

APPENDIX H: Indirect Land Use Impacts Assessment

INDIRECT LAND USE
IMPACTS ASSESSMENT

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

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

DALLAS AND DENTON COUNTIES, TEXAS

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

APRIL 2010

TABLE OF CONTENTS

I. INTRODUCTION	1
Purpose.....	1
Project Limits.....	1
Methodology	1
II. FRAMEWORK FOR EVALUATION.....	2
Definition of Indirect Land Use Impacts	2
Measuring Indirect Land Use Impacts	2
III. EXISTING AND FORECASTED CONDITIONS	3
Description of the Proposed Project, the Study Area Boundary, and the Time Frame for the Indirect Impacts Analysis.....	3
Population and Employment Forecasts.....	4
Relevant Plans and Policy Documents in the Study Area	5
Development Capacity of the Study Area	12
Land Use Capacity Analysis.....	15
Future Development Patterns in the Study Area.....	16
Summary of Travel Performance Estimates	17
IV. ASSESSMENT OF INDIRECT LAND USE IMPACTS	19
Potential for Land Use Change Assessment	19
Summary of Potential Indirect Land Use Impacts.....	25
Potential Land Use Changes and Compatibility with Land Use Plans.....	28
Policies to Mitigate Potential Land Use Impacts.....	28

TABLES

Table 1	2030 Demographic Forecasts
Table 2	Land Use Capacity Analysis
Table 3	2030 Average Free Speed of Roadway (MPH)
Table 4	2030 Level of Service for Traffic Study Area
Table 5	Potential Induced Land Use Development by Municipality
Table 6	Potential Induced Land Use Development by Area – City of Lewisville
Table 7	Indirect Land Use Impacts Assessment

APPENDIX

Project Location Map
City of Carrollton Transportation Plan
City of Carrollton Future Land Use Map
City of Corinth Thoroughfare Plan
City of Corinth Build Out Land Use Map
City of Corinth Proposed Water System Improvements Map
City of Corinth Proposed Sanitary Sewer System Improvements Map
Town of Hickory Creek Future Land Use Map
Town of Hickory Creek Thoroughfare Plan
Town of Hickory Creek Master Park Plan
City of Highland Village Thoroughfare Plan
City of Highland Village Future Land Use Map
City of Lake Dallas Zoning Map
City of Lewisville 2007 Thoroughfare Plan
City of Lewisville Developable Vacant Land Map
Potential Induced Development (Figures 1 through 7)
Letter from the Mayor of Highland Village to Senator Hutchison Regarding Mitigation for Impacts to Copperas Branch Park

I. INTRODUCTION

Purpose

The purpose of this report is to identify and analyze the potential for indirect land use impacts related to the proposed improvements of Interstate Highway (IH) 35E from the President George Bush Turnpike (PGBT) in Dallas County, Texas to Farm-to-Market (FM) 2181 (Swisher Road) in Denton County, Texas. By definition, indirect land use impacts are the longer-run and wider-spread changes to development patterns and comprehensive plans that are induced by the transportation improvement. The analysis of indirect land use impacts is intended to describe how land use will be different under two alternatives: one with the proposed transportation improvement, and one without it.

Project Limits

IH 35E is a major north/south thoroughfare constructed in the 1950s and early 1960s that bisects North Central Texas. Improvements are proposed for IH 35E from IH 635 in Dallas, Dallas County, Texas to United States Highway (U.S.) 380 in Denton, Denton County, Texas, a distance of approximately 28 miles. However, the IH 35E corridor is currently being evaluated in three separate sections, each having independent utility and logical termini. This indirect land use impact assessment was prepared for the Environmental Assessment (EA) and preliminary design associated with what is referred to as the “Middle Section.” The Middle Section extends from PGBT to FM 2181. The project limits extend from PGBT to FM 2181. The proposed project length for the Middle Section is approximately 12 miles. The proposed project is within the boundaries of the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County, Texas. See **Appendix: Project Location Map**.

Methodology

This evaluation for indirect land use impacts follows the National Cooperative Highway Research Program (NCHRP) Report 25-25, Task 22, *Forecasting Indirect Land Use Effects on Transportation Projects*. Of the six land use forecasting tools provided in the NCHRP Report 25-25 (Task 22), the “Planning Judgment” forecasting tool was utilized as the framework for the analysis. The steps provided for this specific methodology come from *A Guidebook for Evaluating the Indirect Land Use and Growth Impacts of Highway Improvements* (2001) prepared by ECONorthwest and Portland State University for the Oregon Department of Transportation. *Guidance on Preparing Indirect and Cumulative Impact Analyses* (TxDOT, June 2009) was also consulted.

This analysis includes a discussion of Existing and Forecasted Conditions and an Assessment of Indirect Land Use Impacts. The assessment included interviews with planning professionals to determine potential indirect land use impacts from induced development. The results of that analysis are included herein.

II. FRAMEWORK FOR EVALUATION

Definition of Indirect Land Use Impacts

According to the Council on Environmental Quality (CEQ) definition, indirect impacts are “caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable” (40 C.F.R. §1508.8). Indirect impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. **For the purposes of this analysis, the indirect impacts assessment is limited to land use and the effects of the proposed reconstruction of IH 35E.**

Potential impacts to land use include residential, commercial, and industrial development; floodplain encroachment; visual impacts; pre-emption of farmlands; regional economic growth; public improvements such as bus stops; and general increased demand for community facilities.

Measuring Indirect Land Use Impacts

The key variables suggested by the NCHRP Report 25-25 (Task 22) that might contribute to measurable changes in local development patterns in response to a transportation improvement include:

- **Change in accessibility.** This is typically the most important variable. The key measures are average trip time, volumes, and mobility.
- **Change in property value.** Likely changes in land price may influence development.
- **Expected growth.** Forecasted population and employment data may indicate the pressure to develop where good access and services are available.
- **Relationship between supply and demand.** Determine how much vacant, buildable land exists in the study area compared to the rest of a larger city/area/region. The more limited the supply is relative to demand, the more likely improved access would increase the probability of development.
- **Availability of other services.** Access alone is not sufficient to trigger development; other key public facilities like sewer and water often must be available to the study area at a reasonable cost. If they are, improvements in access are more likely to facilitate land use change.
- **Other market factors.** Identifying areas of growth and comparing the study area market to other areas can identify other market factors.
- **Public policy.** Determine whether or not public policies that allow land uses to change can resist pressure for development.

The assessment of these key variables for indirect impacts should take into consideration two questions: (1) How likely is it that a transportation project will be followed by some noticeable change in the land use that would not have occurred in the absence of the project or sooner than anticipated? (2) If such changes did occur, would they be consistent with the comprehensive plan?

III. EXISTING AND FORECASTED CONDITIONS

Description of the Proposed Project, the Study Area Boundary, and the Time Frame for the Indirect Impacts Analysis

Description of the Existing Conditions

IH 35E traverses portions of Carrollton, Lewisville, Highland Village, Hickory Creek, Lake Dallas, and Corinth. Land uses are primarily medium intensity commercial with some transit in Carrollton; retail, commercial, industrial, with some residential and some vacant land not in the floodplain in Lewisville (the majority of land in the project area); highway commercial in Highland Village; commercial, office, and parkland in Hickory Creek; retail, commercial, light industrial, commercial manufactured home and designated IH 35E business corridor in Lake Dallas; and developed and undeveloped with some commercial in Corinth.

Description of the Existing and Proposed Project

The current facility consists of six mainlanes (three in each direction) with two-lane frontage roads from PGBT to FM 2181. Two-lane frontage roads are mostly continuous along the corridor with the exception of the bridge over Lewisville Lake where there are no frontage roads. The northbound frontage roads merge into the mainlanes just north of FM 407 (Justin Road) and resume at the Denton Drive South exit north of the lake. The southbound frontage roads merge into the mainlanes just north of the lake and resume immediately south of the lake.

The Texas Department of Transportation (TxDOT) proposes the expansion of approximately 12 miles of IH 35E within the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County, Texas. The project limits extend from PGBT to FM 2181. The project location map in the **Appendix** illustrates the project limits for this environmental document. The proposed construction plans include:

- Eight mainlanes (four in each direction);
- Two to four collector distributor lanes (each direction) from south of PGBT to north of SH 121;
- Four concurrent tolled High Occupancy Vehicles (HOV)/managed lanes in the center median of IH 35E;
- Two, three, and four-lane continuous frontage roads in each direction along the entire project corridor including auxiliary lanes at the cross streets; and
- Approximately 180 acres of proposed right-of-way (ROW) and approximately 57 acres of proposed easements.

IH 35E would be operated as a HOV/managed facility. According to the Regional Transportation Council's (RTC) *Managed Lane Policies*, utilizing managed lanes would require toll collection for both single occupancy and high-occupancy vehicles. A reduced toll rate (half price) would be applied towards HOV and publicly-operated vanpools during the AM and PM peak periods. During the off-peak periods, HOVs would pay the

same toll as single occupancy vehicles. The RTC may choose to phase out the HOV discount for the AM and PM peak periods once the air quality attainment maintenance period comes to an end. Mainlanes and frontage roads, including the proposed added capacity, would remain non-toll for all users.

Study Area Boundary

The primary study area for indirect land use impacts consists of the municipalities located adjacent to the proposed project: the City of Carrollton in Dallas County and the Cities of Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek in Denton County. Any direct impacts associated with the proposed project would be absorbed by these; therefore, it is reasonable to assume any physical indirect impacts (e.g. land use) would also be concentrated adjacent to the proposed IH 35E facility.

After initial coordination with planners in the study area, a 1,200 foot (ft) wide boundary along either side of the proposed ROW was identified for additional coordination regarding potential induced land use development.

Time Frame for Indirect Impacts Analysis

The temporal boundaries for the indirect land use impacts analysis are the years 2000 to 2030. The years 2000 and 2030 were chosen to correlate with the North Central Texas Council of Governments (NCTCOG) *Mobility 2030*, the City of Carrollton's *Comprehensive Plan* (2003), the City of Lewisville's *2010 Plan* and *2006 Land Use Assumptions*, the Town of Hickory Creek's *Comprehensive Plan* (2008), and Highland Village's *Comprehensive Plan* (2002).

Population and Employment Forecasts

The NCTCOG Demographic Forecast provides long-range, small area population, household, and employment projections for use in intra-regional infrastructure planning and resource allocations in the metropolitan area of North Central Texas. The forecast, which is conducted for the 10 counties surrounding the Dallas-Fort Worth urban core (Collin, Dallas, Denton, Rockwall, Tarrant, Ellis, Johnson, Kaufman, and Parker Counties), predicts growth of almost 4 million persons between 2000 and 2030. By 2030, the area is expected to reach 9.1 million persons and approximately 5.4 million jobs. The forecast was developed using a federally recognized land-use model that allocated households and employment to the 10 counties for a regional control total, then disaggregated the totals to forecast districts, cities, and counties. Local municipalities worked with NCTCOG staff to ensure that local government land use and comprehensive plans were included in the forecast. A task force of local officials from city, county, and transportation entities acted as a governing body for the process and endorsed the forecast for approval by the NCTCOG's Executive Board.¹

Table 1 summarizes the 10-County NCTCOG area as well as the study area's demographic forecast from 2000 to 2030. The study area's population and employment is anticipated to increase by approximately 33 and 39 percent, respectively, from 2000 to 2030. The City of Corinth is expected to experience the highest population growth

¹ NCTCOG, <http://www.nctcog.org/ris/demographics/forecast.asp>

through 2030. The Town of Hickory Creek is expected to experience the highest employment growth through 2030. Compared to the 10-County NCTCOG area, the study area's population and employment forecasts reflect more conservative growth rates.

Table 1: 2030 Demographic Forecasts

Area	2000 Demographics		2030 Demographics		% Change 2000 - 2030	
	Population	Employment	Population	Employment	Population	Employment
10-County NCTCOG Area	5,067,400	3,158,200	9,107,900	5,416,700	79.7	71.5
City of Carrollton	109,364	68,199	124,086	83,148	13.4	21.9
City of Lewisville	78,360	37,145	111,168	62,603	41.8	68.5
City of Highland Village	12,144	1,065	18,624	1,796	53.31	68.6
City of Lake Dallas	6,378	1,683	9,209	2,384	44.3	41.6
City of Corinth	11,365	2,213	27,070	3,225	138.1	45.7
Town of Hickory Creek	2,005	494	3,996	1,115	99.3	125.7
Study Area Total	219,616	110,799	294,153	154,271	33.9	39.2

Source: North Central Texas 2030 Forecast, <http://www.nctcog.org/ris/demographics/forecast.asp>

Relevant Plans and Policy Documents in the Study Area

A variety of plans and policies exist within the study area to promote, guide, and monitor various development activity ranging from regional transportation infrastructure to commercial development aesthetics. These plans are discussed to address planning goals and development trends in the jurisdictions traversed by IH 35E.

North Central Texas Council of Governments

Mobility 2030: The Metropolitan Transportation Plan

This plan defines transportation systems and services in the Dallas-Fort Worth (DFW) metropolitan area. It serves as a guide for the expenditure of State and Federal funds through the year 2030. The plan addresses regional transportation needs that are identified through forecasting current and future travel demand, developing and evaluating system alternatives, and selecting those options which best meet the mobility needs of the region. The proposed IH 35E "Northern Link" project is included in this plan. The "Northern Link" project is shown in the plan as a proposed HOV/managed facility for which the existing lanes in the corridor would be improved and HOV/managed lanes would be added. The plan states that existing lanes would remain free, and tolls would be charged only on added capacity lanes, including the HOV/managed lanes.

Managed Lanes Excess Toll Revenue Sharing Policy

The RTC has adopted the "managed lane" concept over the HOV concept due to the following factors: 1) the ability to provide and manage additional capacity in the corridor, 2) the provision of trip reliability for HOV and transit, 3) the potential for improved air quality through encouragement of increased vehicle occupancy and person movements, and 4) the generation of revenue to construct, operate, and maintain the facility.

A policy for TxDOT managed lanes projects, the *Excess Toll Revenue Sharing: Managed Lane Policy*, has been developed and approved by the RTC. This policy outlines the circumstances under which excess toll revenue would become available and distributed in the region. In the foreseeable future, the proposed IH 35E facility could substantially benefit communities in the project area by generating revenue for additional transportation projects that could also increase capacity, reduce traffic congestion, improve mobility, and improve design deficiencies within the region.

NCTCOG Development Monitoring

The NCTCOG maintains a development monitoring database that tracks over 8,000 major developments that are either existing, under construction, announced, or in the conceptual stages within the NCTCOG Metropolitan Planning Area (MPA). Major industrial, office, or retail developments are over 100,000 square feet (ft) and/or 400 employees. Major hotel or multi-family developments are more than 100 rooms or units. Major recreational sites are anticipated to attract high volumes of people (may be seasonal). A total of nine major developments within the City of Lewisville are either under construction or announced. One major multi-family development has been announced in Highland Village. There are no development monitoring projects reported for the Cities of Carrollton (within the limits of the proposed project), Corinth, Lake Dallas, or the Town of Hickory Creek as of January 2009.

Regional Rail Corridor Study and the Regional Transit Initiative

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. *Mobility 2030* recommends two rail lines, along with bus rapid transit, that cross within the proposed project's limits.

The rail components would include regional and light rail. The regional rail (provided by the Denton County Transportation Authority) would provide regional rail passenger service between downtown Carrollton and downtown Denton. Approximately six regional rail passenger stations would be constructed between the downtown Carrollton Station at Belt Line Road and the downtown Denton Station. The light rail transit service would be constructed as an extension of the Dallas Area Rapid Transit (DART) planned North West Corridor light rail transit, generally paralleling IH 35E between downtown Carrollton and downtown Denton. Approximately 10 light rail transit passenger stations would be constructed.

Bus rapid transit would provide express bus service operating along a fixed guideway located between downtown Carrollton and downtown Denton. Service would operate within the roadway in mixed traffic approaching downtown Denton. Approximately 10 bus rapid transit stations would be constructed.

Park-and-Ride Facilities

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

Bicycle and Pedestrian Facilities

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

City of Carrollton

Comprehensive Plan

On February 18, 2003, the Carrollton City Council adopted an updated *Comprehensive Plan*. The City of Carrollton's *Comprehensive Plan* is a statement of community values, ideals and aspirations about Carrollton's future environment, and serves as the official policy of the City regarding physical development. It is a guide for future decisions by the City.

The Plan is used to help set priorities for capital improvement expenditures, as a guide for the acquisition and development of sites for community facilities, as a guide for the acquisition and protection of major open space, as a response to the Texas Local Government Code stating that zoning regulations should be adopted in accordance with a Comprehensive Plan, as a basis for zoning and subdivision regulations, as a guide for reparation of detailed physical plans for sub-areas of the City, and to help guide the establishment of programs and policies by which the City will achieve the type of development reflected in this Plan.

Transportation Plan

The City of Carrollton's current *Transportation Plan* was adopted on February 18, 2003 and was last amended on December 6, 2007. The prior *Thoroughfare Plan* was developed in 1982. The TRANPLAN computer model was used in developing the current *Transportation Plan*. This traffic forecasting program incorporates population and employment estimates to project the distribution and volume of traffic on the City's streets. These projections were then used to develop a transportation network, including thoroughfare location and number of lanes necessary, to accommodate projected traffic volumes. The TRANPLAN model assists in implementing the *Future Land Use* and *Transportation Plans* by assessing potential traffic impacts of projects before they occur.

The Transportation Plan has two components: the *Thoroughfare Plan* and the *Transit Plan*. The *Thoroughfare Plan* addresses the street network. It analyzes existing conditions and established design criteria. It recommends goals, objectives, and policies

to achieve a desired thoroughfare network. The *Transit Plan* concerns itself with modes of mass transit. While presented separately by the City, the *Thoroughfare Plan* and the *Transit Plan* are interlinked, in that the thoroughfare network supports mass transit services and changes to the thoroughfare network can impact mass transit services. For example, reconstruction of intersections can result in easier bus movements.²

The existing IH 35E facility is included in the City of Carrollton's *Thoroughfare Plan* (2003) and is classified as a "controlled access highway." See **Appendix: City of Carrollton Transportation Plan**.

Future Land Use Plan

The City of Carrollton's current *Future Land Use Plan* was adopted on February 18, 2003 and was last amended on December 6, 2007. Land use designations along the IH 35E corridor presented in the City of Carrollton's *Future Land Use Plan* include medium intensity commercial, mixed use transit, and public park/recreation. See **Appendix: City of Carrollton Future Land Use Map**.

Both the *Transportation Plan* and *Future Land Use Plan* are components to the *Comprehensive Plan*.

Capital Improvement Projects

According to the City of Carrollton, capital improvement projects and major development projects are anticipated to occur in accordance with the *Future Land Use Plan*.³ Plans for transit-oriented developments continue to move forward in the City of Carrollton.

City of Corinth

Comprehensive Plan

The City of Corinth is beginning the process of developing a *Comprehensive Plan*, as of January 2009.⁴

Thoroughfare Plan

The City of Corinth's *Thoroughfare Plan* was last updated on April 5, 2006. The existing IH 35E facility is shown in the City's *Thoroughfare Plan*; however, it is not classified. It is crossed by two city thoroughfares and one collector. See **Appendix: City of Corinth Thoroughfare Plan**.

Existing Land Use Plan

The City of Corinth's current *Existing Land Use Plan* was updated in January 2009. Land use designations along the IH 35E corridor presented in the City of Corinth *Existing Land Use Plan* include industrial, undeveloped, commercial, and some multi-family uses. The City of Corinth *Buildout Land Use Plan*, dated February 2006, shows all land uses

² City of Carrollton,
<http://www.ci.carrollton.tx.us/development/planning/Comp%20Plan/Ch%207%20Transportation%20Plan.pdf>

³ Personal communication, City of Carrollton Urban Development Staff, 1/19/09.

⁴ Personal communication, City of Corinth Planning Staff, 1/9/09.

adjacent to IH 35E as commercial with the exception of one area of ¼ acre residential. See **Appendix: City of Corinth Buildout Land Use Map**. According to the City of Corinth, a revision of the *Comprehensive Plan* is underway, which could affect the build out year of 2014.

Capital Improvement Programs

The Corinth City Council has approved three capital improvement projects which include expansion of roads, water utilities, and wastewater systems. These improvements are currently in various stages of development. Various other projects are proposed and awaiting approval.

The City of Corinth has prepared existing and proposed water and sanitary sewer maps. See **Appendix: City of Corinth Proposed Water System Improvements Map** and **Proposed Sanitary Sewer System Improvements Map**. The maps show the proposed improvements by type and construction year.

Town of Hickory Creek

The Town of Hickory Creek has prepared a *Comprehensive Plan* which includes the *Updated Strategic Plan, Existing and Future Land Use Plans, Thoroughfare Plan, Park Plan, Town Sections*, a zoning map, and implementation suggestions as of 2008.⁵

The Town of Hickory Creek outlined its objectives in the Strategic Plan section of the *Comprehensive Plan*:

- Eliminate the possibility of urban sprawl or uncontrolled development;
- Plan for a town square or downtown business district;
- Manage IH 35E expansion and the potential loss of commercial land associated with the project;
- Plan for a community trails system, including walking, bicycle and equestrian trails;
- Protect trees, plants and fauna from being destroyed and care for existing animals and wildlife;
- Continue to enhance the Town's parks and make them accessible and enjoyable to the public.

A key goal for the town's planning process is to identify the highest and best uses for remaining raw acreage of undeveloped land before the Town matures. See **Appendix: Town of Hickory Creek Future Land Use Map**. The current (2008) estimated population is 3,700 persons, and the town anticipates maintaining planning and zoning policies that will limit growth to a maximum of just over 5,000 persons. With the additional visibility provided to the town by improvements to IH 35E, the Town of Hickory Creek seeks to foster additional business growth, recognizing the increased travel into and out of Dallas and Denton Counties that will accompany improvements to the highway. Other road construction projects that will have an effect on land use development for the Town of Hickory Creek include the Lewisville Lake Toll Bridge.

⁵ http://www.hickorycreek-tx.gov/comprehensive_plan (5/20/2008).

Construction of the toll bridge would bring more traffic through Hickory Creek along FM 2181 (Swisher Road). In addition, FM 2181 will be expanded through Hickory Creek. See **Appendix: Town of Hickory Creek Master Thoroughfare Plan**.

The primary limiting factor to land development for Hickory Creek is its adjacency to Lewisville Lake which is managed by the U.S. Army Corps of Engineers (USACE). The town leases some park land from USACE and will need to continue an open dialog so the residents of Hickory Creek will be able to use and enjoy the lake that is adjacent to their town. See **Appendix: Town of Hickory Creek Master Park Plan**.

According to the *Comprehensive Plan*, a new shopping center named Cornelius Town Center has been built between FM 2181 (Swisher Road) and Point Vista Road. This is expected to stimulate additional development in the area. A small amount of light industrial land use has been developed on the east side of FM 2181, but lack of land and lack of freeway access create limits to development in this area. Mixed-use development between FM 2181 (Swisher Road) and Turbeville Road is expected to attract retail and commercial land uses. A mixed-use Design Charette is planned as part of the implementation of the Comprehensive Plan.

Other needed capital improvement projects include upgrading the town's storm water drainage system, constructing additional infrastructure, upgrading the Town's thoroughfare plan, developing a trails system, and construction of additional public recreational facilities, public library, and new stations for emergency services.

City of Highland Village

Comprehensive Plan

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

Thoroughfare Plan

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

Future Land Use Plan

The City of Highland Village current *Future Land Use Plan* was adopted on February 25, 1992 and the *Future Land Use* map was last updated in June 2007. The City's *Future Land Use Plan* is included in the City's *Comprehensive Plan* that provides anticipated future use of undeveloped land. Land use designations along the IH 35E corridor

presented in the City of Highland Village *Future Land Use Plan* include residential, parks and open space (public) uses, highway commercial, and proposed transit oriented development. See **Appendix: City of Highland Village Future Land Use Map**.

The *Thoroughfare Plan* and the *Future Land Use Plan* are incorporated into the *Comprehensive Plan* by reference, along with the *Parks and Open Space Master Plan*, the *Fire Master Plan*, the *Drainage Master Plan*, Land Use Assumptions, and the *Strategic Plan*.

Capital Improvement Programs

As reported in the City of Highland Village *2007 Annual Report*, approximately \$377,500 was spent on capital improvements and approximately \$332,506 on utility improvements. The total annual expenditures for 2007 were approximately \$11.4 million.

The City of Highland Village is continuing construction on Brazos Boulevard by addressing drainage problems and installing new concrete pavement. The City has also developed a Municipal Drainage Utility System to comply with stormwater permitting and management regulations set forth by the Texas Commission on Environmental Quality (TCEQ). No other major developments were reported by the Geographic Information System (GIS) Administrator for the City, as of January 2009.⁶

City of Lake Dallas

Comprehensive Plan

The City of Lake Dallas does not have a *Comprehensive Plan* that is available on-line, nor was one provided when requested from city staff.⁷ The City does have a Zoning Map which designates all land uses within the city limits and adjacent to IH 35E as C-3 Commercial and IH 35E Business Corridor. See **Appendix: City of Lake Dallas Zoning Map**.

Thoroughfare Plan

The City of Lake Dallas does not have a *Thoroughfare Plan* that is available on-line nor was one provided when requested from city staff.⁸

City of Lewisville

Comprehensive Plan

The City of Lewisville's current *Comprehensive Plan* was adopted in December 1994. During October 1993, the City of Lewisville initiated the development of the Comprehensive Neighborhood and City Wide Planning Program. The program was divided into three phases: data collection and analysis, community goal setting, and action plan development. The *Comprehensive Plan* is also known as the Lewisville 2010

⁶ Personal Communication, City of Highland Village GIS Administrator 1/9/09.

⁷ Personal Communication, City of Lake Dallas, Earl Berner, 1/13/09.

⁸ Personal Communication, City of Lake Dallas, Earl Berner, 1/13/09

Plan, which reports the findings of this planning process. The report is also divided into three parts: a Community Profile, Lewisville 2010 Goals, and an Action Plan.

Thoroughfare Plan

The City of Lewisville's current *Thoroughfare Plan* was recommended by the Transportation Board on July 17, 2003 and adopted by the City Council on August 4, 2003. It was updated in June 2007. The existing IH 35E facility is included in the City of Lewisville's *Thoroughfare Plan* (2003) and is classified as a "major traffic carrier." See **Appendix: City of Lewisville 2007 Thoroughfare Plan**. Both the *Thoroughfare Plan* and *Future Land Use Plan* are components to the *Comprehensive Plan*. As of January 2009, the City of Lewisville is preparing to undertake a Master Plan Process which may include an IH 35E Corridor Development Overlay.⁹

Future Land Use Plan

The City of Lewisville's current Future Land Use Plan was published in the July 2006 *Land Use Assumption Report*.¹⁰ The purpose of this report is to update the City of Lewisville's *Comprehensive Plan* as part of an evaluation of land use assumptions that would provide input into the City's Impact Fee Program. State law requires cities that implement an Impact Fee Program to provide updated land use assumptions every five years. The City of Lewisville is approaching full development for low-density single family uses. Regional employment centers have supported residential growth in Lewisville. Future Land Use designations along the IH 35E corridor include commercial and office uses with some multi-family or medium density residential use. Large-scale residential projects in eastern Lewisville are expected to build out in the near future. See **Appendix: City of Lewisville Developable Vacant Land Map**.

Development Capacity of the Study Area

The planned future development outlined in the various NCTCOG and municipal plans presented in the previous section, coupled with existing economic development efforts, create a demand on the development capacity of the study area. Current economic development trends include a range of activities from light rail systems to mixed-use retail development. Following a brief discussion of major initiatives, a more detailed land use capacity analysis is provided. **Table 2** provides acreages of developed and undeveloped land, including undevelopable land and anticipated build-out acreage.

City of Carrollton

The DART light rail system is proposed to travel through the City of Carrollton and connect with the future Denton County Transit Authority (DCTA) light rail system in northern Carrollton. The city has been coordinating with DART and preparing for this planned transportation development. The light rail system is currently under construction in the City of Carrollton and the DART Green Line is scheduled to open in December 2010.¹¹

⁹ Personal communication, Lewisville Planning/Community Services and Economic Development staff, 1/15/09 and 1/21/09.

¹⁰ City of Lewisville,

<http://www.cityoflewisville.com/main/commdev/Land%20Use/2006LUAssumptionsReport.pdf>

¹¹ Dallas Area Transit Authority. <http://www.dart.org/about/expansion/otherprojects.asp>

The City of Carrollton is in the process of developing transit-oriented communities which would include higher density, mixed-use areas with an urban aesthetic. The design of these communities would encourage walking and bicycling, reduce and manage parking, and provide mixed-uses in close proximity to the light rail stations. On January 31, 2009, the *Dallas Morning News* featured an article updating readers on the status of planning and development related to the construction of the DART Green Line.¹² High Street Residential plans to break ground this year for a 295 unit, four-building apartment project with street-level retail near downtown Carrollton station. A 300-unit apartment complex is planned near the North Carrollton station at Frankford Road. Overall, Carrollton has three station areas planned and has spent more than \$10 million on land acquisition, infrastructure development, and zoning in anticipation of the interest in development. The anticipated growth related to the development of transit could bring 8,000 to 10,000 residents to the area.

City of Corinth

The Comfort Inn and Suites hotel has recently opened for business on the east side of IH 35E at FM 2181 (open and taking reservations in February 2009). The City of Corinth will also welcome the Atrium Medical Center, a long term acute care hospital, the first of its kind in Denton County. The Atrium Medical Center will be a three-story, 59,000 square ft building located along the east side of IH 35E. It has been estimated the facility will ultimately employ 150 nursing and administrative personnel and contain 60 beds. The medical center opened during the fall of 2007.

Several commercial developments are planned for the City of Corinth. The Corinth Market Square retail facility is proposed to be built along the west side of IH 35E adjacent to City Hall. The 80,800 square ft, multi-tenant retail facility is currently under construction; ground breaking started in late 2006. Plans were submitted in December 2006 for the development of a Neighborhood Shopping Center at the corner of Robinson and Post Oak Road in Corinth. A 109,048 acre retail center called Hickory Creek Plaza has been announced for development at the intersection of Teasley Lane and Hickory Creek Road.

A single-family residential development, Wheeler Ridge is currently under construction at the southeast corner of the intersection of Teasley Lane and Robinson Street.

Town of Hickory Creek

The Town of Hickory Creek is continuing to experience commercial and residential development. According to an Economic Development Consultant working with Hickory Creek, there are several projects underway.¹³ Hickory Creek Town Center is a planned 115 acre mixed-use project bounded by FM 2181 to the north, IH 35E to the east, Turbeville Road to the south, and Ronald Reagan Avenue to the west. The design would

¹² Sandoval, Stephanie. 1/31/09. The Dallas Morning Newse: *Plans on track for development Near DART in Carrollton, Farmers Branch.*

¹³ Personal Communication, Mr. Barry Steele, Economic Development Consultant to the Town of Hickory Creek, 1/23/09.

be in accordance with the principles of Traditional Neighborhood Development. In addition, the IH 35E Frontage Road and Turbeville Road Commercial Center includes a planned 10-acre commercial/restaurant/office center. This parcel is adjacent to the IH 35E frontage road and could be impacted by ROW acquisition, in which case the owner has secondary development plans including construction of a large sports restaurant.

Along the western edge of IH 35E, several major hotel chains have expressed interest in development. In addition, a high density multi-family residential development is under consideration in Hickory Creek's extraterritorial jurisdiction (ETJ). There is also a site location study being done that may create a Joint Lake Cities Visitor Center along IH 35E in the Town of Hickory Creek.

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

City of Highland Village

Several commercial developments are planned within the City of Highland Village. One development is the District of Highland Village, a 15-acre, mixed-use center comprised of shopping, restaurants, and town homes. The District of Highland Village broke ground in August 2008 and is planned to open during Summer 2009.¹⁴ The Marketplace at Highland Village is a 66-acre, mixed-use retail development. This development would consist of restaurants, retail and office space, and a storefront of the Highland Village Police Department. The Shops at Highland Village is also a planned development located at the intersection of FM 407 and FM 2499. This would consist of a 45-acre lifestyle development that would include connectivity to the city's trail system to provide pedestrian-friendly access to retail areas. The Shops at Highland Village opened in the fall of 2007.¹⁵ In addition to the various retail developments, the City of Highland Village has proposed the development of a new municipal service center complex and an interim senior center meeting facility; however, the proposal is awaiting approval through a future bond election. Double Tree Ranch Retirement Community is planned for development at 2100 Highland Village Road.

City of Lake Dallas

The City of Lake Dallas continues to work to revitalize the downtown area and has recently renovated the historic 1908 Woodman of the World building which houses *The Lake Cities Sun* community newspaper.

The planned development of the Lewisville Lake Toll Bridge would provide an essential link between the City of Lake Dallas and the Town of Little Elm, with the hopes of attracting people, business, and developers to the downtown area. The City of Lake

¹⁴ <http://www.thenewsconnection.com/article.cfm?articleID=31609>

¹⁵ <http://www.pegasusnews.com/news/2007/sep/27/upscale-mall-opens-highlandvillage/>

Dallas plans to continue revitalizing the downtown area and assigning a new urban zoning classification. The planned development of the Main Street Square would consist of commercial and residential spaces, where Phase 1 would include 8,000 square ft of space, with another 16,000 square ft to be built.

City of Lewisville

Development within the City of Lewisville has continued along the IH 35E corridor, surrounding the Vista Ridge Mall. In addition to the existing retail base, new commercial developments are being established around Vista Ridge Mall. Due to the shortage of land within the city limits, residential developers are turning to town home development. In a June 2005 article in the *Dallas Business Journal*, it was estimated approximately 500 new residential units are planned for development in the City of Lewisville.¹⁶ According to NCTCOG's Development Monitoring website, the Plaza Townhomes is under construction for 55 units. The Hebron 121 Station apartments has been announced, with a goal of more than 1,000 units, along with the Double Tree Ranch Retirement Community planned for 218 units.

The Marriott Townplace Suites is under construction for 118 estimated units. Office land uses have been announced or are under construction at Lakeside Office Center Building 2, The Plaza, and Vista Oaks Hotel. There is anticipated industrial development at Majestic Airport Center at DFW airport.¹⁶

Land Use Capacity Analysis

A primary tool for urban planning is land use control. The Cities of Carrollton, Lewisville, Highland Village, Lake Dallas and Corinth actively monitor the acreage of developed versus undeveloped land, growth pressures, demographic trends, and development patterns in order to conduct land use capacity analyses. One form of land use capacity analysis is a build-out analysis. The purpose of a build-out analysis is to inform a municipality what land is available for development, how much development can occur and at what densities, and what consequences may result when complete build-out of available land occurs according to the zoning ordinance. A build-out analysis can reflect changes in the zoning ordinance to illustrate the effects of those changes on future resources. A build-out analysis can also help quantify the costs of growth.¹⁷

For the purpose of this indirect land use impacts assessment, data obtained from the planning departments affiliated with the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, and Corinth can provide a general timeframe as to when the study area will reach a build-out status. Data was not made available by the Town of Hickory Creek for this analysis. According to the data provided in **Table 2**, the Cities of Lewisville, Highland Village, and Corinth expect to reach build-out by the year 2015, and the Cities of Lake Dallas and Carrollton expect to reach build-out by 2020 and 2025, respectively. These build-out dates were provided by city planners based on their adopted planning documents and professional opinions about development trends. The

¹⁶ Dallas Business Journal, June 2005. <http://dallas.bizjournals.com/dallas/stories/2005/03/28/story3.html>

¹⁶ NCTCOG Development Monitoring website, accessed January 2009.

¹⁷ *Build-Out Analysis in GIS as a Planning Tool*, Mary Zirkle, Virginia Polytechnic Institute and State University.

Comprehensive Plan for the Town of Hickory Creek was published in 2008 and discusses goals for the town “for the next 20 years”, thus the planning horizon – which may or may not equate to a build out yet - can be considered as 2028. Though the Cities of Lake Dallas and Carrollton have longer build-out time spans, the percentage of total developed land in these cities is greater in comparison to the Cities of Lewisville, Highland Village and Corinth. This variance of growth patterns can be directly attributed to the annual growth rate. Because the Cities of Lake Dallas and Carrollton have low annual growth rates, it will take longer for them to reach build-out compared to the Cities of Lewisville, Highland Village and Corinth, which exhibit higher annual growth rates. It can be assumed the study area will reach build-out by 2025.

Table 2: Land Use Capacity Analysis

Area ¹	Developed Land (acres/% of total acreage)	Undeveloped Land (acres/% of total acreage)	Undevelopable Land (acres/% of total acreage)	Total Acreage	Build-Out Acreage	Annual Growth Rate ²	Build-Out Year
City of Carrollton	21,310 83%	2,300 9%	2,065 8%	25,675	23,610	0.065%	2025
City of Lewisville	14,790 54%	3,627 13%	8,780 33%	27,197	18,417	2.72%	2015 ⁴
City of Highland Village	1,983 48%	189 5%	1,925 47%	4,097	2,172	1.19%	2015
City of Lake Dallas	1,568 92%	96 6%	34 2%	1,698	1,664	0.39%	2020
City of Corinth	3,396 75%	1,067 24%	41 1%	4,504	4,463	9.2%	2015
Town of Hickory Creek ³	N/A	N/A	N/A	2,905	N/A	N/A	N/A

¹City of Lewisville data based on 2006 estimates. Cities of Highland Village and Lake Dallas data based on 2007 estimates. Cities of Carrollton and Corinth data based on 2008 estimates. All data confirmed or updated in January 2009.

²Annual growth rate = {(build out acreage-developed land)/developed land}/{(build out year-present year)}

³Land use acreage data was not available from the Town of Hickory Creek. Total acreage was estimated from city-data.com square mileage information accessed 2/3/09.

⁴Note: The Build Out Year may be later than 2015 due to economic recession factors; redevelopment of existing lots is anticipated to continue.

Sources: City of Carrollton Planning Department; City of Lewisville *Land Use Assumptions: Lewisville, Texas* (July 2006); City of Highland Village GIS Department; City of Lake Dallas City Manager; City of Corinth Planning Department.

Future Development Patterns in the Study Area

The forecasted developments embodied in the various plans and policy documents previously discussed assumes that the proposed IH 35E facility will be reconstructed. The basic land use patterns surrounding the anticipated improvements to the IH 35E facility are reflected in the comprehensive plans of the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek. The proposed IH 35E facility has existed for many decades, and land use planning for the region reflects the presence of the facility. The comprehensive plans and associated zoning would likely not change, as the proposed IH 35E facility is a planned transportation corridor that would benefit from coordinated design, infrastructure, and compatibility of land uses set forth by the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas,

Corinth, and the Town of Hickory Creek. If the No-Build alternative were to be adopted, land development patterns would still continue toward build out because IH 35E is already a major interstate and would continue to facilitate the transportation of goods and services throughout the region. However, land development patterns along the IH 35E corridor would occur at a slower rate in the long-term when compared to the Build alternative in which land development and redevelopment may be delayed in the short and mid-term during project construction but would rebound and accelerate in the long-term with improvements to mobility, a reduction in traffic congestion, and an increase in capacity.

Summary of Travel Performance Estimates

Travel time and traffic volumes (and perceived/real economic impact) are key transportation measures for estimating impacts on residential and commercial development. Larger volumes that result from transportation improvements could support an increase of demand and prices bid for retail properties along a corridor, which in turn contributes to the potential for land-use changes. Key questions are whether (1) that potential is sufficient to cause property owners and developers to build faster and differently than they would have, and (2) whether the comprehensive plan would have to be changed in any substantial way (e.g. zoning, comprehensive plan designations, city limits, urban growth boundaries) to allow that change in development. Key transportation variables of interest for land use analysis are change in travel time, traffic volumes, and mobility.

Changes in Accessibility

Changes in accessibility are most readily analyzed by comparing differences in travel time, congestion delay, levels of service, and average speed along a particular facility or study area. For IH 35E, changes in accessibility using average free speed in miles per hour (mph) and level of service (LOS) were analyzed for the Build versus the No-Build Alternatives. Utilizing a 79 square mile area bound by the IH 35E corridor adjacent Traffic Serial Zones (TSZs), performance reports developed by the NCTCOG were generated for all expressway, frontage, arterial, and collector streets within the traffic study area. These performance reports allowed for direct comparison of changes in average speed and LOS within the IH 35E traffic study area.

According to the Complete Performance Reports provided by NCTCOG, vehicle hours of total delay (signalized delays and congestion delays) within the traffic analysis study area [freeways, arterials (major arterials and minor arterials), collectors, and frontage roads] decreases 23 percent under the Build Alternative (15,860 hours of delay/day under the No-Build Alternative versus 12,855 hours of delay/day under the Build Alternative). **Table 3** illustrates the anticipated change in free speed for the Build and No-Build Alternatives. The Complete Performance Reports indicated the average free speed of local roadways [major arterials and minor arterials (in mph)] is virtually unchanged and that the average free speed along the frontage roads would increase approximately 2.5 percent or close to 1 mph when compared to the No-Build Alternative. Overall, the percent change in average free speed would result in a non-perceptible effect to users of the major/minor arterials and frontage roads in the traffic analysis study area.

Table 3: 2030 Average Free Speed of Roadway (MPH)

Roadway Classification	No-Build Alternative			Build Alternative			Percent Change in Average Free Speed		
	AM	PM	Daily	AM	PM	Daily	AM	PM	Daily
Major Arterials	35.61	35.64	35.58	35.49	35.60	35.38	-0.34%	-0.11%	-0.56%
Minor Arterials	31.55	34.65	31.65	31.23	31.31	31.13	-1.01%	-9.64%	-1.64%
Frontage Roads	37.76	38.41	38.27	38.69	38.85	38.71	2.46%	1.15%	1.15%

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

According to the Texas Transportation Institute (TTI), the most recent value of travel delay (2005 dollars) is \$14.60/hour of delay for non-commercial vehicles and \$77.10/hour for commercial vehicles.¹⁸ Using the cost for non-commercial vehicles, there would be a cost of travel delay of \$187,683 under the Build Alternative and a cost of \$231,556 per day (2005 dollars) to the users within the traffic analysis study area under the No-Build Alternative.¹⁹ The difference in user cost between Build and No-Build Alternatives is \$43,873 per day.

Table 4 summarizes the anticipated number of lane-miles in 2030 for different LOS conditions during the AM peak hour for the Build and No-Build Alternatives. The LOS comparison indicates that there would be an increase in lane-miles operating under LOS A-B-C along both the mainlanes and HOV/managed lane under the Build Alternative.

Table 4: 2030 Level of Service for Traffic Study Area

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

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

Summary

The LOS comparison derived from the Complete Performance Reports reflecting the IH 35E Build and No-Build Alternatives reveal that there would be less delay [percent increase of lane-miles operating under most favorable LOS conditions (LOS A-B-C)]

¹⁸ 2007 Annual Urban Mobility Report, Texas Transportation Institute, the Texas A&M University System, 2007.

¹⁹ The Annual Urban report was released on September 7, 2007.

under the Build Alternative along the frontage roads, local arterials, and collectors. The analysis also concludes that under the Build Alternative, vehicle hours of total delay (signalized delays and congestion delays) would decrease 23 percent within the traffic analysis study area in comparison to the No-Build Alternative. Additionally, the analysis reveals the average free speed of local roadways (in mph) is virtually unchanged between the 2030 Build and No-Build Alternatives. Overall, the percent change in average free speed would result in a non-perceptible effect to users of the major arterials, minor arterials, and frontage roads within the traffic analysis study area. The difference in user cost between the Build and No-Build Alternatives is estimated to be lower for the Build Alternative than for the No-Build Alternative by \$43,873 per day.

IV. ASSESSMENT OF INDIRECT LAND USE IMPACTS

Potential for Land Use Change Assessment

In addition to the broad discussion of development trends and planning tools in the project area, it was determined that a more narrow investigation of specific areas where induced land use development may occur was needed. Therefore, additional coordination with planning professionals in the various jurisdictions traversed by IH 35E was conducted in July 2009. The following questions were asked:

- As a planner, do you think that a 1,200 ft buffer is reasonable for an assessment of induced land use development? If not, how large or small of a buffer would you suggest for this type of assessment?
- What parcels (if any) do you think would likely be developed as a result of the proposed transportation improvements to IH 35E?
- In your opinion, will transportation improvements to IH 35E induce land use development in your jurisdiction, alone or in conjunction with other factors?
- Would improvements to IH 35E affect the rate of land use development in your jurisdiction?
- Please draw on the maps provided to indicate areas you think are likely to develop. Please indicate whether or not they are currently platted for development.

The resulting mapped information was digitized and each parcel was measured in acres. A total of approximately 700.4 acres within the 1,200 ft buffer on either side of the proposed ROW were determined to be potentially impacted at least in part as a result of the proposed roadway improvements. Many of these areas are currently platted and therefore already committed to developed land uses. These areas are shown in **Appendix: Figures 1 through 7: Potential Induced Development**.

For this analysis, the term “planner” is used for city representatives including those in the urban development department (Carrollton), GIS (Highland Village), consultants and city

staff including the Mayor and economic development staff (Hickory Creek), and planning staff (Lake Dallas, Lewisville).²⁰ Planners in Corinth were contacted but did not respond. Each planner was asked several questions to help them identify where they thought induced land use development would occur as a result, at least in part, of the highway improvements. The first question was whether or not, in their opinion, a 1,200 ft buffer was a reasonable area to investigate for induced land use development. Of the four respondents, two planners agreed, one thought it was a bit too big, one was neutral.

“I think 1,200 is just a bit big. I would probably go with 1,000 feet, but this is not a significant enough difference to worry about.” (Carrollton)

“While most of the area immediately adjacent to the service road will obviously be considered 'prime freeway frontage', I think the 1,200 ft buffer shown will still be impacted by the construction and ultimate completion of the freeway. I have no justification to recommend a larger or smaller buffer.” (Lewisville)

“As to the 1,200 ft buffer it easily captures the areas that Lake Dallas is anticipating will be developed in the near future--3-10 years (economy permitting). The 1,200 ft buffer is a reasonable buffer area for this purpose.” (Lake Dallas)

“Yes, a 1,200 ft buffer is reasonable.” (Hickory Creek)

Each planner was also asked to indicate on maps that showed the proposed ROW, potential displacements, floodplain areas, and the 1,200 ft buffer on either side of the ROW where development would likely occur. The question posed was: What parcels (if any) do you think would likely be developed as a result of the proposed transportation improvements to IH 35E? Their answers were digitized into **Figures 1 through 7: Potential Induced Development** included in the **Appendix**.

The total area of land where induced land use development would occur due to transportation improvements, at least in part, is shown in the table below.

Table 5: Potential Induced Land Use Development by Municipality

Municipality	Acres of Potential Induced Land Use Development
City of Carrollton	0.0
City of Lewisville	433.9
City of Highland Village	95.05
Town of Hickory Creek	82.5
City of Lake Dallas	88.9
City of Corinth	Not available
Total	700.4

²⁰ E-mail correspondence with the municipalities of Carrollton (Christopher Barton), Lewisville (Gene Lewis), Highland Village (Robert Wachal), Hickory Creek (Barry Steele), Lake Dallas (Earl Berner), and Corinth (Barb Cabbage) between July 6 and 16, 2009.

City of Carrollton

According to the Carrollton planner: “In the image provided, the only notable area in Carrollton is the east quadrant of the intersection of IH 35E and SH 121. This area is in a flood hazard area, and has very, very limited access options. Basically, it is only accessible from the northbound frontage road of IH 35E, to the south of SH 121. Because of these two factors, I would doubt that any development of any kind is likely in the foreseeable future...No current plans for development in the east quadrant, nor much likelihood for development in the foreseeable future.”

City of Lewisville

Because the City of Lewisville constitutes the largest land area with jurisdiction traversed by the IH 35E Middle project, there were several parcels that could be affected. Plate references are referring to the graphic plates sent to planners to obtain information. According to the Lewisville planner:

“On Plate 4 are several sites at the southwest corner of IH 35E and FM 407. While #3 (sic) is currently under development as a rehab hospital, the other tracts are the ones most likely to develop as a result of the proposed IH 35E improvements. In the time period before the construction is completed there is always the possibility that one or more of the tracts will develop anyway, but the feeling is that this site would be a prime retail location once the construction is complete. Most other vacant sites within the buffer will probably develop in some form within the next 10 years, but the freeway improvements will be only one factor causing that to happen. Several of the tracts shown as displacements will make adjustments and remain in business while others will go away, leaving parcels that may be able to be combined for new development. The single family displacements on Plate 3 should disappear, hopefully with a sound wall to block the remaining homes in the subdivisions.”

This table shows the parcels numbered consecutively on the attached plates with their status according to the Lewisville planner:

Table 6: Potential Induced Land Use Development by Area – City of Lewisville

Map ID	Plat Status	Acres
1	Platted for development	23.3
2	No plans/not platted	33.5
3	Under development	8.4
4a	Platted for development	3.4
4b	Platted for development	5.4
5	Under development	2.0
6	Approved plat/construction underway	23.0
7	Zoning and site plan	80.7
8	Platted for development	22.1
9	Platted for development/no plans	45.7
10	No plans/former mobile home park	19.5
11	Platted for development/no plans	6.9
12	Platted for development/no plans	4.1
13	Platted for development/no plans	7.5
14	Platted for development/no plans	1.8
15	Platted for development/no plans	2.6
16	Platted for development/no plans	4.6
17	Platted for development/no plans	27.5
18	Platted for development	9.2
19	Not platted	31.2
20	Platted/plans in review	4.8
21	Platted for development	23.8
22	Not platted	37.7
23	Not platted	5.2
Total Estimated Induced Land Use Development Acreage		433.9

City of Highland Village

The City of Highland Village did not answer the questions specifically but provided correspondence about Copperas Branch Park. According to a letter to the Honorable Kay Bailey Hutchison (U.S. Senator from Texas) in which the city is working to secure funding to support the redevelopment effort, the city's Mayor explained that their goal is "to assure that all recreational amenities currently within Copperas Branch Park, a USACE property under a lease agreement with the City, lost due to the IH 35E widening can be restored. Restoration of these amenities will require the purchase of property offsite. Highland Village is a small community near built out conditions. There is a limited amount of land available for the recreational amenities." Highland Village has been working with TxDOT and USACE for several years to reach an agreement on mitigation to comply with Section 4(f) of the Department of Transportation Act. Although the purchase of additional property for mitigation has not been finalized as of July 2009, it is anticipated that an agreement will be reached. For the purposes of this analysis, since direct impacts to recreational resources will lead to development of adjacent land for recreational purposes, this potential impact has been considered as induced land use development. Approximately 95 acres of land near and including the existing park would be acquired and developed for park uses, according to design maps that were the culmination of community workshops and a landscape architect's proposed design. Some change in access would be part of the plan in order to maximize utilization

of lake-front land on both sides of IH 35E and to provide connectivity between the parcels. If the mitigation agreement is completed, the city of Highland Village considers this induced land use development to be a boost to the recreational resources in their community. The letter from the Mayor to Senator Kay Bailey Hutchison, including a map of the proposed park redevelopment concept plan for Copperas Branch Park has been included for reference in the **Appendix**.

City of Lake Dallas

According to planners from Lake Dallas, there are several parcels that could be developed or redeveloped in the buffer area:

- “a. A 12 acre site located between Carlisle and Betchan and fronting on the DCTA line is vacant and for sale with some level of interest.
- b. Between Denton Drive and the Service Drive we have created an overlay zone that hopefully will encourage redevelopment of most if not all of the parcels there over some longer time horizon--10 to 20 years.
- c. Between Overly Drive and Swisher Road are some large parcels that have industrial uses on them but are not fully developed. These parcels are expected to receive either expansion of the current users or the building of facilities for new users. The time horizon for these is 2 to 10 years....With the exception of the property between Carlisle and Betchan Streets that is vacant all other parcels are platted and developed (so redevelopment is sought on those).”

These parcels were digitized and estimated to be approximately 16 acres, 32 acres, and 41 acres, respectively, for a total of approximately 89 acres expected to develop or redevelop as a result, in part, of the proposed roadway improvements.

Town of Hickory Creek

The Hickory Creek experts (including the Mayor, Mayor Pro Tem, Economic Development staff, Economic Development Consultant, and City Council member) identified three areas in the maps provided. Of these, one is a 9.5 acre parcel that is not platted; one is a 65.0 acre area that is not platted; and one is an 8.0 acre area that is platted for development. These areas total 82.5 acres.

Planners were also asked the following: In your opinion, will transportation improvements to IH 35E induce land use development in your jurisdiction, alone or in conjunction with other factors? Answers included the following (not all planners answered this question directly):

“For the parcel in the image provided, the answer is ‘no.’ For Carrollton as a whole, the answer is a very qualified ‘maybe.’ There are other factors, such as fragmented land ownership, making redevelopment more difficult.” (City of Carrollton)

“Land use development is seldom driven by a single element, but having a freeway with high traffic counts that offers easy access to commercial or residential uses would be a significant factor in whether and how a particular tract of land will develop.” (Lewisville)
“We believe that the improvements to IH 35E will help speed up the development of these parcels and in conjunction with the opening of the toll bridge across Lewisville Lake that is using Swisher Road as the access point to IH 35E.” (City of Lake Dallas)

Based on a review of these comments, it appears that planners consider the expansion of IH 35E to play both positive and negative roles in land use development. Increased access increases the desirability of certain parcels for commercial development; however the long timeline for this particular project has affected some individual development decisions. None of the planners indicated that they view the highway expansion as a development issue that is beyond their ability to accommodate.

Planners were also asked the following question: Would improvements to IH 35E affect the rate of land use development in your jurisdiction? The answers varied:

“For the parcel in the image provided, the answer is ‘not really’. For Carrollton as a whole, the answer is ‘probably not’ for the following reasons: first, Carrollton is just about ‘built-out.’ Second, making it easier for people to get ‘further out’ from Carrollton can’t have much of a desirable effect. On the other hand, Carrollton is fairly centrally located, so making it easier for people in Carrollton to get to other places would have a beneficial effect. I see the IH 35E expansion as currently designed as a ‘wash’ for Carrollton.” (City of Carrollton)

“Yes, we expect IH 35E improvements to accelerate the rate of land use development in conjunction with the new Lewisville Lake Toll Bridge. However, please note that the uncertain construction start date (project in limbo) is a major inhibitor to development.” (Hickory Creek)

“Certainly yes, with improved traffic flow the opportunities for new businesses and residential to be exposed to Lake Dallas can only help the process.” (City of Lake Dallas)

“There has already been an indication that some developments may have been postponed or the owners opted for other locations due to the impending lengthy construction time of IH 35E, but the general feeling here is that completion of the construction will spur new development, and possibly some redevelopment, once the construction is complete.” (Lewisville)

The planners who responded feel that the proposed improvements to IH 35E, once completed, will have a beneficial effect in terms of land development and redevelopment from an economic development and traffic flow perspective. However, the delays in executing the project are currently having the effect of delaying some development and redevelopment projects.

Summary of Potential Indirect Land Use Impacts

As discussed in Section II, the potential for land use change can be measured by changes in accessibility, changes in property value, expected growth, the relationship between land supply and demand, availability of public services, market factors, and public policy. The population, employment, and land use forecasts described in this assessment generally presume the improvements to the IH 35E facility. Potential indirect impacts to land use associated with the proposed design and ROW required for the proposed IH 35E project are taken into consideration in **Table 7**.

Table 7: Indirect Land Use Impacts Assessment

Change	Data Sources	Anticipated Indirect Impacts	Potential for Land Use Change
Induced land use development <i>Measured as areas identified by professionals in jurisdictions as likely to develop as a result – at least in part – of construction of roadway improvements</i>	Personal communication with local officials in the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, and the Town of Hickory Creek, (City of Corinth did not respond)	Within a 1,200 ft buffer on either side of the ROW, a total of approximately 700.4 acres of land could be converted from existing uses to developed uses (including redevelopment) between the present and 2035 partially attributed to construction of IH 35E improvements. Some of these lands are currently platted (already dedicated to developed uses). Many of these lands are adjacent to the roadway surrounded by developed uses.	Weak to Moderate
Change in accessibility <i>Measured as change in travel time or delay, if available. Otherwise, assessment of v/c or change in access</i>	NCTCOG Complete Performance Reports	The difference between the No-build and Build scenarios in terms of average speed, and LOS are negligible.	None to very weak
Change in property value <i>Measured in dollars</i>	Consultation with planning departments (Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth and Town of Hickory Creek) NCTCOG 2030 Forecast	A change in residential to commercial land use, regardless of improvements to IH 35E, would likely result in higher property value increases. Improvements to IH 35E coupled with the development of DART/DCTA lines and transit-oriented development projects would increase property values.	None to very weak
Forecasted growth <i>Measured as population employment, land development; for region, city, or sub-area</i>	Land Use Capacity Analysis (Data supplied by the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and Town Hickory Creek)	Average annual population growth rates for the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, and Corinth and the Town of Hickory Creek span from 13.4 to 138.1 percent. Average annual employment growth rates span from 21.9 to 125.7 percent. Annual land development growth rates span from 0.065 to 9.2 percent (does not include estimate for Town of Hickory Creek, for which land development acreage information was not available).	Weak to moderate

Change	Data Sources	Anticipated Indirect Impacts	Potential for Land Use Change
Relationship between supply and demand <i>Measured as population, employment, land development</i>	Land Use Capacity Analysis (Data supplied by the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, and Corinth)	The percentage of undeveloped land for the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, and Corinth ranges from 1 to 47 percent. The annual rate of land use development spans from 0.065 to 9.2 percent. The anticipated build-out year for the study area is 2025. These data do not include estimates for the Town of Hickory Creek, for which information was not available.	None to very weak
Availability of non-transportation services <i>Measured number of people or employees that can be served; or barriers to service provisions</i>	Capital Improvement Projects (Cities of Carrollton, Corinth, Highland Village, Lewisville, and Town of Hickory Creek)	Various CIPs are scheduled for the study area, regardless of the IH 35E project. Improvements to non-transportation services such as utilities, sewer, and water provision are planned for the study area and likely take into account the construction of the proposed improvements to the IH 35E facility.	None to very weak
Other factors that impact the market for development	Current economic development activities Capital Improvement Projects Comprehensive Plans, etc.	The project area has been developing during the last few decades and plans exist for the continuation of development activities until build-out in 2025. The IH 35E proposed improvements are anticipated to hinder new development and investment along the IH 35E Corridor in the short to mid-term; however, commercial development and re-development would continue along the entire IH 35E corridor because interstate locations are favorable with regard to most commercial real estate preferences.	None to very weak
Public policy	NCTCOG Managed Lanes Excess Toll Revenue Sharing Policy and NCTCOG Managed Lanes Policies Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and Town of Hickory Creek Comprehensive Plans, Thoroughfare Plans, Future Land Use Plans, Other Plans	<p>The tolling of the IH 35E HOV/managed lanes has been taken into consideration with the development of the NCTCOG's Managed Lanes Excess Toll Revenue Sharing policy. Potential indirect impacts would result from the proposed acceleration and construction of the Regional Toll Revenue Funding Initiative projects.</p> <p>The IH 35E facility has been in operation for many years, and land use planning for the region reflects the IH 35E facility. The land use planning tools (Comprehensive Plans, Future Land Use Plans, Thoroughfare Plans) have already taken into consideration potential indirect impacts and exist to control the desired land use/transportation changes that would result from the improvements to IH 35E.</p>	None to very weak

Potential Land Use Changes and Compatibility with Land Use Plans

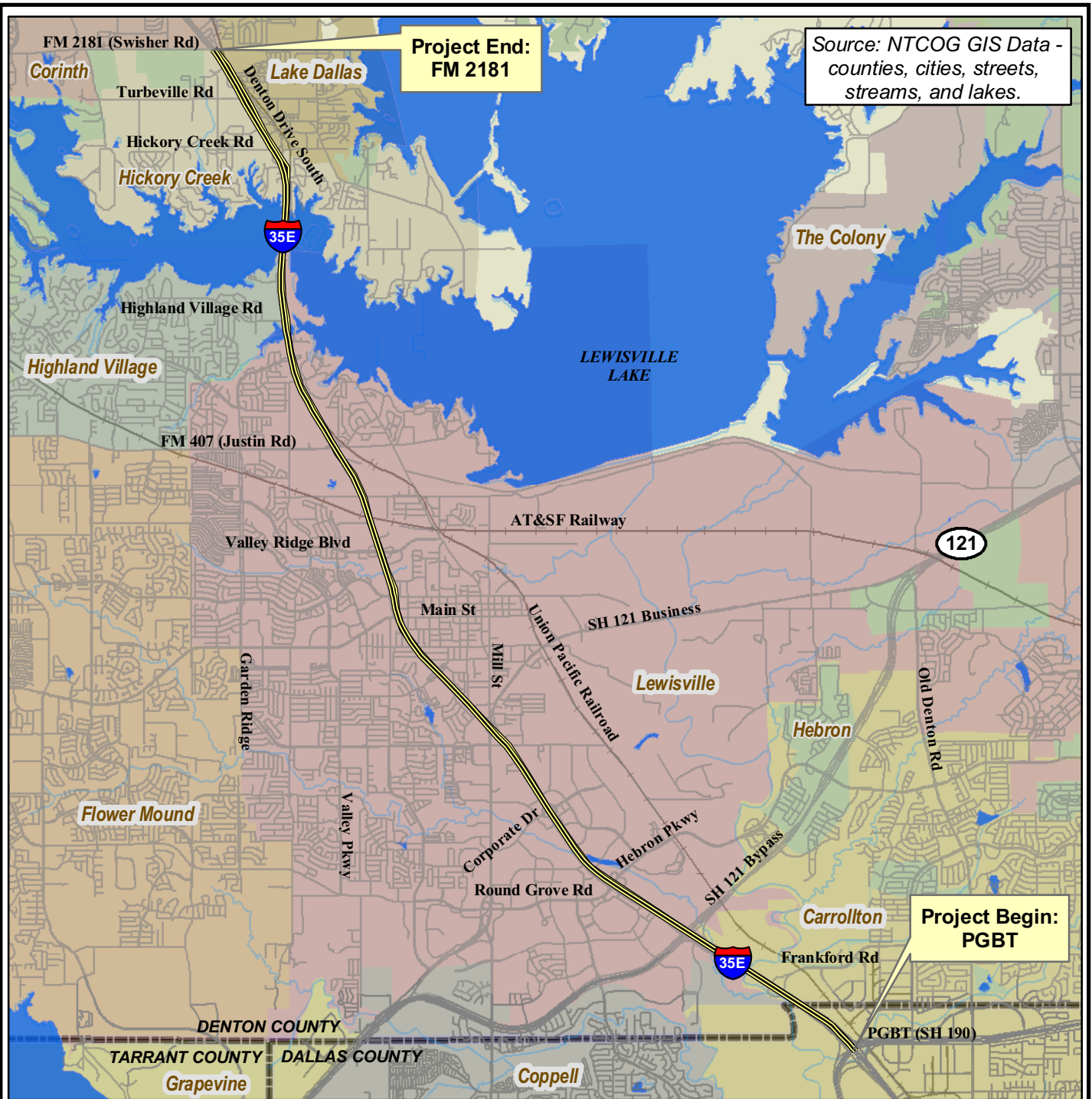
The indirect land use impacts outlined in **Table 7** overall result in a none to very weak potential for land use change as a result of the proposed improvements. The updated comprehensive plans that guide land use development in the study area presume the amount of growth and the level of services to remain consistent with the improvements to the IH 35E facility. The comprehensive plans of the Cities of Carrollton, Lewisville, Highland Village, Lake Dallas, Corinth, and the Town of Hickory Creek assume the IH 35E facility will continue to support the achievement of the development patterns the plans outline. The proposed improvements, deemed necessary to accommodate forecasted growth, are implicit in the planned land use forecasts for the study area and are anticipated by planners in the jurisdictions that would be affected. Although some induced land use development is anticipated by local planners, many of them welcome completion of the proposed improvements to help move their development and redevelopment plans forward. The proposed improvements to the IH 35E facility should minimally alter the future land use patterns in the study area as none of the change indicators portrayed in **Table 7** indicate a significant change between the Build and No-Build alternatives.

Indirect effects would result from the proposed acceleration and construction of the Regional Toll Revenue Funding Initiative projects associated with the NCTCOG's Managed Lanes Excess Toll Revenue Sharing Policy. Under the Managed Lanes Excess Toll Revenue Sharing Policy, excess toll revenue would become available and distributed in the region in the form of Regional Toll Revenue Funding Initiative projects. In the foreseeable future, the IH 35E facility could substantially benefit communities in the project area by generating revenue for additional transportation projects that could also increase capacity, reduce traffic congestion, improve mobility, and improve design deficiencies within the region. Before implementation, Regional Toll Revenue Funding Initiative projects would be environmentally evaluated and would comply with applicable federal, state, and local requirements.

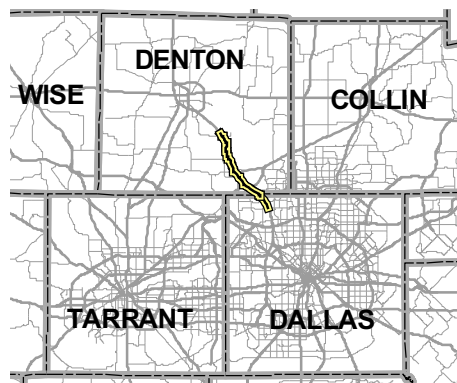
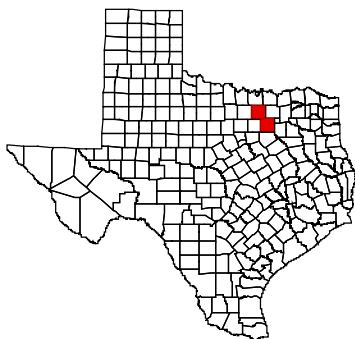
Policies to Mitigate Potential Land Use Impacts

The mitigation of the development within the study area considered for this assessment would rest with the agencies with the authority to implement such controls. This authority rests with the municipal governments and to a lesser extent, the county governments. Examples of municipal government regulations include tree ordinances and land development code. The responsibility of transportation providers such as TxDOT, local and regional transit agencies, and the local governments would be to implement a transportation system to complement the land use or development controls currently in place. As demonstrated here, all the affected municipalities have planning staff and various land use controls in place. Based on interviews with planners representing the six jurisdictions traversed by the proposed improvements, the municipalities are prepared to address direct impacts, redevelopment effects, and even some land use development induced in part by the proposed IH 35E improvements. None of the planners interviewed communicated that they were unprepared to address land use changes that would occur as a result of the proposed highway improvements; to the contrary, they would prefer for the construction project to take place rather than remain "in limbo."

APPENDIX



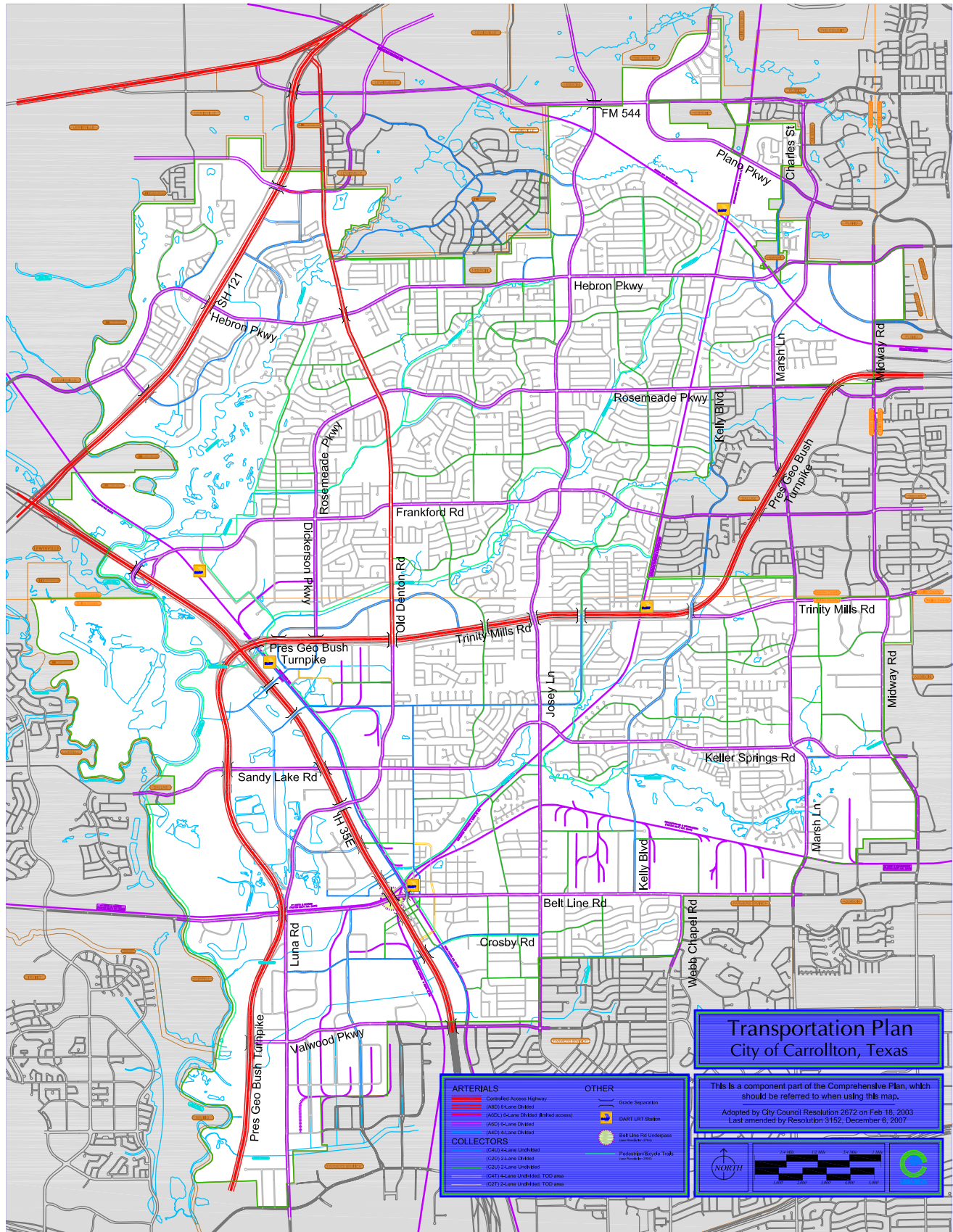
0 0.5 1 1.5 2 Miles

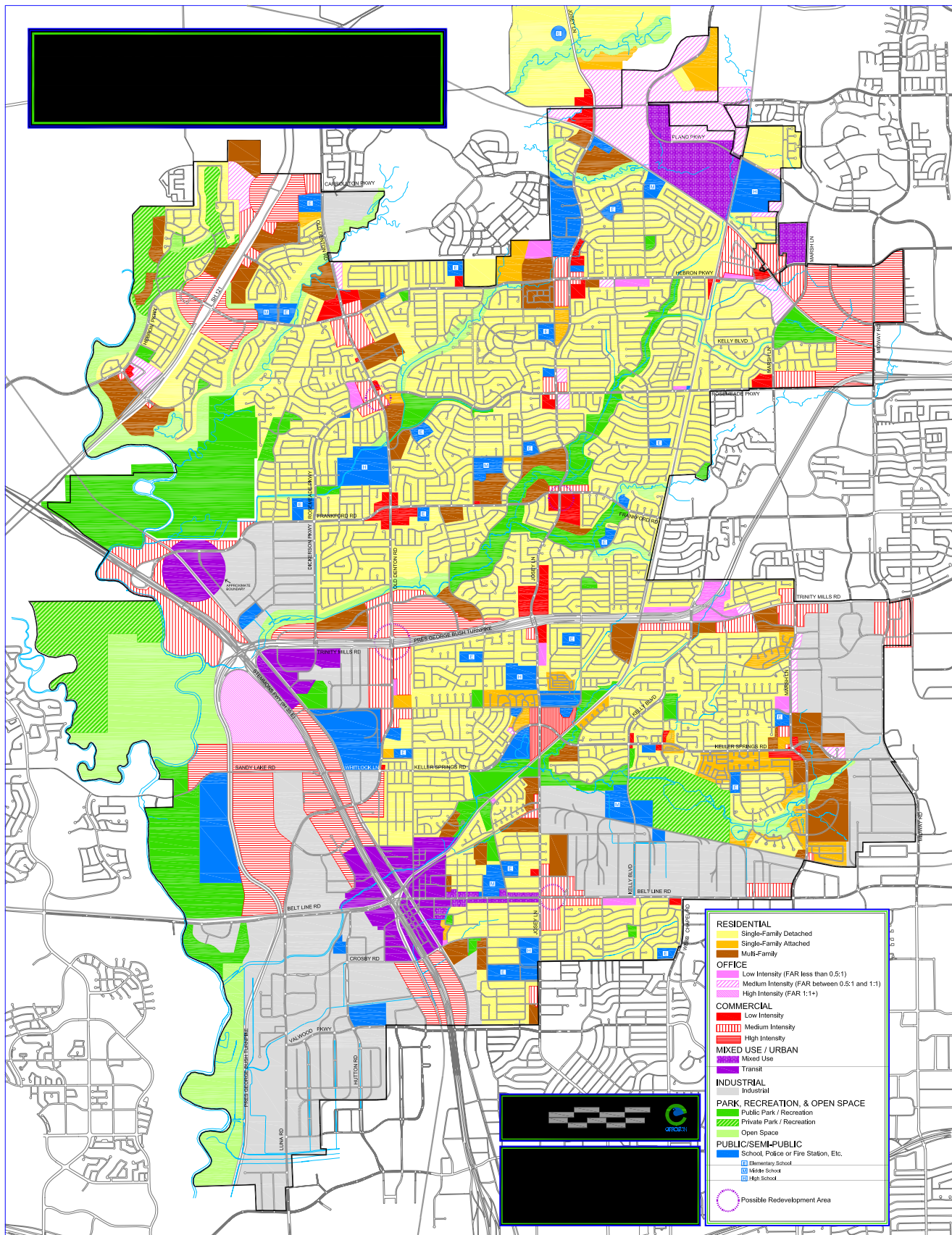


PROJECT LOCATION MAP

IH 35E
PGBT to FM 2181

DALLAS AND DENTON
COUNTIES, TEXAS





Roads

City Limits

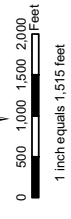
Type

Collector (60' ROW)

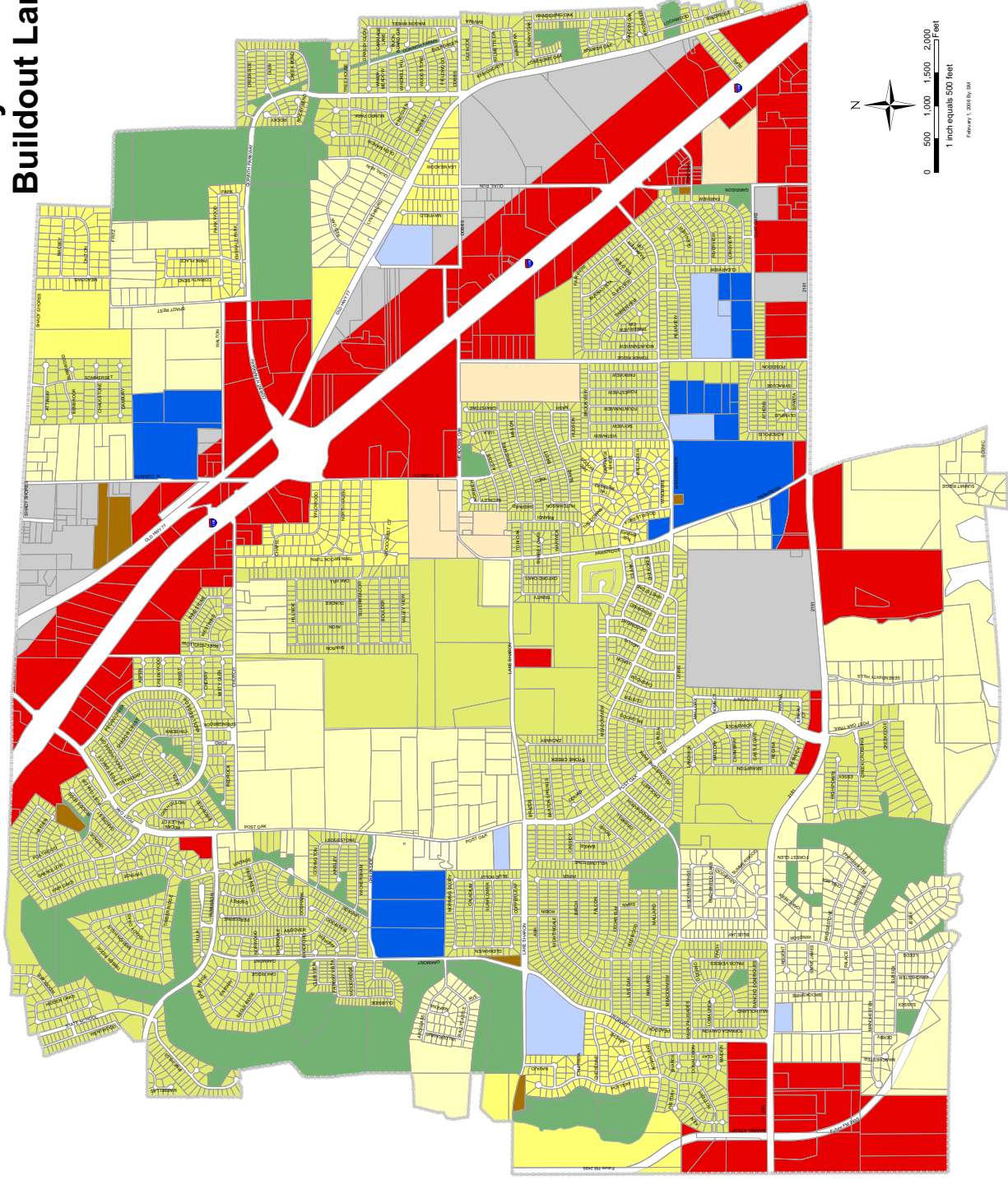
FM 2181 (Major Thoroughfare)

Future FM 2699 (Major Thoroughfare)

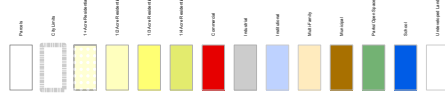
Thoroughfare (84' ROW)



City of Corinth Buildout Land Use



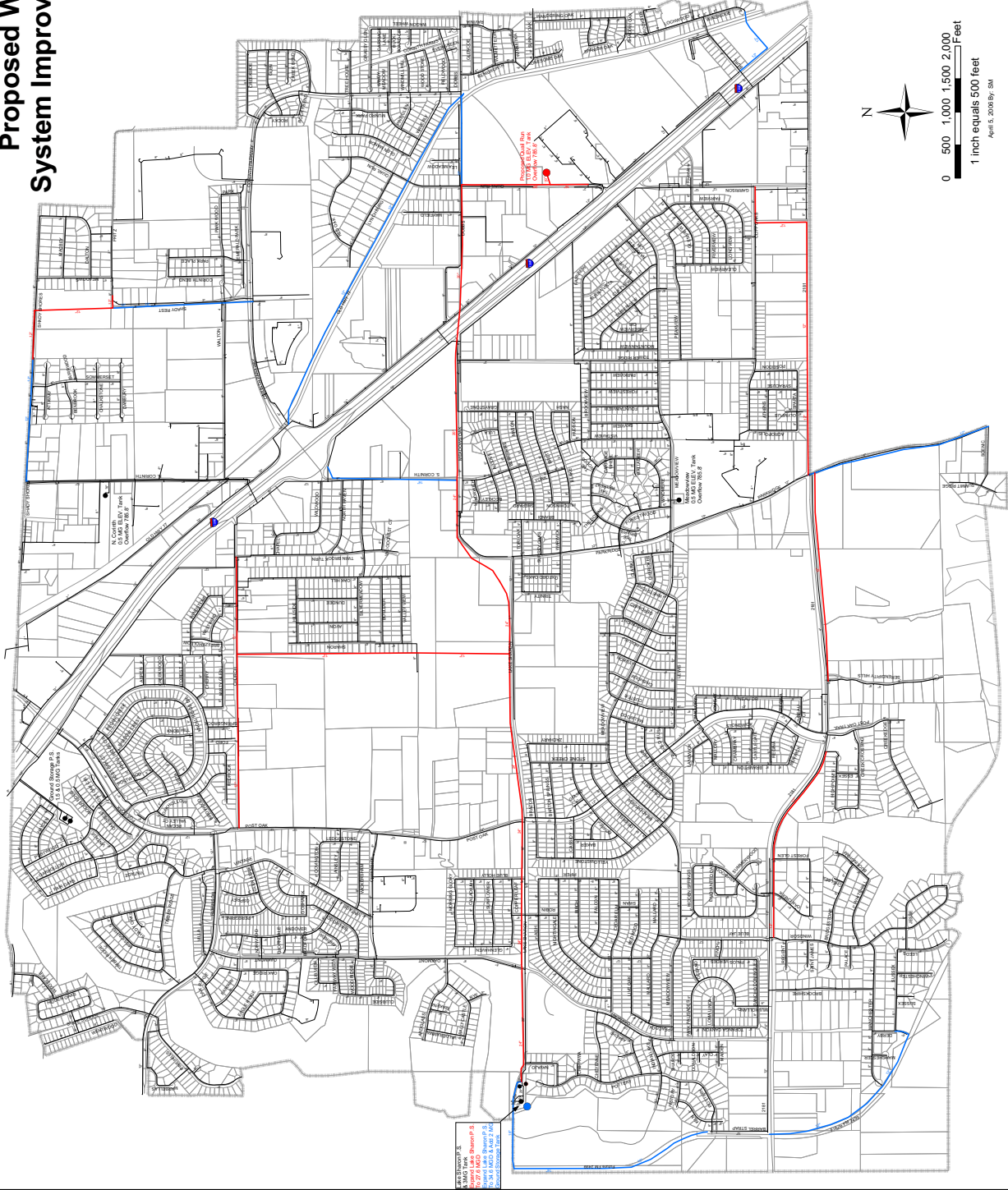
Legend



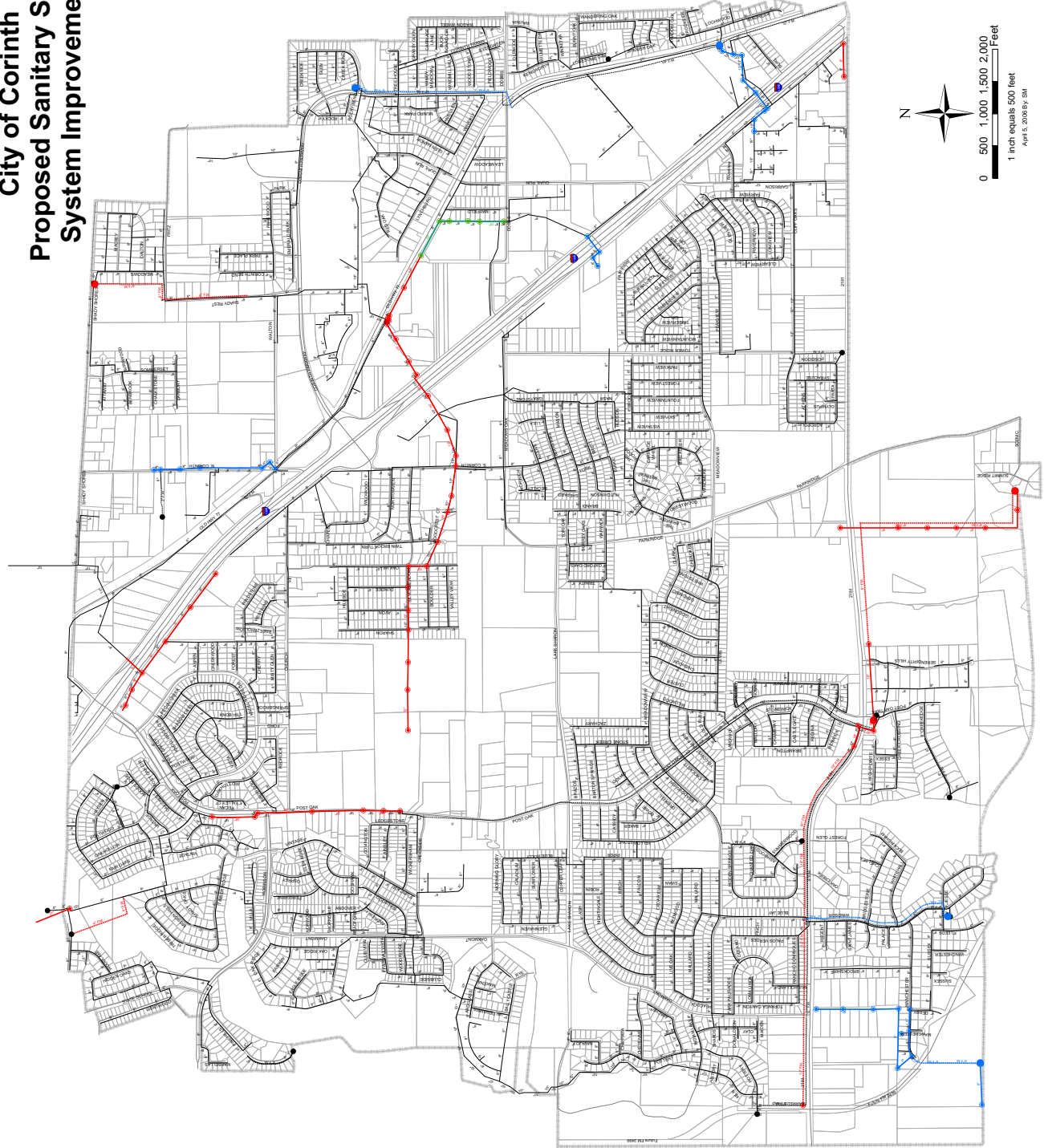
0 500 1,000 1,500 2,000 Feet
1 inch equals 500 feet
February 1, 2018 By GAI



City of Corinth Proposed Water System Improvements



City of Corinth Proposed Sanitary Sewer System Improvements



Legend

Right of Way
Existing Points
Type

Existing Sewer Lines
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

Proposed Sewer Lines
Type

Proposed Sewer Points
Type

0 500 1,000 1,500 2,000 Feet
1 inch equals 500 feet
April 5, 2008 by: SM

