



US 380 Denton County

From Interstate 35 to West of County Road 26

Feasibility Report

CSJs: 0135-10-061, 0135-10-062, 2250-02-022-022

August 2022

Table of Contents

1. Introduction	8
2. Background	9
2.1 Project Objective	9
2.2 Study Area	10
2.3 Existing Conditions.....	11
2.4 Project History and Previous Studies.....	13
a) Denton County Thoroughfare Plan.....	13
2.5 Regional Planning Context	15
2.6 Existing and Planned Transportation System	15
a) In-Progress Project.....	16
b) US 380 Collin County Feasibility Study.....	18
2.7 Other Major Roadways – Existing and Planned.....	19
a) Existing Roadways	19
b) US 377 Widening	24
c) FM 1385 Reconstruction	25
d) FM 2931 Reconstruction	26
e) SL 288 Frontage Roads.....	27
f) Interstate 35.....	28
g) Denton Greenbelt Corridor Feasibility Study.....	29
h) Dallas North Tollway (DNT) Extension	30
i) Parvin Road Reconstruction.....	31
3. Understanding Future Needs	32
3.1 Projected Regional Population and Employment Growth	32
3.2 Existing and Projected Travel Demand.....	36
3.3 Existing and Proposed Typical Sections	37
3.4 Physical Constraints.....	38
3.5 Safety	38
4. Determining Roadway Type Options.....	41
4.1 Modes of Transportation to Relieve Congestion.....	41
4.2 Roadway Typical Section Options	41
4.3 Travel Demand Modeling	42
4.4 Regional Traffic Analysis to Determine Need for Freeway	43
5. Freeway Alignment Analysis	45
5.1 Initial Alignments – Presented January 2019.....	45
5.2 Viable Alignments – Presented December 2020	48
5.3 Evaluation of Viable Alignments.....	49
a) Engineering/Mobility.....	49
b) Environmental	52
c) Economics	55
5.4 Developing a Recommended Alignment – January 2021 to December 2021	57
a) Recommended Alignment – Blue Alignment	57

b) Secondary Recommendation – Teal Alignment for Further Studies	57
5.5 Feedback on Recommendations – December 2021 to January 2022	60
6. Environmental Overview	61
6.1 Land Use – Existing and Planned	61
6.2 Socioeconomic Issues	62
6.3 Development and Possible Displacements – Residential and Commercial.....	63
6.4 Institutional Facilities.....	64
6.5 Emergency Service Facilities.....	66
6.6 Places of Worship	67
6.7 Cemeteries	70
6.8 Parks and Recreational Facilities	70
6.9 Potential Historic Resources	72
6.10 Waters of the United States (U.S.)	73
7. Public Involvement and Stakeholder Outreach	74
7.1 Public Meetings.....	74
a) Winter 2019	74
b) Winter 2020	74
c) Fall 2021	75
7.2 Collection Of Public Comments.....	76
7.3 How Input Impacted the Study.....	76
7.4 Local Government Coordination	77
a) Denton County.....	77
b) City of Denton.....	77
c) City of Frisco	78
d) Town of Little Elm.....	78
e) Town of Cross Roads	78
f) City of Aubrey.....	78
g) City of Celina.....	78
h) City of Krugerville	78
i) Town of Prosper	78
j) Town of Providence Village.....	78
7.5 State And Federal Agency Coordination	79
7.6 Online Outreach and Website	79
7.7 Database/Mailing List	82
8. Economic Analysis	83
8.1 Economic Impact Analysis by City (Sales and Property Tax)	83
8.2 Development Potential Analysis	88
9. Project Implementation Plan.....	90
9.1 Next Steps	90
9.2 Possible Independent Project Segmentation.....	91
9.3 Suggested Construction Phasing.....	94
9.4 Cost.....	97
9.5 Funding.....	97

9.6	Safety and Short-Term/Interim Projects	98
9.7	Recommended Future Feasibility Studies on Adjacent Corridors	98
9.8	Potential Minimization of Effects and Mitigation Strategies.....	98

List of Figures

Figure 2.1.1 Goals and Objectives.....	10
Figure 2.2.1 Study Area.....	11
Figure 2.3.1 US 380 East-West Studies and SL 288.....	12
Figure 2.3.2 Existing Typical Section.....	12
Figure 2.4.1 Denton County Thoroughfare Plan.....	14
Figure 2.6.1 Mobility 2045 Illustrative Map.....	16
Figure 2.6.2 In-Progress Project.....	17
Figure 2.6.3 US 380 Collin County Schematic Projects.....	18
Figure 2.7.1 US 377 Widening.....	24
Figure 2.7.2 FM 1385 Reconstruction.....	25
Figure 2.7.3 FM 2931 Reconstruction.....	26
Figure 2.7.4 SL 288 Frontage Roads.....	27
Figure 2.7.5 Interstate 35.....	28
Figure 2.7.6 Denton Greenbelt Corridor Feasibility Study.....	29
Figure 2.7.7 DNT Extension.....	30
Figure 2.7.8 Parvin Road Reconstruction.....	31
Figure 3.1.1 Historical and Forecasted Population.....	33
Figure 3.1.2 Estimated 2021 Congestion.....	34
Figure 3.1.3 Forecasted 2045 Congestion.....	34
Figure 3.1.4 Purpose of the US 380 Feasibility Study.....	35
Figure 3.2.1 Traffic ID Locations.....	37
Figure 3.5.1 2016-2020 Crashes Heat Map.....	39
Figure 3.5.2 2016-2020 Fatal and Severe Crashes Heat Map4.....	40
Figure 4.2.1 No-Build Option.....	41
Figure 4.2.2 Freeway Option.....	42
Figure 4.4.1 Lanes Warranted by Daily Traffic Volume.....	43
Figure 5.1.1 Initial Alignments.....	45
Figure 5.1.2 Key Factors for Consideration.....	45
Figure 5.1.3 Revised Initial Alignments Maps.....	47
Figure 5.2.1 Viable Alignments.....	48
Figure 5.3.1 Criteria Rating Scale.....	49
Figure 5.4.1 2045 Population Underrepresented Zones.....	58
Figure 5.4.2 Refined Viable Alignments.....	59
Figure 6.1.1 2015-2020 Land Use Changes.....	62
Figure 7.3.1 Public Meeting Photos.....	77
Figure 7.6.1 Screenshot of Project Webpage.....	80
Figure 7.6.1 Screenshot of Project Webpage (Continued).....	81
Figure 7.6.1 Screenshot of Project Webpage (Continued).....	82
Figure 9.1.1 Project Development Process.....	90

List of Tables

Table 2.7.1 Other Roadways within Study Area.....	19
Table 3.2.1 US 380/SL 288 Historic Traffic Data	36
Table 3.5.1 Total Crashes by Year and Severity 2016-2020	38
Table 3.5.2 Fatal and Serious Injury Crashes First Harmful Event	40
Table 5.3.1 2045 Forecasted Denton County Delay.....	49
Table 5.3.2 Crash Rate Analysis	50
Table 5.3.3 2045 Mobility Along Existing US 380/SL 288.....	51
Table 5.3.4 2020 and 2045 Comparison of Delay	52
Table 5.3.5 Parcels, Residential, and Commercial Impacts	53
Table 5.3.6 Future Residential and Commercial Development Impacts.....	54
Table 5.3.7 Floodplain and USACE Impacts.....	55
Table 5.3.8 Economics Summary	56
Table 5.4.1 Recommend Alignment Goals and Objectives.....	57
Table 5.4.2 Potential Future Range of East-West Travel Demand in Study Area.....	59
Table 6.2.1 EJSCREEN Socioeconomic Results	63
Table 6.4.1 Institutional Facilities within Study Area	64
Table 6.5.1 Emergency Service Facilities within Study Area	67
Table 6.6.1 Places of Worship within Study Area	67
Table 6.7.1 Cemeteries within Study Area.....	70
Table 6.8.1 Parks and Recreational Facilities within Study Area.....	71
Table 6.9.1 Potential Historic Resources.....	72
Table 7.1.1 Summary of Public Meetings	75
Table 7.5.1 Major Regional, State, and Federal Stakeholders.....	79
Table 8.1.1 2021 Property Tax Impact Analysis	84
Table 8.1.2 2019 Sales Tax Impact Analysis	85
Table 8.1.3 2021 Property and Sales Tax Impact Analysis.....	87
Table 8.1.4 2019 Sales Tax Impact Analysis.....	87
Table 8.2.1 Vacant Parcel Analysis	89
Table 9.2.1 Possible Independent Project Segments	91
Table 9.2.2 Possible Duration of Project Phases	93
Table 9.3.1 Suggested Construction Phasing by Project Segment	94
Table 9.4.1 Cost Estimate for Project Segments by Cost Category.....	97

List of Appendices

Appendix A: Preliminary Environmental Constraints Map 100

Appendix B: EJSCREEN Part 1..... 101

Appendix C: EJSCREEN Part 2..... 102

Appendix D: Public Meeting Summary #1..... 103

Appendix E: Public Meeting Summary #2 104

Appendix F: Public Meeting Summary #3 105

Appendix G: City of Little Elm Resolution 106

List of Acronyms

<u>Acronym</u>	<u>Definition</u>
AADT	Annual Average Daily Traffic
CFR	Code of Federal Regulations
CSJ	Control Section Job
DFW	Dallas-Fort Worth
DNT	Dallas North Tollway
EJ	Environmental Justice
FHWA	Federal Highway Administration
FM	Farm to Market Road
FONSI	Finding of No Significant Impact
ISD	Independent School District
LOS	Level of Service
MPH	miles per hour
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act of 1969
NTTA	North Texas Tollway Authority
RTC	Regional Transportation Council
SH	State Highway
SL	State Loop
TIP	Transportation Improvement Program
TxDOT	Texas Department of Transportation
U.S.	United States
US	United States Highway
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
V/C	Volume to Capacity Ratio
VMT	Vehicle Miles of Travel
%	Percent

1. Introduction

This report documents findings from the Texas Department of Transportation (TxDOT) Dallas District United States Highway 380 (US 380) Denton County Feasibility Study and outlines an implementation plan for the potential project(s).

Working with Denton County and regional leaders, TxDOT started this feasibility study in March 2018 to identify a recommended corridor and appropriate roadway type. The roadway would need to accommodate the projected east-west travel demand and provide a safe and accessible facility to support east-west mobility across Denton County in the year 2045 and beyond. As the population of Denton County grows, the options to build a new roadway or expand the existing US 380 become more limited and potential impacts to residential and commercial developments increase. The intent of this feasibility study was to start to identify a roadway alignment or alignments to serve as a blueprint to begin land banking or preserving land now.

During the study, TxDOT developed and evaluated roadway options and many potential alignment options, including using the existing alignment and new location alignments, based on engineering factors and environmental constraints.

After three years of study, TxDOT publicly announced its recommended freeway alignment in November 2021.

2. Background

2.1 Project Objective

Denton County is located in the northern part of the Dallas-Fort Worth (DFW) metropolitan area and is the fourth most populous county in the region, with a 2021 estimated population of 941,647 according to the United States Census Bureau. Rapid population growth is placing pressure on roadways in Denton County. US 380, which serves as one of the only major east-west connections between Collin and Denton counties, does not have the capacity to meet the current demand of roadway users, leading to extremely congested conditions. Population growth is only expected to continue in Denton County as the DFW region expands. These reasons sparked the need for this feasibility study in 2018. TxDOT has since evaluated recommendations for how to address long-term needs and demand using research, data collection and analysis, and public input.

This report will document the findings of the feasibility of roadway improvements to US 380, and other potential roadway alignments.

The goal of this study is to improve east-west mobility in Denton County and to improve regional connectivity with an east-west connection between Collin and Denton counties. A feasibility study was conducted in order to determine the best method of achieving this goal, taking into account projected population growth and the vital need for mobility within Denton County and across Collin and Denton counties. TxDOT uses feasibility studies, among other planning tools, when a project is in early stages of development. Feasibility studies help determine how a project should proceed and guides more in-depth environmental analysis, public involvement, schematic design and right of way mapping. This report also describes the process of determining a select number of Viable Alignments and identifying a Recommended Alignment considering the following goals and objectives in **Figure 2.1.1**.

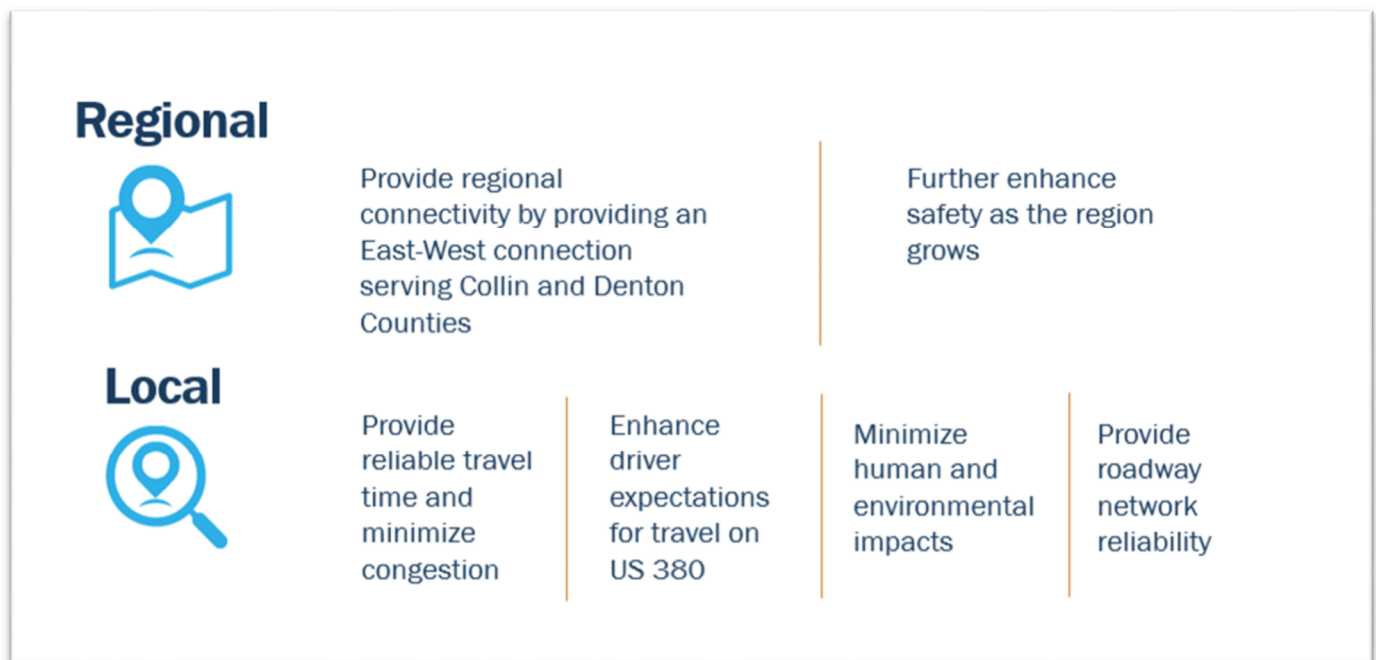


Figure 2.1.1 Goals and Objectives

2.2 Study Area

The project's limits are within the Study Area shown in **Figure 2.2.1**, with Ray Roberts Lake as the northern limit, Interstate 35 (I-35)/I-35E as the western limit, Eldorado Parkway as the southern limit, and State Highway 289 (SH 289) as the eastern limit. Topography in the Study Area is mostly flat terrain. The Study Area is approximately 322 square miles and consists of 12 municipalities including Aubrey, Celina, Cross Roads, Denton, Frisco, Krugerville, Little Elm, Oak Point, Pilot Point, Prosper, Providence Village, and Sanger.

Three control-section-jobs (CSJs) are in the Study Area and include:

- CSJ 0135-10-061: US 377/US 380 between State Loop (SL) 288 in Denton and US 377 in Cross Roads (4.5 miles)
- CSJ 0135-10-062: US 380 between US 377 in Cross Roads and the Collin County Line (10.3 miles)
- CSJ 2250-02-022: SL 288 between I-35 and US 377/US 380 (6.4 miles)

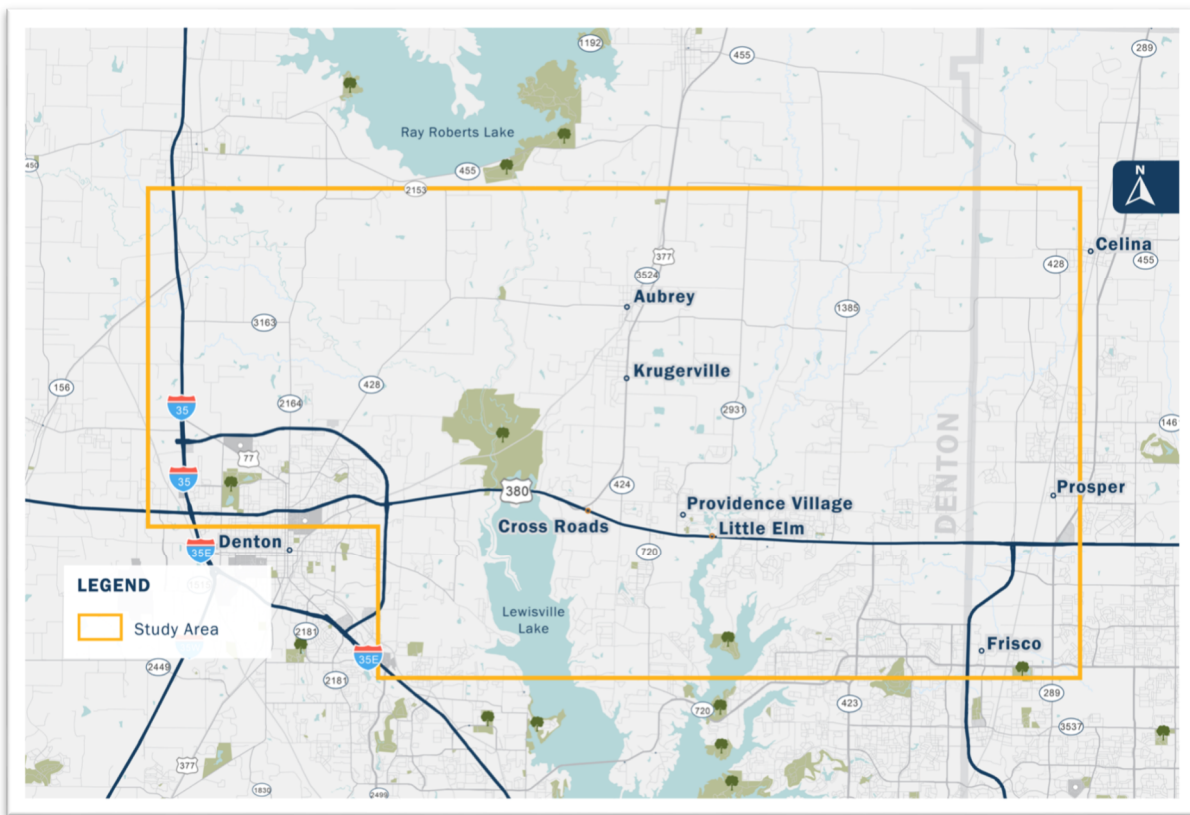


Figure 2.2.1 Study Area

The US 380 corridor has multiple designations such as University Drive, US 377, and simply US 380. For this report and the following sections, the corridor will be referred to as US 380.

2.3 Existing Conditions

In order to fully understand the importance of the regional connectivity that is provided by US 380, it is important to identify all major highways and other high-traffic roadways within the Study Area, and to clearly define the existing roadway design of US 380 and SL 288.

US 380

US 380 runs east-west through Wise, Denton, Collin, and Hunt counties. It provides regional connectivity similar to that of Interstate 20, as seen in **Figure 2.3.1**. US 380 is currently a four-to-six-lane arterial with a two-way left turn lane separating opposing lanes of traffic. Lane widths are 12 feet and the right of way varies from 120 feet to 180 feet. A graphic of the existing US 380 typical section is shown in **Figure 2.3.2**. The average 2020 traffic count for US 380 within the study limits is 39,380 annual average daily traffic (AADT). Several signalized and two-way stop-controlled intersections exist along the corridor, creating traffic congestion issues during peak hours of travel. Level of service (LOS) on US 380 is given an “F” rating within the Study Area (which, based on a scale of A-F, is the worst possible rating by engineering standards). The lack of a median or inside barrier also creates safety issues for drivers on this high-speed arterial with speed limits up to 65 miles per hour (MPH). Drivers making left turns onto US 380 create a safety risk with oncoming traffic.

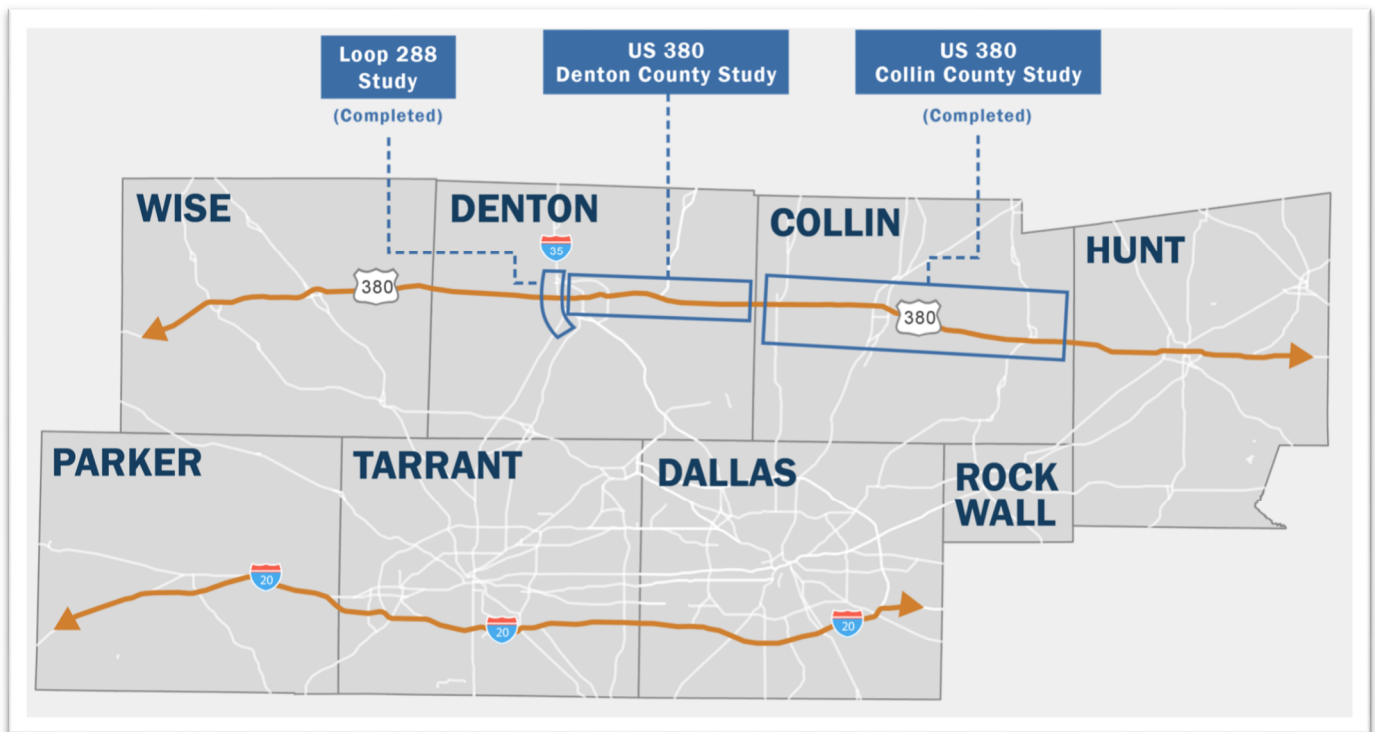


Figure 2.3.1 US 380 East-West Studies and SL 288

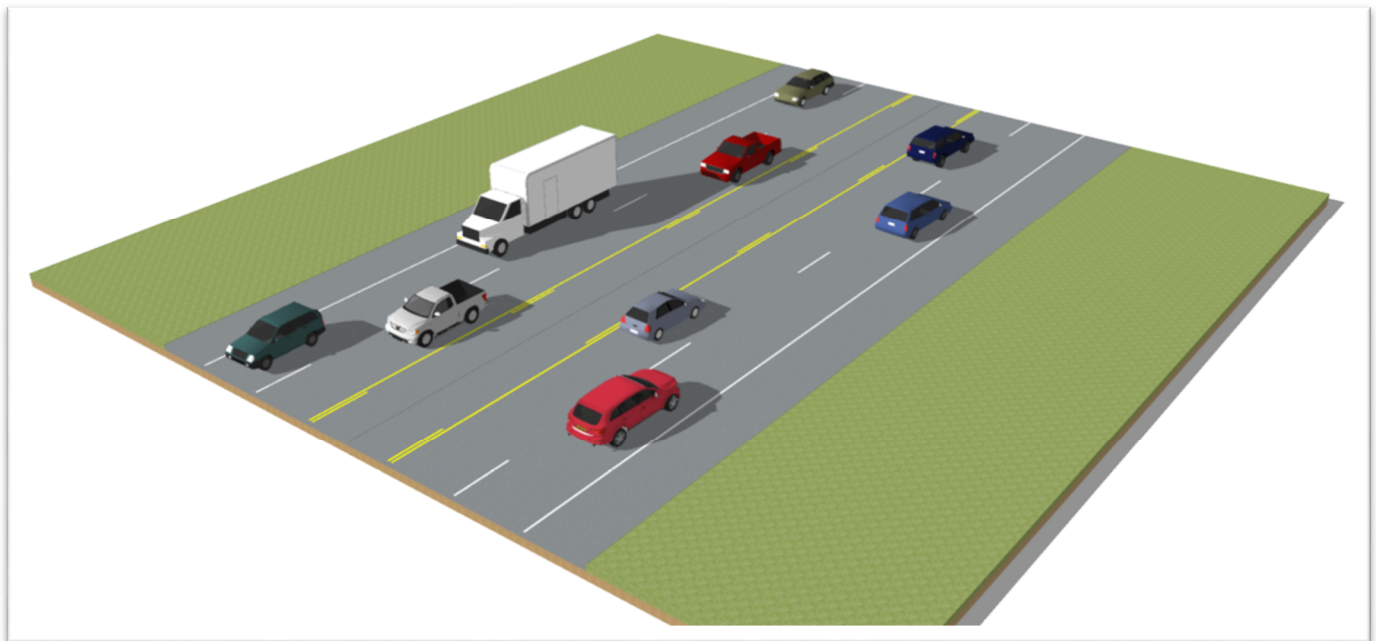


Figure 2.3.2 Existing Typical Section

SL 288 is a partially controlled access state highway that wraps around the northeastern half of the City of Denton. It is currently a four-lane highway with lane widths of 12 feet, a 36-foot minimum median, and right of way varying from 120 to 180 feet. SL 288 has one signalized intersection north of US 380. All other cross street connections use an overpass for the SL 288 mainlanes and are either diamond interchanges or two-way stop-controlled intersections. The posted speed limit on SL 288 is 60 MPH. The average 2020 traffic count on SL 288, within the study limits, is 19,932 AADT.

2.4 Project History and Previous Studies

a) *Denton County Thoroughfare Plan*

The [Denton County Thoroughfare Plan](#) identifies US 380 as a roadway with LOS F, and states the need for improved east-west connectivity and mobility. The Thoroughfare Plan lists the following roadway network changes that address the lack of connectivity:

- Extension of Frontier Parkway as a four-to-six-lane arterial, parallel facility to the north of US 380, connecting to US 377
- Extension of Ike Byrom Road, parallel facility to the north of US 380, east from US 377 towards Dallas North Tollway (DNT)
- Creation of a parallel, east-west facility to the south of US 380
- Extension of Main Street/King Road west to Farm to Market (FM) 720/Eldorado Parkway
- Extension of Collin County Outer Loop west through Denton County to I-35
- Extension of SL 288 west between I-35 and I-35W
- Grade separations on US 380 at major cross streets including FM 423, Navo Road, and FM 720

These changes, amongst other recommended roadway improvements, are shown in **Figure 2.4.1**.

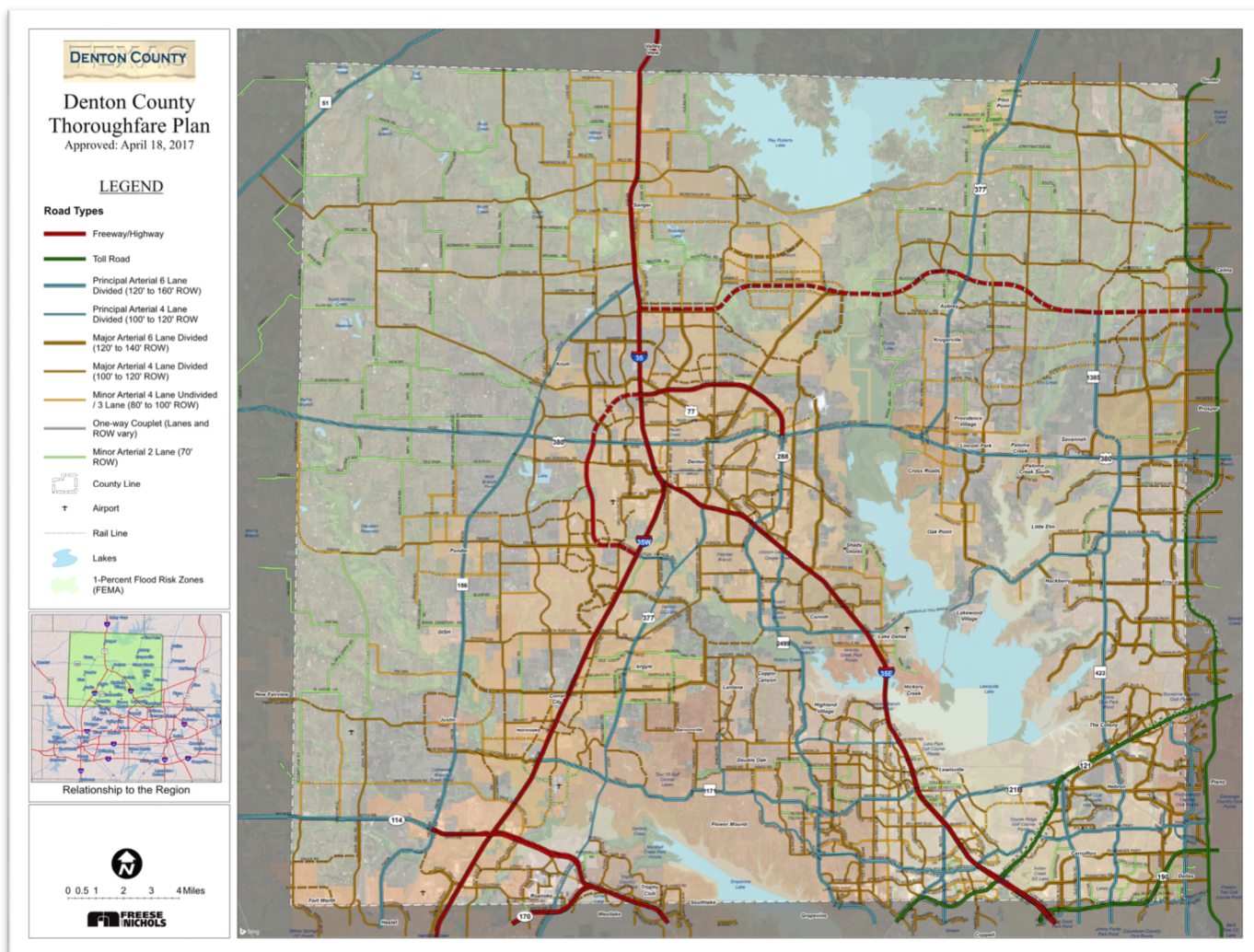


Figure 2.4.1 Denton County Thoroughfare Plan

2.5 Regional Planning Context

The North Central Texas Council of Governments (NCTCOG) is a voluntary association of, by, and for local governments, and was established to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. NCTCOG serves a 16-county region of North Central Texas, which is centered around the two urban centers of Dallas and Fort Worth. NCTCOG has over 230 member governments including 16 counties, numerous cities, school districts, and special districts. NCTCOG serves as the metropolitan planning organization (MPO) for regional transportation planning in the DFW area. The Regional Transportation Council (RTC) is the independent transportation policy body of the MPO and is comprised of elected officials and appointed staff representing the counties, municipalities, and transportation providers in the region. Since the early 1970s, MPOs have had the responsibility of developing and maintaining a metropolitan transportation plan (MTP). The MTP is a federally mandated document that serves to identify transportation needs and guides federal, state, and local transportation expenditures. The MTP includes over 70 policies set by the RTC to help guide the development, implementation, and operation of transportation projects. For example, RTC policy FT3-008 encourages the early preservation of right of way in recommended corridors, and FT3-009 encourages the preservation of right of way in all freeway/tollway corridors to accommodate the ultimate new location, access-controlled transportation facility that would meet the long-term needs of the region.

Mobility 2045 is the defining vision or plan for transportation systems and services in the DFW metropolitan area. Serving as a guide for the expenditure of state and federal funds through the year 2045, 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.

Transportation plans such as Mobility 2045, according to the Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users, metropolitan planning regulations, must be “fiscally constrained,” that is, based on reasonable assumptions about future transportation funding levels. Because the DFW area is designated as a marginal non-attainment area for the eight-hour ozone standard, the Clean Air Amendments Act of 1990 requires the transportation plan to be in conformity with the State Implementation Plan for air quality to demonstrate that projects in the MTP meet air quality goals.

2.6 Existing and Planned Transportation System

Within the Study Area, there are numerous existing and planned transportation facilities that provide access and circulation. In the Mobility 2045 plan, NCTCOG identified future regional roadway corridors for which a need exists. **Figure 2.6.1** shows the Mobility 2045 illustrative map that includes the east-west US 380 facility between SL 288 and the Collin County line. TxDOT will work with NCTCOG to incorporate the recommended alignment into the next MTP.

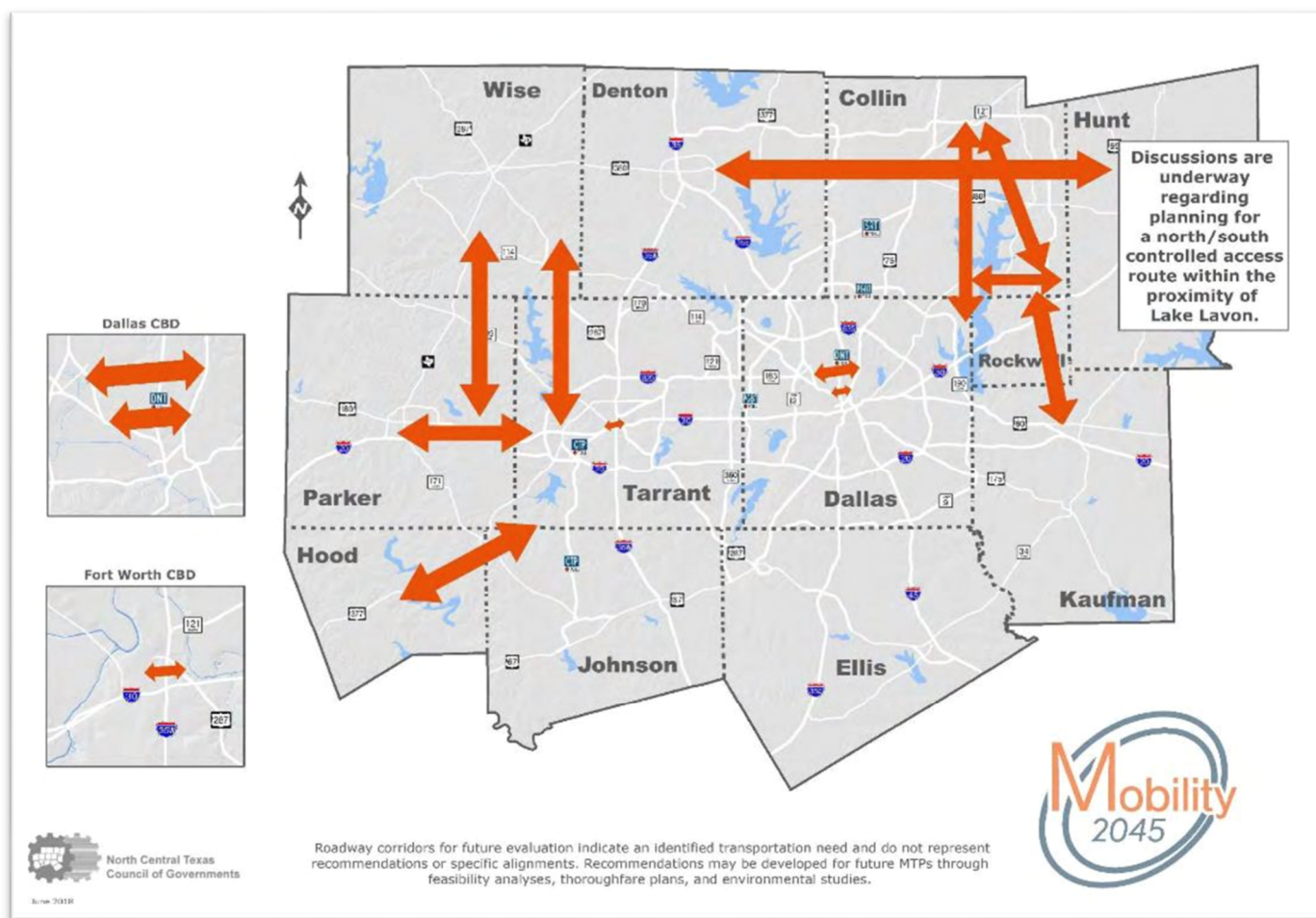


Figure 2.6.1 Mobility 2045 Illustrative Map

The following projects will modify US 380 within the Study Area.

a) In-Progress Project

A TxDOT roadway project is currently in progress for US 380 between SL 288 and west of County Road (CR) 26 (Collin County Line). This project will widen this portion of the corridor from four lanes to six lanes divided with a raised median. Grade separations will be applied at five major intersections along US 380, indicated by the red stars in **Figure 2.6.2**. The project's mainlanes were designed as urban streets with a design speed of 45 MPH. The ramps at grade separations have a design speed of 35 MPH. The five cross streets with grade separations are FM 720, Navo Road, FM 423, Teel Parkway, and Legacy Drive. The project is estimated to have a construction cost of \$156.4 million. Construction began in early 2022 and is anticipated to take three to four years to complete. The purpose of this project, as defined by TxDOT, is to improve mobility by increasing capacity and reducing traffic congestion. The CSJ numbers for this project are 0135-10-057 and 0135-10-050.

The feasibility study acknowledges this in-progress project and evaluates the proposed typical section as the No-Build alternative.



Figure 2.6.2 In-Progress Project

b) US 380 Collin County Feasibility Study

TxDOT completed the US 380 Collin County Feasibility Study in early 2020. The Collin County study recommendation resulted in the identification of five freeway projects along US 380 in Collin County in order to address the mobility issues within the area. These five freeway projects are shown in **Figure 2.6.3**. TxDOT has started the process to complete more in-depth environmental studies, public involvement, and schematic design for each of these projects. The following are the five Collin County projects currently being advanced under National Environmental Policy Act of 1969 (NEPA):

- CSJ 0135-11-024: US 380 from west of CR 26 (Denton County line) to Coit Road
- CSJ 0135-02-065 and 0135-03-053: US 380 from Coit Road to FM 1827
- CSJ 0364-04-051 Spur 399 from US 75 to US 380
- CSJ 0135-04-036 and 0135-03-053: US 380 from FM 1827 to CR 560
- CSJ 0135-05-028: US 380 from CR 560 to CR 699 (Hunt County line)

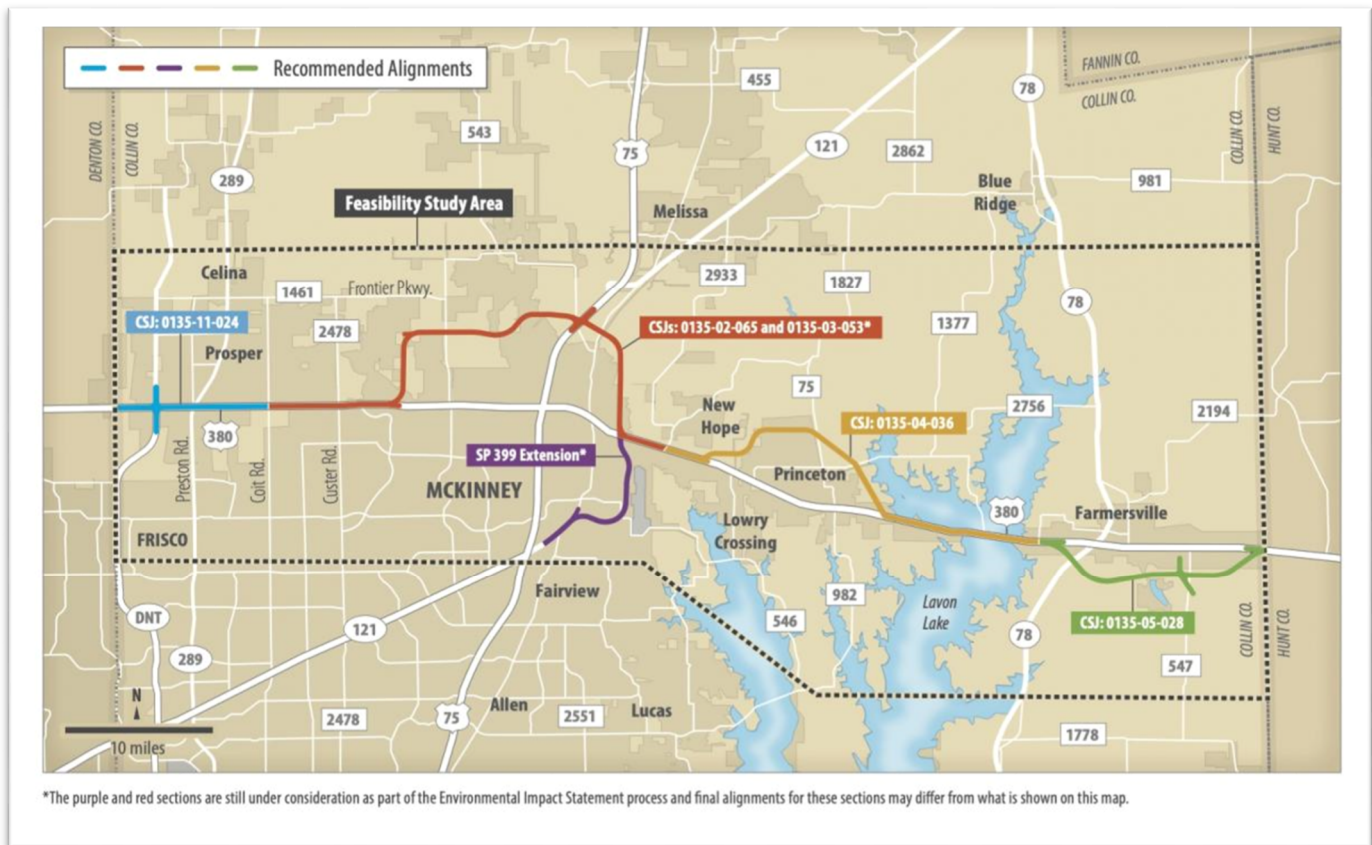


Figure 2.6.3 US 380 Collin County Schematic Projects

As part of the study, the City of Frisco and Town of Prosper coordinated with TxDOT on a preliminary concept that extended the freeway from Collin County into Denton County to FM 423. These projects will advance at different paces depending on needs and availability of funding.

2.7 Other Major Roadways – Existing and Planned

The study team gathered the following information on other existing and planned roadways within the Study Area from a variety of sources including discussions with city and county staff.

a) Existing Roadways

Below, Table 2.7.1 outlines additional roadways in the Study Area.

Table 2.7.1 Other Roadways within Study Area

Facility	Direction of Facility	Existing Facility	Facility Type
US 77	Northwest-Southeast	US 77 (N Elm St) is a four-lane divided arterial that crosses under SL 288 near I-35. A diamond interchange connects US 77 to SL 288. The posted speed limit on US 77 near this interchange is 55 MPH. The latest traffic count recorded near the interchange was in 2017 at 10,562 AADT.	Four-lane divided arterial
Farm to Market Road (FM) 2164	North-South	FM 2164 (N Locust St) is a two-lane undivided road that crosses under SL 288 at a perpendicular angle. A diamond interchange connects FM 2164 to SL 288. The posted speed limit on FM 2164 near this interchange is 45 MPH. The latest traffic count recorded near the interchange was in 2014 at 5,132 AADT.	Two-lane undivided road
FM 428	North-South	FM 428 (E Sherman Drive) is a roadway that crosses under SL 288 at a perpendicular angle. A diamond interchange	Two-lane undivided road north of the interchange, and a four-lane undivided road to the south

Facility	Direction of Facility	Existing Facility	Facility Type
		connects FM 428 to SL 288. FM 428 is a two-lane undivided road north of the interchange, and a four-lane undivided road to the south. The posted speed limit near the interchange is 45 MPH. The latest traffic count recorded near the interchange was in 2017 at 7,163 AADT.	
N Mayhill Road	North-South	N Mayhill Road is a two-lane undivided road that intersects the south side of US 380 at a perpendicular angle. The four-way signalized intersection is located approximately $\frac{1}{2}$ mile to the east of the US 380/SL 288 interchange. Cooper Creek Road serves as the north leg of the intersection with US 380 and is travelled far less than N Mayhill Road. The posted speed limit on the south leg of the intersection is 35 MPH. The latest traffic count recorded near the intersection was in 2014 at 6,674 AADT.	Two-lane undivided road
FM 424	North-South	FM 424 is a two-lane undivided road that intersects the north side of US 380 at a perpendicular angle. The four-way signalized intersection is located approximately $\frac{1}{2}$	Two-lane undivided road

Facility	Direction of Facility	Existing Facility	Facility Type
		<p>mile to the west of the entrance to the nearby Walmart Supercenter. Naylor Road is a four-lane undivided road that serves as the south leg of the intersection with US 380. The posted speed limits near the intersection are 55 MPH on the north leg and 45 MPH on the south leg. The latest traffic count recorded on the north leg was in 2017 at 8,082 AADT. The latest traffic count recorded on the south leg was in 2014 at 5,479 AADT.</p>	
FM 720	North-South	<p>FM 720 is a six-lane arterial that intersects the south side of US 380 at a perpendicular angle. The four-way signalized intersection is located approximately 1/2 mile to the east of the entrance to the nearby Walmart Supercenter. Oak Grove Lane is a two-lane undivided road that serves as the north leg of the intersection with US 380 and is travelled far less than FM 720. The posted speed limit on the south leg of the intersection is 55 MPH. The latest traffic count recorded on the</p>	Six-lane arterial

Facility	Direction of Facility	Existing Facility	Facility Type
		south leg was in 2017 at 12,505 AADT.	
FM 2931	North-South	FM 2931 is a two-lane undivided road that intersects the north side of US 380 at a perpendicular angle. The three-way signalized intersection is located approximately one mile to the west of the Lewisville Lake bridge crossing. The posted speed limit on FM 2931 near the intersection is 60 MPH. The latest traffic count recorded near the intersection was in 2017 at 7,879 AADT.	Two-lane undivided road
Navo Road	North-South	Navo Road is a four-lane divided road that intersects US 380 at a perpendicular angle. Ray Braswell High School is in the southeast quadrant of the four-way signalized intersection. The posted speed limit on Navo Road near the intersection is 35 MPH. The latest traffic count recorded near the intersection was in 2014 at 6,701 AADT.	Four-lane divided road
FM 1385	North-South	FM 1385 is a two-lane undivided road that intersects the north side of US 380 at a perpendicular angle. The three-way intersection with US 380 is	Two-lane undivided road

Facility	Direction of Facility	Existing Facility	Facility Type
		signalized. The posted speed limit on FM 1385 is 55 MPH. The latest traffic count recorded near the intersection was in 2017 at 13,421 AADT.	
FM 423	North-South	FM 423 is a four-lane divided arterial that intersects the south side of US 380 at a perpendicular angle. The four-way signalized intersection with US 380 is located approximately three and a half miles to the west of DNT. Gee Road narrows down from a four-lane divided arterial to a two-lane undivided road that serves as the north leg of the intersection with US 380 and is travelled far less than FM 720. The posted speed limit on FM 423 is 50 MPH. The latest traffic count recorded near the intersection was in 2017 at 16,538 AADT.	Four-lane divided arterial

b) US 377 Widening

TxDOT is planning to widen US 377 from Business (BUS) 377E to US 380 through the cities of Pilot Point, Aubrey, and Krugerville, and the Town of Cross Roads in Denton County, Texas. This will include widening approximately 13.7 miles of US 377 from a two-lane rural roadway to a six-lane urban roadway with a raised median. A public hearing was held on November 19, 2020, and the project received a Finding of No Significant Impact (FONSI) approval for the Preferred Alternative in February 2021. This project is anticipated to let for construction in 2028. This proposed project is shown in **Figure 2.7.1** in orange.

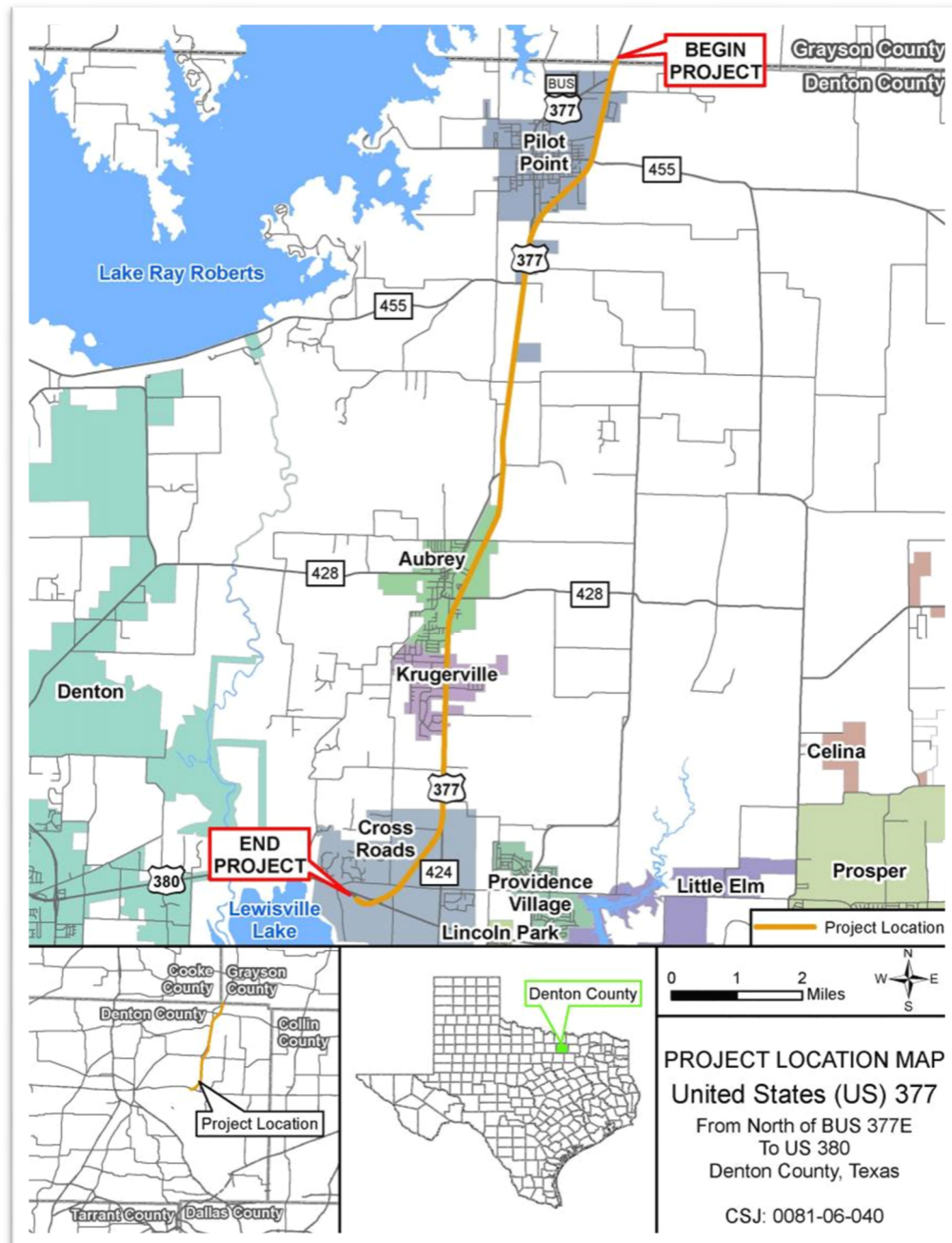


Figure 2.7.1 US 377 Widening

c) FM 1385 Reconstruction

Reconstruction is proposed for the approximately 12-mile section of FM 1385 between US 380 and FM 455. The existing FM 1385 is a two-lane rural highway with 12-foot-wide shoulders within the existing right of way varying from 80 to 120 feet wide. The proposed FM 1385 would be reconstructed as a six-lane divided urban facility. In addition, a potential reroute of the central portion of FM 1385 is being evaluated. The 0.9-mile-long potential reroute is located south of Mustang Road and would directly connect FM 1385 to the north and south without requiring vehicles to travel along the Mustang Road portion of the existing FM 1385. This proposed project is shown in **Figure 2.7.2** in red.

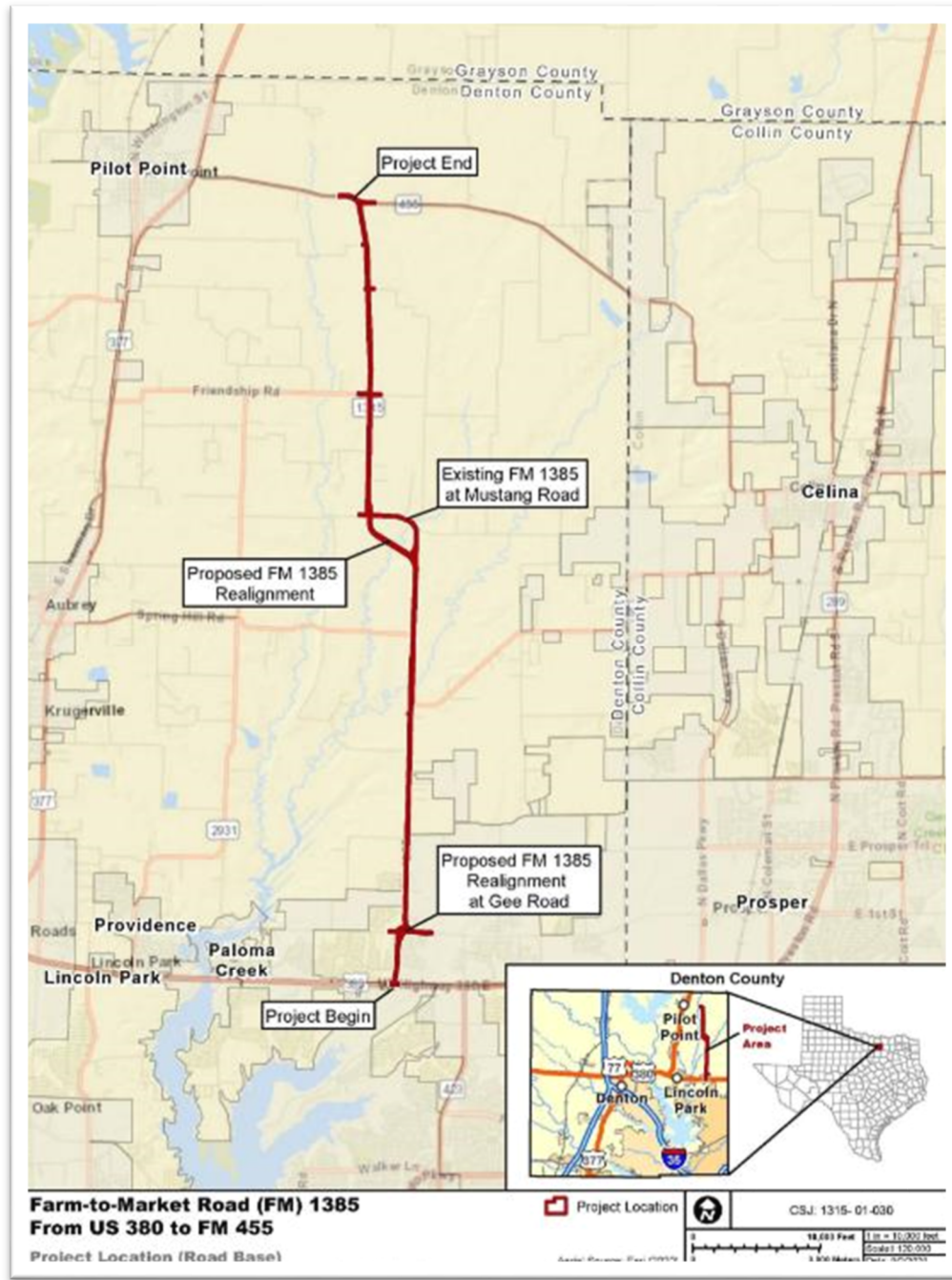


Figure 2.7.2 FM 1385 Reconstruction

d) FM 2931 Reconstruction

Reconstruction is proposed for the approximately 6.4-mile section of FM 2931 between US 380 and FM 428. FM 2931 is currently a rural two-lane roadway. The existing right of way width is approximately 100 feet. The proposed FM 2931 reconstructed roadway would be a four-lane urban roadway with turn lanes (with a future buildout to six-lanes). The proposed right of way would be approximately 140 to 153 feet wide. The proposed project will affect the Town of Providence Village, the Town of Little Elm, the City of Aubrey, and Denton County. This proposed project is shown in **Figure 2.7.3** in red.



Figure 2.7.3 FM 2931 Reconstruction

e) SL 288 Frontage Roads

TxDOT is currently developing the proposed SL 288 project which includes the construction of a four-lane new location frontage road system from I-35W south of Denton to I-35 north of Denton, in Denton County, Texas. The proposed project is approximately 9.0 miles in length with a median that would accommodate the future construction of a mainline roadway. At this time, only the construction of the frontage road system is planned. The new location SL 288 frontage road system would include a northbound and southbound frontage road facility. For rural areas, the roadway would consist of two travel lanes (one 12-foot-wide lane and one 14-foot-wide lane for bicycle accommodation) and eight-foot-wide inside and outside shoulders in each direction, with open ditch drainage. For urbanized areas, the roadway would consist of two travel lanes (one 12-foot-wide lane and one 14-foot-wide lane for bicycle accommodation) in each direction, with curb and gutter drainage. The roadway would also include six-foot-wide sidewalks along both sides of the road throughout the project limits. This proposed project is shown in **Figure 2.7.4** in blue.

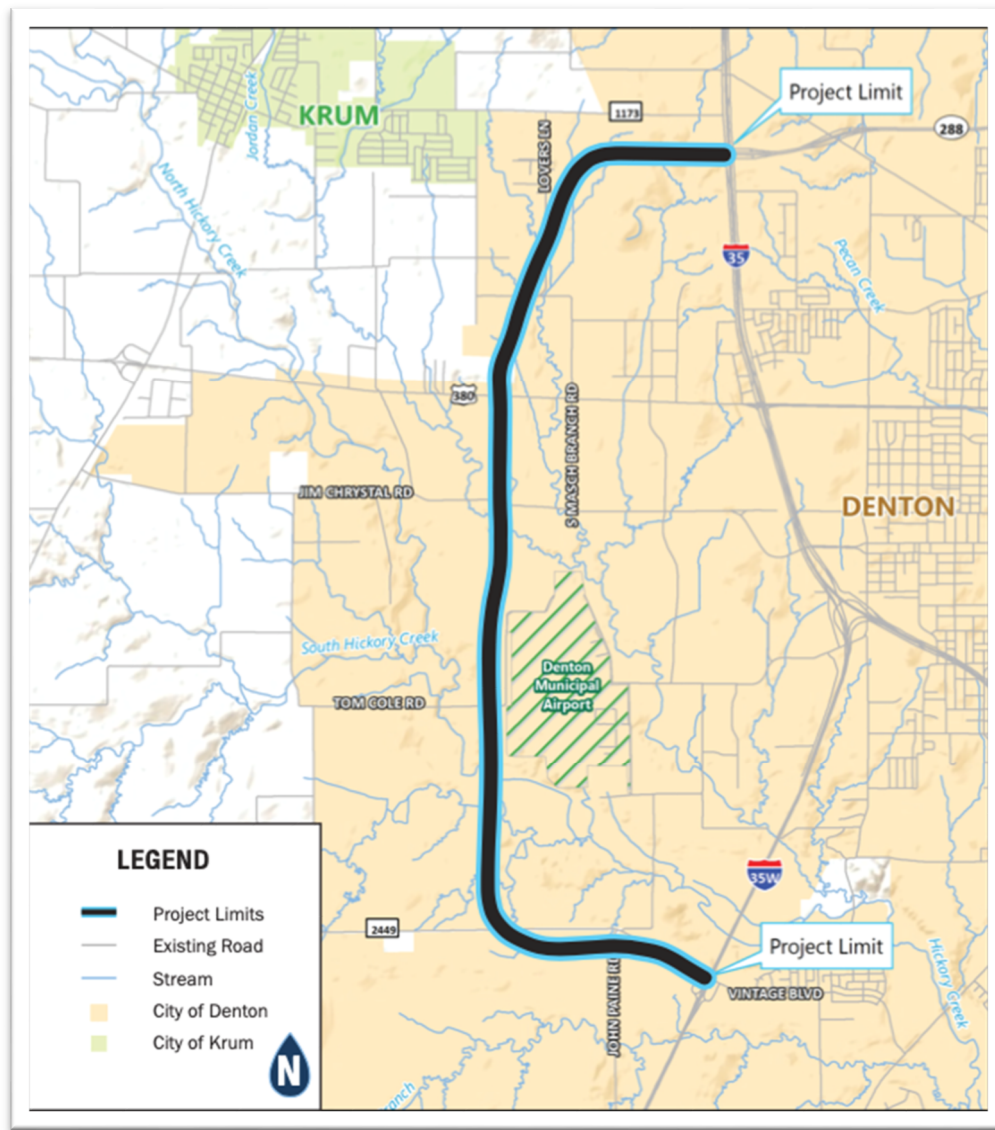


Figure 2.7.4 SL 288 Frontage Roads

f) *Interstate 35*

A project on I-35 is proposed to widen and reconstruct the interstate in Denton and Cooke counties between US 380 and approximately 0.7 mile north of FM 3002 for a total distance of approximately 15 miles. The project consists of three mainlanes in each direction and two frontage road lanes in each direction along the project corridor. The existing interchanges are proposed to be reconstructed to accommodate two-way cross streets and one-way frontage road operations and turnarounds. In addition, existing ramps are proposed to be reconfigured from a "diamond" to an "X" ramp configuration at each intersection. Overall, three intersections are proposed for reconstruction and 47 ramps are proposed to be reversed, relocated, or modified to improve mobility and safety. A public hearing for the project was held on April 4, 2019 and a FONSI was issued on October 7, 2019. This project is anticipated to be phased with the first section, from US 380 to US 77 north of Denton, to be let for construction in 2023. This proposed project is shown in **Figure 2.7.5** in red.

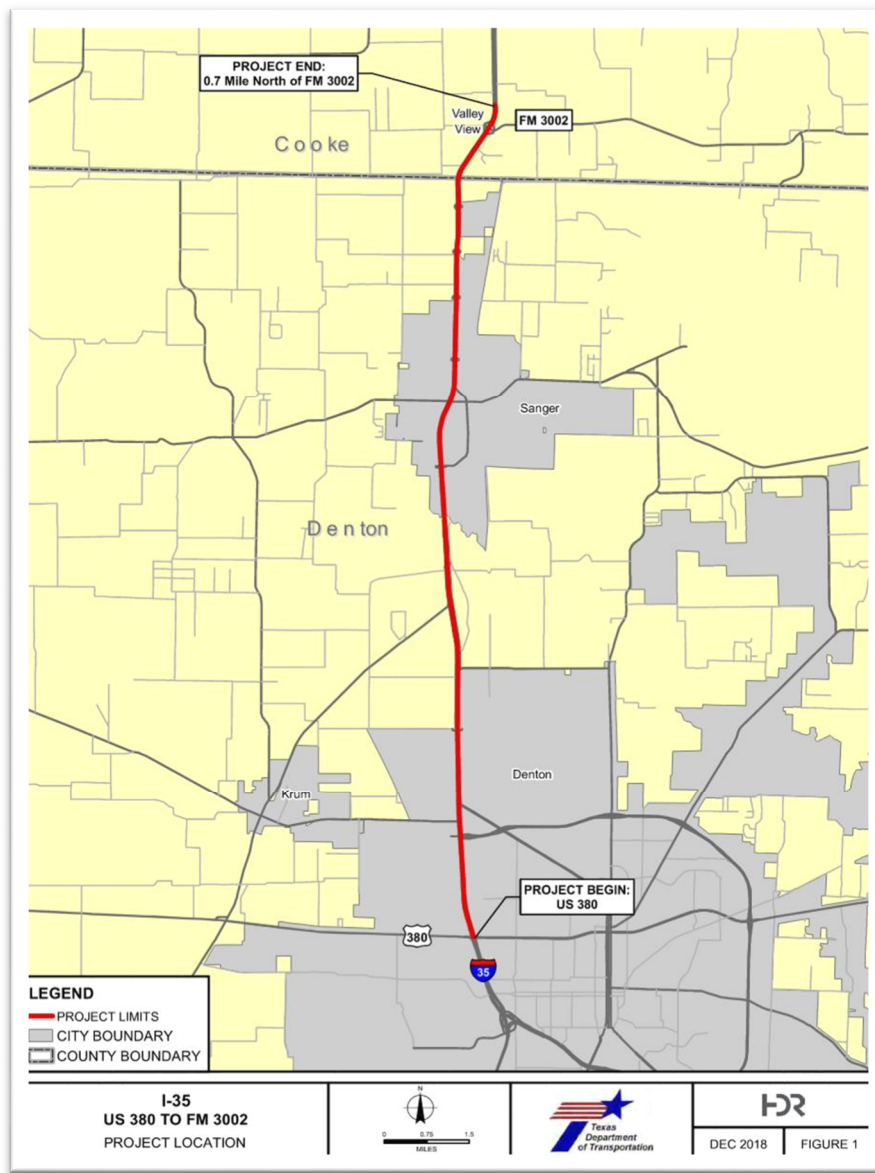


Figure 2.7.5 Interstate 35

g) Denton Greenbelt Corridor Feasibility Study

NCTCOG conducted a formal study of the Regional Outer Loop in November 2011. In accordance with the goals of Mobility 2045, a review of the study has been conducted to evaluate the viability of a freeway corridor across the Denton County Greenbelt, from the Collin County line at DNT to I-35. Mobility 2045 was adopted in June 2018 by the RTC. The Denton County Outer Loop from DNT to I-35 is included in Mobility 2045. Potential alignments are shown in **Figure 2.7.6**.

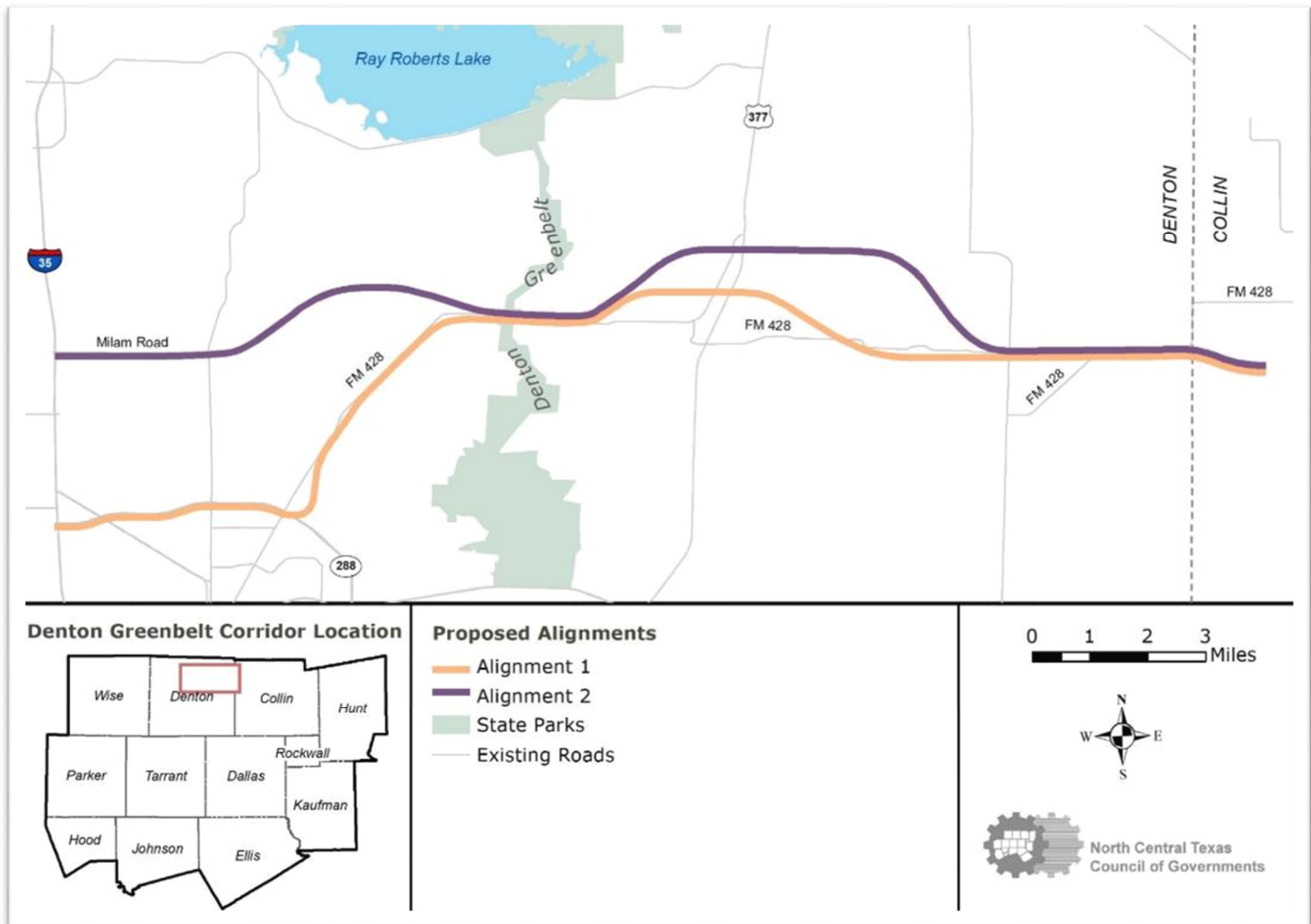


Figure 2.7.6 Denton Greenbelt Corridor Feasibility Study

h) Dallas North Tollway (DNT) Extension

The North Texas Tollway Authority (NTTA) is an organization sanctioned by the State of Texas that works to keep pace with the regional demand for transportation in DFW through the expansion of North Texas' toll road system. NTTA currently has three active projects in varying stages of development within the US 380 study corridor. These projects are shown in **Figure 2.7.7**.

- The first project, which is currently in construction, is the DNT extension over US 380. This project will extend the DNT mainlanes over US 380.
- The second project, DNT Phase 4A, extends the DNT mainlanes north to FM 428. This project is currently undergoing detailed design.
- The third project, DNT Phase 4B, would extend the DNT mainlanes from FM 428 to the Collin/Grayson County line. This alignment is currently undergoing NEPA evaluation to determine its environmental and related social and economic effects.

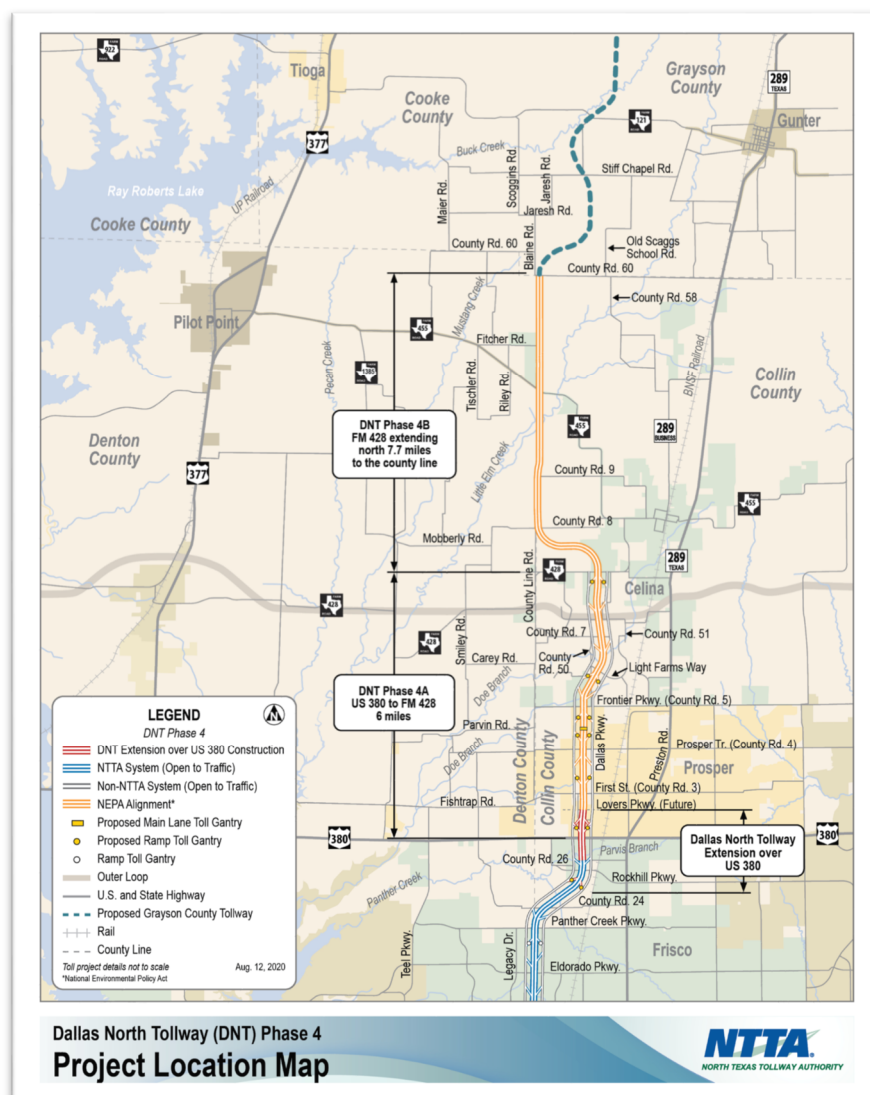


Figure 2.7.7 DNT Extension

i) Parvin Road Reconstruction

Celina and Prosper are currently working together to improve Frontier Parkway from FM 1385 to Legacy Drive, which would tie into the Parvin Road project. The proposed Parvin Road project would widen and realign the existing gravel Parvin Road to a four-lane divided roadway with raised medians. This project is shown in **Figure 2.7.8** in blue.

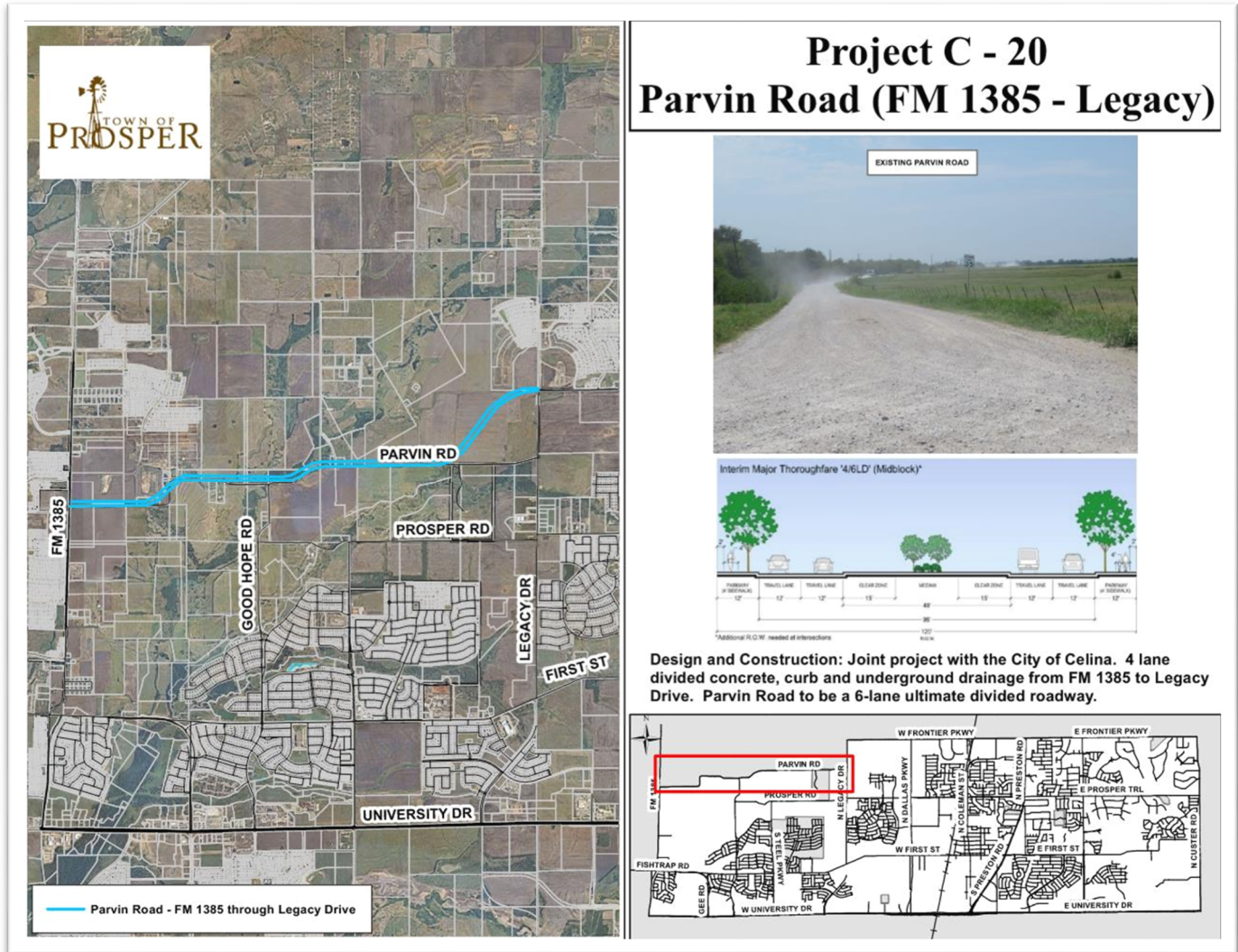


Figure 2.7.8 Parvin Road Reconstruction

3. Understanding Future Needs

3.1 Projected Regional Population and Employment Growth

The Study Area has experienced significant population growth over the past decade, which has resulted in increased travel demand on major roadways, including US 380 and SL 288. According to the United States Census Bureau, the Study Area's population increased from 77,058 in 2010 to 148,318 in 2020. Population forecasts from NTCTCOG show the Study Area population increasing to 254,188 by 2045. Percent increase in the Study Area population between 2010 and 2045 is shown in **Figure 3.1.1**. Forecasted population growth suggests that existing roadways would need improvements and/or new roadway alignments would be needed to accommodate a future increase in travel demand.

Figures 3.1.2 and 3.1.3 show the projected increase in traffic congestion across the Study Area between 2021 and 2045 if the roadway network is not updated. The Study Area is shown as a black outline in both figures, with light pink representing light congestion, light red representing moderate congestion, and red representing severe congestion. The worst congestion in the Study Area is shown along or near the US 380 corridor. Mapping indicates that the increased congestion is primarily from areas southeast of US 380. CSJ 0135-10-057 and 0135-10-050, discussed in **Section 2.6**, are designed to address congestion closest to Collin County, however a choke point could develop westward as these projects are constructed if congestion is not addressed further with additional projects.

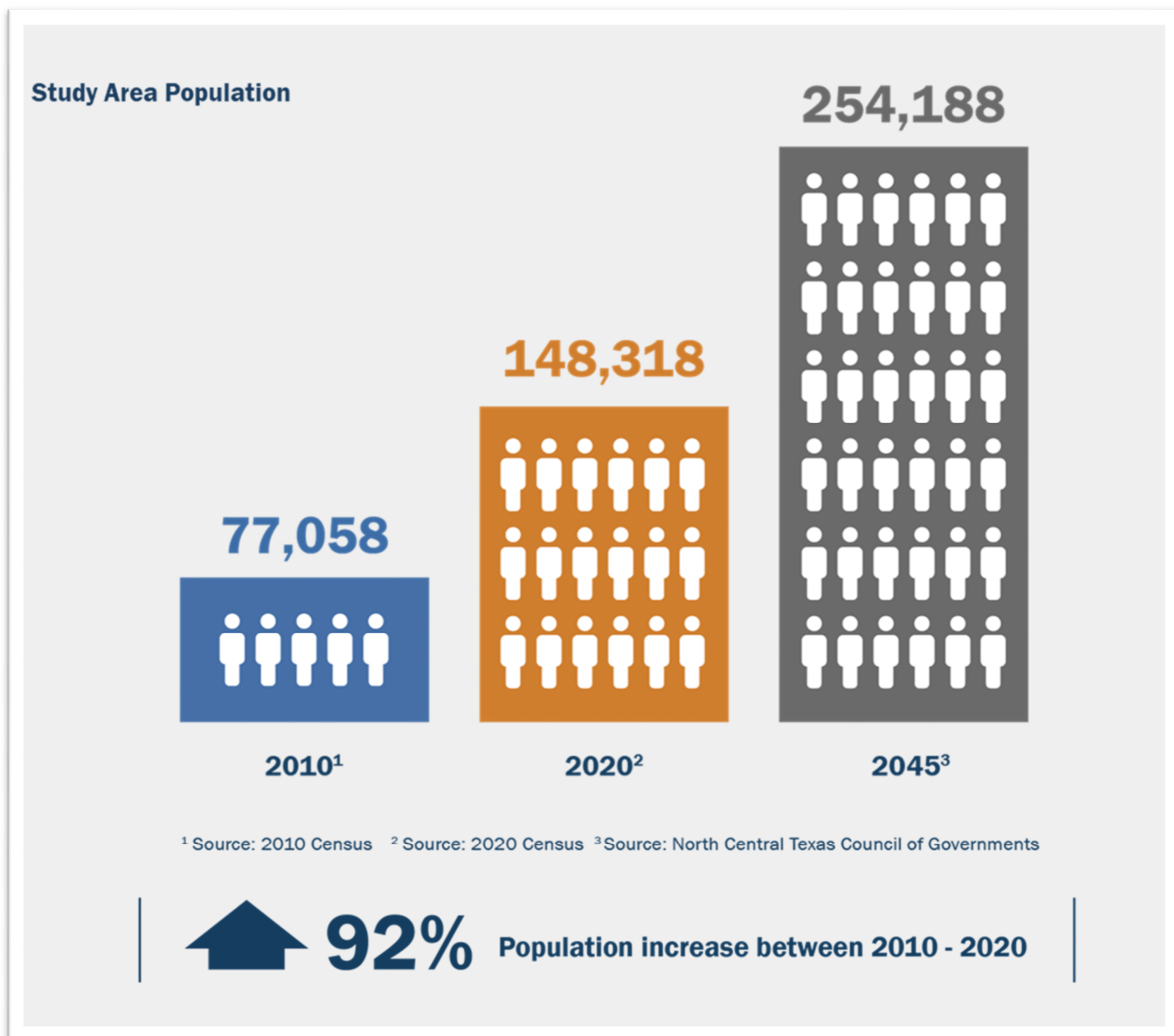


Figure 3.1.1 Historical and Forecasted Population

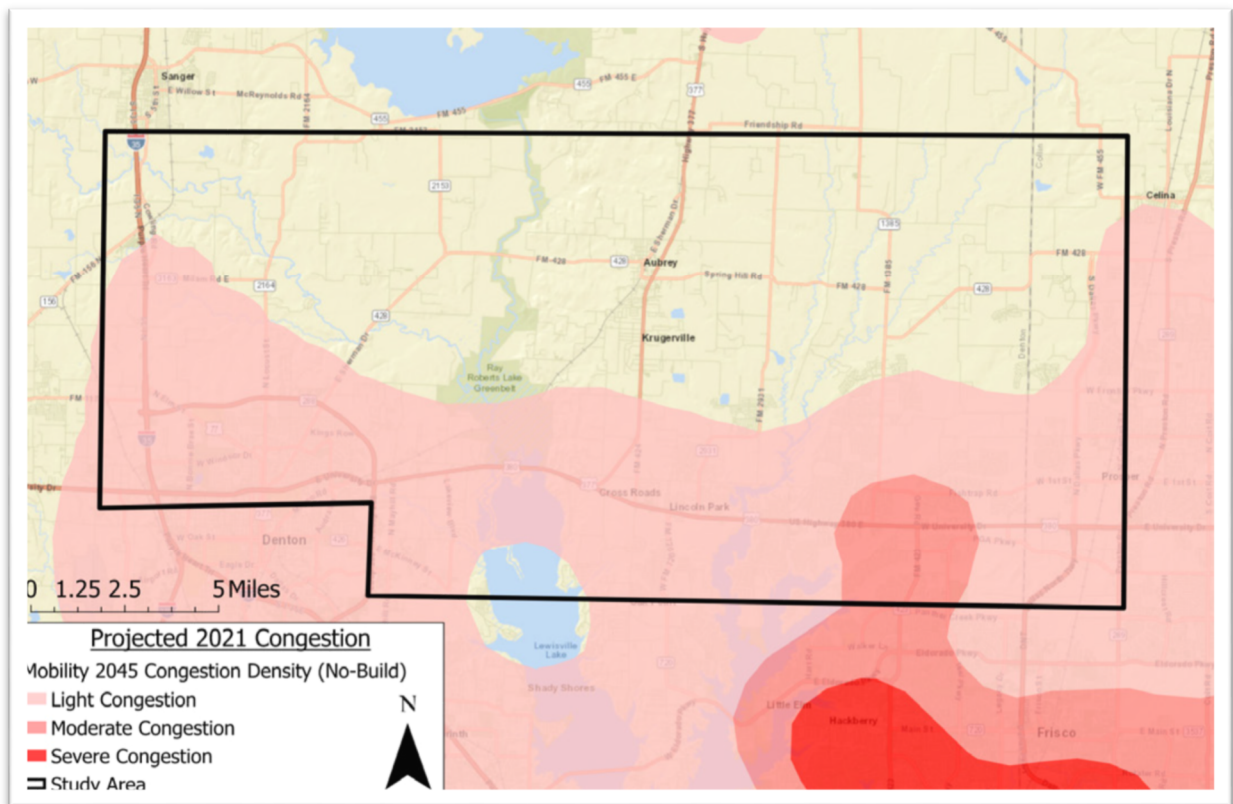


Figure 3.1.2 Estimated 2021 Congestion

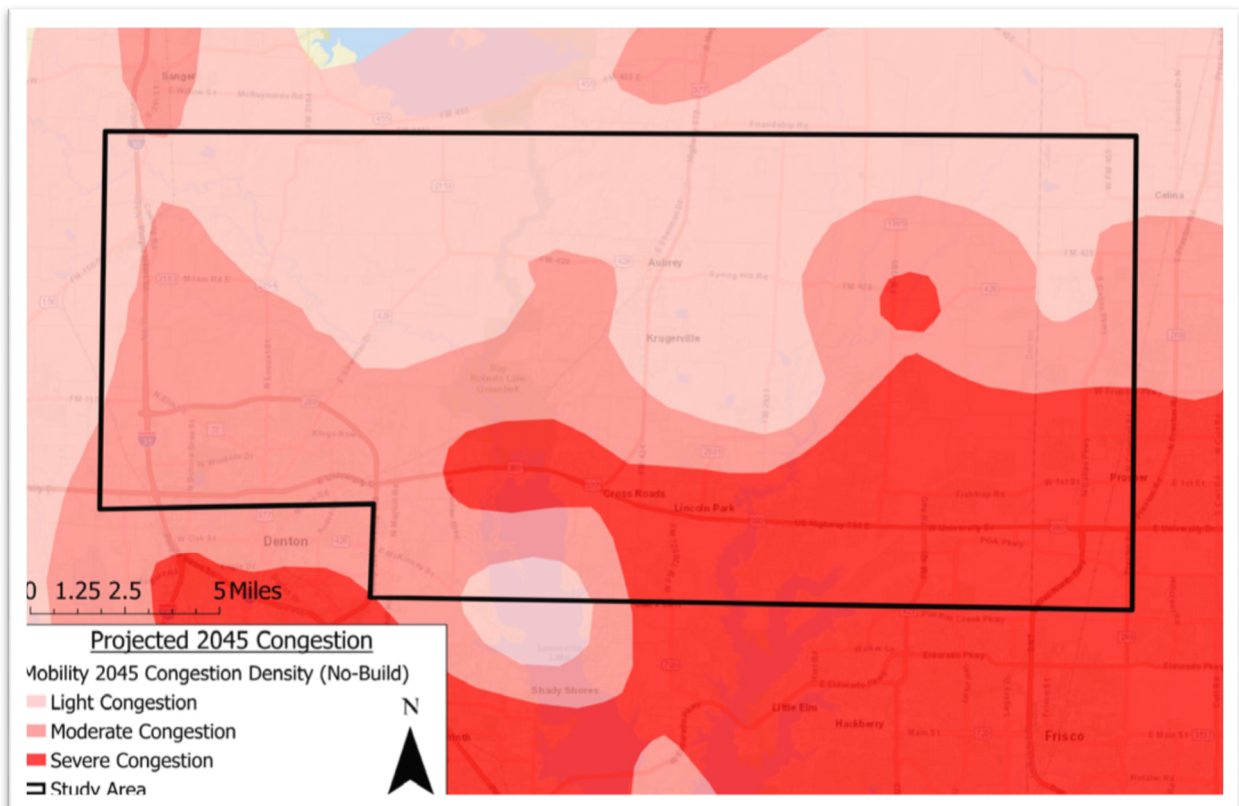


Figure 3.1.3 Forecasted 2045 Congestion

Employment growth in Denton County is also contributing to increased travel demand within the Study Area. Denton County has seen an increase in employment from 177,510 to 267,224 between Q4 of 2010 and Q4 of 2020 according to the United States Census Bureau, an increase of 50.5 percent. Employment in Denton County is expected to increase to 479,619 by 2045 according to NCTCOG forecasts, which is 79.5 percent higher than 2020 employment.

The Study Area's forecasted population and employment growth suggests that existing roadways will need improvements and/or new roadway alignments will be needed to accommodate a future increase in travel demand.

Figure 3.1.4 illustrates the purpose of the study.

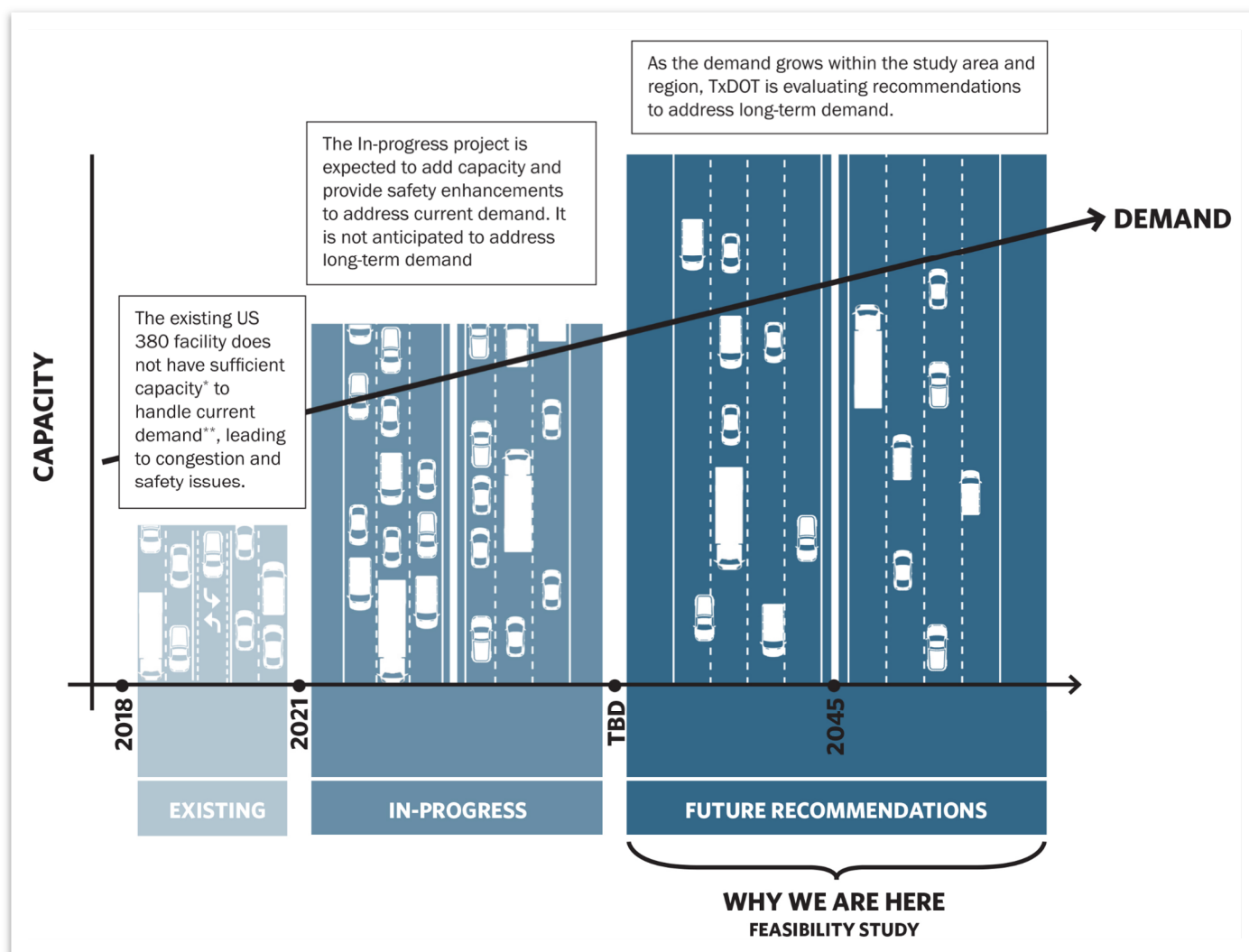


Figure 3.1.4 Purpose of the US 380 Feasibility Study

As shown in **Figure 3.1.4**, there is insufficient capacity to meet the current and future demands along the US 380 corridor. The in-progress project is anticipated to increase capacity to meet demand, however, population growth and land use changes are indicating that the demand for the US 380 corridor will be greater than the capacity of the in-progress project. Therefore, this Feasibility Study

intends to propose improvements to address demand for the corridor through 2045 based on the goals and objectives listed in **Figure 2.1.1**.

3.2 Existing and Projected Travel Demand

US 380 and SL 288 experienced approximately 1.4 million hours of delay in the year 2020. This means, on average, a single person spent over 40 hours sitting in congestion along US 380 and SL 288. Approximately 73 percent of this congestion is located between US 377 and the Denton/Collin County Line which are within the limits of the in-progress project. This project is anticipated to address the immediate demand along the corridor and improve safety.

Table 3.2.1 illustrates US 380 and SL 288's historical traffic data which includes AADT, percent growth, and percent trucks. This data was obtained from TxDOT's Open Data Portal for the analysis years from 2005 to 2020. The locations of the traffic ID numbers are shown in **Figure 3.2.1** which follows the table.

Table 3.2.1 US 380/SL 288 Historic Traffic Data

ID	2005 AADT	2010 AADT	2015 AADT	2020 AADT	2020 Percent (%) Trucks	% GROWTH (2005-2020)
SL288_1	14,070	10,800	13,016	14,340	12.2	2.0
SL288_2	15,190	13,800	18,046	19,512	12.2	28.0
SL288_3	20,280	16,100	19,986	23,878	9.3	18.0
SL288_4	19,030	17,700	20,080	21,998	9.6	16.0
US380_1	26,000	23,000	22,925	26,508	5.2	2.0
US380_2	30,000	30,000	37,484	33,649	5.3	12.0
US380_3	33,000	29,000	35,658	36,434	5.2	10.0
US380_4	25,000	25,000	37,255	37,952	4.1	52.0
US380_5	22,500	29,000	39,404	46,854	3.7	108.0
US380_6	NO DATA	NO DATA	36,613	46,799	3.7	N/A
US380_7	22,000	26,000	34,245	47,464	3.7	116.0

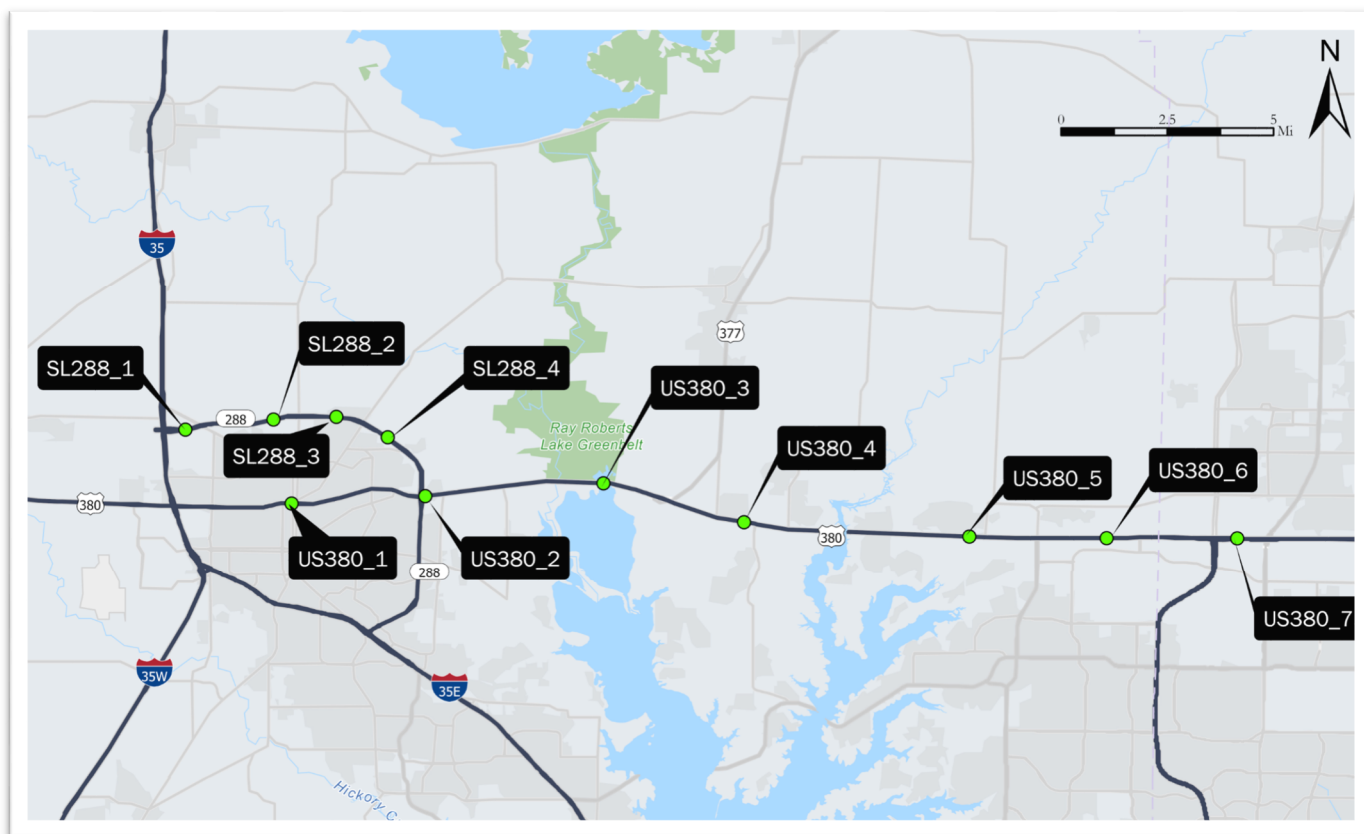


Figure 3.2.1 Traffic ID Locations

The data in **Table 3.2.1** indicates traffic growth along US 380 and SL 288. US 380 east of US 377 experienced the highest amount of growth ranging from 52 to 116 percent increase in traffic over the 15-year timeframe. The data also indicates that SL 288 has a higher ratio of trucks traveling along its respective facility when compared to US 380.

The NCTCOG Mobility 2045 travel demand model indicates that US 380 and SL 288 volumes are estimated to significantly increase.

3.3 Existing and Proposed Typical Sections

US 380 is currently a four- to six-lane principal arterial with a typical right of way width of 100-120 feet. Loop 288 is a four-lane semi-limited access facility with a typical right of way width of 220 feet. The proposed US 380/SL 288 facility would be a six- to eight-lane freeway with two- to three-lane frontage roads in each direction. The proposed US 380/SL 288 facility would have a right of way width of 350 to 400 feet. Freeway lanes would have limited access and would not intersect streets or driveways, allowing for improved traffic flow.

3.4 Physical Constraints

Improvements to the existing US 380 corridor are constrained by existing residential, commercial, and industrial land uses, community resources, and environmental resources. Land within the Study Area is also being developed rapidly. More information about constraints is provided in **Section 6**.

3.5 Safety

The TxDOT Crash Records Information System was used to obtain crash data within the Study Area for the years 2016 through 2020. Along US 380 and SL 288 there were approximately 3,198 crashes in which 20 were fatal. **Table 3.5.1** lists the crashes and their respective crash severity.

Table 3.5.1 Total Crashes by Year and Severity 2016-2020

CRASH SEVERITY	2016	2017	2018	2019	2020	TOTAL
UNKNOWN	4	2	2	2	4	14
SUSPECTED SERIOUS INJURY	21	16	12	17	12	78
SUSPECTED MINOR INJURY	71	71	51	93	60	346
POSSIBLE INJURY	104	121	103	161	104	593
FATAL INJURY	5	3	5	3	4	20
NOT INJURED	410	409	422	500	406	2,147
TOTAL	615	622	595	776	590	3,198

Figure 3.5.1 illustrates a heat map indicating the locations with the highest density of crashes within the Study Area. **Figure 3.5.2** illustrates a heat map indicating the locations with the highest density of fatal and severe injury crashes within the Study Area.

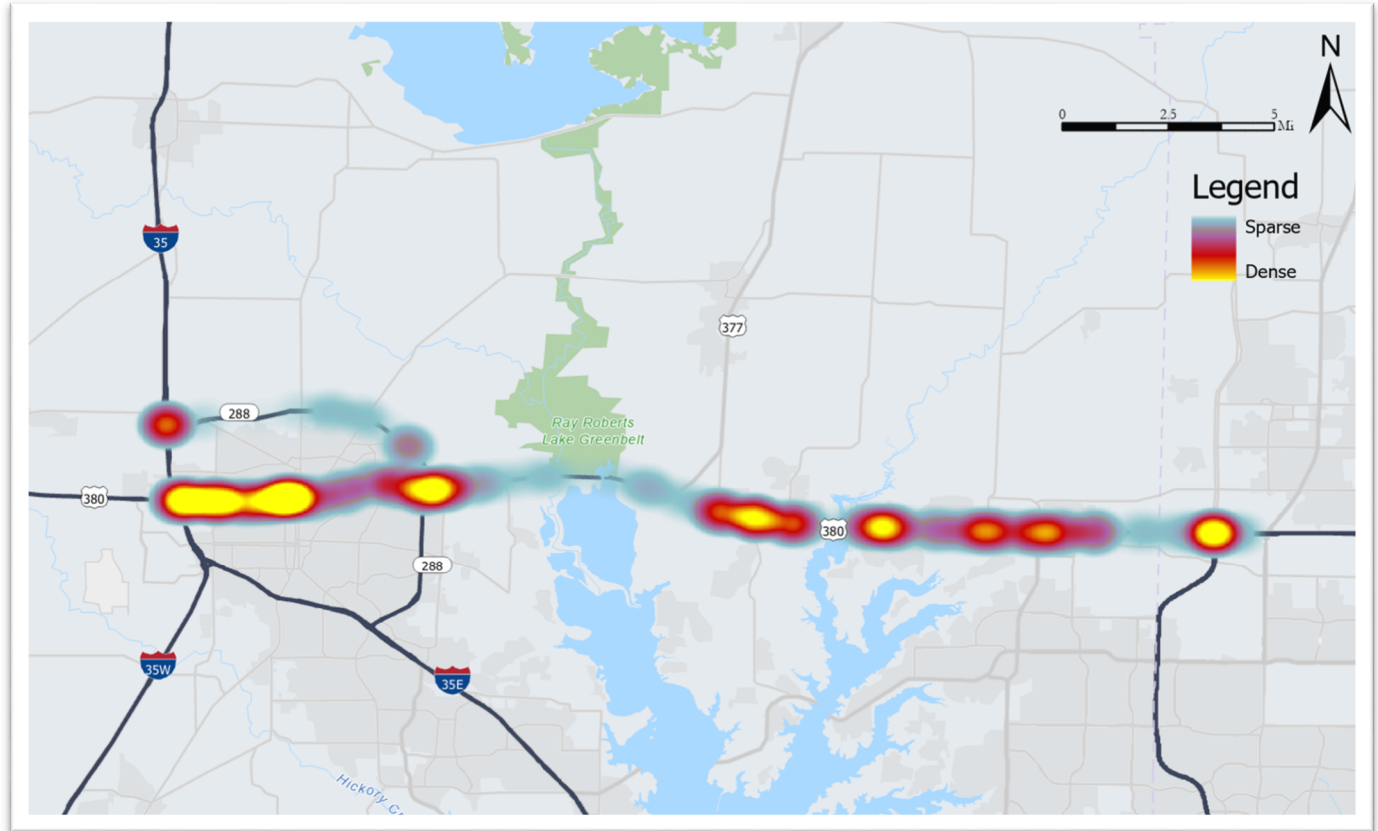


Figure 3.5.1 2016-2020 Crashes Heat Map

As shown in **Figure 3.5.1**, the highest density of crashes occurs between I-35 and SL 288. Additional pockets of crashes appear to occur throughout the corridor at intersections.

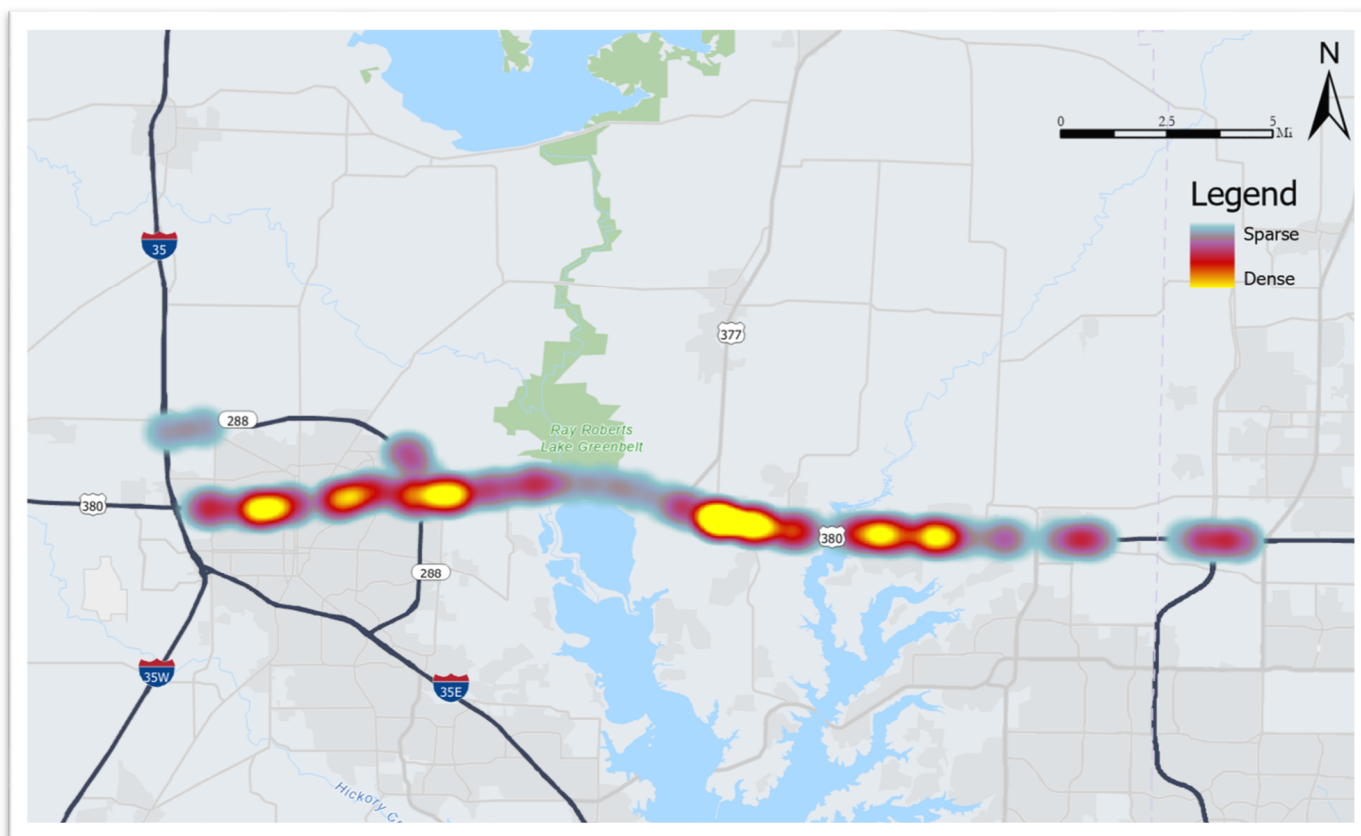


Figure 3.5.2 2016-2020 Fatal and Severe Crashes Heat Map4

When plotting crashes that involved a fatality or serious injury, the crash hot spots differ from **Figure 3.5.1**, which accounts for all crashes. **Figure 3.5.2** indicates that the highest density of fatal and serious injury crashes occurs immediately east of US 377 and at FM 720. The in-progress project is expected to alleviate these hot spots by implementing a raised median to minimize conflict points and providing a grade separation at FM 720. Access control within this area will be critical after the in-progress project is built to further minimize opportunities for crashes to occur.

The first harmful event is defined as the first injury or damage producing event of the crash. **Table 3.5.2** illustrates that a majority of the fatal and serious injury crashes are “motor vehicle in transport,” indicating that they likely impacted another motor vehicle. The second leading first harmful event is “pedestrian/cyclist,” indicating that a pedestrian or cyclist was impacted.

Table 3.5.2 Fatal and Serious Injury Crashes First Harmful Event

FIRST HARMFUL EVENT	SUSPECTED SERIOUS INJURY	FATAL INJURY	TOTAL
FIXED OBJECT	8	1	9
MOTOR VEHICLE IN TRANSPORT	57	12	69
OVERTURNED	3	1	4
PEDESTRIAN/CYCLIST	10	6	16
TOTAL	78	20	98

4. Determining Roadway Type Options

4.1 Modes of Transportation to Relieve Congestion

One way to relieve traffic congestion is to reduce the number of drivers on the road by offering attractive ways for people to get around that do not involve a car. Wide, 10-foot shared use paths are proposed along both frontage roads to encourage more walking and biking. Separation between the frontage road and the shared use path would be provided to improve comfort for pedestrians and cyclists. Improved transit service or people mover systems in the Study Area could lessen the dependency on personally owned vehicles. Due to the large single-family resident nature of the Study Area and long distance commutes, a Park and Ride or mobility hub solutions may offer residents opportunities to tie into area transit providers such as Dallas Area Rapid Transit, Denton County Transit Authority, and Trinity Metro.

4.2 Roadway Typical Section Options

TxDOT considered a variety of roadway options to address the anticipated future transportation needs of the US 380 corridor. Roadway typical section options were narrowed down to the No-Build option and the Freeway option. The No-Build option would involve no new improvements on US 380 other than current planned improvements. The No-Build option includes the in-progress project which will widen US 380 to six lanes and provide a raised median between US 377 and the Collin County Line. The in-progress project will also provide overpasses for through traffic at FM 720, Navo Road, FM 423, Teel Parkway, and Legacy Drive. An example of the No-Build option is shown in **Figure 4.2.1**. The No-Build option is expected to reduce traffic congestion but is not a long-term solution for the corridor as travel demand grows. Anticipated traffic congestion in the year 2045 for the No-Build option is rated as LOS “F”, which corresponds to a breakdown in traffic flow with frequent slowing and unpredictable travel time.



Figure 4.2.1 No-Build Option

The Freeway option would involve a six- to eight-lane freeway with two- to three-lane frontage roads in each direction. An example of the Freeway option is shown in **Figure 4.2.2**. Anticipated traffic congestion in the year 2045 for the Freeway option is rated as LOS “D” on the freeway mainlanes, which corresponds to slightly decreased travel speed and limited freedom to maneuver versus free-flowing conditions. The Freeway option has higher capacity and reduced traffic congestion when compared with the No-Build option.

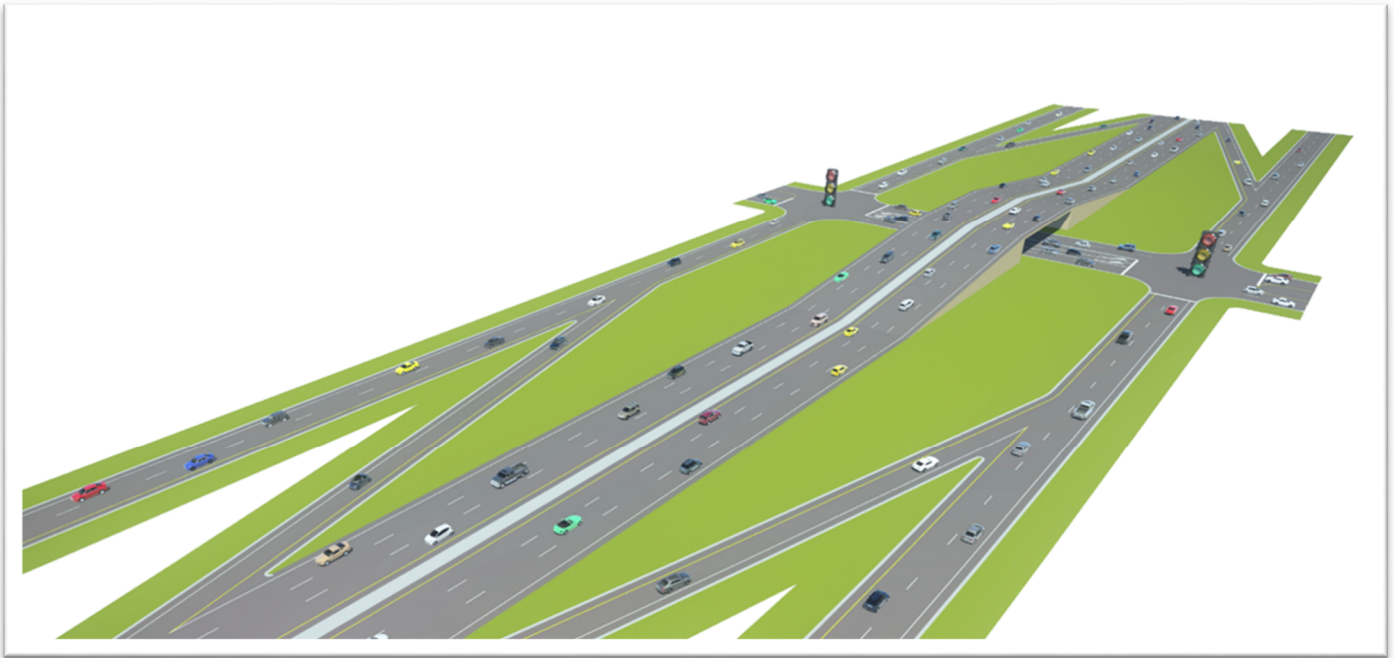


Figure 4.2.2 Freeway Option

4.3 Travel Demand Modeling

NCTCOG’s Mobility 2045 demographics and roadway network were used to estimate future travel demand for year 2045. Study performance measures were developed in consultation with TxDOT and NCTCOG. The following performance measures were identified to evaluate how the transportation alignments satisfied the goals and objectives for the study.

- Vehicle miles of travel (VMT) measures the demand for transportation that is caused by the distribution of trip origins (e.g., households) and trip destinations (e.g., employment) and satisfied by the specific transportation network. When compared between scenarios, a lower VMT value is the result of a more efficient relationship between development patterns and the transportation network. In this sense, it is a reasonable measurement of sustainability because of its correlation to greenhouse gas and other emissions, fuel consumption, crashes, and direct user costs.
- Vehicle hours traveled is calculated from data on speed and miles traveled to measure the quality of service on a roadway.
- LOS is a simple measure of the quality of the vehicle/roadway component of the transportation system. It is described using letter grades A, B, C, D, E, and F based on the ratio

of travel demand (VMT) to capacity (vehicle-miles of capacity) for the transportation system in an area. This ratio is also called the volume to capacity (V/C) ratio.

- Congestion delay measures the amount of vehicular delay, in hours, encountered by all vehicles on the roadway network. The delay is based on the difference in actual (modeled) vehicular speeds and the speed vehicles would travel if there was no congestion.
- Traffic control delay is the portion of the total delay attributed to traffic control operations. Traffic control delay can be categorized into deceleration delay, stopped delay, and acceleration delay.
- V/C is a measure for roadways, comparing roadway demand (vehicle volume) with roadway supply (capacity).

4.4 Regional Traffic Analysis to Determine Need for Freeway

Existing traffic volume along US 380 exceeds 56,000 vehicles per day in some locations. **Figure 4.4.1** shows an exhibit from NCTCOG that illustrates information sourced from the *Transportation Research Board's Highway Capacity Manual 2010* that has provided NCTCOG staff guidance for the number of lanes warranted by daily traffic volume. Comparing existing traffic volumes to the capacity of different types of roadways can help determine what type of roadway is necessary.



Source: NCTCOG

Figure 4.4.1 Lanes Warranted by Daily Traffic Volume

Based on this figure and existing traffic volumes, US 380 would need to be constructed as a four-lane freeway to achieve LOS D or better. The inadequate capacity provided by the existing US 380 facility explains the traffic congestion that is currently experienced by road users during peak periods.

As population in and around the Study Area continues to grow, east-west travel demand is expected to increase. Travel demand along US 380 within the Study Area could exceed 96,000 vehicles per day by 2045. This travel demand would warrant a six to eight-lane freeway, which was recommended as the best long-term option for the Study Area and the region.

5. Freeway Alignment Analysis

5.1 Initial Alignments – Presented January 2019

TxDOT began evaluating various alignment options in July 2018. The Initial Alignments evaluated and shown at Public Meeting #1 (January 15, 2019 and January 22, 2019) are shown in **Figure 5.1.1**.



Figure 5.1.1 Initial Alignments

TxDOT considered many factors and constraints during the alignment evaluation process, which are shown in **Figure 5.1.2** and described below.

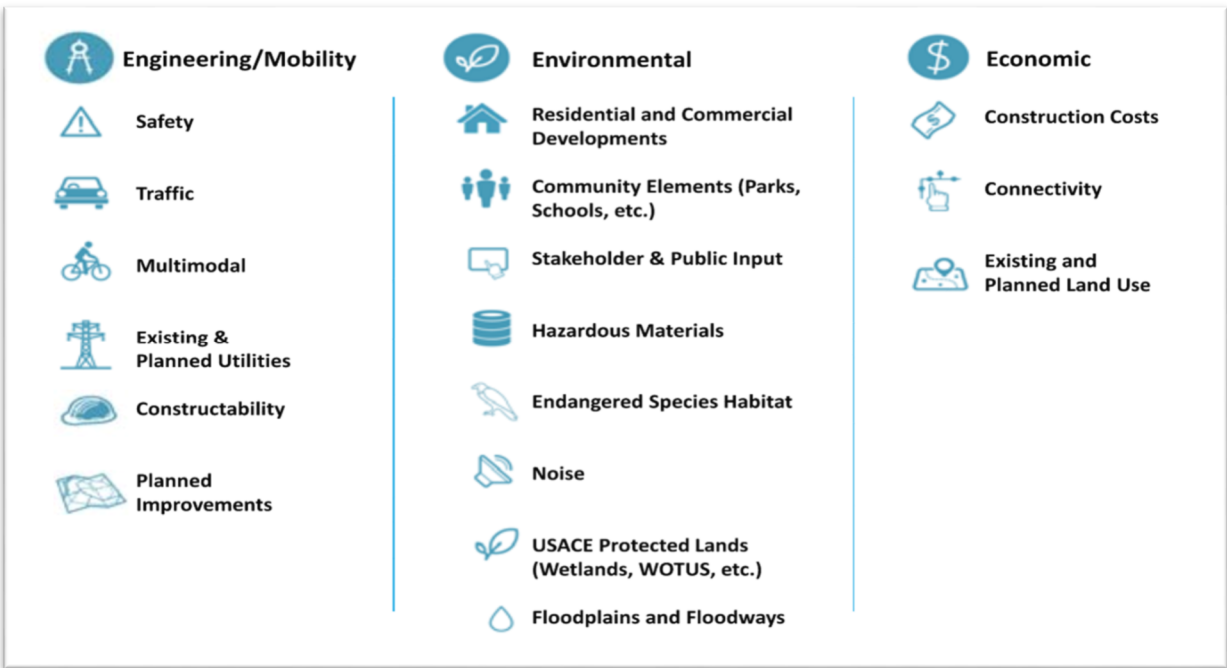


Figure 5.1.2 Key Factors for Consideration

- Length in Miles – the distance along the alignment from the US 380 and DNT interchange to I-35. Lower distances are more favorable.
- Crash Rate – the number of crashes per mile per year assuming traffic volume is constant. Fewer crashes are more favorable.
- Proposed Alignment LOS – a simple measure of the quality of the vehicle/roadway component of the transportation system that is often related to congestion. This criterion measures LOS along the Viable Alignment. A “Good” or better LOS is favorable.
- US 380 Existing Alignment LOS – the amount of congestion relief the Viable Alignment provides to the existing US 380 corridor. A “Good” or better LOS along the existing US 380 corridor is more favorable.
- Parcel Impacts – the number of parcels that overlap the proposed right of way footprint. Fewer parcels being impacted is more favorable.
- Residential Displacements – the number of residential parcels where the proposed right of way footprint physically impacts a structure or would not meet distance requirements of new building codes. Fewer residential displacements is more favorable.
- Commercial Displacements – the number of commercial parcels where the proposed right of way footprint physically impacts a structure or would functionally impair a business or would not meet fire codes or new building codes. Fewer commercial displacements is more favorable.
- Floodplain Impacts – the area of the proposed right of way footprint that overlaps floodplain. A smaller area impacted is more favorable.
- United States Army Corps of Engineers (USACE) Impacts – the area of the proposed right of way footprint that overlaps wetlands, Waters of the US, lakes, and greenbelts. A smaller area impacted is more favorable.
- Future Residential Development Impacts – number of future residential acres that overlap the proposed right of way footprint. Fewer impacts are more favorable.
- Future Commercial Development Impacts – number of future commercial acres that overlap the proposed right of way footprint. Fewer impacts are more favorable.
- Construction Costs – the estimated cost to construct the roadway, bridges, and utilities along the proposed alignment. Lower cost is more favorable.
- Right of way to be Acquired – the area of proposed right of way footprint that is outside of existing TxDOT right of way. A smaller area is more favorable.
- Estimated Number of Businesses (2019) Impacted – the number of businesses that were operational in 2019 that are displaced by the proposed right of way footprint. Fewer displacements is more favorable.
- Estimated Business Sales Volume (2019) Impacted – the sales volume of businesses that were operational in 2019 that are displaced by the proposed right of way footprint (according to data obtained from InfoUSA/DataAxle). Lower sales volume is more favorable.

Rapid growth and development between US 380 and FM 428 east of the Elm Fork of the Trinity River caused many of the proposed northern alignments to be undesirable due to significant anticipated displacements. Due to this and significant stakeholder input in 2018 for additional alignments, TxDOT expanded the range of alternatives to consider alignments further north near FM 428. TxDOT leveraged previous studies from stakeholders such as NCTCOG, Denton County, and cities of Aubrey, Denton, Krugerville, Prosper and Celina to develop additional northern alignments. **Figure 5.1.3** illustrates the revised initial alignment map from 2019.

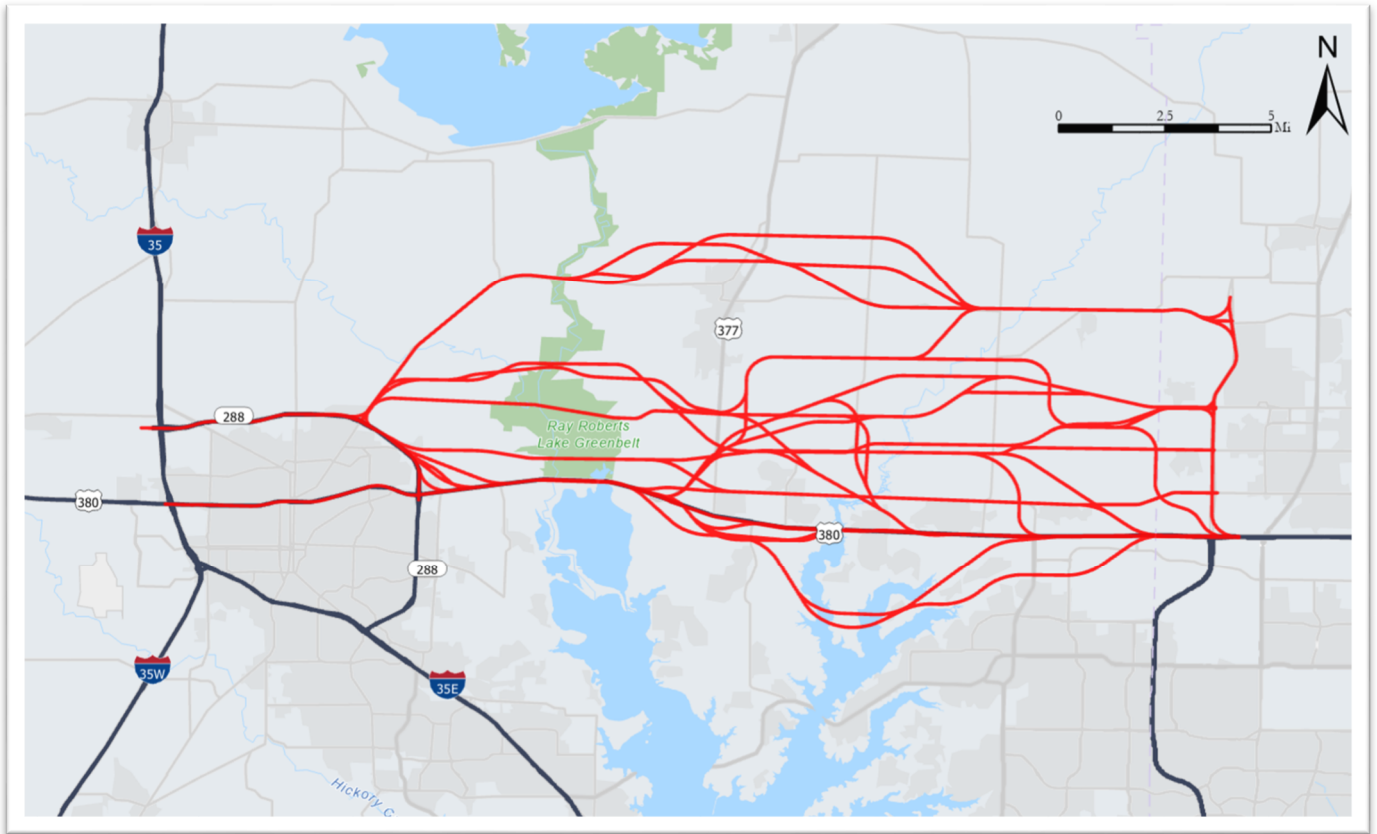


Figure 5.1.3 Revised Initial Alignments Maps

Over 100 alignments were considered during the screening process. One of the first alignments eliminated from consideration was the widening of US 380 in the City of Denton between I-35 and SL 288. TxDOT identified approximately 70 fewer displacements if SL 288 was widened rather than US 380 in this area.

To further narrow the field of alignments, a consolidation process was performed. The consolidated alignments were classified within four categories relative to the Study Area: north (Teal alignment), middle (Purple/Yellow alignment), along existing US 380 (Blue alignment), and a hybrid (Orange alignment). Within each category, a single alignment was identified that best addressed the goals and objectives of the study and would be considered as a Viable Alignment for further evaluation.

5.2 Viable Alignments – Presented December 2020

Five Viable Alignments and a No-Build alternative were presented in the second public meeting in December 2020. The five Viable Alignments were designed for a 70-MPH design speed and 350- to 400-foot right of way width. The Viable Alignments are shown in **Figure 5.2.1** and described below.



Figure 5.2.1 Viable Alignments

- The Blue alignment follows along the existing US 380 corridor except near Providence Village and Cross Roads where it moves to the south to avoid existing businesses along US 380. The Blue alignment bypasses the existing SL 288 and US 380/US 377 interchange and follows SL 288 to/from I-35.
- The Purple alignment intersects DNT near Frontier Parkway, moves south to Parvin Road, moves north and follows a new path east of Krugerville, bypasses Krugerville to the south, moves north to avoid Denton Greenbelt Park, then follows FM 428 to/from SL 288.
- The Yellow alignment follows a new path between US 380 and Parvin Road west of DNT, then follows the Purple alignment.
- The Teal alignment follows DNT to/from FM 428, then follows FM 428 except where it bypasses Aubrey to the north.
- The Orange alignment follows the Teal Alignment east of FM 1385, then moves south to follow the Purple alignment, then moves south to connect to US 377, then follows the Blue alignment to/from I-35.

The main areas with alignment differences are between SL 288 and DNT, where a variety of paths are taken.

5.3 Evaluation of Viable Alignments

TxDOT compared the engineering/mobility, environmental, and economic elements of each of the alignments as well as the No-Build. Using the key factors from **Figure 5.1.2** these three elements were used to infer how well each alignment addresses the goals and objectives. TxDOT and NCTCOG coordinated to develop travel demand model scenarios reflective of the Viable Alignments (Blue, Teal, Orange and Purple/Yellow) as well as known committed and planned projects. NCTCOG’s approved Mobility 2045 model was considered as the No-Build scenario. For consistency purposes, demographics of the model were not changed from the Mobility 2045 analysis.

The following sections list and compare the performance/criteria metrics using the rating system in **Figure 5.3.1**.

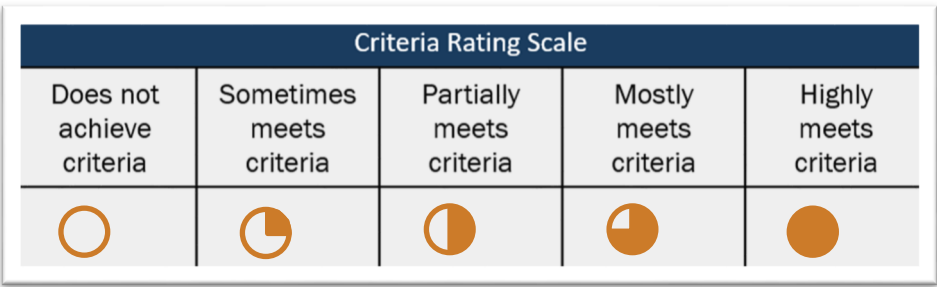


Figure 5.3.1 Criteria Rating Scale

The elements compared in the criteria rating scale are described below.

a) *Engineering/Mobility*






Travel demand model scenarios for the Viable Alignments indicated that each proposed alignment reduced regional delay in Denton County significantly. **Table 5.3.1** compares the forecasted year 2045 No-Build alternative and Viable Alignments estimated annual delay hours and the corresponding percent decrease.

Table 5.3.1 2045 Forecasted Denton County Delay

Alignments	Estimated Annual Delay (Hours)	Decrease in Annual Delay
No-Build	106,098,500	N/A
Blue	92,626,500	13%
Purple/Yellow	96,244,400	10%
Orange	96,244,400	10%
Teal	95,578,300	9%

A preliminary predictive crash analysis was performed utilizing Federal Highway Administration's (FHWA) Interactive Highway Safety Design Model (IHSDM) which is a good faith implication of the Highway Safety Manual's predictive procedures. The intent for using this tool was to capture the implications of the curvatures within each of the Viable Alignments. In general terms, a curve when compared to a tangent piece of roadway has a higher chance of a crash to occur. Crash frequencies further increase with sharper curves. **Table 5.3.2** lists the results from this analysis.

Table 5.3.2 Crash Rate Analysis

















Alignment		No-Build	Blue	Yellow	Purple	Orange	Teal
Crash Rate*	Crashes/mi/yr	N/A	22. 4773 	23.4857 	23. 5243 	23.0172 	22.8163 

* Predictive crashes/rates were based on an assumed volume of 100,000 vehicles per day over 20-year study period.

Crash rates for Yellow and Purple alignments are highest because these two alignments include multiple curves to avoid a number of neighborhoods and other sensitive sites along its path. Since the Blue alignment primarily follows existing corridors it has fewer curves, resulting in the lowest crash rate.









Results from the Travel Demand model scenarios indicated LOS A, B, or C, meaning a good LOS for all Viable Alignments in terms of the proposed US 380 facility. This was not the case for the No-Build alternative. Providing local reliable travel time and minimizing congestion is a goal for this study. **Tables 5.3.3** and **5.3.4** list key mobility metrics used to determine the alignments' effectiveness in achieving this goal.

Table 5.3.3 2045 Mobility Along Existing US 380/SL 288

Alignment	No-Build	Blue	Purple/Yellow	Orange	Teal
Estimated Daily Volumes (Average Number of Vehicles)	56,000	107,000	71,000	64,000	64,000
Annual Hours of Delay	4,073,000	1,513,700 	3,142,600 	2,899,500 	2,899,500 
Average Daily Speed (MPH)	37	60 	46 	35 	35 
Percent Decrease in Congestion	N/A	63% 	23% 	29% 	29% 
Precent Decrease in Delay Per Vehicle	N/A	81% 	39% 	38% 	38% 

Overall findings from **Table 5.3.3** indicate that the Blue alignment is the only Viable Alignment that adequately addresses mobility along the existing US 380 corridor. Similar metrics were a key discussion point when presented at multiple stakeholder meetings. Stakeholders inquired how the forecasted delay/congestion of year 2045 compared to the existing corridor's congestion. In response, TxDOT developed **Table 5.3.4** that compares recorded delay/congestion for year 2020 to the forecasted delay/congestion in year 2045. The recorded 2020 delay/congestion was extracted from the Texas Transportation Institute's 2020 Most Congested Roadways.

Table 5.3.4 2020 and 2045 Comparison of Delay

	Annual Hours of Delay	Percent Increase in Delay
Existing (2020)	1,346,500	N/A
No-Build (2045)	4,073,000	202%
Blue (2045)	1,513,700 	12% 
Purple/Yellow (2045)	3,142,600 	133% 
Orange (2045)	2,899,500 	115% 
Teal (2045)	2,899,500 	115% 
















The Blue alignment was the only alignment to significantly minimize the future delay/congestion along the corridor. While the Blue alignment is estimated to result in a 12 percent increase in overall delay in 2045, delay per vehicle in 2045 would be 67 percent lower than it was in 2020. This means the 40 hours of congestion that each driver experienced in 2020 (described in **Section 3.2**) would be reduced to 13 hours in 2045. Although delay per vehicle is reduced, overall delay is expected to increase by 12 percent because more vehicles would be using the US 380 corridor if the Blue alignment was built as a freeway. It should be noted that no other alignment would reduce the delay per vehicle along the US 380 corridor.

b) Environmental

Minimizing human and environmental impacts was another key goal for the study. TxDOT leveraged multiple public databases, aerial photography, one-on-one meetings with stakeholders and site visits to be able to assess potential impacts to parcels, residential displacements, commercial displacements, floodplain impacts, USACE impacts, future residential development impacts, and future commercial development impacts for each Viable Alignment.

Table 5.3.5 lists the number parcel impacts and residential and commercial displacements.











Table 5.3.5 Parcels, Residential, and Commercial Impacts

	Parcel Impacts	Residential Displacements	Commercial Displacements
No-Build	N/A	N/A	N/A
Blue	399 	14 	55 
Yellow	244 	37 	19 
Purple	238 	36 	11 
Orange	322 	11 	30 
Teal	194 	23 	6 

The Teal alignment fared best in terms of minimizing parcel impacts and commercial displacements and the Orange alignment had the fewest residential displacements. The Blue alignment had the most parcel impacts and commercial displacements partly due to being an already established corridor. Typically established corridors have smaller parcels compared to new location parcels and are more likely to have commercial buildings due to convenient access.











Table 5.3.6 list the potential impacts to future developments. Future developments were evaluated for this study due to the high likelihood that these planned developments would be completed before any improvements proposed in this study are constructed.

Table 5.3.6 Future Residential and Commercial Development Impacts

	Future Residential Development Impacts (Acres)	Future Commercial Development Impacts (Acres)
No-Build	N/A	N/A
Blue	22 	129 
Yellow	224 	54 
Purple	301 	24 
Orange	105 	54 
Teal	265 	49 

The Blue alignment was considered to have the fewest future residential impacts but the most future commercial impacts. Similar to the findings for **Table 5.3.5**, it is understandable why the Blue alignment would have significantly more future commercial development impacts compared to the other new alignments.

Table 5.3.7 Floodplain and USACE Impacts















	Floodplain Impacts (Acres)	USACE Impacts (Acres)
No-Build	N/A	N/A
Blue	89 	3 
Yellow	209 	19 
Purple	234 	19 
Orange	213 	2 
Teal	231 	8 

The Blue alignment had the lowest amount of floodplain impacts and second lowest number of impacts to USACE resources as shown in **Table 5.3.7**. The Yellow and Purple alignments fared the worst for USACE impacts due to these alignments crossing the Elm Fork of the Trinity River. This specific crossing location is part of the Greenbelt which is leased to Texas Parks and Wildlife. The area is considered a highly environmentally sensitive area.

c) Economics

Economics is a critical element that is both supported by and supports transportation systems. **Table 5.3.8** lists the multiple economic data points considered for this study.

Table 5.3.8 Economics Summary

	Preliminary Construction Costs (2019 Dollars)	Right of Way to be Acquired	Estimated Number of Businesses Impacts	Estimated Business Sales Volume Impacted
No - Build	N/A	N/A	N/A	N/A
Blue	1,190,000,000 	398 	78 	40-50 
Yellow	1,290,000,000 	925 	19 	0-10 
Purple	1,350,000,000 	900 	11 	10-20 
Orange	1,490,000,000 	687 	30 	40-50 
Teal	1,370,000,000 	878 	6 	0-10 

Preliminary construction cost estimates were developed for comparison purposes. Overall, the estimates indicated that each of the viable alignments are anticipated to be similar in costs with the Blue alignment being slightly less expensive. The Blue alignment follows the existing US 380 and SL 288 corridor and can use a majority of the existing right of way to minimize the right of way to be acquired. The Teal, Purple, and Yellow alignments do not follow an existing corridor which is likely the reason why they have fewer business impacts and sales volume impacts.

5.4 Developing a Recommended Alignment – January 2021 to December 2021

After the December 2020 public meeting, TxDOT compiled input from the public, performed additional traffic analysis on the Viable Alignments, and met with stakeholders to receive input and information on planned projects and developments. This traffic analysis and public and stakeholder input were key factors in the selection of a Recommended Alignment.

Public input indicated a preference for the Blue alignment. Comments acknowledged the need for improvements on US 380 due to traffic congestion and conditions which feel unsafe. Comments were also focused on minimizing right of way and other environmental impacts.

a) Recommended Alignment – Blue Alignment

Based on TxDOT's data, findings, and public input, TxDOT recommends that the Blue alignment be considered to advance into the Schematic and Environmental project development phase. **Table 5.4.1** list the various goals and illustrates that the Blue alignment achieves the goals within this study.

Table 5.4.1 Recommend Alignment Goals and Objectives

	Project Goals	Blue
Regional Goals	East-west connection	Yes
	Enhance safety	Yes
Local	Minimize congestion	Yes
	Enhance driver expectations	Yes
	Minimize human and environmental impacts	Yes

b) Secondary Recommendation – Teal Alignment for Further Studies

Throughout the Feasibility Study a key concern was raised about the Study Area's development and the travel demand model forecasts potentially underrepresenting the overall vehicular demand within the Study Area. TxDOT reviewed the 2045 demographics and identified zones which may be underrepresented in year 2045 based on current and future land use. **Figure 5.4.1** illustrates dark brown zones indicating a high population change from the original demographic data and light brown zones indicating little change from the original demographic data.

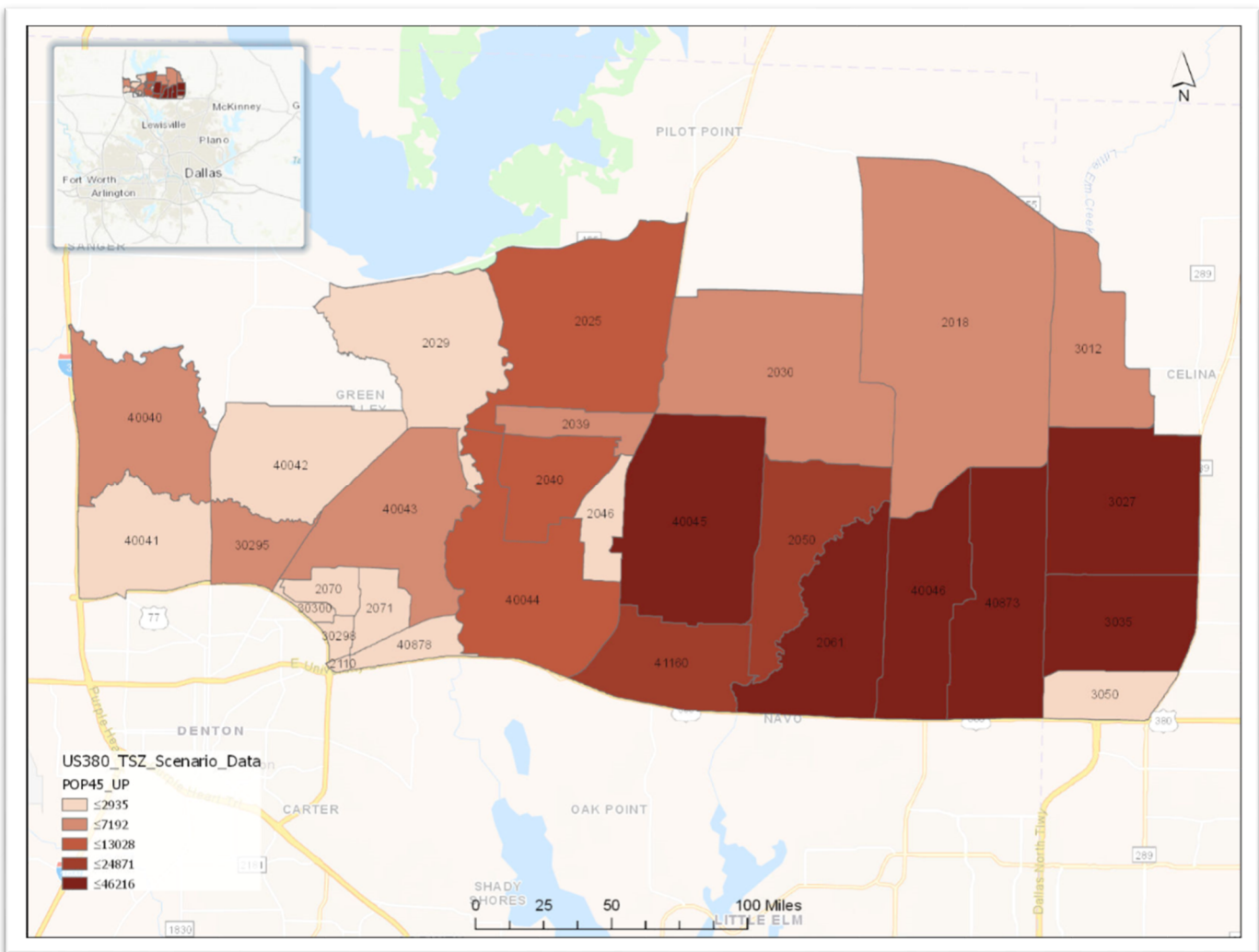


Figure 5.4.1 2045 Population Underrepresented Zones

TxDOT identified multiple zones indicating a high potential of underrepresenting future population. A majority of these zones are located north of US 380 and east of US 377 in the cities of Aubrey, Prosper, Cross Roads, Little Elm, and Celina. In total the Study Area was originally identified to have a forecasted population of approximately 254,000, however, based on preliminary findings the future population within the Study Area could be as high as 440,000. TxDOT further considered the travel demand implications of the underrepresented future population by reviewing east-west movements. **Table 5.4.2** illustrates a range of the potential 2045 east-west movements within the Study Area. For simplicity purposes, the vehicles per day shown are the aggregated volumes at the FM 428 and US 380 crossings of the Elm Fork of the Trinity River.

Table 5.4.2 Potential Future Range of East-West Travel Demand in Study Area

Range	Vehicles per Day*
Low	172,000
Medium	324,000
High**	485,000

*East-west Vehicles per Day are forecasted volumes for FM 428 and US 380 at the Elm Fork of the Trinity River

** High scenario assumes volumes from FM 455 and Eldorado Pkwy would use FM 428/US 380 in a build scenario

Based on these findings, travel demand is expected to exceed the capacity of a single eight-lane freeway, therefore, TxDOT is recommending that a second freeway alignment be considered and recommends the Teal alignment to be further studied. The Teal alignment was the only practical option for a second freeway alignment due it being furthest away from US 380. In general, freeways are typically spaced no less than four to five miles apart.

Both Blue and Teal alignments were further revised to improve operations in the event both facilities are constructed. Revisions to these two alignments are shown in **Figure 5.4.2**.

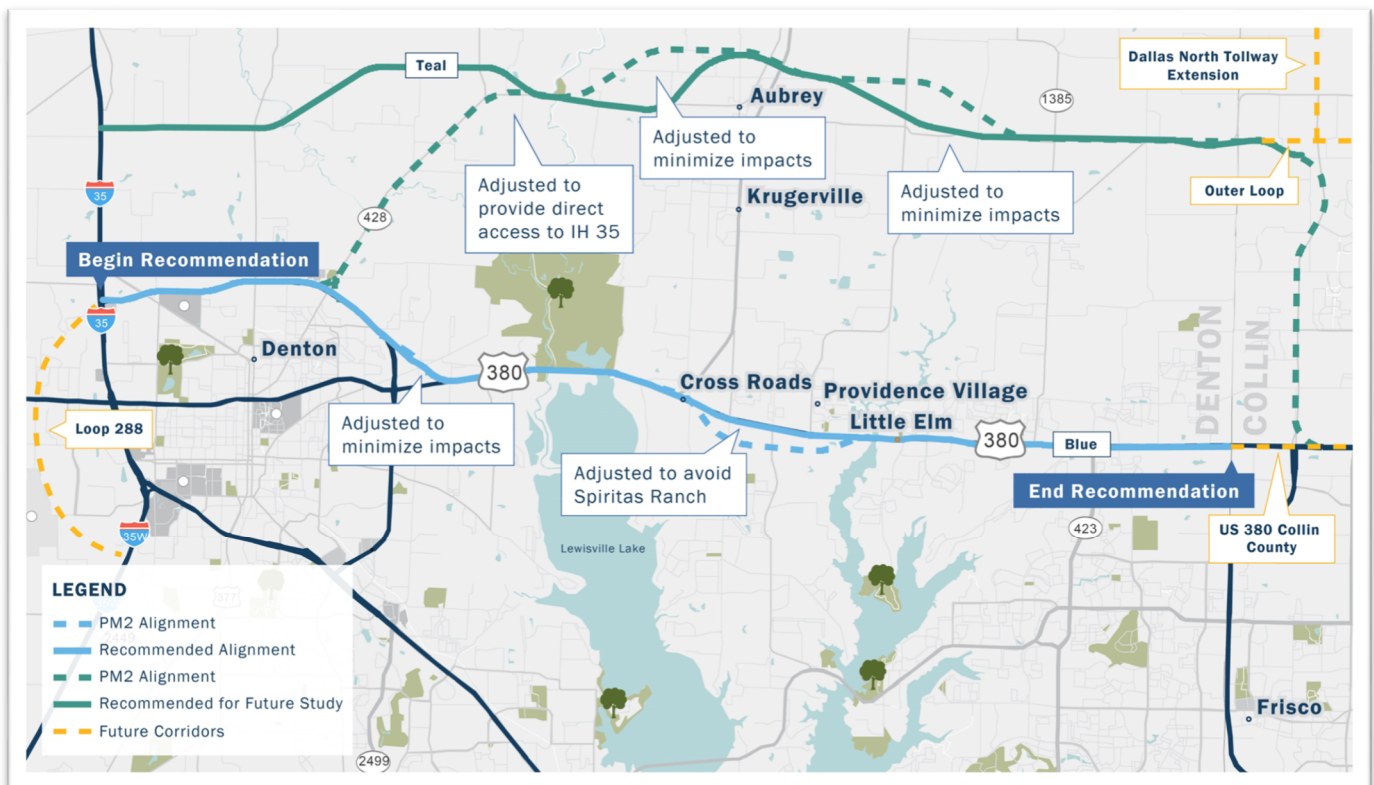


Figure 5.4.2 Refined Viable Alignments

The Blue alignment was revised to avoid impacts to the proposed Spiritas Ranch development in Little Elm, which is expected to include a school, restaurant and retail venues, and over 2,000 new single-family homes. Modifications to the SL 288 and US 380 connection were also made to accommodate stopping sight distances and minimize impacts to adjacent properties.

The Teal alignment was revised to extend directly to I-35 instead of following FM 428. This was done to alleviate future congestion at the SL 288 and I-35 interchange. Additional alignment adjustments were made within the City of Aubrey limits to further minimize impacts to adjacent properties.

5.5 Feedback on Recommendations – December 2021 to January 2022

Public comments mostly viewed the recommendation of the Blue alignment as favorable. The cities of Cross Roads and Little Elm expressed concerns about the economic implications of the recommendations. In response to these concerns, Denton County will be conducting additional economic studies for the US 380 corridor.

Many of the comments from the public expressed concerns regarding the secondary recommendation of the Teal alignment. TxDOT recognizes the public's concerns and the many challenges associated with the Teal alignment. Future studies are recommended to have a significant public involvement effort in order to effectively engage local residents.

6. Environmental Overview

The US 380 Feasibility Study reviewed the potential human, cultural, and natural environmental resources that could be affected by the proposed recommended transportation improvement. **Appendix A** illustrates potential environmental constraints identified within the Study Area.

6.1 Land Use – Existing and Planned

Land use is a critical element in determining transportation needs. The Study Area has seen a rapid change in land use between 2015 and 2020. Plans for existing and future projects were collected from local agencies and major developers within the Study Area. The following cities and towns were listed as having an established city boundary or extraterritorial jurisdiction within the Study Area:

- Aubrey
- Celina
- Cross Roads
- Denton
- Frisco
- Krugerville
- Little Elm
- Oak Point
- Pilot Point
- Prosper
- Providence Village
- Sanger

Coordination with these cities and towns indicated a significant conversion in land use over the five-year period. **Figure 6.1.1** illustrates where over 20,000 acres of farmland, ranch land, timberland, and vacant land was converted to single family or commercial land use between 2015 and 2020. Converted land is shaded pink.

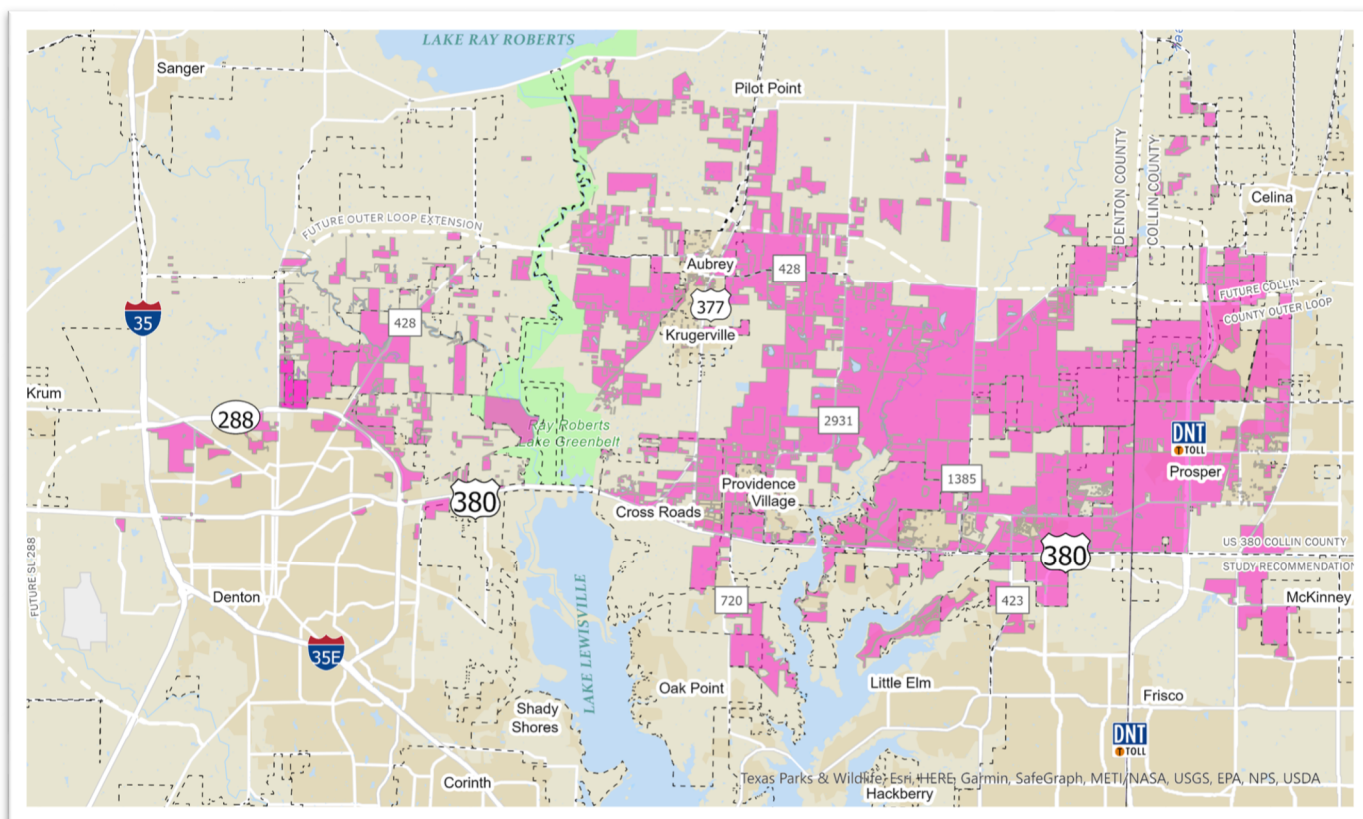


Figure 6.1.1 2015-2020 Land Use Changes

Eastern portions of the Study Area have developed primarily as large single-family communities such as Windsong Ranch, Hollyhock, Rockhill, Star Trail, Creeks of Legacy, Light Farms, Glen Crossing, Green Meadows, Sutton Fields, Sandbrock Ranch, Winn Ridge, Arrowbrooke, Union Park, Savannah, Paloma Creek, Aspen Meadows, and Oak Hill Ranch. Western portions similarly have large single-family developments such as Stark Farms and Beaver Creek. As the Study Area continues to develop and demand for development increases, additional areas are anticipated to change land uses.

6.2 Socioeconomic Issues

TxDOT evaluates socioeconomic issues in terms of Environmental Justice (EJ). EJ is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Executive Order 12898 of 1994 directs Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of federal actions to minority and/or low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, some other race, or a combination of two or more races. The United States Environmental Protection Agency (EPA) has developed an EJ mapping and screening tool called EJSCREEN, which is based on nationally consistent data and an approach that combines environmental and demographic indicators in the form of EJ indexes (<https://www.epa.gov/ejscreen> accessed 03/08/2022). Using EJSCREEN, the Study Area was evaluated to determine whether it contained a concentration of minority and/or low-

income populations. **Table 6.2.1** lists the results of the tool regarding socioeconomic indicators within the Study Area compared to the state, EPA region, and USA.

Table 6.2.1 EJSCREEN Socioeconomic Results

Socioeconomic Indicators	Study Area Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Demographic Index	30%	46%	29	44%	32	36%	49
People of Color	38%	58%	30	52%	38	40%	56
Low Income	20%	34%	32	36%	27	31%	36
Unemployment Rate	4%	5%	44	5%	43	5%	44
Linguistically Isolated	3%	8%	43	6%	53	5%	61
Less than High School Education	8%	16%	36	15%	35	12%	45
Under Age 5	8%	7%	59	7%	62	6%	70
Over Age of 64	9%	12%	37	13%	31	16%	21

Note: descriptions of each indicator can be found at <https://www.epa.gov/ejscreen/overview-demographic-indicators-ejscreen>

The Study Area had a significantly lower percentage than the statewide average in every category except for “Under Age 5,” in which the Study Area had a higher percentage. Additional results provided from the EJSCREEN tool can be found in **Appendix B** and **Appendix C**.

6.3 Development and Possible Displacements – Residential and Commercial

Established residences, businesses, and developments adjacent to the Recommended Alignment were identified through a field visit and labeled on detailed maps at Public Meeting #3. A displacement was counted if the proposed footprint encompassed or intersected a residence, business, or development’s structure. In some instances, displacements may occur if outside of the proposed footprint/right of way. These displacements are evaluated on a case-by-case basis and were not considered in this Feasibility Study.

Totals of the identified displacements were illustrated on the evaluation matrix at each public meeting. The evaluation matrix shown at each public meeting can be found in **Appendices D-F**.

6.4 Institutional Facilities

Institutional facilities were identified by structures serving public education needs such as elementary schools, middle schools, high schools, and academies located along or near the Study Area. Some of these facilities may directly rely on US 380 and SL 288 for mobility since these roadways are considered key transportation connectors within the Study Area. The Feasibility Study recommendations are anticipated to improve mobility to and from these facilities adjacent to the corridors. **Table 6.4.1** lists the 41 identified institutional facilities such as independent school districts (ISD) located within the Study Area.

Table 6.4.1 Institutional Facilities within Study Area

School Name	School District	Type	Address
Lone Star	Frisco ISD	High School	2606 Panther Creek Parkway, Frisco, Texas, 75033
Panther Creek (Opens August 2022)	Frisco ISD	High School	1875 PGA Parkway, Frisco, Texas, 75033
Stafford	Frisco ISD	Middle School	2288 Little River Drive, Frisco, Texas, 75033
Trent	Frisco ISD	Middle School	13131 Coletto Creek Drive, Frisco, Texas, 75033
Boals	Frisco ISD	Elementary School	2035 Jaguar Drive, Frisco, Texas, 75033
Robertson	Frisco ISD	Elementary School	2501 Woodlake Parkway, Little Elm, Texas, 75068
Phillips	Frisco ISD	Elementary School	2285 Little River Drive, Frisco, Texas, 75033
Miller	Frisco ISD	Elementary School	300 Cypress Hill Drive, Little Elm, Texas, 75068
William Rushing	Prosper ISD	Middle School	Fishtrap Road, Prosper, Texas, 75078
Windsong Ranch	Prosper ISD	Elementary School	800 Copper Canyon Drive, Prosper, Texas, 75078
Ralph And Mary Lynn Boyer	Prosper ISD	Elementary School	1616 Montgomery Lane, Prosper, Texas, 75078
Chuck And Cindy Stuber	Prosper ISD	Elementary School	Village Park Lane, Prosper, Texas, 75078

School Name	School District	Type	Address
Mrs Jerry Bryant	Prosper ISD	Elementary School	Freeman Way, Prosper, Texas, 75078
North Texas Collegiate Academy-North Campus	N/A	College	4601 N Interstate 35, Denton, Texas, 76207
University of North Texas – Discovery Park	N/A	College	University of North Texas Discovery Park, 3940 N Elm Street, Denton, TX 76207
Texas Woman’s University - Denton	N/A	College	304 Administration Drive, Denton, TX 76204
Ryan	Denton ISD	High School	5101 E McKinney Street, Denton, Texas, 76208
Ray Braswell	Denton ISD	High School	E University Drive, Aubrey, Texas, 76227
The Lagrone Academy	Denton ISD	High School	1504 Long Road, Denton, Texas, 76207
Strickland	Denton ISD	Middle School	3003 N Bell Avenue, Denton, Texas, 76209
Navo	Denton ISD	Middle School	1701 Navo Road, Aubrey, Texas, 76227
Rodriguez	Denton ISD	Middle School	8650 Martop Road, Aubrey, Texas, 76227
Hodge	Denton ISD	Elementary School	3900 Grant Parkway, Denton, Texas, 76208
Newton Rayzor	Denton ISD	Elementary School	1400 Malone Street, Denton, Texas, 76201
Nette Shultz	Denton ISD	Elementary School	1502 Hanover Drive, Denton, Texas, 76209
Ginnings	Denton ISD	Elementary School	2525 Yellowstone Place, Denton, Texas, 76209
Evers Park	Denton ISD	Elementary School	3300 Evers Parkway, Denton, Texas, 76207
Providence	Denton ISD	Elementary School	1000 FM-2931, Aubrey, Texas, 76227
Savannah	Denton ISD	Elementary School	1101 Cotton Exchange Drive, Aubrey, Texas, 76227
Paloma Creek	Denton ISD	Elementary School	1600 Navo Road, Aubrey, Texas, 76227

School Name	School District	Type	Address
Emilio & Guadalupe Gonzalez	Denton ISD	Pre-K School	1212 Long Road, Denton, Texas, 76207
Cross Oaks	Denton ISD	Elementary School	600 Liberty Boulevard, Aubrey, Texas, 76227
Catherine Bell	Denton ISD	Elementary School	601 Villa Paloma Boulevard, Little Elm, Texas, 75068
Union Park	Denton ISD	Elementary School	7301 Fieldwood Way, Aubrey, TX 76227
Community	Denton ISD	Elementary School	1400 Malone Street, Denton, Texas, 76201
Aubrey	Aubrey ISD	High School	510 Spring Hill Road, Aubrey, Texas, 76227
Denton County JJAEP	Aubrey ISD	Juvenile Justice Alternative	415 Tisdell Lane, Aubrey, Texas, 76227
Aubrey Middle	Aubrey ISD	Middle School	815 W Sherman Drive, Aubrey, Texas, 76227
HL Brockett	Aubrey ISD	Elementary School	900 Chestnut Street, Aubrey, Texas, 76227
James A Monaco	Aubrey ISD	Elementary School	9350 Cape Cod Boulevard, Aubrey, Texas, 76227
Jackie Fuller El	Aubrey ISD	Elementary School	Quicksilver Boulevard, Aubrey, Texas, 76227

6.5 Emergency Service Facilities

Twelve emergency service facilities were identified by structures serving emergency needs such as medical, police, fire and rescue services located along or near the Study Area. **Table 6.5.1** lists the identified institutional facilities located within the Study Area. It is anticipated that all of the emergency service facilities rely on US 380 and/or SL 288 to service the general public. The Feasibility Study recommendations are anticipated to improve mobility to and from these facilities adjacent to the corridors.

Table 6.5.1 Emergency Service Facilities within Study Area

Name	Type	Address
University Behavioral Health of Denton	Medical - Psychiatric	2026 West University, Denton, Tx, 76201
Baylor Scott & White Emergency Hospital Aubrey	Medical - General Acute Care	26791 Highway 380, Aubrey, Tx, 76227
Aubrey Fire Department Station 1	Fire and Rescue	200 West Sycamore Street, Aubrey, Tx, 76227
Denton Fire Department Station 4	Fire and Rescue	2110 East Sherman Drive, Denton, Tx, 76209
Denton Fire Department Station 5	Fire and Rescue	2230 West Windsor Drive, Denton, Tx, 76207
Oak Point Department of Public Safety Fire Services	Fire and Rescue	100 North Naylor Road, Oak Point, Tx, 75068
Aubrey Fire Department Station 2	Fire and Rescue	2020 Navo Road, Aubrey, Tx, 76227
Prosper Police Department	Police	110 West Broadway Street, Prosper, Tx, 75078
Aubrey Police Department	Police	108 East Elm Street, Aubrey, Tx, 76227
Oak Point Police Department	Police	100 North Naylor Road, Oak Point, Tx, 75068
Krugerville Police Department	Police	5097 US Hwy 377 S, Krugerville, Tx, 76227
Texas Woman's University Department of Public Safety	Police	301 Administration Drive, Hubbard Hall Lower Level, Denton, Tx, 76204

6.6 Places of Worship

A place of worship is defined as a location, place, or site where people regularly congregate for religious worship. These locations are typically operated by a religious body organized to sustain public worship. **Table 6.6.1** lists the 62 known locations of places of worship within the Study Area.

Table 6.6.1 Places of Worship within Study Area

Name	Address
Harvest International Church	2205 Chatham Place, Aubrey, Tx, 76227
Gods Blessings Ministry Church	6199 Moss Rose Lane, Aubrey, Tx, 76227
Sound Word Ministries Inc	810 Trail Drive, Prosper, Tx, 75078

Name	Address
Sonrise New Testament Ministries Incorporated	981 English Ivy Drive, Prosper, Tx, 75078
Lighthouse Evangelistic Christian Center Inc	1400 Samantha Creek Drive, Little Elm, Tx, 75068
Denton County Church Of Christ	15421 Mount Evans Drive, Little Elm, Tx, 75068
Mission Denton	215 Buckingham Drive, Denton, Tx, 76209
Ambassador Ministry Inc	617 Pawnee Street, Aubrey, Tx, 76227
Denton Church Of Christ Inc	1510 Audra Lane, Denton, Tx, 76209
First Assembly Of God	2227 N Carroll Boulevard, Denton, Tx, 76201
Metropolitan Community Church Of Greater Dallas	7494 Pudim Hill Road, Aubrey, Tx, 76227
Latter House Glory Tabernacle	419 E University Drive, Denton, Tx, 76209
Frisco Vineyard Church	913 Freesia Drive, Little Elm, Tx, 75068
Tabernacle Church Inc	4001 Oak Point Drive, Crossroads, Tx, 76227
Up Church	1524 Carriage Lane, Savannah, Tx, 76227
Divinus Ministries	3061 Aerial Drive, Frisco, Tx, 75033
Chosen To Evangelize Ministries	1216 Golden Eagle Court, Aubrey, Tx, 76227
Inhim Ministries Church	2309 Kayewood Drive, Denton, Tx, 76209
Trilogy Community Church	270 Oak Bluff Drive, Crossroads, Tx, 76227
Denton North Church Inc	3806 Hampton Road, Denton, Tx, 76207
Voice Of Hope Religious And Charitable Trust	1122 Polo Heights Drive, Frisco, Tx, 75033
Deck Family Foundation Inc	2012 Cindy Labe, Denton, Tx, 76207
Pentecostal Harvest Ministries	8825 Wagon Trail, Crossroads, Tx, 76227
Manna To Go	355 Doe Creek Road, Little Elm, Tx, 75068
End Time Harvest Church	5301 E Mckinney Street 380, Denton, Tx, 76208
Restoration To The Nations Inc	9025 Sundance Trail, Crossroads, Tx, 76227
Reach Out Christian Center	211 Coronado Drive Apt 205, Denton, Tx, 76209
Billy Banks Ministries Inc	9909 Baywood Court, Denton, Tx, 76207
Sherman Drive Church Of Christ	2321 E Sherman Drive, Denton, Tx, 76209
Camp Copass	8200 E Mckinney Street, Denton, Tx, 76208
Denton Hope Community	3600 Kings Row, Denton, Tx, 76208
Friendship Church Of Denton Texas Inc	3813 W University Drive, Denton, Tx, 76207

Name	Address
First Christian Church	Po Box 93, Aubrey, Tx, 76227
Midway Baptist Church	Po Box 210, Aubrey, Tx, 76227
Barry Wood Evangelistic Association Inc	850 Nightwind Court, Prosper, Tx, 75078
Denton Bible Church	2300 E University Drive, Denton, Tx, 76209
Aubrey Church Of Christ	Po Box 201, Aubrey, Tx, 76227
Eastside Chruch Of Christ	2109 Shawnee Street, Denton, Tx, 76209
First Assembly Of God	Po Box 13, Aubrey, Tx, 76227
Christ The Servant Lutheran Church	2121 E University Drive, Denton, Tx, 76209
Living Stones Christian Fellowship	101 Countryside Drive, Denton, Tx, 76208
Lifegate Church	3350 Deerwood Parkway, Denton, Tx, 76208
Belle Avenue Church	2401 N Bell Avenue, Denton, Tx, 76209
Evangelistic Services Inc	908 Imperial Drive, Denton, Tx, 76209
Luthern Men In Mission Ntnl-Elca	2314 Kingston Trace, Denton, Tx, 76209
Pastor Norine Mccloud Wings Of Love Ministry Inc	624 W University Drive 332, Denton, Tx, 76201
Duane White Ministries Inc	4582 Fishtrap Road, Denton, Tx, 76208
Denton Korean Baptist Church	2810 N Locust Street, Denton, Tx, 76209
Prayer Bear Ministry	1624 Meadow Trail Lane, Aubrey, Tx, 76227
Fountain Of Life Missionary Church	2801 Spencer Road Apt 4107, Denton, Tx, 76208
New Life Church Of Denton Texas	1350 Milam Road E, Sanger, Tx, 76266
Peace Of The Rock Ministries Inc	Po Box 51, Aubrey, Tx, 76227
Wellspring Worldwide Ministries Inc	1919 N Elm Street, Denton, Tx, 76201
Teach One International Inc	2124 Sundown Drive, Little Elm, Tx, 75068
Life 365 Church	6315 Lone Star Lane, Aubrey, Tx, 76227
Big Chapel International	5731 Salisbury, Prosper, Tx, 75078
Risen Church Of Denton	2810 N Locust Street, Denton, Tx, 76209
Empowered Outreach Church	909 N SL 288 Ste 300, Denton, Tx, 76209
Alter Ministries Inc	14700 Little Anne Drive, Little Elm, Tx, 75068
Wild Your Life	1214 Clover Lane, Denton, Tx, 76209
New Life Baptist Seminary	626 Burr Oak Drive, Frisco, Tx, 75033
Cornerstone Christian Center	8828 Holliday Lane, Auberry, Tx, 76227

6.7 Cemeteries

An inventory of cemeteries was developed using local and state databases as well as a desktop review of aerials dated 2020. Through this process, 19 cemeteries were identified within the Study Area and listed within **Table 6.7.1**.

Table 6.7.1 Cemeteries within Study Area

Name	Address
Lower Oak Grove	3740 Blue Stream Drive, Little Elm, Texas, 75068
Clark	1101 Woods Drive, Little Elm, Texas, 75068
Unknown (Oak Grove Ch)	4725 FM 720, Aubrey, Texas, 76227
Zion	1212 Shortgrass Lane, Frisco, Texas, 75033
Old Celina	5793 Private Road 5281, Celina, Texas, 75009
Cooper Creek	2730 Cooper Creek Road, Denton, Texas, 76208
Unknown (Green Valley)	6670 FM 2153, Aubrey, Texas, 76227
Unknown (Gribble Springs Ch)	6933 FM 2164, Sanger, Texas, 76266
Blue Mound	8421 N Interstate 35, Denton, Texas, 76207
Taylor Family	661 Alexandrite Drive, Little Elm, Texas, 75068
Belew	9226 Massey Road, Pilot Point, Texas, 76258
Key	766 Rock Hill Road, Aubrey, Texas, 76227
Peace-Holmes	805 Lloyds Road, Little Elm, Texas, 75068
Wilson-Black Jack	Wilson Cemetery Road, Aubrey, TX 76227
Trinity	712 S Trinity Road, Denton, Texas, 76208
Conway	4111 S Highway 377, Aubrey, Texas, 76227
Crutchfield	4136 Fitzgerald Avenue, Aubrey, Texas, 76227
Mustang	8508 Lights Ranch Road, Pilot Point, Texas, 76258
Rucker	9911 Marthas Vineyard Circle, Aubrey, Texas, 76227

6.8 Parks and Recreational Facilities

An inventory of public parks, open space, and recreation areas was conducted using local, state, and federal data sources. **Table 6.8.1** lists these 20 places along with their respective addresses. Publicly owned, significant and accessible parks, recreation areas, and wildlife and waterfowl refuges are protected under Sections 4(f) of the United States Department of Transportation (USDOT) Act of 1966 as amended (23 Code of Federal Regulations (CFR) 774- codified in 49 United States Code 303) and

Chapter 26 of the Texas Parks and Wildlife Code and Section 6(f) of the Land and Water Conservation Fund Act of 1965 (Section 6(f)). Section 4(f) requires avoidance and planning to minimize harm to publicly owned land of a public park as part of a highway/roadway project that may receive federal funding.

Table 6.8.1 Parks and Recreational Facilities within Study Area

Name	Address
Northwest Community Park	2525 Gloryview Road, Frisco, TX 75034
Falcons Field Park	1911 Spirit Falls Drive, Frisco, TX 75033
Evers Park	3201 N Locust Street, Denton, TX 76209
Bowling Green Park	2200 Bowling Green Street, Denton, TX 76207
North Lakes Park	2001 W Windsor Drive Denton, TX 76207
Water Works Park	2400 Long Road Denton, TX 76208
Windsor Open Space	1101 Monterey Drive Denton, TX 76209
Nette Schultz Park	2514 Royal Lane Denton, TX 76209
Bluffview Park	1410 E University Drive Denton, TX 76209
Avondale Park	2020 Devonshire Drive Denton, TX 76209
Clear Creek Natural Heritage Center	3310 Collins Road Denton, TX 76208
Ray Roberts Greenbelt	Greenbelt Trail, Aubrey, TX 76227
Fish Trap Park	5224 E University Drive Denton, Texas, 76208
Paloma Park	700 Teal Drive Aubrey, TX 76227
Doe Branch Park	950 Gammon Road Little Elm, TX 75068
Main Street Park	200 S Main Street, Prosper, TX 75078
Hackberry Knoll Park	760 Gordon Heights Lane Little Elm, TX 75068
Frontier Park	1551 Frontier Parkway Prosper, TX 75078
Sunset Pointe Park	Cascade Code Drive, Little Elm, TX 75068
Windsong Ranch Community Park	1001 Windsong Parkway Prosper, TX 75078

While the Feasibility Study recommendations attempted to avoid impacting parks, additional engineering and environmental studies will be needed to determine compliance with Section 4(f).

6.9 Potential Historic Resources

A desktop survey was conducted to identify potentially historic sites such as, but not limited to, historic-age non-archaeological resources including buildings, structures, objects, and districts within the Study Area. Resources that meet eligibility criteria are provided protection under Section 106 of the National Historic Preservation Act. The historic preservation process in Section 106 must be followed by federal agencies that fund, license, own, or approve projects. TxDOT complies with Section 106 on behalf of the FHWA on projects within Texas. If an adverse effect cannot be avoided or minimized, appropriate mitigation must be provided. Such resources are also protected under Section 4(f) of the USDOT Act of 1966 (49 USC § 303 and 23 USC §138).

No previously designated National Register of Historic Places eligible or listed resources are located within the Study Area. The desktop survey did identify six sites and one historic district as resources recognized by local and state agencies. These sites, their approximate location and description can be found in **Table 6.9.1**.

Table 6.9.1 Potential Historic Resources

Name	Approximate Location
Elm Fork of The Trinity River Bridge	Adjacent to the FM 428 bridge of the Elm Fork
Cooper Creek Baptist Church	On Fish Trap Road east of Cooper Creek Road
University Gardens Texas Woman's University	On Chapel Drive west of North Bell Avenue
Green Valley Schools	At the intersection of County Road 2153 and Shepard Road
Tom Cole Bridge	At Tom Cole Road and Little Elm Creek Crossing
McKinney Road Bridge	McKinney Road Bridge and Elm Fork of Trinity River
Bell Avenue Conservation District	Adjacent to the North limit of US 380/US 377 along Bell Avenue

It is anticipated that the Feasibility Study recommendations would not impact the resources identified in **Table 6.9.1**. Further historic resource Identification, evaluation, and documentation would be required when the project enters the NEPA phase of the project.

6.10 Waters of the United States (U.S.)

A formal delineation of waters of the U.S. was not conducted but would be conducted in a later project planning phase should the project advance. The following standard desktop resources were reviewed to determine the most accurate datasets to use for analyzing each individual resource of interest:

- National Hydrography Dataset
- National Wetlands Inventory
- Recent and Historic Aerial Photography
- United States Geological Survey 7.5 Minute Topographic Maps - SGS Green Valley (1978), Aubrey (1960), Denton East (1973), and Little Elm (1968)
- Federal Emergency Management Agency Designated 100-Year Floodplains
- Light Detection and Ranging Aerial Photography
- Parks (Denton Central Appraisal District, Texas Parks and Wildlife data)
- Recreation Trails (www.trails.com)
- Ecological Mapping Systems of Texas: Habitat Types
- USACE Wildlife Management Areas

Additional geographic information systems processing of these standard data layers was conducted to determine potential water resources within the Study Area. The purpose of this additional processing was to provide the most accurate desktop delineation of each resource without conducting a formal delineation of waters of the U.S. These impacts were identified within the evaluation matrix of the Viable Alignments provided in Public Meeting #3. **Appendix A** shows a map of these resources. Multiple coordination meetings with USACE were conducted to solicit input to minimize impacts to environmentally sensitive sites. A formal Pre-Application Meeting (*Project Name: SWF-2019-00294 – US 380 Denton County*) was conducted with the USACE Fort Worth District to review proposed alternatives. Overall, USACE deferred official comments till the NEPA phase of the project development where field delineations of waters of the U.S. would be provided.

7. Public Involvement and Stakeholder Outreach

Public involvement and stakeholder outreach were critical components of this Feasibility Study, informing TxDOT throughout the project of specific concerns, priorities, and needs. Public and stakeholder input is one of many factors TxDOT considers when making decisions about the future of US 380.

TxDOT conducted outreach to the public using various avenues, obtaining feedback and interfacing with communities and other entities along the way. Some of the strategies used include:

- Coordination with Denton County and Study Area cities, towns, and local agencies.
- Three series of public meetings where each meeting offered the public the opportunity to provide input and comments, both via hard copies and through online engagement.
- Small group and stakeholder work group meetings.

7.1 Public Meetings

Three series of public meetings (one in-person, one virtual, and one hybrid) were hosted by TxDOT. All public meeting materials and summaries, including comment response matrices, are posted on the project website at: www.keepitmovingdallas.com/projects/us-highways/us-380-denton-county-feasibility-study.

a) Winter 2019

The first series of two public meetings was held to introduce the project to the public, present initial data, and get feedback on the initial alignments of all potential options for the future of US 380. Meeting #1 took place on January 15, 2019 at Memorial High School in Frisco. Meeting #2 took place on January 22, 2019 at the Denton Civic Center in Denton. The meeting presented the existing conditions along the corridor, current and forecasted traffic volumes, a high-level description of planned improvements, the purpose of the Feasibility Study, the Study Area, the goals and objectives of the Feasibility Study, proposed typical sections for the corridor, and a map of Initial Alignments. The public was asked to comment on the initial alignments, which helped TxDOT further refine these alignments. The comment period for both meetings was open through February 6, 2019. A total of 403 people attended the in-person meetings, which resulted in 1,012 surveys and comments. A summary of the meetings, including comments, is available in **Appendix D**.

b) Winter 2020

The second public meeting was held to present and get feedback on the five draft Viable Alignments for US 380. The meeting was held virtually due to the COVID-19 pandemic. Information presented during this meeting was built upon comments received during the initial series of meetings. This meeting provided detailed information on the draft Viable Alignments, including the evaluation criteria and results of engineering/mobility, environmental, and economic analyses. The comment period was open from December 2 through December 17, 2020. In total, there were 3,435 unique pageviews on the public meeting webpage, 1,365 views of the YouTube presentation, and 1,035

visitors to the interactive website. A total of 329 comments was recorded, and 411 surveys were completed during the meeting period. A summary of the meetings, including comments, is available in **Appendix E**.

c) Fall 2021

The third series of two public meetings was held to present TxDOT's Recommended Alignment for US 380 and additional study information. The meeting was held in person, but a virtual option was also available. Meeting #1 took place on November 30, 2021 at the Prosper ISD Children's Health Stadium in Prosper. Meeting #2 took place on December 2, 2021 at the Denton Civic Center in Denton. The comment period was open through January 19, 2022. A total of 151 people attended the in-person meetings, and 126 comments were received during the comment period. In total, there were 1,858 unique pageviews on the public meeting webpage, 469 views of the YouTube presentation, and 1,484 visitors to the interactive website. A summary of the meeting, including comments, is available in **Appendix F**.

Table 7.1.1 outlines the public meetings that were held during the feasibility study, the number of meeting attendees, the number of website/YouTube/and public meeting webpage views, and the number of comments/surveys that were received during the public comment period.

Table 7.1.1 Summary of Public Meetings

Meetings	Dates	# Meeting Attendees/Site Visitors	Comments/Surveys Received
Public Meeting – Series 1	January 15 and 22, 2019	403 In-person attendees	1,012
Public Meeting – Series 2	December 2 to December 17, 2020	Public Meeting Webpage: 3,435 YouTube Presentation: 1,365 Interactive Website: 1,035	329 comments/411 surveys
Public Meeting – Series 3	November 30 and December 2, 2021 through January 19, 2022	151 In-person attendees Public Meeting Webpage: 1,858 YouTube Presentation: 469 Interactive Website: 1,484	126 comments

Public meeting summaries, which include responses to surveys and comments received during a public comment period, are also posted at www.keepitmovingdallas.com/projects/us-highways/us-380-denton-county-feasibility-study.

7.2 Collection Of Public Comments

TxDOT collected feedback on the Feasibility Study by using TxDOT comment forms, both paper and online surveys, by email to the Project Manager, and by voicemail for those that wished to comment verbally. These methods allowed TxDOT to ask for input on specific issues and streamline feedback. Examples of the surveys and comment forms used during each series of public meetings can be found in **Appendix D, E, and F**. Completed comment forms and surveys can be found in each public meeting summary posted at www.keepitmovingdallas.com/projects/us-highways/us-380-denton-county-feasibility-study.

7.3 How Input Impacted the Study

The feedback TxDOT received from the public and stakeholders throughout the project was used by the project team in several ways during the study. At the onset of the study, public and stakeholder input confirmed the need for the study, highlighted community priorities, and demonstrated overall sentiment toward the project.

TxDOT also initiated more studies based on public and stakeholder concerns. Some examples of this are as follows:

- Additional traffic analysis.
- Expanding the Study Area to allow for additional alignments to be evaluated.

After Public Meeting #1, TxDOT expanded the Study Area and evaluated additional alignments that do not follow the existing US 380 alignment based on public and stakeholder feedback. Examples include the following:

- Additional alignments that do not follow the existing US 380 alignment including new alignments in the Aubrey and Krugerville areas. This included the Yellow, Orange, Purple, and Teal alignments presented in Public Meeting #2.



Figure 7.3.1 Public Meeting Photos

After Public Meeting #2, TxDOT refined Viable Alignments based on public and stakeholder feedback. Examples include:

- A northern Study Area alignment that connects directly to I-35 rather than SL 288.
- Removing the Orange and Purple alignments based on public feedback.

7.4 Local Government Coordination

Throughout the study, TxDOT worked with local cities and towns to keep them updated on the study progress, as well as stay informed of any local government happenings. TxDOT held meetings with key elected officials and staff to obtain feedback on alignments, to learn about new residential and commercial developments, and to discuss the impact of alignments.

a) Denton County

During the study, TxDOT met several times with Denton County elected officials and staff to discuss alignments, data collection, and potential impacts through the region.

b) City of Denton

TxDOT met and coordinated with the City of Denton as the study progressed to discuss alignments, residential and commercial development, and potential impacts the alignments would have on the city. The City of Denton did not take a formal position on the study during the Feasibility Study development.

c) *City of Frisco*

TxDOT met with City of Frisco staff throughout the study to review alignments and residential and commercial development in the Study Area, and to discuss impacts to the City of Frisco. The City of Frisco did not take a formal position on the study during the Feasibility Study development. The City of Frisco provided a resolution of support for US 380 as a future limited access roadway within the city limits of Frisco during the US 380 Collin County Feasibility Study.

d) *Town of Little Elm*

TxDOT met several times with elected officials, staff, and economic development staff of the Town of Little Elm regarding the Feasibility Study. In 2020, the Town of Little Elm passed a resolution opposing any further alignment of US 380 which expands right of way along the corridor between FM 423 and FM 720, within the Town of Little Elm. The resolution can be found in **Appendix G**.

e) *Town of Cross Roads*

TxDOT met with Town of Cross Roads staff and elected officials regarding the Feasibility Study. TxDOT did not receive a formal resolution from the Town of Cross Roads.

f) *City of Aubrey*

TxDOT met with City of Aubrey staff to discuss the study and rapid residential development in Aubrey. TxDOT did not receive a formal resolution from the Town of Aubrey.

g) *City of Celina*

TxDOT met with City of Celina staff. TxDOT did not receive a formal resolution from the City of Celina.

h) *City of Krugerville*

TxDOT met with City of Krugerville staff during the Feasibility Study development to discuss alignment options in and around Krugerville. TxDOT did not receive a formal resolution from the City of Krugerville.

i) *Town of Prosper*

During the Feasibility Study development, TxDOT met with Town of Prosper staff. TxDOT did not receive a formal resolution from the Town of Prosper. The Town of Prosper provided a resolution of support for US 380 as a controlled access highway remaining in its current alignment within the corporate limits of the Town of Prosper during the US 380 Collin County Feasibility Study.

j) *Town of Providence Village*

TxDOT met with Town of Providence Village staff during the Feasibility Study development. TxDOT did not receive a formal resolution from the Town of Providence Village.

7.5 State And Federal Agency Coordination

In addition to local government coordination, TxDOT also coordinated with several regional state and federal stakeholders/agencies listed in **Table 7.5.1**.

Table 7.5.1 Major Regional, State, and Federal Stakeholders

Stakeholder	Meeting Topics
Texas Parks & Wildlife	Impacts to parks and recreational facilities
North Central Texas Council of Governments	Travel demand modeling, demographics, and route analysis
Upper Trinity Regional Water District	Impacts to regional water lines and proposed facilities
United States Army Corps of Engineers	Impacts to USACE properties
North Texas Tollway Authority	Alignments and connections to existing tollway facilities

7.6 Online Outreach and Website

The study webpage can be found at www.KeepItMovingDallas.com/projects/us-highways/us-380-denton-county-feasibility-study, including:

- Detailed alignment route maps presented at each public meeting
- Public meeting summaries
- Project timeline
- Frequently Asked Questions
- Presentation slides and boards from all the public meetings

As of February 1, 2022, 308 people had signed up on www.KeepItMovingDallas.com/projects/us-highways/us-380-denton-county-feasibility-study to receive updates about the Feasibility Study. A screenshot of the Feasibility Study webpage is shown in **Figure 7.6.1**.

US 380 Denton County Feasibility Study



What is the purpose of the study?

Analyze potential alternative alignments for a limited access facility, including the existing alignment and new alignments, for US 380 & SL 288 from I-35 to Collin County line within Denton County. This study assumes that the planned grade separated improvements from the US 380 from Loop 288 to West of CR 26 project to be considered as the No-Build (do nothing) scenario.

What is a feasibility study?

A feasibility study is one planning tool that TxDOT uses when a project is in the very early stages of development. It helps determine if the project should move on to more advanced phases of project development such as more in-depth environmental analysis, public involvement, schematic design and right-of-way mapping.

The reason this type of study is done is to identify high level or critical elements of engineering, impacts to stakeholders and the public, and the economic feasibility of potential new roadways or improvements to existing roadways.

Feasibility studies are not intended to result in detailed design, environmental analysis, or cost estimates.

What will be evaluated in this feasibility study?

The study team will consider projected regional traffic, existing and planned developments, stakeholder input and the impact on the economy and environment.

Figure 7.6.1 Screenshot of Project Webpage

What are expected project milestones?

Spring 2018 – Study begins

Spring 2018-Winter 2018 – Data collection, alternatives development, and stakeholder meetings

January 2019 – Public open house meetings

Spring 2019-Winter 2020 – Alternatives studied and refined, narrow alternatives to a few alignments, stakeholder meetings

December 2020 – Virtual public meeting

Winter 2020-Fall 2021 – Alternatives continue to be studied and refined, stakeholder meetings, working toward identification of a single recommended alignment

Fall-Winter 2021 – Public Meeting planned

Winter 2021-Spring 2022 – Refine recommended alignment and document findings in a final feasibility report

*Please note that the project schedule is subject to change.

Why is the study being conducted?

The County is growing...

Similar to Collin County, the population of Denton County is projected to grow from approximately 663,000 people (2010 Census) to over 3 million people in 2050, according to the Texas Demographic Center.*

*Assume the 2000-2010 Migration scenario for 2014 Texas Population Projections

More and more land in the County is being preserved for developments.

The study team is working with Denton County and cities in the study area to identify land which has been purchased and right of way that is preserved for existing or future planned residential or commercial development. As the County's population grows, the options to build a new roadway or expand the existing US 380 become more limited and potential impacts to residential and commercial developments increase. The feasibility study will identify a roadway alignment or alignments to serve as a blueprint for City staff to begin preserving land now.

When will construction begin?

There are many steps that must be completed after this project before construction could begin such as a more in-depth environmental analysis and public involvement, schematic design, right-of-way mapping and detailed roadway design.

Public Meeting #1 – January 15, 2019 (Frisco) and January 22, 2019 (Denton)

- [Presentation Slides](#)
- [Presentation Boards](#)
- [Initial Alternative Alignments Roll Plot](#)

Public Meeting #2 (Virtual) – December 2, 2020:

- [Meeting website \(exhibits and presentation\) \[www.KeepItMovingDallas.com/US380DentonPM2\]\(http://www.KeepItMovingDallas.com/US380DentonPM2\)](#)
- [Meeting summary](#)

Figure 7.6.1 Screenshot of Project Webpage (Continued)

Public Meeting #3 – Virtual & In-Person

***Materials presented at the virtual and in-person public meetings are identical.**

- Virtual Meeting [not a live event] -- November 30 to January 19, 2022 at www.keepitmovingdallas.com/US380DentonPM3
- Open House In-Person meetings: November 30, 2021 (Prosper) & December 2, 2021 (Denton)
- For more information about the public meetings, click [HERE](#)

[US 380 Denton County Sign up to Receive Study Updates](#)

For questions or comments, please contact:

Stephen Endres, P.E.

Stephen.Endres@txdot.gov

(214) 320-4469

[US 380 Sign up to Receive Study Updates](#)

Figure 7.6.1 Screenshot of Project Webpage (Continued)

7.7 Database/Mailing List

The project team maintained a project database throughout the study, which was used primarily to send meeting notices. The database included several lists, including information on:

- Mailing and physical addresses for property owners within a quarter mile buffer of alignments presented at public meetings.
- Major stakeholders, elected officials, and agency representatives.
- Potential stakeholder work group members including business owners/representatives, neighborhood leader or representative of a neighborhood association.
- Interested persons who requested to receive updates/meeting notices.

8. Economic Analysis

8.1 Economic Impact Analysis by City (Sales and Property Tax)

Using data from the Denton County Appraisal District, the property tax impact analysis considered the net loss of municipal property tax revenue attributed to parcels impacted by each alignment. For parcels where a partial taking was estimated, a value per square foot was calculated from the certified assessed value and total square footage of the impacted parcel. This calculated value was then used to estimate the value of the area impacted to determine impacts to tax revenue. If a building structure within a parcel was displaced by the alignment, it was assumed that the entire property tax revenue from that building and parcel would be lost.

The value of the impacted areas was used to estimate impacts to property tax revenue for each taxing entity (city, county, independent school district, and special district). Additionally, an overall estimate of impacts to property tax revenue was determined for each alignment.

Like the property tax impact analysis, the sales tax analysis considered the net loss of sales revenue attributed to businesses impacted by each alignment. The analysis used data from InfoUSA/DataAxle which reports sales revenue for businesses to determine the potential loss of revenue for each impacted business.

The results of the property tax revenue analysis (2021 data) are summarized in **Table 8.1.1** and impacts to business revenue (2019 data) are summarized in **Table 8.1.2**.

Table 8.1.1 2021 Property Tax Impact Analysis

2021 Property Tax and Sales Revenue Impact*						
Jurisdiction	Old Blue Alignment	Revised Blue Alignment	Purple Alignment	Yellow Alignment	Orange Alignment	Teal Alignment
	Property Tax Impact	Property Tax Impact	Property Tax Impact	Property Tax Impact	Property Tax Impact	Property Tax Impact
City of Aubrey	-	\$8,089.46	\$127,177.73	-	-	\$1,764.18
Aubrey ISD	\$7,606.50	-	-	\$127,177.73	\$188,584.54	\$117,147.56
City of Celina	-	-	\$215.58	\$215.58	\$157.28	\$157.28
Celina ISD	-	-	-	-	\$7,420.79	\$7,420.81
Town of Cross Roads	-	-	-	-	-	-
City of Denton	\$45,992.06	\$43,804.36	\$13,086.17	\$13,086.17	\$45,991.52	\$25,601.91
Denton ISD	\$1,002,817.98	\$1,564,156.56	\$33,046.27	\$33,046.28	\$220,604.23	\$63,494.63
Denton Co.	\$231,282.49	\$334,163.19	\$27,050.78	\$35,090.25	\$2,366.84	\$29,701.65
City of Frisco	\$113,001.74	\$145,304.58	-	-	-	-
Frisco ISD	\$320,803.98	\$412,459.30	-	-	-	-
City of Krugerville	-	-	\$4,615.13	\$4,615.13	\$4,615.13	-
Town of Little Elm	\$180,410.92	\$286,790.61	-	-	-	-
Pilot Point ISD	-	-	\$12,968.23	-	\$23.94	\$29.91
Town of Prosper	\$28,673.42	\$15,635.97	-	\$18,275.16	-	-

2021 Property Tax and Sales Revenue Impact*						
Jurisdiction	Old Blue Alignment	Revised Blue Alignment	Purple Alignment	Yellow Alignment	Orange Alignment	Teal Alignment
	Property Tax Impact	Property Tax Impact	Property Tax Impact	Property Tax Impact	Property Tax Impact	Property Tax Impact
Prosper ISD	\$48,684.61	\$8,490.50	-	\$65,149.68	-	-
Providence Village	-	\$3,513.80				
Denton Co. FWSD 8-B	\$125,228.74	\$115,071.37	-	-	-	-
Denton Co. FWSD 10	\$61,201.85	\$61,575.22	-	-	-	-
Clearcreek Watershed Authority	\$0.08	-	\$90.65	\$90.65	\$0.08	\$63.81
Smiley Rd WCID #1'	-	-	-	-	\$12.68	\$12.68
TOTALS	\$2,165,704.37	\$2,999,054.92	\$218,250.54	\$296,746.63	\$469,777.03	\$245,381.74
*Impacts if all needed right of way was acquired during 2021.						

Table 8.1.2 2019 Sales Tax Impact Analysis

Business Revenue Impact	
Old Blue Alignment	\$14,029,000
Revised Blue Alignment	\$33,067,000
Purple Alignment	\$38,723,000
Yellow Alignment	\$9,104,000
Orange Alignment	\$59,736,000
Teal Alignment	\$35,362,000

The economic impact of the revised Blue alignment is approximately \$2,999,055 for property tax revenue, which is the highest impact compared to the other alignments, and \$33,067,000 for business revenue, which is the fourth highest impact compared to the other alignments. For comparison, the property tax and business revenue impacts were included for the old Blue alignment prior to its revised version. The economic impact of the Purple alignment is approximately \$218,251 for property tax revenue and \$38,723,000 for business revenue. The economic impact of the Yellow alignment is approximately \$296,747 for property tax revenue and \$9,104,000 for business revenue. The economic impact of the Orange alignment is approximately \$469,777 for property tax revenue and \$59,736,000 for business revenue. The economic impact of the Teal alignment is approximately \$245,382 for property tax revenue and \$35,362,000 for business revenue. The alignment with the highest combined economic impact is the Orange alignment with a total of \$60,205,777 dollars of economic impacts followed by the Purple alignment with \$38,941,251 in economic impacts.

In addition to the analysis of the Viable Alignments, an analysis was conducted for the Blue alignment to analyze the economic impacts it would have by shifting the alignment 175 feet north of the current location and the same distance to the south. This analysis did not include the section along SL 288. As a result, the City of Aubrey, City of Celina including the Celina ISD, City of Krugerville, Pilot Point ISD, Providence Village, Clearcreek Watershed Authority, and Smiley Road WDIC # 1 were not included in the analysis for the shifted alignment. The results of the economic impact analysis are summarized in **Table 8.1.3** and **Table 8.1.4**. Overall, keeping the Blue alignment along the existing right of way has the least economic impact compared to shifting the alignment north or south.

Table 8.1.3 2021 Property and Sales Tax Impact Analysis

2021 Property Tax and Sales Revenue Impact*			
Jurisdiction	Blue Alignment	Blue Alignment (175' North)	Blue Alignment (175' South)
	Property Tax Impact	Property Tax Impact	Property Tax Impact
Aubrey ISD	\$8,566.98	\$ 17,665.74	-
Town of Cross Roads	-	-	-
City of Denton	\$19,410.06	\$ 1,6431.41	\$24,620.24
Denton ISD	\$1,468,868.87	\$ 2,305,970.63	\$2,527,026.69
Denton Co.	\$320,687.20	\$ 494,407.48	\$525,518.34
City of Frisco	\$149,711.44	\$ 5,663.63	\$214,370.78
Frisco ISD	\$424,961.47	\$16,072.19	\$608,779.90
Providence Village	\$3,513.80	\$ 91,261.04	-
Town of Little Elm	\$268,534.12	\$ 152,089.40	\$894,751.63
Town of Prosper	\$14,680.46	\$ 286,042.89	-
Prosper ISD	\$8,302.60	\$ 699,986.34	-
Denton Co. FWSD 8-B	\$114,928.66	\$ 190,071.76	\$3,892.22
Denton Co. FWSD 10	\$70,500.03	\$ 282,764.42	\$494,738.35
Total	\$2,872,665.69	\$4,558,426.93	\$5,293,698.15

Table 8.1.4 2019 Sales Tax Impact Analysis

Business Revenue Impact	
Blue Alignment	\$33,067,000
Blue Alignment (175' North)	\$165,521,000
Blue Alignment (175' South)	\$36,907,000

It should be noted that both analyses are general and conceptual in nature and are intended to provide order-of-magnitude comparisons between alignments. Additionally, the analyses are based on the most recent tax rate, sales, and property value data. Future fluctuations in any of these would influence economic impacts.

8.2 Development Potential Analysis

In contrast to the economic impact analysis, the development potential analysis provided information on opportunities for new development along each alignment. For this analysis, development potential is defined as the area of vacant commercial parcels.

More specifically, the analysis included vacant parcels located within 1,500 feet of an alignment, with a commercial (e.g., not residential, agriculture, institutional, open space/conservation) zoning designation. To account for development constraints associated with floodways, the portion of parcels located in the 100-year floodplain was excluded from the analysis, and the remaining area of floodplain parcels was reduced by 50 percent.

Subject parcels are divided into three categories:

- 0.5 to five acres, representing standalone businesses such as fast-food restaurants
- Five to 25 acres, representing big-box developments and strip centers
- Greater than 25 acres, representing regional developments such as malls

The results of the development potential analysis are shown in **Table 8.2.1**.

The Blue alignment serves the most vacant commercial land in terms of number of parcels and size. The Purple alignment serves 45 parcels with a total area of approximately 405 acres, while the Yellow alignment serves 47 parcels with a total area of approximately 416 acres. The Orange alignment serves 65 parcels with a total area of approximately 440 acres while the Teal alignment serves 38 parcels with a total area of approximately 357 acres.

Further, the alignments include a robust distribution of vacant parcel sizes. The Blue alignment serves 185 total vacant parcels, of which approximately 146 are “small”, 31 are “medium”, and eight are “large”. The Purple alignment serves 45 total vacant parcels, of which approximately 32 are “small”, nine are “medium”, and four are “large.” The Yellow alignment serves 47 total vacant parcels, of which approximately 33 are “small”, 10 are “medium”, and four are “large.” The Orange alignment serves 65 total vacant parcels, of which approximately 46 are “small”, 16 are “medium”, and three are “large.” The Teal alignment serves 38 total vacant parcels, of which approximately 27 are “small”, six are “medium”, and four are “large.”

Table 8.2.1 Vacant Parcel Analysis

Alignment	Total Vacant Parcels	Total Area (acres)	Floodplain Area (acres)	Remaining Floodplain Parcel Area at 50%	Total Net Area (acres)	Parcels			Acres		
						Small (0.5 to 5 acres)	Medium (5 to 25 acres)	Large (>25 acres)	Small (0.5 to 5 acres)	Medium (5 to 25 acres)	Large (>25 acres)
Blue Alignment	185	1099.82	44.71	48.61	1,006.50	146	31	8	254.27	305.88	446.33
Purple Alignment	45	424.96	13.03	6.51	405.42	32	9	4	53.49	104.90	247.03
Yellow Alignment	47	455.23	26.68	11.99	416.56	33	10	4	57.02	116.88	242.66
Orange Alignment	65	441.89	0.81	0.39	440.69	46	16	3	79.34	145.44	215.91
Teal Alignment	38	358.85	1.35	0.11	357.39	27	6	4	51.65	61.95	243.77

9. Project Implementation Plan

9.1 Next Steps

The anticipated project development process for the corridor is shown in **Figure 9.1.1**.

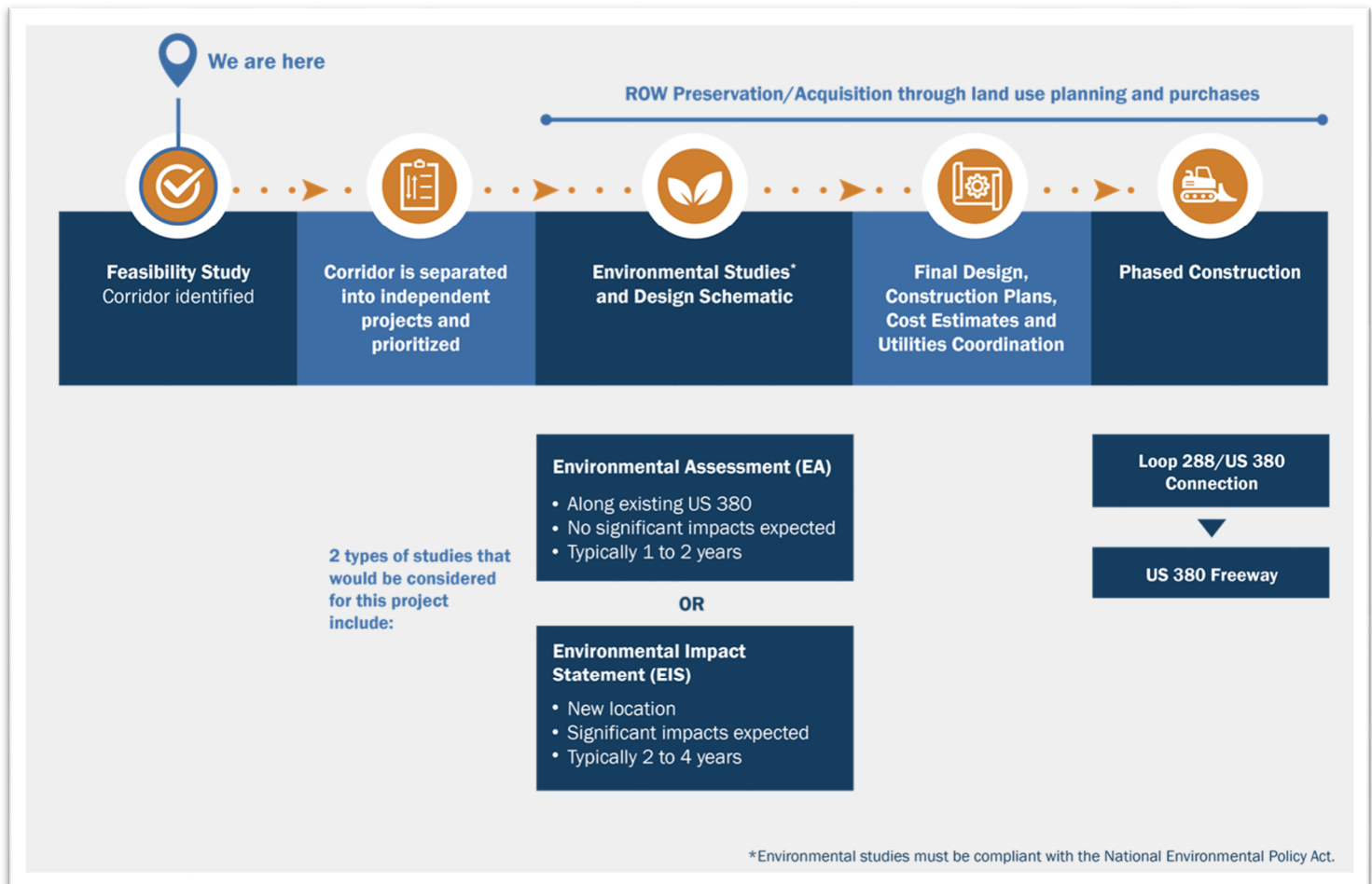


Figure 9.1.1 Project Development Process

Recommendations from this Feasibility Study will likely be broken into smaller projects which could be implemented independently over different timeframes. Federal regulations require that:

- Federally funded transportation projects have logical termini, meaning the project must have rational beginning and end points. End points may not be created to avoid proper analysis of environmental impacts.
- Federally funded transportation projects have independent utility and are reasonable expenditures even if no additional transportation improvements are made. A project must be able to provide benefits by itself and satisfy its purpose and need with no other projects being built.

TxDOT, in coordination with NCTCOG and local officials, proposes to advance the highest priority projects from this study through the environmental process. The environmental process for independent projects would cover the initial near-term phased construction and would also document the need to preserve the necessary right of way to achieve long-term goals.

These projects would be incorporated into local and state transportation plans, including the MTP, Unified Transportation Program (UTP), Transportation Improvement Program (TIP), and Statewide Transportation Improvement Program as appropriate. This action is consistent with the RTC policy FT3-008 and FT3-009 to accommodate the ultimate access-controlled transportation facility that would meet long-term needs.

9.2 Possible Independent Project Segmentation

Possible independent project segments for schematic design and environmental study are shown in Table 9.2.1.

Table 9.2.1 Possible Independent Project Segments

Project Limits	Project Priority Factors	Priority Level	Overall Project Priority	Length
SL 288 between I-35 and Dominion Street	Risk of land being developed	High	Medium	5.5 miles
	Anticipated population growth	Medium		
	Traffic need	Low		
SL 288 and US 380/US 377 interchange bypass	Risk of land being developed	High	Medium	1.5 miles
	Anticipated population growth	Low		
	Traffic need	Medium		
US 380/US 377 between Geesling	Risk of land being developed	Low	Low	3.5 miles

Project Limits	Project Priority Factors	Priority Level	Overall Project Priority	Length
Road and Fishtrap Road	Anticipated population growth	Low		
	Traffic need	Medium		
US 380 between Fishtrap Road and Doe Creek Road	Risk of land being developed	High	High	8.0 miles
	Anticipated population growth	High		
	Traffic need	High		
US 380 between Doe Creek Road and CR 26 (Collin County Line)	Risk of land being developed	High	Medium	2.5 miles
	Anticipated population growth	High		
	Traffic need	Low		

The segment of SL 288 between I-35 and Dominion Street is rated medium priority due to the level of interest in new residential developments along the corridor. Traffic needs in this section are lower than in other sections due to medium anticipated population growth and minimal traffic signals for through traffic.

The proposed SL 288 and US 380 interchange bypass is rated medium priority due to the likelihood of new development along its path and anticipated traffic demand for this connection.

The segment of US 380 between Geesling Road and Fishtrap Road is rated low priority due to lower risk of land being developed, lower anticipated population growth, and medium traffic need due to the minimal traffic signals within this section.

The segment of US 380 between Fishtrap Road and Doe Creek Road is rated high priority due to the level of interest in new developments along the corridor, high anticipated population growth, high traffic need and limited alternate routes.

The segment of US 380 between Doe Creek Road and CR 26 (Collin County Line) is rated medium priority despite high level of interest in new developments along the corridor and high anticipated population growth due to roadway improvements being provided by the in-progress US 380 project and a higher number of available alternate routes.

As funding is identified for an individual project, the environmental process, public involvement activities, schematic design, and any necessary environmental permitting would begin. During the environmental process and schematic design, additional agency coordination would be conducted to ensure that the project being developed complies with all state and federal laws, guidance, rules, and regulations, as appropriate.

Once the schematic design and environmental study have been completed and environmental clearance has been obtained, TxDOT would begin the right of way acquisition process, which is estimated to take approximately 24 months to complete. Although TxDOT is required to have obtained environmental clearance before purchasing right of way, it is possible for others, such as Denton County, to purchase and landbank right of way at risk of development prior to a project receiving environmental clearance so it will be available in the future. Time is an important factor in land banking or purchasing right of way in this rapidly developing area. Prices for land are very likely to increase in the future.

Following land banking and right of way acquisition, construction would begin and could take an additional 36 to 48 months to complete. Projects can begin at any time once funding for a specific project has been identified.

An estimate of the possible duration of future phases of project development is shown in **Table 9.2.2**.

Table 9.2.2 Possible Duration of Project Phases

Project Phase	Estimated Duration
Environmental study and schematic design	1 year if environmental assessment 2 to 4 years if environmental impact study
Final design, construction plans, cost estimates, utilities coordination	2 to 4 years
Phased construction	4 years

9.3 Suggested Construction Phasing

Several phases of project development remain before construction begins on these projects in Denton County. If a project in this report moves forward to construction after all phases of project development are complete, one suggested approach to phasing construction is shown in **Table 9.3.1**, which lists potential phases of construction from first to last.

Table 9.3.1 Suggested Construction Phasing by Project Segment

Project Limits	Construction Priority Factors	Suggested Construction Phasing
SL 288 between I-35 and Dominion Street	<ul style="list-style-type: none"> • Preserve right of way along the corridor. • Construct in coordination with I-35 improvements to mitigate multiple construction impacts to property owners/users. • Construct in coordination with the SL 288 and US 380 interchange bypass to mitigate multiple construction impacts to property owners/users. 	<ul style="list-style-type: none"> • Construct frontage roads. • Construct intersections. • Construct mainlanes.
SL 288 and US 380/US 377 interchange bypass	<ul style="list-style-type: none"> • Preserve right of way along the proposed alignment and reduce traffic congestion. • Construct in coordination with SL 288 improvements to mitigate multiple construction impacts to property owners/users. • Construct in coordination with US 380 improvements to mitigate multiple construction impacts to property owners/users. 	<ul style="list-style-type: none"> • Construct bypass. • Construct tie-ins.

Project Limits	Construction Priority Factors	Suggested Construction Phasing
US 380/US 377 between Geesling Road and Fishtrap Road	<ul style="list-style-type: none"> • Improve safety and complete freeway corridor. • Construct in coordination with the SL 288 and US 380 interchange bypass to mitigate multiple construction impacts to property owners/users. • Construct in coordination with US 380 improvements between Fishtrap Road and Doe Creek Road to mitigate multiple construction impacts to property owners/users. 	<ul style="list-style-type: none"> • Construct full freeway section.
US 380 between Fishtrap Road and Doe Creek Road	<ul style="list-style-type: none"> • Preserve right of way along the corridor and reduce traffic congestion. • Construct in coordination with US 380 improvements between Geesling Road and Fishtrap Road to mitigate multiple construction impacts to property owners/users. • Construct in coordination with US 380 improvements between Doe Creek Road and CR 26 (Collin County Line) to mitigate multiple construction impacts to property owners/users. 	<ul style="list-style-type: none"> • Construct full freeway section.

Project Limits	Construction Priority Factors	Suggested Construction Phasing
US 380 between Doe Creek Road and CR 26 (Collin County Line)	<ul style="list-style-type: none"> • Preserve right of way along the corridor and complete freeway corridor. • Construct in coordination with US 380 improvements between Fishtrap Road and Doe Creek Road to mitigate multiple construction impacts to property owners/users. • Construct in coordination with US 380 improvements in Collin County to mitigate multiple construction impacts to property owners/users. 	<ul style="list-style-type: none"> • Construct eastbound frontage road and mainlanes. • Construct westbound frontage road and mainlanes.

9.4 Cost

The revised Blue alignment is estimated to cost between \$1.9 to \$2.5 billion in 2022 dollars. A breakdown of the total cost by segment and cost category is shown in **Table 9.4.1**.

Table 9.4.1 Cost Estimate for Project Segments by Cost Category

Cost Category	SL 288 between I-35 and Dominion Street (Millions)	SL 288 and US 380/US 377 interchange bypass (Millions)	US 380/US 377 between Geesling Road and Fishtrap Road (Millions)	US 380 between Fishtrap Road and Doe Creek Road (Millions)	US 380 between Doe Creek Road and CR 26 (Collin County Line) (Millions)	Total (Millions)
Environmental and engineering	\$15-20	\$5-10	\$20-30	\$30-40	\$10-15	\$80-115
Right of way	\$30-40	\$10-15	\$40-50	\$120-150	\$40-55	\$240-310
Construction	\$300-380	\$100-125	\$400-500	\$600-760	\$200-265	\$1,600-2,030
Total	\$345-440	\$115-150	\$460-580	\$750-950	\$250-335	\$1,920-2,455

9.5 Funding

Funding for this project could be identified from national, state, and local sources. Below are sources that have currently been identified:

- Denton County – Bond Program
- Regional/State funding – Grant Applications

This project is not currently included in the region's MTP or TxDOT's UTP but would need to be included in those documents as well as the TIP. The UTP is TxDOT's statewide 10-year plan that guides the development of transportation work across the state. Organized into 12 funding categories, with each one addressing a specific type of work, the UTP authorizes the distribution of construction dollars expected to be available over the next 10 years. The outcome of the UTP process is a list of projects TxDOT intends to develop or begin constructing over the next 10 years, as well as information on the available funding associated with those projects.

The funding categories US 380 would be eligible for would likely include categories 2, 4, 7, 11, and 12. The funding allocation for the 2022 UTP for these categories for projects in the Dallas District is \$5.9 billion and is as follows:

- Category 2 (Metropolitan and Urban Area Corridor Projects) – \$2.0 billion
- Category 4 (Statewide Connectivity Corridor Projects) – \$0.9 billion
- Category 7 (Metropolitan Mobility and Rehabilitation) – \$1.1 billion
- Category 11 (District Discretionary) – \$0.2 billion
- Category 12 (Strategic Priority) – \$1.7 billion

It is important to note that there are many transportation needs in the DFW region that would also need to be funded through these categories. Funding in the UTP is already allocated to other projects, but funds could be moved to new projects when the UTP is updated each year. Currently, it appears it may take over 20 years to fund a freeway along the entire recommended alignment in Denton County unless other funds are identified.

TxDOT, Denton County, and NCTCOG plan to continue to work together to identify funding as this project moves forward.

9.6 Safety and Short-Term/Interim Projects

The in-progress US 380 project (which will widen US 380 to six lanes and provide a raised median between US 377 and the Collin County line, and provide overpasses for through traffic at FM 720, Navo Road, FM 423, Teel Parkway, and Legacy Drive) is intended to improve safety and relieve traffic congestion in the short-term. TxDOT will continue to consider future improvements designed to enhance safety, coordinate with projects on streets that intersect US 380, and consider modifications to access and intersections.

9.7 Recommended Future Feasibility Studies on Adjacent Corridors

TxDOT recommends a future feasibility study for a second freeway facility parallel to US 380 to improve east-west mobility in the region. This conceptual freeway facility is known as the Outer Loop and would follow the Teal alignment several miles north of US 380.

9.8 Potential Minimization of Effects and Mitigation Strategies

During the development of alignments, both built and natural environmental factors and constraints were considered. Practicable efforts have been made in the planning process to avoid impacts to the human and natural environments. When impacts are unavoidable, steps would be taken first to minimize impacts and then to mitigate for impacts. Impacts would be evaluated during the environmental process. According to the Council on Environmental Quality regulations (40 CFR 1508.20), mitigation efforts may be defined as:

- Avoiding an impact altogether.

- Minimizing the impact by limiting the degree or magnitude of the action.
- Rectifying the impact by repairing, rehabilitating, and restoring the resource.
- Reducing or eliminating the impact over time by preservation and maintenance activities.
- Compensating for the impact by replacing or providing substitutes to the resource impacted.

As each individual project moves forward through project development, alignments could be shifted to avoid future development or unexpected impacts. Where impacts to resources require coordination and permitting, required processes would be followed with the appropriate agency. A mitigation plan would be developed in cooperation with state and federal resource agencies and would be designed to mitigate unavoidable project impacts in accordance with applicable requirements of state and federal law.