences in travel time, congestion 29 delay, LOS, and average speed along a particular facility or study area. For the indirect impacts analysis 30 of the proposed project, changes in accessibility were analyzed for the 2030 No-Build Alternative versus 31 the 2030 Build Alternative. Utilizing a 23.8 square mile traffic study area developed by NCTCOG and 32 encompassing the AOI, performance reports were generated for freeways, frontage roads, principal and 33 minor arterials, collector roads, freeway ramps, and managed HOV lanes. These performance reports 34 allowed for a direct comparison of changes in average speed and LOS within the traffic study area. 35 Table 6-9 provides data pertaining to the 2030 average loaded speed on the various roadway 36 classifications for the No-Build and Build Alternatives. The average loaded speed is the average speed 37 on roadways with traffic on the road; it is the volume-weighted average of loaded speed. The value is

- 1 given in mph. As shown in **Table 6-9**, the average loaded speed increases for all roadway classifications
- 2 in the Build Alternative as compared to the No-Build Alternative, indicating that the average trip times on
- 3 the various roadways would be less in the Build Alternative.
- 4

Roadway	No-Build			Build			Percent (%) Change		
Classification	AM	PM	Daily	AM	PM	Daily	AM	PM	Daily
Freeways	47.61	47.98	52.81	55.44	55.69	58.17	16.45	16.07	10.15
Principal Arterials	27.51	28.19	30.14	28.06	28.49	30.37	2.00	1.06	0.76
Minor Arterials	21.44	22.79	24.48	22.43	23.90	25.05	4.62	4.87	2.33
Collectors	18.78	20.39	21.91	19.31	20.80	22.22	2.82	2.01	1.41
Freeway Ramps	37.29	37.13	39.08	39.45	39.87	41.17	5.79	7.38	5.35
Frontage Roads	23.87	25.46	29.09	31.67	32.58	34.60	32.68	27.97	18.94
Managed HOV Lanes	46.46	55.35	53.29	58.72	58.75	59.00	26.39	6.14	10.71
Source: NCTCOG TransCAD® data for 2030 daily traffic Build and No-Build Alternatives (Complete									
Performance Reports, April 2009).									

TABLE 6-9. 2030 AVERAGE LOADED SPEED OF USED ROADWAY (MPH)

Table 6-10 compares the LOS for the 2030 No-Build and 2030 Build Alternatives within the traffic study area. LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Each of six levels of service represents a range of operating conditions and the driver's perception of those conditions (see **Table 2-5** for definitions of each LOS level). Traditionally, a facility is considered to have reached capacity at LOS E.

12

LOS measures vary, depending on facility type. For interstates and divided highways, LOS is determined as a function of density; that is, the number of vehicles per lane per mile of roadway. For arterial streets, LOS determination is based on the average travel speed of the vehicles traveling the defined section. At intersections, both signalized and unsignalized, LOS is a function of delay. For two-lane highways, LOS is determined according to two measures: percent time spent following (which represents the freedom to maneuver and the comfort and convenience of travel) and average travel speed.⁷⁰

⁷⁰ TRB (2000), *Highway Capacity Manual*.

Roadway Classification	LOS No-Build Alternative	LOS Build Alternative	
	A-B-C (16.68 lane-miles)	A-B-C (68.40 lane-miles)	
Freeways (includes toll roads)	D-E (18.69 lane-miles)	D-E (31.97 lane-miles)	
	F (25.32 lane-miles)	F (1.62 lane-miles)	
	A-B-C (55.07 lane-miles)	A-B-C (51.35 lane-miles)	
Principal Arterials	D-E (3.33 lane-miles)	D-E (11.91 lane-miles)	
	F (11.36 lane-miles)	F (6.73 lane-miles)	
	A-B-C (28.44 lane-miles)	A-B-C (35.24 lane-miles)	
Minor Arterials	D-E (7.40 lane-miles)	D-E (.78 lane-miles)	
	F (8.96 lane-miles)	F (6.49 lane-miles)	
	A-B-C (59.22 lane-miles)	A-B-C (60.52 lane-miles)	
Collectors	D-E (10.12 lane-miles)	D-E (10.99 lane-miles)	
	F (12.73 lane-miles)	F (10.99 lane-miles)	
	A-B-C (5.54 lane-miles)	A-B-C (7.09 lane-miles)	
Freeway Ramps	D-E (0.53 lane-miles)	D-E (1.28 lane-miles)	
	F (0.58 lane-miles)	F (0.63 lane-miles)	
	A-B-C (24.43 lane-miles)	A-B-C (53.65 lane-miles)	
Frontage Roads	D-E (8.26 lane-miles)	D-E (10.68 lane-miles)	
	F (16.87 lane-miles)	F (2.49 lane-miles)	
	A-B-C (1.80 lane-miles)	A-B-C (44.42 lane-miles)	
HOV Lanes (includes managed lanes)	D-E (0.00 lane-miles)	D-E (0.00 lane-miles)	
	F (0.16 lane-miles)	F (0.00 lane-miles)	
Source: NCTCOG TransCAD® data for 203 Reports, April 2009).	0 daily traffic Build and No-Build Alte	rnatives (Complete Performance	

TABLE 6-10. LEVEL OF SERVICE WITHIN THE TRAFFIC STUDY AREA (2030)

2

3 The No-Build Alternative had 191.2 total lane-miles operating at LOS A-B-C and the Build Alternative had 4 320.5 total lane-miles operating at LOS A-B-C. This represents a 40.3 percent increase in lane-miles in 5 the traffic study area operating at LOS A-B-C in the Build Alternative. The No-Build Alternative had 76.0 6 total lane-miles operating at LOS F and the Build Alternative had 29.0 total lane-miles operating at LOS F. 7 This represents a 162.5 percent decrease in lane-miles operating at LOS F in the Build Alternative. The 8 LOS comparison indicates the 2030 Build Alternative is predicted to have more lane-miles operating at 9 the favorable operating condition of LOS A-B-C in the traffic study area and fewer lane-miles operating at 10 LOS F. As mentioned in the need and purpose of this EA, the IH 35E proposed improvements are 11 designed to meet future demand on the facility.

1B.Project-Influenced Land Use Change Assessment Part 2 (NCHRP Report 25-25, Task 22):2Overall Determination of Indirect Land Use Impacts

3

4 Potential for Land Use Change Assessment

5 As previously discussed, the potential for land use change can be measured by changes in accessibility, changes in property value, expected growth, the relationship between supply and demand, availability of 6 7 public services, market factors, and public policy. Table 6-11 summarizes the potential for land use 8 change within the AOI as influenced by the above listed change indicators. The summary is based on 9 quantitative and qualitative assessments of the AOI as evaluated in Section A above (Project-Influenced 10 Land Use Change Assessment Part 1) via spatial analysis techniques and using information gathered 11 from Planning Officials. This was then analyzed using thresholds and assumptions described in NCHRP 12 Report 25-25, Task 22.

13

TABLE 6-11. ASSESSMENT OF INDIRECT LAND USE IMPACTS

Change	Data Sources	Anticipated Indirect Impacts	Potential for Land Use Change
Change in accessibility Measured as change in travel time or delay, if available. Otherwise, assessment of v/c or change in access.	Performance reports provided by NCTCOG; Expert opinion of transportation planners and engineers.	 Within the NCTCOG traffic study area (23.8 square miles) encompassing the AOI, the average loaded speed¹ increases in the AM, PM, and Daily scenarios for the Build Alternative as compared to the No-Build Alternative; thus average trip times are less with the proposed improvements. For the Build Alternative, there is a 40.3 percent increase in lane- miles operating at LOS A-B-C and a 162.5 percent decrease in lane- miles operating at LOS F as compared to the No-Build Alternative within the NCTCOG traffic study area. The project does provide improved mobility throughout the corridor. This improved mobility was taken into account by Planning Officials in their identification of potential locations (27 sites) for project- induced land use change (see Appendix D, Figure D-3). 	NCHRP Report 25-25 Scale (a) Less than a couple minutes of time savings for an average trip, or no change in v/c = none to very weak (b) 2-5 minutes = weak to moderate (c) 5-10 minutes = strong (d) more than 10 minutes = very strong Summary of Reasoning Estimated time savings of the Build Alternative is unknown; however, conclusions can be drawn from the following conditions of the Build Alternative: (1) Increase in average loaded speed ¹ (2) Improvement in LOS (3) Improved mobility Conclusion of Potential Strong
Change	Data Sources	Anticipated Indirect Impacts	Potential for Land Use Change
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Change in property value <i>Measured in</i> <i>dollars.</i>	Planning documents for the AOI municipalities; Interviews with Planning Officials from the AOI municipalities.	 The proposed project has been accounted for in planning documents for all AOI municipalities. It is an established goal of all AOI municipalities to maintain areas of residential development and to protect these established areas from non-conforming uses. Improved mobility resulting from the proposed improvements could stimulate growth near the project alignment, resulting in infill development and improved accessibility to services. Although an exact percent change in property value is unknown for the Build Alternative, Planning Officials acknowledge that some increases in property value could occur as a result of project-induced land use change. They also concur, however, that land use changes would primarily be driven by market forces and municipal regulations governing development, not the proposed IH 35E improvements. In relation to the economy, Planning Officials anticipate that property values could decrease somewhat in the immediate future, but that forecasted growth should aid in stabilizing and eventually increasing property values over the long-term. 	NCHRP Report 25-25 Scale (a) No change = none to very weak (b) 0-20 percent increase = weak to moderate (c) 20-50 percent increase = strong (d) More than 50 percent increase = very strong Summary of Reasoning Percent change in property value for the Build Alternative is unknown; however, Planning Officials acknowledge a potential increase in property value for the Build Alternative, but that any increases resulting from the proposed project would generally be outweighed by market conditions. Conclusion of Potential Weak
Forecasted growth <i>Measured as</i> <i>population,</i> <i>employment,</i> <i>land</i> <i>development;</i> <i>for region, city,</i> <i>or sub-area</i>	NCTCOG 2030 forecast; Planning documents for the AOI municipalities; Interviews with Planning Officials from the AOI municipalities.	 The 2000 to 2030 AOI municipality total average annual population growth rate is 4.95 percent and the average annual employment growth rate is 2.75 percent. According to Planning Officials for the City of Lake Dallas and Towns of Hickory Creek and Shady Shores, land use conversion is limited in various areas throughout their municipalities due to the presence of constraining factors (100-year floodplain, dedicated parkland, USACE land, and/or heavy residential zoning precluding commercial development). For all the AOI municipalities, population and employment projections increase from 2000 to 2030 (Table 6-7). It is the opinion of Planning Officials that the rate of residential and commercial growth could slow somewhat under the current economic conditions, but that the forecasted trend of population and employment increases from 2000 to 2030 (provided by the NCTCOG) represent long-term projections that generally account for the cyclical nature of economic downturns. 	NCHRP Report 25-25 Scale(a) <1 percent = none to very

TABLE 6-11.	ASSESSMENT	OF INDIRECT	LAND	USE IMPACTS
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Change	Data Sources	Anticipated Indirect Impacts	Potential for Land Use Change
Relationship between supply and demand <i>Measured as</i> <i>population,</i> <i>employment,</i> <i>and</i> <i>development.</i>	Planning documents for the AOI municipalities; Interviews with Planning Officials from the AOI municipalities.	 The build-out years (as confirmed by Planning Officials) and annual growth rates (as calculated based on the NCTCOG demographic forecast), respectively, for the affected municipalities of the AOI are as follows: Denton (at least 2030, 5.35 percent); Corinth (2014, 4.61 percent); Lake Dallas (2015, 1.48 percent); Hickory Creek (2020, 3.31 percent); and Shady Shores (2014, 5.22 percent). The City of Denton has large areas of ETJ; thus, even with a 5.35 percent growth rate, the predicted build-out year is anticipated to be at least 2030. Planning Officials anticipate less than a 10-year supply of land for the municipalities of Corinth, Hickory Creek, Shady Shores, and Lake Dallas; all except Lake Dallas have forecasted average annual growth rates of over 3 percent. The amount of vacant, buildable land in the Lake Cities is somewhat limited. The City of Corinth is limited on available land for commercial development. The municipalities of Hickory Creek, Shady Shores, and Lake Dallas are limited in available land for commercial development due to the presence of land use constraints (e.g., USACE land, heavy residential zoning, large areas of dedicated parkland, and/or land is surrounded by Lewisville Lake). Planning Officials for all the AOI municipalities cite market forces as the primary factor in meeting the above listed build-out years. Many of these build-out years were established prior to the current weakening of the economy. Planning Officials acknowledge the slowing progress of some development projects. However, even though growth rate in the immediate future may slow somewhat, the overall trend for population growth is still anticipated by the AOI municipalities; therefore, continued demand is also expected in 	NCHRP Report 25-25 Scale(a) More than 20-year supply ofland types = none to very weak(b) 10 to 20-year supply = weakto moderate(c) Less than 10-year supply =strong(d) Less than 10-year supplyand identified problems withinthe study area = very strongSummary of ReasoningPlanning Officials cite theslowing progress of somedevelopment projects.However, even though growth inthe immediate future may slowsomewhat due to economicconditions, the overall trend forpopulation growth is stillanticipated by the AOImunicipalities. As such,continued demand is alsoexpected to accommodate thisgrowth.Conclusion of PotentialModerate in the immediatefuture; Stronger over the long- term
Availability of non- transportation services Measured number of people or employees that can be served; or barriers to service provision.	Planning documents for the AOI municipalities.	 The Cities of Denton, Corinth, and Lake Dallas all have active CIPs. The Town of Hickory Creek's infrastructure improvement needs are currently addressed within the comprehensive plan; the Town is working on establishing a CIP. The Town of Shady Shores does not have a CIP, but addresses improvement needs within planning regulations and contracts out work as needed. The areas of existing development within the AOI are, in general, well-outfitted with necessary infrastructure (streets, sewer, sidewalk, curb, gutter, parks, recreation, etc.). An exception to this is along the proposed project alignment within the City of Corinth, where large areas of vacant land have remained undeveloped due to a lack of infrastructure. Although not currently available, the CIP for the City focuses on improving infrastructure in these vacant areas; Planning Officials acknowledge this commitment to improving infrastructure for the purpose of supporting commercial development along IH 35E. 	NCHRP Report 25-25 Scale (a) Key services not available and difficult to provide = none to weak (b) Not available and can be provided = weak to moderate (c) Not available, easily provided and programmed = strong (d) Available now = very strong Summary of Reasoning Within the AOI, in general, key services are available; if unavailable, easily provided and programmed through CIPs or other planning regulations. Conclusion of Potential Strong

Change	Data Sources	Anticipated Indirect Impacts	Potential for Land Use Change
Other factors that impact the market for development	Planning documents for the AOI municipalities; Interviews with Planning Officials from the AOI municipalities; Current economic development activities in surrounding area.	 All AOI municipalities account for the proposed improvements within their respective planning documents. Planning Officials for the AOI municipalities (including officials from economic development boards/councils) acknowledge that the improved mobility generated from the proposed improvements could stimulate growth near the project alignment, resulting in infill development and improved accessibility to services. In turn, the value of existing land near areas of project-induced development could also be somewhat influenced. However, Planning Officials also acknowledge that changes to property values would be more heavily influenced by market forces and local planning documents governing development, not the proposed IH 35E improvements. Of the entire AOI, project-induced land use impacts are anticipated to occur at 27 locations along the proposed IH 35E alignment, accounting for approximately 3.8 percent of the AOI. Based on current market forces, Planning Officials anticipate a somewhat weaker market for development in the immediate future. However, even with the economic downturn, overall population growth is still anticipated within the AOI municipalities. In turn, continued demand is expected in order to accommodate this forecasted growth. Over the long-term, forecasted growth is expected to create a strong market for development. 	NCHRP Report 25-25 Scale(a) Weak market for development = none to very weak(b) Weak to moderate market = weak to moderate(c) Strong market = strong (d) Very strong market = very strong
			Summary of Reasoning As cited in interviews with Planning Officials of all the AOI municipalities, an overall weak market for development is anticipated based on current economic conditions.
			Conclusion of Potential Weak to Moderate in the immediate future; Stronger over the long-term
Public Policy	NCTCOG Plans; Planning documents for the AOI municipalities; Interviews with Planning	 The proposed improvements to IH 35E are accounted for within both regional and local planning initiatives. As determined in interviews with Public Officials, all municipalities of the AOI acknowledge the need for, and are in support of, the proposed IH 35E improvements. All AOI municipalities have a strong commitment to land policy enforcement. The areas of anticipated induced development (27 locations or 3.8 percent of the AOI) were identified by Planning Officials in accordance with the goals and objectives outlined within their associated planning documents and regulations. 	NCHRP Report 25-25 Scale (a) Strong policy and record of policy enforcement and implementation = none to very weak (b) Weak policy and enforcement = moderate to strong (c) No policy, weak enforcement = very strong
	Officials from the AOI municipalities.		All municipalities of the AOI have a strong commitment to policy enforcement. Conclusion of Potential None to weak

Source: TRB (2007), NCHRP Report 25-25, Task 22, Forecasting Indirect Land Use Effects on Transportation Projects. Notes: 1. Average loaded speed is the average speed on roadways with traffic on the road; it is the volume-weighted average of loaded speed.

2 Project-Influenced Land Use Change Conclusions

- 3 As indicated in Table 6-11, conditions within the AOI vary from "none to weak" to "very strong" in their
- 4 potential to influence land use change. As all of the change indicators/categories listed in Table 6-11
- 5 play an integral role in the daily tasks/objectives of planning departments, these categories were carefully
- 6 considered by Planning Officials when asked to identify areas of potential project-induced land use
- 7 change. Planning Officials identified 27 potential locations for project-induced land use change along IH
- 8 35E, accounting for approximately 3.8 percent (996.6 acres) of the AOI (see **Appendix D, Figure D-3**).
- 9 Because the proposed improvements will increase capacity thereby improving mobility, Planning Officials

acknowledge that economic growth could be somewhat stimulated along the IH 35E corridor, resulting in
infill development and improved accessibility to services. Planning Officials also unanimously agree,
however, that future development within the AOI is less likely to be influenced by the proposed IH 35E
improvements and instead, more likely influenced by market forces and regulations guiding development
within municipal planning documents.

6 7

6.6.3 Impacts Resulting from Project-Influenced Land Use Change

8 The potential for project-induced land use change, as acknowledged by Planning Officials, is consistent 9 with the local plans, policies, and/or ordinances of the AOI municipalities. However, project-influenced 10 land use conversion does have the potential to impact sensitive habitats and species, valued 11 environmental components, sensitive landscape features, and/or any vulnerable elements of the 12 population associated with the specific locations of land use change. Thus, additional discussion is 13 necessary. In order to ensure a comprehensive assessment, any resource/issue assessed for direct 14 impacts was also screened for potential impacts resulting from project-induced land use conversion. As a 15 continuation of Step 5, the objective of this screening process is to determine if an impact has the 16 potential to be substantial by assessing its context, likelihood, and reversibility.

17

The following features are associated in some magnitude with the 27 potential sites for project-induced development and warrant additional discussion to determine if there exists a potential for substantial indirect land use impacts: various water resources (streams, open water, and wetlands), valued wildlife habitat (riparian forest, upland forest, and water resources), valued species (timber/canebrake rattlesnake, Texas garter snake, and plains spotted skunk), and EJ populations. The likelihood and magnitude of potential impacts to these valued elements are further analyzed in the sections below.

24

25 Other resources/issues and features were eliminated in the screening process based on the following:

26 27

28

(1) The lack of an association with the 27 locations of anticipated project-induced land use conversion (e.g., Section 4(f) properties, cultural resources, UNT, etc.); and

(2) The determination that the amount of change resulting from project-induced development, along
 with the implementation of prevention programs, ordinances, and other local and state regulations
 limiting impacts, would not be great enough to trigger a substantial impact (e.g., air quality, noise,
 water quality, etc.).

33

As an example and in relation to air quality, the identified areas of project-influenced land use conversion are not anticipated to result in enough of a change to alter the attainment status of ozone or any other NAAQS criteria pollutant, including CO. Although MSAT emissions could temporarily rise due to increased construction activity at the 27 identified sites, over time these emissions are anticipated decrease with the implementation of the EPA's national vehicle and fuel control regulations. For these reasons, substantial indirect impacts to air quality are not anticipated and no additional discussion below
 is necessary.

3

4 Water Resources

5 Within the AOI, the proposed project crosses eleven ephemeral stream channels, all of which are waters 6 of the U.S. Approximately 2.8 acres (3.2 percent) of streams, 3.2 acres (4.5 percent) of wetlands, and 8.2 7 acres (1.6 percent) of open water would be impacted within the AOI at the 27 identified locations of 8 potential project-induced land use change. Waters of the U.S., including wetlands are subject to USACE 9 jurisdiction under Section 404 of the CWA and/or Sections 9 and 10 of the Rivers and Harbors Act. In 10 addition, any possible sedimentation from future developments would be subject to the TPDES storm 11 water management plan supervised by the City of Denton and the Lake Cities, which should serve to 12 control and minimize sedimentation impacts. Substantial project-influenced impacts to water resources 13 are not anticipated based on the strength of the above described regulations and the limited amount (14.2 14 acres or 2.1 percent) of impacts to water features within the AOI.

15

16 Vegetation and Wildlife Habitat and Threatened/Endangered Species

17 The activities associated with urbanization (including agricultural, residential, and commercial uses) have 18 permanently and irreversibly changed vegetation and wildlife habitat within the AOI. Consequently, only 19 wildlife species that have been able to adapt to the impacts of human encroachment have survived in the 20 area. Species abundance and diversity have declined, and would be expected to decline further, as 21 natural habitat is replaced by urban development. A land use classification performed using ArcGIS 22 determined that the AOI is composed of approximately 17,070.0 total acres of urbanized area, 8,455.5 23 acres of undeveloped land, and 676.0 acres of water resources. As previously described, approximately 24 997 acres (3.8 percent) of the AOI could potentially be impacted by project-induced land use change. A 25 breakdown of the estimated indirect land use impacts to vegetation and wildlife habitat is shown in 26 **Table 6-12**. Of the land use types considered to have high value for wildlife habitat, approximately 20.8 27 acres (2.6 percent) of upland forest, 23.2 acres (1.6 percent) of riparian forest, 2.8 acres (3.2 percent) of 28 stream, 8.2 acres (1.6 percent) of open water, and 3.2 acres (4.5 percent) of wetlands could potentially be 29 impacted at the 27 identified sites of project-induced land use change (see Appendix D, Figure D-3). 30 The remaining acreage consists of grassland (414.6 acres) and urbanized area (523.8), both of which 31 provide little value for wildlife habitat.

TABLE 6-12. SUMMARY OF ESTIMATED INDIRECT IMPACTS FROM PROJECT-INDUCED/ACCELERATED LAND USE CHANGE TO VEGETATION AND WILDLIFE HABITAT

Resource	Total Acres in the AOI	Total Acres of Project- Induced Land Use Change			
Upland Forest	799.1	20.8			
Riparian Forest	1,450.4	23.2			
Grass	6,206.0	414.6			
Stream	87.5	2.8			
Open Water	517.1	8.2			
Wetlands	71.4*	3.2			
Urban Area (including infrastructure)	17,070.0	523.8			
Total	26,201.5	996.6			
Courses Study Team I and Use Classification using ArcCIS					

Source: Study Team - Land Use Classification using ArcGIS. Note: * Due to a lack of digital wetland data for the entire indirect impacts AOI, wetlands within the indirect impact study area were calculated using the known ratio of wetland acres to stream acres within a 1-mile buffer of the proposed project.

2

3 The indirect impacts AOI contains appropriate habitat for one threatened/endangered species 4 (timber/canebrake rattlesnake) and two SOC (Texas garter snake and plains spotted skunk). Riparian 5 forest and wetlands are the preferred habitat of the timber/canebrake rattlesnake. Upland forest also 6 serves as preferred habitat of the timber/canebrake rattlesnake and plains spotted skunk, who also 7 prefers areas of tallgrass prairie. Approximately 1.6 percent (23.2 acres) of riparian forest habitat, 4.5 8 percent (3.2 acres) of wetland habitat, and 2.6 percent (20.8 acres) of upland forest habitat could be 9 impacted by project-induced land use change. The proposed project and resulting potential 10 developments would not change the capacity of the environment to support the aforementioned species. 11 For the above reasons, substantial project-influenced land use impacts on vegetation, habitat, and 12 threatened/endangered species are not anticipated.

13

14 Environmental Justice Populations

Only one Census block (204.03-4-4004) reporting a minority population of 50 percent or greater falls 15 within the area identified for project-induced land use change; this Census block reported a total 16 17 population of six people. This area is the future development site of Rayzor Ranch South (see **Appendix** 18 D, Figure D-3, Site 4) and was identified by Planning Officials as a site where planned development 19 could potentially be accelerated by the proposed IH 35E improvements. Although the 2000 Census 20 reported a total population of six within this block, field verification in 2009 determined that there are no 21 residences located within this Census block. In addition, seven percent of the encompassing Census 22 block group (204.03-4) reported a 1999 income below poverty level; the Census block group reported a 23 median household income (\$46,341) above the HHS 2011 poverty guideline (\$22,350) for a family of four. 24 For the aforementioned reasons, a substantial impact to EJ populations resulting from project-influenced 25 land use change is not anticipated.

1 6.6.4 Evaluation of Conclusions

2 As indicated in NCHRP Report 466 (Page 92), "[t]here is inherent uncertainty in estimating indirect 3 effects." Various methods were utilized to gather information on the existing and forecasted conditions of 4 the AOI under the Build and No-Build Alternatives. These included: spatial analysis of geographic data, 5 assessment of demographic trends, literature review of planning documents and ordinances, 6 questionnaires to AOI municipalities, and meetings with Planning Officials from the AOI municipalities. 7 Planning Officials provided their professional judgments based on years of service, their knowledge of 8 development trends particular to each jurisdiction, and their backgrounds as informed stakeholders in the 9 planning and development of the proposed IH 35E project. Meetings were held with each municipality of 10 the AOI (see Appendix D-5) and the indirect impacts study team maintained contact with Planning 11 Officials throughout the analysis process. The questionnaires and meetings not only provided insight into 12 the potential for land use change within the AOI, but specifically identified locations of potential project-13 induced land use change. Planning Officials acknowledge that the mobility improvements generated by 14 the proposed project could somewhat stimulate economic growth along the project corridor, resulting in 15 higher occupancy rates of vacant buildings, as well as improved accessibility to services. However, it was 16 the consensus of Planning Officials that economic conditions and municipal regulations governing 17 development would be the major factors affecting land use change within the AOI.

18

19 6.7 Step 7 - Assess the Consequences of Indirect Impacts and Develop Appropriate Mitigation

20 Step 7 assesses the consequences of the analyzed indirect impacts and considers/develops strategies to 21 address unacceptable indirect impacts. Potential positive indirect impacts are anticipated to result from 22 the implementation of the IH 35E MHOV-C lanes. That is, in accordance with the RTC's Excess Toll 23 Revenue Sharing: Managed Lane Policy (approved June 2005), the excess toll revenue generated would 24 remain within the county in which the revenue generating project is located (i.e., Denton County); and that 25 excess revenue could be used to fund future transportation projects (see Appendix G-2). Nearly all other 26 readily identifiable indirect impacts involve project-influenced land use change within the AOI. This 27 project-influenced land use change accounts for 3.8 percent of the AOI. Land development activities 28 would generally be private ventures regulated by land development ordinances of the AOI municipalities. 29 The local government regulation of land development addresses environmental and social impacts by 30 requiring mitigation as part of site design and construction such that development is in accordance with 31 overall municipality objectives. In addition, much of the discussion of agencies and programs that would 32 guide any development induced by a potential project would be similar to typical mitigation and permitting 33 measures, as described within Section 5.0 and Section 9.0 this report. For example, all development 34 must comply with flood control regulations under FEMA and local floodplain administration, the CWA, 35 Section 401 Water Quality Certification requirements, Section 404 permits for projects affecting waters of 36 the U.S., and other regulations requiring mitigation if there are effects on species habitat.

1 Ultimately, since the proposed project is not anticipated to cause substantial negative indirect impacts,

2 the requirement for mitigation of environmental impacts would be limited to mitigating only the direct

3 impacts associated with this proposed project. Therefore, mitigation for indirect impacts would not be

4 required.

1 7.0 PROJECT LEVEL CUMULATIVE IMPACTS

2

This section presents a project-level analysis of the potential cumulative impacts (or effects) related to
the IH 35E proposed improvements. A system-level analysis of the potential impacts of the regional toll
and managed/HOV system is provided in Section 8.0.

6 7

7.1 Introduction and Methodology

CEQ regulations⁷¹ define cumulative impacts (i.e., effects) as "the impact on the environment which 8 9 results from the incremental impact of the proposed action when added to other past, present and 10 reasonably foreseeable future actions." As this regulation suggests, the purpose of a cumulative impacts 11 analysis is to view the direct and indirect impacts of the proposed project within the larger context of past, 12 present, and future activities that are independent of the proposed project, but which are likely to affect 13 the same resources in the future. Second, these same resources are evaluated from the standpoint of 14 their relative abundance among similar resources within a larger geographic area. Broadening the view 15 of resource impacts in this way allows the decision maker to evaluate the incremental impacts of the 16 proposed Build Alternative in light of the overall health and abundance of selected resources. In essence, 17 a cumulative impacts evaluation creates a model of the predicted condition of each resource that is 18 independent of the proposed project, and then analyzes the expected direct and indirect impacts of the 19 project within that context to determine if there is a cumulative impact. The evaluation process for each 20 resource considered may be expressed in shorthand form as follows:

21

22 BASELINE CONDITION + PROJECT IMPACTS + FUTURE EFFECTS = CUMULATIVE IMPACTS

23 (historical and current) (direct and indirect) (other expected projects)

24

The evaluation of cumulative impacts discussed in this document follows the eight-step process in guidance set forth in the TxDOT ICI Guidance.⁷² As with the previous section on indirect impacts, this analysis considers the potential cumulative impacts of the direct and indirect impacts of the proposed project. The methodology used to prepare this evaluation is also in accordance with the requirements of controlling case law⁷³ and guidance from the CEQ.⁷⁴

30

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

- 33 1. Identify the resources to consider in the analysis;
- 34 2. Define the study area for each affected resource;

⁷¹ 40 CFR Section 1508.7

⁷² TxDOT (September 2010). TxDOT's Guidance on Preparing Indirect and Cumulative Impact Analyses, Revised.

⁷³ 772 F.2d 1225, 5th Circuit (1985), *Fritiofson v. Alexander*

⁷⁴ CEQ (January 1997), Considering Cumulative Effects under the National Environmental Policy Act.

1 3. Describe the current health and historical context for each resource;

2 4. Identify direct and indirect impacts that may affect resources;

- 3 5. Identify other reasonably foreseeable actions that may affect resources;
- 4 6. Assess potential cumulative impacts to each resource;
- 5 7. Report the results; and,

8. Assess and discuss mitigation issues for all adverse impacts.

6 7

8 Steps 1 through 6 will be applied to each resource (see Sections 7.2 through 7.6). Once each resource
9 is analyzed, Step 7 - Results (see Section 7.7) and Step 8 - Mitigation (see Section 7.8) will follow and
10 address all identified resource/issues.

11

12 A cumulative impacts analysis uses information from the evaluation of direct and indirect impacts in the 13 selection of environmental resources that should be evaluated to determine cumulative impacts. TxDOT 14 ICI Guidance states that "the cumulative impact analysis should focus on: (1) those resources 15 substantially impacted by the project; and (2) resources currently in poor or declining health or at risk 16 even if project impacts are relatively small." The guidance further states that, as a caveat to the above 17 two rules, a cumulative analysis should also be performed even when direct or indirect impacts are "minor 18 or potentially appear inconsequential, but actions by other agencies/developers cause substantial 19 impacts." Similarly, the CEQ guidance recommends narrowing the focus of the cumulative impacts 20 analysis to important issues of national, regional, or local significance so as to "count what counts', not 21 produce superficial analysis of a long laundry list of issues that have little relevance to the impacts of the 22 proposed action or the eventual decisions." Thus, the cumulative impacts analysis should focus only on 23 those resources that are substantially affected by the proposed project by direct and/or indirect impacts, 24 resources that are in poor health, or resources that are substantially impacted by the actions of other 25 agencies/developers. Whether a resource is substantially affected is a function of the existing abundance 26 and condition of the resource and would include resources that are currently in poor or declining health or 27 are at risk, potentially from other actions, even if the proposed project impacts are relatively small.

28

29 Applying the foregoing criteria, the resources or environmental issues related to the proposed project with 30 the potential for cumulative impacts are listed in Table 7-1 and further described in Step 1 for each 31 resource/issue evaluated. As recommended by the CEQ guidance (page 26), specific indicators of each 32 resource's condition have been identified and are shown in Table 7-1. The use of indicators of a 33 resource's health, abundance, and/or integrity is a helpful tool in formulating quantitative or qualitative 34 metrics for characterizing overall impacts to resources. These indicators are also key aspects of each 35 resource that have already been evaluated in terms of the project's direct and indirect impacts, and 36 facilitate greater consistency and objectivity in the analysis of cumulative impacts.

Resource Category	Indicators of Resource Condition and Potential Impacts	Resource Study Area (RSA) ¹		
	Ozone – The project is located in Denton County, which is part of the EPA's designated nine-county serious ² nonattainment area for the eight-hour ozone standard: ability of this nine-county area to meet the NAAQS air quality standard.	Nine-county serious ² nonattainment area, which includes Collin, Dallas, Denton, Tarrant, Ellis, Johnson, Kaufman, Parker, and Rockwall Counties		
Air Quality	Carbon Monoxide (CO) The EPA designated nine-county ozone serious ² nonattainment area is in attainment for all other NAAQS criteria pollutants, including CO, with the exception of a portion of Collin County that is in nonattainment for lead: ability of the nine-county area to not exceed the NAAQS	Project ROW line, which represents the locations with the highest potential for CO concentrations		
	MSAT: trend of emissions over time	Affected transportation network located within the MPA ³ (includes roadway links with $a \pm five$ or greater percent volume change)		
Water Resources	Waters of the U.S., including Wetlands: the amount/quality of areas affected	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake		
	Wildlife Habitat: the amount and quality of riparian, forested, and wetland habitat areas suitable for sustaining a diversity of wildlife species	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake		
Biological Resources	Threatened or Endangered Species: habitat for the timber/canebrake rattlesnake, Texas garter snake, and plains spotted skunk. The amount of preferred habitat available for each of these state- listed threatened species	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake		
Land Use	Land Use Plans: consistency of the proposed project and changes in land use with local land use plans	Cities of Denton, Corinth, and Lake Dallas and the Towns of Shady Shores and Hickory Creek		
Economic Impacts of Tolling (EJ/Tolling)	The effect of tolling on minority or low-income populations	MPA ³		
Note:		·		
 See Appendix E, Figure E-1 for visual representation of all the listed RSAs. On August 9, 2010, the EPA proposed to determine that the nine-county moderate eight-hour ozone non-attainment area for DFW did not attain the 1997 eight-hour ozone NAAQS by the June 15, 2010 attainment deadline set forth in the CAA and CFR for moderate non-attainment areas (75 F.R. 152, August 9, 2010) under Title 40 C.F.R. Part 81. On January 19, 2011, the EPA reclassified the nine-county DFW non-attainment area from moderate to serious non-attainment for the 2007 eight- hour ozone standards. 				
3. MPA prior to the October 2009 expansion; includes five entire counties (Collin, Dallas, Denton, Rockwall, and Tarrant Counties) and four partial counties (Ellis, Johnson, Kaufman, and Parker Counties).				
2 Of additional note, CEQ regulations indicate that cumulative impacts analyses must include an				
assessment of "reasonably foreseeable future actions" affecting the issues/resources studied (40 CFR				

TABLE 7-1. RESOURCE INDICATORS AND STUDY AREAS

Section 1508.7). Step 5 of the cumulative impacts analysis identifies other transportation projects and
 planned large-scale residential and commercial developments within the RSAs for water and biological

6 resources and land use. The identification of reasonably foreseeable future actions for this assessment

- 7 was based on a review of proposed and ongoing development projects located within these RSAs that
- 8 have been filed with the RSA municipalities (Cities of Denton, Corinth, Lake Dallas, and Krum, and the
- 9 Towns of Shady Shores and Hickory Creek). Transportation projects were identified from NCTCOG and
- 10 TxDOT databases and engineering documents. For each issue/resource identified for further analysis,

Step 5 includes a more detailed discussion of reasonably foreseeable transportation and development
 projects in relation to cumulative impacts.

3

7.2 Air Quality

4 5 6

7.2.1 Step 1: Resource Identification – Air Quality

7 The Clean Air Act as Amended (CAAA) of 1990 requires the EPA to set NAAQS for pollutants considered 8 harmful to public health and the environment. The EPA has established NAAQS for six "criteria" 9 pollutants, two of which include Ozone and CO. Inclusion of Air Quality in the cumulative impacts 10 evaluation was determined due to the prevailing ozone non-attainment conditions within Denton County 11 and potential impacts relating to CO concentrations. Further, as the EPA regulates MSATs, their 12 potential for impacts in relation to Air Quality within the cumulative impacts study area was also included 13 in the evaluation.

14

15 7.2.2 Step 2: Resource Study Area – Air Quality

The RSA for evaluating the ozone NAAQS was designated as the nine-county serious⁷⁵ eight-hour ozone 16 nonattainment area for DFW, which includes Collin, Dallas, Denton, Tarrant, Ellis, Johnson, Kaufman, 17 18 Parker, and Rockwall Counties. The RSA for CO was based on the ROW line, which represents the 19 locations with the highest potential for CO concentrations. Unlike the other resources evaluated, air 20 quality impacts from MSATs have been evaluated qualitatively in this proposed project by TxDOT and 21 FHWA. MSATs are regulated by EPA on a national basis through requirements for fuels and vehicle 22 technology. The MSAT RSA qualitatively evaluated emission changes based upon the proposed project. 23 The affected transportation network was derived from the 2030 No-Build scenario compared to the 2030 24 Build scenario to determine which roadway links in the model achieved a ±five percent volume change. 25 These links were then compared to the 2009 model in order to extrapolate a baseline traffic network. The 26 application was adopted as the basis to determine the affected transportation network RSA. The air 27 quality RSAs are shown in Appendix E, Figure E-1.

28

In addition, the temporal boundaries for analyzing Air Quality cumulative impacts are the years 1990 to 2030. The early date was established because the CAA, as amended in 1990 (CAAA), authorized the EPA to designate areas in "non-attainment" or failing to meet established NAAQS. The year 2030 was chosen as the future temporal limit in order to capture the primary impacts that would be realized by the proposed project, as well as the expected implementation of local land use plans and *Mobility 2030* -

34 2009 Amendment.

⁷⁵ On August 9, 2010, the EPA proposed to determine that the nine-county moderate eight-hour ozone nonattainment area for DFW did not attain the 1997 eight-hour ozone NAAQS by the June 15, 2010 attainment deadline set forth in the CAA and CFR for moderate non-attainment areas (75 F.R. 152, August 9, 2010) under Title 40 C.F.R. Part 81. On January 19, 2011, the EPA reclassified the nine-county DFW non-attainment area from moderate to serious non-attainment for the 2007 eight-hour ozone standards.

1 7.2.3 Step 3: Resource Health and Historical Context – Air Quality

2 The amount of pollution emitted into the local atmosphere has been the net effect of population growth. 3 The DFW Metropolitan Area has seen tremendous population growth in recent decades and the trend is 4 for that growth to continue. With growth comes increased development, an increase in vehicles, and an 5 increase in daily VMT on the area's transportation systems. Traffic congestion on the transportation 6 system has become one of the greatest challenges facing the DFW Metropolitan Area, and is a primary 7 contributor to regional air quality. Throughout recent decades, multiple regional and local initiatives have 8 been planned and implemented in an effort to reduce emission of pollutants into the air. Several of these 9 initiatives specific to the area's transportation system include increased capacity highways and roadways 10 (through construction of additional travel lanes and bottleneck improvements), construction of high-11 occupancy vehicle lanes, and the promoting of alternative transportation (e.g., hike and bike trails, bus, 12 and light rail).

13

14 The EPA establishes limits on atmospheric pollutant concentrations through enactment of the NAAQS for 15 six principal ("criteria") pollutants. The proposed North Central Texas project is located in Denton County, 16 which is part of the EPA designated nine-county serious non-attainment area for the eight-hour standard 17 for the pollutant ozone. The nine-county area is currently in attainment for all other criteria pollutants 18 (CO, PM, nitrogen dioxide, and sulfur dioxide), with the exception of a small part of Collin County that is in 19 non-attainment for lead, effective December 31, 2010. This project is located outside that portion of Collin 20 County in non-attainment for lead. Although there have been year-to-year fluctuations, the ozone trend 21 continues to show improvement. The trend of improving air quality in the region is attributable in part to 22 the effective integration of highway and alternative modes of transportation, cleaner fuels, improved 23 emission control technologies, and NCTCOG regional clean air initiatives. The proposed project is 24 consistent with Mobility 2035 that was found to conform to the ozone SIP for DFW. The SIP is required 25 by the CAA Amendment to improve regional air quality for ozone.

26

27 On August 9, 2010, the EPA proposed to determine that the DFW area moderate eight-hour ozone non-28 attainment area did not attain the 1997 eight-hour ozone NAAQS by June 15, 2010, the attainment 29 deadline set forth in the CAA and CFR for moderate non-attainment areas (75 F.R. 152, August 9, 2010) 30 under Title 40 C.F.R. Part 81. On January 19, 2011, the EPA reclassified the nine-county DFW non-31 attainment area from moderate to serious non-attainment for the 2007 eight-hour ozone standard. 32 Therefore. Texas must submit SIP revisions for DFW that meet the 1997 eight-hour ozone non-attainment 33 requirements for serious areas as required by the CAA. The EPA is also proposing that Texas submit the 34 required SIP revisions for the serious area attainment demonstration, reasonable further progress, 35 reasonably available control technology, contingency measures, and for all other serious area measures 36 required under CAA section 182(c) to the EPA no later than one year after the effective date of the final 37 rulemaking for this reclassification.

2 In addition to the criteria, air pollutants for which there are NAAQS, EPA also regulates air toxics. Most 3 air toxics originate from human-made sources, including on-road mobile sources, non-road mobile 4 sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or 5 refineries). Although no NAAQS for MSATs exist, EPA has certain responsibilities regarding the health 6 effects of MSATs. The EPA controls emissions of air pollutants through one of two major strategies: 7 NAAQS or regulatory controls that result in specific emission reductions. Both strategies provide for 8 increased protection of human health and the environment. In order to more quickly implement MSAT 9 emission reductions, the EPA has focused efforts on nationwide regulatory controls.

10

On March 29, 2001, the EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants 11 from Mobile Sources.⁷⁶ This rule was issued under the authority in § 202 of the CAA. In its rule, EPA 12 13 examined the impacts of existing and newly promulgated mobile source control programs, including its 14 RFG program, its NLEV standards, its Tier II motor vehicle emissions standards and gasoline sulfur 15 control requirements, and its 26 proposed heavy-duty engine and vehicle standards and on-highway 16 diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA expects that even with a 64 17 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 18 1,3- butadiene, acrolein, and acetaldehyde between 57 percent and 65 percent, and will reduce on 19 highway DPM and diesel organic gas emissions by 87 percent.

20

On February 26, 2007, the EPA finalized additional rules under authority of CAA Section 202(I) 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. The rule changes were effective April 27, 2007. EPA adopted the following new requirements to substantially 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.

28

Additional regulations include: petroleum refiners meeting an annual average gasoline benzene content standard for reformulated and conventional gasoline (beginning in 2011), implementation of EPA standards to reduce NMHC exhaust emissions from gasoline-fueled vehicles (implemented in phases based on vehicle type, beginning in 2010), evaporative requirements for portable gas containers (beginning in 2009), and more stringent evaporative emission standards for new passenger vehicles (effective in 2009 for light vehicles and 2010 for heavy vehicles).

⁷⁶ 66 FR 17229, March 29, 2001

1 7.2.4 Step 4: Direct and Indirect Impacts – Air Quality

2

3 Direct Impacts

Direct impacts on air quality and MSATs from the project are primarily those associated with 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.

7

8 **Ozone**

9 Long-term meteorological data and detailed wide emission rates for industry, business, and transportation 10 sources are required in the complex process of modeling ozone concentrations. As this process is often 11 beyond the scope of a typical environmental analysis for a highway project, concentrations of ozone for 12 the purpose of comparing the results of the NAAQS are modeled by the regional air quality planning 13 agency for the SIP.

14

15 Carbon Monoxide (CO)

As required by federal regulations, concentrations of CO are readily modeled for highway projects. In accordance with the TxDOT Air Quality Guidelines, CO modeling included adverse meteorological conditions and sensitive receptors at the ROW line (i.e., the worst-case scenario). Modeling was performed for the project design year of 2030, as well as the ETC years of 2020 (IH 35E from FM 2181 to the IH 35E/IH 35W interchange) and 2026 (IH 35E from the IH 35E/IH 35W interchange to US 380), using traffic obtained from the TxDOT TPP Division. Per the modeling results, as detailed in **Table 5-3**, local concentrations of CO are not expected to exceed national standards at any time.

23

24 Mobile Source Air Toxics

Regulated by the EPA, MSATs are a subset of the 188 air toxics defined by the CAA. An analysis ofMSATs yielded the following findings:

- 27
- A total of four active monitoring sites are located between 1.8 and 18.2 miles from the proposed project (see Table 5-5). Of the dozens of air toxics monitored in the Denton County area, only two MSATs (benzene and 1,3-butadiene) were at levels detected by monitors within Denton County during 2008.
- 32
- Sensitive receptors are defined as schools (both public and private), licensed day care facilities, hospitals, and senior citizen care facilities. Twenty-four sensitive receptors were identified within the IH 35E study area, (see Tables 5-7 and 5-8 and Appendix C, Figure C-1). Of the 24 sensitive receptors, five are within 100 meters (328 feet) of the study area and 19 are within 500 meters (1,640 feet).

Although the VMT for the IH 35E Build scenario would increase approximately 36 percent by 2030
 when compared to 2009, total MSAT emissions for the same scenario would decrease by 59
 percent by 2030. The total MSAT load for the Build scenario in 2030 is approximately 5.3 tons
 higher than the No-Build scenario. MSATs for the 2030 Build scenario are higher than the No-Build
 scenarios because of the greater number of vehicles utilizing the roadways and the higher amount
 of VMT.

8

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 so when factoring in the 2008 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 indicates that MSAT emissions in the study area are likely to be lower in the future in all cases.

16

17 Indirect Impacts

18 Project-influenced land use change is anticipated to affect 3.8 percent (996.6 acres at 27 locations) of the 19 indirect impacts study AOI. No change in attainment status is anticipated within the indirect impacts AOI 20 as this amount of land use conversion is not expected to provide enough change, if any, on its own to 21 alter the non-attainment status of ozone, the non-attainment status for lead in a portion of Collin County, 22 or the attainment status of all other NAAQS criteria pollutants, including CO. Further, there are 23 mandatory federal and state air emissions regulations enforced by the EPA and TCEQ, as well as other 24 strategies (e.g., CMP for managing congestion (see **Table 5-4**)), to ensure that growth and development 25 do not prevent regional compliance with the ozone standard or threaten the maintenance of the other air 26 quality standards.

27

28 Off-road emissions from construction equipment may temporarily degrade air quality through dust and 29 exhaust gases. However, EPA has issued regulations to control air pollutants from off-road mobile 30 sources. Indirect air quality impacts from MSATs are unquantifiable due to existing limitations in 31 determining pollutant emissions, dispersion, and impacts to human health; however emissions would 32 likely be lower than present levels in future years as a result of the EPA's national control regulations (i.e., 33 new light-duty and heavy-duty on road fuel and vehicle rules; use of low sulfur diesel fuel). Even with an 34 increase in VMT and possible temporary emission increases related to construction activities, the EPA's 35 vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions of 36 on road emissions, including CO, MSATs, and the ozone precursors VOC and NOx.

1 7.2.5 Step 5: Reasonably Foreseeable Actions – Air Quality

2 As previously described, of the criteria pollutants for which the EPA has established NAAQS, the EPA 3 designated nine-county area in North Central Texas is currently in non-attainment for the eight-hour 4 ozone standard, but in attainment for the remaining NAAQS criteria pollutants, including CO, with the exception of a portion of Collin County that is in nonattainment for lead. Reasonably foreseeable projects 5 were not inventoried for the nine-county ozone serious⁷⁷ non-attainment area because air quality is 6 7 regulated and managed on a regional level where expected development projects and air emissions are 8 included in pollution budgets, dispersion modeling, and air quality implementation plans. Although no 9 NAAQS for MSATs exist, the EPA has established nationwide regulatory controls to garner emission 10 reduction.

11

12 In general, implementation of transportation system improvements and reasonably foreseeable 13 development in the region would likely result in temporary negative impacts to air quality in terms of 14 construction-related impacts. However, the impact of reasonably foreseeable projects on air quality 15 would be minimized through the EPA and TCEQ enforcement of federal and state regulations. These 16 mandates ensure that despite the increase in urbanization (and likely increase in VMT), compliance with 17 ozone standards is not prevented and the maintenance of air guality standards for all other criteria 18 pollutants, including CO, is not jeopardized. Although the health effects of MSATs from reasonably 19 foreseeable projects are unquantifiable due to unavailable or incomplete information, the EPA's vehicle 20 and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on-road 21 emissions. In almost all cases, lower emissions will cause MSAT levels, as well as VOC and NOx levels, 22 to be substantially lower than they are today. With regard to air quality conformity, reasonably 23 foreseeable transportation projects are primarily managed through the NCTCOG. For example, the 24 NCTCOG operational CMP details the type of strategy, implementing responsibilities, schedules, and 25 expected costs of all regional project commitments. The majority of the transportation projects planned for the region are included in the MTP and TIP, as amended, which have been determined to conform to 26 27 the SIP.

28

29 7.2.6 Step 6: Cumulative Impacts Assessment – Air Quality

Cumulative impacts to 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 is included in and consistent with the area's financially constrained long-range MTP (*Mobility 2035*) and the 2011-2014 TIP, as amended.

⁷⁷ On August 9, 2010, the EPA proposed to determine that the nine-county moderate eight-hour ozone nonattainment area for DFW did not attain the 1997 eight-hour ozone NAAQS by the June 15, 2010 attainment deadline set forth in the CAA and CFR for moderate non-attainment areas (75 F.R. 152, August 9, 2010) under Title 40 C.F.R. Part 81. On January 19, 2011, the EPA reclassified the nine-county DFW non-attainment area from moderate to serious non-attainment for the 2007 eight-hour ozone standards.

1 The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011. Other 2 reasonably foreseeable transportation projects are included in the MTP and the TIP, and have been 3 determined to conform to the SIP.

4

5 The DFW Metropolitan Area is expected to continue to experience substantial population growth, 6 urbanization, and economic development. The cumulative impact of reasonably foreseeable future 7 growth and urbanization on air quality would be minimized by enforcement of federal and state 8 regulations, by the EPA and TCEQ. These agencies are mandated to ensure that such growth and 9 urbanization would not prevent compliance with the ozone standard or threaten the maintenance of the 10 other air quality standards, along with regulated entities in compliance with regulations. Throughout the region, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial 11 12 reductions of on-road emissions including CO, MSATs and the ozone precursors (VOC and NOx). 13 Modeling results under the worst-case conditions indicate that CO concentrations would not exceed the 14 NAAQS. A quantitative MSAT analysis (Section 5.1.8) indicates that by 2030, although VMT increases, 15 MSAT emissions would substantially decrease when compared to 2009. This is further illustrated in 16 Table 7-2, which shows that although VMT in the North Central Texas non-attainment area is projected to 17 increase over time, VOC and NOx on-road emission trends are expected to decrease over time; 18 Figure 7-1 is a graphical representation of these trends. 19

TABLE 7-2. EMISSIONS AND VMT TRENDS FOR THE NORTH CENTRAL TEXASNONATTAINMENT AREA1

Analysia Vaar	Emissions ²		λ (MT (10 ⁶ miles)	
Analysis fear	VOC (tons/day)	NOx (tons/day)	vivit (10 miles)	
2007	108	210	172	
2009	93	178	179	
2015	62	80	207	
2025	47	39	248	
2030	50	38	266	
Source: Mobility 2030 - 2009 Amendment.				
Notes:				
1 Nonattainment area includes the following nine counties: Collin, Dollas, Donton, Ellis, Johnson, Kaufman				

1. Nonattainment area includes the following nine counties: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties.

2. Emissions do not include reductions from transportation control measures and the Texas Emission Reduction Plan.



FIGURE 7-1. EMISSIONS AND VMT TRENDS FOR THE NORTH CENTRAL TEXAS NONATTAINMENT AREA¹

3

Source: NCTCOG Transportation Department. Graph is consistent with *Mobility 2030 - 2009 Amendment*.
 Notes: 1. Nonattainment area includes the following nine counties: Collin, Dallas, Denton, Ellis, Johnson, Kaufman,
 Parker, Rockwall, and Tarrant Counties.

8 In sum, any increased air pollutant or MSAT emissions resulting from increased capacity, accessibility, 9 and development are projected to be more than offset by emissions reductions from EPA's new fuel and 10 vehicle standards or addressed by EPA's and TCEQ's regulatory emissions limits programs. Projected 11 traffic volumes are expected to result in minimal or no impacts on air quality; improved mobility and 12 circulation may benefit air quality. Increased urbanization would likely have a negative impact on air quality. However, planned transportation improvements in the project area, included in and consistent 13 14 with a conforming MTP and TIP, are anticipated to have a cumulatively beneficial impact on air guality. 15 As previously stated, FHWA will not take final action until a project is included in and consistent with a 16 conforming MTP and TIP.

17

18 7.3 Water Resources

19

20 7.3.1 Step 1: Resource Identification – Water Resources

Waters of the U.S., including wetlands, are resources that serve a variety of functions including sediment filtering, upland and aquatic wildlife habitat, and reduction of floodwater velocity. As the proposed improvements to IH 35E are anticipated to result in impacts to waters of the U.S., including wetlands, as well as open water areas, further analysis of water resources in relation to potential cumulative impacts
 was determined necessary.

3

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

11

12 In addition, in 1991 the State of Texas adopted state goals for "no net loss" of acreage or aquatic function 13 of wetlands. These goals reflect the regulatory program in the CWA legislation that prohibits the 14 discharge of soil into waters of the U.S., including wetlands, unless authorized by a permit issued under 15 CWA Section 404. The USACE has authority over such actions and may require the permittee to restore, 16 create, enhance, or preserve nearby aquatic features as compensation to offset unavoidable adverse 17 impacts to the aguatic environment. Compensatory mitigation is intended to comply with the general 18 goals of the CWA and the specific goal of "no net loss" of aquatic functions. Future trends in the 19 regulation of waters of the U.S., including wetlands, are likely to focus on compensatory mitigation 20 requirements. Regulatory agencies are expected to develop procedures to track the success and 21 completion of mitigation efforts as the focus moves toward replacement of specific aquatic functions, 22 rather than replacement of total area. Consequently, regulatory controls are expected to continue the 23 trend of stabilizing the amount of existing waters of the U.S., including wetlands, through vigorous 24 application of mitigation requirements under the CWA.

25

26 7.3.2 Step 2: Resource Study Area – Water Resources

27 A watershed represents a bounded hydrologic system wherein natural resources are interconnected and 28 integrated through a common water course. This water-centered integration of resources is linked 29 directly to the indicators of water resources noted above in Table 7-1. The RSA evaluated for water 30 resources includes portions of adjacent watershed areas upstream and downstream of the proposed 31 project. These adjacent watershed areas include portions of Hickory Creek, Pecan Creek, and Lewisville 32 Lake watersheds. The entire IH 35E project area drains into Lewisville Lake through a number of 33 tributaries. The water resources RSA, shown in Appendix E, Figures E-1 and E-2, comprises 34 approximately 45,666.6 acres, or roughly 430 times the size of the area required for the project's ROW 35 and easements (i.e., 106.59 acres). The years 1972 to 2030 were established as the temporal 36 boundaries for analyzing cumulative impacts to water resources. The former year was chosen because it 37 is the year Congress enacted the CWA, which expanded and strengthened earlier legislation. The latter

year was chosen in correspondence with *Mobility 2030 - 2009 Amendment*, other planning efforts, and
 the design year of the proposed project.

3

4 7.3.3 Step 3: Resource Health and Historical Context – Water Resources

Historically, waters of the U.S., including wetlands, were not recognized for their ecological importance. Over time, many of these areas were filled, dredged, or developed to make the land available for use. From the mid-1800s until about 1970, approximately one-half of Texas' historic wetlands acreage was converted from natural systems in response to society's demand for urban development and sustenance. In the local watershed areas adjacent to the proposed project, the conversion of prairies to agricultural uses and subsequent development and urbanization have resulted in the impoundment, excavation, and filling of many of the area's natural streams and wetlands.

12

As described in **Step 2**, the RSA coverage area is vast (45,666.6 acres), and therefore difficult to field survey for waters of the U.S., including wetlands, and open water areas. Unlike the "hands on" field delineations conducted for the direct impacts analysis, the cumulative impacts analysis for water resources relies heavily on background literature and digital analysis using ArcGIS.

17

18 Waters of the U.S., including wetlands, within the RSA were analyzed using a variety of methods, 19 including a review of aerial photography, USGS topographic maps, and a NCTCOG digital stream file. 20 Although not field verified, these three data sources showed similar attributes in relation to stream order; 21 thus the digital stream file was used to determine the approximate acreage of waters of the U.S., 22 including wetlands, within the RSA. Jurisdictional water determinations along the proposed project 23 alignment yielded, on average, an ordinary high water mark of approximately eight feet. Accordingly, 24 stream acreages located within the RSA were determined in ArcGIS using a total eight-foot buffer. 25 resulting in an estimated 158 acres of stream channel located within the RSA. Areas of open water were 26 also spatially analyzed in ArcGIS and verified using aerial photography and USGS topographic maps. 27 Approximately 631 acres of open water were identified within the RSA.

28

29 USFWS National Wetland Inventory maps were utilized to help identify areas of wetlands within the RSA. 30 However, as these maps are unavailable in digital format, examination of wetland areas within the 31 45,666.6 acre RSA also relied on visual examination and comparison of aerial photographs and USGS 32 topographic maps. In addition, spatial analysis techniques were used to quantify wetland areas from the 33 NWI maps for a smaller area within the RSA (a one-mile buffer from the proposed project alignment). 34 The presence and location of wetlands are typically associated with that of stream channels. As such, 35 the ratio of known stream channel acreage to known wetland acreage within the one-mile buffer area and 36 the known acreage of stream channels within the RSA for water resources were utilized to extrapolate the total estimated acreage of wetland areas within the RSA. Using this methodology, the generally uniformly
 upland RSA was estimated to contain roughly 117 acres of wetlands.

3

4 7.3.4 Step 4: Direct and Indirect Impacts – Water Resources

5

6 Direct Impacts

7 The proposed IH 35E improvements cross eleven ephemeral stream channels that discharge into 8 Lewisville Lake (see **Appendix A, Figure A-4**); all eleven are waters of the U.S. with one having an 9 adjacent wetland/pond area. Permanent fill impacts to waters of the U.S., including wetlands are as 10 follows: 0.38 acres to open ephemeral stream channels and 1.08 acres to existing culverts (total stream 11 impacts of 1.46 acres); 0.01 acre to a pond (open water); and 0.19 acre to a wetland. The pond and 12 wetland are both on the west side of IH 35E north of Post Oak Drive.

13

14 Indirect Impacts

Encroachment-alteration impacts to water resources are not anticipated. That is, impacts to water resources are not anticipated to result in impacts that reach beyond the project footprint (see **Section 6.5.1**). Project-influenced land use change is anticipated at 27 locations, accounting for 996.6 acres. Of this, approximately 2.8 acres of streams, 3.2 acres of wetlands, and 8.2 acres of open water could potentially be impacted by project-induced development.

20

21 7.3.5 Step 5: Reasonably Foreseeable Actions – Water Resources

22 Urbanization has been the primary cause of impacts to water resources. Research for reasonably 23 foreseeable projects identified 58 private development projects and eight major transportation projects 24 that are underway in terms of permit applications or construction within the RSA for water resources. 25 These reasonably foreseeable future actions are shown on the RSA map in Appendix E, Figure E-2. A 26 description of these reasonably foreseeable actions and their anticipated impacts to water resources is 27 included as **Appendix E-3**. It is estimated that roughly 6.0 acres of streams, 6.0 acres of open water, and 28 3.9 acres of wetlands could be impacted by reasonably foreseeable transportation and development 29 projects located within the RSA. Local government land use plans, zoning ordinances, and the input 30 provided by local Planning Officials were considered in estimating these future impacts to water 31 resources. Qualitative inferences as to potential impacts on the resources studied were drawn from the 32 description of each proposed future project or plan provided by local Planning Officials.

33

34 7.3.6 Step 6: Cumulative Impacts Assessment – Water Resources

The direct and indirect impacts of the proposed project could potentially affect approximately 4.3 acres of streams (open, ephemeral channels and existing culverts), 8.2 acres of open water, and 3.4 acres of wetlands. An additional 6.0 acres of streams, 6.0 acres of open water, and 3.9 acres of wetlands could potentially be affected by reasonably foreseeable actions. Considering these impacts (31.8 acres) amount to 3.5 percent of the total acreage for water resources (918.3 acres) found within the RSA, and assuming the appropriate implementation of regulatory control strategies and policies, the proposed project would not contribute substantial cumulative impacts to the area's waters of the U.S., including wetlands.

6 7

7.4 Biological Resources

- 8
- 9

7.4.1 Step 1: Resource Identification – Biological Resources

10

11 Vegetation and Wildlife Habitat

The Texas Transportation Code⁷⁸ directs TxDOT to adopt memoranda of understanding with appropriate 12 13 environmental resource agencies, including TPWD. The responsibilities of the TPWD relate primarily to 14 its function as a natural resource agency, including its resource protection functions, designated by the 15 Parks and Wildlife Code. The Memorandum of Agreement (MOA) between TxDOT and TPWD (see 16 T.A.C.) provides an efficient and consistent methodology for describing habitats, transportation impacts to 17 those habitats after avoidance and minimization efforts, and mitigation to be considered as a result of 18 those impacts. The MOA sets forth resources that would be given consideration for compensatory 19 mitigation. Vegetation and wildlife habitat was included in the evaluation of cumulative impacts because 20 the proposed improvements could potentially result in the loss of "unusual" and/or "special" habitat in an 21 area that has historically seen encroachment and the loss of available habitat.

22

23 Threatened/Endangered Species

24 The TPWD designates animals which are "threatened with statewide extinction" as endangered within the 25 State of Texas. Those species that are "likely to become endangered in the future" are listed as 26 threatened. Listed species are protected under the T.A.C. (Section 65.171) from being killed, removed, 27 transported, owned, sold, released, or exported without an appropriate permit. Violators are penalized with a Class C Parks and Wildlife Code misdemeanor.⁷⁹ Some species listed by the state are protected 28 by federal regulations as well; these are listed by the USFWS. Federally listed threatened or endangered 29 30 species are similarly protected under the Endangered Species Act (ESA), and implementing federal 31 regulations. In addition, species considered uncommon or exhibiting declining numbers are assigned the 32 designation "species of concern" by the TPWD, an act ensued to prevent such species from becoming 33 threatened or endangered. As previously established in Section 5.1.6, habitat for one state-listed 34 threatened or endangered species (timber/canebrake rattlesnake) and two SOC (plains spotted skunk

⁷⁸ Section 201.607

⁷⁹ TPWD Code (Section 68.021)

and Texas garter snake) is present within the proposed project area, necessitating a cumulative impacts
 assessment in relation to the preferred habitat of the above identified species.

3

4 7.4.2 Step 2: Resource Study Area – Biological Resources

5 The RSA evaluated for biological resources (identical to that for water resources) consists of adjacent 6 watershed areas upstream and downstream of the proposed project (Appendix E, Figure E-1). As 7 previously stated, this area encompasses approximately 45,666.6 acres and is a naturally bounded basin 8 with interconnected hydrologic features. This water-centered integration of resources is linked directly to 9 the biological resources. Moreover, while little detailed information is available on wildlife populations in 10 the IH 35E project area, inferences may be drawn from a study of habitat that is known to support a 11 diversity of animal species. Key wildlife habitat, in turn, is often proximate to water sources that 12 characterize local watersheds.

13

The year 1984 was used as the beginning temporal boundary for vegetation resources as it corresponds to the year TPWD defined the Vegetation Types of Texas. As the ESA was passed in 1973, this was defined as the beginning temporal limit for threatened or endangered species. The ending temporal boundary for both resources was established as 2030, again in correspondence with the project design year and other local and regional (*Mobility 2030 - 2009 Amendment*) planning documents.

19

20 7.4.3 Step 3: Resource Health and Historical Context – Biological Resources

21

22 Vegetation and Wildlife Habitat

23 The local watershed in which the proposed project occurs is located in the Cross Timbers Prairies 24 Ecological Area. The vegetation in the area may include cultivated cover crops or row crops and may 25 also portray grassland associated with crop rotation. Over the course of a century (i.e., late 1800s to late 26 1900s), nearly all the native environment was dramatically altered by conversion of native grasslands and 27 many forested areas to croplands and pastures. In recent decades, urban expansion has converted 28 many agricultural lands and much of the surviving native areas to residential, commercial, and other 29 urban uses. Consequently, only wildlife species that have been able to adapt to the impacts of these 30 human encroachments have survived in the area, and species abundance and diversity have declined 31 (and would be expected to decline further) as forested and aquatic resources are replaced by urban 32 developments. The watershed RSA consists of approximately 25,554.4 acres of developed/disturbed 33 urban areas that are not considered valuable habitat due to fragmentation by urban structures and 34 proximity to human activity. The remaining areas of vegetation and potential habitat within the RSA are 35 presented in Table 7-3 below.

Habitat Types	Total Habitat (acres) within RSA	
Riparian	2,472.9	
Grassland	14,197.7	
Upland Forest	2,523.4	
Steams	158.3	
Open Water	631.0	
Wetlands	129.0	
Total All Habitat Types	20,112.3	

TABLE 7-3. HABITAT PRESENT WITHIN THE RSA FOR BIOLOGICAL RESOURCES

1

2 Threatened/Endangered Species

3 As noted in the discussion above, the local watershed area associated with the proposed project lies 4 within a prairie ecosystem that has been transformed to support agricultural uses. Over the last several 5 decades, urbanization in the RSA has had a substantial negative impact on the preferred habitat for 6 common wildlife species as well as threatened or endangered species. Despite the effects of urban 7 development in the area, municipal governments have acted to establish parks for recreation and require 8 or encourage the creation of private parks or open space areas. State, federal, and local regulations 9 restrict development within floodplains and waters of the U.S. These efforts have served to preserve and 10 enhance the availability of habitat for common as well as rare animal species. Within the RSA, there are 11 approximately 5,515.1 acres of undisturbed floodplain expected to be preserved throughout future 12 decades. In addition, there are approximately 1,936.5 acres of non-urbanized parkland, of which 13 approximately 672.3 acres are located outside of floodplain areas.

14

15 7.4.4 Step 4: Direct and Indirect Impacts – Biological Resources

16

17 Vegetation and Wildlife Habitat

18

19 Direct Impacts

20 The reconstruction of IH 35E would result in approximately 459.5 acres of permanent impacts (i.e., the 21 replacement of existing vegetation with paved surfaces) and 175.3 acres of temporary impacts (i.e., the 22 replacement of existing vegetation with maintained grasses). Impacts from the conversion of existing 23 vegetation to paved surfaces or maintained grasses would include the loss of the following: 2.0 acres of 24 riparian forest, 11.5 acres of upland forest (including fencerows), 319.0 acres of grass (including brush 25 areas), 0.38 acre of streams, 0.01 acre of open water, and 0.19 acre of wetlands. Approximately 1,370 26 trees greater than six inches dbh occurring on 11.96 acres of riparian and upland forest are expected to 27 be removed due to the proposed IH 35E improvements. Additional trees greater than six inches dbh are 28 included among the 1.54 acres of fencerow trees expected to be removed.

1 Indirect Impacts

2 Based on historical and existing conditions in the indirect impacts AOI (i.e., widespread habitat fragmentation and loss), and the presence of various zoning and planning regulations calling for 3 4 continued urbanization while preserving parks and floodplains (and thereby valuable upland and riparian 5 habitat), encroachment-alteration impacts are not anticipated to result from the proposed improvements 6 (see Section 6.5.1). A total of 996.6 acres could be impacted at the 27 anticipated locations of project-7 influenced land use change, including 20.8 acres of upland forest, 23.2 acres of riparian forest, 414.6 8 acres of grassland, 2.8 acres of streams, 8.2 acres of open water, and 3.2 acres of wetlands. The 9 remaining 523.8 acres include developed/disturbed urban areas.

10

11 Threatened/Endangered Species

12

13 Direct Impacts

As was detailed in **Table 5-2**, one state listed species (timber/canebrake rattlesnake) and two SOCs (Texas garter snake and the plains spotted skunk) were identified within Denton County as having preferred habitat within the IH 35E project area. The timber/canebrake rattlesnake and Texas garter snake both prefer wet, densely covered areas typical of riparian forests and wetlands. Preferred habitat for the timber/canebrake rattlesnake also includes areas of upland forest with dense brush cover, which along with tallgrass prairie, also serves as the preferred habitat of the plains spotted skunk.

20

21 None of the aforementioned species were seen during a local reconnaissance survey. In relation to the 22 timber/canebrake rattlesnake and Texas garter snake, the amount of potential habitat affected by the 23 proposed improvements would encompass only a small portion of their individual ranges. In addition, the 24 heavily urbanized nature of the study area has severely limited the amount of preferred habitat available 25 for the two reptile species, as well as the plains spotted skunk. Further analysis was performed via a 26 TXNDD search, which identified a sighting of the Texas garter snake within 1.5 miles of the proposed 27 project in the City of Lake Dallas, although the date and exact location of the observation are unknown. 28 Lake Dallas is adjacent to the northern shoreline of Lewisville Lake. This area would serve as the most 29 likely preferred habitat of the Texas garter snake; however, no new ROW is required near the lake or in 30 Lake Dallas. The proposed project would affect approximately 13.7 acres of preferred habitat as follows: 31 2.0 acres of riparian forest, 11.5 acres of upland forest, and 0.19 acre of wetlands; however, for the 32 reasons stated above, these affects to habitat would not impact the aforementioned species.

33

34 Indirect Impacts

Appropriate habitat for the timber/canebrake rattlesnake (riparian forest, upland forest, and wetlands), Texas garter snake (riparian forest and wetlands), and plains spotted skunk (tallgrass prairie and upland forest), is present within the indirect impacts study area. As previously described, encroachment 1 alteration impacts to vegetation and wildlife habitat are not anticipated as a result of the proposed project.

2 The 27 locations of potential project-influenced land use change include impacts to approximately 23.2 3 acres of preferred riparian habitat, 20.8 acres of preferred upland forest habitat, and 3.2 acres of

4 preferred wetland habitat. No indirect impacts to tallgrass prairie are anticipated.

5

7.4.5 Step 5: Reasonably Foreseeable Actions – Biological Resources

6 7

8 Vegetation and Wildlife Habitat

9 Continued growth and development within the corridor from other reasonably forseeable actions would 10 result in further encroachment and further loss of available habitat and/or habitat fragmentation. As 11 previously described, a review of city and regional land use plans, project plans, and interviews with City 12 Planners identified 58 reasonably foreseeable development projects and eight major reasonably 13 foreseeable transportation projects within the RSA for biological resources (locations pictured in 14 Appendix E, Figure E-2). Appendix E-3 lists detailed potential impacts to vegetation and wildlife habitat 15 resulting from each of these proposed projects. In summary, 141.0 acres of upland forest, 39.5 acres of 16 riparian forest, 1,034.9 acres of grassland, 6.0 acres of stream, 6.0 acres of open water, and 3.9 acres of 17 wetlands could potentially be impacted as a result of reasonably foreseeable projects within the RSA.

18

19 Threatened/Endangered Species

As previously described, preferred habitat exists within the RSA for the timber/canebrake rattlesnake, Texas garter snake, and plains spotted skunk. The 66 reasonably foreseeable projects (development and transportation projects) identified within the RSA for biological resources (see **Appendix E-3**) could potentially impact approximately 184.4 acres preferred timber/canebrake rattlesnake habitat (riparian forest, upland forest, and wetlands); 43.4 acres of preferred Texas garter snake habitat (riparian forest and wetlands); and 141.0 acres of preferred plains spotted skunk habitat (upland forest).

26

27 7.4.6 Step 6: Cumulative Impacts Assessment – Biological Resources

28

29 Vegetation and Wildlife Habitat

30 Although urbanized areas within the watershed RSA (approximately 25,554.4 acres) contain limited 31 habitat associated with landscaping, these areas are not included in this discussion as such areas do not 32 represent preferred habitat for many wildlife species because of habitat fragmentation by urban structures 33 and proximity to human activities. The discussion of biological resources focuses on the remaining areas 34 within the RSA that are relatively undeveloped, and are reflected by habitat type in **Table 7-4**. Some 35 undeveloped areas would most likely be designated for preservation of natural features and/or public 36 safety in federal or local government plans. Reporting this information provides a snapshot of the 37 expected condition of habitat resources as development actions not yet specifically identified occur as

outlined in the FLUPs for Corinth and Denton. The areas where wildlife habitat and other natural
resources would be expected to be preserved and enhanced over the long term include approximately
5,515.1 acres of undeveloped areas within floodplains; that is, the total area for floodplains in the RSA is
7,445.9 acres, of which 1,930.1 acres are existing urban land surfaces. An estimated additional 672.3
acres would be protected within existing parks and open space.

6

TABLE 7-4. SUMMARY OF EXISTING WILDLIFE HABITAT AND POTENTIAL IMPACTS

Wildlife Habitat Types	Total Habitat (acres) within RSA ¹	Potential Impacts: All Sources (acres) ²	Total Habitat Remaining (acres) within RSA
Riparian	2,472.9	64.7	2,408.2
Upland Forest	2,523.4	173.3	2,350.1
Grassland	14,197.7	1,768.5	12,429.2
Water Resources ³	918.3	30.7	887.6
TOTAL All Habitat Types	2,0112.3	2,037.2	18,075.1
Notes:			

RSA is comprised of local watershed area adjacent to the proposed project (see **Appendix E, Figure E-1**).
 This column represents the expected potential impacts within the RSA from direct/indirect impacts of the proposed project when added to the impacts of reasonably foreseeable future actions; information is from **Table 7-5** (see **Step 7** of the Cumulative Impacts Analysis).
 Impacts to water resources assessed for streams (open, ephemeral channels), open water, and wetlands.

8 The potential impacts of the proposed project and other planned projects on preferred wildlife habitat (i.e., 9 not including developed or grass areas) in the RSA would be 268.7 acres. Currently, preferred wildlife 10 habitat makes up approximately 5,914.6 acres within the RSA. Thus, these impacts comprise 4.5 percent 11 of the available wildlife habitat within the RSA. Based on the continued availability of protected habitat 12 areas, and assuming appropriate implementation of regulated avoidance, minimization, and mitigation 13 strategies for vegetation and habitat impacts, the proposed project would not contribute to substantial 14 cumulative impacts to the area's vegetation and habitat.

16 Threatened/Endangered Species

17 Preferred habitat in the RSA for biological resources includes riparian forest and wetlands 18 (timber/canebrake rattlesnake and Texas garter snake), and upland forest (timber/canebrake rattlesnake 19 and plains spotted skunk). Direct and indirect impacts of the proposed IH 35E improvements could 20 potentially affect approximately 60.9 acres (1.2 percent) of the 5,125.3 acres of riparian forest, upland 21 forest, and wetlands in the RSA. No impacts are anticipated to tallgrass prairie. Impacts from reasonably 22 foreseeable future actions within the RSA (see Appendix E, Figure E-2 and Appendix E-3) could 23 potentially affect approximately 184.4 acres (3.6 percent) of riparian forest, upland forest, and wetlands 24 within the RSA. Total impacts (direct, indirect, and reasonably foreseeable) would affect approximately 25 245.3 acres (4.8 percent) of available riparian forest, upland forest, and wetland habitat in the RSA. 26 During field surveys for the proposed project, no evidence of the timber/canebrake rattlesnake, Texas 27 garter snake, or plains spotted skunk was observed in the project area. The proposed project would have 28 no impact on the aforementioned state-listed threatened or endangered species.

⁷

1 7.5 Land Use

2

3 7.5.1 Step 1: Resource Identification – Land Use

4 Land use within and near the IH 35E project area is regulated by the affected municipalities through 5 zoning plans and land use ordinances designed to minimize the adverse effects of growth and 6 urbanization. Municipal zoning and land use regulations control the intensity and type of development 7 and control where land should be developed and where land should be preserved. Changes in land use 8 were included within the cumulative impacts assessment because additional acreage would be required 9 for ROW in a highly urbanized corridor where land not already developed is somewhat limited; in addition, 10 the land acquired for the proposed new ROW would be made unavailable for other uses. Further, 11 project-induced changes in land use were identified as potential indirect impacts.

12

13 7.5.2 Step 2: Resource Study Area – Land Use

14 Cumulative impacts that could affect the FLUPs of local municipalities were evaluated with reference to 15 the municipal boundaries of the Cities of Corinth, Denton, and Lake Dallas and the Towns of Shady 16 Shores and Hickory Creek (see Appendix E, Figure E-1), which together encompass an area of approximately 63.610.8 acres. Although land use is not a resource in the traditional sense, it is 17 18 considered an important characteristic of an urbanizing landscape that is unavoidably affected when 19 transportation and other projects alter existing land use. Because the overall management of land use is 20 within the province of local municipalities, municipal boundaries define an appropriate RSA for evaluating 21 cumulative impacts on land use. Because the above municipalities began to experience substantial 22 growth between 1990 and present day, 1990 was established as the early temporal boundary for 23 assessing cumulative impacts to land use. The MTP year of 2030 was chosen as the future temporal 24 boundary in order to capture all possible impacts resulting from the proposed project and other FLUPs.

25

26 **7.5.3** Step 3: Resource Health and Historical Context – Land Use

27 The RSA is comprised of the Cities of Denton, Corinth, and Lake Dallas, and the Towns of Shady Shores and Hickory Creek. According to NCTCOG⁸⁰, the percentages of vacant land in 2000 for the 28 29 municipalities of the RSA were as follows: 60 percent (24,354 acres) for the City of Denton, 48 percent 30 (2,479 acres) for the City of Corinth, 16 percent (279 acres) for the City of Lake Dallas, 38 percent (1,112 31 acres) for the Town of Hickory Creek, and 56 percent (1,049 acres) for the Town of Shady Shores. 32 Historically, there has been a direct correlation between the use of land (development) and population 33 growth. As a population grows, additional infrastructure and facilities are needed to adequately support 34 the population, thus creating a constant need to balance the amount of land needed for transportation 35 versus other land uses. NCTCOG's Demographic Data indicate the municipalities in the RSA are 36 expected to experience substantial population growth between the years of 2000 and 2030. These

⁸⁰ NCTCOG 2000 Land Use Inventory by City database

growth rates include 160 percent for the City of Denton, 138 percent for the City of Corinth, 44 percent for
 the City of Lake Dallas, 99 percent for the Town of Hickory Creek, and 154 percent for the Town of Shady
 Shores. Accordingly, local land use and zoning plans reflect a continuation of urban development and
 roadway improvements designed to bear the demands of future traffic.

5

7.5.4 Step 4: Direct and Indirect Impacts – Land Use

6 7

8 Direct Impacts

9 The proposed IH 35E improvements would require approximately 106.59 acres of additional ROW. The 10 following development classifications, and their associated acreages, would be converted to 11 transportation ROW: approximately 54.87 acres of undeveloped land, 3.95 acres of developed 12 residential land, 46.53 acres of developed commercial land, 1.04 acres of undeveloped easement, and 13 0.20 acre of developed commercial easement. ROW acquisition would impact a total of 57 properties, 14 including 17 residential and 40 commercial. These properties contain 78 structures, consisting of 16 15 single-family residences, two apartment buildings with eight apartment units each, and 60 commercial 16 structures (including buildings and canopies at gasoline service stations) that would be displaced by the proposed project. In relation to prime farmland, the proposed project is exempt from the requirements of 17 18 the FFPA and coordination with the NRCS is not required. There are no impacts to section 4(f) properties 19 and consideration under Section 6(f) is not required.

20

21 Indirect Impacts

22 Based on interviews with Planning Officials from the municipalities of the indirect impacts AOI, 27 areas 23 located adjacent to the proposed project are anticipated to experience project-influenced land use change 24 (see Appendix D, Figure D-3). These locations account approximately 996.6 acres, of which 25 approximately 523.8 acres are developed/disturbed and 472.8 acres are undeveloped. Planning Officials 26 acknowledge that the improved mobility generated by the proposed improvements could stimulate growth 27 near the project alignment, resulting in higher occupancy rates of vacant buildings and improved 28 accessibility to services, both of which are objectives outlined by all of the AOI municipalities in their 29 respective planning documents. However, it was the overwhelming consensus among Planning Officials 30 that, even with the improved mobility generated by the proposed improvements, economic forces and 31 municipal regulations governing development would be the major factors affecting land use change within 32 the AOI.

33

34 7.5.5 Step 5: Reasonably Foreseeable Actions – Land Use

35 The municipal boundaries of Denton, Corinth, Lake Dallas, Shady Shores, and Hickory Creek form the

land use RSA, an area encompassing 63,611 acres (see **Appendix E, Figure E-1**). All of the reasonably

37 foreseeable development and transportation projects identified within the water/biological resources RSA

1 are also included within the land use RSA. A list of these reasonably foreseeable actions is presented in 2 Appendix E-3; and these projects account for a total of approximately 1,747.4 acres of land use 3 conversion. As the land use RSA is larger than that of the water/biological resources RSA, eight 4 additional development projects and the continuation of one transportation project were also identified 5 within the land use RSA. These additional projects account for approximately 16,348 acres of land use 6 conversion and include four projects that are large-scale planned single-family residential communities. A 7 list of these additional reasonably foreseeable projects located within the land use RSA, but not included 8 in Appendix E-3 are as follows: 9 • Beaver Creek, residential development, 98 acres affected;

- Cole Ranch, residential development, 3,406 acres affected;
- Country Lakes North and West, residential development, 361 acres affected;
- Hills of Argyle, residential development, 304 acres affected;
- Hills of Denton, mixed-use/residential development, 2,121 acres affected;
- Hunter Ranch, residential development, 3,331 acres affected;
- 15 McKamy Evers Estates, residential development, 38 acres affected;
- Robson Ranch, residential development, 6,651 acres affected; and
- Continuation of Loop 288 NW Phase II to IH 35W, transportation project, 38 acres affected.
- 18

Based on the reasonably foreseeable actions listed in **Appendix E-3** and the bulleted list above, reasonably foreseeable development and transportation projects are anticipated to result in the land use conversion of approximately 18,095.4 acres (28 percent) of the land use RSA, of which approximately 516.1 acres are developed/disturbed and approximately 17,579.3 acres are undeveloped.

23

24 Land use changes associated with Mobility 2030 - 2009 Amendment projects, including the IH 35E 25 Southern Link section, and other development projects may result in additional relocations and 26 displacements within the land use RSA. Within the land use RSA, the proposed reconstruction of the IH 27 35E Middle section is anticipated to result in a total of 18 displacements within the Town of Hickory 28 Creek, five displacements within the City of Corinth and three displacements within the City of Lake 29 Dallas. Specifically, within the Town of Hickory Creek, four residential displacements, nine commercial 30 displacements, three vacant building displacements and two municipal facility displacements are 31 anticipated. Within the City of Corinth, two residential displacements and three commerical displacements 32 are anticipated. Within the City of Lake Dallas one business displacement, one residential displacement 33 and one vacant property displacement are anticipated. "Other development projects" include 34 transportation projects throughout the land use RSA.

35

Numerous initiatives would continue to shape development and redevelopment within the land use RSA.
 The area is expected to see continued urbanization as growth is projected to continue, guided by local

1 land use plans and policies. The specific impacts of continued development within the corridor are 2 speculative due to market forces and individual developer decisions, and could be both beneficial and 3 adverse. In general, as indicated by various land use plans and by the opinions of City Planners, 4 anticipated beneficial impacts include new economic opportunities, housing alternatives, employment, 5 community services, redevelopment of deteriorated buildings or areas, and recreational resources. Land 6 use planning documents and goals prepared by the RSA municipalities seek to achieve a balance of 7 community amenities (e.g., public services, parks/open space, and transportation routes), while 8 maximizing the land that may be developed for various private uses.

9

10 Transportation projects play a major role in the process of achieving the appropriate balance of land uses 11 to meet the needs of local residents and businesses. Although implementation of planned transportation 12 projects within the land use RSA (as detailed in local municipality thoroughfare plans, CIPs, etc.) could 13 result in impacts to land use, these projects would improve local and regional traffic circulation by 14 providing reduced congestion/bottlenecks on local streets and highways, additional system capacity, 15 improved regional mobility, accident reduction, and travel time savings. Transportation mobility is an 16 essential aspect of the successful operation of any developed property. While reasonably foreseeable 17 transportation projects inside the land use RSA would also result in impacts to the human environment 18 (including socioeconomic, physical, and natural environment impacts), government leaders and agencies 19 at all levels may be expected to continue to seek the optimum balance of land uses to meet the needs of 20 the local and regional populace by sustaining growth throughout the region.

21

22 7.5.6 Step 6: Cumulative Impacts Assessment – Land Use

Implementation of projects within the Cities of Denton, Corinth, and Lake Dallas, and the Towns of Hickory Creek and Shady Shores would likely impact the human and natural environment; however, such projects also have the potential to increase mobility, manage congestion, and improve the socioeconomic environment in response to local and regional population increases and the resulting demand on transportation facilities and the community.

28

29 Direct impacts of the proposed IH 35E improvements would involve the conversion of approximately 30 106.59 acres to transportation ROW. ROW acquisition would impact a total of 57 properties, including 17 31 residential and 40 commercial. Approximately 996.6 acres could be affected by project-influenced land 32 use change (indirect impacts), and approximately 18,095.4 acres could potentially be impacted by 33 reasonably foreseeable development and transportation projects. A sum total of approximately 19,198.8 34 acres of land could potentially be developed with urban or transportation uses within the land use RSA, 35 Of the 19,198.8 acres of anticipated land use conversion, approximately 18,108.1 acres would be 36 undeveloped land and approximately 1,090.7 acres would be developed/disturbed land.

1 Considering the acres of potential land use change within the RSA, substantial cumulative impacts to land 2 use are anticipated. However, approximately 94 percent of these impacts result from reasonably 3 foreseeable projects that have been planned and accounted for by zoning and other regulatory measures 4 of the RSA municipalities. These municipalities have experienced substantial growth over the last 20 5 years, and anticipate growth to continue through 2030. As such, this growth has been accounted for 6 within the respective planning documents of the RSA municipalities.

7

A complete assessment of anticipated relocations and displacements associated with the reasonably foreseeable projects within the land use 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 land use RSA has the capacity to absorb the relocations and displacements.

13

14

7.6 Economic Impacts of Tolling (EJ/Tolling)

15

16 7.6.1 Step 1: Resource Identification – EJ/Tolling

17 As detailed in Section 5.2.10, the proposed project would not evenly distribute the benefits of time cost 18 savings associated with the MHOV-C lanes among all income groups because lower income groups 19 would pay a higher proportion (approximately three to four times more) of their income for tolls as 20 compared to middle and higher income groups for the same time savings benefit. However, alternative 21 project-specific, non-toll options currently exist or would at the time the MHOV-C lanes would open (i.e., 22 DCTA A-train, the addition of mainlanes to the existing facility, construction of continuous frontage roads 23 throughout the project corridor, etc.). These options would be available to all groups, including low-24 income populations, and would assist in offsetting the unequal distribution of travel time cost savings 25 benefits based on income, regardless of toll collection method. In light of the emerging regional tolling 26 network, (see Table 7-1) and potential accompanying financial impacts to potential users, a cumulative 27 impacts analysis of EJ/Tolling impacts was determined necessary.

28 29

7.6.2 Step 2: Resource Study Area – EJ/Tolling

The RSA for EJ/Tolling is the extent of the MPA boundary before its expansion to a 12-county region⁸¹ in October 2009. As previously described, prior to this expansion, the MPA consisted of 5,000 square miles (see **Appendix E, Figure E-1**) and encompassed five entire counties (Collin, Dallas, Denton, Rockwall, and Tarrant Counties) and four partial counties (Ellis, Johnson, Kaufman, and Parker Counties). The MPA (prior to its expansion) was selected to correspond with data obtained for the O&D analysis, which determined that populations from these nine counties are anticipated to utilize the IH 35E facility. The

⁸¹ The expanded MPA (as of October 2009) includes the following counties in their entirety: Collin, Dallas, Denton, Rockwall, Tarrant, Ellis, Johnson, Kaufman, Parker, Hunt, Wise, and Hood Counties.

time span of 1990 to 2030 was chosen as the temporal boundary for assessing cumulative impacts to EJ populations in relation to tolling. The early date corresponds with when the project area began to experience heavy population growth and the later date corresponds with *Mobility 2030 - 2009 Amendment*.

5

6 7.6.3 Step 3: Resource Health and Historical Context – EJ/Tolling

7 The 2009 transportation network for North Central Texas (calculated in mainlane miles) consisted of 8 30,721 lane-miles of roadways with freeways, tollways, and HOV lanes comprising 14.9 percent of the 9 system. Of the total 2009 system, 495 of the lane-miles are tolled (approximately 1.6 percent). The 10 anticipated 2030 transportation network for Dallas-Fort Worth would consist of approximately 41,070 11 lane-miles of roadways with freeway, tollway, and managed lanes comprising 20.7 percent of the system. 12 Of the total system in 2030, approximately 3,339 lane-miles (toll roads and managed lanes) or 8.3 13 percent are tolled. The anticipated increase of tolled mainlanes from 1.6 to 8.3 percent is indicative of an 14 emerging regional tolling network.

15

Existing tolling systems within the region include the DNT, PGBT, and Sam Rayburn Tollway (formerly the
 SH 121 tollway) in Denton County. Reasonably foreseeable tolling projects near the proposed project
 include MHOV-C lane facilities on IH 35E from IH 635 to FM 2181, LLTB, and the Regional Outer Loop.

19

All new added capacity projects in the DFW Metropolitan Area would be considered for tolling. The decision to toll new added capacity would be determined on a case by case basis by the RTC in conjunction with TxDOT. TxDOT policy mandates that existing free lanes not be considered for tolling.

The total population of the nine counties included in the EJ/Tolling RSA is 5,030,828. Of Denton County's total population (432,976), approximately 3.9 percent were racial minority and 6.5 percent were lowincome.⁸²

26

Presidential EO 12898 requires federal agencies to: "make achieving EJ part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." EO 13166 requires federal agencies to examine the services they provide and identify any need for those with LEP. The thresholds used to identify areas with high concentrations of low-income or minority populations were based on the definitions of low-income and minority established in the FHWA Order and by the CEQ EJ Guidance under the NEPA documentation.

⁸² Census 2000

1 As previously stated in Section 2.2, TxDOT has historically financed highway projects on a "pay-as-you-2 go" basis, using motor fuel taxes and other revenue deposited in the State highway fund. However, 3 population increases and traffic demand have outpaced the efficiency of this traditional finance 4 mechanism. Transportation agencies have worked cooperatively to plan a proposed integrated system of 5 managed lanes and toll roads for the DFW Metropolitan Area. The combination of traditional and toll 6 funding would allow projects to be completed earlier than previously programmed using traditional 7 highway funds, thus adding freeway/highway and frontage road capacity to the system earlier than 8 originally programmed by using traditional funding alone. As funding mechanisms evolve, the trend 9 towards utilization of tolling facilities in this region may through time create "user impacts" as access to 10 highway systems becomes an issue to the economically disadvantaged.

11

12 7.6.4 Step 4: Direct and Indirect Impacts – EJ/Tolling

13

14 Direct Impacts

15 There would be a time savings impact to any motorist utilizing the IH 35E MHOV-C lanes. The travel time 16 savings would be more pronounced during the peak periods of travel, when traffic congestion on the 17 mainlanes would more pointedly warrant the use of the less congested MHOV-C lanes. Additionally, 18 there would be an economic impact to any motorist utilizing the IH 35E MHOV-C lanes; however, a 19 motorists' ability travel on the MHOV-C lanes would be influenced by their ability to afford the toll rates, 20 thus affecting a motorists' potential for experiencing the aforementioned travel time savings. As was 21 modeled in Section 5.2.10, for an afternoon peak hour round trip on the proposed MHOV-C lanes (from 22 FM 2181 to US 380), a low-income household would spend approximately 1.4 percent more of their 23 annual household income on tolls via electronic toll collection as compared to a household of median 24 income: and approximately 0.2 percent more during both mid-day peak and off-peak travel hours for both 25 proposed project ETC years of 2020 and 2026. Under a video billing scenario and assuming the same 26 round trip and time of day, a low-income household would spend approximately 2.1 percent more of their 27 annual household income on tolls as compared to a household of median income; and approximately 0.4 28 percent more during both mid-day peak and off-peak travel hours for both proposed project ETC years of 29 2020 and 2026.

30

As demonstrated above, the proposed project would not evenly distribute the benefits of time cost savings associated with the MHOV-C lanes among all income groups because lower income groups would pay a higher proportion (approximately three to four times more) of their income for tolls as compared to middle and higher income groups for the same time savings benefit. However, alternative project-specific, non-toll options currently exist or would at the time the MHOV-C lanes opens to traffic. In general, such project-centric, non-tolled options include, adding one to three non-tolled mainlanes in each direction, making the existing two-lane non-tolled frontage roads continuous throughout the project corridor, providing an additional frontage road lane at the IH 35E exit ramps and where traffic projections exhibited high traffic volumes, and providing intersection improvements. These improvements to the existing IH 35E facility would improve mobility for all users (including low-income users) who do not elect or only on an occasional basis can afford to travel on the MHOV-C lanes. Additionally, by using transit options, such as the DCTA A-train, all users (including low-income) would realize a travel-time savings and reduce their personal economic impact since tolls would be waived for the transit provider per RTC policy (see **Appendix G-1**).

8

9 Overall, the project-specific, non-toll options (including transit), available to all groups, including low-10 income populations, would assist in offsetting the unequal distribution of travel time cost savings benefits 11 based on income.

12

13 Indirect Impacts

14 The economic impacts of tolling on EJ populations are considered direct impacts and are accordingly 15 addressed in Section 5.2.10; however, current plans indicate that when the proposed project opens, the 16 IH 35E Middle section (project limits from: PGBT to FM 2181) will be operational. This could potentially 17 allow a longer trip for users, if desired. For additional trip length information, see Appendix G-6: Traffic 18 and Revenue Analysis Consistency and MTP Phasing Compatibility. Potential positive indirect impacts 19 are anticipated to result from implementation of the proposed MHOV-C lanes. That is, in accordance with 20 the RTC's Excess Toll Revenue Sharing: Managed Lane Policy (approved June 2005), the excess toll 21 revenue generated would remain in the county in which the revenue-generating project is located (i.e., 22 Denton County). This revenue could be used in the construction/reconstruction and/or maintenance of 23 other tolled and/or non-tolled roadways and for other congestion reducing efforts (i.e., transit, ITS, park 24 and ride, etc.). Such efforts could function to improve mobility and manage congestion within the 25 communities of the indirect impacts AOI, affecting all motorists, including those from EJ populations (see 26 Appendix G-2).

27

28 7.6.5 Step 5: Reasonably Foreseeable Actions – EJ/Tolling

29 Approximately 1.6 percent of the lane-miles of the regional transportation system are currently tolled. An 30 anticipated increase to 8.3 percent tolled lanes in 2030 is indicative of an emerging tolling network in the 31 region. Future added capacity transportation projects with toll-free lanes would provide mobility and congestion relief for all users, including low-income users. Tolled and managed HOV facilities are 32 33 expected to increase efficiency and assist in meeting region capacity and mobility needs. Users, 34 including those with low-incomes, who utilize the non-tolled facilities may experience a difference in travel 35 time compared to users of tolled facilities and managed HOV facilities. Low-income users who use the 36 tolled facilities and managed HOV facility would pay a greater portion of household income on tolls as 37 compared to the non low-income user. Plans exist to expand the current transit options that are available
within the IH 35E corridor, including the southern expansion of the DCTA A-train regional commuter rail
 facility, that runs parallel to IH 35E and serves as an additional non-tolled transit alternative for commuter.

3

4 7.6.6 Step 6: Cumulative Impacts Assessment – EJ/Tolling

5 The project level analysis in Sections 5.2.9 (O&D) and 5.2.10 accounts for most cumulative impacts 6 because of its consideration of the entire regional transportation system in the MPO planning area and 7 inclusion of the projected 2030 highway and transit networks in the O&D select link analysis that was 8 provided by NCTCOG. In this way, other reasonably foreseeable transportation projects and land 9 development projects are included in the analysis. As stated previously, the anticipated Mobility 2030 -10 2009 Amendment transportation network for North Central Texas would consist of approximately 41,070 11 mainlane lane-miles, of which 8.3 percent (approximately 3,339 lane-miles) are proposed to be tolled. Of 12 the anticipated lane-miles accounted for in the 2030 network, the proposed project would contribute 13 approximately 36.3 tolled lane miles, 88.4 lane miles of non-tolled general purpose mainlanes, and 58.1 lane miles of non-tolled frontage roads.⁸³ 14

15

16 There would be an economic impact to any motorist who utilizes the proposed IH 35E MHOV-C lanes: 17 however, the economic impact would be higher for low-income users because the cost of paying tolls 18 would represent a higher percentage of household income than for non-low-income users (see Section 19 5.2.10). As such, low-income users may be more likely to use the non-tolled mainlanes and non-tolled 20 frontage roads. The difference in travel times between the MHOV-C lanes and non-tolled mainlanes and 21 non-tolled frontage roads would likely be highest during peak hours of travel when traffic congestion 22 within the IH 35E corridor would be the greatest. Frontage road travel time would also be influenced by 23 lower posted speeds and signalization.

24

At some point in the future, the managed lane system along the IH 35E corridor may extend from IH 635 to US 380. Based on the Level 2 T&R Study, the average trip length would be 11 miles (For additional information regarding trip length, see Appendix **G-6** and **Section 5.2.10**).

28

29 The IH 35E MHOV-C lanes, as an element of the system of toll roads now being developed for the 30 greater-DFW area, would contribute to a cumulative impact on low-income users of the system. If one 31 were to assume an average commute distance of 14 miles in the greater-DFW area, (assumption based 32 on the NCTCOG TransCAD® model) and applied that distance to toll facilities at the estimated toll rate of 33 14.5 cents per mile, the total year 2010 future value cumulative cost for one round-trip along a toll facility 34 would be approximately \$4.06. Assuming the average household would make 250 round-trips per year, 35 the annual cost for the average commute distance at these different rates would be approximately \$1,050 36 per year, which equates to 4.7 percent of a household income at the 2010 DHHS poverty level for a

⁸³ Calculation excludes auxiliary lanes

family of four. Given the lay-out and orientation of the 2030 proposed 419 mile toll system, it is possible that many drivers would routinely travel the length of a tolled facility during the course of normal daily activities. For individuals who do not have a TollTag® account, the cost to drive the same amount of mileage, at 21.0 cents per mile (which includes a 45 percent premium), would correspond to approximately \$1,470, which equates to 6.6 percent of a household income at the 2010 DHHS poverty level.

7

8 Overall, however, the following improvements to the existing IH 35E facility associated with the proposed 9 project would improve mobility for all populations using IH 35E, including EJ populations:

- 10 The addition of one to three non-tolled mainlanes in each direction;
- 11 Construction to make the existing two-lane frontage roads continuous throughout the project
- corridor;
- Construction of an additional frontage road lane at exit ramp locations and where traffic
- projections exhibited high traffic volumes; and
- 15 Improvements to existing intersections.
- 16

17 Additionally, transit options will be available as non-tolled alternatives to SOV and HOV usage of the IH 18 35E MHOV-C lanes, including the DCTA A-train. MHOV-C lane users, (including low-income) would 19 realize a travel-time savings and reduce their personal economic impact by using transit in which tolls 20 would be waived for the transit provider per RTC policy. Further, implementation of the proposed MHOV-21 C lanes could potentially benefit traffic operations on non-tolled roadways for all motorists, including those 22 from EJ populations. That is, revenue generated from tolls would remain in Denton County and could be 23 used for the funding of other roadway and/or transit projects that would work to improve mobility and manage congestion within the nearby communities of Denton County.⁸⁴ 24 Ultimately, all of the 25 aforementioned non-toll alternatives would assist in offsetting the unequal distribution of travel time cost 26 savings benefits based on income, regardless of the toll collection method. Although it is reasonable to 27 assume that there would be a cumulative effect on EJ populations upon build-out of the regional toll 28 system, at this time it is not considered substantial. Strategies are currently under consideration for 29 if/when the impact becomes substantial.

30

31 7.7 Step 7: Results

The information provided in **Table 7-5** represents the starting point for assessing the potential cumulative impacts considering the condition and trend of each resource/issue. The analysis considers the available information on direct and indirect impacts of the proposed project in addition to impacts of expected future actions in drawing conclusions as to whether there would be cumulative impacts, in addition to whether the proposed project would contribute substantially to any cumulative impacts. **Table 7-5** summarizes the

⁸⁴ RTC (June 2005), *Excess Toll Revenue Sharing: Managed Lane Policy* (see **Appendix G-2**).

- 1 information gathered in **Step 1** though **Step 6** and represents the potential cumulative impacts for each
- 2 resource. The analysis to this point does not consider the mitigation that would be required as part of the
- 3 regulatory programs, which are discussed in **Step 8** of the cumulative impacts analysis.

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Indicator of		Summary of Existing Resource Conditions and Potential Impacts (Analysis Step #)				
Resource Condition	Resource Study Area	Existing Condition 1	Proposed Project: Direct	Proposed Project: Indirect	Impacts from Other	Potential Cumulative Impacts
(Step 1)	(Step 2)	(Step 3)	(Step 4)	(Step 4)	(Step 5)	(Step 6)
Air Quality Impacts on Eight-Hour Ozone Standard Impacts on Carbon Monoxide (CO)	Ozone: 9-county serious ³ nonattainment area (includes Denton County) CO: Project ROW line, which represents the locations with the highest potential for CO concentrations	Air Quality Control Region (9- county EPA designated area in North Central Texas) is currently in nonattainment for the eight- hour ozone standard and in attainment for NAAQS criteria pollutants, including CO, with the exception of a portion of Collin County that is in nonattainment for lead.	The proposed project would not cause or contribute to any new localized CO violations or increase the frequency and severity of any existing CO violations. The proposed project is included in and is consistent with <i>Mobility 2035</i> and the FY 2011- 2014 TIP, as amended. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011.	Project-influenced land use change accounts for approximately 3.8 percent of the indirect impacts AOI, which is not expected to provide enough change to alter the non-attainment status of ozone or the attainment status of all other NAAQS criteria pollutants, including CO with the exception of a portion of Collin County that is in nonattainment for lead.	Increased development and urbanization would likely have a temporary negative effect on air quality due to construction-related impacts. However, 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.	The proposed project is included in and is consistent with Mobility 2035 and the FY 2011-2014 TIP, as amended. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011. Other reasonably foreseeable planned transportation improvements are included in the MTP and TIP, which were found to conform to the SIP. Although the DFW Metropolitan Area 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. 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 (as illustrated in Table 7-2 and Figure 7-1)

Indicator of		Summary of Existing Resource Conditions and Potential Impacts (Analysis Step #)				
Resource Condition (Step 1)	Resource Study Area (Step 2)	Existing Condition ¹ (Step 3)	Proposed Project: Direct Impacts ² (Step 4)	Proposed Project: Indirect Impacts ² (Step 4)	Impacts from Other Foreseeable Projects ² (Step 5)	Potential Cumulative Impacts Step 4+Step 5 (Step 6)
Air Quality Mobile Source Air Toxics (MSATs)	Affected Transportation Network located within the MPA ⁴ (includes roadway links with a ± five percent volume change)	No NAAQS have been established for MSATs. Higher levels of MSATs would be expected to occur within 100 meters (328 feet) of existing roadways based on recent FHWA review of several air quality studies (see Section 5.1.8). Monitored levels of MSATs near the project area are located in Table 5-5.	The quantitative MSAT analysis (Section 5.1.8) for the proposed project indicates that by 2030, MSAT emissions related to the proposed project would substantially decrease when compared to 2009, even with the projected VMT increases.	Indirect air quality impacts from MSATs are unquantifiable due to existing limitations in determining pollutant emissions, dispersion, and impacts to human health. Emissions would likely be lower than present levels in future years as a result of the EPA's national control regulations. 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 reductions of on road emissions, including MSATs.	Although increased development and urbanization would likely have a negative effect on air quality, 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.	The proposed project is included in and is consistent with <i>Mobility</i> 2035 and the FY 2011-2014 TIP, as amended. The USDOT (FHWA/FTA) found the MTP and the TIP to conform to the SIP on July 14, 2011. Other reasonably foreseeable planned transportation improvements are included in MTP and TIP, which were found to conform to the SIP. Although increased development and urbanization would likely have a negative effect on air quality, 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. 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 (as illustrated in Table 7-2 and Figure 7-1).
Water Resources: Waters of the U.S., incl. Wetlands	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake	In acres: Stream: 158.3 Open Water: 631.0 Wetlands: 129.0	In acres: Stream ⁵ - Open Channel: 0.38 Existing culverts: 1.08 Open Water: 0.01 Wetlands: 0.19	In acres: Stream: 2.8 Open Water: 8.2 Wetlands: 3.2	In acres: Stream: 6.0 Open Water: 6.0 Wetlands: 3.9	In acres: Stream: 10.3 Open Water: 14.2 Wetlands: 7.3
Biological Resources: Vegetation	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake	In acres: Riparian Forest: 2,472.9 Upland Forest: 2,523.4 Grass: 14,197.7 Stream: 158.3 Open Water: 631.0 Wetlands: 129.0	In acres: Riparian Forest: 2.0 Upland Forest: 11.5 Grass: 319.0 Streams ⁶ : 0.38 Open Water: 0.01 Wetlands: 0.19	In acres: Riparian Forest: 23.2 Upland Forest: 20.8 Grass: 414.6 Stream: 2.8 Open Water: 8.2 Wetlands: 3.2	In acres: Riparian Forest: 39.5 Upland Forest: 141.0 Grass: 1,034.9 Stream: 6.0 Open Water: 6.0 Wetlands: 3.9	In acres: Riparian Forest: 64.7 Upland Forest: 173.3 Grass: 1,768.5 Stream: 9.2 Open Water: 14.2 Wetlands: 7.3

Indicator of		Summary of Existing Resource Conditions and Potential Impacts (Analysis Step #)				
Resource Condition (Step 1)	Resource Study Area (Step 2)	Existing Condition ¹ (Step 3)	Proposed Project: Direct Impacts ² (Step 4)	Proposed Project: Indirect Impacts ² (Step 4)	Impacts from Other Foreseeable Projects ² (Step 5)	Potential Cumulative Impacts Step 4+Step 5 (Step 6)
Biological Resources: Timber/ Canebrake Rattlesnake	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake	In acres: Riparian Forest: 2,472.9 Upland Forest: 2,523.4 Wetlands: 129.0	Preferred habitat in acres: Riparian Forest: 2.0 Upland Forest: 11.5 Wetlands: 0.19	Preferred habitat in acres: Riparian Forest: 23.2 Upland Forest: 20.8 Wetlands: 3.2	Preferred habitat in acres: Riparian Forest: 39.5 Upland Forest: 141.0 Wetlands: 3.9	Preferred habitat in acres: Riparian Forest: 64.7 Upland Forest: 173.3 Wetlands: 7.3
Biological Resources: Texas Garter Snake Habitat	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake	In acres: Riparian Forest: 2,472.9 Wetlands: 129.0	Preferred habitat in acres: Riparian Forest: 2.0 Wetlands: 0.19	Preferred habitat in acres: Riparian Forest: 23.2 Wetlands: 3.2	Preferred habitat in acres: Riparian Forest: 39.5 Wetlands: 3.9	Preferred habitat in acres: Riparian Forest: 64.7 Wetlands: 7.3
Biological Resources: Plains Spotted Skunk Habitat	Portions of adjacent watersheds consisting of Hickory Creek, Pecan Creek, and Lewisville Lake	In acres: Upland Forest: 2,523.4	Preferred habitat in acres: Upland Forest: 11.5	Preferred habitat in acres: Upland Forest: 20.8	Preferred habitat in acres: Upland Forest: 141.0	Preferred habitat in acres: Upland Forest: 173.3

Indicator of		Summary of Existing Resource Conditions and Potential Impacts (Analysis Step #)					
Resource Condition	Resource Study Area	Existing Condition 1	Proposed Project: Direct	Proposed Project: Indirect	Impacts from Other	Potential Cumulative Impacts	
(Step 1)	(Step 2)	(Step 3)	(Step 4)	(Step 4)	(Step 5)	(Step 6)	
Land Use: Impacts on Land Use Plans	City limits for: the Cities of Denton, Corinth, and Lake Dallas; and the Towns of Shady Shores and Hickory Creek	Substantial growth rates are anticipated between 2000 and 2030. Local land use plans reflect a continuation of urban development and roadway improvements designed to accommodate the demands of future traffic. Currently available acres and percent of vacant land for each municipality ⁷ within the RSA in acres are as follows: Denton: 24,354 (60%) Corinth: 2,479 (48%) Lake Dallas: 279 (16%) Hickory Creek: 1,112 (38%) Shady Shores: 1,049 (56%)	Approximately 106.59 acres of additional ROW are to be converted to transportation ROW, broken down into the following (in acres): Undeveloped: 54.87 Developed residential: 3.95 Developed commercial: 46.53 Undeveloped easement: 1.04 Developed commercial easement: 0.20 ROW acquisition would impact a total of 57 properties, including 17 residential and 40 commercial. Road improvements are part of the plans for each municipality within the RSA; the proposed project is necessitated by past growth and would facilitate future growth.	Project influenced land use change is anticipated at 27 locations along the IH 35E corridor (primarily at locations of improved access), accounting for 996.6 acres.	There are 75 identified major reasonably foreseeable development and transportation projects within the land use RSA; these projects have a total approximate footprint of 18,095.4 acres (28%) within the RSA. This includes approximately 17,579.3 acres of undeveloped land and 516.1 acres of developed/disturbed land. All projects would conform to municipal planning documents. Land use changes associated with Mobility 2030 – 2009 Amendment projects and other development projects may result in additional relocations and displacements throughout the Land Use RSA.	A substantial amount of land use conversion (28%) is anticipated to result from reasonably foreseeable development and transportation projects. Considering all direct, indirect, and reasonably foreseeable impacts, approximately 19,198.8 acres of land are likely to be developed with urban or transportation uses. This includes approximately 18,108.1 acres of undeveloped land and approximately 1,090.7 acres of developed/disturbed land. Road improvements and commercial development are part of the plans for each municipality within the RSA; projects are necessitated by past growth and would facilitate future growth. All projects would conform to municipal planning documents. 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, when considered collectively, are indicative of major transportation enhancements; however, the Land Use RSA has the capacity to absorb the relocations and displacements.	

Indicator of		Summary of Existing Resource Conditions and Potential Impacts (Analysis Step #)					
Resource	Resource		Proposed Project: Direct	Proposed Project: Indirect	Impacts from Other	Potential Cumulative Impacts	
Condition	Study Area	Existing Condition ¹	Impacts ²	Impacts ²	Foreseeable Projects ²	Step 4+Step 5	
(Step 1)	(Step 2)	(Step 3)	(Step 4)	(Step 4)	(Step 5)	(Step 6)	
EJ/Tolling	MPA ⁴	Approximately 1.6% of the lane- miles of the regional transportation system are currently tolled. An anticipated increase to 8.3% tolled lanes in 2030 is indicative of an emerging tolling network in the region. Project area demographics indicate a 27.3% minority population, with 11.0% of the population below the poverty	Motorists on IH 35E, including low- income individuals, would: (1) benefit from capacity and mobility improvements on the IH 35E non- tolled mainlanes and non-tolled frontage roads; and (2) experience a difference in travel time on the IH 35E non-tolled general purpose mainlanes and non-tolled frontage roads during peak travel periods compared to motorists on the MHOV-C lanes.	Impacts relating to the economic impacts of tolling on EJ populations are considered direct impacts; however, current plans indicate that when the proposed project opens, the IH 35E Middle section (project limits from: PGBT to FM 2181) will be operational. This could potentially allow a longer trip for users, if desired. For additional trip length information, see Appendix G-6 :	Current RTC policy mandates that new added capacity projects be considered for the possibility of tolling. TxDOT policy mandates that existing free lanes would not be considered for tolling. Future added capacity transportation projects with toll- free lanes would provide mobility and congestion relief for all motorists, including low-income	Motorists using the MHOV-C lanes, including low-income individuals, would experience a difference in travel time during peak travel periods compared to users of non-tolled general purpose mainlanes or other non-toll alternatives (including the proposed project's non- tolled general purpose mainlanes and frontage roads). Low-income motorists on tolled and MHOV-C facilities (including the proposed	
		level, and 7.6% of the population speaking English less than "very well."	Low-income motorists who use the MHOV-C lanes would pay a greater portion of household income on tolls compared to non low-income motorists (see afternoon peak, mid- day peak, and off peak toll pricing scenarios presented in Section 5.2.10). As demonstrated above, although the proposed project would not evenly distribute the benefits of time cost savings associated with the MHOV-C lanes among all income groups, alternative project-specific, non-toll options, including transit currently exist or would at the time the MHOV- C lanes would open. 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, regardless of toll collection method.	Traffic and Revenue Analysis Consistency and MTP Phasing Compatibility. Excess toll revenue generated from the proposed MHOV-C lanes would remain in Denton County (returned to the funding partners) and could be used in the construction/reconstruction and/or maintenance of other tolled and/or non-tolled roadways and on other congestion reducing efforts (i.e., transit, ITS, park and ride, etc.). ⁸	motorists. MHOV-C lanes are expected to increase efficiency and assist in meeting regional capacity and mobility needs. Motorists, including low-income populations, who use the non- tolled facilities, would experience a difference in travel time, compared to motorists of tolled and MHOV-C facilities. Low-income motorists of tolled and MHOV-C lanes would pay a greater portion of household income on tolls, compared to a non low-income motorist. An anticipated increase to 8.3% of tolled lanes is predicted by 2030.	project) would pay a greater portion of household income on tolls, compared to non-low-income motorists. An anticipated increase to 8.3% tolled lanes in 2030 is indicative of an emerging tolling network in the region. At some point in the future, the managed lane system along the IH 35E corridor may extend from IH 635 to U.S. 380. Based on the Level 2 T&R Study, the average trip length would be 11 miles (For additional information regarding trip length, see Appendix G-6 and Section 5.2.10). Excess toll revenue generated from the proposed MHOV-C lanes would remain in Denton County and could be used in the construction/reconstruction and/or maintenance of other tolled and/or non- tolled roadways and on other congestion reducing efforts (i.e., transit, ITS, park and ride, etc.). ⁸ Motorists, including low-income individuals, would benefit from the region- wide addition of capacity and mobility improvements on non-tolled mainlanes and frontage roads, as well as other non- tolled options such as transit.	

Indicator of		Summary of Existing Resource Conditions and Potential Impacts (Analysis Step #)					
Resource	Resource		Proposed Project: Direct	Proposed Project: Indirect	Impacts from Other	Potential Cumulative Impacts	
Condition	Study Area	Existing Condition ¹	Impacts ²	Impacts ²	Foreseeable Projects ²	Step 4+Step 5	
(Step 1)	(Step 2)	(Step 3)	(Step 4)	(Step 4)	(Step 5)	(Step 6)	

NOTES:

1. Acreages (ac) and other data are approximate estimates, and based on information presented earlier in this report.

2. Acreages (ac) and other data are approximate. The information presented reflects expected potential impacts, and does not take into consideration potential mitigation or other measures stipulated/required by regulatory authorities. The influence of these factors is discussed in the following section (Section 7.8).

3. On August 9, 2010, the EPA proposed to determine that the nine-county moderate eight-hour ozone non-attainment area for DFW did not attain the 1997 eight-hour ozone NAAQS by the June 15, 2010 attainment deadline set forth in the CAA and CFR for moderate non-attainment areas (75 F.R. 152, August 9, 2010) under Title 40 C.F.R. Part 81. On January 19, 2011, the EPA reclassified the nine-county DFW non-attainment area from moderate to serious non-attainment for the 2007 eight-hour ozone standard.

4. MPA prior to the October 2009 expansion; includes five entire counties (Collin, Dallas, Denton, Rockwall, and Tarrant Counties) and four partial counties (Ellis, Johnson, Kaufman, and Parker Counties).

5. Direct impacts to stream channels include impacts to both open channels and existing culverts.

6. Although portions of stream channels enclosed within existing culverts were included in calculating the impacts to water resources, only stream segments that are existing open channels were considered in estimating impacts to vegetation and wildlife habitat.

7. NCTCOG 2000 Land Use Inventory by City database.

8. In accordance with the RTC's Excess Toll Revenue Sharing: Managed Lane Policy, approved June 2005 (see Appendix G-2).

7.8 Step 8: Mitigation

1 2 3

7.8.1 Air Quality

4

5 A variety of federal, state, and local regulatory controls as well as local plans and projects have had a 6 beneficial impact on regional air quality. The CAA, as amended, provides the framework for federal, 7 state, tribal, and local rules and regulations to protect air quality. The CAA required the EPA to establish 8 NAAQS for pollutants considered harmful to public health and the environment. In Texas, the TCEQ has 9 the legal authority to implement, maintain, and enforce the NAAQS. The TCEQ establishes the level of 10 quality to be maintained in the state's air and to control the quality of the state's air by preparing and 11 developing a general comprehensive plan. Authorization in the Texas Clean Air Act (TCAA) allows the 12 TCEQ to do the following: collect information and develop an inventory of emissions; conduct research 13 and investigations; prescribe monitoring requirements; institute enforcement; formulate rules to control 14 and reduce emissions; establish air quality control regions; encourage cooperation with citizens' groups 15 and other agencies and political subdivisions of the state, as well as with industries and the federal 16 government; and to establish and operate a system of permits for construction or modification of facilities. 17 Local governments having some of the same powers as the TCEQ can make recommendations to the 18 commission concerning any action of the TCEQ that may affect their territorial jurisdiction, and can 19 execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town 20 may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the 21 provisions of the TCAA or the rules or orders of the TCEQ.

22

23 The CAA also requires states with areas that fail to meet the NAAQS prescribed for criteria pollutants to 24 develop a SIP. The SIP describes how the state would reduce and maintain air pollution emissions in 25 order to comply with the federal standards. Important components of a SIP include emission inventories, 26 motor vehicle emission budgets, control strategies to reduce emissions, and an attainment 27 demonstration. The TCEQ develops the Texas SIP for submittal to the EPA. One SIP is created for each 28 state, but portions of the plan are specifically written to address each of the non-attainment areas. These 29 regulatory controls, as well as other local transportation and development initiatives implemented 30 throughout North Central Texas by local governments and other entities, provide the framework for 31 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 32 33 NCTCOG for conformity with the SIP.

34

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 attainment with the
ozone standard or threaten the maintenance of the other air quality standards.

3

4 7.8.2 Water Resources

5 The potential cumulative impacts to waters of the U.S., including wetlands, would be avoided or 6 minimized by compliance with the USACE NWP program, the federal "no net loss" policy, and by 7 enforcement of applicable USACE, USFWS, TPWD, and USCG regulations for projects subject to state 8 and federal jurisdiction. Assuming appropriate implementation of regulatory control strategies and 9 policies, future potential impacts to the area's waters of the U.S., including wetlands, would be expected 10 to be reduced, or at a minimum have no net loss. The proposed project would not contribute substantial 11 cumulative impacts to the area's waters of the U.S., including wetlands.

12

13 7.8.3 Biological Resources

14

15 Vegetation and Wildlife Habitat

The Texas Transportation Code⁸⁵ directs TxDOT to adopt memoranda of understanding with appropriate 16 environmental resource agencies, including TPWD. The responsibilities of the TPWD relate primarily to 17 18 its function as a natural resource agency, including its resource protection functions, designated by Parks 19 and Wildlife Code. The TPWD acts as the state agency with primary responsibility to protect the state's 20 fish and wildlife resources. The MOA between TxDOT and TPWD (see T.A.C.) provides an efficient and 21 consistent methodology for describing habitats, transportation impacts to those habitats after avoidance 22 and minimization efforts, and mitigation to be considered as a result of those impacts. The MOA sets 23 forth resources that would be given consideration for compensatory mitigation. With regard to the 24 protection of state-listed threatened or endangered species, the TPWD implements regulatory controls for 25 the State of Texas.

26

Municipal governments have the authority to avoid, minimize, and mitigate the impacts of private property development to habitat within their jurisdictions through application of regulations that guide the intensity, type, and location of new development. The zoning and land use regulations of the City of Denton and the Lake Cities are designed to minimize the adverse effects of growth and urbanization.

31

The impacts of the proposed project and other transportation projects to riparian or floodplain forests would be avoided and minimized in compliance with the TxDOT / TPWD MOA. The impacts of reasonably foreseeable private development to vegetation and habitat would be avoided, minimized, and mitigated through enforcement of applicable municipal zoning and land use regulations. Additionally,

⁸⁵ §201.607

1 USFWS and TPWD regulations would apply for those actions that are subject to state and federal 2 jurisdiction.

3

Preferred habitat would, as a whole, be preserved under local, state, and federal agency policies and regulations concerning development within floodplains. Based on the availability of park and floodplain/riparian forested habitat in the RSA, and assuming appropriate implementation of regulated avoidance, minimization, and mitigation strategies for vegetation and habitat impacts, the proposed project would not contribute to substantial cumulative impacts to the area's vegetation and habitat.

9

10 Threatened/Endangered Species

The TPWD designates animals that are "threatened with statewide extinction" as endangered within the state of Texas. Those species which are "likely to become endangered in the future" are listed as threatened. Listed species are protected under the T.A.C.⁸⁶ from being killed, removed, transported, owned, sold, released, or exported without an appropriate permit. Violators are penalized with a Class C Parks and Wildlife Code misdemeanor.⁸⁷ Some species listed by the state are also protected by federal regulations as well; these are listed by the USFWS. Federally listed threatened or endangered species are similarly protected under the ESA that implements federal regulations.

18

Municipal governments have the authority to avoid, minimize, and mitigate the impacts of private property development to habitat within their jurisdictions through application of regulations that guide the intensity, type, and location of new development. The zoning and land use regulations of local cities are designed to minimize the adverse effects of growth and urbanization, and include ordinances that regulate development within floodplains and provide for preservation of trees.

24

The impacts of the proposed project and other reasonably foreseeable transportation projects to vegetation and habitat would be avoided, minimized, and mitigated in compliance with the TxDOT/ TPWD MOA. As transportation projects affect a small portion of total impacts, reasonably foreseeable private development impacts to vegetation and habitat would be avoided, minimized, and mitigated through enforcement of applicable tree preservation, municipal zoning, and land use regulations. Effective enforcement of these protective measures by municipalities would be the primary means of ensuring mitigation of habitat for threatened species

32

Based on the availability of riparian forest, upland forest, and water resources within the RSA, and assuming appropriate implementation of regulated avoidance, minimization, and mitigation strategies for vegetation and habitat impacts, the proposed project would not substantially contribute to cumulative

⁸⁶ Section 65.171

⁸⁷ TPWD Code Section 68.021

impacts to the area's vegetation and habitat. Further, the proposed project would have no impact on the
timber/canebrake rattlesnake, Texas garter snake, or the plains spotted skunk.

3

4 7.8.4 Land Use

5 There is not a universally-accepted hierarchy of land uses, and the choice to construct transportation 6 projects in the IH 35E corridor or otherwise develop or redevelop land reflects a balancing of competing 7 land uses to meet city and regional needs. Mitigation is part of transportation planning, however, and all 8 transportation projects are subject to an extensive environmental review process to ensure that the 9 amount of ROW needed for a project is minimized. Similarly, municipal and private development actions 10 are subject to established policies and procedures that allow a weighing of public interests (e.g., zoning 11 and development ordinances). As TxDOT and FHWA do not have the authority to implement zoning or 12 planning regulations, mitigation for cumulative impacts to land use, redevelopment, or continued 13 conversion of undeveloped land to developed land would require the collaborative efforts of local, county, 14 and regional planners, the public, and private developers. These parties all have a stake in the ultimate 15 landscape in which they reside and only proactive, cooperative interactions would provide the optimum 16 blend of natural and developed communities.

17

18 The proposed improvements to IH 35E are consistent with local land use and zoning plans. Assuming 19 appropriate implementation of applicable land use planning regulations and control strategies, related 20 effects on air and water and other natural systems, including ecosystems, would be avoided and 21 minimized. Reasonably foreseeable development and transportation projects are anticipated to result in 22 the land use conversion of approximately 28% of the land use RSA; and this land use conversion has 23 been planned and accounted for within local planning documents. Other than the collaborative planning 24 process involving multiple government agencies at the federal, state, regional, and municipal level, no 25 additional mitigation would be warranted to address changes in land use.

26

27 **7.8.5 EJ/Tolling**

The MPO (i.e., NCTCOG for the 16-county region⁸⁸ of North Central Texas) is responsible for coordination and implementation of transportation planning within its MPO boundary. This effort includes updating the area wide MTP and approving toll road systems in the DFW Metropolitan Area. Where the MTP is changed or approved to include an inter-connected network of toll roads, the EJ/Title VI impacts are analyzed not only for the individual toll facilities but also cumulatively for the entire system. To this end, an EJ/Title VI analysis is required 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.

⁸⁸ The NCTCOG 16-county region includes Collin, Dallas, Denton, Ellis, Erath, Hood, Hunt, Johnson, Kaufman, Navarro, Palo Pint, Parker, Rockwall, Somervell, Tarrant, and Wise Counties.

Continuing efforts by the MPO would ensure that recommendations of the MTP do not adversely impact
 the protected populations disproportionately when compared to the unprotected population.

Mobility 2030 - 2009 Amendment, the current MTP, identifies a number of possible mitigation measures that may be considered in order to minimize potential disproportionate impacts on low-income populations from MHOV-C lanes. Some of these measures would require cooperation between or amongst various governmental entities or agencies. These do not constitute current commitments, but possible solutions that may be developed and implemented after appropriate study and consideration. Possible mitigation measures may include but are not limited to:

- 9 Improvements to non-tolled roadway facilities and alternative transportation modes;
- Increased public transit access through improved headways and/or routes;
- 11 Increased efforts to promote ridesharing and vanpooling;
- Improvements in transportation systems management, through measures such as improved signal timing, additional left/right turn bays, and additional bus bays;
- Funding of alternative transportation infrastructure (rail transit, bicycle and pedestrian facilities,
 etc.); and,
- Funding of non-toll projects within the current transportation plan, which would add capacity to
 non-tolled general purpose lanes.
- 18

19 These are measures that would contribute to facilitating travel for low-income persons who may be

20 unable to afford traveling on MHOV-C lanes. Additionally, the RTC's Managed Lane Policies⁸⁹ (as

21 detailed in **Appendix G-1**: Business Terms for TxDOT-Sponsored Managed Lane Facilities) states that

22 HOVs of two or more occupants may receive a reduced rate or incentives during the peak period.

⁸⁹ (approved May 2006, modified September 2007)

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8.0 REGIONAL PRICED FACILITY SYSTEM ANALYSIS

2

The indirect impact section identified the need to study the impacts of proposed expansions to the regional toll/managed lane or priced facility network through 2030. Each cumulative resource is studied from a regional perspective and the impacts that the proposed priced facility network would have on each resource is addressed. Because of the availability of data resources at the regional level, the resource study area (RSA) for the regional study is the Dallas-Fort Worth metropolitan planning area (MPA) as defined in *Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment* (*Mobility 2030 – 2009 Amendment*).

10

11 At a regional level, Mobility 2030 – 2009 Amendment, the MTP, presents a system of transportation 12 improvements needed to address travel demand and maintain mobility in the Dallas-Fort Worth area over 13 the next 20 plus years. The Federal transportation act requires the MTP to be fiscally constrained, so 14 only projects that can be constructed under reasonable funding assumptions are contained in the multiyear plan. Therefore, the MTP also serves as a guide for the expenditure of state and federal funds for 15 16 the region, plans, programs, policies, projects, partnerships, and performance. The development of the 17 MTP is led by NCTCOG, which serves as the MPO for the North Texas region. At a minimum, the MTP 18 must be updated every four years in nonattainment areas and must maintain a 20-year planning horizon. 19 The MTP is coordinated with the public, local governments, transit authorities, TxDOT, FHWA, and FTA. 20 The current MTP can be found at http://www.nctcog.org/trans/mtp/2030/2009Amendment.asp.

21

The MTP must also meet other federal regulations for planning requirements and air quality. For example, the Clean Air Act Amendments (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 Dallas-Fort Worth region is classified as a transportation management area (population over 200,000) so the MTP must include a CMP to address congestion.

27

28 Challenged with modest transportation funding, relative to identified needs and growth, the Dallas-Fort 29 Worth region optimizes the use of its limited transportation funds through innovative financing 30 mechanisms. Population increases and traffic demand have outpaced traditional funding sources (e.g., 31 gas tax, vehicle registration). Innovative funding tools were made available by Congress in Intermodal 32 Surface Transportation Efficiency Act (ISTEA) and the Texas State Legislature (House Bills 3588 and 33 2702). State legislation also enables toll bonds, concession fees, and excess revenues to fund 34 supplemental roadway projects that are either adjacent to those new corridors or of greatest need in the 35 TxDOT districts where the corridors are constructed. Using these tools, the North Texas region is 36 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.

3

4 Mobility 2030 – 2009 Amendment was developed amidst growing concerns regarding air quality of the 5 Dallas-Fort Worth region and projected shortfalls in funding for many desired transportation projects and 6 programs. Available funds are first allocated to cost-effective air quality projects and programs, and then 7 to more traditional major capital intensive projects, if they are affordable from both a financial and air 8 quality standpoint (see Appendix F-1). This is done by first investing in the maintenance and operation 9 of existing facilities and improving efficiencies [e.g., transportation system management (TSM), intelligent 10 transportation system (ITS)], removing trips from the system (e.g., carpool/vanpool programs, bicycle and 11 pedestrian facilities), inducing a switch to transit (e.g., bus and passenger rail), and increasing auto 12 occupancy [e.g., high occupancy vehicle system (HOV)]. Only after maximizing the operational capacity 13 of the existing transportation system are additional capacity and/or new location projects such as toll 14 roads or tax-supported highways considered.

15

Appendices F-2 and F-3 from *Mobility 2030 – 2009 Amendment* show the proposed roadway and passenger rail for the region in 2030. Table 8-1 shows a summary of the roadway and passenger rail system.

- 19
- 20

TABLE 8-1. SUMMARY ROADWAY AND PASSENGER RAIL SYSTEM

System	2009 E	xisting	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

21

For the roadway system, the 2009 transportation network for the Dallas-Fort Worth 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

25 (approximately 1.6 percent). The anticipated 2030 transportation network for Dallas-Fort Worth 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.

4

5 The proposed roadway system for the Dallas-Fort Worth area includes priced facilities (i.e., toll roads and 6 managed lanes). Toll roads are facilities where the driver is charged a fixed priced (toll or fee) to use the 7 roadway. Current toll rates on toll roads operated by North Texas Tollway Authority (NTTA) (i.e., Dallas 8 North Tollway, the President George Bush Turnpike, and the Sam Rayburn Tollway) are 14.5 cents per 9 mile using a TollTag. Starting in 2011, small incremental rate increases will occur every two years. Rates 10 will adjust every odd year at 5.6 percent starting in 2011 to account for inflation. For TxDOT-sponsored 11 tollways, the RTC and TxDOT developed business terms, which set the toll rates and rate adjustments to 12 maintain price consistency between the various toll projects.

13

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.

21

22 Managed lanes are separate lanes within a highway that charge a toll but the cost varies based on time-23 of-day, vehicle occupancy, or other operational strategies. This type of pricing is also called value, 24 congestion, or dynamic pricing. This pricing strategy establishes higher rates during the peak periods 25 and lower rates during off-peak travel times. Peak toll rates would be set to maintain a minimum average 26 speed of 50 miles per hour, thus offering motorists a reliable and congestion-free trip in exchange for the 27 higher peak toll. This can encourage telecommuting or flexible work hours so that motorists may switch 28 to using toll facilities more during off-peak periods. These effects are anticipated to help improve peak 29 period LOS, reduce congestion, and improve regional air quality. Commuters who travel on the managed 30 lanes will be able to benefit from faster and more reliable travel times through the use of value pricing.

31

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.

1 Prior to construction, a detailed traffic and revenue study will be performed on each facility. Toll rates will 2 be determined on a facility-by-facility basis and would be established in accordance with the business 3 terms for TxDOT-sponsored managed lane facilities as approved by the RTC (Appendix G-1). Per 4 Senate Bill 792, TxDOT is required to release the financial information on a CDA project and conduct a 5 public hearing to disclose the anticipated toll rates. The RTC managed lane policy sets up a two-phase 6 process for implementing dynamic pricing on regional managed lane facilities. The first phase lasts six 7 months and would include a fixed-schedule fee depending on the time of day that would not exceed a toll 8 rate of 75 cents per mile. During this phase the fee schedule will be evaluated and updated on a monthly 9 basis. After the six months fixed-schedule pricing will be replaced with market-based dynamic pricing. 10 The toll rate will be established to ensure a minimum average corridor speed of 50 miles per hour. A toll 11 rate cap will be established, but the dynamic price will be allowed to exceed the cap temporarily if the 12 performance of the managed lanes deteriorates too rapidly. The fixed and variable toll rates will vary 13 depending on the corridor. Conceptual fixed-fee schedule and dynamic pricing are shown in Appendix 14 F-4. Dynamic pricing systems continuously adjust and do not need to be recalibrated to incorporate 15 inflation adjustments, but the price cap would need to be reevaluated periodically.

16

17 The inflation factor assumed as part of the modeling process is based on the Consumer Price Index. 18 Assuming a steady three percent inflation rate, a toll road with a rate of 14.5 cents per mile in 2010 would 19 be adjusted to 19.5 cents per mile and 26.2 cents per mile in 2020 and 2030, respectively. The RTC toll 20 rate policy for TxDOT sponsored toll roads on state highways calls for an inflation adjusted fixed rate of 21 14.5 cents per mile or variable rates of 12.5 cents per mile during off-peak periods and 17 cents per mile 22 during peak periods on new toll facilities. The NTTA controls toll rate policies on existing facilities in their 23 system and has established a toll rate increase schedule through 2017. Appendix F-5 shows these RTC 24 and NTTA policies in both inflation adjusted and constant dollar terms.

25

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.

32

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 8-2** lists the major planned roadway projects included in *Mobility 2030 – 2009 Amendment* and when they are expected to be open to traffic. **Appendices F-6, F-7,** and **F-8** show the priced facilities listed in **Table 8-1** for the projected years of 2019, 2025, and 2030.

Roadway	Location	Responsible Agency	Work Planned
Traffic by 2019			
0 T 0			

Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
Open to Traffic by 2019		I		
Dallas North Tollway	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	US 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 US 77 (north of Waxahachie)	TxDOT-Dallas	Add general purpose lanes	None
IH 35E - South	US 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/US 175	TxDOT Dallas	Add general purpose lanes	None
IH 635	SH 121 to Royal Lane	TxDOT Fort Worth (CDA)	Add general purpose lanes	None
IH 635	Luna Road to US 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	US 287/Outer Loop to IH 20/SH 190	TxDOT-Dallas	New toll road	Fixed
President George Bush Turnpike	IH 35E to SH 78	NTTA	Expand existing toll road	Fixed
President George Bush Turnpike (Eastern Extension)	SH 78 to IH 30	NTTA	New toll road	Fixed
S.M. Wright Parkway	IH 45 to US 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 -	Business SH 121 West	TxDOT-Dallas	Add general purpose lanes	None
Dallas County	to Tarrant County Line			

Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
SH 121 – Sam Rayburn Tollway	US 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 US 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 US 81/US 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 US 287	NTTÁ	New toll road	Fixed
Trinity Parkway	IH 35E to IH 45/US 175	NTTA	New toll road	Fixed
US 287	Business US 287 to IH 45	TxDOT-Dallas	Add general purpose lanes	None
US 287	Walnut Creek Drive to Broad Street	TxDOT-Fort Worth	Add frontage roads	None
US 287	Avondale-Haslett Road to IH 35W	TxDOT-Fort Worth	Add frontage roads	None
US 377	IH 20 to SH 171	TxDOT-Fort Worth	Add general purpose lanes	None
US 380 - Collin County (East)	Lake Lavon to CR 608	TxDOT-Dallas	Add general purpose lanes	None
US 380 - Denton County (West)	County Line Road to IH 35	TxDOT-Dallas	Add general purpose lanes	None
US 380 - Denton County (West)	IH 35 to US 77/US 377	TxDOT-Dallas	Add general purpose lanes	None
US 380 - Denton/Collin County	FM 423 to Lake Forest Drive	TxDOT-Dallas	Add general purpose lanes	None
US 67 - Cleburne bypass	Business US 67 East to FM 1434	TxDOT-Fort Worth	Add general purpose lanes	None
US 75 – Collin/Dallas County	SH 121 (South) to IH 635	TxDOT-Dallas	Add general purpose and managed lanes	Variable
US 75 - North Collin County	Regional Outer Loop to SH 121 South	TxDOT-Dallas	Add general purpose lanes	None
US 75 – North Collin County	US 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				
Dallas North Tollway	FM 121 to US 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	US 180/Lakeshore Drive to IH 30	TxDOT-Fort Worth	Add general purpose lanes	None
IH 20/US 287	Forest Hill Drive to Park Springs Boulevard	TxDOT-Fort Worth	Add general purpose lanes	None
IH 20/US 287	IH 20 to Sublett Road (US 287)	TxDOT-Fort Worth	Add general purpose lanes	None
IH 20/US 287	IH 820 to Park Springs	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

ΤΔΒΙ Ε 8-2	MAJOR PLANNER	PROJECTS
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Roadway	Location	Responsible Agency	Work Planned	Type of Tolling
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/US 175 to IH 20	TxDOT-Dallas	Add general purpose lanes	None
IH 635	US 75 to IH 30	TxDOT-Dallas	Add general purpose and managed lanes	Variable
IH 820/US 287	Meadowbrook Drive to IH 820/US 287	TxDOT-Fort Worth	Add general purpose lanes	None
IH 820/US 287	US 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 US 377	TxDOT-Dallas	Add general purpose lanes	None
Outer Loop (Eastern Subregion)	US 175 to IH 30	TxDOT-Dallas	New toll road	Fixed
Outer Loop (Eastern Subregion)	US 75 to IH 35	TxDOT-Dallas/ Collin County Toll Road Authority	New toll road	Fixed
Outer Loop (Western Subregion)	SH 199 to US 287/Loop 9	TxDOT-Fort Worth	New toll road	Fixed
President George Bush Turnpike	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 US 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 US 81/US 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)	US 287 to Outer Loop/Loop 9	NTTA	New toll road	Fixed
US 287	Berry Street to IH 820	TxDOT-Fort Worth	Add managed lanes	Variable
US 67	IH 35E to FM 1382	TxDOT-Dallas	Add general purpose and managed lanes	Variable
US 67 – Dallas/Ellis County	FM 1382 to Loop 9	TxDOT-Dallas	Add general purpose and managed lanes	Variable
US 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 US 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

TABLE 8-2 .	MAJOR PL	ANNED RO	ADWAY	PROJECTS
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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	US 80 to IH 20	TxDOT-Dallas	Add managed lanes	Variable
Outer Loop (Eastern Subregion)	IH 30 to US 75	TxDOT-Dallas/ Collin County Toll Road Authority	New toll road	Fixed
US 175	SH 310 to CR 4106	TxDOT-Dallas	Add general purpose lanes	None
US 380 - Denton/Collin County	US 377 to FM 423	TxDOT-Dallas	Add general purpose lanes	None
US 75 - North Collin County	County Line Road to Regional Outer Loop	TxDOT-Dallas	Add general purpose lanes	None
US 80	FM 460 to Spur 557	TxDOT-Dallas	Add general purpose lanes	None
Source: Mobility 2030 - 2009 A	mendment, April 2009			

TABLE 8-2	MA.IOR	PI ANNED	ROADWAY	PROJECTS
TADLE 0-2.	MAUCH	LANNED	IIUADIIAI	THOULOIS

Of the 108 projects listed in **Table 8-2**, 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.

8

9 8.1 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.

17

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.
- 6 7

8 The essence of sustainable development is the wise use of scarce resources so that future generations 9 may enjoy them. At the regional level, the key to maintaining sustainable patterns of development is to 10 allow municipalities the option to present a variety of land use, zoning, mobility, and service packages to 11 the development market and residents. This can be accomplished by providing planning support for a 12 diverse range of mobility options such as rail, automobiles, bicycling, transit, and walking.

13

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 VOCs and NOx, improving air quality.

21

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.

27

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 Dallas-Fort Worth 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 8-3** shows the statistics produced through the analysis of each scenario. Brief descriptions of each scenario are as follows:

- 35
- 36 37

• Rail Scenario: NCTCOG redistributed population and employment growth occurring between 2010 and 2030, while maintaining the population and employment control totals for the region.

1 Growth was taken from rural areas of the region and added primarily to passenger rail station 2 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.
- 17

TABLE 8-3. 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 - 200	9 Amendment,	April 2009, Ext	hibits 4-6 and 4-7	7	

18

19 The results of the analyses show a strong correlation between passenger rail and VNT scenarios, both 20 reducing the greatest amount of ozone emissions and the amount of MPA vehicle miles traveled and

21 hours of delay.

22

23 *Mobility 2030 – 2009 Amendment* does not pick, favor, or choose any alternative land use scenario. This

24 data is provided by NCTCOG as an educational guide for the cities and municipalities that comprise the

25 Dallas-Fort Worth metropolitan area. The alternative growth scenarios are presented as potential options

26 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.

4

5 Mobility 2030 – 2009 Amendment does not utilize any of these alternative growth scenarios as a basis for 6 development because these regional scenarios cannot be realistically implemented. The proposed 7 roadway system (includes priced facilities) included in the MTP is based on projected growth and land 8 use changes that are forecasted to occur. The MTP growth model takes land use growth projections from 9 each municipality as a basis for Mobility 2030 - 2009 Amendment. Each municipality has its own method 10 of addressing development within their boundaries depending on the growth they are experiencing. This 11 growth includes mixed use, redevelopment, new development, industrial, commercial, high density, low 12 density, transit oriented, rural growth, etc. Mobility 2030 - 2009 Amendment was modeled using growth 13 projections from each municipality and future growth patterns extrapolated from existing patterns for the 14 region.

15

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:

- 20
- 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.
- 26

27 Although Mobility 2030 - 2009 Amendment and the RTC encourage these sustainable development 28 practices, the local municipalities have direct jurisdiction over land use, and public agencies such as 29 DART, The T, TxDOT, and NTTA have jurisdiction over the regional transportation system. These 30 agencies and municipalities would need to work with NCTCOG and the RTC to implement these 31 sustainable development policies. These policies represent an important new trend in local development 32 patterns that are based on an increased desire for a greater variety of transportation options, mixed-use 33 developments, and unique communities with a sense of place. This trend contributes to the increase in 34 emphasis in the region on sustainable development and the ability to achieve federal air quality 35 attainment. Additionally, this sustainable land use is one tool the NCTCOG uses to reduce the need for 36 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.

4

5 The future roadway network outlined in *Mobility 2030 – 2009 Amendment* supports the predicted land use 6 changes and growth in the region. Current and anticipated funding from the federal government for 7 transportation will not meet the demands for the transportation infrastructure needed to support the 8 projected population growth and land use changes. Priced facilities are one method that the MTP 9 employs to ensure the transportation demands from future growth are met based on limited transportation 10 funds.

11

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.

18

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.

26

27 8.2 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 lowincome populations (as specified in Title VI and Executive Order 12898) as well as persons 65 years old and over, persons with disabilities, and female head of household.

33

34 8.2.1 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
- 4 5

1

2

3

6 The daily VMT on each roadway classification under the three conditions is shown in **Table 8-4**. In the 7 2009 baseline condition there are approximately 16.7 million trips per day on the roadway system. The 8 existing freeway network, which comprises 12.8 percent of the total roadway network carries almost half 9 (43.8 percent) of the daily VMT (see **Table 8-1**). The existing toll roads and HOV lanes carry 4.5 percent 10 and 0.7 percent of all VMT, respectively.

11

Roadway	2009 Base	eline	2030 System	No Build	2030 Syster	m Build		
Classification	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 DFWRT	Source: NCTCOG DFWRTM model runs for Mobility 2030 – 2009 Amendment							

TABLE 8-4. DAILY VEHICLE MILES TRAVELED

12

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.

18

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.

25

A comparison of the average loaded speed per roadway classification is shown in **Table 8-5**. 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.

6

Boodway Classification	2009 Baseline			2030 System No Build			2030 System Build		
Roduway Classification	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 DFWRT	Source: NCTCOG DFWRTM model runs for Mobility 2030 – 2009 Amendment								

TABLE 8-5. AVERAGE LOADED SPEED (MPH)

7

8 In addition, **Table 8-6** shows a comparison of the congestion levels during the morning peak period for 9 the three analysis conditions. The 2030 system no build condition shows that, compared to the 2009 10 baseline condition, fewer lane-miles are at LOS A, B, and C and more lane-miles at LOS F for all roadway 11 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 12 13 Mobility 2030 - 2009 Amendment, including the additional priced facilities, are expected to accommodate 14 the increased travel demand created by an increasing regional population while maintaining similar LOS 15 throughout the roadway network. 16

Deedway	2	009 Baselir	ne	2030	System No	Build	2030 System Build		
Classification	Lane- Miles	LOS	% by Class	Lane- Miles	LOS	% by Class	Lane- Miles	LOS	% by Class
		A-B-C	64%		A-B-C	41%		A-B-C	60%
Freeways	3,931	D-E	22%	3,931	D-E	29%	5,099	D-E	27%
-		F	14%		F	30%		F	13%
		A-B-C	69%		A-B-C	46%		A-B-C	88%
Toll Roads	495	D-E	19%	495	D-E	27%	2,556	D-E	7%
		F	12%		F	27%		F	5%
		A-B-C	75%		A-B-C	49%		A-B-C	72%
Major Arterials	4,197	D-E	14%	4,197	D-E	18%	9,307	D-E	15%
		F	12%		F	33%		F	13%
		A-B-C	84%		A-B-C	65%		A-B-C	82%
Minor Arterials	9,854	D-E	9%	9,854	D-E	13%	8,765	D-E	9%
		F	7%		F	22%		F	9%
		A-B-C	91%		A-B-C	74%		A-B-C	87%
Collectors	9,449	D-E	4%	9,449	D-E	9%	10,123	D-E	6%
		F	5%		F	17%		F	7%
		A-B-C	84%		A-B-C	68%		A-B-C	85%
Frontage Roads	2,649	D-E	7%	2,649	D-E	9%	4,375	D-E	6%
		F	9%		F	23%		F	8%
		A-B-C	77%		A-B-C	68%		A-B-C	78%
Managed Lanes	141	D-E	20%	141	D-E	10%	841	D-E	16%
		F	3%		F	22%		F	6%
ource: NCTCOG DFW	RTM model ru	ins for Mobil	ity 2030 – 2	009 Amend	ment				

TABLE 8-6. MORNING PEAK PERIOD LEVEL OF SERVICE FOR THE TRAFFIC STUDY AREA (2030)

2

3 8.2.2 Job Accessibility

4 As part of the development of the Mobility 2030 - 2009 Amendment, NCTCOG performed an 5 environmental justice and Title VI analysis to ensure that no person is excluded from participation in, 6 denied benefits of, or discriminated against in planning efforts. Performance measures related to job 7 accessibility, either by automobile or transit, and congestion levels were computed based on the travel 8 times forecasted for the system no build and system build conditions described in Section 8.2.1. In both 9 cases, and for each performance measure, the analysis classified each traffic survey zone (TSZ) as 10 above or below the regional average (see Table 8-7). A zone with a percentage of protected class 11 population greater than the regional average was classified as protected.

-	

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	

TABLE 8-7. CENSUS 2000 REGIONAL PERCENTAGES FOR EACH PROTECTED CLASS

2

3 After this classification was performed for each of the travel forecast zones, the number of jobs accessible 4 from the zones was calculated within 30 minutes by automobile and within 60 minutes by transit. Table 5 8-8 provides a summary of the results. In this table, symbols represent the relative difference in 6 accessibility and congestion between protected populations and unprotected populations. Black. 7 Hispanic, low-income, and persons with disabilities would have greater than five percent more 8 accessibility or more than a five percent decrease in congestion levels relative to the unprotected 9 population under the system no build and build conditions. Asian American populations would have 10 greater accessibility by auto and transit and experience similar levels of congestion as unprotected 11 populations under the system no build and build. American Indian/Alaskan Native populations would 12 have similar accessibility by auto and experience similar levels of congestion as unprotected populations 13 but less accessibility by transit under the system no build and build conditions. Persons over 65 years 14 would have more accessibility by auto and lower levels of congestion as unprotected populations but less 15 accessibility by transit under the system no build and build. Female head of household populations would 16 have more accessibility by auto and lower levels of congestion as unprotected populations under the 17 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 18 19 condition.

20

TABLE 8-8. TITLE VI AND ENVIRONMENTAL JUSTICE JOB ACCESSIBILITY PERFORMANCE MEASURES

			Trip	Link Based			
Drotocted Deputations	Census	by Auto		by Tr	ansit	Level of Service	
Protected Populations	Year	System No Build	System Build	System No Build	System Build	System No Build	System Build
Black	2000	+	+	+	+	+	+
Hispanic	2000	+	+	+	+	+	+
Asian American	2000	+	+	+	+	0	0
American Indian/Alaskan Native	2000	0	0	-	-	0	0
Under Poverty Line (Low-Income)	2000	+	+	+	+	+	+
Over 65 Years Old	2000	+	+	-	-	+	+
Persons with Disabilities	2000	+	+	+	+	+	+
Females (Head of Household)	2000	+	+	-	0	+	+
Source: Mability 2020 2000	Amondmo	nt Anril 200	10 Evhibit	00.00			•

Source: *Mobility 2030 – 2009 Amendment*, April 2009, Exhibit 23-20 Notes:

+ 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 Less than five percent absolute difference in job accessibility or congestion levels between protected and unprotected population.

- Protected class has less than five percent more accessibility or experiences greater than five percent more congestion relative to unprotected population.

3

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.

9

10 8.2.3 Travel Time Comparison

11 A travel time comparison for environmental justice and non-environmental justice TSZs was performed 12 based on the baseline, system no build, and system build conditions defined in Section 8.2.1. There are 13 4,813 total TSZs that comprise the RSA. However, 35 have zero population and employment (e.g., TSZs 14 representing lakes, airport runways), so the total of trip producing TSZs is 4,778. Minority TSZs were 15 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 16 17 minority population of the TSZ exceeded 50 percent because the meaningfully greater percent exceeded 18 50 percent [the regional minority population average of 41.3 percent (see Table 8-7) so twice this regional 19 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 20 21 environmental justice TSZs (e.g., 16 low-income, 1,240 minority, 75 both low-income and minority).

Appendix F-9 show 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.

4

5 The Dallas-Fort Worth Regional Travel Model (DFWRTM) model results indicate that trips from both 6 environmental justice and non-environmental justice TSZs receive travel benefits under the system build 7 condition. Table 8-9 shows the changes in average travel time, trip length, and trip speed between 8 morning peak period home based work trips under the system no build and build conditions as compared 9 The increase in average trip times expected for residents of both to 2009 baseline condition. 10 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 11 12 under the system build condition allows longer average trip lengths for residents of all TSZs. Based on 13 the small increase in trip times and longer trip lengths, the average travel speed for trips from all TSZs 14 increased in the system build condition, while decreasing under the system no build condition.

- 15
- 16

TABLE 8-9. HOME BASED WORK TRIP CHARACTERISTICS

		Environmental Justice Status		Environmental Justice TSZ Type			
	All TSZs	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							

17

18 Most of the differential distribution in improvements to trip characteristics is a reflection of the more urban 19 nature of the environmental justice TSZs as shown in **Table 8-10**. **Table 8-11** shows how travel

20 performance improvements under the system build condition vary based on the land area type. The

21 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.

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TABLE	8-10.	TSZ	AREA	TYPES
	• • • •			

	All TSZs	Environmenta	I Justice Status	Environmental Justice TSZ Type			
Area 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							

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TABLE 8-11. 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							

1 8.2.4 Regional Origin-Destination Study

To further analyze the effects of the expansion of the priced facility network in the MPA, a regional origindestination 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:

7 8

9

- 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.
- 12

13 The origin-destination results in Table 8-12 show how trips on the existing and future priced facility 14 networks are distributed based on the environmental justice status of TSZs in the MPA. For the existing 15 facilities scenario, approximately the same percentage of non-environmental justice TSZs and 16 environmental justice TSZs send at least one trip per day to an existing toll facility. However, the 17 proportion of toll trips originating from non-environmental justice TSZs is higher than environmental 18 justice TSZs. Environmental justice TSZs represent almost 28 percent of the TSZs but only account for 19 11.1 percent of the trips utilizing existing toll facilities and 21.5 percent of trips on the entire transportation 20 network. For environmental justice TSZs, approximately 0.6 percent of trips would be on existing tolled 21 facilities compared to 1.2 percent for non-environmental justice TSZs.

- 22
- 23
1 2

TABLE 8-12. 2030 MORNING PEAK PERIOD (6:30 AM TO 9:00 AM) ORIGIN-

All Trip-		Environmental Justice Status		Environmental Justice TSZ Type		
Data of Interest	Generating TSZs (Non- Zero Population and Employment)	Non- Environmenta I 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 Fa	cilities (at least o	nce per day)				
Existing Facilities	4,736	3,414	1,322	16	1,232	74
Scenario	(99.1%)	(99.0%)	(99.3%)	(100.0%)	(99.4%)	(98.7%)
Future Facilities	4,767	3,438	1,329	16	1,238	75
Scenario	(99.8%)	(99.7%)	(99.8%)	(100.0%)	(99.8%)	(100.0%)
Trips from TSZs Utilizin	g Priced Facilities	S				
Existing Facilities	265 231	235,674	29,557	228	28,676	653
Scenario	200,201	(88.9%)	(11.1%)	(0.1%)	(10.8%)	(0.2%)
Future Facilities	120 021	372,290	57,631	459	57,631	2,104
Scenario	429,921	(86.6%)	(13.4%)	(0.1%)	(13.4%)	(0.5%)
Trips on Entire Transportation Network from TSZs that have any Tolled Trips						
Existing Facilities	24,311,520	19,073,499	5,238,021	103,463	4,977,473	260,548
Scenario		(78.5%)	(21.5%)	(0.4%)	(20.5%)	(1.1%)
Future Facilities	24 229 044	19,085,405	5,242,639	103,463	4,981,984	260,655
Scenario	24,328,044	(78.5%)	(21.5%)	(0.4%)	(20.5%)	(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 Trans0	CAD® data for 203	0 regional existin	a 2009 and future	2030 scenarios (2008 Oriain-De	stination data).

DESTINATION RESULTS

3

Under the future facilities scenario, slightly more TSZs would send trips to priced facilities because the 4 5 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 6 7 send at least one trip per day to a priced facility. However, the proportion of toll trips originating from non-8 environmental justice TSZs is higher than environmental justice TSZs. Environmental justice TSZs 9 represent almost 28 percent of the TSZs but only account for 13.4 percent of the trips utilizing future toll 10 facilities and 21.5 percent of trips on the entire transportation network. For environmental justice TSZs, 11 approximately 1.1 percent of trips would be on future priced facilities compared to 2.0 percent for non-12 environmental justice TSZs.

13

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 **Appendices F-9** and **F-10**, 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.

6

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 8-12**, 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.

14

15 8.2.5 Incomplete or Unavailable Information

The traffic analysis performance report, travel time comparison, and origin-destination study were 16 17 completed using the DFWRTM. This application is developed and maintained by the NCTCOG Model 18 Development Group and consists of a collection of software components implemented on the 19 TransCAD® 4.8 platform. The DFWRTM is a four-step trip-based travel demand model which models a 20 5,000 square mile area in North Central Texas. The four steps of the modeling process are: trip 21 generation, trip distribution, mode choice, and traffic assignment. The model was validated (for the year 22 1999) using a variety of user surveys and traffic counts to ensure that roadway traffic volume, transit 23 usage, peak/off-peak period conditions, and roadway speeds are accurately reproduced by the model.

24

25 The DFWRTM application was implemented to forecast travel demand within the MPA. It is not a social 26 or economic prediction model, but it does incorporate some income data in the trip generation, mode 27 choice, and transit trip assignment steps for home based work trips. Within each TSZ the total 28 population, number of households, and number of jobs in several employment categories vary depending 29 on the selected year of analysis and/or demographic scenario. The forecasted demographic datasets 30 used in this analysis are derived from the NCTCOG 2030 demographic forecast. Median income levels 31 for each TSZ are included as primary demographic inputs, but they are held largely static (except for 32 inflation adjustments) for all modeled years and scenarios because no reliable forecasts of changes in the 33 geographic distribution of income levels are available. At no point in the modeling process is the race or 34 ethnicity of transportation system users considered.

35

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 oneperson 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 Dallas-Fort Worth region, based on the decennial census data.

7

8 In the trip generation step of the travel model forecasting process, the socio-economic characteristics of 9 each TSZ are used to determine the number of trips that will be generated by and attracted to each TSZ. 10 Trip production rates are based on the 1996 Dallas-Fort Worth household survey conducted by 11 NCTCOG. Trip attraction rates are based on a 1994 workplace survey conducted by NCTCOG. These 12 rates do not vary between model years or demographic scenarios. The rates are used in conjunction with 13 the socio-economic data to calculate the number of trips of a variety of types to and from each TSZ.

14

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.

21

22 Each vehicle trip is classified by the purpose of the trip. Each vehicle trip of a given type is treated 23 equally by the model, so the socio-economic factors that contributed to the creation of any given vehicle 24 trip do not factor into the trip assignment step of the modeling process. As currently implemented, the 25 modeling process requires all vehicle trips to operate under the same value of time assumptions. No data 26 to reliably estimate variations in the value of time based on socio-economic status is readily available. At 27 the step in the modeling process where socio-economic variations in the value of time would need to be 28 applied, some of the relevant socio-economic information is no longer tracked by the DFWRTM 29 application.

30

Based on these characteristics of the modeling process, the environmental justice analysis performed using the DFWRTM should be understood to have the following limitations:

33

34 • 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 US Census
 geographies and NCTCOG Research and Information Services traffic survey zones required the

1			application of statistical techniques that reduce the reliability of categorizations based on race,
2			ethnicity, and economic status at the TSZ level.
3		0	Income, race, and ethnicity are based on 2000 census data. Therefore, the data used does not
4			reflect any changes to these factors.
5		0	Model-derived production of socio-economic characteristics of vehicle trips has not been
6			validated using any control data and should not be assumed to be accurate.
7		0	Demographic projections to 2030 assume the same distribution of income, race, and ethnicity and
8			does not account for any potential shifts in population types across the region.
9			
10	•	Мс	odel limitations
11		0	Model inputs do not include race or ethnicity; therefore, the model cannot identify trips based on
12			the race or ethnicity of an individual user.
13		0	Income quartiles are only used in the assignment of home-based work trips, which are only 25
14			percent of trips. All other vehicle trips are not assigned based on income.
15		0	For the purposes of trip distribution, mode choice, and traffic assignment, all vehicle trips of the
16			same type are treated identically. The DFWRTM model, as implemented, is not capable of
17			generating results that produce outputs that differentiate vehicle trips based on the economic
18			characteristics of transportation system users.
19		0	The vehicle trip assignment process does not consider relative income differences or the
20			differences in relative cost to potential users in the population when assigning vehicle trips. All
21			vehicle trips operate under the same value of time assumptions.
22		0	The DFWRTM was not designed to model the socio-economic characteristics of each trip.
23			Model-derived reproductions of socio-economic characteristics of trips have not been validated
24			using any control data and should not be assumed to be accurate.
25		0	The DFWRTM cannot replicate dynamic pricing.
26			

27 8.2.6 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.

33

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 8-1**, 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.

6

7 Avoidance and minimization of adverse effects to environmental justice populations occurred during the 8 development of the MTP. Impacts to environmental justice populations were one of the several issues 9 included and considered during the MTP planning process. All corridor planning and development 10 activities are consistent with the MTP recommendations for congestion management and multimodal 11 opportunities which benefit all segments of populations. The region will continue its efforts to work with all 12 communities in the planning process to identify transportation challenges and explore and develop the 13 appropriate strategies to respond to the issues. Example strategies could include programs and projects 14 to improve availability and accessibility to alternate transportation options such as discounted transit fares 15 and tolls, HOV discounts on priced facilities, better accessibility to regional transportation systems, and 16 community level congestion management. Specific strategies and projects would be developed through 17 discussions with local governments and community representatives, as needed.

18

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 Executive Order 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.

26

27 8.3 Air Quality

The NCTCOG serves as the MPO for the Dallas-Fort Worth 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.

32

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. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (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.

4

5 Transportation plans such as *Mobility 2030 – 2009 Amendment* according to SAFETEA-LU metropolitan 6 planning regulations, must be fiscally constrained, that is, based on reasonable assumptions about future 7 transportation funding levels. Because the Dallas-Fort Worth area is designated as a nonattainment area 8 for the eight-hour ozone standard, the CAAA require the transportation plan to be in conformity with the 9 SIP for air quality to demonstrate that projects in the MTP meet air quality goals. Mobility 2030 - 2009 10 Amendment specifically addresses regional ozone in addition to its studies of general regional air quality 11 and the final result of the studies showed that the regional roadway network (including priced facilities) 12 would show a decrease in nitrogen oxides and emissions of volatile organic compounds, which are both 13 precursors to ozone.

14

15 Transportation conformity is a process which ensures federal funding and approval goes to transportation 16 activities that are consistent with air quality goals. Transportation activities that do not conform to state 17 air quality plans cannot be approved or funded.

18

19 The CAAA established specific criteria which must be met for air quality non-attainment areas. The 20 criteria are based on the severity of the air pollution problem. Transportation conformity is a CAAA 21 requirement that calls for the US Environmental Protection Agency (EPA), USDOT, and various regional, 22 state, and local government agencies to integrate air quality and transportation planning development 23 processes. Transportation conformity supports the development of transportation plans, programs, 24 policies, projects, partnerships, and performance that enable areas to meet and maintain national air 25 quality standards for ozone, PM, and CO, which impact human health and the environment. Through the 26 SIP, the air quality planning process ties transportation planning to the conformity provisions of the CAAA. 27 This ensures that transportation investments are consistent with state and local air quality objectives. 28 The NCTCOG is responsible for the conformity analysis in the Dallas-Fort Worth area. If the criteria are 29 not met, EPA can then impose sanctions on all or part of the state. Sanctions include stricter industrial 30 controls and the withholding of federal highway and transit funds.

31

In the Dallas-Fort Worth region, a nine-county "serious" nonattainment area for eight-hour ozone has been designated by the EPA. As discussed in **Section 8.0**, 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 single occupant vehicles (SOV).

1 Transportation system performance information was developed as a product of the DFWRTM throughout 2 the MTP development process. This information guided development of the system alternatives and 3 indicated the impact of various improvements. The improvements recommended in Mobility 2035 include 4 regional congestion management strategies, bicycle and pedestrian facilities, managed HOV lanes, 5 light/commuter rail and bus transit improvements, ITS technology, freeway and tollway lanes, and 6 improvements to the regional arterial and local thoroughfare system such as intersection improvements 7 and signal timing. Because Mobility 2035 is financially and air quality constrained, other more cost 8 effective methods are reviewed before SOV lanes (freeways and toll roads) are added into the roadway 9 system. ITS, transit, HOV lanes, and managed lanes are ways to meet regional transportation demands 10 under the financially constrained MTP while improving regional air quality.

11

12 The additional introduction of priced facilities into the existing roadway network would not cause any 13 cumulative impacts to air quality. The regional priced facility system would provide additional travel 14 capacity to the roadway network which would allow a greater flow of traffic throughout the region, 15 decreasing the amount of cars traveling at lower speeds or idling conditions. This would result in less fuel 16 combustion and lower emissions including mobile source air toxins (MSATs), CO, and ozone. As noted in 17 the direct, indirect, and system cumulative analysis discussions, EPA vehicle and fuel regulations, 18 coupled with fleet turnover, are expected to result in substantial reductions of on-road emissions, 19 including MSATs, CO, and ozone precursors.

20

21 8.4 Water Quality

Water quality is regulated on the state level by Texas Council on Environmental Quality (TCEQ). 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.

26

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.

32

As stated previously, TCEQ regulates water quality through storm water pollution prevention plans (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.

4

5 8.5 Waters of the U.S.

The US Army Corps of Engineers (USACE) regulates waters of the US 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 US is
required to be permitted through the USACE.

9

While the USACE has specific guidelines for identifying waters of the US, 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 US Fish and Wildlife Service (USFWS) attempts to identify potential wetlands through the use of infrared aerial photography (digital ortho quarter quads). The current status for the National Wetland Inventory maps for the MPA consists of digital formats and hard copy formats; some areas are currently not mapped.

17

Although this data is incomplete, it serves as a background for the identification of waters of the US.
Government and private developments must receive permits to fill waters of the US and the identification
of these waters of the US is completed at the project level with field surveys.

21

22 From the available data, the regional priced facility system would impact and cause fill to waters of the 23 US, both streams and potential wetlands. USACE policy requires that any potential impacts to waters of 24 the US be avoided or minimized before impacts are assessed. Additionally, any permit for impacts to 25 waters of the US requires statements regarding avoidance and minimization measures taken for the 26 project as stated in 33 CFR 325.1(d)(7). These priced facility projects would be required to comply with 27 permitting and mitigation for the fill of these waters of the US. Any land use change or development that 28 would occur from this regional priced facility system would also be required to acquire a permit and 29 provide mitigation for fill and loss of waters of the US.

30

Through the permitting and mitigation process the USACE has implemented a no net loss policy for permanent impacts to wetlands and waters of the US. 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 US, the priced facility network would not cause a cumulative impact to waters of the US.

1 8.6 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.

7

8 The MPA lies in the Blackland and Cross Timbers prairies ecological regions identified by TPWD. The 9 construction of most of the proposed priced facility system would occur in areas already developed and 10 contain urban type vegetation. The projects outside the urban areas could impact natural vegetation and 11 the changes in land use and development that may be caused by these facilities would impact vegetation 12 surrounding these projects.

13

14 Under Planning and Environmental Linkages (PEL) and SAFETEA-LU Section 6001, coordination with 15 resource agencies is encouraged to help minimize and avoid impact to the environment (both human and 16 biological). Through different programs and grants, NCTCOG works with various supporting agencies on 17 resource protection from the transportation system, including vegetation. Currently, NCTCOG is working 18 to implement PEL efforts in consultation with resource agencies. Consultation efforts are conducted at 19 Transportation Resource Agency Consultation and Environmental Streamlining (TRACES) meetings that 20 offer both transportation and environmental planning professionals a forum to develop consensus on 21 environmental and transportation aspects of long-range transportation plans. Other mitigation can occur 22 through TxDOT districts for loss of vegetation based on the Memorandum of Understanding and 23 Memorandum of Agreement with TPWD, which focuses on special habitat types of wildlife and protected 24 species. Wetlands are under the jurisdiction of the USACE and mitigation for the loss of these wetlands 25 (which includes the vegetation) would occur through the permitting process. The USFWS can regulate 26 and require mitigation for loss of vegetation that is designated habitat for a threatened or endangered 27 species. Finally, municipalities can implement ordinances to protect trees, natural land, or open green 28 spaces.

29

30 Although impacts to vegetation would occur from the priced facility system, these impacts could be 31 regulated at the project level for each individual roadway project. Regulated vegetation (i.e., wetlands, 32 threatened, or endangered species habitat) would be protected and any impacts to these regulated 33 vegetation areas would require mitigation. Unregulated vegetation would not receive any direct protection 34 or mitigation through laws or regulations. Any potential protection would be done on a per project basis 35 and would be implemented by the project owner. Because of the potential mitigation for vegetation, most 36 impacts would be avoided or minimized; therefore, there would be no cumulative impacts to vegetation 37 from the priced facility system.

1 8.7 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.

6

7 As part of Mobility 2030 - 2009 Amendment, NCTCOG specifically addresses two issues - air quality and 8 environmental justice populations. The transportation planning process, at a regional level, provides 9 ways to avoid and minimize potential impacts that could occur. To be implemented, priced facility 10 projects must be included in the Statewide Transportation Improvement Program/Transportation Improvement Program (TIP) and MTP and the TIP and MTP must conform to the SIP. Additionally, 11 12 NCTCOG performed an environmental justice and Title VI analysis to ensure that no person is excluded 13 from participation in, denied benefits of, or discriminated against in planning efforts, including the 14 development of the MTP. This assures that each project is in compliance with the STIP/TIP and MTP for 15 air quality under the CAAA and the MTP is consistent with Title VI of the Civil Rights Act of 1964 and 16 Executive Order 12898 on environmental justice, as well as the Civil Rights Restoration Act of 1987.

17

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.

1 2

9.0 MITIGATION AND MONITORING COMMITMENTS

All project-specific commitments and conditions of approval, including resource agency permitting compliance and monitoring requirements, would be incorporated in the project plan for the proposed IH 35E project. These project-specific commitments and conditions for approval, as further described below, may vary depending on the project's final design and construction. Mitigation monitoring would be conducted by TxDOT and other federal, state, and local agencies to ensure compliance.

8

9 9.1 Waters of the U.S., including Wetlands

10 The placement of temporary and permanent dredge or fill material into each of the jurisdictional waters of 11 the U.S., including wetlands, would meet the criteria for a NWP 14 under Section 404 of the CWA. A 12 NWP 14 PCN is required for five of the eleven water features (Sites W-2, W-6, W-9, W-10, and W-11) due 13 to permanent fill exceeding the threshold of 0.10 acre; also, at Site W-6, there are impacts to a 14 jurisdictional wetland. See Section 5.1.2 and Appendix A, Figure A-4 for water crossing details and 15 locations. Details about wetland mitigation and the permitting of the various crossings are anticipated to be addressed as part of the PCN review and approval process. Compensatory mitigation for Section 404 16 17 impacts would be coordinated with USACE and performed in accordance with the terms of USACE NWP 18 14 approval.

19

20 9.2 Water Quality

The proposed project would disturb more than one acre; therefore, TxDOT compliance is required with the TCEQ TPDES General Permit for Construction Activity. The proposed project would also disturb more than five acres; therefore, a Notice of Intent would be filed to comply with TCEQ stating that TxDOT would have a SW3P in place during construction of the proposed project. In addition, TCEQ guidelines for the proposed project require completion of the Tier I (Small Projects) Checklist (TCEQ-20228, revised 12/29/2006), which requires at least one BMP from the Section 401 BMPs for Tier I Projects published by the TCEQ on April 12, 2004 (**Section 5.1.4**).

28

29 9.3 Vegetation and Wildlife Habitat/Threatened or Endangered Species

In accordance with TPWD (see **Appendix B-5**), of the habitats given consideration for non-regulatory mitigation during project planning by the TxDOT-TPWD MOA (see **Section 5.1.5**), mitigation is anticipated for six sites (approximately 1.20 acres) of riparian forest and 18 sites (approximately 4.25 acres) of upland forest (and associated large trees), for a total of 5.45 acres. Non-regulatory mitigation would take place at LLELA and be through fee payment. During construction, TxDOT would minimize the amount of wildlife habitat disturbed. Existing vegetation, especially native trees, would be preserved wherever practicable.

1 Re-vegetation and landscaping activities would occur in compliance with EO 13112, which calls for 2 preventing and controlling the spread of invasive plant and animal species. Further, landscaping 3 activities would be follow the Executive Memorandum on Beneficial Landscaping, thereby utilizing 4 techniques that complement and enhance the local environment and seek to minimize the adverse effect 5 that the landscaping would have on it (e.g., use of regionally native plants and water conservation 6 practices). Such efforts would be limited to TxDOT approved seeding specification or something 7 equivalent and replanting with natives in the project ROW (where cost effective and to the extent 8 practicable).

9

10 The forested habitat in the IH 35E project area would be surveyed for signs of the timber/canebrake 11 rattlesnake prior to construction activities. If evidence of the species is observed, TxDOT personnel 12 would be contacted to determine an appropriate course of action.

13

A brief field survey of riparian habitat and creeks would be conducted prior to construction clearing to verify the presence of migratory birds in the proposed project area. If species are present, work should cease at the location, and TxDOT personnel should be contacted. If construction or clearing is to take place during nesting season, which could extend from February 15 through October 1, the area would need to be checked for active nests prior to the commencement of work. If any active nests are found, local USFWS biologists should be contacted by TxDOT to determine an appropriate plan of action.

20

21 9.4 Relocations and Displacements

22 Approximately 106.59 acres of additional ROW are required under the Build Alternative. ROW acquisition 23 would impact a total of 57 properties, including 17 residential and 40 commercial. The 17 residential 24 displacements have an associated 18 residential structures (including two apartment buildings with eight 25 apartment units each); and the 40 commercial properties have an associated 60 commercial structures 26 (including buildings and canopies at gasoline service stations). There are 44 businesses associated with 27 the anticipated 40 commercial property displacements. Both the United States and Texas Constitutions 28 provide that no private land may be taken for public purposes without just compensation being paid. All 29 relocation efforts would be consistent with the Uniform Relocation Assistance and Real Property 30 Acquisition Policies Act of 1970 as amended, the Civil Rights Act of 1964, and the Urban Development 31 Act of 1974. A range of approximately 372 to 784 employees could experience job relocation or loss in 32 association with 44 affected businesses. Assistance to affected employees would be available through 33 the Texas Workforce Commission and Workforce Solutions for North Central Texas. Representatives 34 from the Workforce Solutions for North Central Texas would be present at the Public Hearing to answer 35 questions and provide information relating to their job assistance and placement services.

1 9.5 Noise

2 Traffic noise impacts would occur from the construction and operation of the proposed project. Five noise 3 barriers were determined to be both feasible and reasonable as to mitigate for anticipated traffic noise 4 impacts. Appendix C, Figure C-20 shows the proposed noise walls. There are 169 receivers that would 5 benefit from the proposed noise barriers. The final decision to construct the proposed noise barriers 6 would be made upon completion of the project design and utility evaluation, as well as through public 7 involvement efforts (i.e., noise workshops). Such noise workshops would determine if the noise walls are 8 desired and, if so, assist in their aesthetic design. Any subsequent project design changes may require a 9 reevaluation of this proposal.

10

11 9.6 Archeological Resources

12 If evidence of archeological deposits is encountered during construction, work in the immediate area 13 would cease and TxDOT archeological staff would be contacted to initiate accidental discovery 14 procedures under the provisions of the Programmatic Agreement between TxDOT, THC, FHWA, and the 15 Advisory Council on Historic Preservation, and the MOU between TxDOT and the THC.

16

17 9.7 Hazardous Wastes/Substances

18 As detailed in Section 5.4.1, 24 sites with a high risk of hazardous materials were identified within one 19 mile of the proposed project. During the ROW negotiation and acquisition process, further inquiry into the 20 existing and previous ownership and uses of each property would be performed. Further assessment 21 and investigations would be postponed until right-of-entry can be obtained in later stages of project 22 development. If identified and confirmed, any hazardous material issues would be addressed during the 23 ROW negotiation, acquisition, or eminent domain process prior to construction. Appropriate subsurface 24 investigations and soils and/or groundwater management plans for activities within these areas would be 25 developed. Special provisions or contingency language would be included in the project's Plans, 26 Specifications, and Estimates to address hazardous materials and/or petroleum contamination according 27 to applicable state, federal, and local regulations per TxDOT Standard Specifications.

28

29 9.8 Aesthetic Considerations

Aesthetic design guidelines are being developed for IH 35E mainlanes and cross street bridges. Aesthetic treatments for structural components (retaining walls, bridges, etc.) and landscaping would be incorporated into the proposed project during final design, and stakeholder input would be considered during this design process to minimize the potential for aesthetic impacts. Additional aesthetic design concepts would be dependent on additional funding from local governments, interest groups, and organizations. THIS PAGE LEFT BLANK INTENTIONALLY

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10.0 DETERMINATION OF ASSESSMENT

2

The No-Build Alternative would avoid the direct impacts envisioned for the Build Alternative, however, it
would not address the need and purpose for the proposed project as summarized below.

5

6 The Build Alternative is recommended as it is responsive to the needs for the transportation improvement 7 project based on historic and projected population increases, urbanization, and the existing inadequacy of 8 the road network in the area. If constructed, the proposed Build Alternative would fulfill the public's need 9 for a safe and efficient transportation system in the study area that satisfies the project objectives, as 10 outlined below:

11

Improve Mobility - The proposed Build Alternative includes the reconstruction of IH 35E from FM
 2181 to US 380 as to accommodate for the addition of mainlanes, frontage road lanes, and
 MHOV-C lanes, thereby increasing the overall number of travel lanes and improving mobility
 along IH 35E.

- Manage Traffic Congestion At present, the predominant roadway configuration along IH 35E
 through the project area is two general purpose mainlanes and two frontage roads on each side,
 both of which become congested during periods of peak use. The proposed Build Alternative
 includes the addition of travel lanes to IH 35E, thus reducing the number of vehicles per lane mile
 of roadway as to better manage congestion.
- Increase People and Goods-Carrying Capacity Continued urbanization in the project area
 has already created a demand for increased transportation capacity to move people and
 commerce. Increasing the number of mainlanes, frontage road lanes, and the addition of MHOV C lanes on IH 35E would improve road carrying capacity.
- Enhance Safety Existing conditions of IH 35E within the project area do not meet current TxDOT and AASHTO guidelines. For example, IH 35E was originally constructed with a design speed of 50 mph; and portions of the roadway are of inadequate lane width, provide too short of a distance from the ramps to the cross street intersections, and have bridge clearances less than 16.5 feet. The proposed Build Alternative would address such roadway deficiencies as well as increasing the number of travel lanes, thereby decreasing the amount of time spent by motorists in congestion and decreasing the likelihood of congestion-related accidents.
- Compatibility with Local, County, and Regional Needs and Plans The proposed Build
 Alternative is compatible with local and regional planning; the Build Alternative has been
 incorporated into the municipal planning documents of the project area and the project is
 consistent with *Mobility 2030 2009 Amendment* and the FY 2011-2014 TIP, as amended.
- Minimize Social, Economic, and Environmental Effects on the Human Environment The
 proposed Build Alternative is the result of close examination of the No-Build Alternative, as well

as other alternatives via the MIS process. by avoiding/minimizing impacts where practicable, and
 the active participation among public officials and citizens in the consideration of potential
 impacts, the Build Alternative design described herein is the result of efforts to avoid or minimize
 social, economic, and environmental impacts.

5

6 The engineering, social, economic, and environmental investigations conducted thus far indicate that the

7 proposed Build Alternative would result in no significant impacts to the quality of the human or natural

8 environment.

1 11.0 LIST OF ACRONYMS

2		
3	AADT	Average Annual Daily Traffic
4	AASHTO	American Association of State Highway and Transportation Officials
5	ADA	Americans with Disabilities Act
6	ADT	Average Daily Traffic
7	AGC	Annual Guideline Concentration
8	AM	Morning hours (i.e. before noon)
9	AOI	Area of Influence
10	APE	Area of Potential Effects
11	BLS	Bureau of Labor Statistics
12	BMP	Best Management Practice
13	CAA	Clean Air Act
14	CAAA	Clean Air Act, as Amended
15	CAI	Civil Associates, Inc
16	CDA	Comprehensive Development Agreement
17	CEQ	Council on Environmental Quality
18	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
19	CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information
20		System
21	CFR	Code of Federal Regulations
22	CIP	Capital Improvement Program
23	CLUP	Comprehensive Land Use Plan
24	CMP	Congestion Management Process
25	CMS	Congestion Management System
26	CO	Carbon Monoxide
27	CORRACTS	Corrective Action Report
28	CWA	Clean Water Act
29	DART	Dallas Area Rapid Transit
30	dB	Decibels
31	dB(A)	Decibels (A-weighted)
32	dbh	Diameter at Breast Height
33	DCAD	Denton Central Appraisal District
34	DCTA	Denton County Transit Authority
35	DE	Diesel Exhaust
36	DFW	Dallas-Fort Worth

1	DFWRTM	Dallas-Fort Worth Regional Travel Model
2	DNT	Dallas North Tollway
3	DPM	Diesel Particulate Matter
4	EA	Environmental Assessment
5	EJ TSZ	Environmental Justice Traffic Survey Zone
6	EJ	Environmental Justice
7	ELDP	Express Lanes Demonstration Program
8	EO	Executive Order
9	EOID	Element Occurrence Identification
10	EPA	Environmental Protection Agency
11	ER	Entrance Ramp
12	ERNS	Emergency Response Notification System
13	ESA	Endangered Species Act
14	ESL	Effects Screening Levels
15	ETC	Estimated Time of Completion
16	ETJ	Extraterritorial Jurisdiction
17	FAA	Federal Aviation Administration
18	FEMA	Federal Emergency Management Agency
19	FHWA	Federal Highway Administration
20	FIRM	Flood Insurance Rate Map
21	FLUP	Future Land Use Plan
22	FM	Farm-to-Market Road
23	FPPA	Farmland Protection Policy Act
24	FTA	Federal Transit Administration
25	GIS	Geographic Information Systems
26	HCTRA	Harris County Toll Road Authority
27	HDDV	Heavy-Duty Diesel Vehicle
28	HHS	Department of Health and Human Services
29	HOA	Homeowners Association
30	HOV	High Occupancy Vehicle
31	IDLH	Immediately Dangerous to Life or Health
32	IH	Interstate Highway
33	IRIS	Integrated Risk Information System
34	ISTEA	Intermodal Surface Transportation Efficiency Act
35	ITS	Intelligent Transportation Systems
36	LEP	Limited English Proficiency
37	Leq	Average/equivalent Sound Level

1	LLELA	Lewisville Lake Environmental Learning Area
2	LLTB	Lewisville Lake Toll Bridge
3	LOS	Level of Service
4	LPST	Leaking Petroleum Storage Tank
5	LT-ESL	Long Term Effects Screening Levels
6	LWCF	Land and Water Conservation Fund
7	MBTA	Migratory Bird Treaty Act
8	MHOV-C	Managed/High Occupancy Vehicle Concurrent Flow
9	MIS	Major Investment Study
10	MKT	Missouri Kansas Texas
11	ML	Mainlanes
12	MOA	Memorandum of Agreement
13	MOU	Memorandum of Understanding
14	MPA	Metropolitan Planning Area
15	mph	Miles per Hour
16	MPO	Metropolitan Planning Organization
17	MSAT	Mobile Source Air Toxic
18	msl	Mean Sea Level
19	MTP	Metropolitan Transportation Plan
20	NAAQS	National Ambient Air Quality Standards
21	NAC	Noise Abatement Criteria
22	NAFTA	North American Free Trade Agreement
23	NATA	National Air Toxics Assessment
24	NB	Northbound
25	NCHRP	National Cooperative Highway Research Program
26	NCTCOG	North Central Texas Council of Governments
27	NEPA	National Environmental Policy Act
28	NHPA	National Historic Preservation Act
29	NIOSH	National Institute of Occupational Safety & Health
30	NLEV	National Low Emission Vehicle
31	NMHC	Non-methane Hydrocarbon
32	NOx	Nitrogen Oxides
33	NPL	National Priorities List
34	NRCS	Natural Resources Conservation Service
35	NRHP	National Register of Historic Places
36	NTTA	North Texas Tollway Authority
37	NWP	Nationwide Permit

1	O&D	Origin and Destination
2	OSHA	Occupational Safety and Health Administration
3	OTHM	Official State (Texas) Historical Markers
4	PA-TU	First Amended Programmatic Agreement Regarding the Implementation of
5		Transportation Undertakings
6	PCN	Preconstruction Notification
7	PCWG	Project Coordination Work Group
8	PEL	Permissible Exposure Limits
9	PGBT	President George Bush Turnpike
10	PM	Afternoon/evening hours (i.e. after 12:00)
11	PM	Particulate Matter
12	PST	Petroleum Storage Tank
13	RAC	Reference Air Concentration
14	RCCT	Rail with County Control Totals
15	RCRA	Resource Conservation and Recovery Act
16	RFG	Reformulated Gasoline
17	RIA	Regulatory Impact Analysis
18	ROW	Right-of-Way
19	RSA	Resource Study Area
20	RsD	Risk Specific Dose
21	RTC	Regional Transportation Council
22	RTHL	Recorded Texas Historic Landmarks
23	SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
24	SAL	State Archeological Landmarks
25	SB	Southbound
26	SGC	Short-Term Guideline Concentration
27	SH	State Highway
28	SIP	State Implementation Plan
29	SOC	Species of Concern
30	SOV	Single Occupancy Vehicle
31	STAND	Statistical trends and News of Denton
32	ST-ESL	Short Term Effects Screening Levels
33	STIP	Statewide Transportation Improvement Program
34	SW3P	Storm Water Pollution Prevention Plan
35	T.A.C.	Texas Administrative Code
36	TCAA	Texas Clean Air Act
37	TCEQ	Texas Commission on Environmental Quality

1	TEA-21	Transportation Equity Act for the 21 st Century
2	THC	Texas Historical Commission
3	TIP	Transportation Improvement Program
4	TOD	Transit Oriented Development
5	TPDES	Texas Pollutant Discharge Elimination System
6	TPH	Total Petroleum Hydrocarbons
7	TPP	Transportation Planning and Programming
8	TPWD	Texas Parks and Wildlife Department
9	TRB	Transportation Research Board
10	TSD	Treatment, Storage, and Disposal
11	TSHPO	Texas State Historic Preservation Officer
12	TSZ	Traffic Survey Zone
13	TWU	Texas Women's University
14	TX VCP	Texas Voluntary Compliance Program
15	TxDOT	Texas Department of Transportation
16	TXNDD	Texas Natural Diversity Database
17	USACE	United States Army Corps of Engineers
18	USDOL	United States Department of Labor
19	USDOT	United States Department of Transportation
20	UNT	University of North Texas
21	US	United States Highway
22	U.S.C.	United States Code
23	USCG	United States Coast Guard
24	USFWS	United States Fish and Wildlife Service
25	USGS	United States Geological Survey
26	v/c	Volume/Capacity
27	VMT	Vehicle Miles Traveled
28	VNT	Vision North Texas
29	VOC	Volatile Organic Compounds
30	vpd	Vehicles per Day
31		

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