APPENDIX S: Indirect and Cumulative Effects

Indirect and Cumulative Effects Analysis Technical Report

US 380 McKinney - Coit Road to FM 1827

CSJs 0135-02-065, 0135-03-053, and 0135-15-002

Texas Department of Transportation, Dallas District

September 2022

Table of Contents

List of Figures

Attachment A – Risk Assessment for Cumulative Effects and Risk Assessment for Indirect Effects

1.0 Induced Growth

The CEQ defines direct effects as those effects that are "caused by the action and occur at the same time and place".[1] Direct effects are predictable and are a direct result of the project. In addition to direct effects, major transportation projects may also have indirect effects on land use and the environment. As defined by the CEQ, indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems".[2]

TxDOT identifies two categories of indirect effects, induced growth effects and encroachment alteration effects.

> **Induced Growth**: For transportation projects, induced growth effects are most often related to changes in accessibility of an area, which in turn affects the area's attractiveness for development. Indirect effects associated with induced development are also like direct impacts but would occur in association with future land use development undertaken by others over the development horizon within a larger study area beyond the direct footprint of the proposed project.
>
> **Encroachment Alteration Indirect Effects**: These effects may result from changes in ecosystems, natural processes, or socioeconomic conditions that are caused by the proposed action but occur later in time or farther removed in distance. One example of this type of effect would be a change in habitat or flow regime downstream resulting from installation of a new culvert.

According to TxDOT's 2019 *Indirect Impacts Analysis Guidance*[3], direct impacts and indirect effects are linked in a causal chain. By nature, indirect effects are less certain than direct impacts but are still reasonably foreseeable. Indirect effects are probable rather than just possible consequences of an action. Determining probable consequences of an action involves reviewing numerous sources of information – such as development trends, land purchases, local plans, investment and/or marketing studies, etc. – and requires logical analysis of the likely effects of the proposed action and the possible consequences to determine the likelihood they will occur. TxDOT's *Risk Assessment for Indirect Impacts* was completed to document and record the need for an indirect effects analysis (see **Attachment A**).

The following sections outline the six-step process in the induced growth effects analysis.

1.1 Define the Methodology

A combined planning and collaborative judgment approach was selected to identify areas of potential growth, development trends, and the probability of the proposed project to influence local land use decisions within an Area of Influence (AOI). The planning judgment approach considers data collected from local and regional planning entities and an assessment of local conditions and trends using professional judgment to determine the potential for induced growth. Review of regional population estimates and local growth trends (2010 to 2045) and information from local and county planning documents was used to identify the potential extent of the AOI. The *US 380 Collin County Feasibility Study (*Feasibility Study*),* completed by TxDOT in 2020 was also

---

1 40 CFR § 1508.1(g)(1)

2 40 CFR § 1508.1(g)(2)

3 TxDOT's 2019 Indirect Impacts Analysis Guidance - https://ftp.txdot.gov/pub/txdot-info/env/toolkit/720-02-gui.pdf

used to identify issues pertaining to future development related to transportation improvements raised by the various jurisdictions consulted in defining the AOI.

As part of the collaborative approach, an *Indirect Impacts Questionnaire* including a map showing the defined AOI, was sent via email to planners and city officials with Collin County, City of McKinney, Town of Prosper, City of Frisco, Town of Fairview, City of Melissa, Town of New Hope, City of Weston, the North Central Texas Council of Governments (NCTCOG), and the North Texas Municipal Water District (NTMWD). The questionnaire presented the following seven questions/discussion topics:

1. Please briefly summarize the development trends and land use changes within your jurisdiction during the past 5 – 10 years. If possible, please provide a few examples.
2. In your professional opinion, would the proposed US 380 McKinney project induce development in your jurisdiction or planning area and why? If so, would this development occur without the project or in conjunction with other factors?
3. In your professional opinion, would the proposed US 380 McKinney project prohibit development in your jurisdiction or planning area and why?
4. In your professional opinion, would any redevelopment occur as a result of the proposed US 380 McKinney project? If so, where?
5. What future development would you not expect to be dependent on the proposed US 380 McKinney project?
6. Using a scale of 1 to 5, please indicate if you think the proposed Spur 399 Extension project would affect the rate and intensity of development within your jurisdiction?
7. In your opinion, would the proposed US 380 McKinney project affect or change the type of development within your jurisdiction?

The responses to the questionnaire are discussed in the following steps.

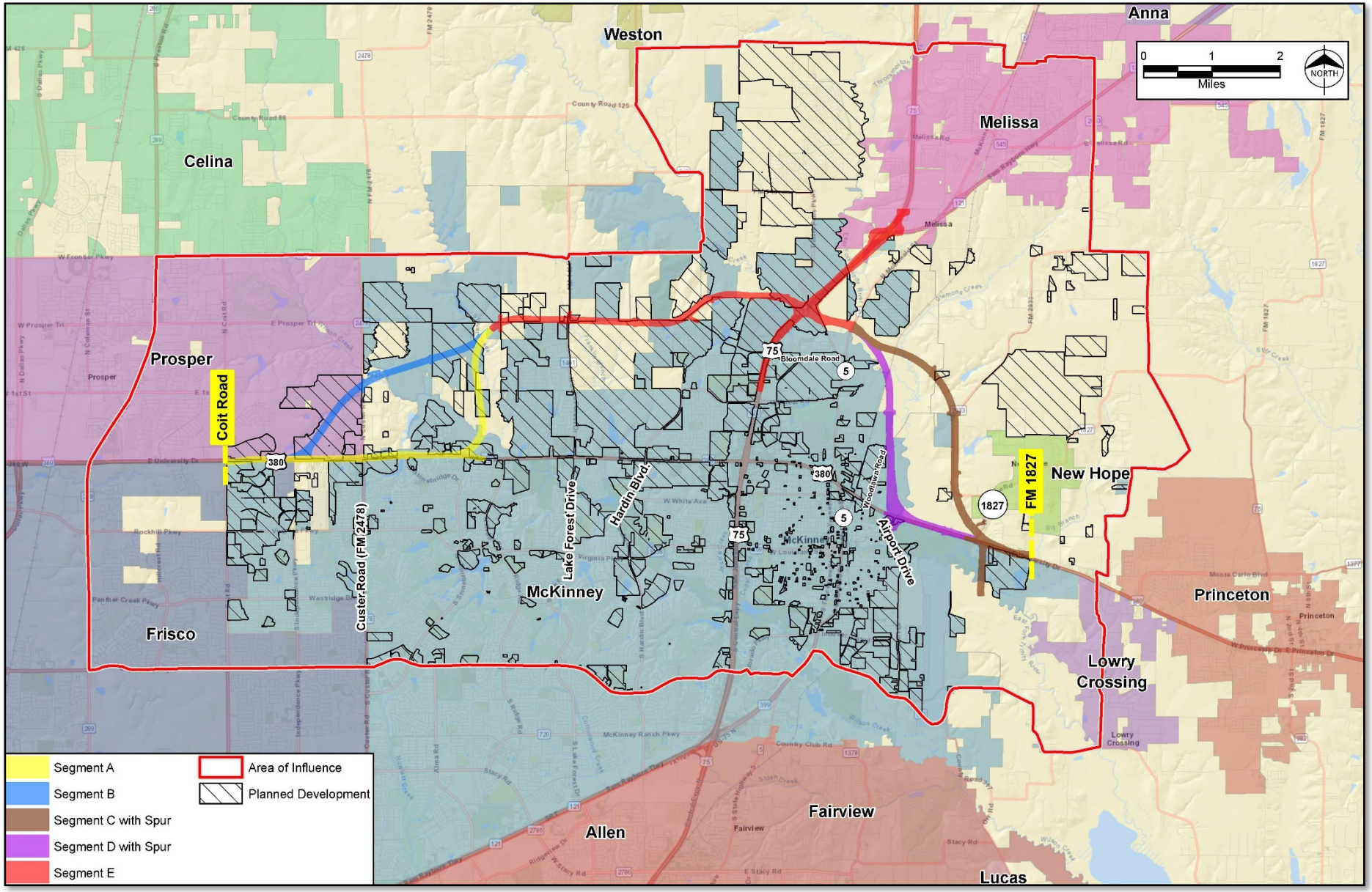
1.2 Define the Area of Influence (AOI) and Study Timeframe

An essential process objective is to define the scope of the analysis by considering potential indirect and induced growth effects and the possible geographic range or extent of those effects. The attributes and context of the proposed project are considered leading to a general assessment of the level of effects anticipated. In addition, the assessment considers the distance from the project construction footprint necessary for those effects to decrease to a negligible level. This approach helps determine the level of effort and approach needed to complete the analysis and is also critical in determining the geographic extent of the indirect effects study area, or the AOI.

1.2.1 Geographic Boundary of the Area of Influence

Depicted in **Figure 1**, the US 380 McKinney AOI encompasses approximately 71,914 acres and is bounded by Preston Road to the west; Farm to Market road (FM) FM 1461, portions of unincorporated Collin County, and portions of the jurisdictional boundaries of Melissa to the north; FM 2933, County Roads (CR) 412, 409, 408 and 406, and South Bridgefarmer Road to the east; and FM 546, SH 5 and El Dorado Parkway to the south. The AOI includes the cities of Prosper, Frisco, McKinney, Melissa, Lowry Crossing, and New Hope with McKinney comprising a majority of the AOI acreage.

Figure 1: US 380 McKinney Area of Influence (AOI)



The AOI was defined considering the following factors:

- The neighborhoods and areas best served by the proposed project – primarily potential travelers heading west and then south.
- Areas with potential to be opened for development following construction of the new freeway providing increased mobility and area access.
- Natural resources that have the potential to be indirectly affected.

1.2.2 Time Frame for Assessing Indirect Effects

The temporal boundary for the induced growth effects analysis extends from 2022 (date of the DEIS) to 2045 (the planning horizon year for NCTCOG's *Mobility 2045 Update*[4]).

1.3 Identify Areas Subject to Induced Growth in the AOI

Vacant land and undevelopable areas (such as waterbodies, floodplains, parklands, and existing development) were identified to determine where induced growth could occur in the AOI and where development would be limited. Future land use plans and local planning regulations were reviewed to identify projected areas of growth, areas of redevelopment, and policies that may encourage or restrict development. Of the jurisdictions in the AOI, the City of McKinney, Town of Prosper, City of Frisco, Town of New Hope, Collin County, and the City of Melissa have adopted future land use plans.

The total acreage of potentially developable and undevelopable land in the AOI is presented in **Figure 2** and illustrated in **Figure 1** and **Figure 3**.

Figure 2: Total Acreage of Potentially Developable and Undevelopable Land in the AOI

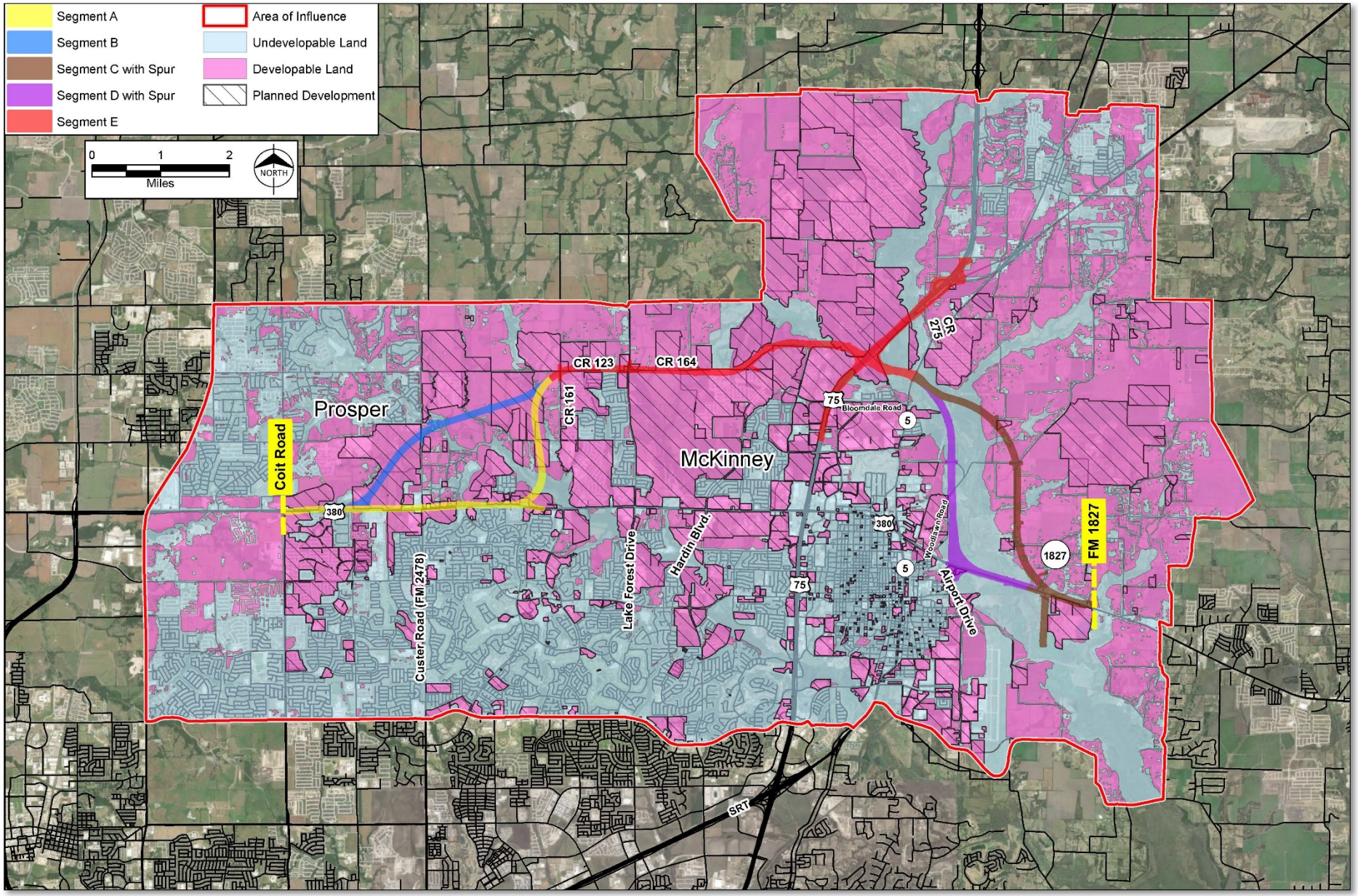
Land Type	Acres	Percent of AOI
Total Area of Influence (AOI)	71,914	-
Undevelopable Land (floodplains, waterbodies, parklands, and existing development)	35,207	49%
Planned Development	17,079	24%
Developable Land	19,628	27%

Source: NCTCOG, 2018, and City of McKinney and Town of Prosper, 2022

Developed areas in the AOI include existing and planned development (i.e. cleared lands and projects under construction), which is mostly in the southern, central, and northwest portions of the AOI, in the cities of McKinney, Frisco, and Prosper. Single-family residential construction is either underway or recently completed west of Coit Road in Prosper (far west of Segment B), north and south of Bloomdale Road (Segment E) in McKinney, and within Melissa and unincorporated parts of Collin County to the northwest and west. Approximately 17,079 acres in the AOI is comprised of planned development (known to-date) and approximately 19,628 acres is considered land that has the potential to be developed. Approximately 35,207 acres, or 49 percent, of the land in the AOI is considered undevelopable because it is located in floodplains, included within existing and proposed occupied by existing development. A substantial portion of the AOI encompasses the floodplains of Wilson Creek (central AOI), Honey Creek (central-north AOI),

[4] NCTCOG's Mobility 2045 Update - https://www.nctcog.org/trans/plan/mtp/mobility-2045-2022-update

Figure 3: Potentially Developable and Undevelopable Land in the AOI



the East Fork Trinity River (north and southeast AOI), and Clemons Creek (northeast AOI). Development is limited due to the presence of mapped floodplains and the need to add fill material to raise building foundations and most roadways above the base flood elevation, which has a cumulative effect on the downstream flow regime of the watershed, potentially causing flooding to worsen both in water depth, velocity, and extent. Development in floodplains must be permitted through the applicable city or county and typically includes mitigation in the form of compensatory storage (e.g., creating depressions or basins that can store the flood water displaced by development). For these reasons along with the additional expense in developing within floodplain areas, the likelihood of induced growth is low. Many parklands, like the City of McKinney park and greenbelt system, also occupy low-lying areas of the landscape including areas subject to flooding and mapped within the floodplain, and also may have been acquired or developed using federal monies that prohibit their conversion to other uses. As depicted in **Figure 2** approximately 24 percent of the AOI is also in various stages of planned development. **Figure 4** illustrates the planned developments that have been tracked during the development of the DEIS. There are no planned developments along Segment C and D within the eastern portion of the AOI.

1.3.1 Existing Land Use and Future Land Use in the AOI

City of McKinney – Per the city's ONE McKinney 2040 Comprehensive Plan [5], the Preferred Scenario[6] for future land use shows the general geographic development pattern the community hopes to achieve. In the southern portion of the AOI, south of US 380, the City of McKinney is mostly built-out and is characterized as Established Community District (Suburban Living, Urban Living, Professional Campus, Commercial Center, Neighborhood Commercial, Employment Mix, Manufacturing & Warehouse, Mixed Use, and Aviation), Town Center District (Historic Town Center – Downtown, Residential, and Mix, Commercial Center, and Professional Campus), Mill District (Transit-Ready Development, Urban Living, and Mixed Use Center), and Business and Aviation District (Aviation, Employment Mix, Professional Campus, Manufacturing & Warehousing, and Commercial Center). Existing and planned development in these areas matches McKinney's future vision for future development.

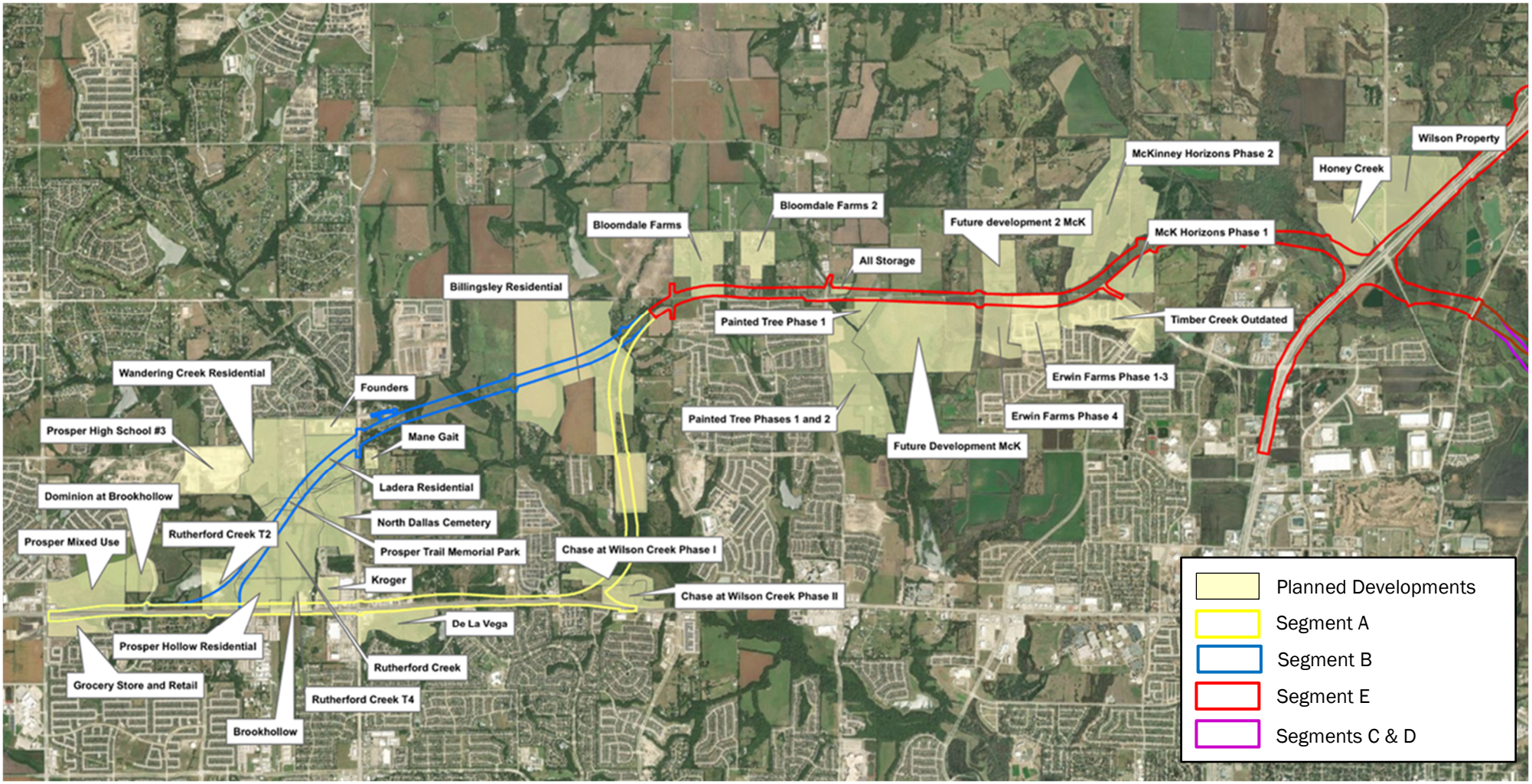
The ONE McKinney 2040 Land Use and Development Strategy[7] component of the ONE McKinney 2040 Comprehensive Plan "is intended to provide direction related to desired development patterns around the city, and to inform decisions related to the timing and phasing of future infrastructure investments in the city". Where Segments A, B, and E are proposed, McKinney's future land use plan has designated the areas north of US 380 and west of US 75 as the Northridge District, Outer Loop District, Scenic District, Medical District, Trinity Falls District, Honey Creek District, and Collin Crossing District. These districts all include a mix of residential, commercial, and professional campus, (i.e., office uses). Existing and planned development in these areas matches McKinney's 2040 development strategy. Numerous single-family and multi-family residential, as well as multi-use developments are in various stages of development (e.g. site plats submitted or under construction) and have been planned without the US 380 McKinney project as the driver of the

5 ONE McKinney 2040 Comprehensive Plan - https://www.mckinneytexas.org/292/2040-Comprehensive-Plan

6 Preferred-Scenario - https://www.mckinneytexas.org/DocumentCenter/View/17329/Preferred-Scenario?bidId=

7 Land Use and Development Strategy https://www.mckinneytexas.org/DocumentCenter/View/17301/2020-Comp-Plan-Amendments-Chapter-3---Spreads?bidId=

Figure 4: Planned Developments Along Segments A, B, and E



developments. These planned and future developments are situated east of N. Custer Road and encompass Segments A, B, and E. East of US 75 and north of US 380, where Segments C and D are proposed, the Preferred Scenario designates these areas as the Oak Hollow District, East Fork District, and the Agricultural District. Between US 75 and SH 5 the existing development matches the preferred development types of the Oak Hollow District, being residential, commercial, and manufacturing and warehousing. The areas along Segments C and D are currently rural with sparsely populated areas consisting of large lot single-family parcels. These areas have the potential to be influenced by the US 380 McKinney project due to increased access to currently undeveloped lands, warehousing, and commercial developments.

Town of Prosper – The northwestern portion of the AOI, north of US 380 and west of Custer Road, includes the Town of Prosper where current land uses are predominately large lot single-family residences, single-family tract developments, commercial developments along US 380, agricultural tracts, parkland, and undeveloped areas. Per the Town's Comprehensive Plan[8] approximately 65 percent of the developed land in Prosper is single-family residences and approximately 57 percent of all land in the town is vacant or undeveloped. The Town's Future Land Use Plan[9] designates the area bounded by US 380, Custer Road, Coit Road, and FM 1461 as Low Density Residential, Medium Density Residential, Retail & Neighborhood Services, and US 380 District. Existing and planned development in this area matches the Future Land Use Plan. Numerous planned developments are in various stages of development along Segment B in Prosper. These developments include single-family residential, mixed use, multi-family residential, municipal utilities, and a cemetery.

City of Frisco – The southwestern portion of the AOI, south of US 380, includes the City of Frisco where current land uses include single-family residences, retail, mixed use, office, agricultural, and multi-family residences. According to the city's Future Land Use Plan[10], the areas west of Custer Road, east of Preston Road, and north of El Dorado Parkway is slated for five different Place Types: Suburban Neighborhood, Business Park and Commercial Node (along US 380), Public (e.g., schools) and Park (City of Frisco 2015). Suburban Neighborhood primary land uses include single-family detached homes, duplexes, townhomes and secondary land uses include civic and institutional uses and parks. Business Park primary land uses include professional office, corporate office, supporting retail, and restaurants and secondary land uses include retail, restaurants, civic and institutional uses, commercial and parks. Commercial Node primary land uses include retail, restaurants, multi-tenant commercial, and junior anchor commercial and secondary land uses include civic and institutional uses, and parks. Existing and planned development in these areas matches the Future Land Use Plan.

Collin County – Most of the areas of unincorporated Collin County within the AOI are east of SH 5, south of SH 121 and north of US 380 with pockets of unincorporated areas along Segment A, east of Segment B and north and south of Segment E. Existing land use in these areas consist of rural, large lot single-family residential tracts, undeveloped parcels, and floodplain. According to the Collin County Mobility Plan 2013 Update[11] for

---

8 Town of Prosper Comprehensive Plan - https://www.prospertx.gov/business/land-development/planning/comprehensive-plan/

9 Town of Prosper Future Land Use Plan - https://www.prospertx.gov/wp-content/uploads/Plate-2-Future-Land-Use-Plan-Adopted-August-2021.pdf

10 City of Frisco Future Land Use Plan - https://www.friscotexas.gov/DocumentCenter/View/5406/Future-Land-Use-Plan-Map-PDF

11 Collin County's Future Land Use - https://www.collincountytx.gov/Transportation/Documents/mobility_plan/FutureLandUseMap.pdf

future land use, these areas are designated mostly for rural and urban residential development, and to a less extent, commercial and industrial developments. The County does not have zoning regulations, so development is mostly regulated through the subdivision platting process or by individual health and nuisance codes and ordinances. The cities maintain subdivision approval authority within its ETJ. These areas are also within the ETJs of McKinney and Melissa and, according to future land use plans, these areas are designated as rural and urban residential, estate residential, and commercial. There are developable parcels in these areas; however, the proposed project improvements would not increase accessibility in these areas, and therefore is not likely to induce growth.

McKinney National Airport – The McKinney National Airport (Airport) is south of existing US 380 where Segments C and D connect to US 380. The City of McKinney plans to extend the primary runway and expand the airfield and terminal area. The FAA issued a FONSI/ROD for the proposed action on July 27, 2022, with construction of the southern extension anticipated to begin in December 2022, and the northern extension beginning in March 2023. The city has designated the area around the Airport as the Business & Aviation District and according to the Preferred Scenario for future land use, the area would include aviation uses, employment centers, professional campuses, manufacturing and warehousing, and commercial centers. The Spur 399 Extension project has the potential to speed up development or redevelopment in this area by creating increased accessibility.

City of Melissa – The northeast corner of the AOI includes portions of the City of Melissa where existing land use is mostly comprised of large lot single-family residences, single-family tract developments, agricultural tracts, and undeveloped areas. According to the city's 2015 Comprehensive Plan Update, Future Land Use Plan[12] the areas along and between US 75, SH 5, and SH 121 (known as Melissa's "Core") are designated as Residential Estate, Low, Medium, and High Density Residential, Mixed Use, Commercial, Old Town, Parks and Open Space, Town Center, Public/Semi-Public, and a Transit Oriented District. According to the city, Low Density Residential is shown to comprise approximately 32 percent of future land uses in Melissa. Existing land uses match what is shown in the Future Land Use Plan. There are some undeveloped areas west of US 75 and SH 5 that could potentially be influenced by the US 380 McKinney project; however, it is uncertain to what degree the project may influence these undeveloped areas.

Town of New Hope - In between the unincorporated areas and bisected by FM 1827, is the Town of New Hope. The town does not have a future land use plan but does have a Zoning District Map[13], adopted in 2005, available online. The map shows platted residential subdivisions and zoning designations for areas that include single-family residential for two to four acre lots, manufactured home district, general business district, and municipal district (Town of New Hope, 2020). According to the zoning map, large lot single-family residences are located north of FM 1827, the general business district is located along FM 1827, two-acre lot single-family residences are located south of FM 1827, and the manufactured home district is in the southeastern portion of the city boundary along County Road 331. The proposed project improvements would not increase accessibility to this area, and therefore is not likely to induce growth in New Hope.

---

[12] Melissa Future Land Use Plan - https://www.cityofmelissa.com/DocumentCenter/View/110/Chapter-3---Future-Land-Use-Plan-PDF

[13] New Hope Zoning District Map - https://static1.squarespace.com/static/5779303b15d5db17f9719026/t/62bf2a822f37303b044ff8f3/1656695434298/SIGNED+-+New+Hope+2005+Zoning+Map+with+2021+ETJ+F+06-29-22.pdf

City of Lowry Crossing – The southeast portion of the AOI encompasses the western extent of the City of Lowry Crossing which has not adopted a comprehensive plan or future land use plan; however, the Collin County future land use plan shows Residential Rural, Residential Urban, and a small area of Service (Office, Commercial) within the jurisdictional boundaries of Lowry Crossing. Land use in the city is currently dominated by large lot single-family homes and open tracts of land. The proposed project improvements would not increase accessibility to this area, and therefore is not likely to induce growth in this city.

Based on future land use plans of the jurisdictions in the AOI, developable and undevelopable areas, and accessibility of undeveloped parcels, there are limited areas in the AOI that have the potential for induced growth and/or the potential to speed up planned development because of the US 380 McKinney project. The area with the greatest potential for induced growth are parcels along Segment C between SH 5 and existing US 380 and east of Segment C, west of and outside of the Town of New Hope. The DEIS will include further assessment of the potential for induced growth associated with the Preferred Alternative.

1.4 Determine if Growth is Likely to Occur in the Induced Growth Areas

Improvements in transportation infrastructure that increase mobility, reduce congestion, decrease travel times, and provide better access may attract development. In addition to transportation improvements, several factors contribute to where growth may occur including land suitability, availability of utilities, physical constraints, favorable planning policies, and development trends. This step analyzes the likelihood for induced growth to occur in areas within the AOI that are subject to induced growth.

1.4.1 Regional and Local Growth Trends

Based on population and employment trends, growth is likely to occur in the AOI. Except for the City of Lowry Crossing and Town of New Hope which experienced a loss of population and employment, most of the jurisdictions in the AOI have grown substantially in population and employment from 2010 to 2020. According to the Texas Water Development Board (TWDB) and NCTCOG, all the jurisdictions in the AOI are projected to increase in population by 2040. 2040 and 2045 employment data were unavailable for Prosper, Lowry Crossing, New Hope, and Melissa; however, due to the rapid growth occurring in the AOI, employment is anticipated to increase with increases in population. Population and employment estimates and projections for the jurisdictions within the AOI are summarized in **Figure 5**.

Figure 5: Historical and Projected Population Growth

Jurisdiction	Estimate		Projections	Percent Change	Percent Change
	2010[a]	2020[b]	2040[c]/2045[d]	(2010-2020)	(2019-2040/2045)
City of McKinney					
Total Population	131,117	191,197	238,474	48%	51%
Employment	60,251	96,766	119,846	61%	31%
Town of Prosper					
Total Population	8,173	25,887	44,878	217%	99%
Employment	3,774	11,912	-	216%	-
City of Frisco					
Total Population	103,158	188,387	280,000	83%	58%
Employment	52,950	94,824	87,064	79%	-3%
City of Lowry Crossing					
Total Population	1,945	1,205	3,000	-38%	122%
Employment	1,515	625	-	-59%	-
Town of New Hope					
Total Population	614	600	1,195	-2%	102%
Employment	404	282	-	-30%	-
City of Melissa					
Total Population	4,163	10,774	13,216	159%	39%
Employment	1,879	5,160	-	175%	-
Collin County					
Total Population[(d)]	782,341	1,006,038	1,689,168	29%	73%
Employment[(d)]	383,069	525,711	835,342	37%	64%
Dallas-Fort Worth MPA					
Total Population[(d)]	6,417,724	7,235,508	11,246,531	13%	55%
Employment[(d)]	2,700,000	4,584,235	7,024,227	70%	53%

Source: (a) US Census 2010
(b) American Community Survey (ACS) 2016-2020
(c) TWDB 2018
(d) NCTCOG 2022

1.4.2 Indirect Effects Questionnaire Responses

As discussed in Step 1, an *Indirect Impacts Questionnaire* was sent via email to planners and city officials with the City of McKinney, Collin County, Town of Prosper, City of Frisco, Town of Fairview, City of Melissa, Town of New Hope, NCTCOG, and NTMWD. As shown in **Figure 6**, six of the eight jurisdictions provided responses to the questionnaire with the City of McKinney responding to a follow up email resulting in a phone call interview.

Figure 6: Indirect Effects Questionnaire Respondents

Jurisdiction/Stakeholder	Correspondence Date	Response Date*
City of McKinney	7/13/2021; 2/11/2022	2/11/2022; 2/15/2022
Collin County	7/13/2021	No response received.
Town of Prosper	7/13/2021	8/6/2021
City of Frisco	7/13/2021; 2/23/2022	No response received.
City of Melissa	7/13/2021	7/15/2021
Town of New Hope	7/13/2021	7/14/2021
NCTCOG	7/13/2021	8/9/2021
NTMWD	7/13/2021	7/23/2021

Source: Burns & McDonnell, 2021 and 2022

Answers to the questionnaire for each jurisdiction that responded are as follows:

City of McKinney

The city did not respond to the questionnaire; however, a follow-up email was sent on February 11, 2022, and a phone interview was conducted on February 15, 2022. During the interview the city made the following key points:

- Multifamily and commercial developments are planned north of US 380 at Segment A.
- Planned single-family residential development (Tucker Hill) would be bisected by Segment A.
- Planned residential development north of CR 164 (Segment E).
- Approximately 1,000 acres with 3,400 residential developments (Painted Tree) at southeast quadrant of CR 164 and Lake Forest Drive.
- Planned commercial development along US 380.
- Segments C and D would likely induce commercial and industrial development.

Town of Prosper

The Town of Prosper provided responses to the questionnaire via email on August 6, 2021. Key points include:

- Question 1, significant growth in residential development over the past 10 years with over 1,000 home permits per year and large increase in non-residential development with over two million square-feet added since 2014.
- Question 2, improvement of US 380 would not induce development in the Town of Prosper; however, the type of development in certain locations may change. The project could reshape how tracts will develop to be more intense but will have minimal effect on other locations.

- Question 3, the project would not prohibit development in the Town of Prosper but may have an adverse effect on existing development if the roadway improvements don't follow the current US 380 alignment.
- Question 4, any redevelopment would be minimal. Any redevelopment would likely occur where businesses would be potentially displaced, most likely at the northwest corner of US 380 and N. Custer Rd.
- Question 5, the expectation is no development along US 380 to be dependent on the proposed project.
- Question 6, using a scale of 1 to 5, the respondent indicated the rate of development would be 1 and the intensity of development would be 3.
- Question 7, any realignment of US 380 could have a significant negative effect to the type of development in Prosper as the Town's Comprehensive Master Plan and Future Land Use Plan would not have contemplated uses in the new realignment.

City of Melissa

The City of Melissa provided responses to the questionnaire via email on July 15, 2021. Key points include:

- Question 1, "first wave" single-family residential development and an increase in commercial development over the past 10 years.
- Question 2, the project would likely increase traffic, but the city's road system is designed and built for expansion. The increase in traffic would come anyway due to the growth in the city's area of Collin County.
- Questions 3, 4, and 7, the city indicated that the project would not prohibit development in their jurisdiction or planning area, no redevelopment would occur, and the project would not affect or change the type of development.
- Question 6, using a scale of 1 to 5, the respondent indicated the rate of development would be 3 and the intensity of development would be 2.

Town of New Hope

The Town of New Hope provided responses to the questionnaire via email on July 14, 2021. Key points include:

- Question 1, none of the properties within the Town's extra-territorial jurisdiction (ETJ) or town limits would be affected by either the Purple or Orange Alternative. The construction schedule of the Orange route could affect traffic coming into New Hope. The town requests the connection of FM 1827/New Hope Road West and the US 380 McKinney project would be coordinated so traffic would not detour onto FM 1827 before the bypass is started.
- Question 2, Per the mayor, "We do not have much commercial, I do not believe it would increase development. We only have a few undeveloped parcels and not sure if this would affect in either a positive or negative way".
- Questions 3, 4, and 5, the Town answered 'no' for Questions 3 and 4 and 'N/A' for Question 5.
- Question 6, using a scale of 1 to 5, the respondent indicated the rate of development would be 2 and the intensity of development would be 2.

NCTCOG

The NCTCOG provided responses to the questionnaire via email on August 9, 2021. Key points include:

- Question 1, the northern portion of Collin County has consistently been amongst the most rapidly growing areas in the Nation, and this is expected to be the trend for the foreseeable future.
- Question 2, considering the rapid residential growth that continues to persist around the project area, the proposed project would induce development along whichever alignment is chosen.
- Question 3, any prohibitions on intense commercial development would come from locations that are not along a chosen alignment. This would be due to practicality in that intense commercial development tends to prefer high visibility, high traffic corridors. Non-corridor areas may still develop but would most likely not develop to the intensity of the chosen alignment.
- Question 4, NCTCOG expects some redevelopment to occur, but not expect it to be rapid or widespread.
- Question 5, it's anticipated that residential development would be least dependent on the proposed project.
- Question 6, using a scale of 1 to 5, the respondent indicated the rate of development would be 3 and the intensity of development would be 5.
- Question 7, areas along the chosen alignment will be developed at a higher intensity than areas not along the chosen alignment.

NTMWD

The NTMWD provided a response on July 23, 2021, but did not respond to the questions in the questionnaire. Key points:

- The NTMWD does not have jurisdiction over developments or land use within its service area.
- NTMWD has existing and plans for new infrastructure to provide services to its member cities and customers in the US 380 Study Area.
- NTMWD stated they have coordinated closely with TxDOT for several projects that both entities have in the AOI.

1.4.3 Potential for induced Development

Based on the communications received in response to the questionnaire, a phone interview conducted with the City of McKinney, and consideration of existing land and future land uses and development plans, areas within the AOI that may be subject to induced growth are likely confined within the city limits and ETJ of McKinney and potentially portions of unincorporated Collin County adjacent to the proposed Build Alternatives. The potential each Build Alternative has to induce growth is discussed below.

Purple Alternative (A+E+D)

The Purple Alternative, representing the recommended alignment from the Feasibility Study, would be constructed primarily on new location which may open areas to development that are currently undeveloped or in agricultural use. Along the portion of Segment A that would improve existing US 380 within the Town of Prosper, the project would not induce development but could change the type of development or reshape how vacant tracts develop or occupied tracts redevelop. Redevelopment would likely occur on parcels currently

occupied by businesses that may be displaced by the proposed improvements, primarily between Coit Road and N. Custer Road. The town planner does not expect development along US 380 to be dependent on the proposed project.

In the McKinney portion of Segment A, east of N. Custer Road, multifamily and commercial developments are planned north of existing US 380 (see **Figures 1**, **3**, and **4**). North of existing US 380, several large single-family residential developments exist, and others are planned that are in various stages of plat review or are currently under construction. Along Segment E numerous single-family developments are in various stages of planning and construction, as well as a mixed tenant/retail/office park planned in the northwest quadrant of the intersection of Segment E and US 75. A single-family residential development is also planned adjacent to and east of Erwin Park. TxDOT and the City of McKinney have worked closely to concur on the location of the proposed US 75 interchange and the alignment of Segment E along existing Bloomdale Road in consideration of planned developments, the city's Thoroughfare Plan, and the location of existing and planned major utilities (in coordination with NTMWD). Large lot residential areas north of Bloomdale Road are also converting to denser residential developments. According to the city, with the amount of existing and proposed development the proposed project is not expected to induce development within their jurisdiction between N. Custer Road and US 75.

Segment D passes through vacant and undeveloped land, most located within the 100-year floodplain of the East Fork Trinity River, which for the purposes of this analysis is considered undevelopable. The costs associated with developing a property within a flood prone area may also be prohibitive, and therefore, further limiting the amount of growth and development induced along Segment D. However, the City of McKinney stated that the project would likely induce commercial and industrial development along Segment D where permitting could be obtained.

Blue Alternative (A+E+C)

Segments A and E of the Blue Alternative would result in the same limited induced growth as under the Purple Alternative. According to Prosper and McKinney planners, induced development would likely not occur along Segments A and E; however, NCTCOG stated induced development would likely occur along whichever alignment is chosen but did not specify locations.

Segment C traverses across vacant and undeveloped lands which include scattered rural, large parcel single-family residences. Segment C is east and outside of the East Fork Trinity River 100-year floodplain but within the extra territorial jurisdiction (ETJ) of McKinney, unincorporated Collin County, and just west of the municipal boundary of the Town of New Hope. The City of McKinney stated that the project would likely induce commercial and industrial development along Segment D. Segment C has the greatest potential for induced growth of the segments under consideration because it is primarily outside of the 100-year floodplain and in a relatively undeveloped area in close proximity to existing US 380.

Brown Alternative (B+E+C)

Along the portion of Segment B that improves existing US 380 through the Town of Prosper, the project would not induce development within their jurisdiction, but would influence the type of redevelopment or reshape how tracts would develop possibly with greater density. Any redevelopment would likely occur on parcels where businesses would be potentially displaced, particularly at the northwest corner of US 380 and N. Custer Road. The town does not expect development along US 380 to be dependent on the proposed project. Within the

area of Segment B, numerous developments, including single-family and senior housing, multi-family, and a planned cemetery, have been zoned, platted, have approved site plans, or have obtained building permits for initial phases and have started construction. Although there are still undeveloped parcels north of existing US 380 and along and west of Segment B, the town does not anticipate that construction of Segment B would induce development on these parcels.

Segments E and C of the Brown Alternative would result in the same limited induced growth as described under the Blue Alternative. Segment E includes the same existing and planned developments as described under the Blue Alternative and would have the same potential for induced development. As noted previously, Segment C has the greatest potential for induced growth of the study segments considered.

Gold Alternative (B+E+D)

Segments B and E of the Gold Alternative include the same existing and planned developments as described under Segments B and E of the Brown Alternative and the same low potential for induced development along Segment D of the Purple Alternative.

1.5 Identify Resources Subject to Induced Growth

The methodology for assessing the potential for induced growth was based on a combined planning and collaborative judgment approach and qualitative analysis; therefore, specific resources within the AOI that may be affected because of induced growth were not quantified for the DEIS. The proposed project has the potential for encroachment alteration effects to floodplains and floodways, vegetation and wildlife habitat, water resources, and the visual and aesthetic environment.

Floodplains/Floodways and Water Resources - Based on the analyses conducted to date and because of the presence of Wilson Creek, Honey Creek, and the East Fork Trinity River and their associated floodplains, floodways, riparian habitats, and wetlands, encroachment alteration effects within the downstream reaches of both watersheds leading to Lavon Lake could occur. The USACE manages a flowage easement along a section of the East Fork Trinity River south of existing US 380 used to maintain water flow to Lavon Lake. Part of the easement is buffered by McKinney Future Parkland while the rest passes through privately-owned lands. Although Segments C and D are being designed to avoid and minimize, where feasible and practicable, the placement of fill materials within waters of the United States (WOTUS) and the location of pier/bent locations within floodplains/floodways, mitigation or compensatory storage may be needed to offset unavoidable ecosystem and downstream flooding effects to avoid/minimize the need to create compensatory flood storage and possibly cause additional effects on water features. The land around the flowage easement, south of the existing US 380 and within the East Fork Trinity River floodplain would not be developable and is also designated by the City of McKinney for future public recreational use. The expansion of the Airport, south of existing US 380, includes an extension of the primary runway northward and into the East Fork Trinity River floodplain. The Airport is developing a Conditional Letter of Map Revision (CLOMR) to make changes to the floodplain boundary (FEMA FIRM map) and water surface elevation resulting from the amount of fill that needs to be placed within the floodplain to accommodate the runway extension. This action could cause changes in the floodplain north of existing US 380 (Segment D) and is just upstream of the East Fork Trinity River crossing of the Spur 399 Extension Preferred (Orange).

Vegetation and Wildlife Habitat - Any induced growth occurring along Segments C and D would increase the amount of impervious cover and contribute to increased runoff rates and negatively affect the water quality of the East Fork Trinity River and potentially Lavon Lake. The water features and riparian and floodplain forests that would be cleared for development may support federally and state protected species known to occur within Study Area that include mussels, the alligator snapping turtle, numerous birds, and bats. Encroachment alteration effects on these habitats and the resident species could occur after construction of the Preferred Alternative and in combination with other areas disturbed to support development induced by the project.

Visual and Aesthetic Environment - The open landscape where Segments C and D would be built would change drastically with the introduction of an 8-lane freeway, much of which would be elevated either on earthen fill or on a bridge-like structure. Most of the areas along Segment C and D are relatively open requiring limited clearing with the exception of large clusters of trees where each segment crosses the DART/DNGO Railroad. Induced development that may occur along Segments C or D would also contribute to a substantial change to the visual landscape of the area over time with the addition of rooftops, pavement, above ground transmission lines, overhead street lighting and signage, and traffic signals that would clutter the viewshed.

The DEIS will include further assessment of the potential for induced growth associated with the Preferred Alternative.

1.6 Identify Mitigation if Applicable

As TxDOT and the FHWA do not have the authority to implement zoning or planning regulations, mitigation for indirect effects is within the control of municipal agencies rather than a sponsoring agency. TxDOT and FWHA are obligated to advise state and local agencies with mitigation authority as to what it considers appropriate mitigation. This advice is considered part of the federal agency's National Environmental Policy Act responsibility.

All development (public or private developers) must comply with FEMA flood control regulations and local floodplain administration; the Endangered Species Act; the Migratory Bird Treaty Act, the CWA, including Section 401 Water Quality Certification requirements and Section 404 permits for projects effecting WOTUS; and other regulations requiring mitigation, if there are effects on species habitat.

The proposed US 380 McKinney project could influence future land use changes within the AOI; however, new and planned residential developments are more likely to influence changes in land use patterns and induce growth within the AOI than construction of any of the roadway segments. The proposed project would support future development in the AOI; however, the proposed project would not be a primary factor in making land use decisions in the area. The proposed project is not anticipated to substantially induce growth; therefore, no mitigation for induced growth effects would be required.

No-Build Alternative

Under the No-Build Alternative, minor areas of induced growth would occur due to the amount of undeveloped land along existing US 380 and the potential for redevelopment elsewhere in the Study Area. The planned US 380 improvements that are part of the No-Build Alternative may address safety and property access issues in the short-term for what limited properties would be subject to development and redevelopment.

Preferred Alternative

The DEIS will include further assessment of the potential for induced growth and any mitigation warranted for the Preferred Alternative.

2.0 Cumulative Effects

The CEQ defines cumulative effects as the "effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of the agency (federal or non-federal) or person undertakes such other actions".[14] These types of effects "can result from individually minor but collectively significant actions taking place over a period of time"[15].

The purpose of a cumulative effects analysis is to view the direct impacts and indirect effects of the proposed project within the larger context of past, present, and future activities that are independent of the proposed project, but which are likely to affect the same resources in the future. Environmental and social resources are evaluated from the standpoint of relative abundance among similar resources within a larger geographic area. Broadening the view of resource effects in this way allows the decision maker an insight into the magnitude of project-related effects in light of the overall health and abundance of selected resources.

The following provides a comparison of the potential cumulative effects of each reasonable alternative when considered with the anticipated impacts of the following other current and future actions planned to occur within the Study Area. The analysis was based on the data contained in this DEIS and inferences as to the potential impacts of the current and future actions assessed, because many of them are undergoing current study or are anticipating studies to be conducted in the near future. The cumulative effects of the Preferred Alternative (once selected) will be addressed in greater detail in the DEIS.

2.1 Resource Study Area, Conditions, and Trends

Scoping for the US 380 McKinney project, including cumulative effects, was conducted through outreach to agencies, stakeholders, and the public through meetings; and from information obtained after the distribution of an Indirect Impact Questionnaire (see **Section 1.4**) to local planning entities. The scoping process and assessment of the direct impacts and indirect effects of the Build Alternatives, led to the identification of key resources for detailed cumulative effects analysis. The resource categories considered for further assessment are listed in **Figure 7**.

2.2 Direct Impacts and Indirect Effects on each Resource from the Proposed Project

Figure 7 summarizes the direct impacts and indirect effects of the Build Alternatives, an assessment of the health of the resource, and recommendation on carrying the resource category forward for further evaluation in the cumulative effects assessment.

[14] 40 CFR § 1508.1 (g)(3)

[15] 40 CFR §1508.7

Figure 7: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Community Impacts	PURPLE ALTERNATIVE (A+E+D	**Without Spur 399** -18 potential single-family residential displacements; 3 potential displacements located in a minority block group (BG). -26 potential commercial displacements. -4 potential "other" displacements. -Constructed adjacent to 24 identified neighborhoods. -Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -Three BGs with 50 percent or greater minority population are mapped within the Segment C-D focus area. -Shared-use paths (SUPs) adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails. **With Spur 399** -18 potential single-family residential displacements; 3 potential displacements located in a minority BG. -28 potential commercial displacements. -4 potential "other" displacements. -Constructed adjacent to 24 identified neighborhoods. Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -Three BGs with 50 percent or greater minority population in the Segment C-D focus area. -SUPs adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails.	Residential and commercial properties located near the Project Area that are not physically impacted may experience a change in market value, either positive or negative, and may be conducive to redevelopment. Views of the Study Area would be obstructed in areas where the freeway is elevated, creating a physical and visual barrier between the established and planned neighborhoods. The proposed project is not expected to substantially induce growth or result in adverse encroachment-alteration effects on existing neighborhoods and communities.	No	No. None of the Build Alternatives would result in disproportionately high and adverse direct impacts or indirect effects to populations with environmental justice concerns. Moreover, *Mobility 2045 Update* roadway and transit recommendations do not have disparate effects on protected populations. Neighborhoods located within the Study Area are not considered to be in poor or declining health according to the findings of the CIA technical report.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Community Impacts	BLUE ALTERNATIVE (A+E+C)	**Without Spur 399** -24 potential single-family residential potential displacements. -33 potential commercial displacements. -3 potential "other" displacements. -Constructed adjacent to 21 identified neighborhoods. -Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -Three BGs with 50 percent or greater minority population in the Segment C-D focus area. -3 potential EJ displacements along Segment C. -SUPs adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails. **With Spur 399** -24 potential single-family residential potential displacements. -34 potential commercial displacements. -4 potential "other" displacements. -Constructed adjacent to 21 identified neighborhoods. -Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -Three BGs with 50 percent or greater minority population in the Segment C-D focus area. -3 potential EJ displacements along Segment C. -SUPs adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails.	Residential and commercial properties located near the Project Area that are not physically impacted may experience a change in market value, either positive or negative, and may be conducive to redevelopment. Views of the Study Area would be obstructed in areas where the freeway is elevated, creating a physical and visual barrier between the established and planned neighborhoods. The proposed project is not expected to substantially induce growth or result in adverse encroachment-alteration effects on existing neighborhoods and communities.	No	No. None of the Build Alternatives would result in disproportionately high and adverse direct impacts or indirect effects to populations with environmental justice concerns. Moreover, *Mobility 2045* roadway and transit recommendations do not have disparate effects on protected populations. Neighborhoods located within the Study Area are not considered to be in poor or declining health according to the findings of the CIA technical report.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Community Impacts	BROWN ALTERNATIVE (B+E+C)	**<u>Without Spur 399</u>** -26 potential single-family residential displacements. -19 potential commercial displacements. -2 potential "other" displacements. -Constructed adjacent to 20 identified neighborhoods. -Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -3 BGs with 50 percent or greater minority population in the Segment C-D focus area. -3 potential EJ displacements along Segment C. -SUPs adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails. **<u>With Spur 399</u>** -26 potential single-family residential displacements. -20 potential commercial displacements w/Spur. -3 potential "other" displacements. -Constructed adjacent to 20 identified neighborhoods. -Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -3 BGs with 50 percent or greater minority population in the Segment C-D focus area. -3 potential EJ displacements along Segment C. -SUPs adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails. .	Residential and commercial properties located near the Project Area that are not physically impacted may experience a change in market value, either positive or negative, and may be conducive to redevelopment. Views of the Study Area would be obstructed in areas where the freeway is elevated, creating a physical and visual barrier between the established and planned neighborhoods. The proposed project is not expected to substantially induce growth or result in adverse encroachment-alteration effects on existing neighborhoods and communities.	No	No. None of the Build Alternatives would result in disproportionately high and adverse direct impacts or indirect effects to populations with environmental justice concerns. Moreover, *Mobility 2045* roadway and transit recommendations do not have disparate effects on protected populations. Neighborhoods located within the Study Area are not considered to be in poor or declining health according to the findings of the CIA technical report.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Community Impacts	GOLD ALTERNATIVE (B+E+D)	**Without Spur 399** -20 potential single-family residential displacements; 3 potential displacements located in a minority BG. -12 potential commercial displacements. -3 potential "other" displacements. -Constructed adjacent to 24 identified neighborhoods. -Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -3 BGs with 50 percent or greater minority population in the Segment C-D focus area. -SUPs adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails. **With Spur 399** -20 potential single-family residential displacements; 3 potential displacements located in a minority BG. -14 potential commercial displacements. -3 potential "other" displacements. -Constructed adjacent to 24 identified neighborhoods. -Would not directly or indirectly separate or isolate groups of people and nor would they bisect neighborhoods not already separated by US 380 or other major highway in the Study Area; however, the proposed project may create a barrier or separation between established and planned neighborhoods. -Three BGs with 50 percent or greater minority population in the Segment C-D focus area. -SUPs adjacent to the frontage roads would provide multi-modal access to neighborhoods, commercial areas, parklands, and existing/planned trails.	Residential and commercial properties located near the Project Area that are not physically impacted may experience a change in market value, either positive or negative, and may be conducive to redevelopment. Views of the Study Area would be obstructed in areas where the freeway is elevated, creating a physical and visual barrier between the established and planned neighborhoods. The proposed project is not expected to substantially induce growth or result in adverse encroachment-alteration effects on existing neighborhoods and communities.	No	No. None of the Build Alternatives would result in disproportionately high and adverse direct impacts or indirect effects to populations with environmental justice concerns. Moreover, *Mobility 2045* roadway and transit recommendations do not have disparate effects on protected populations. Neighborhoods located within the Study Area are not considered to be in poor or declining health according to the findings of the CIA technical report.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Water Resources - Wetlands and Surface Waters	PURPLE ALTERNATIVE (A+E+D	**With and Without Spur 399** - Approximately 47.18 acres of water features, including streams, are mapped within the Environmental Footprint and include Rutherford Creek, Wilson Creek, Stover Creek, Franklin Branch, Honey Creek and their tributaries and the East Fork Trinity River and its tributaries. - 19 crossings require a NWP 14 w/PCN. - 3.18 ac (8,164 LF) of permanent impacts to water features. - 19.14 ac (9,521 LF) of temporary impacts to water features.	Anticipated impacts to water features because of the placement of fill materials would be limited to within the project area/proposed ROW. Temporary and permanent impacts to water features would not disrupt natural processes in the vicinity. Encroachment alteration effects farther removed in time and distance are not anticipated because induced development resulting from the alternative is not anticipated to be substantial.	No	No. The USACE effectively regulates the discharge of dredged and fill material into jurisdictional water features, including wetlands, under Section 404 of the CWA. The resource is not in decline per the "no net loss" wetland policy and cumulative effects are not anticipated to be substantial. Mitigation would be provided for that exceed the thresholds outlined in 2021 Combined Texas Regional Conditions.
	BLUE ALTERNATIVE (A+E+C)	**With and Without Spur 399** - Approximately 35.42 acres of water features, including streams, are mapped within the Environmental Footprint and include Rutherford Creek, Wilson Creek, Stover Creek, Franklin Branch, Honey Creek and their tributaries and the East Fork Trinity River and its tributaries. - 16 crossings require a NWP 14 w/PCN. - 2.91 ac (8,144 LF) of permanent impacts to water features. - 14.72 ac (9,711 LF) of temporary impacts to water features.	Anticipated impacts to water features because of the placement of fill materials would be limited to within the project area/proposed ROW. Temporary and permanent impacts to water features would not disrupt natural processes in the vicinity. Encroachment alteration effects farther removed in time and distance are not anticipated because induced development resulting from the alternative is not anticipated to be substantial.	No	No. The USACE effectively regulates the discharge of dredged and fill material into jurisdictional water features, including wetlands, under Section 404 of the CWA. The resource is not in decline per the "no net loss" wetland policy and cumulative effects are not anticipated to be substantial. Mitigation would be provided for impacts that exceed the thresholds outlined in 2021 Combined Texas Regional Conditions.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Water Resources - Wetlands and Surface Waters	BROWN ALTERNATIVE (B+E+C)	**With and Without Spur 399** - Approximately 37.26 acres of water features, including streams, are mapped within the Environmental Footprint and include Rutherford Branch, Stover Creek, Franklin Branch, and Honey Creek and their tributaries and the East Fork Trinity River and its tributaries. - 14 crossings require a NWP 14 w/PCN. - 1.80 ac (5,483 LF) of permanent impacts to water features. - 18.86 ac (9,170 LF) of temporary impacts to water features.	Anticipated impacts to water features because of the placement of fill materials would be limited to within the project area/proposed ROW. Temporary and permanent impacts to water features would not disrupt natural processes in the vicinity. Encroachment alteration effects farther removed in time and distance are not anticipated because induced development resulting from the alternative is not anticipated to be substantial.	No	No. The USACE effectively regulates the discharge of dredged and fill material into jurisdictional water features, including wetlands, under Section 404 of the CWA. The resource is not in decline per the "no net loss" wetland policy and cumulative effects are not anticipated to be substantial. Mitigation would be provided for impacts that exceed the thresholds outlined in 2021 Combined Texas Regional Conditions.
	GOLD ALTERNATIVE (B+E+D)	**With and Without Spur 399** - Approximately 49.12 acres of water features, including streams, are mapped within the Environmental Footprint and include Rutherford Branch, Stover Creek, Franklin Branch, and Honey Creek and their tributaries and the East Fork Trinity River and its tributaries. - 20 crossings require a NWP 14 w/PCN - 2.07 ac (5,503 LF) of permanent impacts to water features. - 23.28 ac (8,980 LF) of temporary impacts to water features.	Anticipated impacts to water features because of the placement of fill materials would be limited to within the project area/proposed ROW. Temporary and permanent impacts to water features would not disrupt natural processes in the vicinity. Encroachment alteration effects farther removed in time and distance are not anticipated because induced development resulting from the alternative is not anticipated to be substantial.	No	No. The USACE effectively regulates the discharge of dredged and fill material into jurisdictional water features, including wetlands, under Section 404 of the CWA. The resource is not in decline per the "no net loss" wetland policy and cumulative effects are not anticipated to be substantial. Mitigation would be provided for impacts that exceed the thresholds outlined in 2021 Combined Texas Regional Conditions.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Water Resources - Floodplains and Floodways	PURPLE ALTERNATIVE (A+E+D	**Without Spur 399** -Crosses 262 acres of floodplains/floodways associated with Wilson Creek and East Fork Trinity River and stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain. **With Spur 399** -Crosses 262 acres of floodplains/floodway of Wilson Creek and the East Fork Trinity River as well as stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain.	All of the Build Alternatives would encroach into regulatory floodplains and would cause and increase in the amount of impervious surface within watersheds. Potential to indirectly affect sediment and pollutant loading in the FEMA flood hazard areas. However, floodplain management regulations and design standards require the project be designed to not alter base flood elevations and not cause adverse flood effects to upstream or downstream properties unless mitigation in the form of compensatory storage can be accommodated. All Build Alternatives are designed with sections on structure (elevated) instead of on earthen embankment, over mapped floodplain/floodways and smaller streams. TxDOT will continue to collaborate with the local floodplain administrator on a regional approach to address flooding issues in the vicinity of the proposed project. The hydraulic design and analysis conducted during the design phase for the Preferred Alternative will address encroachment alteration effects to regulatory floodplains.	Yes	Yes. Coordination with the FEMA local floodplain administrator (W. Kyle Odom, CFM, RS – City of McKinney, TX) is ongoing. A combination of proposed culverts and bridges are being designed to minimize/avoid effects on the floodplains where the proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Other actions in the area have the potential to affect the same systems. The McKinney National Airport is pursuing a CLOMR to modify the floodplain south of existing US 380 between the termini of Segments C and D to accommodate the northward extension of Runway 18-36. Once information is available on the proposed changes, they will be factored into the ongoing hydraulic design of the Build Alternatives and ultimately of the Preferred Alternative in the DEIS, especially if a "With Spur" option is selected.
	BLUE ALTERNATIVE (A+E+C)	**Without Spur 399** -Crosses 166 acres of floodplains/floodways associated with Wilson Creek and East Fork Trinity River as well as stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain. **With Spur 399** -Crosses 262 acres of floodplains/floodways associated with Wilson Creek and the East Fork Trinity River as well as stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain.			

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Water Resources - Floodplains and Floodways	BROWN ALTERNATIVE (B+E+C)	**Without Spur 399** -Crosses 171 acres of floodplains/floodways associated with Wilson Creek and the East Fork Trinity River as well as stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain. **With Spur 399** -Crosses 262 acres of floodplains/floodways associated with Wilson Creek and the East Fork Trinity River as well as stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain.	All of the Build Alternatives would encroach into regulatory floodplains and would cause and increase in the amount of impervious surface within watersheds. Potential to indirectly affect sediment and pollutant loading in the FEMA flood hazard areas. However, floodplain management regulations and design standards require the project be designed to not alter base flood elevations and not cause adverse flood impacts to upstream or downstream properties unless mitigation in the form of compensatory storage can be accommodated. All Build Alternatives are designed with sections on structure (elevated) instead of on earthen embankment, over mapped floodplain/floodways and smaller streams. TxDOT will continue to collaborate with the local floodplain administrator on a regional approach to address flooding issues in the vicinity of the proposed project. The hydraulic design and analysis conducted during the design phase for the Preferred Alternative will address encroachment alteration effects to regulatory floodplains.	Yes	Yes. Coordination with the FEMA local floodplain administrator (W. Kyle Odom, CFM, RS – City of McKinney, TX) is ongoing. A combination of proposed culverts and bridges are being designed to minimize/avoid effects on the floodplains where the proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Other actions in the area have the potential to affect the same systems. The McKinney National Airport is pursuing a CLOMR to modify the floodplain south of existing US 380 between the termini of Segments C and D to accommodate the northward extension of Runway 18-36. Once information is available on the proposed changes, they will be factored into the ongoing hydraulic design of the Build Alternatives and ultimately of the Preferred Alternative in the DEIS, especially if a "With Spur" option is selected.
	GOLD ALTERNATIVE (B+E+D)	**Without Spur 399** -Crosses 267 acres of floodplains/floodways associated with Wilson Creek and the East Fork Trinity River as well as stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain. **With Spur 399** -Crosses 262 acres of floodplains/floodways associated with Wilson Creek and the East Fork Trinity River as well as stream branches including Throckmorton Creek, Rutherford Branch, Franklin Branch, Stover Creek, Honey Creek, Jean's Creek, and Clemons Creek. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain.			

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Water Resources – Impaired Water Resources	PURPLE ALTERNATIVE (A+E+D)	**Without Spur 399** - All Build Alternatives are within five linear miles (not stream miles) of 2 impaired waters: Segment 0821D of the East Fork Trinity River. Segment 0821C Above Lavon Lake and Wilson Creek. **With Spur 399** - All Build Alternatives are within five linear miles (not stream miles) of 2 impaired waters: Segment 0821D of the East Fork Trinity River. Segment 0821C Above Lavon Lake and Wilson Creek.	Construction of any of the Build Alternative is not anticipated to substantially induce growth and/or redevelopment. Any encroachment-alteration effects to surface water quality due to the project would be minimal due to the existing urbanization of the area and the incorporation of water quality BMPs.	Yes	No. With stringent regulatory protections in place, and with measures to be undertaken to substantially reduce potential adverse effects to surface waters through the implementation of BMPs, control measures required under TCEQs CGP, and design elements included before, during, and after construction, this resource is not analyzed further in the cumulative effects analysis.
	BLUE ALTERNATIVE (B+E+C)				
	BROWN ALTERNATIVE (B+E+C)				
	GOLD ALTERNATIVE (B+E+D)				

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Biological Resources - Vegetation	PURPLE ALTERNATIVE (A+E+D	**Without Spur 399** -Of the approx. 1,047.7 acres of proposed ROW, of which approx. 443.9 (acres (42.4%) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 603.8 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Wilson Creek, Stover Creek, Franklin Branch, Honey Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities identified within the proposed ROW during field investigations. **With Spur 399** -Of the approx. 1,069.1 acres of proposed ROW, of which approx. 457.4 acres (42.8%) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 611.7 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Wilson Creek, Stover Creek, Franklin Branch, Honey Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities were identified within the proposed ROW during field investigations.	The loss of vegetation may be substantial due to the undeveloped nature of the majority of the proposed ROW and the presence of pastures, hay meadows, and native grassland remnants to row crops and riparian and hardwood forests. Induced development potential is restricted to the southern-most portion of Segment D due to its proximity to existing US 380 and limited encroachment of the East Fork Trinity River floodplain.	Yes	Yes. Direct impacts and indirect effects to vegetation are anticipated to be marginal to substantial as the resource is in decline and, in conjunction with other reasonably foreseeable projects, this resource is included in the analysis.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Biological Resources - Vegetation	BLUE ALTERNATIVE (A+E+C)	**Without Spur 399** -Of the approx. 1,042.0 acres of proposed ROW, approx. 468.7 acres (45.0%) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 573.4 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Wilson Creek, Stover Creek, Franklin Branch, Honey Creek, Clemons Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities identified within the proposed ROW during field investigations. **With Spur 399** -Of the approx. 1,081.3 acres of proposed ROW, of which approximately 473.2 acres (43.8%) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 608.1 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Wilson Creek, Stover Creek, Franklin Branch, Honey Creek, Clemons Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities identified within the proposed ROW during field investigations.	The loss of vegetation may be substantial due to the undeveloped nature of the majority of the proposed ROW and the presence of pastures, hay meadows, and native grassland remnants to row crops and riparian and hardwood forests. Induced development potential is restricted to areas along Segment C as it is relatively undeveloped and not located within the East Fork Trinity River floodplain.	Yes	Yes. Direct impacts and indirect effects to vegetation are anticipated to be marginal to substantial as the resource is in decline and, in conjunction with other reasonably foreseeable projects, this resource is included in the analysis.

Figure 7 continued: Direct Impacts and Indirect Effectsof the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Biological Resources - Vegetation	BROWN ALTERNATIVE (B+E+C)	**Without Spur 399** -Of the approx. 1,010.3 acres of proposed ROW, of which approximately 406.2 acres (40.2 percent) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 604.1 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Stover Creek, Franklin Branch, Honey Creek, Clemons Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities identified within the proposed ROW during field investigations. **With Spur 399** -Of the approx. 1,049.5 acres of proposed ROW, of which approximately 410.8 acres (39.1 percent) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 638.7 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Stover Creek, Franklin Branch, Honey Creek, Clemons Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities identified within the proposed ROW during field investigations.	The loss of vegetation may be substantial due to the undeveloped nature of the majority of the proposed ROW and the presence of pastures, hay meadows, and native grassland remnants to row crops and riparian and hardwood forests. Induced development potential is restricted to areas along Segment C as it is relatively undeveloped and not located within the East Fork Trinity River floodplain.	Yes	Yes. Direct impacts and indirect effects to vegetation are anticipated to be marginal to substantial as the resource is in decline and, in conjunction with other reasonably foreseeable projects, this resource is included in the analysis.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Biological Resources - Vegetation	GOLD ALTERNATIVE (B+E+D)	**Without Spur 399** -Of the approx. 1,016.0 acres of proposed ROW, of which approximately 381.5 acres (37.25 percent) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 634.5 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Stover Creek, Franklin Branch, Honey Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities identified within the proposed ROW during field investigations. **With Spur 399** -Of the approx. 1,037.4 acres of proposed ROW, of which approximately 394.9 acres (38.1 percent) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. -Remaining 642.4 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Rutherford Branch, Stover Creek, Franklin Branch, Honey Creek, and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, Edwards Plateau woodlands/savanna grassland, row crops, and some open water. -No protected or rare vegetation communities identified within the proposed ROW during field investigations.	The loss of vegetation may be substantial due to the undeveloped nature of the majority of the proposed ROW and the presence of pastures, hay meadows, and native grassland remnants to row crops and riparian and hardwood forests. Induced development potential is restricted to the southern-most portion of Segment D due to its proximity to existing US 380 and limited encroachment of the East Fork Trinity River floodplain.	Yes	Yes. Direct impacts and indirect effects to vegetation are anticipated to be marginal to substantial as the resource is in decline and, in conjunction with other reasonably foreseeable projects, this resource is included in the analysis.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Wildlife, Including Threatened, Endangered, and Candidate Species	PURPLE ALTERNATIVE (A+E+D	**With and Without Spur 399** -Crosses 6 perennial streams providing potential habitat for protected mussels, alligator snapping turtle, and potentially the White-faced Ibis and Wood Stork. Crosses 30 wooded areas providing habitat for SGCN bats and several SGCN reptiles, amphibians, birds, mammals, invertebrates, and plants. -No habitat was identified that would support federally listed species, but the alignment is within the range of and contains suitable habitats for Texas fawnsfoot, alligator snapping turtle, two species proposed for federal listing as threatened, and the monarch butterfly, a federal candidate species. -May impact 4 state-listed threatened species: White-faced Ibis, Wood Stork, Louisiana pigtoe, and Texas heelsplitter.	Induced growth is not anticipated to be substantial; however, encroachment-alteration could result in additional loss and fragmentation of wildlife habitat with development of adjacent lands. Development in general encroaches on vegetation, and reductions in vegetation typically equate to reduced wildlife habitat. Implementation of TPWD BMPs would occur prior to, during, and after construction to minimize impacts.	Yes	Yes. Although direct impacts and indirect effects to protected species and wildlife are not anticipated to be substantial, the resources are in decline and, in conjunction with other reasonably foreseeable projects on new location in the area, this resource is included in the analysis.
	BLUE ALTERNATIVE (A+E+C)	**With and Without Spur 399** -Crosses 7 perennial streams providing potential habitat for protected mussels, alligator snapping turtle, and potentially the White-faced Ibis and Wood Stork. -Crosses 32 wooded areas providing habitat for SGCN bats and several SGCN reptiles, amphibians, birds, mammals, invertebrates, and plants. - No habitat was identified that would support federally listed species, but the alignment is within the range of and contains suitable habitats for Texas fawnsfoot, alligator snapping turtle, two species proposed for federal listing as threatened, and the monarch butterfly, a federal candidate species. -May impact 4 state-listed threatened species: White-faced Ibis, Wood Stork, Louisiana pigtoe, and Texas heelsplitter.	Induced growth is not anticipated to be substantial; however, encroachment-alteration could result in additional loss and fragmentation of wildlife habitat with development of adjacent lands. Development in general encroaches on vegetation, and reductions in vegetation typically equate to reduced wildlife habitat. Implementation of TPWD BMPs would occur prior to, during, and after construction to minimize impacts.	Yes	Yes. Although direct impacts and indirect effects to protected species and wildlife are not anticipated to be substantial, the resources are in decline and, conjunction with other reasonably foreseeable projects on new location in the area, this resource is included in the analysis.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Wildlife, Including Threatened, Endangered, and Candidate Species	BROWN ALTERNATIVE (B+E+C)	**With and Without Spur 399** -Crosses 6 perennial streams providing potential habitat for protected mussels, alligator snapping turtle, and potentially the White-faced Ibis and Wood Stork. -Crosses 32 wooded areas providing habitat for SGCN bats and several SGCN reptiles, amphibians, birds, mammals, invertebrates, and plants. -No habitat was identified that would support federally listed species, but the alignment is within the range of and contains suitable habitats for Texas fawnsfoot, alligator snapping turtle, two species proposed for federal listing as threatened, and the monarch butterfly, a federal candidate species. -May impact 4 state-listed threatened species: White-faced Ibis, Wood Stork, Louisiana pigtoe, and Texas heelsplitter.	Induced growth is not anticipated to be substantial; however, encroachment-alteration could result in additional loss and fragmentation of wildlife habitat with development of adjacent lands. Development in general encroaches on vegetation, and reductions in vegetation typically equate to reduced wildlife habitat. Implementation of TPWD BMPs would occur prior to, during, and after construction to minimize impacts.	Yes	Yes. Although direct impacts and indirect effects to protected species and wildlife are not anticipated to be substantial, the resources are in decline and, conjunction with other reasonably foreseeable projects on new location in the area, this resource is included in the analysis.
	GOLD ALTERNATIVE (B+E+D)	**With and Without Spur 399** - Crosses 5 perennial streams providing potential habitat for protected mussels, alligator snapping turtle, and potentially the White-faced Ibis and Wood Stork. -Crosses 30 wooded areas providing habitat for SGCN bats and several SGCN reptiles, amphibians, birds, mammals, invertebrates, and plants. -No habitat was identified that would support federally listed species, but the alignment is within the range of and contains suitable habitats for Texas fawnsfoot, alligator snapping turtle, two species proposed for federal listing as threatened, and the monarch butterfly, a federal candidate species. -May impact 4 state-listed threatened species: White-faced Ibis, Wood Stork, Louisiana pigtoe, and Texas heelsplitter.	Induced growth is not anticipated to be substantial; however, encroachment-alteration could result in additional loss and fragmentation of wildlife habitat with development of adjacent lands. Development in general encroaches on vegetation, and reductions in vegetation typically equate to reduced wildlife habitat. Implementation of TPWD BMPs would occur prior to, during, and after construction to minimize impacts.	Yes	Yes. Although direct impacts and indirect effects to protected species and wildlife are not anticipated to be substantial, the resources are in decline and, conjunction with other reasonably foreseeable projects on new location in the area, this resource is included in the analysis.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Visual and Aesthetics	PURPLE ALTERNATIVE (A+E+D)	**With and Without Spur 399** -Introduces an elevated freeway facility in areas where one does not currently exist within areas of both existing and planned development (Segments A and E) and across large expanses of open, undeveloped land primarily in agricultural use (Segment D). -Collective bulk and mass of the elevated roadway would alter the visual quality of these areas, creating a more urban rather than suburban character within developed/developing areas and a sharp contrast to the relatively flat topography and open, undeveloped areas along Segment D. -Introduces a multi-level interchange at US 75.	The Purple Alternative is not expected to substantially induce growth because the majority of the lands adjacent to the proposed alignment are developed or have approved plans to be. The most undeveloped segment, Segment D, is mostly encompassed by East Fork Trinity River 100-yr floodplain, constraining the potential for induced development. Introduction of an elevated freeway within an area where a roadway does not exist would result in encroachment alteration effects to the viewshed.	Yes	Yes. The proposed project in conjunction with other reasonably foreseeable projects in the area would alter viewsheds and the overall visual and aesthetic character of the Study Area.
	BLUE ALTERNATIVE (A+E+C)	**With and Without Spur 399** - Introduces an elevated freeway facility in areas where one does not currently exist within areas of both existing and planned development (Segments B and E) and across large expanses of open, undeveloped land primarily in agricultural use (Segment C). -Collective bulk and mass of the elevated roadway would alter the visual quality of these areas, creating a more urban rather than suburban character within developed/developing areas and a sharp contrast to the rolling topography and open, undeveloped areas along Segment C. -Introduces a multi-level interchange at US 75.	The Blue Alternative is not expected to substantially induce growth because the majority of the lands adjacent to the proposed alignment are developed or have approved plans to be. The most undeveloped segment, Segment C, is outside of the 100-yr floodplain and would have greater potential to induce commercial and industrial development. Introduction of an elevated freeway within an area where a roadway does not exist would result in encroachment alteration effects to the viewshed.	Yes	Yes. The proposed project in conjunction with other reasonably foreseeable projects in the area would alter viewsheds and the overall visual and aesthetic character of the Study Area.

Figure 7 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is the Resource in Poor or Declining Health?	Resource included in the Cumulative Effects Analysis? Yes or No, Reason for Including/Excluding the Resource
Visual and Aesthetics	BROWN ALTERNATIVE (B+E+C)	**With and Without Spur 399** - Introduces an elevated freeway facility in areas where one does not currently exist within areas of both existing and planned development (Segments B and E) and across large expanses of open, undeveloped land primarily in agricultural use (Segment C). -Collective bulk and mass of the elevated roadway would alter the visual quality of these areas, creating a more urban rather than suburban character within developed/developing areas and a sharp contrast to the rolling topography and open, undeveloped areas along Segment C. -Introduces a multi-level interchange at US 75.	The Brown Alternative is not expected to substantially induce growth because the majority of the lands adjacent to the proposed alignment are developed or have approved plans to be. The most undeveloped segment, Segment C, is outside of the 100-yr floodplain and would have greater potential to induce commercial and industrial development. Introduction of an elevated freeway within an area where a roadway does not exist would result in encroachment alteration effects to the viewshed.	**Yes**	Yes. The proposed project in conjunction with other reasonably foreseeable projects in the area would alter viewsheds and the overall visual and aesthetic character of the Study Area.
	GOLD ALTERNATIVE (B+E+D)	**With and Without Spur 399** - Introduces an elevated freeway facility in areas where one does not currently exist within areas of both existing and planned development (Segments A and E) and across large expanses of open, undeveloped land primarily in agricultural use (Segment D). -Collective bulk and mass of the elevated roadway would alter the visual quality of these areas, creating a more urban rather than suburban character within developed/developing areas and a sharp contrast to the relatively flat topography and open, undeveloped areas along Segment D. -Introduces a multi-level interchange at US 75.	The Gold Alternative is not expected to substantially induce growth because the majority of the lands adjacent to the proposed alignment are developed or have approved plans to be. The most undeveloped segment, Segment D, is mostly encompassed by East Fork Trinity River 100-yr floodplain, constraining the potential for induced development. Introduction of an elevated freeway within an area where a roadway does not exist would result in encroachment alteration effects to the viewshed.	**Yes**	Yes. The proposed project in conjunction with other reasonably foreseeable projects in the area would alter viewsheds and the overall visual and aesthetic character of the Study Area.

2.3 Other Actions –Present and Reasonably Foreseeable and their Effect on Each Resource

The other present and reasonably foreseeable future actions assessed in this analysis are:

McKinney National Airport Master Plan Improvements – extend Runway 18-36 1,000 feet to the north and 500 feet to the south; construct a parallel runway east of existing Runway 18-36, and expansion including terminal development. The FAA issued a FONSI/ROD for the proposed action on July 27, 2022 with construction of the southern extension anticipated to begin in December 2022 and the northern extension beginning in March 2023.

FM 546 from Airport Drive to CR 393 in Lowry Crossing (CSJ 1013-01-040) - construct a 4-lane divided urban arterial roadway with open median to allow for future expansion to a 6-lane roadway. The eastern portion of the project (CR 324 to CR 393) would reconstruct the existing 2-lane section of FM 546, while the western portion of the project (Airport Drive to CR 324) would realign and construct a new FM 546 corridor. The new FM 546 corridor would include bicycle/pedestrian accommodations. The existing FM 546 bridge and retaining walls across the Lavon Lake would be reconstructed. Six new location alternatives have been developed for consideration with the recommended alternative anticipated to be identified in Spring 2023. Environmental clearance is anticipated by Fall 2023. No funding for construction has been identified at this time.

Collin County Outer Loop - a 55-mile planned multi-modal transportation facility that will ultimately go from the Denton/Collin County line, through the communities of Celina, Weston, Anna, Melissa, Farmersville, Josephine and Royse City, to the Rockwall/Collin County line. The facility is planned to be a freeway with a wide area in the center reserved as a future rail corridor. Collin County has been planning for the facility since 2000, starting with a corridor study and leading up to the identification of a preferred alignment. The outer loop is comprised of five segments:

- Segment 1 – US 75 to SH 121 – county completed the 2-lane roadway in 2012 which will function as the future westbound freeway between Anna and Melissa
- Segment 2 – FM 6 to Rockwall County line – the technically preferred alignment between Nevada and Josephine was approved in 2009. No further work has been completed on this segment.
- Segment 3 – DNT to US 75 – the county completed the schematic for the outer loop from the Denton/Collin County line to US 75 in 2019, including concepts for future interchanges at US 75, SH 289/Preston Road, and the DNT. Construction of the 2-lane roadway from just east of the Denton/Collin County line to SH 289/Preston Road was completed in 2021, with construction of the 2-lane road from SH 289/Preston Road to FM 2478/Custer Road anticipated to be complete in late 2022. ROW acquisition is ongoing between FM 2478/Custer Road and US 75, but no construction timeline has been set for this section.
- Segment 4 – US 380 to FM 6 – technically preferred alignment from Farmersville to Josephine was approved in 2010. No further work has been completed on this segment.
- Segment 5 – SH 121 to US 380 - technically preferred alignment was approved in 2006. No further work has been completed on this segment.

US 380 Prosper-Frisco – Teel Parkway/Championship Drive to West of Lakewood Drive (CSJs 0135-11-024, 0135-10-065, and 0135-02-068) – construct a 6-lane, access-controlled freeway with one-way frontage roads on each side within an anticipated ROW width of between 245 to 522 feet depending on location. The freeway

facility would include ramps, direct connector roadways, frontage roads, and arterial roadways to support connectivity to the existing roadway network. Grade-separated interchanges would be constructed at major crossroads including the Dallas North Tollway (DNT) (multi-level interchange) and existing SH 289. The US 380 Prosper-Frisco improvements anticipated to be ready to let for construction in 2026.

Spur 399 Extension – US 75 to US 380 (CSJs 0364-04-051, 0047-05-058, and 0047-10-002) – construct an 8-lane freeway with frontage roads connecting US 75 (southern terminus) with US 380 (northern terminus) around the southeastern quadrant of McKinney, Texas. The Preferred (Orange) Alternative would add one travel lane in each direction and an exit ramp within the existing SH 5 corridor extending from the US 75/SRT-SH 121 junction to approximately 1,500 feet south of the intersection of FM 546/Harry McKillop Boulevard and SH 5. At this location the proposed freeway alignment would turn east on new location and parallel FM 546/Harry McKillop Boulevard until approximately 500 feet west of Couch Drive where it would continue east on new location crossing Airport Drive/Old Mill Road, extending further east and south around the southern end of the McKinney National Airport, then turning north near CR 317 to connect to US 380 east of the Airport, for a distance of approximately 6.25 miles. Only the mainlanes would be constructed in the freeway section parallel to FM 546/Harry McKillop Boulevard to allow FM 546/Harry McKillop Boulevard to function as the frontage road. As the alignment continues east and south, frontage roads would be added and continue along the alignment until its terminus at US 380. The freeway would be built on an elevated structure from SH 5 to Airport Drive/Old Mill Road. From Airport Drive/Old Mill Road to approximately 600 feet north of CR 722/Enloe Road, the freeway and frontage roads would be built on an earth-filled embankment with sloping sides. North of CR 722/Enloe Road the freeway would transition to being on elevated structure to span the floodplain along the East Fork Trinity River, forest and wetland habitats, and parklands. The alignment would return to ground-level to connect to US 380 at an at-grade, intersection with a traffic signal. Shared use paths (SUPs) would be constructed along the outside of frontage roads. The proposed ROW needed for the Orange Alternative would vary from 165 feet-wide to 696 feet-wide. The Record of Decision for the Spur 399 Extension is anticipated in March 2023 with improvements anticipated to be ready to let for construction in 2026.

US 380 Princeton - FM 1827 to CR 560 (CSJs 0135-03-056, 0135-16-002, and 0135-04-036) – reconstruct approximately 11.8 miles of US 380 on a combination of existing and new location alignments. The new location controlled access freeway would realign US 380 north of the City of Princeton within an anticipated ROW ranging in width from 320 feet to 400 feet, depending on location. The 8-lane to 10-lane freeway would (4 to 5-lanes in each direction) would include continuous 2-lane one-way frontage roads with raised curbs, and 10-foot-wide SUPs located along the outside of the frontage roads. The existing US 380 crossing of Lavon Lake would be reconstructed within the existing ROW to include continuous frontage roads on bridge structures. Proposed grade separated interchanges would be constructed at major cross streets to accommodate connectivity to existing and future roadways and bicycle/pedestrian networks. Existing US 380 through the City of Princeton would remain connected to the new freeway via interchanges on both the east and west sides of the city. The US 380 Princeton improvements are anticipated to be ready to let for construction in 2027.

US 380 Farmersville - CR 560 to CR 699 (Hunt County Line) (CSJs 0135-04-038, 0135-17-002, and 0135-05-028) – construct a 6-lane divided roadway with continuous, 2-lane one-way frontage roads and a 10-foot-wide SUP on both sides of the roadway within an anticipated ROW width ranging from 322 feet to 384 feet. The new roadway would be constructed on new location across a distance of approximately 8.5 miles. Existing US 380

through Farmerville would remain and be named Audie Murphy Parkway. The US 380 Farmersville improvements are anticipated to be ready to let for construction in 2026.

SH 5 Improvements – South of CR 275 to south of Melissa Road in Collin County (CSJs 0047-04-030 & 0549-03-031) – reconfiguration of the SH 5 and SH 121 intersection to accommodate the upgrade of SH 5 and SH 121 to the south from 2-lane rural highways (each) to a 6-lane (ultimate) divided urban roadway and a 4-lane urban roadway, respectively. The SH 5/SH 121 improvements are anticipated to be ready to let in Spring 2024.

2.4 The Overall Effects of the Proposed Project Combined with other Actions

The other reasonably foreseeable actions described in **Section 2.3** are proposed to support the current and forecasted growth and transportation needs across Collin County and the region. Most of the actions, with the exception of the McKinney National Airport Master Plan Improvements, portions of the Collin County Outer Loop, and the Spur 399 Extension are in the early study stages. The overall cumulative effects of these actions when added to the direct impacts of the US 380 McKinney project as summarized in **Figure 7** focus on land disturbance and floodplain/floodway encroachment, other water features, the effects on vegetation clearing on wildlife species and habitats, and visual effects. Changes in land use and land cover would result in a cumulative increase in impervious cover that would lead to an increase in surface runoff, potentially degrading surface water quality, and resulting in more frequent and intense storm events with higher flows occurring over shorter durations. The proposed runway extension at the McKinney National Airport requires a CLOMR to address the anticipated hydrologic changes within the East Fork Trinity River, which would affect the hydraulic modeling conducted and the need for compensatory flood storage for the Spur 399 Extension. The loss of vegetation and introduction of an elevated roadway lessen the overall quality of the visual environment and the natural contrast and complement vegetation provides against man-made features to make them potentially less visually disruptive.

The DEIS will provide a more in-depth assessment of other reasonably foreseeable actions regarding potential cumulative effects once the Preferred Alternative has been recommended.

2.5 Mitigation of Cumulative Effects

No-Build Alternative

No ROW would be acquired nor would land disturbance occur under the No-Build Alternative. The proposed widening of US 380 from Airport Drive to CR 458 9CSJs 0135-03-046 and 0135-04-033) cleared in 2020 and anticipated to be under construction in early 2024, would be completed within existing ROW. Ongoing pavement and structure maintenance, and slope stabilization and drainage improvements would have the potential to create minimal areas of ground disturbance, vegetation clearing, and short-term effects to localized water quality but at a much lesser magnitude than the other reasonably foreseeable actions. Implementation of appropriate stormwater and erosion control BMPs and limiting the amount of area cleared at any one time before it is restored would mitigate possible negative effects. TxDOT would also implement TPWD BMPs in areas of known habitats or species presence including limiting some construction or operations activities depending on the season (e.g., nesting or spawning) particularly at the existing crossings of Wilson Creek, the East Fork Trinity River, and their respective tributaries.

As development and redevelopment occur along existing US 380 between Coit Road and FM 1827 and areas within Prosper and McKinney, particularly within the Wilson Creek watershed, the resulting changes in land use and loss of land cover will increase the amount of impervious area leading to increases in the quantity and turbidity of surface runoff, and the potential for more frequent and intense storm events with higher flows occurring along the stream channels within the Study Area. The City of McKinney would continue to work with developers to ensure compliance with their development standards[16] including the Stormwater Management Ordinance and the associated engineering design standards and when applicable, obtaining a Floodplain Development Permit in accordance with the city's floodplain regulations if improvements would occur within a designated floodplain. The Town of Prosper would also work with developers to ensure site development, construction, and maintenance activities maintain compliance with the town's Development Manual.[17]

Preferred Alternative

The DEIS will provide a more in-depth assessment of the cumulative effects of the Preferred Alternative. In consideration of the general attributes and features of all of the Build Alternatives considered, the Preferred Alternative would result in substantial vegetation clearing due to the length and location of the alignment through undeveloped areas [along Segments A/B and C/D] dominated by open agricultural lands, wooded areas, grasslands, and floodplains. Land clearing, stormwater management, and erosion control BMPs would be implemented before and during construction with the incorporation of permanent BMPs given consideration as part of the final design to manage roadway runoff. TPWD BMPs would be implemented before, during, and after construction to address the potential presence of protected species and their habitats. Clearing would be limited to smaller work areas and should be stabilized or restored as quickly as possible. The design of the project, particularly through floodplain areas would avoid and minimize to the extent feasible and practicable floodplain encroachments.

Vegetation clearing would be limited to that necessary for construction with seeding and revegetation plans developed according to TxDOT guidelines. Through context sensitive design solutions, consideration could be given to using materials and features that would make the roadway and bridge components more compatible with the surrounding environment.

16 NEW CODE McKinney, Installment 3: Development Standards, Public Draft September 2021.
17 Town of Prosper Development Manual; Updated December 2017.

References

City of McKinney 2021. NEW CODE McKinney, Installment 3: Development Standards, Public Draft September 2021. Website: https://www.newcodemckinney.com/_files/ugd/10a638_29b6cdd7938f4aec95d5dc294bb80f04.pdf . Accessed July 2022.

North Central Texas Council of Governments 2022. 2045 Demographic Forecasts. Regional Transportation Council, January 13, 2022. Website: https://www.nctcog.org/getmedia/e5650473-7d4f-47f4-b934-0cc33911ce41/RTC-2022-01.pdf.aspx. Assessed July 2022.

Texas Water Development Board (TWDB) 2021. 2021 Regional Water Plan: Population Projections for 2020 – 2070. Website: http://www.twdb.texas.gov/waterplanning/data/projections/2022/popproj.asp. Accessed June 2022.

Town of Prosper 2017. Town of Prosper Development Manual; Updated December 2017. Website: https://www.prospertx.gov/wp-content/uploads/Development-Manual-Combined-122817.pdf. Accessed July 2022.

U.S. Census Bureau. 2010. Census 2010. Website: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Population and Employment data tables. Accessed May 2022.

———. 2020. 2016-2020 American Community Survey (ACS) Population and Employment data tables. Website: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed May 2022.

ATTACHMENT A

Risk Assessment for Indirect Impacts

Project Name: US 380 McKinney - Coit Road to FM 1827

CSJ Number: 0135-02-065, 0135-03-053, and 0135-15-002

County: Collin

District: Dallas

Requirement: Indirect Impacts Analysis

1. Does the Purpose and Need include economic development, or is the project proposed to serve a specific development?

☐	**Yes**	If **Yes**, Indirect impacts analysis is required. Include Indirect Impacts Analysis task on project scope*. No further assessment for indirect impacts is required.
☒	**No**	If **No**, proceed to the next question.
☐	**Unknown**	If **Unknown**, include the following outstanding task in the scoping document: **Determine if project Need and Purpose relates to economic development.** Update Risk Assessment when known.

2. Are economic development or new opportunities for growth/development cited as benefits of the project?

☐	**Yes**	If **Yes**, Indirect impacts analysis is required. Include Indirect Impacts Analysis task on project scope*. No further assessment for indirect impacts is required.
☒	**No**	If **No**, proceed to the next question.
☐	**Unknown**	If **Unknown**, include the following outstanding task in the scoping document: **Determine if economic growth is described as a benefit of the project.** Update Risk Assessment when known.

3. Is land in the project area available for development and/or redevelopment?

☒	**Yes**	If **Yes**, proceed to the next question.
☐	**No**	If **No**, no indirect impacts analysis is required, and no further risk assessment is needed.
☐	**Unknown**	If **Unknown**, include the following outstanding task in the scoping document: **Determine if land in the project area is available for development and/or redevelopment.** Update Risk Assessment when known.

4. Does the project add capacity?

- ☒ **Yes** — If **Yes**, proceed to the next question.
- ☐ **No** — If **No**, skip to Question 6.
- ☐ **Unknown** — If **Unknown**, include the following outstanding task in the scoping document: **Determine if project will add capacity.** Update Risk Assessment when known.

5. Is the project located in a rural area outside of the MPO boundary?

- ☐ **Yes** — If **Yes**, no indirect impacts analysis is required, and no further risk assessment is needed.
- ☒ **No** — If **No**, proceed to the next question.
- ☐ **Unknown** — If **Unknown**, include the following outstanding task in the scoping document: **Determine if project is located in a rural area outside of the MPO boundary.** Update Risk Assessment when known.

6. Does the project substantially increase access or mobility in the project area?

- ☒ **Yes** — If **Yes**, proceed to the next question.
- ☐ **No** — If **No**, no indirect impacts analysis is required, and no further risk assessment is needed.
- ☐ **Unknown** — If **Unknown,** include the following outstanding task in the scoping document: **Determine if project will substantially increase access or mobility.** Update Risk Assessment when known.

7. Is the project area experiencing population and/or economic growth?

- ☒ **Yes** — If **Yes**, indirect impacts analysis is required. Include Indirect Impacts Analysis task on project scope*.
- ☐ **No** — If **No**, no indirect impacts analysis is required, and no further risk assessment is needed.
- ☐ **Unknown** — If **Unknown**, include the following outstanding task in the scoping document: **Determine if project area is experiencing population/economic growth.** Update Risk Assessment when known.

* *For planning purposes, include Cumulative Impacts Analysis in the project scope when Indirect Impacts Analysis is required. In general, the final determination regarding whether Cumulative Impacts Analysis is necessary will occur when other technical studies are complete.*

The following table shows the revision history for this document.

Revision History	
Effective Date Month, Year	**Reason for and Description of Change**

Risk Assessment for Cumulative Impacts

Project Name: US 380 McKinney - Coit Road to FM 1827

CSJ Number: 0135-02-065, 0135-03-053, and 0135-15-002

County: Collin

District: Dallas

Requirement: Cumulative Impacts Analysis

1. Will the project have substantial direct or indirect impacts on any resource?

☒ **Yes** — If **Yes**, cumulative impacts analysis is required. Include Cumulative Impacts Analysis task on project scope*. No further assessment for indirect impacts is required.

☐ **No** — If **No**, proceed to the next question.

2. Are any resources in the project area in poor or declining health?

☒ **Yes** — If **Yes**, proceed to next question.

☐ **No** — If **No**, no cumulative impacts analysis is required. No further assessment for cumulative impacts required.

3. Will the project have any impact on a resource that is in poor or declining health?

☒ **Yes** — If **Yes**, cumulative impacts analysis is required. Include Cumulative Impacts Analysis task on project scope*.

☐ **No** — If **No**, no cumulative impacts analysis is required, and no further risk assessment is needed.

* For planning purposes, include Cumulative Impacts Analysis in the project scope when Indirect Impacts Analysis is required. In general, the final determination regarding whether Cumulative Impacts Analysis is necessary will occur when other technical studies are complete.

The following table shows the revision history for this document.

Revision History	
Effective Date Month, Year	**Reason for and Description of Change**