DRAFT ENVIRONMENTAL IMPACT STATEMENT

SPUR 399 EXTENSION

US 75 to US 380

Collin County, Texas

CSJs 0364-04-051, 0047-05-058, and 0047-10-002

September 2022

Prepared by the Texas Department of Transportation

Submitted pursuant to 42 USC § 4332(2)(c)

and 49 USC § 303

Cooperating Agencies:

U.S. Army Corps of Engineers, Fort Worth District

Environmental Protection Agency, Region 6

This Draft Environmental Impact Statement presents the purpose and need and evaluates the potential environmental consequences of three reasonable alternatives for this project. The reasonable alternatives evaluated are two Build Alternatives – Purple Alternative and Orange Alternative – and the No-Build Alternative. Potential environmental impacts of the alternatives are evaluated across multiple resource areas, including community impacts, visual/aesthetic impacts, cultural resources, protected lands, water resources, biological resources, air quality, hazardous materials, traffic noise, and induced growth. This Draft Environmental Impact Statement identifies the Orange Alternative as the Preferred Alternative.

For additional information on this document, please contact: Mr. Doug Booher, Director of Environmental Affairs, Texas Department of Transportation, 125 East 11th Street, Austin, Texas 78701; Telephone: (512) 416-2663.

Comments on the Draft Environmental Impact Statement are due **December 10, 2022.**

After circulation of the Draft Environmental Impact Statement and consideration of comments received, TxDOT will issue a single Final Environmental Impact Statement and Record of Decision document pursuant to 23 USC § 139(n)(2) unless TxDOT determines statutory criteria or practicability considerations preclude issuance of the combined document.

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 USC § 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

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SEPTEMBER 2022

Director, Environmental Affairs Division
Texas Department of Transportation

27 September 2022
Date of Approval
Texas Department of Transportation

Summary of Draft Environmental Impact Statement

This summary is meant to provide a brief overview of some of the information contained in this Draft Environmental Impact Statement (DEIS). It is not meant to replace or supersede any of the analysis, information, or conclusions stated within the body of the DEIS.

The purpose of the proposed action is to improve north-south mobility and connectivity for travelers from northern and eastern Collin County to destinations south of McKinney, including the core of the Dallas Metroplex.

In 2020, the Texas Department of Transportation (TxDOT) completed the *US 380 Collin County Feasibility Study* (Feasibility Study) that recommended the development of a new freeway facility extending across the county from the Denton County line to Hunt County line. One of the projects of independent utility identified in the Feasibility Study was the extension of Spur 399 from US 75 south of McKinney to United States (US) Highway 380 east of McKinney. This DEIS evaluates the No-Build Alternative and two Build Alternatives under consideration to extend Spur 399.

The No-Build Alternative would not extend Spur 399 and no other new roadways would be constructed in the Study Area. The existing highway system consisting of US 75/Sam Rayburn Tollway (SRT)-State Highway (SH) 121, SH 5, and US 380 would continue to provide the primary connections between the northern and eastern portions of Collin County and the rest of the Dallas Metroplex. In addition to programmed maintenance activities and safety improvements to maintain operations along existing roadways, the No-Build Alternative includes the following programmed improvements to US 380 and SH 5.

- *US 380 Widening from Airport Drive to County Road (CR) 458 (CSJs 0135-03-046 and 0135-04-033)* –would widen the existing 4-lane 7.2 mile-long section of US 380 to a 6-lane divided urban facility with a raised median and new curb and gutter drainage within the existing highway right-of-way (ROW). The project was environmentally cleared on January 15, 2020, and is anticipated to be ready to let for construction in February 2024.
- *SH 5 Improvements from South of Farm to Market (FM) 1378 (Country Club Road) to South of CR 275 (CSJs: 0047-05-054, 0047-09-034, and 0364-04-049)* – would reconstruct and widen this 7.2 mile-long section of SH 5 through Fairview and McKinney to a 4-lane and 6-lane divided urban roadway. This project was environmentally cleared in July 2020, and is anticipated to be ready to let for construction in June 2027.

Two reasonable alternatives, in addition to the No-Build Alternative, are evaluated in this DEIS. Both Build Alternatives would 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. Both Build Alternatives 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. This portion of the proposed Spur 399 Extension from the US 75/SRT-SH 121 junction along SH 5 to approximately 1,500 feet south of the intersection of FM 546/Harry McKillop Boulevard and then east on new location to

approximately 500 feet west of Couch Drive is referred to as the "Common Alignment" for both Build Alternatives. At this point the separate alignments of the Build Alternatives diverge.

The Purple Alternative would extend existing Spur 399 as a freeway from its current terminus near the junction of US 75/SRT-SH 121 along the Common Alignment, then travel east and north along the alignment of Airport Drive to connect to US 380 west of the McKinney National Airport (Airport), a distance of approximately 4.8 miles. Only the mainlanes would be built 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 turns north to follow Airport Drive, the frontage roads would be added to provide connections to local roadways and adjacent properties. Grade-separated interchanges would be provided at Industrial Boulevard and Elm Street. The freeway would be built on an elevated structure from SH 5 to Airport Drive, and on an earth-filled embankment supported by retaining walls along Airport Drive to just south of US 380 where it would return to ground level to connect to US 380 at an at-grade intersection with a traffic signal. The proposed ROW needed for the Purple Alternative would vary from 165 feet-wide to 696 feet-wide.

Like the Purple Alternative, the Orange Alternative would extend existing Spur 399 as a freeway from its current terminus near the junction of US 75/SRT-SH 121 along the Common Alignment. From the end of the Common Alignment, the Orange Alternative would continue east on new location crossing Airport Drive/Old Mill Road, and continuing further east and south around the southern end of the Airport, then turning north near CR 317 to connect to US 380 east of the Airport, 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. The proposed ROW needed for the Orange Alternative would vary from 165 feet-wide to 696 feet-wide.

The DEIS addresses the environmental impacts associated with each of the identified reasonable alternatives and the No-Build Alternative including the following areas: ROW/displacements, land use, farmlands, utility relocation, bicycle and pedestrian facilities, community impacts, visual/aesthetic impacts, cultural resources, protected lands, water resources, biological resources, air quality, hazardous materials, traffic noise, induced growth, cumulative effects, construction phase impacts, and greenhouse gases and climate change.

The Purple Alternative results in substantial impacts to existing and planned infrastructure including major utilities, existing local roadways, and major developments; creates a visual and physical barrier between two historically African American and Mexican/Latin American communities and future park properties; and displaces a major national distribution facility and the active expansion project of one of McKinney's largest employers. The Purple Alternative would require the relocation of major water utility infrastructure, and would affect more receptors with traffic noise due to its proximity to neighborhoods. The Purple Alternative would not

displace any residences. The Purple Alternative would include a noise barrier to reduce traffic noise impacts within a low-income neighborhood.

The Orange Alternative provides a more centrally located connection between the high-growth areas generating the current and forecasted travel demand and the existing regional arterials south of McKinney, while providing the needed roadway capacity and resiliency to support growth and continued development in the region. The Orange Alternative would result in greater impacts on farmland, water features, natural vegetation, and floodplain, and would cause the potential displacement of seven residences and two businesses, none of which are located within Environmental Justice (EJ) communities. The Orange Alternative would include a noise barrier to reduce traffic noise within a low-income neighborhood.

The City of McKinney and Collin County requested that an economic analysis be conducted to determine the effect of the alternatives on changes in potential land use and approximate land value based on an increase or reduction in acreage within areas of planned development. Setting the No-Build Alternative as the benchmark, implementation of the Orange Alternative is estimated to result in a net increase in parcel values of approximately $107 million (M) in contrast to the net decrease in parcel values of approximately $34M anticipated to result from implementation of the Purple Alternative. See **Section 3.6.7** and **Appendix K** for the *Economic Capacity Evaluation Memo*. Businesses along Airport Drive have commented on the indirect effect the Purple Alternative would have on access to their facilities and planned facility expansions.

Residents along CR 722/Enloe Road and members of the public voiced opposition to the Orange Alternative because it crosses a farm that has been in single-family ownership for more than 100 years and has historic significance to the family. TxDOT conducted a historic resources Intensive Survey and completed archeological surveys of the property in February 2022 with the family's permission. With the loss of many of the original structures on the property, changes to the appearance and design of the primary residence, and changes in the use and character of the associated lands; TxDOT found the Enloe Farm does not retain the integrity needed to convey significance, as defined under Section 106 of the National Historic Preservation Act, and it does not meet the required standards to be considered eligible for listing on the National Register of Historic Places (see **Section 3.8.2**).

In consideration of the impacts of both Build Alternatives, TxDOT recommends the Orange Alternative as the Preferred Alternative. The Orange Alternative meets the stated Purpose and Need, and has been planned and designed to function independent of any other improvements. It would provide a complete and functional connection between US 75/SRT-SH 121 and US 380 to address the connectivity and mobility needs identified without any additional improvements. The Orange Alternative would provide additional capacity to accommodate forecasted traffic volumes; and support regional mobility and connectivity between areas of high-growth in northern and eastern Collin County and the education, employment, health care, and commerce centers within the core of the Dallas Metroplex. It would also provide system redundancy and resiliency by leaving Airport Drive in place to function as a reliever or emergency access route when incidents occur or construction activities clog SH 5 or US 75 while allowing the Orange Alternative to operate at near free-flow conditions. The Orange Alternative would provide access to McKinney's expanding airport and support limited growth and development within an area designated for industrial and commercial uses.

TxDOT will consider any public comment on this DEIS prior to preparing a combined Final Environmental Impact Statement (FEIS)/Record of Decision (ROD). This DEIS indicates a Preferred Alternative, but TxDOT's selection of an alternative will be made in the ROD. The Preferred Alternative – Orange Alternative - will be evaluated to a higher level of detail, as appropriate, in the FEIS following the public hearing. TxDOT will issue a combined FEIS/ROD pursuant to Pub. L. 112-141, 126 Stat. 405, § 1319(b) unless TxDOT determines statutory criteria or practicability considerations preclude issuance of a combined document pursuant to Section 1319.

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List of Acronyms and Abbreviations

ACRONYM/ABBREVIATION	FULL DEFINITION
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADT	average daily traffic
AIRPORT	McKinney National Airport
AOI	Area of Influence
APE	area of potential effect(s)
AST	aboveground storage tank
BGEPA	Bald and Golden Eagle Protection Act
BLRA	Black Rail
BMP	best management practice
ca.	circa
CCSRP	Collin County Strategic Roadway Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
Ch. 26	Chapter 26 Protection of Public Parks and Recreational Lands
CIA	Community Impacts Assessment
CMAQ	Congestion Mitigation and Air Quality Improvement
CMP	Congestion Management Process
CO TAQA	Carbon Monoxide Traffic Air Quality Analysis
CR	County Road
CSJ	Control Section Job (key descriptor for a TxDOT project)
CWA	Clean Water Act
DART	Dallas Area Rapid Transit
dB	decibel(s)
dB(A)	A-weighted decibels
DEIS	Draft Environmental Impact Statement
DFW	Dallas-Fort Worth
DHHS	U.S. Department of Health and Human Services
DHV	design hourly volume
DNT	Dallas North Tollway
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMS	Emergency Management Systems
EMST	Ecological Mapping Systems of Texas
EO	Executive Order
ENV	TxDOT Environmental Affairs Division
ENV-HMM	TxDOT Environmental Affairs Division Hazardous Materials Management
EPA	U.S. Environmental Protection Agency

ACRONYM/ABBREVIATION	FULL DEFINITION
ESA	Endangered Species Act
ETC	estimated time of completion
ETJ	extraterritorial jurisdiction
FAA	Federal Aviation Administration
FEASIBILITY STUDY	US 380 Collin County Feasibility Study
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FM	Farm to Market
FPPA	Farmland Protection Policy Act
FR	Federal Register
FTA	Federal Transit Administration
GC	General Conditions
GHG	greenhouse gas
GIS	geographic information system
HRSR	Historic Resources Survey Report
HOV	high-occupancy vehicle
HUD	U.S. Department of Housing and Urban Development
IBWC	International Boundary and Water Commission
ISA	Initial Site Assessment
LCA	LCA Environmental Inc.
LEP	limited English proficiency
Leq	average or equivalent sound level
LF	linear feet
LOS	Level of Service
LWCF	Land and Water Conservation Fund
M	million
MBTA	Migratory Bird Treaty Act
MMT	million metric tons
MOU	Memorandum of Understanding
MOVES	Motor Vehicle Emissions Simulator
mph	miles per hour
MPO	Metropolitan Planning Organization
MSAT	mobile source air toxics
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service

ACRONYM/ABBREVIATION	FULL DEFINITION
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTMWD	North Texas Municipal Water District
NWP	Nationwide Permit
OHWM	ordinary high water mark
ONE-MCKINNEY 2040	City of McKinney Comprehensive Plan
PALM	Potential Archeological Liability Map
PCN	pre-construction notification
PCR	Project Coordination Request
PM	particulate matter
ppm	parts per million
PS&E	plans, specifications, and estimates
PST	petroleum storage tank
PUB L.	Public Law
ROD	Record of Decision
ROW	Right(s)-of-way
RPZ	Runway Protection Zone
RSA	regionally significant arterial
SAL	State Antiquities Landmark
SGCN	Species of Greatest Conservation Need
SH	State Highway
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SOV	single-occupancy vehicle
SRT-SH 121	Sam Rayburn Tollway/SH 121
STAT.	Statute
STIP	Statewide Transportation Improvement Program
SUP	shared-use path
SW3P	stormwater pollution prevention plan
TCEQ	Texas Commission on Environmental Quality
TDM	Transportation Demand Management
TERP	Texas Emissions Reduction Plan
THC	Texas Historical Commission
TIP	Transportation Improvement Program
TMDL	total maximum daily load
TPDES	Texas Pollutant Discharges Elimination System
TPWD	Texas Parks and Wildlife Department
TPWD BMP	Texas Parks and Wildlife Department Best Management Practice
TSM	Transportation System Management
TWDB	Texas Water Development Board
TXDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database

ACRONYM/ABBREVIATION	FULL DEFINITION
Uniform Act	Uniform Relocation and Real Property Acquisition Policies Act of 1970
USC	United States Code
US	United States (Highway)
U.S.	United States (agency names)
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UTP	Unified Transportation Program
VMT	vehicle miles traveled
vpd	vehicles per day
WHCR	Whooping Crane
WOTUS	Waters of the United States

1.0 Purpose of and Need for Action

The *US 380 Collin County Feasibility Study*[1] (Feasibility Study), completed in April 2020, identified the initial purpose and need for the proposed action. It was formalized and provided in the agency scoping packets distributed on November 23, 2020, during the virtual agency scoping meeting conducted on December 10, 2020, and shared with the public during a virtual scoping meeting conducted between February 23, 2021, and March 10, 2021. The Texas Department of Transportation (TxDOT) updated the need statements and supporting facts following scoping to include the results of additional traffic analyses and travel demand modeling conducted during schematic design development. The supporting data was updated in March 2022 to capture 2020 census data.

1.1 Need

The need for the proposed action is in response to reduced mobility and limited connectivity caused by the lack of regionally significant arterials (RSAs)[2] between the northern and eastern portions of Collin County and destinations south of McKinney, including most of the Dallas Metroplex. Mobility is reduced because the existing deficient arterial roadway network cannot address current travel demand and because of the burden forecasted population growth will place on the existing transportation system in the future.

1.2 Supporting Facts

1.2.1 Deficient Arterial Roadway Network to Support Anticipated Travel Demand

Northern and eastern portions of Collin County have been identified by the North Central Texas Council of Governments (NCTCOG) as areas of high population and employment growth with deficient existing arterial roadway networks. Based on the technical analyses conducted to support development of the Metropolitan Transportation Plan (MTP), *Mobility 2045 Update*[3] (approved June 9, 2022), the high-growth areas shown in dark green in **Figure 1-1** are also areas where the existing arterial roadway framework is insufficient to support current and future travel demand. The analyses conducted by NCTCOG for the *Mobility 2045 Update* considered forecasted population and employment growth, existing arterial spacing and connectivity, congestion on existing arterials, and congestion on any surrounding facilities.[4]

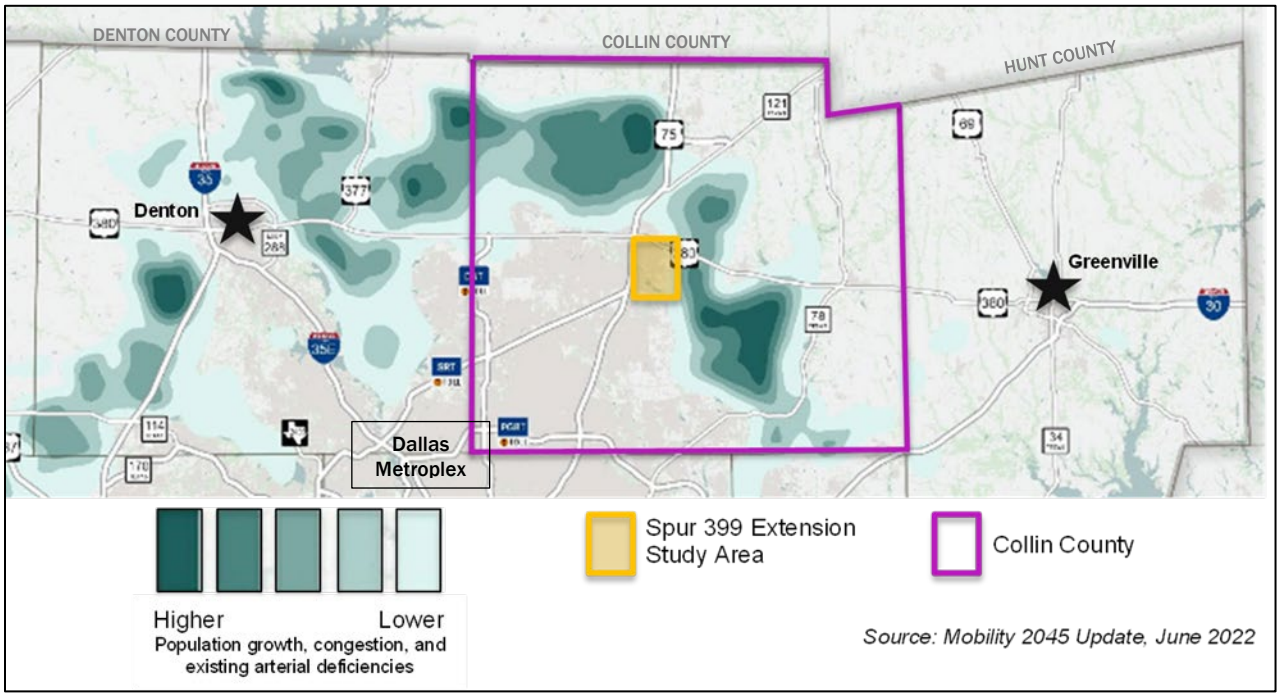
1 The *US 380 Collin County Feasibility Study* can be accessed at https://www.keepitmovingdallas.com/projects/us-highways/us-380-collin-county-feasibility-study

2 RSAs form the backbone of the arterial roadway network. *Mobility 2045* identifies arterials as regionally significant if they serve regional transportation needs, provide service to regional activity centers, connect communities, and maintain access to and from areas outside of the region. RSAs are forecasted to carry approximately 22 percent of all vehicular traffic in the region by 2045.

3 *Mobility 2045 Update*. https://www.nctcog.org/trans/plan/mtp/mobility-2045-2022-update

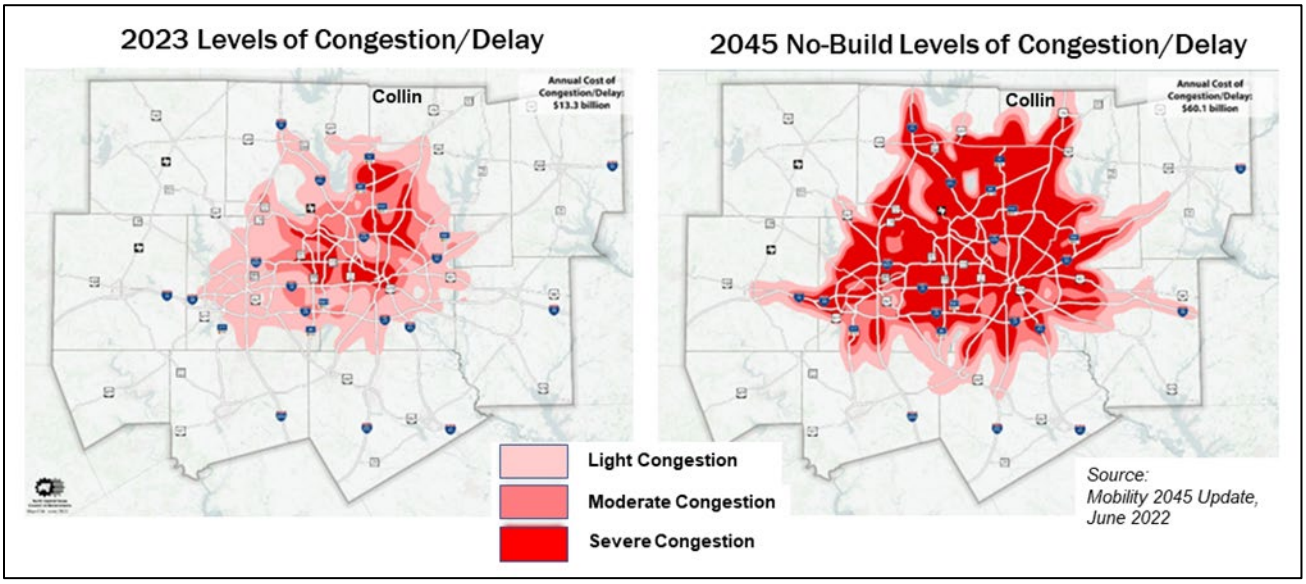
4 *Mobility 2045 Update*, E-Mobility Options; NCTCOG

Figure 1-1: Areas of High Forecast Growth and Deficient Existing Arterial Networks



The *Mobility 2045 Update* also documents congestion and delay occurring along existing major arterials connecting Collin County to the Dallas Metroplex. Illustrated in **Figure 1-2**, in 2023, areas of moderate to severe levels of congestion/delay would be centered in Dallas County along United States (US) Highway 75 (US 75), Interstate 635 (I-635), I-30, and the Dallas North Tollway (DNT). If no improvements are made to these major regional arterials, moderate and severe levels of congestion/delay are forecasted to spread along them, including US 75, extending into Collin County by 2045.

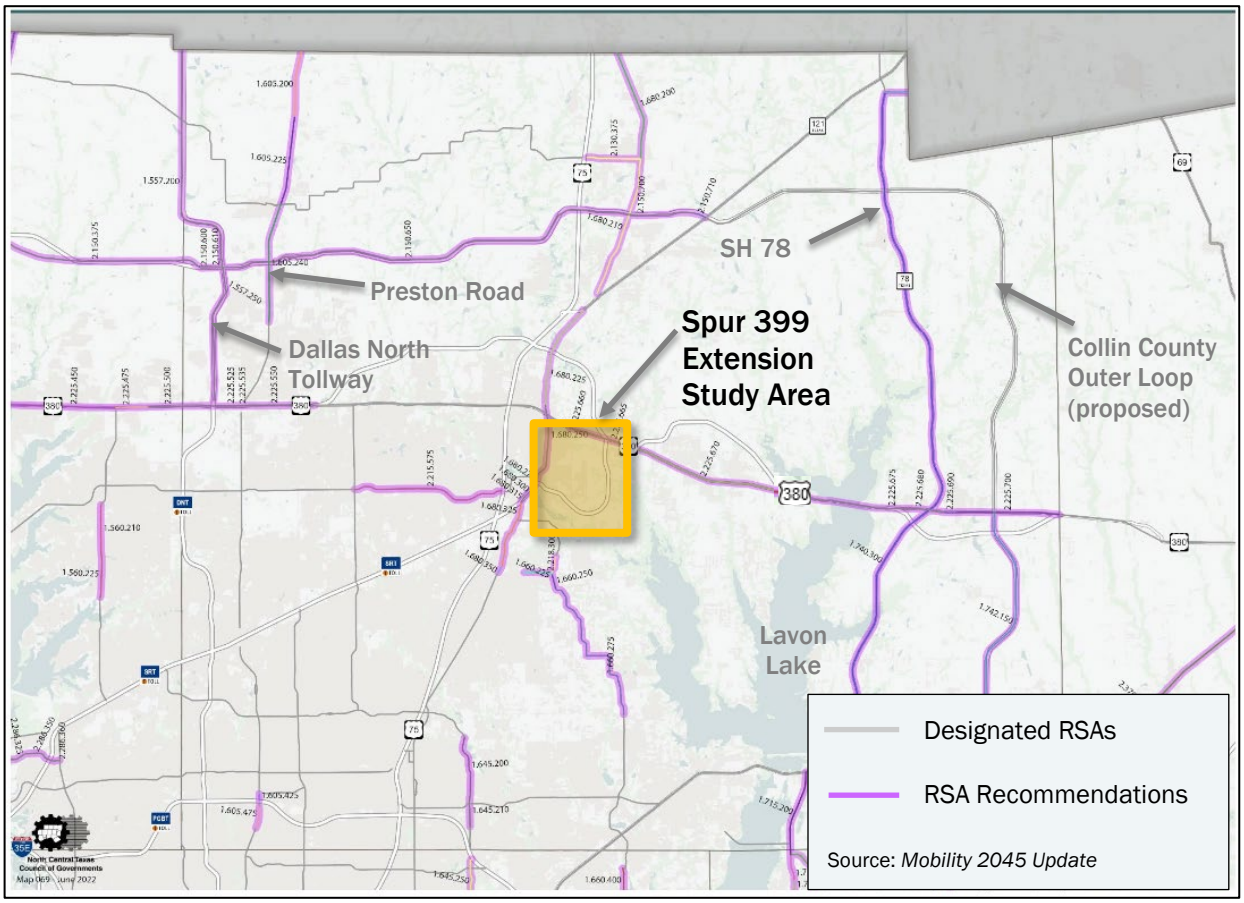
Figure 1-2: Areas of Moderate to Severe Traffic Congestion/Delay



The *Mobility 2045 Update* also indicated the existing arterial framework outside of the growth areas in Collin County lacks the capacity to handle the anticipated travel demand. Travelers accessing employment, education, health care, and commerce across the Dallas Metroplex use US 75/Sam Rayburn Tollway (SRT-State Highway (SH) 121) through McKinney to travel south. As growth has and will continue, congestion along US 75 through McKinney will continue to worsen without considering additional reliever routes to bypass the most congested areas and provide connectivity to destinations to the south.

The primary north-south RSAs serving Collin County include US 75/SRT-SH 121 through McKinney, SH 78 east of Lavon Lake, and SH 289/Preston Road and the DNT near the western boundary with Denton County. NCTCOG has recommended studies and improvements to US 75/SRT-SH 121, SH 78, SH 5, SH 289/Preston Road, and the DNT to address current and forecasted transportation needs, highlighted in purple in **Figure 1-3**. In addition to these existing roadways, when completed, the proposed Collin County Outer Loop (segments are in various stages of study, right-of-way (ROW) acquisition, and construction by Collin County) would serve future transportation needs.

Figure 1-3: Regionally Significant Arterials in Collin County



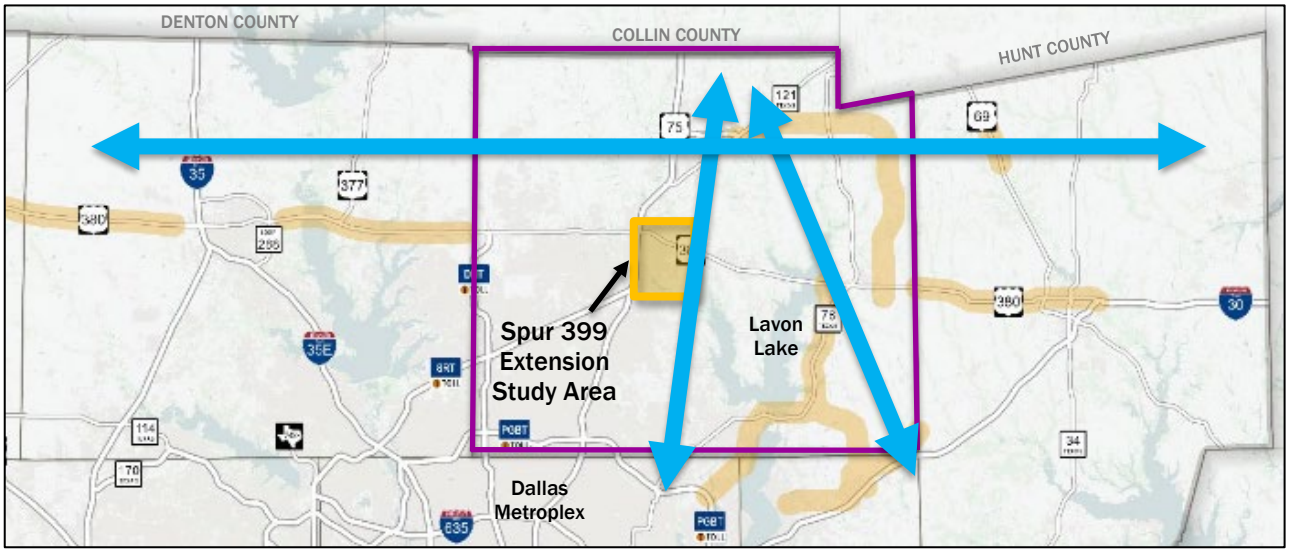
Other factors contributing to the deficient arterial network include physical constraints limiting their development, such as Lavon Lake and its associated public lands, managed by the U.S. Army Corps of Engineers (USACE), and the East Fork Trinity River and its associated floodplains. Much of the area northeast

and east of the Spur 399 Extension Study Area has been sparsely developed. In recent years sporadic growth has occurred to the north toward Melissa and New Hope and east toward Princeton.

As shown in **Figure 1-3**, physical constraints such as Lavon Lake and the associated USACE-managed lands to the southeast and developed communities to the west and south limit consideration of other RSAs in Collin County. US 75/SRT-SH 121 and the DNT are the only north-south arterials connecting Collin County travelers to the rest of the Dallas Metroplex. These physical constraints and the US 75/SRT-SH 121 and SH 5 corridors have defined the Spur 399 Extension Study Area.

In addition to the improvements recommended to some of the existing RSAs, *Mobility 2045 Update* also identifies areas where further study is needed to address future transportation, regional travel, and mobility issues across the region, depicted as blue arrows in **Figure 1-4**.

Figure 1-4: NCTCOG Corridors for Future Evaluation



The blue arrows on the map illustrate the general travel patterns under study by the NCTCOG, TxDOT, or Collin County. The tan shading represents corridors to be considered in future MTPs that are not included in the financially constrained portion of *Mobility 2045 Update*. These shaded corridors reflect areas of additional transportation need and require further analysis or funding before recommendations can be included in the MTP.
Source: *Mobility 2045 Update, June 2022*

NCTCOG is assisting Collin County with developing a comprehensive planning process to identify major transportation needs to improve mobility and accommodate future growth in the area east of the US 75 corridor. As part of the Strategic Corridor Initiatives identified in the Unified Planning Work Program, the Collin County Strategic Roadway Plan (CCSRP) planning process will evaluate possible north-south roadway connections to/from Dallas and Rockwall counties and potential east-west roadway connections to/from Hunt and Rockwall counties.

Work efforts associated with this planning process include travel demand modeling; reports on future traffic volumes, origin-destination analyses and other travel characteristics; and presentations to local governments, elected officials, technical staff, and communities. The CCSRP planning process is currently under way and includes arterial and freeway (non-tolled) recommendations to be included in the *Mobility 2045 Update*.

1.2.2 Demands on the Transportation System

1.2.2.1 Population Growth

Collin County recorded a population of more than one million people in 2019, making it one of the most populous counties in Texas. Other Study Area communities experienced more robust growth, as indicated in **Figure 1-5**. The 2020 census data shows Study Area communities continued to grow at similar or stronger rates except for the cities of McKinney and Princeton that both experienced a decline in population between 2019 and 2020.

As reported in the Feasibility Study, according to the 2014 Texas State Demographer's population projections by migration scenario data, over the next 30 years, Collin County could anticipate an increase in population of up to 160 to 170 percent.

Figure 1-5: Population Growth in the Study Area and Vicinity

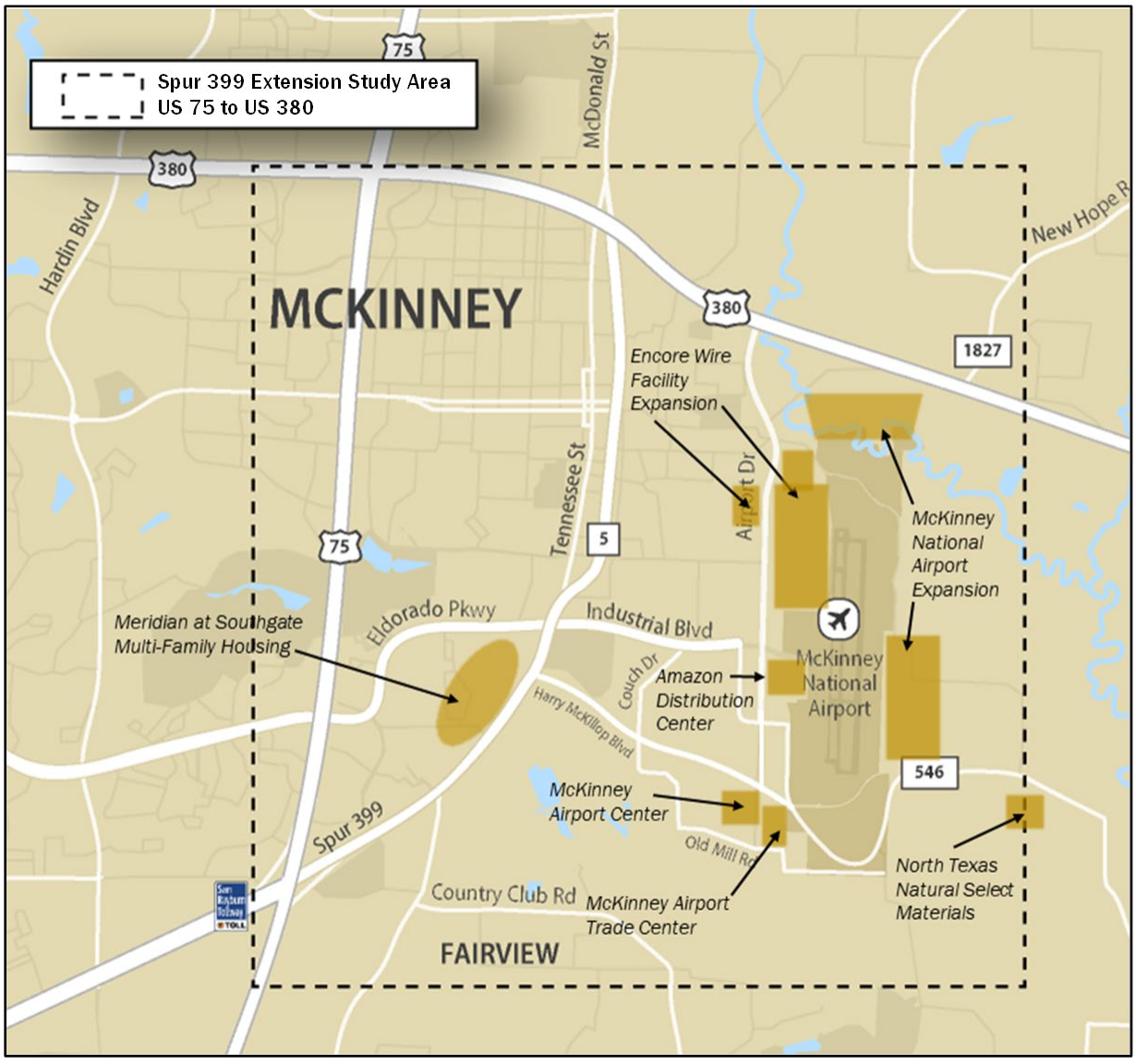
Jurisdiction	Population		Percent Population Increase	Annual Growth Rate
	2010	2019	2010-2019	2010-2019
		2020	2010-2020	2010-2020
Collin County	782,341	1,034,730	32%	3.16%
		1,006,038	36%	3.13%
City of McKinney	131,117	199,177	52%	4.76%
		191,197	49%	4.07%
City of Princeton	6,907	13,894	104%	8.25%
		12,208	77%	5.86%
Town of Fairview	7,248	9,141	26%	2.61%
		9,998	38%	3.27%

SOURCE: 1 - US Census Bureau 2010 and 2019 data, American FactFinder; accessed July 2020
2 - US Census Bureau 2016-2020 ACS 5-YR, accessed March 2022)

In addition to a growing population, the Study Area is gaining new development. Many of the existing industrial businesses along Airport Drive have facility expansion plans, which in combination with new development, continues to add traffic and increase congestion on existing roadways.

Figure 1-6 illustrates developments within the Study Area either recently completed or planned to occur within the next 1 to 5 years that will continue to add traffic to the existing roadway network. Airport Drive, the only access to the McKinney National Airport (Airport) and the neighboring industrial area, carries traffic between US 380 and US 75/SRT-SH 121. It connects to Farm to Market (FM) 546/Harry McKillop Boulevard and Industrial Boulevard and is used by drivers to avoid traveling through McKinney along US 75 or SH 5 south to reach destinations in the core of the Dallas Metroplex.

Figure 1-6: Current and Planned Development in the Study Area



1.2.2.2 Roadway Capacity and Continuity

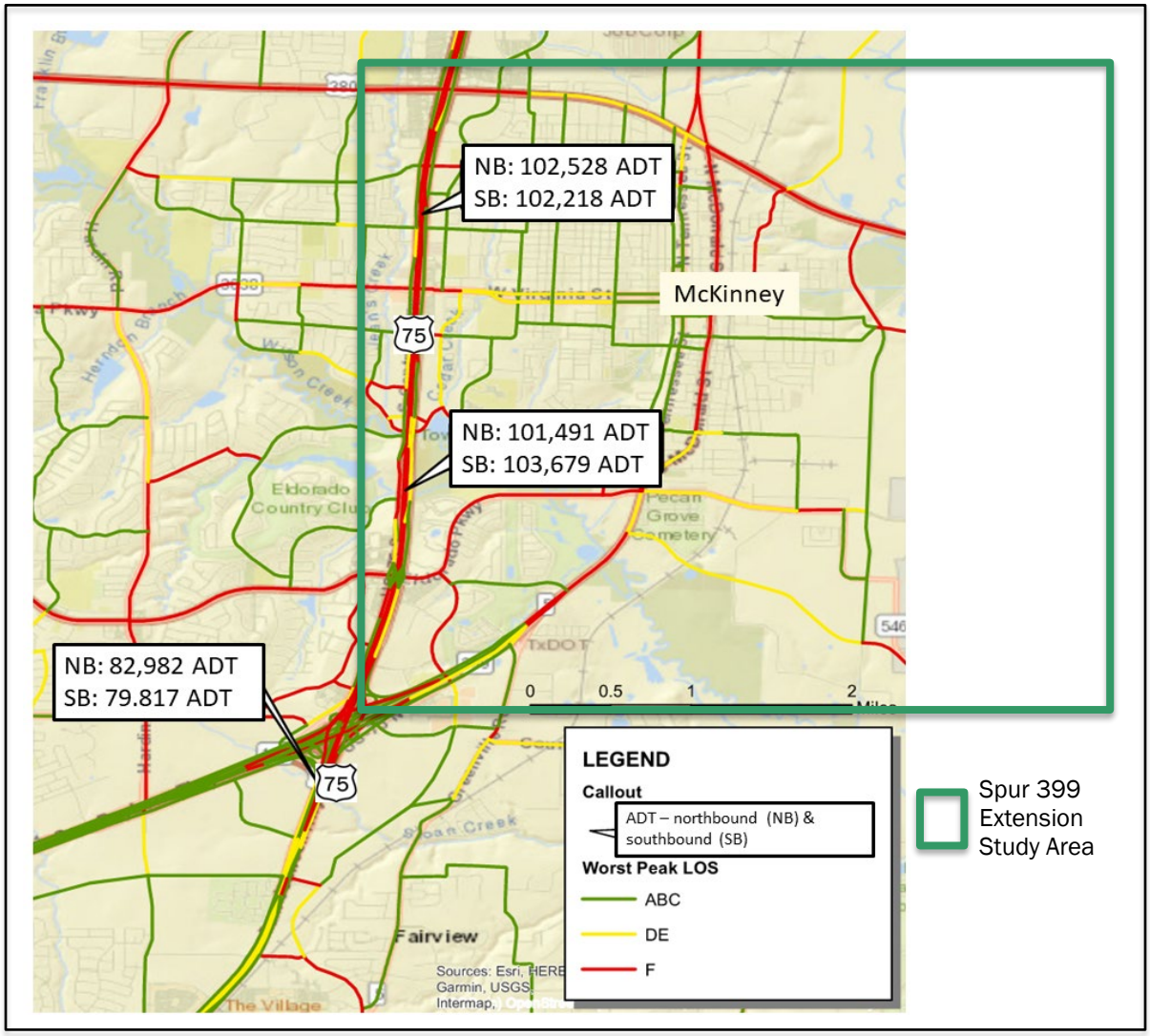
As growth continues and travel demand increases, NCTCOG has made the following recommendations to add capacity to the existing north-south roadway network within the Study Area by 2045:

- SRT-SH 121 – widen the existing 6-lane tollway to an 8-lane tollway to provide new/additional toll road capacity by 2045.
- SH 5 (Spur 399 to Industrial Boulevard/El Dorado Parkway, terminating at Airport Drive) – expand the existing 2-lane facility to a 4-lane facility by 2028, and to a 6-lane facility by 2045.
- US 75 – widen the existing 8-lane freeway from US 380 south to SRT-SH 121 to a 10-lane facility by 2045.

These recommended improvements would add capacity to the existing roadway network but would not support the connectivity and mobility needs of travelers from the northern and eastern portions of Collin County wanting to bypass congested areas along these roadways, particularly through McKinney, to reach destinations to the south.

In the 2014 *Collin County Mobility Plan*, the section of US 75 between US 380 and the junction with SH 5, Spur 399, and the SRT-SH 121, was forecasted to operate at Level of Service (LOS) F in 2035. As modeled in *Mobility 2045* (November 2018) and depicted in **Figure 1-7**, NCTCOG indicated the same section of US 75 will be over capacity, with some areas operating at LOS D/E, but the majority operating at LOS F during peak hours in 2045.

Figure 1-7: US 75/SH 121 Level of Service and Traffic Volumes



SOURCE: Kimley-Horn, November 2020; data obtained from NCTCOG 2045 MTP

Resiliency of a corridor, or the ability of a roadway network to adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions, is an essential consideration in a transportation system. Incidents and construction projects will exacerbate the already constrained capacity and congestion along US 75 and connecting roadways. Traffic from northern and eastern Collin County must take US 75 or SH 5 to reach destinations south of McKinney because they are the only major roadways connecting that portion of the county to the Dallas Metroplex. Traffic analyses conducted during the Feasibility Study indicated that instead of staying on major roadways, motorists are diverting to Airport Drive from US 380. Data showed that traffic traveling to the south would take Airport Drive and then connect to SH 5 via FM 546/Harry McKillop Boulevard, West Eldorado Parkway/Industrial Boulevard, and even local neighborhood streets. These routes allow motorists to bypass congested sections of US 75 to travel to the south but also take them through industrial, commercial, and residential areas along city 2-lane and 4-lane streets.

1.3 Purpose

The purpose of the proposed action is to improve north-south mobility and connectivity for travelers from northern and eastern Collin County to destinations south of McKinney, including the core of the Dallas Metroplex.

2.0 Alternatives Including the Proposed Action

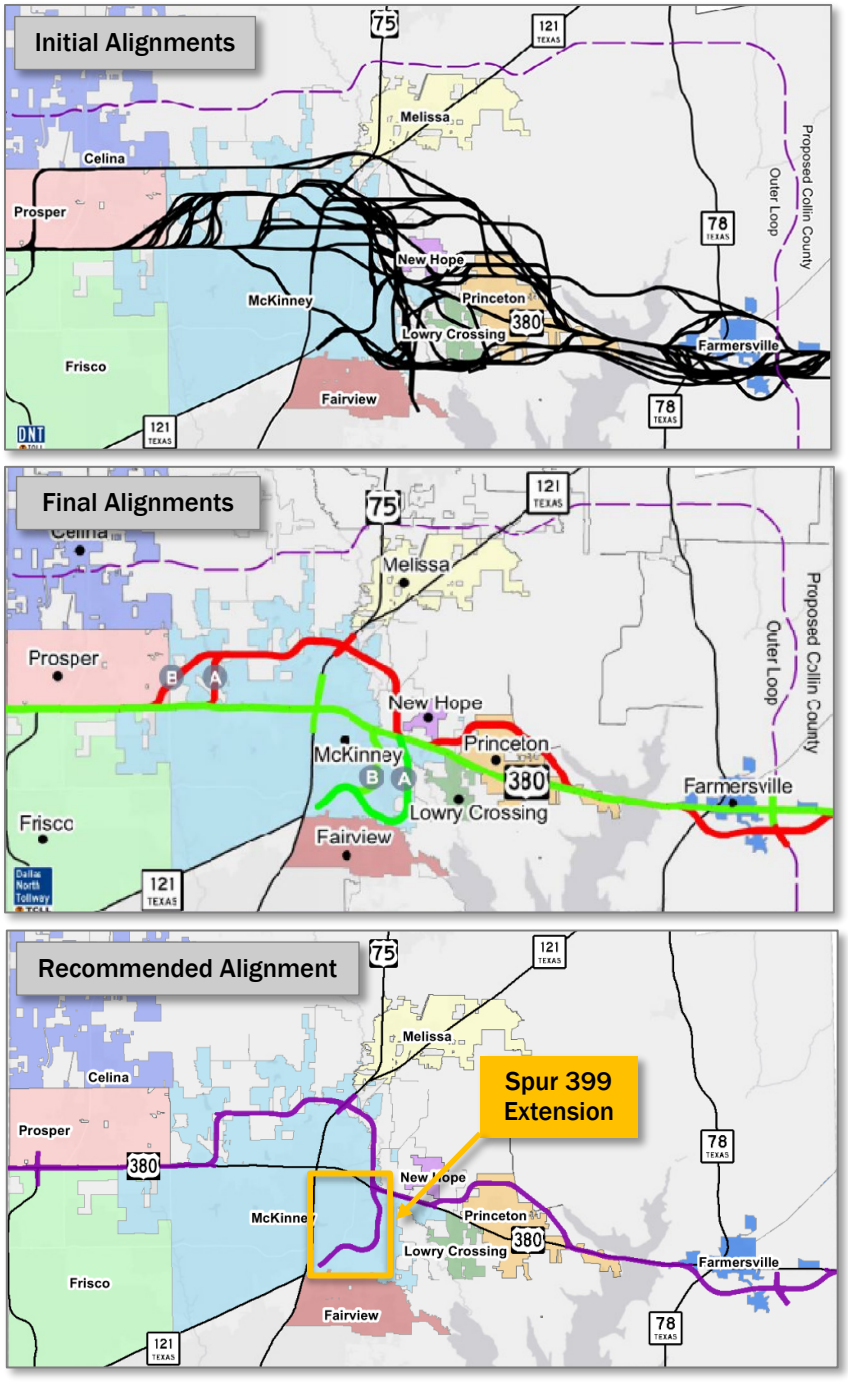
The Feasibility Study, completed in April 2020, identified a Recommended Alignment for an improved US 380 across Collin County. Residents within many of the communities provided input into the development, refinement, and evaluation of the alignments throughout the study process. After determining that a freeway facility would best meet the future growth and transportation needs within the county through the current regional planning horizon of 2045, several initial alignments were developed as illustrated in **Figure 2-1**.

TxDOT considered input received during multiple public meetings, results from additional travel demand modeling coordinated closely with NCTCOG, and the results of high-level analyses of the potential impacts of a new freeway on water features, public lands (e.g., parks and recreation areas), community facilities, potential historic resources, neighborhoods, and residences to identify the final alignments.

After completing additional traffic modeling, a preliminary noise analysis for key areas within the Study Area, and assessing the short-term economic effects of the proposed project on neighboring communities, TxDOT announced a Recommended Alignment.

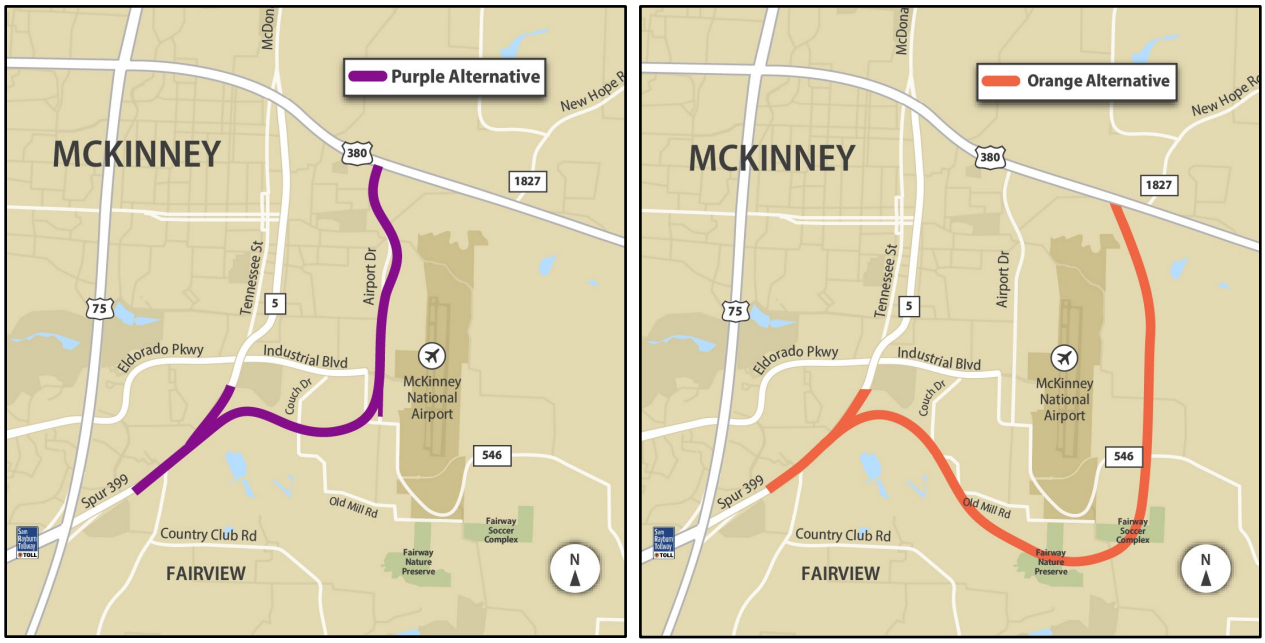
The Extension of Spur 399 around the southeast corner of McKinney to connect US 75 and US 380 was one of the recommended projects of independent utility identified from the Feasibility Study.

Figure 2-1: Feasibility Study Alignment Development



Initial Spur 399 Extension Alternatives – Illustrated in **Figure 2-2**, the Purple Alternative is the alignment recommended from the Feasibility Study following the existing Airport Drive corridor along the west side of the Airport. The Orange Alternative was brought back from consideration in the Feasibility Study to avoid impacts to newly constructed businesses along Airport Drive potentially affected by the Purple Alternative. As shown in **Figure 2-2** and **Figure 2-3**, the Orange Alternative initially extended farther south through the Fairview Soccer Park and Fairview Nature Preserve to accommodate the proposed south extension of Runway 18-36 at the Airport. The Orange Alternative was not supported by the City of McKinney or the Town of Fairview during the Feasibility Study.

Figure 2-2: Initial Spur 399 Extension Alternatives



After initiating the Schematic and Environmental Study for the Spur 399 Extension, TxDOT worked with businesses along Airport Drive and McKinney's aviation department to refine both alternatives. Through ongoing coordination with the City of McKinney, Collin County, Town of Fairview, and the North Texas Municipal Water District (NTMWD), and with consideration of comments received during agency and public scoping, the Purple and Orange Alternatives were modified to address existing and proposed utility projects and access to the NTMWD/McKinney Landfill in the highly constrained area east of SH 5 (shown in **Figure 2-3**). Additional changes were made to the Purple Alternative to address current and future access needs through coordination with the City of McKinney, the Airport, and businesses along Airport Drive. Additionally, alignment and frontage road modifications were made in consideration of Collin County's independent ongoing study to realign FM 546 south of the Airport.

After completion of the Feasibility Study, the Airport decided to shift the proposed extension of Runway 18-36 to the north allowing TxDOT to develop an alternate orange alignment that moved north and closer to FM 546 along the south edge of the Airport avoiding the Fairview Soccer Park and Nature Preserve (shown in **Figure 2-4**) and the Runway Protection Zone (RPZ) -- an area of restricted land use (including major public roadways) mandated by the Federal Aviation Administration (FAA) that extends beyond the physical runway limits.

Figure 2-3: Alignment Change Areas Along FM 546 and the Landfill and Airport Drive

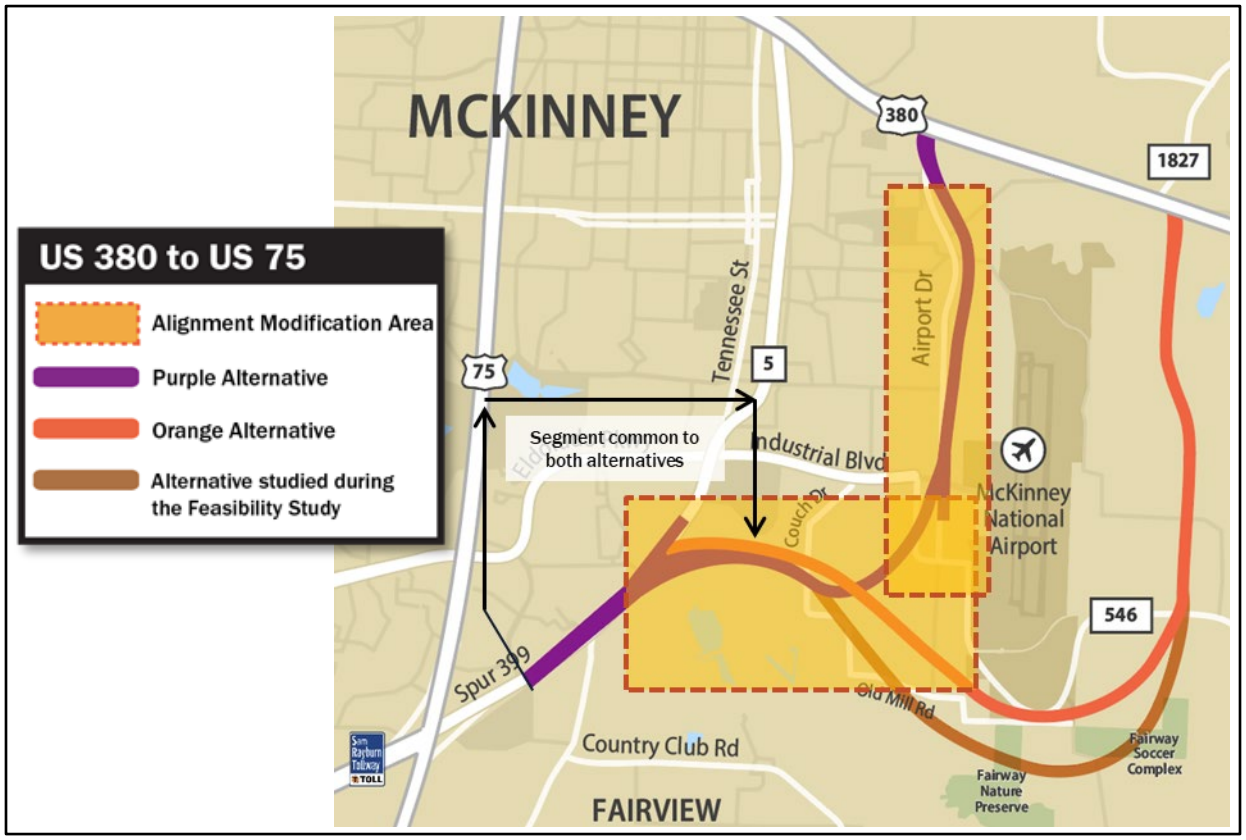
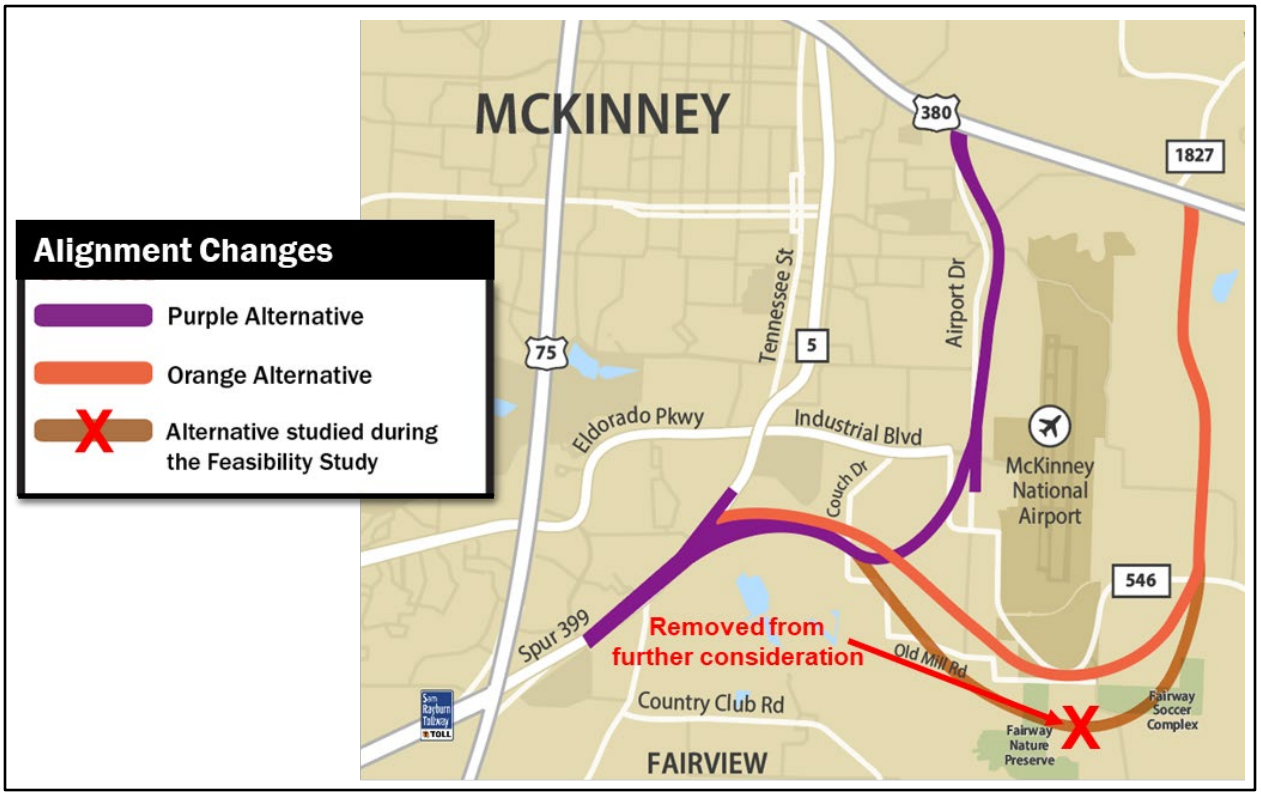


Figure 2-4: Removal of the More Southerly Orange Alignment South of the McKinney National Airport



To avoid both Fairview properties and with the Airport formally updating their runway extension plans (including updating the Airport Layout Plan, preparing an Environmental Assessment [EA] for review by the FAA, submitting a Section 404 Individual Standard Permit application through the USACE), the southern orange alignment was removed from further consideration.

These changes to the two Build Alternatives along with the No-Build Alternative were presented during a virtual agency scoping meeting conducted on December 10, 2020, and during public scoping conducted virtually February 23, 2021, through March 10, 2021. The alternatives considered in this Draft Environmental Impact Statement (DEIS) and decisions based on this DEIS will achieve the requirements of Sections 101 and 102(1) of the National Environmental Policy Act (NEPA), as interpreted by the Council on Environmental Quality's (CEQ) regulations and other environmental laws and policies, by ensuring that decisions regarding this project will be based on a robust evaluation of reasonable alternatives and the potential environmental impacts of those alternatives.

2.1 Alternatives Eliminated from Detailed Study in the EIS

2.1.1 Build Alternative – Orange South Alignment

As depicted in **Figure 2-4**, the proposed runway shift allowed the alignment considered for the Orange Alternative to more closely parallel FM 546 along the southern edge of the Airport and potentially avoid the two recreational properties owned by the Town of Fairview. The southern orange alignment is not evaluated in this DEIS.

In May 2022, the *Environmental Assessment for Runway Extension and Other Improvements at McKinney National Airport* was published for public review. The FAA and TxDOT Aviation Division issued a FONSI/ROD for the proposed action on July 27, 2022. The Airport has received their Section 404 Individual permit (the USACE issued a public notice on April 6, 2021 [SWF-2020-00359] regarding the proposed runway extension), and submitted a Conditional Letter of Map Revision (CLOMR) to the City of McKinney for review to address proposed changes in the 100-year floodplain boundary along the East Fork Trinity River to facilitate construction of earthen fill below the 100-year water surface elevation. The Airport anticipates beginning construction of the southern runway (Runway 36) extension in December 2022, and the northern runway (Runway 18) extension in March 2023, pending receipt of all permits and approvals.

2.1.2 Improve Existing North-South Highways – SH 5 and/or US 75

Improvement of SH 5 and/or US 75 would not address the identified needs. The rapid growth and associated development occurring in northern and eastern Collin County is contributing traffic to the existing roadway system (SH 5 and US 75), which is forecasted to operate at LOS D/E/F during peak hours in 2045 (see **Figure 1-7**). Improvements are recommended for both highways, as described in **Section 1.2.2.2,** but they would only add capacity to the existing roadway network and would not provide the needed connectivity nor support the mobility needs of travelers in the high-growth areas of the county. Improvement of SH 5 and/or US 75 was not considered as an initial alternative and is not evaluated as a stand-alone alternative in this DEIS.

2.1.3 Transportation System Management (TSM)

Transportation system management (TSM) is a set of low-cost (non-capital-intensive) strategies to enhance safety, reduce congestion, and improve traffic flow. Specific strategies include traffic signal synchronization, freeway operations improvements (e.g., changeable message signs, ramp metering), and incident management (e.g., clearing accidents and breakdowns quickly to allow traffic to move more smoothly). Other methods can include providing bus pullouts to remove stopped buses from the traffic stream, intersection improvements that provide signal priority for transit vehicles, and queue-jumper lanes to get transit vehicles to the front of the line at intersections.

TSM would not increase the overall capacity of US 380, SH 5, or US 75 and would not provide the connectivity needed to support the current and forecasted travel demand from the high-growth areas in the county. It would only address certain access/egress issues and other minor safety and operational issues in the short-term. TSM could be incorporated as an enhancement into either Build Alternative but would not satisfy the stated needs as a standalone alternative. TSM is not evaluated in the DEIS.

2.1.4 Transportation Demand Management (TDM)

Transportation demand management (TDM) includes managing or decreasing the demand for auto-related travel to increase the operating efficiency of transportation facilities. Managing or decreasing the demand for auto-related travel can be accomplished by providing mobility options to using single-occupant vehicles (e.g., transit, carpool, vanpool, bicycle), incentives/disincentives to using single-occupant vehicles (e.g., congestion pricing, high-occupancy vehicle (HOV) lanes, travel time advantages for HOVs, alternative work environments (e.g., telecommuting and flex time), and parking management.

TDM strategies would not increase the overall capacity of US 380, SH 5, or US 75 and would not provide the connectivity needed to support the current and forecasted travel demand from the high-growth areas in the county. It could be used in combination with the recommended improvements to SH 5 and US 75 as described in **Section 1.2.2.2**, if those projects would add HOV lanes or managed lanes to encourage such use, particularly during peak hour travel periods. TDM could be incorporated as an enhancement into either Build Alternative but would not satisfy the stated needs as a standalone alternative. TDM is not evaluated in the DEIS.

2.1.5 Mass Transit

Mass transit as a standalone alternative would not satisfy the identified needs and was not considered to be a reasonable alternative under this proposed action. Dallas Area Rapid Transit (DART) provides bus service as far north as Parker Road and US 75 in Plano, approximately 13.6 miles south of the Study Area. The Draft DART 2045 Transit System Plan,[5] published September 2021, does not include any future service extension to the McKinney area. DART also has partial ownership of the rail line that extends through the western portion of the Study Area and east of SH 5. At this time, DART has not indicated plans to extend light rail along this corridor. Fixed rail transit such as DART's light rail system would not address the transportation needs within the Study Area. Collin County Transit provides transit service for residents 65 years of age or over, individuals with

[5] DART 2045 Transit System Plan; accessed on November 5, 2021, at https://www.dart.org/about/expansion/transitsystemplan.asp

disabilities, and low-income individuals in the Study Area through door-to-door service. This on-demand transit service would not address the transportation needs within the Study Area, even paired with another form of transit service. Mass transit is not evaluated in the DEIS.

2.2 Descriptions of Reasonable Alternatives and the No-Build Alternative

Two reasonable alternatives to extend Spur 399 are carried forward for detailed study in addition to the No-Build Alterative. The Purple Alternative and the Orange Alternative would each construct an 8-lane freeway with frontage roads primarily on new location connecting US 75 south of McKinney to US 380 east of McKinney (see **Appendix A**). Depending on the location, the typical freeway section would consist of four 12-foot-wide travel lanes in each direction with 10-foot-wide inside and outside shoulders and 2-lane (each 12-feet-wide), one-way frontage roads on either side of the mainlanes. Grade-separated interchanges would include 14-foot-wide ramps with 2-foot-wide inside shoulders and 6-foot-wide outside shoulders, with curb and gutter to support drainage. Bridges and overpasses along the mainlanes would have a desired vertical clearance of 18.5 feet, with a vertical clearance over railroads proposed at 23.5 feet. Shared-use paths (SUPs) built along the outside of the frontage roads would provide bicycle and pedestrian accommodations and support multi-modal access. The anticipated ROW width needed to accommodate the proposed new location improvements ranges between 165 feet and 696 feet, with an average ROW width of approximately 400 feet.[6]

The Purple and Orange Alternatives share a section of "Common Alignment" from the southern terminus of the proposed action (Spur 399/US 75/SRT-SH 121 junction) extending north along SH 5 to just south of FM 546/Harry McKillop Boulevard where the alignment turns east on new location. The Common Alignment ends approximately 500 feet west of Couch Drive where the remaining portions of the Build Alternatives diverge to connect to US 380, the northern project terminus.

The estimated total project costs (2022 dollars) for the proposed project are approximately $742 million (M) for the Purple Alternative and approximately $755M for the Orange Alternative. A combination of federal and state funds would be used to construct the project. Only partial funding has been allocated for the Spur 399 Extension at this time.

2.2.1 Description of the No-Build Alternative

Under the No-Build Alternative, existing Spur 399 would not be extended, and no other new roadways would be built in the Study Area. Spur 399 is a 1.14 mile-long section of roadway connecting SH 5 to US 75/SRT-SH 121 south of McKinney. Spur 399 serves as a frontage road to SH 5, with two 12-foot-wide travel lanes in each direction and 10-foot-wide outside and 4-foot-wide inside shoulders along the outside of SH 5 with open ditch drainage. Ramps with curb and gutter connect Spur 399 to Medical Center Drive. The existing ROW is approximately 350-feet wide accommodating both Spur 399 and SH 5.

The existing highway system consisting of US 75/SRT-SH 121, SH 5, and US 380 would continue to provide the primary connections between the northern and eastern portions of Collin County and the rest of the Dallas Metroplex. In addition to programmed maintenance activities and safety improvements to maintain operations

[6] 60% Geometric Schematic Design submitted to the TxDOT Dallas District on January 3, 2022.

along existing roadways, the No-Build Alternative includes the following programmed improvements to US 380 and SH 5 within the Study Area.

US 380 Widening from Airport Drive to CR 458 (CSJs 0135-03-046 and 0135-04-033) –would widen the existing 4-lane 7.2 mile-long section of US 380 to a 6-lane divided urban facility with a raised median and new curb and gutter drainage. Existing ROW through the Project Area ranges from 60-feet-wide to 90-feet-wide with no additional ROW needed to complete the widening. The improvements would consist of two 12-foot-wide travel lanes and one 14-foot-wide shared-use travel lane in each direction with 2-foot offsets from the inside and outside curbs and a 5-foot-wide sidewalk along each side of the roadway. Right-turn lanes (12-feet-wide) at intersections would be provided as warranted by traffic analyses. The three existing bridges over the East Fork Trinity River would be widened to two 12-foot-wide travel lanes and one 14-foot-wide travel lane in each direction with a raised median that varies from 5-feet-wide to 14-feet-wide, and include a 10-foot-wide outside shoulder in each direction, and a 6-foot-wide sidewalk in each direction separated from the travel lanes by a concrete traffic barrier with a pedestrian rail on the outside. The US 380 widening project was environmentally cleared on January 15, 2020, and is anticipated to be ready to let for construction in February 2024.

SH 5 Improvements from South of FM 1378 (Country Club Road) to South of CR 275 (CSJs: 0047-05-054, 0047-09-034, and 0364-04-049) – would reconstruct and widen this 7.2 mile-long section of SH 5 through Fairview and McKinney. From FM 1378 (Country Club Road) to Spur 399, the existing 2-lane rural roadway would be reconstructed to a 4-lane divided urban roadway. From Spur 399 to Industrial Boulevard (FM 546), the existing 4-lane divided rural roadway would be reconstructed to a 6-lane divided urban roadway. Frontage roads and ramps would be added to this section. From Industrial Boulevard (FM 546) to Power House Street, the existing 4-lane divided rural roadway would be reconstructed to a 4-lane divided urban roadway. From Power House Street to just south of CR 275, the existing 2-lane rural roadway would be reconstructed to a 4-lane divided urban roadway. Side streets within the project limits would be reconstructed to tie into the improved SH 5. Buffered sidewalks, with space for buffers between the sidewalks and the roadway, are proposed adjacent to the roadways to accommodate pedestrians. The SH 5 improvement project was environmentally cleared in July 2020, and is anticipated to be ready to let for construction in June 2027.

2.2.2 Description of the Purple Alternative

The Purple Alternative (**Figure 2-5**) would extend existing Spur 399 as a freeway from its current terminus near the junction of US 75/SRT-SH 121 and along SH 5 to a point south of FM 546/Harry McKillop Boulevard where it turns east on new location, then travels east and north along the alignment of Airport Drive to connect to US 380 west of the Airport, a distance of approximately 4.8 miles.

2.2.2.1 Existing Facility – Purple Alternative

The Purple Alternative includes a portion of existing SH 5 from its intersection with Spur 399 to near Stewart Road. In 2022, SH 5 from the intersection with existing Spur 399 to FM 546/Harry McKillop Boulevard (Old Mill Road), north of Stewart Road, is a 4-lane divided rural highway with a variable-width curbed median and right- and left-turn lanes at at-grade intersections and driveways. The at-grade intersection at FM 546/Harry McKillop Boulevard is signalized, while all other intersections are non-signal controlled. Inside shoulders vary from non-existent to 4-feet in width with 10-foot-wide outside shoulders consistent throughout the section. The

pavement width including intermittent turn lanes both northbound and southbound is 27 feet. The existing ROW width varies from 150 feet to 320 feet. The section contains a bridged crossing of Wilson Creek.

The SH 5 Improvement Project cleared for this section in 2020 and anticipated to be under construction before the Spur 399 Extension, would reconstruct the 4-lane divided roadway within the SH 5 portion of the Common Alignment to a 6-lane divided urban roadway with a 17-foot-wide curbed median transitioning to a narrow median with a center concrete barrier. From existing Spur 399 to SH 5, an extended shoulder/additional lane width (unstriped) to accommodate future capacity would be provided along the outside of the mainlanes and 15-foot-wide shoulders would be provided to the inside. Frontage roads and ramps would be constructed along existing Spur 399/SH 5 from US 75 to the crossing of Wilson Creek. The mainlanes would transition from 11-feet-wide to 12-feet-wide after the Wilson Creek crossing. The two existing bridges over Wilson Creek would be replaced with two wider bridges carrying three mainlanes in each direction with extended shoulders/additional lane width (unstriped) on the outside to accommodate future lane capacity. The intersection at Stewart Road would be grade-separated with no traffic signals installed on the frontage road. The improvements would be accomplished primarily within existing ROW with minor new ROW acquisition in areas around Steward Road and various property corner clips along the corridor.

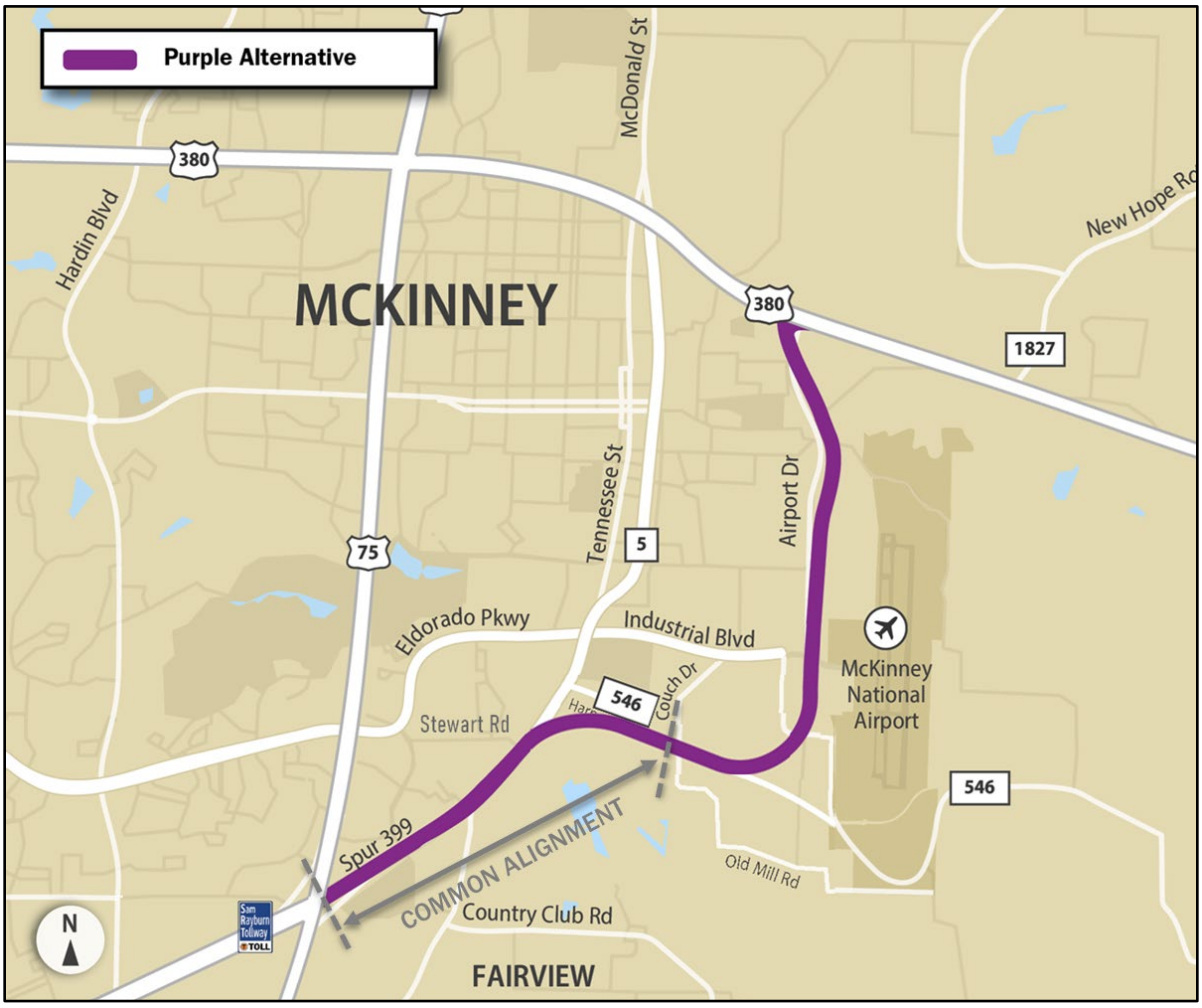
2.2.2.2 Proposed Facility – Purple Alternative

The Purple Alternative (**Figure 2-5**) would modify the SH 5 improvements proposed that would widen SH 5 to 6-lanes. The Purple Alternative would restripe the extended shoulders/additional lane width constructed under the SH 5 Improvement Project to add a fifth 12-foot-wide mainlane in each direction along SH 5 from US 75 to just past Stewart Road where the Purple Alternative turns east on new location to parallel FM 546/Harry McKillop Boulevard.

An additional eastbound fifth mainlane would be striped west of Medical Center Drive, and east of Medical Center Drive the SH 5 frontage road would be removed and replaced with a new frontage road and mainlane entrance ramp, including a direct right-turn to access southbound SH 5, and an access to northbound SH 5. These improvements would accommodate traffic merge movements and the changes in travel speeds of traffic moving between SH 5 and the Spur 399 Extension. These improvements would be built within the existing SH 5 ROW. See **Appendix B** for the Geometric Schematic Design-January 2022.

Most of the Purple Alternative would be constructed on new location beginning where the alignment leaves the existing SH 5 corridor near Stewart Road approximately 1,500 feet south of the FM 546/Harry McKillop Boulevard intersection with SH 5. The new location alignment would be south of and roughly parallel to FM 546/Harry McKillop Boulevard to approximately 500 feet west of Couch Drive where it turns north crossing FM 546/Harry McKillop Boulevard to follow the general alignment of existing Airport Drive, and continues north to connect to US 380 west of the Airport. After crossing Wilson Creek, the roadway section roughly parallels FM 546/Harry McKillop Boulevard to a new interchange at Industrial Boulevard. Only the mainlanes (no frontage roads or SUPs) would be constructed through this section with FM 546/Harry McKillop Boulevard serving as the frontage road. The freeway alignment is severely restricted between SH 5 and Airport Drive due to the presence of FM 546/Harry McKillop Boulevard, the NTMWD/McKinney Landfill to the south, and a combined utility corridor identified by the City of McKinney, Collin County, and the NTMWD for the future

Figure 2-5: Purple Alternative



extension of major water utilities. This section of the Spur 399 Extension would be built on an elevated structure consisting of four 12-foot-wide travel lanes in each direction, with 10-foot-wide to 28-foot-wide outside shoulders and 15-foot-wide to 28-foot-wide inside shoulders separated by a center concrete barrier. The ROW width through this section would be approximately 180 to 200 feet, with no frontage roads or SUPs.

From Industrial Boulevard to US 380, the freeway would roughly follow the alignment of Airport Drive. Airport Drive would be replaced by the elevated 8-lane divided freeway section. The elevated freeway would be supported in some places by earthen fill and retaining walls and in other areas bridges would support the freeway mainlanes to allow local streets (Industrial Boulevard and Elm Street) to pass under the freeway and connect to the frontage roads on both sides of the freeway. The freeway would have four 12-foot-wide travel lanes in each direction, 10-foot-wide outside shoulders, and be separated by 15-foot-wide inside shoulders in each direction and a concrete center barrier. The 2-lane to 3-lane frontage roads (each lane 11-feet-wide) would be built at-grade to allow driveways to tie-in from adjacent industrial properties and to connect to Enloe Road and Greenville Road to maintain access to the neighborhoods west of Airport Drive. A 10-foot-wide SUP would be built along the outside of each frontage road. The proposed ROW from Industrial Boulevard to US 380

varies in width from approximately 200 feet to 497 feet. An at-grade, signalized intersection would terminate the Spur 399 Extension at US 380. See **Appendix B** for the Geometric Schematic Design-January 2022.

2.2.2.3 Logical Termini and Independent Utility – Purple Alternative

Federal regulations require that federally funded transportation projects have logical termini.[7] Simply stated, this means that a project must have rational beginning and ending points. Those beginning and ending points may not be created simply to avoid proper analysis of environmental impacts.

The logical termini for the Spur 399 Extension are US 75 on the south and US 380 on the north. These major highways were selected because they are the primary collectors of traffic generated by the growing population within the Study Area. As indicated in **Chapter 1.0**, the existing Spur 399, an approximately one-mile-long roadway, serves to transition traffic from US 75/SRT-SH 121 to SH 5 with US 75 and SH 5 serving as the primary north-south travel corridors connecting the Study Area to the rest of the Dallas Metroplex. US 380 is the primary collector of traffic coming from the northern and eastern parts of Collin County and feeds traffic to Airport Drive, SH 5, and US 75 in the Study Area, and the DNT and other routes west of the Study Area, as travelers make their way to employment, education, health care, and commerce destinations in the Dallas Metroplex core (see **Chapter 1.0**).

Federal regulations require a project to have independent utility and be a reasonable expenditure even if no other transportation improvements are made in the area.[8] This means a project must be able to provide benefit by itself, and that the project not compel further expenditures to make the project useful. Stated another way, a project must be able to satisfy its purpose and need with no other projects being built.

The proposed extension of Spur 399 would provide the system linkage, connectivity, and capacity needed to serve existing and forecasted travel demand from northern and eastern Collin County to the Dallas Metroplex as identified in **Chapter 1.0** independent of any other roadways being constructed in the Study Area. Because the Spur 399 Extension-Purple Alternative would operate as a standalone facility, it cannot and does not irretrievably commit federal funds for other future transportation projects.

Federal law prohibits a project from restricting consideration of alternatives for other reasonably foreseeable transportation improvements.[9] This means that a project must not dictate or restrict any future roadway alternatives. The Spur 399 Extension-Purple Alternative has been planned and designed to function independent of any other improvements. It would provide a complete and functional connection between US 75/SRT-SH 121 and US 380 to address the connectivity and mobility needs identified without any additional improvements.

2.2.2.4 Planning Consistency – Purple Alternative

The proposed Spur 399 Extension is included in the NCTCOG's *Mobility 2045 Update* and the 2023–2026 Transportation Improvement Program (TIP) approved by the Regional Transportation Council (RTC), the independent transportation policy body of NCTCOG, on June 9, 2022. With approval of the *Mobility 2045*

7 23 CFR § 771.111(f)(1)

8 23 CFR § 771.111(f)(2)

9 23 CFR § 771.111(f)(3)

Update and the TIP, the project is consistent with both plans. The Statewide Transportation Improvement Program (STIP) will be updated in November 2022, with TxDOT anticipating Federal Transit Administration (FTA)/Federal Highway Administration (FHWA) approvals shortly thereafter, making the project consistent with the STIP.

2.2.3 Description of the Orange Alternative

The Orange Alternative (**Figure 2-6**) would extend existing Spur 399 from its current terminus near the junction of US 75/SRT-SH 121 and along the same common alignment with SH 5 as the Purple Alternative to a point south of FM 546/Harry McKillop Boulevard where it turns east on new location. After crossing Airport Drive/Old Mill Road, the alignment travels farther east and south around the southern end of the Airport, then turning north to connect to US 380 east of the Airport, a distance of approximately 6.25 miles.

2.2.3.1 Existing Facility – Orange Alternative

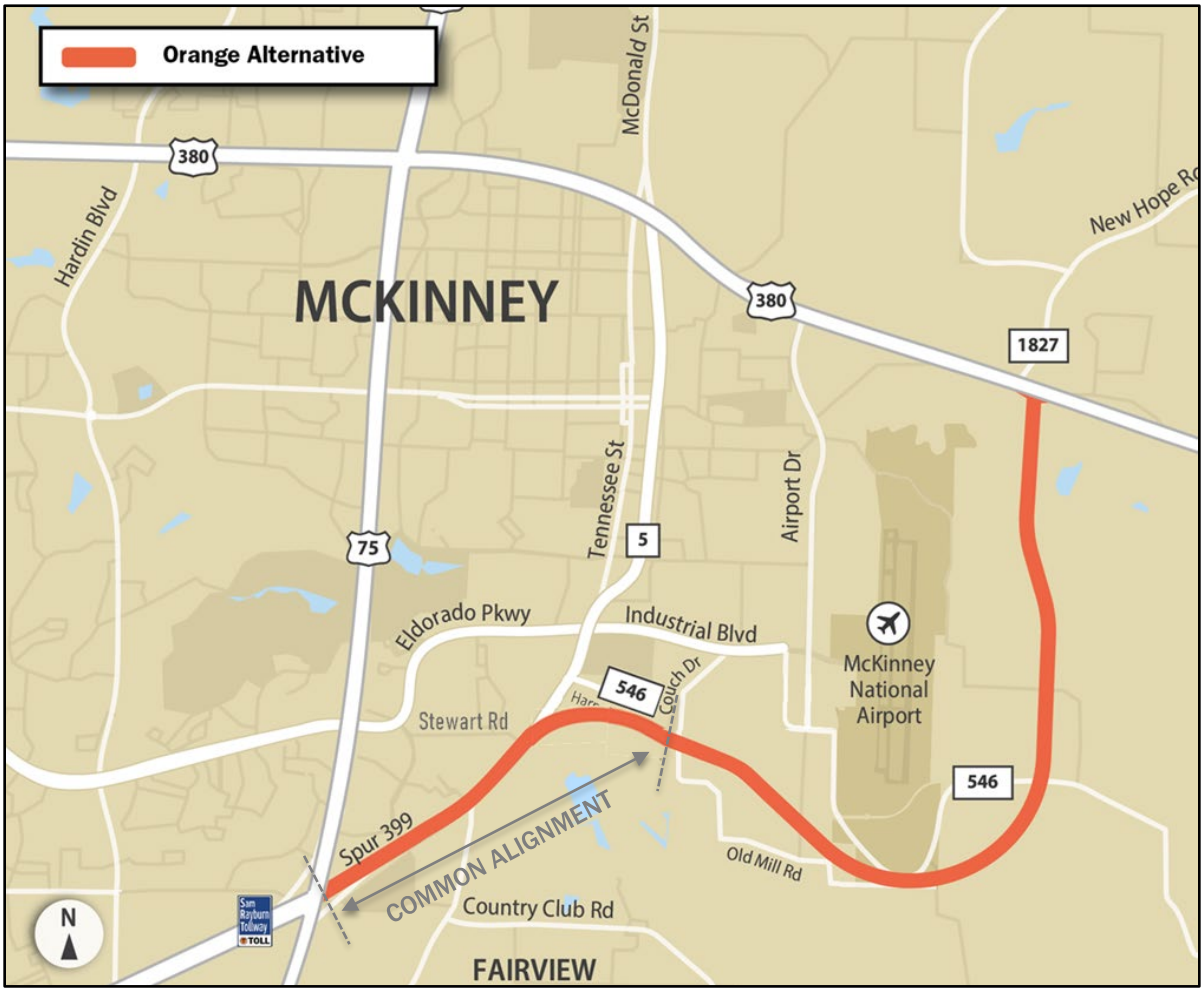
The Orange Alternative includes the same portion of existing SH 5 from its intersection with Spur 399 to near Stewart Road as the Purple Alternative. In 2022, SH 5 from the intersection with existing Spur 399 to FM 546/Harry McKillop Boulevard (Old Mill Road), north of Stewart Road, is a 4-lane divided rural highway with a variable-width curbed median and right- and left-turn lanes at at-grade intersections and driveways. The at-grade intersection at FM 546/Harry McKillop Boulevard is signalized, while all other intersections are non-signal controlled. Inside shoulders vary from non-existent to four-feet in width with 10-foot-wide outside shoulders consistent throughout the section. The pavement width including intermittent turn lanes both northbound and southbound is 27 feet. The existing ROW width varies from 150 feet to 320 feet. The section contains a bridged crossing of Wilson Creek.

The SH 5 Improvement Project cleared for this section in 2020 and anticipated to be under construction before the Spur 399 Extension, would reconstruct the 4-lane divided roadway within the SH 5 portion of the Common Alignment to a 6-lane divided urban roadway with a 17-foot-wide curbed median transitioning to a narrow median with a center concrete barrier. From existing Spur 399 to SH 5, an extended shoulder/additional lane width (unstriped) to accommodate future capacity would be provided along the outside of the mainlanes and 15-foot-wide shoulders would be provided to the inside. Frontage roads and ramps would be constructed along existing Spur 399/SH 5 from US 75 to the crossing of Wilson Creek. The mainlanes would transition from 11-feet-wide to 12-feet-wide after the Wilson Creek crossing. The two existing bridges over Wilson Creek would be replaced with two wider bridges carrying three mainlanes in each direction with extended shoulders/additional lane width (unstriped) on the outside to accommodate future lane capacity. The intersection at Stewart Road would be grade-separated with no traffic signals installed on the frontage road. The improvements would be accomplished primarily within existing ROW with minor new ROW acquisition in areas around Steward Road and various property corner clips along the corridor.

2.2.3.2 Proposed Facility – Orange Alternative

The Orange Alternative (**Figure 2-6**) would modify the proposed improvements that would widen SH 5 to 6-lanes in the same manner as the Purple Alternative. The Orange Alternative would restripe the extended shoulders/additional lane width constructed under the SH 5 Improvement Project to add a fifth 12-foot-wide mainlane in each direction along SH 5 from US 75 to just past Stewart Road where the Orange Alternative

Figure 2-6: Orange Alternative



turns east on new location to parallel FM 546/Harry McKillop Boulevard. An additional eastbound fifth mainlane would be striped west of Medical Center Drive, and east of Medical Center Drive the existing SH 5 frontage road would be removed and replaced with a new frontage road and mainlane entrance ramp, providing a right-turn to access southbound SH 5, and access to northbound SH 5. These improvements would accommodate traffic merge movements and the changes in travel speeds of traffic moving between SH 5 and the Spur 399 Extension. These improvements would be built within the existing SH 5 ROW. See **Appendix B** for the Geometric Schematic Design-January 2022.

The majority of the Orange Alternative would be constructed on new location beginning where the alignment leaves the existing SH 5 corridor near Stewart Road approximately 1,500 feet south of the FM 546/Harry McKillop Boulevard intersection with SH 5. This section of the alignment would be south of and roughly parallel to FM 546/Harry McKillop Boulevard to approximately 500 feet west of Couch Drive where it continues in a southeasterly direction to curve around the south end of the Airport adjacent to FM 546 (the 'Harry McKillop Boulevard' name is dropped east of Airport Drive), then turning north near the intersection of FM 546 and CR 317 to extend to US 380 east of the Airport. Only the mainlanes, four 12-foot-wide travel lanes in each direction, with 10-foot-wide to 28-foot-wide outside shoulders and 15-foot-wide to 28-foot-wide inside shoulders separated by a center concrete barrier, would be constructed through the section on an elevated

structure from SH 5 past Couch Drive. No frontage roads or SUPs would be constructed between SH 5 and Couch Drive. The freeway alignment is severely restricted between SH 5 and Airport Drive due to the presence of FM 546/Harry McKillop Boulevard, the NTMWD/McKinney Landfill to the south, and a combined utility corridor identified by the City of McKinney, Collin County, and the NTMWD for the future extension of major water utilities. The ROW width through this section would be approximately 180 to 200 feet wide.

From east of Couch Drive through the alignment around the Airport and connecting to US 380, the freeway would include mainlanes, four 12-foot-wide travel lanes in each direction with 10-foot-wide outside shoulders and 15-foot-wide inside shoulders separated by a center concrete barrier; and 2-lane to 3-lane frontage roads with 2-foot-wide inside shoulders and 10-foot wide SUPs on the outside. From Couch Drive to just north of CR 722/Enloe Road, the freeway would be built on sloped earthen fill with grade-separated interchanges at Airport Drive and FM 546, CR 317, and FM 546 to allow the cross-roads to pass under the freeway and connect to the frontage roads. From approximately 600 feet north of CR 722/Enloe Road to the intersection with US 380, the freeway section including frontage roads would be built on elevated structure to minimize impacts to the floodplain/floodway associated with the East Fork Trinity River, its tributaries and associated wetlands, McKinney Future Parkland south of US 380, and to maintain equipment and livestock access for an agricultural property split by the freeway. Through both of these areas four 12-foot-wide travel lanes in each direction, with 10-foot-wide outside shoulders and 15-foot-wide inside shoulders separated by a center concrete barrier would be built along the freeway mainlanes; and 2-lane frontage roads with 2-foot-wide inside shoulders and 10-foot wide SUPs would be provided. The frontage roads would connect to Country Lane, Old Mill Road, FM 546, CR 317, and CR 722/Enloe Road. A U-turn under the freeway mainlanes would be provided approximately halfway between CR 722/Enloe Road and US 380 in an area outside of the mapped floodplain. An at-grade, signalized intersection would terminate the Spur 399 Extension at US 380. The ROW width needed from CR 317 to US 380 averages 400 feet. See **Appendix B** for the Geometric Schematic Design-January 2022.

2.2.3.3 Logical Termini and Independent Utility – Orange Alternative

Federal regulations require that federally funded transportation projects have logical termini. Simply stated, this means that a project must have rational beginning and end points. Those end points may not be created simply to avoid proper analysis of environmental impacts.

The logical termini for the Spur 399 Extension are US 75 on the south and US 380 on the north. These major highways were selected because they are the primary collectors of traffic generated by the growing population within the Study Area. As indicated in **Chapter 1.0**, the existing Spur 399, an approximately one-mile-long roadway, serves to transition traffic from US 75/SRT-SH 121 to SH 5, with US 75 and SH 5 serving as the primary north-south travel corridors connecting the Study Area to the rest of the Dallas Metroplex. US 380 is the primary collector of traffic coming from the northern and eastern parts of Collin County and feeds traffic to Airport Drive, SH 5, and US 75 in the Study Area, and the DNT and other routes west of the Study Area, as travelers make their way to employment, education, health care, and commerce destinations in the Dallas Metroplex core (see **Chapter 1.0**).

Federal regulations require that a project have independent utility and be a reasonable expenditure even if no other transportation improvements are made in the area. This means a project must be able to provide benefit

by itself, and that the project would not compel further expenditures to make the project useful. Stated another way, a project must be able to satisfy its purpose and need with no other projects being built.

The proposed extension of Spur 399 would provide the system linkage, connectivity, and capacity needed to serve existing and forecasted travel demand from northern and eastern Collin County to the Dallas Metroplex core as identified in **Chapter 1.0** independent of any other roadways being constructed in the Study Area. Because the Spur 399 Extension–Orange Alternative would operate as a standalone facility, it cannot and does not irretrievably commit federal funds for other future transportation projects.

Federal law prohibits a project from restricting consideration of alternatives for other reasonably foreseeable transportation improvements. This means that a project must not dictate or restrict any future roadway alternatives. The Spur 399 Extension-Orange Alternative has been planned and designed to function independent of any other improvements. It would provide a complete and functional connection between US 75/SRT-SH 121 and US 380 that would address the connectivity and mobility needs identified without any additional improvements.

2.2.3.4 Planning Consistency – Orange Alternative

The proposed Spur 399 Extension included in the NCTCOG's *Mobility 2045 Update* and the 2023–2026 TIP approved by RTC on June 9, 2022. With approval of the. With approval of the *Mobility 2045 Update* and the TIP, the project is consistent with both plans. The STIP will be updated in November 2022 with TxDOT anticipating FTA/FHWA approvals shortly thereafter, making the project consistent with the STIP.

2.3 Comparison of Reasonable Alternatives and the No-Build Alternative

2.3.1 Methodologies Presented During Agency and Public Scoping

The *Methodology and Level of Detail for Analyzing Alternatives* matrix was shared with agencies and the public during scoping activities conducted in December 2020, and February-March 2021, respectively. The matrix included general need statements, engineering criteria, and environmental criteria based on TxDOT guidance and recommended levels of analysis for the No-Build, Purple (Build), and Orange (Build) Alternatives. The initial *Methodology and Level of Detail for Analyzing Alternatives* matrix is shown in **Figure 2-7**. Comments received regarding the proposed evaluation criteria and methodologies are summarized as follows:

- Agency scoping comments included: request for USACE/Texas Commission on Environmental Quality (TCEQ) coordination, inquiry as to the level of Section 404 permitting/Section 401 water quality certification anticipated, fragmentation of riparian habitats and effect on aquatic species/habitats, incorporation of wildlife crossings into the design, request to span water crossings, and incorporation of dark-sky lighting practices. The summary of agency comments received is included in **Appendix F**.
- Public scoping comments included: air quality and TxDOT required analyses, traffic noise, Tribal coordination and environmental justice (EJ) assessments, displacements, a historic family farm, Airport (safety, drainage, emergency access), loss of habitat and impacts to wildlife species, and potential business disruptions and loss of jobs. The summary of public comments received is included in **Appendix F**.

Figure 2-7: Methodology and Level of Detail for Analyzing Alternatives Matrix Shared with Agencies and the Public During Scoping – Purpose & Need, Engineering, and Public Input

Screening/Evaluation Category		No Build Alternative	Purple Alternative	Orange Alternative
P&N	Improve Mobility and Connectivity - SW to NE	How well does the alternative satisfy the identified need?		
	Provide Capacity to Support Regional Growth			
Engineering	Total Alternative Length Along Centerline	miles		
	Major Utility Conflicts	number and length (feet) of crossings by utility type (large pipelines, major overhead electrical utilities, etc.)		
	Estimated Construction Cost (installed facility, ROW, utility relocations, etc.)	millions of dollars		
	Estimated Construction Cost per Mile (installed facility)	millions of dollars		
	Total Bridge Length	miles		
	Number of New Grade-Separated Interchanges	number		
	Airport Access and ROW	location/geometric changes in access, ROW required for roadway improvements		
	Airspace Considerations	acceptable roadway structure, sign, lighting heights that do not penetrate navigable airspace		
	Amount of New ROW Required	acres		
Public Input	Input/Comments/Feedback/Acceptance	level of support, general sentiment, specific concerns		

Source: Spur 399 Extension Agency Scoping Packets, December 2020.

Figure 2-7 continued: Methodology and Level of Detail for Analyzing Alternatives Matrix Shared with Agencies and the Public During Scoping – Environmental Resources

	Screening/Evaluation Category	No Build Alternative	Purple Alternative	Orange Alternative
Environmental Resources	Residential Displacements	number within project footprint, identify if minority/low-income		
	Business Displacements	number within project footprint, identify if minority-owned		
	Land Use	acres within footprint by land use category, effects on developable land, creation of uneconomical remnants, conformance with published plans, etc.		
	Farmland Impacts	acres of prime and statewide important farmland within footprint potentially converted to non-agricultural use		
	Farmland Impacts (separation of farmland from homestead)	number and location of properties, type of separation (main facility, supporting roadway network improvements)		
	Community Demographics and Services (EJ, LEP, Title VI)	minority, low-income, disabled, elderly populations within footprint, type and magnitude of effects - displacements (see above), community cohesion, accessibility to community facilities (see below), bicycle/pedestrian issues, emergency services access/travel time		
	Community Facilities (schools, places of worship, libraries, etc.)	number, type, ownership, population served		
	Visual/Aesthetic Impacts	changes in visual character, sight lines (grade separations), signage, lighting; effects on important views/viewsheds in the project area		
	Archeological Sites and Cemeteries	number and proximity of properties to the footprint (cemeteries, recorded sites, high probability areas)		
	Historic Properties	number and proximity of properties to the footprint (NRHP-listed and NRHP-eligible properties)		
	Protected Lands (Section 4(f), Section 6(f), Chapter 26 properties)	number, ownership, funding, public accessibility, acres within footprint		
	Waters of the US - Wetlands	acres within footprint by type (emergent, scrub-shrub, forested) and jurisdictional status		
	Waters of the US - Streams and Rivers	number of crossings and linear feet within footprint by type (ephemeral, intermittent, perennial) and jurisdictional status		
	Section 303(d) Waters	proximity of impaired assessment unit (within 5 linear miles of water, watershed, or drains to)		
	Floodplains (100-year) and Floodways	acres of each within footprint, longitudinal or perpendicular crossing		
	Impacts to Vegetation/Habitat	acres within footprint by type (riparian forest, upland forest, meadow/pasture/old field, etc.) by EMST classification/field verification		
	Impacts to Wildlife	species and habitat affected, habitat fragmentation, movement corridors		
	Threatened, Endangered, or Candidate Species	species, Federal/State status, potential effects		
	State Species of Greatest Conservation Need (SGCN)	species, potential effects		
	Air Quality	do anticipated emissions from future predicted traffic volumes necessitate the need for a conformity analysis, CO analysis, MSAT, or CMP?		
	Hazardous Materials	number of potential regulated materials sites and level of risk (low, moderate, high) and proximity to footprint		
	Traffic Noise	location and number of sensitive noise receivers that experience an increase in traffic noise levels that approach or exceed the FHWA NAC or that will substantially exceed existing noise levels		
	Induced Growth	location and number of parcels within a defined area of influence (AOI) that may be subject to development/redevelopment induced by the proposed project		
	Reasonably Foreseeable/Cumulative Effects	reasonably foreseeable effects of this project in combination with other related actions within the project area		

Source: Spur 399 Extension Agency Scoping Packets, January 2021

2.3.2 Comparison of Reasonable Alternatives

The matrix shared during scoping (**Figure 2-7**) was adapted to reflect the results of the ongoing study of the reasonable alternatives and presented at the October 21, 2021, public meeting (in-person and virtual). Data in relevant categories were presented to compare the potential impacts of the alternatives based on the developing Geometric Schematic Design (see **Appendix B**). Some environmental categories were combined, some quantitative data were provided, and results for other categories still under review were presented in a qualitative form.

The following effects of the Reasonable Alternatives are provided to supplement the information provided in the Alternatives Comparison Matrix (**Figure 2-8**).

- ***Improve Mobility and Connectivity*** – Both Build Alternatives improve mobility over the No-Build Alternative by providing additional capacity that addresses congestion, improves LOS (the ease at which the traffic stream flows), and reduces travel times. Both Build Alternatives also improve connectivity by linking US 75 and US 380 and the growing populations north and east of McKinney with the employment, education, health care, and commerce centers within the center of the Dallas Metroplex. Because the Orange Alternative is on the east side of the Airport, it provides better connectivity than the Purple Alternative to areas of rapid growth and that lack arterial roadway connectivity in Collin County.
- ***Support System Redundancy and Resiliency*** – An additional benefit of the Orange Alternative is the system redundancy/resiliency gained by leaving Airport Drive in place. Airport Drive can function as a reliever or emergency access route when incidents occur or construction activities clog SH 5 or US 75, while allowing the Orange Alternative to operate at near free-flow conditions. The Purple Alternative would replace Airport Drive with a freeway, removing the existing roadway and the system redundancy it could provide.
- ***Displacements*** – The Purple Alternative would potentially displace an Amazon Delivery Station Distribution Warehouse opened in 2021 on Airport Drive adjacent to the Airport. Other businesses along Airport Drive have indicated the changes in access brought about by developing a freeway along Airport Drive could negatively affect their access, ability to expand their facilities, and could force them to relocate away from McKinney. The Purple Alternative would displace no residences. The Orange Alternative would potentially displace two businesses – the McKinney Airport Center, a two-building complex opened in 2021, and Don's Plumbing, a single proprietorship located near FM 546 and Almeta Lane southeast of the Airport. The Orange Alternative also passes through a parcel owned by a business on Airport Drive where they are considering building a new facility. The Orange Alternative would also potentially displace seven residences – one single family home, and the other displacements are single parcels with three single-family dwellings on each, one is on the same parcel as Don's Plumbing.
- ***Compatibility With McKinney National Airport Expansion*** – Although the alignment follows the southern edge of the Airport, the Orange Alternative would accommodate the proposed Runway 18-36 extension and the future airfield and terminal area improvements planned on the east side

of the Airport. Access to the east airfield improvements could be provided from the Orange Alternative while the existing access points along Airport Drive are maintained.

- ***NTMWD/McKinney Landfill Permitted Boundary Change*** – The Common Alignment for both Build Alternatives passes through a constrained area east of SH 5 and south of and parallel to FM 546/Harry McKillop Boulevard bounded by the landfill on the south. A number of underground utilities, existing and planned, are between FM 546/Harry McKillop Boulevard and the Common Alignment that also need to be accommodated. The Common Alignment extends over a portion of the landfill within its permitted boundary that requires drainage improvements, groundwater monitoring wells, a gas flare, and other improvements to be moved. The landfill's northern permitted boundary would need to be relocated south of the Common Alignment through the TCEQ permitting process that could take 2 to 4 years to complete including the relocation of the landfill's supporting infrastructure and other utilities. The landfill boundary was modified in 2016 with the extension/construction of FM 546/Harry McKillop Boulevard to SH 5.
- ***Relocation of Major Utilities*** – In addition to the relocation of underground utilities in the area of the landfill affecting both Build Alternatives, the Purple Alternative would cause the relocation of a 20-inch natural gas pipeline and several components of the NTMWD's water and wastewater treatment system located along the Airport Drive corridor -– the North McKinney Lift Station, North McKinney Phase III 72-inch water pipeline, and Wilson Creek Transfer Force Mains – in addition to another lift station and five miles of 42-inch force main to begin construction in 2022-2023. The estimated cost to relocate the in-place components is approximately $191M. The Orange Alternative would also require some of the same utility relocations along FM 546/Harry McKillop Boulevard east of SH 5 including four crossings of a 20-inch natural gas pipeline, but would avoid relocating the NTMWD utilities along Airport Drive affected by the Purple Alternative.
- ***Park and Public Land Impacts*** – The Common Alignment crosses over part of the Wilson Creek Greenbelt owned by the City of McKinney. The property is open to the public (protected under Section 4(f) and Chapter 26) and has trails and seating areas. The freeway would be built on an elevated structure over the park. The Purple Alternative would also take land from the Trinity River Greenway, an undeveloped park parcel owned by the City of McKinney, and protected under Section 4(f). The Orange Alternative would also take land from the McKinney Future Parkland located between the East Fork Trinity River and US 380. Although owned by the City of McKinney, the McKinney Future Parkland property was conveyed to the city with a Blanket Easement to accommodate a transportation corridor connecting to US 380. With the easement in place covering the transportation use, Section 4(f) does not apply to the use of land from the McKinney Future Parkland parcel. The Orange Alternative takes minimal ROW from the Fairview Nature Preserve and Fairview Soccer Park, both owned by the Town of Fairview. The nature preserve is fenced, gated, and closed to the public. The soccer park is leased to a private club that restricts entry to only during events and practices. For these reasons, neither Fairview property is considered open for public use and are not protected under Section 4(f) or Chapter 26.
- ***Water Features –*** Both Build Alternatives result in unavoidable impacts to floodplains and associated stream and wetland features because of the general northwest to southeast flow of

the major streams (Wilson Creek and the East Fork Trinity River) and the general north-south and east-west orientation of the roadways that serve as the logical termini (US 75 and US 380). Because of its greater length and closer proximity/lower in the watershed, the Orange Alternative results in greater stream and wetland impacts than the Purple Alternative. The layout of bridge piers/bents and the use of elevated structures in lieu of embankment fill to avoid and minimize impacts has been and will continue to be considered. Based on the Geometric Schematic Design submitted in January 2022, the crossings identified for both alternatives would meet the terms and conditions of Nationwide Permit (NWP) 14 with a Pre-Construction Notification (PCN). The crossing of the Orange Alternative over the East Fork Trinity River floodplain requires the placement of approximately 1,800 to 2,000 cubic feet of fill material (piers) below the 100-year floodplain water surface elevation. Storage to offset this increase can be provided by excavating shallow ditches or swales within the floodplain located within the proposed ROW.

- ***Traffic Noise*** – A noise barrier previously modeled and approved as part of the SH 5 Improvement Project (part of the No-Build Alternative) along the Common Alignment would provide the necessary traffic noise abatement for 14 receptors anticipated from the Spur 399 Extension improvements at that location. A second barrier in the same area is warranted to abate traffic noise for 12 additional receptors with implementation of either Build Alternative. Other barrier locations were modeled but do not meet the feasible or reasonableness criteria and would not be implemented as part of the project.

The Alternatives Comparison Matrix (**Figure 2-8**) summarizes the analysis of quantifiable data under each performance measure and criterion identified to compare the Purple, Orange, and No-Build Alternatives.

Figure 2-8: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
PURPOSE AND NEED					
Improve Mobility and Connectivity	Proposed roadway to operate at an acceptable or better LOS in 2050 (acceptable >LOS D)	LOS using a scale of A to F. Derived from Highway Capacity Software using TxDOT-approved traffic projections based on the NCTCOG Travel Demand Model, historical roadway volumes, and census data.	Primarily LOS A & B, with a minimum LOS C	Primarily LOS A & B, with a minimum LOS C	In 2050, existing US 380, US 75, and SH 5 would operate at LOS D/E/F at various locations along each roadway.
	Improve regional mobility	Measured by total hours of congestion relief per day experienced by Collin County drivers in 2045 (NCTCOG planning year). Derived from the NCTCOG Travel Demand Model.	Reduces total delay (caused by congestion) experienced by Collin County drivers by 13,532 hours per day.	Reduces total delay (caused by congestion) experienced by Collin County drivers by 13,532 hours per day.	Does not reduce delay (caused by congestion) experienced by Collin County drivers.
	Enhance connectivity between northern and eastern Collin County and the core of the Dallas Metroplex (see **Figure 1-1**)	Proximity of the proposed Spur 399 Extension (Ext.) to areas of high-growth and where the existing arterial roadway network is not sufficient to support current and future travel demand; connects "arterial needs areas" identified as "low, medium, or high" in *Mobility 2045 Update*.	Provides an arterial connection between areas of high-growth and "low and medium" arterial needs with the Dallas Metroplex.	Provides an arterial connection between areas of high-growth and "low, medium, and high" arterial needs with the Dallas Metroplex.	Would not provide an arterial connection between Collin County areas of high-growth and arterial needs and the Dallas Metroplex.
	Support system redundancy and expand transportation network options to enhance vehicle volume throughput by 2050	In 2050 the vehicles per day (vpd) that could be carried along the proposed Spur 399 Ext. Derived from TxDOT-approved traffic projections.	76.900 vpd (along Spur 399 Ext. only)	72,900 vpd (along Spur 399 Ext. only)	No additional vehicles because Spur 399 Ext. would not exist.
		In 2050 the vpd that could be carried along the proposed Spur 399 Ext. and other major north-south roadways in close proximity. Derived from TxDOT-approved traffic projections.	133,300 vpd (along Spur 399 Ext., SH 5)	137,600 vpd (along Spur 399 Ext., Airport Dr., SH 5)	81,806 vehicles per day (along SH 5 and Airport Dr.)
	Ability to provide additional north-south roadway capacity beyond 2050	Maximum roadway capacity (vpd) along major north-south roadways in close proximity to the Study Area (SH 5, Airport Dr., proposed Spur 399 Ext.). Derived from FHWA's Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System.	Maximum of 206,100 vpd (along Spur 399 Ext. and SH 5)	Maximum of 243,200 vpd (along Spur 399 Ext., SH 5, and Airport Dr.)	Maximum of 93,100 vpd (along SH 5 and Airport Dr.)
Does the Alternative meet the stated Purpose and Need? Yes or No			Yes	Yes	No

Figure 2-8 continued: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
	PROPERTY AND COMMUNITY IMPACTS				
Potential Property Impacts	Minimize residential displacements	Number of potential single family residential displacements.	0	7 (2 clusters of 3 houses on same tract, 1 house associated with a displaced business)	No residences would be displaced.
	Minimize business displacements	Number of potential business displacements – primary building within the proposed ROW.	1 Amazon Delivery Station Distribution Warehouse	2 McKinney Airport Center Doc's Plumbing	No businesses would be displaced.
		Number of other businesses potentially impacted due to the proximity of the freeway facility to the property, changes/restrictions in access, owner-perceived restrictions to future expansion or operational plans[10]	3 Encore Wire Simpson Strong Tie Blue Mountain Equipment	1 Simpson Strong Tie	Would not affect future business expansion or operations.
	Minimize ancillary building displacements.	Number of other structures potentially displaced that are not considered primary residences or businesses (e.g., garages, outbuildings, sheds, etc.)	2 (barn and silo)	7 (barns and outbuildings)	No ancillary buildings would be displaced.
	Impact on Economic Development Potential	Considers the change in potential land use and approximate value based on an increase or reduction of acres in areas of planned development	Changes in land use are unlikely as most of the Study Area is developed or planned for development. Proposed ROW would be acquired from areas under active development (based on data from McKinney's Planning and Zoning Commission), including land owned by Encore Wire (under construction to accommodate facility expansion), and would reduce parcel values and associated property tax generated due to the reduction in the remaining acreage/parcels available for development.	Changes in land use north of FM 546 and east of the Airport are likely in response to access provided by the freeway. Undeveloped, open agricultural lands, and scattered residential tracts would likely be attractive to developers desiring freeway access and proximity to the Airport and other commercial and industrial uses. Development would be limited within the East Fork Trinity River Floodplain.	Limited economic growth and development potential would continue to occur without construction of a freeway.

[10] Appendix K – *Community Impacts Assessment Technical Report Form*, Appendix B - Detailed Economic Analysis – Supplemental Information

Figure 2-8 continued: Alternatives Comparison Matrrx

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
PROPERTY AND COMMUNITY EFFECTS continued					
Low-Income and Minority Populations	Minimize impacts to Low-Income and Minority Communities (Environmental Justice).	Are there EJ communities that will suffer disproportionately high or adverse impacts – yes or no?	No. The Lively Hill/La Loma and Central/Mouzon neighborhoods west of Airport Drive would not be directly affected, but would be separated from 2 parks north of the Airport by this alternative.	No. One of the clusters of 3 single-family homes that would be potentially displaced is within a minority census block. This alternative would not affect the Lively Hill/La Loma or Central/Mouzon neighborhoods.	Yes. Drivers avoiding congestion and traffic incidents along SH 5 and US 75 and seeking a faster route from US 380 to destinations south of McKinney cut-through the Lively Hill/La Loma and Central/Mouzon neighborhoods west of Airport Drive.
Community Facilities	Minimize impacts to community facilities.	Number of community facilities impacted or separated from neighborhoods served.	2 Trinity River Greenway McKinney Future Parkland	1 Fairview Soccer Park	No ROW would be acquired from community facilities.
Protected Lands	Avoid/minimize impacts to Section 4(f), Section 6(f), and Chapter 26 (Ch. 26) protected lands.	Number and type of protected lands and the anticipated level of impact.	2 Wilson Creek Greenbelt, (*de minimis* 4(f) / Ch. 26) Trinity River Greenway (*de minimis* 4(f))	1 Wilson Creek Greenbelt (*de minimis* 4(f) / Ch. 26), McKinney Future Parkland exempt w/transportation easement	No ROW would be acquired from Section 4(f), Section 6(f), or Ch. 26 protected lands.
Hazardous Material Sites	Avoid/minimize risks from hazardous material sites.	Number of sites of moderate or high risk within or adjacent to the proposed ROW.	4 (3 moderate, 1 high – NTMWD/McKinney Landfill)	5 (4 moderate, 1 high – NTMWD/McKinney Landfill)	No sites of moderate or high risk would be affected.
Farmland	Minimize impacts to prime and statewide important farmland.	Acres of prime and statewide important farmland in the proposed ROW; percent of the affected farmland in an Urbanized Area.	166.9 acres Prime/Statewide Important 60% in Urbanized Area	165.7 acres Prime/Statewide Important 47% in Urbanized Area	No conversion of prime or statewide important farmland would occur.

Figure 2-8 continued: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
PROPERTY AND COMMUNITY EFFECTS continued					
Induced Growth	Induced growth	Would the action induce growth – yes or no? What general types of growth?	No. Redevelopment potential along the Purple Alternative is low due to the size and location of the parcels along the alignment and the current ownership or lease status. Redevelopment to commercial or light industrial uses that desire both highway and Airport access would occur on vacant parcels and remnant parcels after acquisition (input from City of McKinney). Limited induced growth may continue to occur along US 380 and SH 5 as noted under the No-Build Alternative.	Yes. Land in agricultural use and not constrained by floodplains and other commitments south and east of the Airport would be targeted for light-industrial development (warehousing, distribution, intermodal freight facilities) where highway access and proximity to the Airport is desired; especially if the Airport completes the terminal expansion plans which are dependent on having an eastern access.	Yes. Capacity and access improvements along US 380/SH 5 (already cleared) may encourage limited commercial and industrial development and redevelopment along those existing roadways where vacant parcels are present, and utilities are or can be provided to support continued regional growth.
Traffic Noise	Minimize noise impacts on receptors.	Number of receptors that approach/exceed the respective Noise Abatement Criteria (NAC) under the build condition in 2050.	183	159	NA
		Number of receptors that have substantial increases in noise levels in 2050.	46	41	NA
		Number of locations where noise abatement is determined feasible and reasonable; and number of receivers benefitted.	1 – along SH 5 (Barrier 1) 12 benefitted receivers [Barrier 3, part of the No-Build SH 5 improvements would benefit an additional 14 receivers]	1 – along SH 5 (Barrier 1) 12 benefitted receivers [Barrier 3, part of the No-Build SH 5 improvements would benefit an additional 14 receivers]	Barrier 3, part of the SH 5 Improvements proposed to be completed as part of the No-Build Alternative, would benefit 14 receivers.

Figure 2-8 continued: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
PROPERTY AND COMMUNITY EFFECTS continued					
Air Quality	Evaluate air quality impacts.	Reduces Mobile Source Air Toxics (MSAT) as compared to current conditions – yes or no?	Yes, regardless of the alternative, MSAT are expected to decline significantly in the future due to federal regulations on vehicles, fuels, fleet turnover, and increased use of electric vehicles.		
		Do Design Year [2050] traffic volumes warrant a Carbon Monoxide (CO) Traffic Air Quality Analysis (TAQA)?	Yes, Design Year [2050] traffic forecasts for mainlanes and frontage roads combined exceed the 140,000 vpd threshold, therefore warranting a CO TAQA.		No-Build traffic volumes do not exceed 140,000 vpd.
		Is the project consistent with the regional conformity determination?	Regardless of the Build Alternative, the Preferred Alternative will be in a nonattainment area and will be evaluated for consistency with the regional emissions analysis in the MTP and the STIP by FHWA.		NA
		Is the project consistent with NCTCOG's project-level Congestion Management Process (CMP) coordination?	Regardless of the Build Alternative, the Preferred Alternative will be included in the NCTCOG's adopted CMP.		NA
Visual Impacts	Change in visual character of the Study Area.	Design features that potentially change the visual character of the Study Area, change sight lines, obstruct existing views, etc.	Grade-separations, elevated roadway sections, ramps, signage, and safety lighting would be most visible to the neighborhoods west of Airport Drive, changing the visual character of the industrial area. The elevated freeway would form a physical and visual barrier between the neighborhoods to the west and the Airport and parklands to the east.	Grade-separations, elevated roadway sections, ramps, signage, and safety lighting would be introduced east of the Airport, changing the rural character of the area. The elevated sections of the freeway would preclude views of the surrounding landscape from locations along the corridor.	No change would occur in the visual character of the Study Area.

Figure 2-8 continued: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
		CULTURAL RESOURCES			
Historic and Archeological Resources	Avoid/minimize impacts to NRHP-eligible historic resources	Number of NRHP-eligible historic resources affected by the alternative	0	0	NA
	Avoid/minimize impacts to recorded archeological sites	Number of NRHP-eligible archeological sites affected by the alternative	0	0	NA
	Avoid impacts to cemeteries	Number of cemeteries within or adjacent to proposed ROW	0	0	NA
	Avoid impacts to historic Section 4(f) properties	Number of protected historic properties and type of Section 4(f) use/documentation (temporary use, *de minimis*, Programmatic, or Individual)	0	0	NA
		NATURAL RESOURCES			
Water Resources	Minimize permanent impacts to Wetlands	Total area of jurisdictional wetlands within proposed ROW (acres)	0 acres	0 acres	No permanent fill would be placed within jurisdictional wetlands.
	Minimize permanent impacts to Rivers/ Streams	Total linear feet of jurisdictional features within proposed ROW (LF)	767 LF	2,997 LF	No permanent impacts to jurisdictional streams/rivers would occur.
	Minimize impacts to 100-year floodplain areas	Area mapped 100-floodplain within proposed ROW (acres)	77.5 acres	86.9 acres	SH 5 and US 380 cross the Wilson Creek and East Fork Trinity River floodplains, respectively.
	Minimize impacts to regulatory floodway	Area mapped regulatory floodway within proposed ROW (acres)	37.4 acres	43.3 acres	SH 5 and US 380 cross the Wilson Creek and East Fork Trinity River regulatory floodways, respectively.
	Proximity to impaired waters (303(d))	Number of impaired waterway segments that cross the proposed ROW (number)	2	2	SH 5 and US 380 cross these same 2 impaired waterway segments.

Figure 2-8 continued: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
NATURAL RESOURCES continued					
Potential Vegetation and Habitat	Minimize forest habitat impacts.	Area of forest (riparian, upland) within proposed ROW (acres)	24.1 acres majority of corridor is developed	67.3 acres	No forested areas would be impacted.
	Minimize disturbed prairie/grassland habitat impacts.	Area of grassland (tallgrass prairie, grassland, disturbed prairie) within proposed ROW (acres)	9.1 acres	54.2 acres	No grassland areas would be impacted.
Protected Species	Minimize impacts to potential Black Rail (BLRA) and Whooping Crane (WHCR) stop-over habitats.	Presence and quality of stop-over habitats within proposed ROW	BLRA – "no effect"; habitat present, considered of marginal quality and only incidental/ephemeral use WHCR – "no effect"; habitat present, considered suitable but only incidental/ephemeral use	BLRA – "no effect"; habitat present, considered of marginal quality and only incidental/ephemeral use WHCR – "no effect"; habitat present, considered suitable but only incidental/ephemeral use	No new ROW would be disturbed affecting potential stop-over habitats.
	Minimize potential impacts to state-listed mussel species.	Number of perennial stream crossings within the proposed ROW (number)	3	4	SH 5 crosses Wilson Creek and US 380 crosses the East Fork Trinity River and several of its tributaries.
	Minimize potential impacts to SGCN bat species.	Number of wooded habitat crossings within the proposed ROW (number)	4	14	US 380 passes through wooded habitats associated with the East Fork Trinity River.

Figure 2-8 continued: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
ENGINEERING					
Provide a freeway facility meeting current design standards	Minimize project costs while also avoiding significant environmental impacts.	Total Length Along Centerline	4.8 miles	6.25 miles	NA
		Total length of bridges or elevated structures needed to clear water features, cross-roads, etc.	2.2 miles	2 miles	NA
		Number of new grade separated interchanges to maintain freeway design standards and provide access to local/regional roadway system.	2 new grade-separated interchanges	3 new grade-separated interchanges	NA
		Major Utility Conflicts (water mains, sanitary sewer/lift stations, etc.).	5 NTMWD North McKinney Lift Station, NTMWD North McKinney Phase III 72" water pipeline, NTMWD Wilson Creek Transfer Force Mains, NTMWD/McKinney Landfill Boundary Repermitting, Atmos 20" natural gas line, additional NTMWD improvements preparing for construction	2 NTMWD/McKinney Landfill Boundary Repermitting, Atmos 20" natural gas line (4 crossings)	No utilities require relocation.
		Acres of New ROW Anticipated.	Approx. 117.8 acres	Approx. 243.3 acres	No new ROW required.
	Avoid/Minimize Impacts to Airport	Maintain Airport access, minimize ROW needed from Airport-owned land, and avoid creating obstructions within safety areas and airspace.	Access provided from frontage roads along new freeway. Alignment outside of the RPZ, other safety areas, and runway approach/departure surfaces.	Access maintained to the Airport from Airport Drive; additional access may be provided from the east side of the Airport. Alignment outside of the RPZ, other safety areas, and runway approach/departure surfaces.	Access maintained to the Airport from Airport Drive.

Figure 2-8 continued: Alternatives Comparison Matrix

Performance Measure	Criterion	Evaluation Parameter and Units	PURPLE ALTERNATIVE	ORANGE ALTERNATIVE	NO-BUILD ALTERNATIVE
ENGINEERING					
Preliminary Project Costs	Manage project costs.	Estimated ROW Cost	$105 M +	$86 M +	Although no money would be spent building a new road, long-term costs would occur due to existing road maintenance, increased congestion and travel times/delay, and safety considerations as travel demand continues to increase along Airport Drive, US 380, SH 5, and US 75.
		Estimated Cost to Relocate and Accommodate Planned Utilities	$191 M +	$15 M +	
		Design and Construction Cost Estimate	$446 M =	$654 M =	
		TOTAL PROJECT COST	**$742 M**	**$755 M**	

2.4 Identification of Preferred Alternative

The Orange Alternative is recommended as the Preferred Alternative and has been developed to a higher level of detail than other reasonable alternatives to facilitate development of mitigation measures and concurrent compliance with other applicable laws, as provided for by 23 USC § 139(f)(4)(D). Development of such higher level of detail will not prevent TxDOT from making an impartial decision as to whether to accept another alternative.

The Orange Alternative as the Preferred Alternative for the Spur 399 Extension has been planned and designed to function independent of any other improvements. It would provide a complete and functional connection between US 75/SRT-SH 121 and US 380 that would address the connectivity and mobility needs identified without any additional improvements. The Orange Alternative would provide additional capacity to accommodate forecasted traffic volumes; and support regional mobility and connectivity between areas of high-growth in northern and eastern Collin County and the employment, education, health care, and commerce centers within the core of the Dallas Metroplex. It would also provide system redundancy and resiliency by leaving Airport Drive in place to function as a reliever or emergency access route when incidents occur or construction activities clog SH 5 or US 75, allowing the Orange Alternative to operate at near free-flow conditions. The Orange Alternative would not require relocation of several major utility improvements, many belonging to NTMWD, and the added costs, with the exception of relocation of the NTMWD/McKinney Landfill permitted boundary that would also be required under the Purple Alternative. The Orange Alternative would provide access to McKinney's expanding airport and support limited induced growth and development within an area designated for industrial and commercial uses and without displacing any of the existing businesses along Airport Drive. The Orange Alternative would potentially result in increased parcel values along the route because it provides access to areas that are currently undeveloped.

3.0 Affected Environment and Environmental Consequences

In support of this DEIS, the following technical documentation were prepared:

- Farmland Conversion Impact Rating For Corridor Type Projects (NRCS-CPA-106) and Supporting Documentation
- Community Impacts Assessment Form Technical Report
- Traffic Noise Analysis Technical Report

Cultural Resources:

- Archeological Background Study
- Antiquities Permit Application
- Archeological Survey Report
- Project Coordination Request for Historical Studies
- Historical Studies Research Design
- Historic Resources Survey Report
- Intensive Survey Report

Water Resources:

- Water Features Delineation Report
- Surface Water Analysis Form
- Section 404/10 Impact Table

Biological Resources:

- Species Analysis Spreadsheet, Species Analysis Form, and Supporting U.S. Fish and Wildlife Service (USFWS) and Texas Parks and Wildlife Department (TPWD) Species Lists
- TPWD Beneficial Management Practices Form
- TPWD EMST Analysis and Supporting Comparative Data
- Mussel and Woodland Bat Habitat Supporting Information

Air Quality:

- Transportation Conformity Report Form
- Congestion Management Process Disclosure Statement
- Quantitative Mobile Source Air Toxics (MSAT) Analysis
- Carbon Monoxide Traffic Air Quality Analysis (CO TAQA)

Hazardous Materials

- Hazardous Materials Initial Site Assessment and Hazardous Materials Impact Evaluation
- Hazardous Materials File Review and Letter Report

Copies of the appropriate technical documents are provided in **Appendices J through R**.

This chapter describes the direct impacts of the Purple and Orange Alternatives and the No-Build Alternative (described in **Section 2.2**) on the features and conditions within the proposed ROW needed to construct the alternatives and where direct impacts would occur; also referred to as the Project Area. To better understand the potential effects the project could have on related features and larger connected systems, the following areas were defined to describe the affected environment and determine potential project impacts:

- Study Area - The area encompassing the alternatives under consideration generally bounded by US 380 on the north, Big Branch and the East Fork Trinity River on the east, the Town of Fairview on the south, and US 75 on the west. It is used to describe the affected built and natural environment including the existing transportation network and natural ecosystems such as stream systems and watersheds.
- Environmental Footprint – An area associated with each Build Alternative that is slightly larger than the proposed ROW within which early desktop and field surveys were used to identify features that could be potentially affected by construction of the alternative. The Environmental Footprint provides room for alignment adjustments without requiring additional field surveys. As an example, **Section 3.10** includes descriptions of the water features (e.g., wetlands, streams, ponds, etc.) within the Environmental Footprint, while impacts are determined based on the Project Area.
- Project Area or Proposed ROW – The area defined on the Geometric Schematic Design plans needed to construct the alternative. It includes property that would be acquired by TxDOT in fee title and permanent and temporary easements needed for drainage and utilities. The proposed ROW is used to determine the direct impacts resulting from construction of each Build Alternative.

In addition to direct impacts such as clearing vegetation, placing fill material within wetlands, or displacing homes or businesses; TxDOT must consider the potential for the alternatives considered to potentially induce changes in land use and growth within the Study Area (see **Section 3.15**)**.** TxDOT must also consider the potential effects of each of the Build Alternatives (Purple and Orange) in combination or "cumulatively" with other past, present, and reasonably foreseeable actions within the Spur 399 Extension Study Area and a defined Area of Influence (see **Section 3.16**)**.** This chapter also addresses any adverse environmental impacts which cannot be avoided, the measures considered to minimize harm and to mitigate adverse effects, where applicable; and the steps taken during the study to comply with applicable state and federal environmental laws.

3.1 Right-of-Way/Displacements

Property acquisition required for the proposed improvements would be conducted by TxDOT in accordance with the Uniform Relocation and Real Property Acquisition Policies Act of 1970; 49 CFR Part 24, Subparts C through F; Title VIII of the Civil Rights Act of 1968 (Fair Housing Act); Housing and Community Development Act of 1974, and TxDOT policies and procedures. Relocation resources will be made available, without discrimination, to all affected property owners and tenants required to relocate as a result of implementation of the proposed project. No person will be displaced by the proposed project unless and until adequate replacement housing has been provided or is in place. Non-residential property owners, such as businesses, places of worship, and others will be provided information on adequate replacement locations for their current property and may be reimbursed for relocation costs based on TxDOT policies and procedures.

Direct displacements would result from the primary residence or business structure being located within the proposed ROW. At this time, no induced displacements (e.g., removal of access or reduction in parking, lot size, or substantial effects to the parcel that would negatively affect the viability of the business or livability of a residence) are anticipated.

Figure 3-1 summarizes the number of parcels to be acquired, total acres of ROW needed, and potential displacements resulting from the Purple and Orange Alternatives. The potential displacements are described in more detail in the following sections.

Figure 3-1: Comparison of Potential Displacements Resulting from the Purple and Orange Alternatives

Build Alternative	Number of Parcels to be Acquired *	Total Acres of ROW Needed (approx.)	Potential Residential Displacements	Potential Commercial Displacements	Other Potential Displacements
PURPLE ALTERNATIVE	40	263.4 acres	None	Amazon Delivery Station Distribution Warehouse	Barn & Silo (potential major utility displacements discussed in Section 3.4)
ORANGE ALTERNATIVE	48	366.1 acres	7	McKinney Airport Center Doc's Plumbing	7 barns/ outbuildings (potential major utility displacements discussed in Section 3.4)

*Note: Based on Geometric Schematic Design, January 2022

Purple Alternative

Construction of the Purple Alternative would require approximately 263.4 acres of ROW (estimated at approximately 117.8 acres of new ROW and 145.6 acres of existing ROW), including both existing ROW along SH 5 and ROW acquired on new location adjacent to sections of FM 546/Harry McKillop Boulevard and along Airport Drive. Because this part of the Study Area is dominated by commercial and industrial development, no residences would be displaced by the Purple Alternative. The Purple Alternative would potentially displace one business; Amazon Delivery Station Distribution Warehouse, a 201,484 square foot storage and distribution facility opened in late 2021, located west of the Airport, east of Airport Drive, and south of industrial Boulevard (shown in **Appendix D**). Other potential displacements include a barn and silo located on Greenville Road east

of Airport Drive near the NTMWD North McKinney Lift Station. Several major utilities owned by NTMWD located under and adjacent to Airport Drive would need to be relocated and are discussed in **Section 3.4**.

Orange Alternative

Construction of the Orange Alternative would require approximately 366.1 acres of ROW (estimated at approximately 243.3 acres of new ROW and 122.8 acres of existing ROW), including both existing ROW along SH 5 and on new location. The Orange Alternative would potentially displace seven residences, two businesses, and seven barns or outbuildings associated with the described single-family residences. The seven potential residential displacements include:

- One 1,680 square-foot single-family residence located on Old Mill Road, south of FM 546 and west of CR 317.
- Group of three single-family residences (256 square-feet, 1,216 square-feet, and 525 square-feet in size), located in the northeast quadrant of the intersection of Old Mill Road and CR 317 associated with the Doc's Plumbing property.
- Group of three single-family residences (341 square-feet, 800 square-feet, and 1,200 square-feet, in size) located on FM 546, west of Almeta Lane.

The two potential business displacements include:

- McKinney Airport Center, a two-building complex providing a total of 231,259 square feet of multi-use office/warehouse space opened in 2021, located at the southwest quadrant of FM 546/Harry McKillop Boulevard and Airport Drive.
- Doc's Plumbing, 1,842 square-foot single story building, located northeast of Old Mill Road on CR 317, which is also listed as a single-family residence located in a cluster with three other single-family residences on the same parcel on Old Mill Road. The three other residences are located adjacent to and north of Doc's Plumbing (described above).

Orange Alternative potential residential and commercial displacements are shown in **Appendix D**. Major utility relocations would be required to construct the Orange Alternative including the relocation of a 20" Atmos natural gas pipeline discussed in **Section 3.4**. Potential indirect business displacements caused by the Purple and Orange Alternatives are discussed in detail in **Section 3.6**.

No-Build Alternative

The No-Build Alternative would not result in the acquisition of new ROW or any displacements.

Orange Alternative - Preferred Alternative

Although the Orange Alternative would potentially displace seven single-family homes and two businesses, it would avoid the major NTMWD utility displacements caused by the Purple Alternative but would require the relocation of an Atmos natural gas pipeline, discussed further in **Section 3.4**. Alignment modifications may be developed during final design to avoid displacements or minimize impacts on adjacent properties if determined feasible.

3.2 Land Use

This section describes current land use patterns and development trends within and adjacent to the proposed Project Area and the project's potential effect on land uses and development.

3.2.1 Consistency with Local Plans and Land Use Policies

The development and implementation of the Spur 399 Extension was reviewed to determine its consistency with the land use plans, land use policies/zoning, and transportation plans governing the Study Area. Local jurisdictions and governing entities (e.g., NCTCOG, Collin County, City of McKinney, and the NTMWD) have been engaged throughout the development of the previous Feasibility Study (precursor to this DEIS) and development of this DEIS including providing information regarding planned and proposed development and input on project design. The most relevant local and regional plans and policy documents are briefly discussed below.

Mobility 2045 Update - *Mobility 2045 Update,*[11] the MTP for the 12-county Dallas-Fort Worth region developed by the NCTCOG, describes the transportation needs of the region to guide federal, state, and local transportation expenditures through the year 2045. *Mobility 2045 Update* includes recommendations to address forecasted population and development growth and the corresponding anticipated travel demand across the region, including areas where RSAs are lacking (see **Section 1.2**). The area surrounding the Spur 399 Extension Study Area is identified as an area of further study to address future transportation, regional travel, and mobility issues across the region (see **Figure 1-4**). The proposed Spur 399 Extension is included in the *Mobility 2045 Update*, approved on June 9, 2022.

Transportation Improvement Program, Statewide Transportation Improvement Program, and Unified Transportation Program – A TIP is developed by a Metropolitan Planning Organization (MPO) (in this case NCTCOG) and includes all projects within the MPOs boundaries. The TIP is a short-term planning document, typically listing approximately four years of funded transportation projects designed to carry out the recommendations of the long-range MTP. The STIP includes all MPO TIPs, plus rural listings of projects for the entire state and is approved by the Texas Transportation Commission, and then by the both the FTA and the FHWA. The STIP is TxDOT's four-year capital improvement program and federal dollars cannot be spent on a project until it is listed individually in the STIP or included by reference. The STIP is updated every two years. In most cases, a project must be included in both the TIP and the STIP to move forward. The Unified Transportation Program (UTP), TxDOT's 10-year program updated annually, guides development of the transportation network across the state. The UTP links the planning activities conducted to support development of the MTPs and STIP. At this time, the proposed Spur 399 Extension is not included in the UTP.

On June 9, 2022, the RTC approved the *Mobility 2045 Update* and the 2023-2026 TIP. The proposed Spur 399 Extension is included in both and therefore is consistent with the MTP and TIP. The STIP will be updated in November 2022 with TxDOT anticipating FTA/FHWA approvals shortly thereafter, making the project consistent with the STIP.

[11] North Central Texas Council of Governments (NCTCOG), *Mobility 2045 Update*, adopted by the Regional Transportation Council, June 9, 2022. https://www.nctcog.org/trans/plan/mtp/mobility-2045-2022-update.

McKinney National Airport Master Plan - The McKinney National Airport, a division of the City of McKinney, completed a master plan update in 2019,[12] that included a proposed extension of Runway 18-36. Alternatives were considered to extend the runway both to the north and to the south to obtain the desired additional operational length. The Draft EA for the runway extension was released for public review by the FAA and the TxDOT Aviation Division on May 1, 2022. The FAA and TxDOT Aviation Division issued a FONSI/ROD for the proposed action on July 27, 2022. The Airport Master Plan also includes the proposed expansion of the Airport footprint to the east to provide a parallel runway and additional ramp/apron areas (pavement area for the parking and movement of aircraft) near a proposed passenger terminal and parking garage (as depicted on the Purple and Orange Alternative Resource-Specific Maps in **Appendix D**).

ONE McKinney 2040 Comprehensive Plan City of McKinney Comprehensive Plan - *ONE McKinney 2040 Comprehensive Plan (ONE-McKinney 2040)*[13] is the City of McKinney's recently amended comprehensive plan, incorporating the city's future land use, development, and mobility strategies, among other planning components. Overall, *ONE-McKinney 2040* provides a vision and guiding principles to direct the city's growth and development over the next two decades. The plan's land use and development strategy defines 17 distinct districts within the city and defines the preferred development types and predominant land uses to be encouraged within each district to retain the defined character and compatibility, while still providing the city the flexibility to take advantage of changing market trends. The mobility strategy encourages a forward-thinking, strategic, multimodal approach to meeting the city's future transportation needs. The mobility strategy includes the *Master Thoroughfare Plan*, a long-term vision of the major street network necessary to meet future travel needs, while also recognizing changing preferences for transportation mode choices. The mobility strategy supports the land use district approach by encouraging the city to consider unique transportation needs of varied development contexts, and aims to support connectivity and efficiency in conjunction with regional transportation plans.

McKinney City-Wide Trail Master Plan (Conceptual Trail Network Plan) - The City of McKinney is developing a *City-Wide Trail Master Plan*[14] to guide implementation of a connected trail network. In community meetings as part of the plan development process, the city defined character zones to guide trail development compatible with the varied character of different city areas. The conceptual version of the plan identifies trail types that may be strategically developed across the city based on needs and character zone compatibility. Trail and amenity types include "Parkway Trails", "Greenbelt & Park Trails", "Bicycle Boulevards" (on-street), "Easement Trails", and roadway crossings and trailheads. The effects of the proposed action on the components of the proposed *City-Wide Trail Master Plan* within the Study Area are described in **Section 3.5**.

Collin County Mobility Plan - The *Collin County Mobility Plan* (updated in 2014 with major addendum in 2016) is a comprehensive, multi-modal plan and guide for transportation systems and investments that will serve the mobility needs of county residents into the future. The purpose of the plan is to identify the transportation needs of area residents and businesses, and includes a county-wide system of roadways, transit facilities, and hike-and-bike trails. It identifies the future transportation network that will be needed to serve projected

12 Coffman Associates, McKinney National Airport, *Airport Master Plan*; https://www.mckinneytexas.org/3378/About-Us

13 City of McKinney, ONE-McKinney 2040 Comprehensive Plan; https://www.mckinneytexas.org/292/2040-Comprehensive-Plan

14 City of McKinney, City-Wide Trail Master Plan Conceptual Trail Network Plan; https://www.mckinneytexas.org/612/Parks-Trails

population and employment growth and increased travel demand. The plan includes policies, programs, and projects for implementation and continued development and guidance for local funding decisions. The 2016 plan addendum provides transportation options based on an alternate county build-out scenario subsequently developed based on changes to population forecasts and revisions cities made to their respective comprehensive plans. Collin County Transit provides transit service for residents 65 years of age or over, individuals with disabilities, and low-income individuals in the Study Area through door-to-door service. No facilities or infrastructure that support this service are in the Study Area.

3.2.2 Impacts of the Alternatives on Land Use

Current land uses were identified for parcels within and adjacent to the proposed ROW for the Purple and Orange Alternatives using land use data available from the City of McKinney[15] and the NCTCOG.[16] Where appropriate, land use data were modified based on observed conditions within the Study Area and review of current aerial imagery. Thirteen dominant categories of land uses are mapped across the Project Area, shown in **Figures 3-2** through **3-4**, and lands designated as undeveloped or vacant indicate parcels that do not have buildings or on-site improvements but are within a larger urban setting. With implementation of the Purple and Orange Alternatives, land from several categories would be converted to transportation use. The area within each land use category was calculated using geographic information system (GIS) resources and is summarized in **Figure 3-5.**

Purple Alternative

The Purple Alternative extends through areas of existing urban development with more than half of the proposed route making use of existing highway ROW along Spur 399, SH 5, FM 546/Harry McKillop Boulevard, and Airport Drive. Limited areas of undeveloped/vacant lands and lands in agricultural use are present along the Purple Alternative with pockets of undeveloped/vacant lands scattered along the Common Alignment. Most of these areas are leased and/or owned by institutional or industrial entities. In particular, much of the land shown in agricultural use east of Airport Drive and north of the Airport is owned by Encore Wire (their existing facility is across Airport Drive to the west). Though currently leased for crop production, Encore Wire intends to expand its facility onto that property. In addition to Encore Wire, other businesses along Airport Drive are considering expanding their facilities. These plans and the potential for new development along either Build Alternative are discussed under **Section 3.15** Induced Growth and **Section 3.16** Cumulative Effects.

Public parklands, owned by the City of McKinney, exist along the Purple Alternative including a parcel within the Wilson Creek Greenbelt along Wilson Creek crossing under SH 5 along the Common Alignment, and the Trinity River Greenway near the tie-in point with US 380. These parklands are protected public lands and/or recreational facilities and are discussed further in **Section 3.9**. Existing and planned bicycle and pedestrian facilities, part of the proposed *City-Wide Trail Master Plan*, are discussed further in **Section 3.5**. The Meridian at Southgate development along the west side of SH 5, included as “residential land use” contains open space for the private use of the residents adjacent to SH 5. This area was previously part of the Greens of McKinney Golf Course.

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15 *ONE-McKinney 2040 Comprehensive Plan (2018)*, Existing Land Use, Figure 2.4; https://www.mckinneytexas.org/292/2040-Comprehensive-Plan

16 NCTCOG Regional Data Center; https://www.dfwmaps.com/#

Figure 3-2: Land Use Adjacent to the Purple and Orange Alternatives – Common Alignment

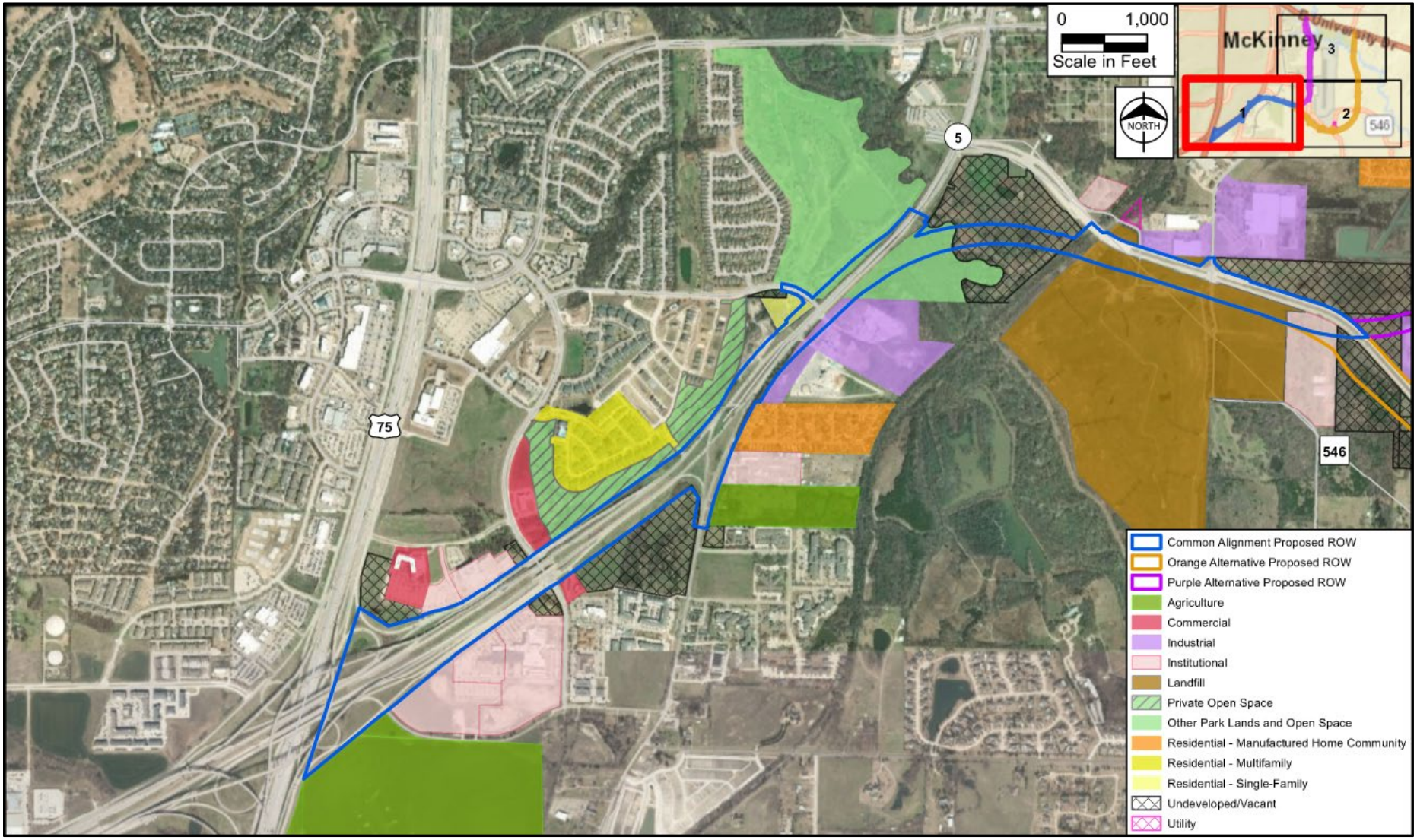


Figure 3-3: Land Use Adjacent to the Purple and Orange Alternatives – South

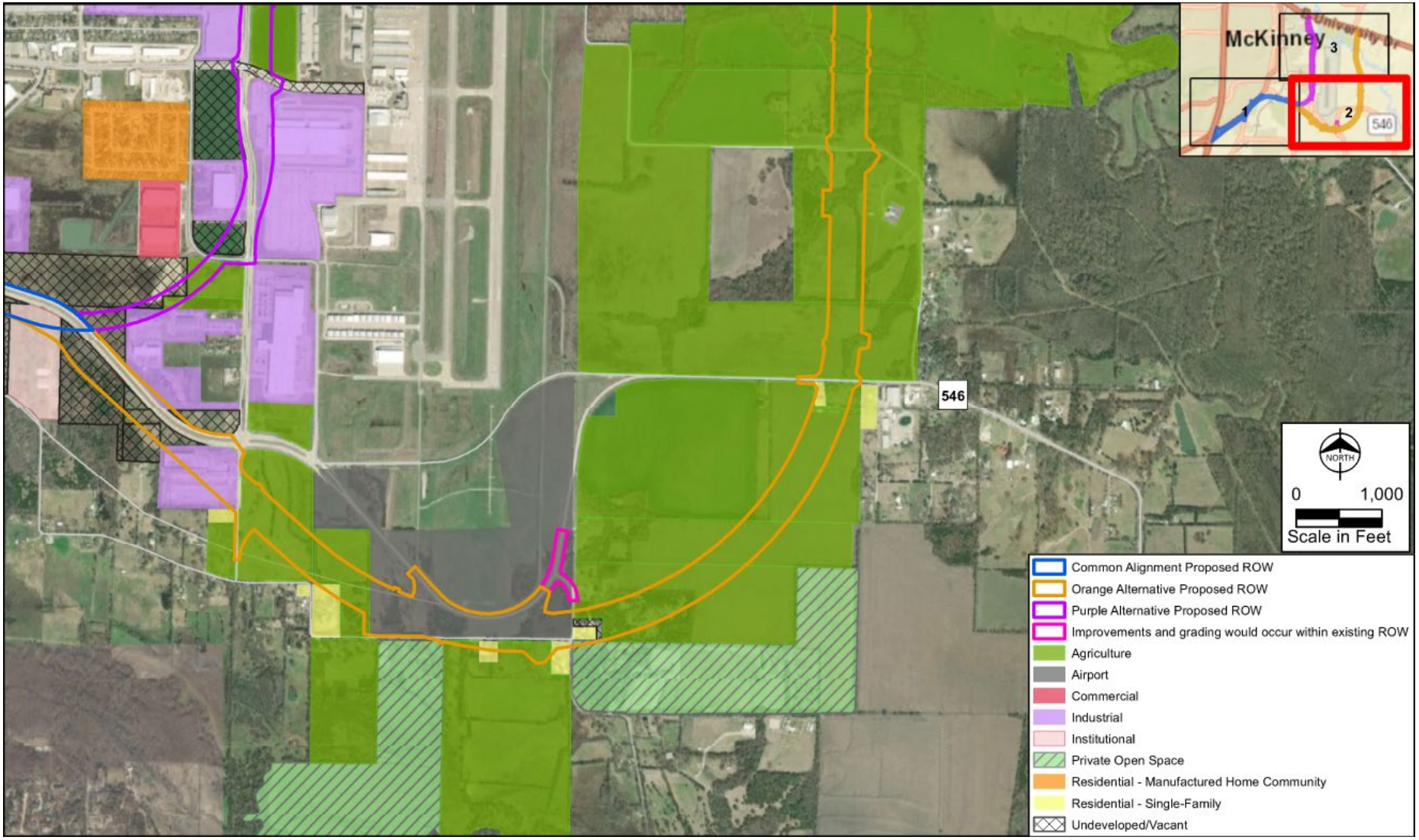


Figure 3-4: Land Use Adjacent to the Purple and Orange Alternatives - North

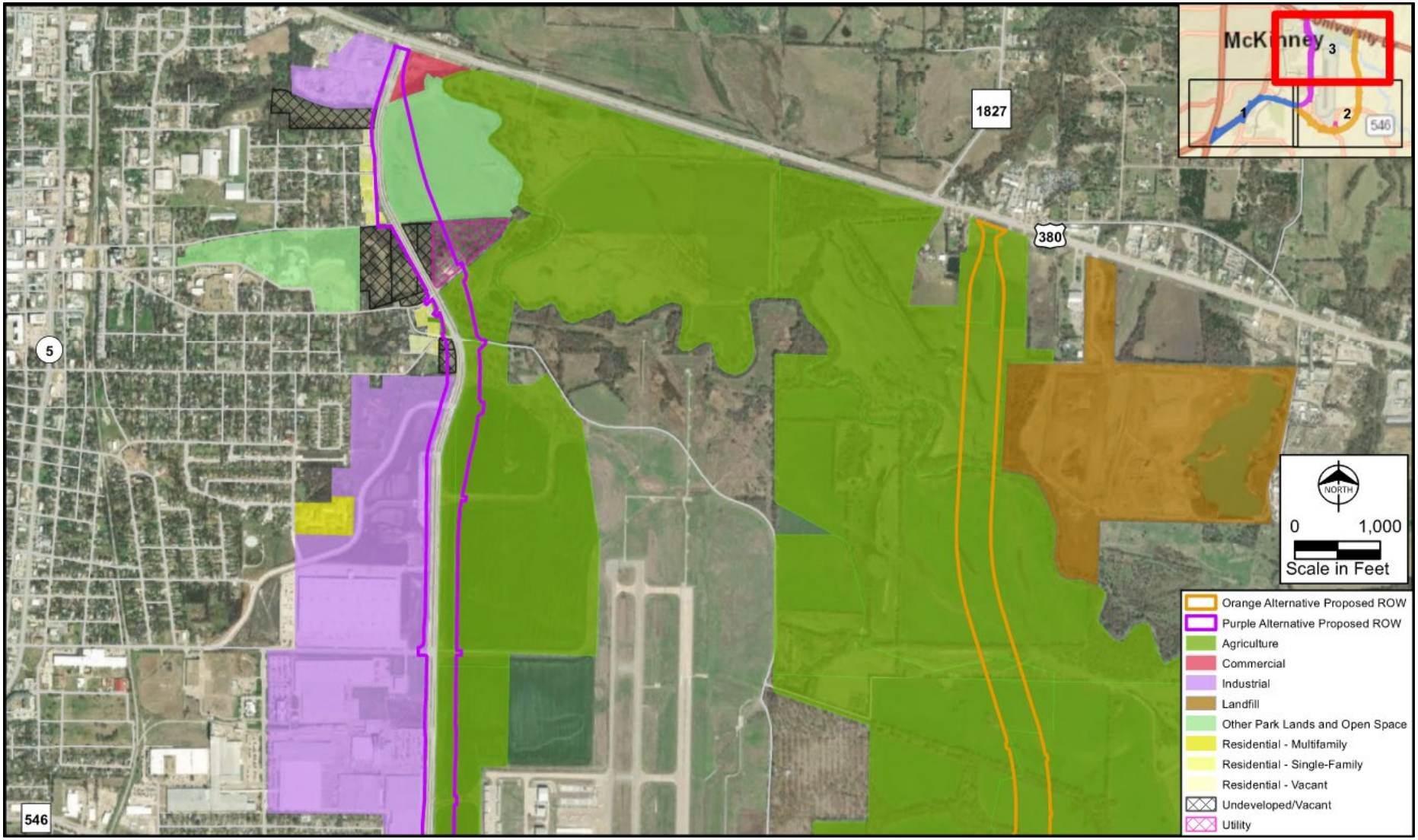


Figure 3-5: Direct Land Use Impacts (Acres) of the Purple and Orange Alternatives

Existing Land Use	Purple Alternative		Orange Alternative	
	Acres	Percent of the Proposed ROW	Acres	Percent of the Proposed ROW
Agriculture	40.6	15.4%	162.8	44.4%
Public and Private Park Lands/Open Spaces	25.6	9.7%	8.8	2.4%
Residential – Single-Family	0.8	0.3%	3.7	1.0%
Residential – Manufactured Homes	0.2	0.07%	0.1	0.05%
Residential - Vacant	0	0%	0	0%
Institutional	2.7	1.0%	3.6	1.0%
Commercial	0.9	0.3%	0	0%
Industrial	16.9	6.4%	9.8	2.7%
Airport	0	0%	23.9	6.5%
Landfill	6.5	2.4%	6.4	1.7%
Undeveloped/Vacant[1]	23.7	8.9%	24.0	6.6%
Existing Roadway and ROW[2] (no land use conversion)	145.6	55.3%	122.8	33.5%
Total Acres within Proposed ROW	263.4	100%	366.1	100%

Note: Quantity calculations are based on the proposed ROW shown on the Geometric Schematic Design January 2022, overlain on mapped land use categories across the Project Area. The quantities may not match those indicated in other resource sections such as park properties or farmland as they may be based on different data sources. Acres shown are approximate.

1 – Undeveloped/Vacant – land not in active agricultural use but cleared for development, may have access to utilities

2 – Existing ROW limits are interpreted based on GIS data; actual existing ROW limits (based on survey) were not available for existing roadways.

Numerous privately and publicly owned utilities cross and are within and adjacent to the Project Area for the Purple Alternative. These include both above-grade and subsurface utilities located in easements on private property or within public ROW and are discussed further in **Section 3.4**. Utilities are not accounted for as a separate land use category in the referenced land use plans.

Construction of the Purple Alternative would modify access to developed and undeveloped lands adjacent to the proposed ROW by limiting direct property access to the frontage road system, that would provide access to the freeway mainlanes at designated grade-separated interchanges. Existing utilities would be relocated to make way for the roadway improvements and proposed/planned utilities may be moved or upgraded to support future development and growth. As previously discussed, undeveloped areas adjacent to the Purple Alternative are limited, are leased or under contract for development, and are presumed compatible with the commercial/light industrial character of the Airport Drive/Airport area. Open properties farther removed from the proposed freeway may also be attractive for similar development once the freeway is operational. This potential for induced development and growth is discussed in **Section 3.15.**

Orange Alternative

The Orange Alternative affects the same land uses described along the Common Alignment under the Purple Alternative. As the Orange Alternative continues east of the Common Alignment and around the south end of the Airport, it crosses rural areas dominated by agricultural uses (e.g., row crops, pasture, and livestock). In addition to the open space and parkland along the Common Alignment, the Orange Alternative encroaches on two park properties owned by the Town of Fairview south of the Airport. Neither property is open for public use. The Orange Alternative also crosses land designated for future park use by the City of McKinney just south of US 380. These park properties are discussed in **Section 3.9**. As noted under the Purple Alternative, existing and planned bicycle and pedestrian facilities, part of the proposed *City-Wide Trail Master Plan*, are further discussed in **Section 3.5.**

As noted under the Purple Alternative, numerous privately and publicly owned utilities cross and are within and adjacent to the Project Area for the Orange Alternative. These utilities include both above-grade and subsurface utilities and are further described in **Section 3.4**.

The Orange Alternative hugs the existing FM 546 ROW across land incorporated into the Airport boundary. The Airport plans to extend Runway 18-36 by 1,000 feet to the north and by 500 feet to the south, which would extend the RPZ at the south end of the Airport to just north of FM 546.[17] The Airport Master Plan also includes construction of a new parallel runway east of Runway 18-36 and development of a passenger terminal and supporting facilities east of the airfield which could be accessible from the Orange Alternative. The land in this area is currently in agricultural use and contains scattered residences. Construction of the Orange Alternative would introduce a major roadway into a primarily rural area, opening access to undeveloped land that is currently served by a limited network of rural and county roads, utilities, and other public services. The potential for induced development and growth associated with the Orange Alternative is discussed in **Section 3.15** Induced Growth and **Section 3.16** Cumulative Effects.

No-Build Alternative

Under the No-Build Alternative, no new ROW would be acquired, and no new roadways would be constructed; therefore, no impacts to land use would result. Vacant land along Airport Drive, FM 546/Harry McKillop Boulevard, SH 5, and US 380 would continue to develop to support commercial and industrial uses similar to those already present.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternative through the undeveloped area south and east of the Airport would expose areas for potential development resulting in changes in land use along the corridor. New development would be limited by the extent of the floodplain associated with the East Fork Trinity River and the lack of utilities and infrastructure in the area. The City of McKinney has obtained the approvals needed to move forward with the Runway 18-36 extension which will put greater emphasis on their plans to expand the remainder of the airfield and terminal area to the east.

[17] USACE Fort Worth District, Public Notice, City of McKinney, SWF-2020-00359; April 6. 2021.

3.3 Farmlands

The Farmland Protection Policy Act (FPPA) of 1981 is intended to minimize the unnecessary conversion of prime farmlands and farmlands of statewide importance to non-agricultural uses by federal projects and programs. Projects that cross soils classified as prime or statewide important farmlands and that are not located on land already in urban development, are subject to review by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) under the FPPA. Because of its proximity to the Dallas Metroplex, a large portion of the Study Area is located within the census-designated McKinney Urbanized Area and the Dallas-Fort-Worth-Arlington Urbanized Area (UA). Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land. Farmland "committed to urban development or water storage" includes all such land that receives a combined score of 160 points or less from the land evaluation and site assessment criteria based on the use of the NRCS-CPA-106 Farmland Conversion Impact Rating Form completed for this project.

Purple and Orange Alternatives

Figure 3-6 indicates the acreage of mapped prime and statewide important farmland soils that would be converted to non-agricultural use with construction of the Purple or Orange Alternative. Along the Purple Alternative, most of these areas are already developed or are planned to be developed as they are within the City of McKinney and the two census-designated UAs described above. Conversely, the majority of the Orange Alternative crosses a rural area dominated by current agricultural uses (e.g., row crops, pasture, and livestock).

Figure 3-6: Comparison of Farmland Impacts of the Purple and Orange Alternatives

Prime and Statewide Important Farmland	Purple Alternative		Orange Alternative	
	Acres	Percent Total Acres	Acres	Percent Total Acres
Total Area within the Proposed ROW	263.4	100%	366.1	100%
Total Area of Mapped Prime and Statewide Important Farmland W/in Proposed ROW	166.9	63.4%	165.7	45.3%
Area of Mapped Prime Farmland	142.4	85.3%	148.9	89.8%
Area of Mapped Farmland of Statewide Importance	24.5	14.7%	16.8	10.2%
Total Acreage of Proposed ROW in Urbanized Areas (UA)	158.0	60%	173.4	47%
McKinney UA	147.5	56%	162.3	44%
Dallas-Fort Worth-Arlington UA	10.5	4%	11.1	3%

Quantities based on proposed ROW limits in the Geometric Schematic Design, January 2022.

A total corridor assessment was initiated for the Purple and Orange Alternatives using Parts I, III, and VI of the NRCS-CPA-106 Farmland Conversion Impact Rating Form. TxDOT-rated sections of the form indicated a total of 75 points for the Purple Alternative and a total of 83 points for the Orange Alternative, both exceeding 60 total points and requiring coordination with the NRCS. TxDOT submitted the NRCS-CPA-106 Form and a request to initiate coordination to the NRCS on August 3, 2021. No response was received from the NRCS within the 30-day comment period. Therefore, coordination under the FPPA is complete and the project may proceed as though either there is no protected farmland in the Project Area, or that the relative land values show the conversion of protected farmland does not result in an adverse effect, and no minimization is recommended.[18] A copy of the NRCS-CPA-106 Form and supporting documentation is included in **Appendix J**.

No-Build Alternative

Under the No-Build alternative, no ROW acquisition or development would occur, therefore, no impacts to farmlands would occur.

Orange Alternative - Preferred Alternative

The areas of mapped farmland converted to transportation ROW are primarily used for hay production, pasture, and livestock grazing. No specialty crops and no irrigated fields are affected by the Orange Alternative that would require mitigation to be considered. TxDOT continues to work with the Enloe Family to accommodate the crossing of equipment and cattle near the current location of Enloe Road under the proposed freeway.

3.4 Utility Relocation

Utility lines in the Study Area include water and wastewater, fiber optics, natural gas, telephone, cable, and electrical lines. A public utility, the NTMWD, supplies water and wastewater services throughout the Study Area. Internet, cable, and telephone service is provided in the City of McKinney and surrounding areas by private companies, including AT&T, Earthlink, Spectrum, and other providers. Natural gas is supplied by Atmos Energy, a private company.

Implementation of either Build Alternative requires the acquisition of new ROW and construction activities that involve land clearing, grading, and sub-surface excavation. Prior to initiating construction, utilities in the proposed path of the new freeway must be moved. Coordination with the utility owner will continue through design and construction to either relocate the utility to a location outside of the proposed ROW or make provisions for the utility to be incorporated within the proposed TxDOT ROW.

TxDOT has not determined whether dislocated utilities will be re-installed within the TxDOT ROW, or would be moved to a location outside the TxDOT ROW for either Build Alternative. However, the potential impacts resulting from re-installation of the displaced utilities within the TxDOT ROW have been considered as part of the overall project footprint impacts (e.g., construction noise, potential disturbance to archeological resources, and potential impacts to species habitat) within this DEIS. To the extent that the owner of any displaced utility determines to re-install the displaced utility at a location outside TxDOT ROW, such location will be determined by the owner of the utility subject to the rules and policies governing the utility relocation process. Additionally,

[18] FPPA Guidelines, 7 CFR § 658.4(a); and TxDOT, *Environmental Handbook for Farmland Protection Policy Act, June 2021*; https://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/natural-resources.html

the owner of the utility will be responsible for acquiring any easements outside of the TxDOT ROW and ensuring that the design and construction meet all regulatory and environmental compliance requirements.[19]

Purple Alternative

Both publicly and privately owned major utilities are within or cross the proposed ROW of the Purple Alternative. Overhead utilities including electric, telecommunications (telecom), and fiber optic extend along the east side of SH 5 and Couch Drive, west and east of Airport Drive, north of Enloe Road and Industrial Boulevard, and south of US 380. **Figure 3-7** describes the size, type, owner, and general location of the above-grade/overhead utilities located within the Purple Alternative ROW.

The schematic showing utilities within the Purple Alternative ROW is included in **Appendix B**.

Figure 3-7: Purple Alternative Above-Grade Utilities

PURPLE ALTERNATIVE Above-Grade Utilities

Utility ID	Size	Type	Owner	Location
OE1	N/A	Electric	Encore	East side of SH 5 East side of Couch Dr. South side of Old FM 546 Along Virginia St. North side of Enloe Rd. Both sides of Airport Dr. North side of Industrial Blvd. South side of US 380
OTV1	N/A	CATV	Spectrum	East side of SH 5 East side of Couch Dr.
OFO3	N/A	Fiber	Zayo	West side of Airport Dr. South side of US 380
E1 (D)	N/A	Electric	Oncore	West side of Airport Dr. North side of Enloe Rd.
OFO1	N/A	Fiber	Spectrum	North side of Industrial Blvd.
OFO	N/A	Fiber	Unknown	South side of US 380

Key: N/A - Not Applicable

Subsurface utilities include water, wastewater, storm sewer, electric, natural gas, telecom, and fiber optic extending along SH 5, FM 546, US 380, Couch Drive, Airport Drive, Enloe Road, and Industrial Boulevard. A NTMWD 24-inch water pipeline and the North McKinney Lift Station located north of Greenville Road and east of Airport Drive, require relocation to construct the Purple Alternative. The lift station serves the communities of McKinney, Melissa, and Anna. NTMWD is constructing a Transfer Lift Station and Transfer Force Main adjacent to the North McKinney Lift Station that will provide additional capacity to the same communities. In 2020, NTMWD put into service a 72-inch water line that parallels Airport Drive. Additional force main projects within/adjacent to the Purple Alternative are under design by NTMWD including five miles of proposed 42-inch force main anticipated to be completed in late 2023. NTMWD has estimated the relocation cost of both lift

[19] See 43 TAC 21.37(a)(9), (g)(1)), and (g)(4); 43 TAC 21.38(e)(2).

stations and the associated services lines, the 72-inch waterline, and the proposed force mains at approximately $181M.[20] TxDOT will continue to coordinate with NTMWD and the City of McKinney as the design progresses to determine if options are feasible to avoid or minimize impacts to the NTMWD infrastructure. At this time, NTMWD has not identified locations to relocate these utilities, but they would need to remain in close proximity to where they are or are planned to be today to maintain serviceability to their customers. **Figure 3-8** describes the size, type, owner, and general location of the subsurface utilities located within the proposed ROW for the Purple Alternative.

In addition to the utilities described, the Common Alignment crosses through a portion of the NTMWD/McKinney Landfill located south of FM 546/Harry McKillop Boulevard and east of SH 5 (see **Section 3.13** for more information). The permitted boundary of the facility extends to the south ROW of FM 546/Harry McKillop Boulevard. Although the landfill has been closed since 2010, the surface drainage system, groundwater monitoring wells, gas flare, and other improvements are still in use and monitored by NTMWD. The boundary of the landfill would need to be moved southward, through a TCEQ permitting process, before the ROW can be used for the Spur 399 Extension. According to NTMWD, the new drainage system, monitoring wells, and other equipment would need to be designed, installed, and made operational before the existing components can be removed. The TCEQ permitting process could take as long as two years with an all-in cost of approximately $2.47 million for the redesign, installation, and permitting.

The total estimated utility relocation cost for the Purple Alternative is $191M which includes approximately $700,000 for general underground utilities (e.g., McKinney 2”, 6”, 24”, and 60” water mains and 10” and 30” storm sewer mains); $5M to relocate overhead electrical poles and wires; and $3M to relocate a 20” Atmos natural gas pipeline in addition to relocation of the landfill permitted boundary and associated infrastructure and the in-ground NTMWD utilities described above.

Figure 3-8: Purple Alternative Subsurface Utilities

	Utility ID	Size	Type	Owner	Location
PURPLE ALTERNATIVE Subsurface Utilities	PL1	10.75"	NG Pipeline	Atmos Mid-Tex	West side of SH 5 to SP 399 South of SP 399 west side of SH 5
	W3 (D)	2"-36"	Water	COM	East side of SH 5 In between FM 546 and Airport Dr. West side of Airport Dr. South side of US 380
	W3	16"-36"	Water	COM	West side of SH 5 East side of Couch Dr. South side of FM 546
	T2	N/A	Telephone	AT&T	West side of SH 5 North side of Old FM 546 South side of Enloe Rd. Both sides of Greenville Rd. North side of Industrial Blvd. South side of US 380

[20] Letter from NTMWD, Cesar Baptista, Deputy Director Engineering & CIP to Stephen Endres, PE, Project Manager, TxDOT Dallas District; October 19, 2021.

Figure 3-8 continued: Purple Alternative Subsurface Utilities (continued)

PURPLE ALTERNATIVE Subsurface Utilities

Utility ID	Size	Type	Owner	Location
FO2	N/A	Fiber	AT&T	West side of SH 5 East side of Couch Dr. South side of Old FM 546 West side of Airport Dr. South side of US 380
WW1 (C)	30"-48"	Wastewater	COM	In between SH 5 and Couch Dr. North side of Old FM 546 West side of Airport Dr. Along Virginia St. North side of Industrial Blvd.
E1	N/A	Electric	Encore	In between SH.5 and Couch Dr.
STM5 (C)	N/A	Storm Sewer	TxDOT	South side of FM 546
FO3	N/A	Fiber	Zayo	West side of Couch Dr. Both sides of Airport Dr. South side of Industrial Blvd.
T2 (D)	N/A	Telephone	AT&T	West side of Couch Dr. South side of Enloe Rd.
W4 (D)	24"	Water	NTMWD	Across FM 546 In between Couch Dr. and Airport Dr. North side of Greenville Rd.
WW3 (D)	6"	Wastewater	Private	In between Existing FM 546 and Airport Dr.
PL-2	20”	NG Pipeline	Atmos Texas	East side of US 75 Across SH 5 to FM 546 Across FM 546 to north side of FM 546
STM3 (D)	N/A	Storm Sewer	COM	Both sides of Airport Dr. South side of US 380
E6	N/A	Street Light	COM	Down center of Airport Dr. Down center of Industrial Blvd.
W4	60"	Water	NTMWD	East side of Airport Dr.
FO6	N./A	Fiber	COM	Down center of Airport Dr.
WW1 (D)	24"	Wastewater	COM	North side of Greenville Rd.
WW2 (D)	24"	Wastewater	NTMWD	East side of Airport Dr.
FO1	N/A	Fiber	Spectrum	North side of Industrial Blvd.
TV	N/A	CATV	Unknown	North side of Industrial Blvd.

Key: N/A - Not Available
COM - City of McKinney

Orange Alternative

Both publicly and privately owned major utilities are within or cross the proposed ROW of the Orange Alternative. Overhead utilities include electric, telecom, and fiber optic along the east side of SH 5 and Couch Drive, west and east of Airport Drive, east of CR 317, north of Old Mill Road, and south of FM 546, CR 722/ Enloe Road, and US 380. **Figure 3-9** describes the size, type, owner, and general location of the above-grade/overhead utilities located within the proposed ROW of the Orange Alternative. The schematic showing utilities within the proposed ROW for the Orange Alternative is included in **Appendix B**.

Figure 3-9: Orange Alternative Above-Grade Utilities

	Utility ID	Size	Type	Owner	Location
ORANGE ALTERNATIVE Above-Grade Utilities	OE1	N/A	Electric	Encore	East side of SH 5 East side of Couch Dr. East side of Airport Dr. North side of Old Mill Rd. East side of CR 317 South side of US 380
	OTV1	N/A	CATV	Spectrum	East side of SH 5 East side of Couch Dr.
	E1 (D)	N/A	Electric	Oncore	South side of Old Mill Rd. South side of FM 546 South side of CR 722
	OFO1	N/A	Fiber	Spectrum	South side of US 380

Key: N/A - Not available

Subsurface utilities include water, wastewater, storm sewer, electric, natural gas, telecom, and fiber optic along SH 5, FM 546, US 380, Couch Drive, Airport Drive, CR 317, CR 722/Enloe Road, and Old Mill Road. **Figure 3-10** describes the size, type, owner, and general location of the subsurface utilities located within the proposed ROW for the Orange Alternative.

The landfill boundary re-permitting would also apply to the Orange Alternative.

Figure 3-10: Orange Alternative Subsurface Utilities

	Utility ID	Size	Type	Owner	Location
ORANGE ALTERNATIVE Subsurface Utilities	PL1	10.75"	NG Pipeline	Atmos Mid-Tex	West side of SH 5 to SP 399 South of SP 399 west side of SH 5
	W3 (D)	2"-36"	Water	COM	East side of SH 5
	W3	16"-36"	Water	COM	West side of SH 5 East side of Couch Dr. South side of FM 546

Figure 3-10 continued: Orange Alternative Subsurface Utilities

Utility ID	Size	Type	Owner	Location
T2	N/A	Telephone	AT&T	West side of SH 5 West side of Airport Dr. West side of CR 317 Both sides of FM 546 North side of CR 722/Enloe Road In between US 380 and CR 722/Enloe Road
FO2	N/A	Fiber	AT&T	West side of SH 5 East side of Couch Dr. South side of FM 546
WW1 (c)	30"-48"	Wastewater	COM	In between SH 5 and Couch Dr.
E1	N/A	Electric	Encore	In between SH 5 and Couch Dr.
STM5 (C)	N/A	Storm Sewer	TxDOT	South side of FM 546
FO3		Fiber	Zayo	West side of Couch Dr. South side of Old Mill Rd. East side of CR 317 South side of US 380
T2 (D)		Telephone	AT&T	West side of Couch Dr.
W4 (D)	24"-60"	Water	NTMWD	Across FM 546 in between Couch Dr. and Airport Dr. South side of US 380
W5 (D)	2"	Water	Milligan WSC	West side of Airport Dr. South side of Old Mill Rd. West side of CR 317 South side of FM 546 South side of CR 722/Enloe Road
PL-2	20"	NG Pipeline	Atmos Texas	East side of US 75 Across SH 5 to FM 546 Across FM 546 to north side of FM 546 Across FM 546 west of Airport Dr. Across FM 546 to north of FM 546 North of FM 546 and west of Almeta Ln
WW1 (D)	12”-24"	Wastewater	COM	East side of Airport Dr.
WW2 (C)	N/A	Wastewater	NTMWD	In between US 380 and CR 722/Enloe Road

Key: N/A - Not available
COM - City of McKinney

No-Build Alternative

No ROW acquisition or construction would occur under the No-Build Alternative; therefore, no utilities would be relocated.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternative would avoid the major NTMWD utility relocations caused by the Purple Alternative but would still require relocation of a 20-inch Atmos natural gas pipeline at four locations along the proposed alignment (SH 5, near the NTMWD/McKinney Landfill, within the proposed interchange with Airport

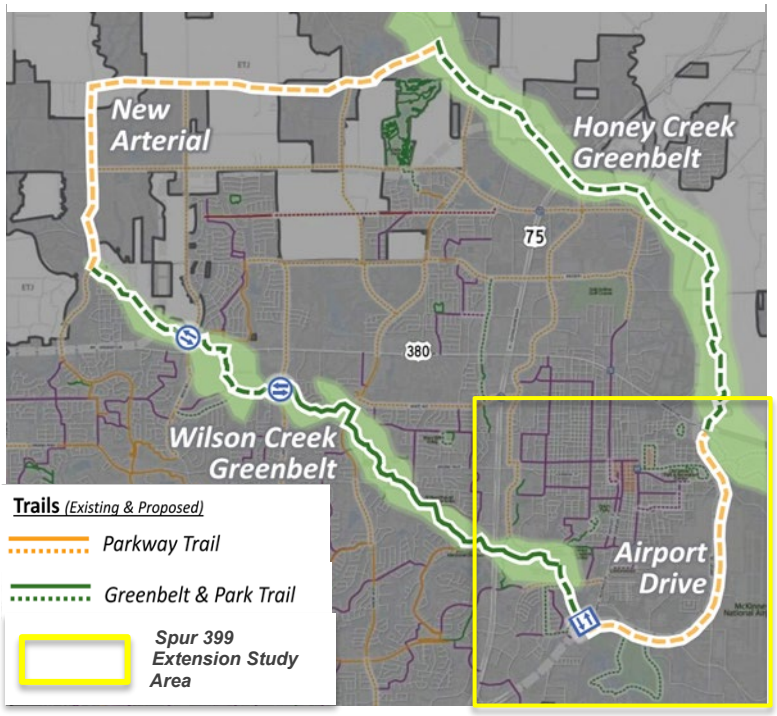
Drive, and within the proposed interchange with FM 546). The Orange Alternative would also require revision of the NTMWD/McKinney Landfill permitted boundary prior to initiating construction. The cost of the multiple 20-inch natural gas pipeline relocations and landfill permitting, along with miscellaneous water, wastewater, and communication utilities relocations is estimated at approximately $14.6M. Two to four years of design and construction could be needed to relocate the landfill drainage, groundwater sampling wells, and gas flare components from within the proposed ROW before roadway construction could begin. As final design progresses for the Orange Alternative, further assessment would determine which underground utilities could be crossed and which would need to be relocated outside of the proposed ROW and within a separate easement. Overhead utilities would be addressed in a similar manner through coordination with the utility companies. The order, lead time, and cost of the utility relocations would also be determined.

3.5 Bicycle and Pedestrian Facilities

Within the Study Area, existing bicycle and pedestrian facilities are established within the Wilson Creek Greenbelt, and sidewalks are present along the west side of Airport Drive between Elm Street and Industrial Boulevard, and along the east side of Airport Drive between Wattley Drive and FM 546/Harry McKillop Boulevard. Sidewalks border both sides of FM 546/Harry McKillop Boulevard from Old Mill Road to Airport Drive. The existing sidewalk system along Airport Drive and FM 546/Harry McKillop Boulevard within the vicinity of the proposed alternatives is disjointed and does not provide connectivity to other sidewalk or trail systems in neighboring areas within the larger Study Area. No trails have been developed within the Trinity River Greenway or McKinney Future Parkland properties owned by the City of McKinney described in **Section 3.9**. Bicycle users share the roadways with vehicles across the city, including along Airport Drive, the primary 4-lane divided access route within an industrial area experiencing increased development and construction activity. As described in **Section 3.2**, public transit does not serve the Study Area.

The City of McKinney is developing a *City-Wide Trail Master Plan* to guide implementation of a connected trail network. City planners are looking at the potential to provide a Greenbelt Loop Trail connecting trails along the Wilson Creek Greenbelt (formerly Greenway) and the Honey Creek Greenbelt (northeast of McKinney) via an on-street trail along Airport Drive, illustrated in **Figure 3-11**. The yellow box indicates a portion of the Spur 399 Extension Study Area.

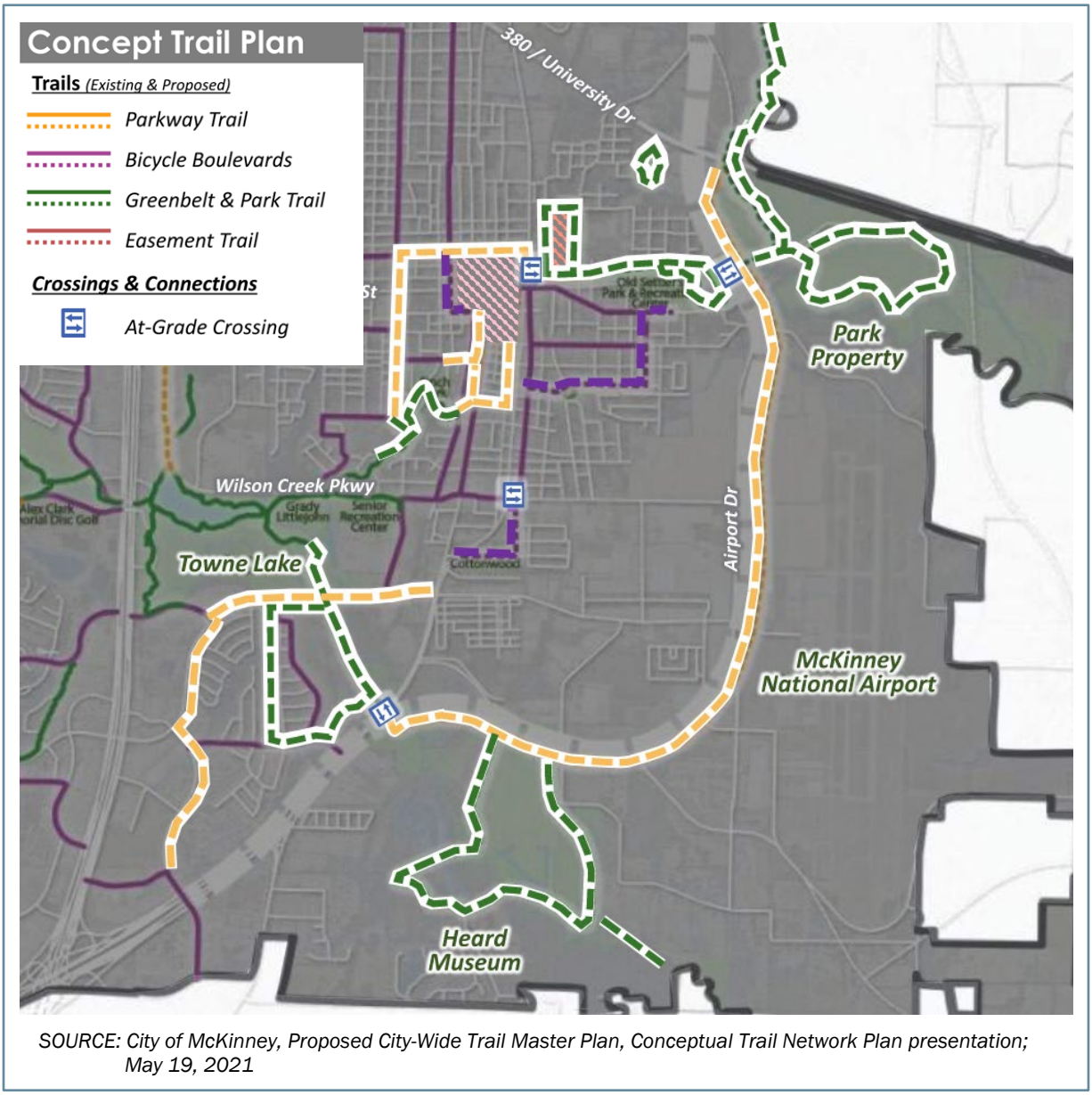
Figure 3-11: City of McKinney Conceptual Trail Network Plan – Proposed Greenbelt Loop Trail



SOURCE: City of McKinney, City-Wide Trail Master Plan, Conceptual Trail Network Plan presentation; May 19, 2021

Figure 3-12 indicates the parkway/bicycle boulevards (on-street) and greenbelt and park trails being considered in the Trail Master Plan within the Study Area.

Figure 3-12: City of McKinney Conceptual Trail Network Plan – Trail Network Proposed Within the Study Area



SOURCE: City of McKinney, Proposed City-Wide Trail Master Plan, Conceptual Trail Network Plan presentation; May 19, 2021

Purple Alternative

The Purple Alternative would replace/incorporate the Airport Drive alignment into the new freeway facility. SUPs proposed along the frontage roads would maintain bike-pedestrian connectivity along the corridor, and connections at grade-separations could be provided to connect to existing and proposed trail system components and sidewalks. The Purple Alternative would also require land from the Trinity River Greenway property adjacent to US 380 where "Greenbelt & Park Trails" (green) are proposed as part of the Trail Master Plan. The "Greenbelt & Park Trails" proposed to extend south from Airport Drive and FM 546/Harry McKillop Boulevard through the Wilson Creek Greenbelt would need to pass under the elevated section of the proposed

Spur 399 Extension. As described in **Chapter 2.0**, this section of the Purple and Orange Alternatives referred to as the Common Alignment is very constrained because of existing and proposed infrastructure, including the NTMWD/McKinney Landfill south of FM 546/Harry McKillop Boulevard, existing and proposed underground water and wastewater lines south of FM 546/Harry McKillop Boulevard, and the piers and foundations needed to support the proposed elevated Spur 399 Extension, if constructed. These constraints may influence the location, design, and construction techniques used to implement the proposed trail crossings.

As indicated above, the Purple Alternative includes a 10-foot-wide SUP adjacent to, but separated from, the frontage roads on both sides of the freeway where frontage roads are proposed. The SUPs would connect to existing sidewalks or trails, as applicable, located on public ROW to provide connectivity. The Purple Alternative complies with TxDOT's *Bicycle Accommodation Design Guidance* (adopted April 2, 2021) which also implements U.S. Department of Transportation (USDOT) and FHWA policies regarding bicycle and pedestrian accommodations.

Orange Alternative

The Orange Alternative would not interfere with implementation of the city's proposed Trail Master Plan because most of the new freeway facility would be constructed east of the Airport leaving Airport Drive as it is today. According to the preliminary trails plan depicted in the far-right portion of **Figure 3-12**, no "Greenbelt & Park Trails" would be implemented within the portion of the McKinney Future Parkland adjacent to US 380 where the Orange Alternative would cross. As described under the Purple Alternative, the "Greenbelt & Park Trails" proposed to extend south from Airport Drive and FM 546/Harry McKillop Boulevard through the Wilson Creek Greenbelt would need to pass under the elevated section of the proposed Spur 399 Extension. The constraints described in this area may influence the location, design, and construction techniques used to implement the proposed trail crossings.

The Orange Alternative also includes a 10-foot wide SUP adjacent to but separated from the frontage roads on both sides of the freeway where frontage roads are proposed. The SUPs would connect to existing sidewalks or trails, as applicable, located on public ROW to provide connectivity. Along the portion of the Orange Alternative from CR 317 to US 380, the SUPs would be constructed, although connections to planned trails or other infrastructure would be determined in the future. The Orange Alternative complies with TxDOT's *Bicycle Accommodation Design Guidance* (adopted April 2, 2021), which also implements USDOT and FHWA policies regarding bicycle and pedestrian accommodations.

No-Build Alternative

The No-Build Alternative would make no improvements to existing roadways nor construct new roadways, therefore, no effect on existing or planned bicycle and pedestrian facilities would occur. The No-Build Alternative would not interfere with the City of McKinney's implementation of the proposed Trail Master Plan. The SUPs along frontage roads proposed under the Purple and Orange Alternatives would not be built.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternative would comply with TxDOT's *Bicycle Accommodation Design Guidance* (adopted April 2, 2021), which also implements the USDOTs and FHWA's policies regarding bicycle and pedestrian accommodations. SUPs built along the outside of the frontage roads would link to existing sidewalk

systems and the components of McKinney's City-Wide Trail Master Plan as it is implemented. The design of the SUPs would comply with TxDOT's Roadway Design Manual and guidelines developed by the American Association of State Highway and Transportation Officials (AASHTO) and would comply with the Americans with Disabilities Act (ADA). Providing SUPs with connectivity to existing and planned bicycle and pedestrian systems would comply with the USDOT's policy to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into transportation systems. The SUPs would also support multi-modal use of the corridor for those residents that do not have access to a vehicle.

3.6 Community Impacts

This section summarizes the potential effects of construction of the Purple and Orange Alternatives in comparison to the No-Build Alternative on the communities within the Community Impact Assessment (CIA) Study Area defined by the 2020 census blocks that encompass both Build Alternatives. The CIA Study Area and detailed evaluation of community impacts is further described in the *Community Impacts Assessment Technical Report and Addendum*, included as **Appendix K**.

The CIA Study Area encompasses densely developed portions of the City of McKinney and sparsely developed areas within Collin County. The Lively Hill/La Loma and Central/Mouzon neighborhoods, two historically African American and Mexican/Latin American communities, are immediately west of Airport Drive within the western portion of the CIA Study Area. Additional background information on these neighborhoods is provided in the *Historical Resources Survey Report* in **Appendix L-6.** The neighborhoods include Central/Mouzon, Old Settlers, and Wattley Parks that are the focal points of community activities. Although not directly affected by either Build Alternative, the neighborhoods influence the demographic character of the CIA Study Area.

3.6.1 Demographics

Figure 3-13 summarizes the demographic profile of the CIA Study Area in comparison to that of the City of McKinney and Collin County. Using the 2016–2020 American Community Survey (ACS) 5-year (YR) Estimates, approximately 83 percent or a total of 185 census blocks out of 223 populated census blocks comprising the CIA Study Area have populations ranging from 50 percent to 100 percent minority. One census geography (block group 1, census tract 309.03) within the CIA Study Area shows a median household income below the U.S. Department of Health and Human Services (DHHS) 2022 poverty level of $27,750.

The latitude/longitude coordinates associated with the census data locate the low-income block in the vicinity of the Martin Marietta McKinney Ready Mix, which most likely applies to the High Point Manufactured Home Community south of and adjacent to the ready mix plant. No ROW will be acquired from this community.

Eleven of the 20 block groups that intersect or encompass the CIA Study Area have a minority population of 50 percent or greater, with approximately 65 percent of the minority populations classified as Hispanic. As indicated in **Figure 3-13**, 3 percent to 34 percent of the population in the CIA Study Area have limited English proficiency (LEP), with approximately 1 percent of the total population speaking English "not well" based on the census data reviewed. LEP is discussed in further detail in **Section 3.12**.

Figure 3-13: Demographic Profile of the CIA Study Area

Demographic Characteristics	CIA Study Area (2020)[1]	City of McKinney (2020)[2]	Collin County (2020)[2]
Total Population	16,727	199,177	1,034,730
Race and Ethnicity:			
White	33.6%	71.5%	65.9%
Black or African American	17.5%	11.1%	9.7%
American Indian/Alaskan Native	0.3%	0.4%	0.4%
Asian	3.1%	9.3%	15.7%
Native Hawaiian/Other Pacific Islander	0%	0%	0.1%
Hispanic	41.5%	17.9%	15.3%
Median Household Income	$81,298	$100,775	$100,541
Percent Living Below Poverty	0.7%	10%	9%
Persons w/Limited English Proficiency[3]	3% - 34%	7.5%	9.5%

1 – US Census Bureau 2016-2020 ACS 5-YR Estimates; accessed March 2022
2 – US Census Bureau 2020 Quick Facts, McKinney, Texas and Collin County, Texas; accessed March 2022
3 – 2020 Census data for LEP populations was not available; therefore, 2019 5-YR ACS data is shown

Purple Alternative

Minority census blocks are concentrated in the areas west of SH 5 and Airport Drive and north of FM 546/Harry McKillop Boulevard encompassing the Lively Hill/La Loma and Central/Mouzon neighborhoods. These census blocks are not crossed by the Purple Alternative.

Orange Alternative

Census block 2057 (block group 2, census tract 310.07) south of US 380 has a minority population of approximately 97 percent (total population of 34 persons) and census block 2026 (block group 2, census tract 314.20) has a minority population of approximately 67 percent (total population of 3 persons). The cluster of three potential residential displacements on FM 546 west of Almeta Lane are not within census block 2026. Census block 2057 is contiguous with the McKinney Future Parkland south of US 380 owned by the City of McKinney. Census block 2002 (block group 2, census tract 309.03) has a minority population of approximately 93 percent (total population of 269 persons) and includes the McKinney Airport Center (completed in 2021 and partially occupied) in addition to several undeveloped properties.

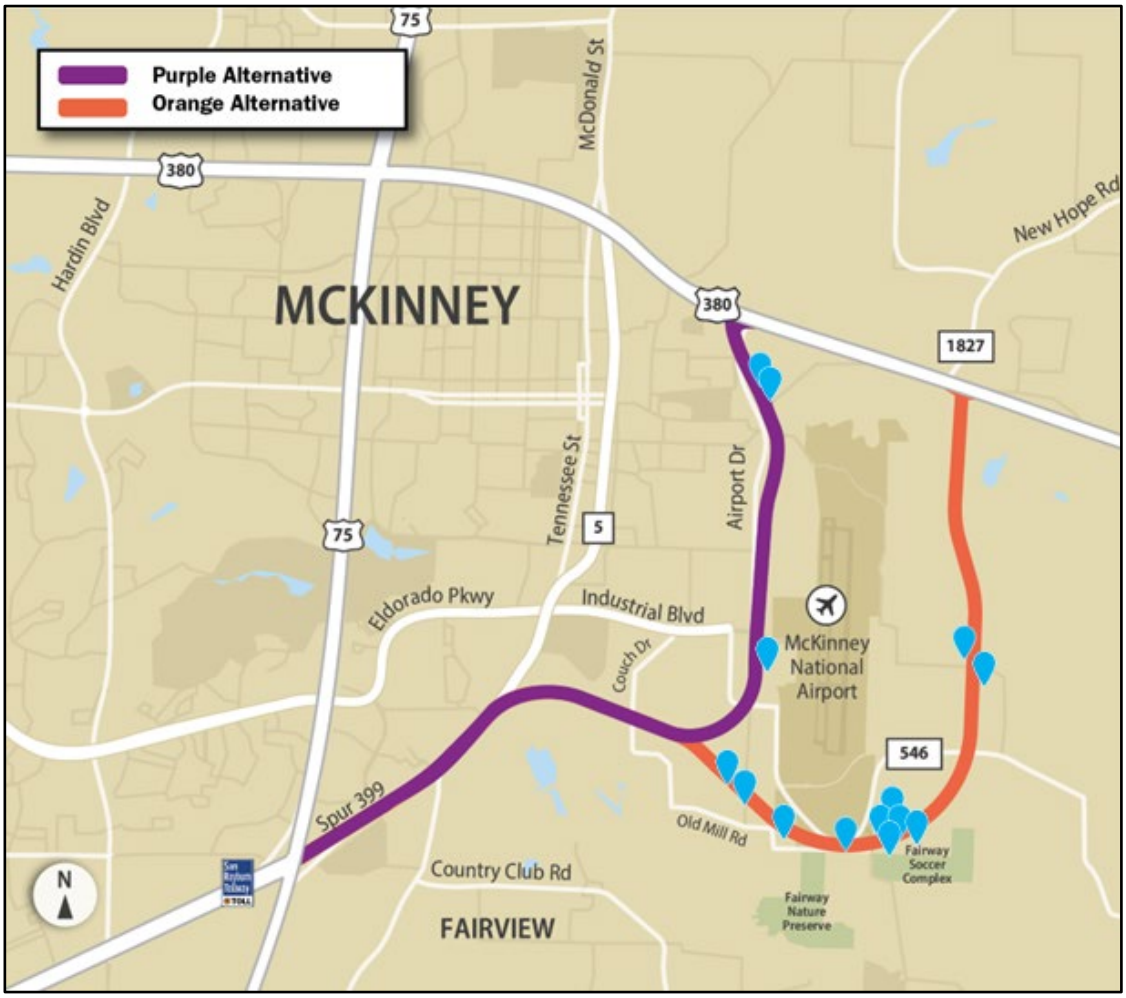
3.6.2 Displacements

Potential residential and business displacements would occur when ROW is acquired for construction of either Build Alternative as summarized in **Figure 3-14**. ROW and displacements are discussed further in **Section 3.1. Figure 3-15** illustrates the general locations of the potential residential and business displacements along the Purple and Orange Alternatives.

Figure 3-14: Comparison of Potential Displacements Resulting from the Purple and Orange Alternatives

Build Alternative	Potential Residential Displacements	Potential Commercial Displacements	Other Potential Displacements
PURPLE ALTERNATIVE	None	Amazon Delivery Station Distribution Warehouse	Barn & Silo (major utility displacements are discussed in Section 3.4)
ORANGE ALTERNATIVE	7	McKinney Airport Center Doc's Plumbing	7 barns/ outbuildings (major utility displacements are discussed in Section 3.4)

Figure 3-15: General Location of Purple and Orange Potential Displacements



Purple Alternative

No residences would be displaced by the Purple Alternative. Construction of the Purple Alternative would potentially displace the Amazon Delivery Station Distribution Warehouse at 1398 Industrial Boulevard, adjacent to the Airport. The western edge of the building, which contains the main office and conduit to support the electric vehicle fleet planned for use at the facility, is in the proposed ROW. With acquisition of the property and removal of the building, access to the remaining portion of the parcel could be maintained, making it available for potential redevelopment with a driveway connecting to the proposed US 380 frontage road along the Airport Drive alignment. The existing driveway access to the property from Industrial Boulevard would remain.

The Amazon Delivery Station Distribution Warehouse opened in late 2021, and employs approximately 700 people representing more than five percent of the workforce in the CIA Study Area. Amazon would attempt to find a suitable alternative site to serve customers and keep the jobs in the area, but locating, developing, and launching such a site could take years, and it may be located outside of McKinney. Amazon has reported an estimated annual property tax revenue of $575,000 to the City of McKinney.[21] The 24-hour Amazon Warehouse operation is key to last mile deliveries within a 45-mile radius of the facility. The location was a strategic choice, and it is one of approximately 25 current or planned locations in the region. According to the McKinney Economic Development Corporation, the Amazon Warehouse has a taxable value of $35,000,000.

The NTMWD North McKinney Lift Station and a barn and silo are in the proposed ROW south of the Trinity River Greenway property and near the proposed tie-in to US 380. NTMWD is currently constructing a Transfer Lift Station and Transfer Force Main adjacent to the North McKinney Lift Station that will provide additional capacity to the same service area. Cost estimates associated with these utility relocations are discussed in **Section 3.4**. The barn and silo are privately held, they do not serve a specific population, and do not appear to be in active agricultural use. TxDOT will continue to coordinate with NTMWD and the City of McKinney as the schematic design progresses to determine if options are feasible to avoid or minimize impacts to the NTMWD infrastructure.

Orange Alternative

Seven residences, two businesses, and seven barns/outbuildings associated with the residences would be potentially displaced by the Orange Alternative. The seven residential displacements include:

- One single-family residence located on Old Mill Road, south of FM 546 and west of CR 317.
- Group of three single-family residences located in the northeast quadrant of the intersection of Old Mill Road and CR 317 associated with the Doc's Plumbing property.
- Group of three single-family residences located on FM 546, west of Almeta Lane.

A search of homes for sale on Zillow.com on December 8, 2021, showed more than 39 homes and/or lots for sale in zip code 75069. Housing on these properties would be comparable, but most would be on single-family lots with no additional acreage.

[21] Letter from Amazon.com Services LLC, Amanda Kearney to Mohamed "Mo" Bur, PE, TxDOT Dallas District Engineer; September 27, 2021.

The Orange Alternative would displace two businesses:

- McKinney Airport Center – New industrial construction, completed in late 2021, at 2182 Country Lane in the southwest quadrant of FM 546/Harry McKillop Boulevard and Country Lane. The property includes two buildings providing multiple suites for mixed-use commercial/light-industrial uses. At the time of this evaluation, the owner is seeking tenants with some of the units occupied. Both buildings are in the proposed ROW.
- Doc's Plumbing – A plumbing business operated out of a single-family residence at 3487 CR 317. The business is in the proposed ROW.

The displaced businesses are not unique to the area. Several industrial parks and plumbing businesses are in the McKinney area. Open/undeveloped properties along and in the vicinity of Airport Drive are owned or leased and either under construction or awaiting development pending development of the Spur 399 Extension Preferred Alternative. Vacant properties located more distant from the Purple Alternative are in private ownership and would require rezoning, the extension of public/private utilities, and other infrastructure investments (e.g., roadway, access, and drainage improvements) to support development.

3.6.3 Access and Travel Patterns

Construction of either Build Alternative would introduce an access-controlled freeway on new location connecting existing RSAs (US 380 and US 75/SH 5) within the CIA Study Area. The new multi-lane freeway would provide additional roadway capacity introducing increased traffic volumes within the Airport Drive industrial area and new traffic within the area east of the Airport. Both Build Alternatives would change established travel patterns by allowing traffic from northern and eastern Collin County traveling on US 380 that currently uses SH 5, US 75, or a combination of Airport Drive/Industrial Boulevard and FM 546/Harry McKillop Boulevard and local streets, to access destinations south of McKinney via an access-controlled freeway directly connecting US 380 and US 75. Either Build Alternative would provide an alternate route for travelers to avoid delays along those existing corridors caused by maintenance, construction, or traffic incidents. Both Build Alternatives would have a posted speed of between 65 and 70 miles per hour (mph) improving travel times compared to those along the existing highways.

Although travel-time studies have not been conducted, it is anticipated the added capacity and higher travel speeds along either Build Alternative would improve travel times for both emergency responders and commuters using these routes. The proposed intersection improvements (including U-turns) along the frontage roads and grade separations would reduce congestion at major cross-streets, thereby allowing emergency vehicles to bypass traffic lights and shorten transit times through the CIA Study Area.

Purple Alternative

The Purple Alternative would maintain access points to communities and destinations adjacent to Airport Drive. Garcia Street, Greenville Road, and Enloe Road would be converted to right-in/right-out connections to the southbound frontage road maintaining access to adjacent neighborhoods. Two private roads serving the Encore Wire property west of Airport Drive would also connect to the southbound frontage road. The new access point created at Garcia Street, just south of US 380, would access the Lively Hill/La Loma and Central/Mouzon neighborhoods west of the Purple Alternative. The Purple Alternative would attract the cut-

through traffic currently traveling through these neighborhoods attempting to avoid congestion along SH 5 and US 75. Removing the cut-through traffic from neighborhood streets should also lessen any interference it may have on access by Collin County Transit, school buses, and emergency responders within those neighborhoods.

To mitigate potential adverse impacts on access and travel patterns, the Purple Alternative includes U-turns along the frontage roads at Stewart Road and signalized intersections and U-turns along the frontage roads at Elm Street and Industrial Boulevard to access businesses, the Airport, and the neighborhoods west of the alignment. No frontage roads would be constructed south of the intersection of Airport Drive and FM 546/Harry McKillop Boulevard. From this intersection and west to the tie-in with SH 5, existing FM 546/Harry McKillop Boulevard would serve as the frontage road.

Along the Common Alignment shared by the Purple and Orange Alternatives within the existing US 75 and SH 5 corridors, additional mainlanes, turn-lanes, exit/entrance ramps, and frontage roads would be incorporated into the existing ROW to connect the proposed Spur 399 Extension improvements to the existing highway. The CIA in **Appendix K** includes a detailed description of the changes in access and travel patterns within the Common Alignment.

Orange Alternative

The Orange Alternative would modify or close access to several local roadways. Access to CR 722/Enloe Road would no longer be available under the Orange Alternative.[22] Travelers on CR 722/Enloe Road driving east and west would connect to the proposed frontage road and proceed to the next available intersection at FM 546 making right-, left-, or U-turns under the freeway to travel in the opposite direction. Direct access to CR 317 and FM 546 would be provided at interchanges and the section of FM 546 along the southern edge of the Airport would be incorporated as part of the proposed frontage road system. Other local roadways – Old Mill Road and Country Lane – south of the Airport Drive industrial area would be connected to the frontage road system and include right- and left-turns and U-turns as indicated in the schematic design to maintain local access. As noted above, the Orange Alternative would include the same improvements within the existing US 75 and SH 5 corridors as the Purple Alternative. **Appendix K** includes a detailed description of the changes in access and travel patterns

3.6.4 Community Cohesion

Most of the community facilities and activity centers identified within the CIA Study Area are within the Lively Hill/La Loma and Central/Mouzon neighborhoods west of Airport Drive and north of Industrial Boulevard. Numerous places of worship, schools, senior centers, parks, a community food pantry, and restaurants are present, and in addition to the related history and age of this community as shared with the study team by a City of McKinney planner, the neighborhoods support a high level of community cohesion. A list of community facilities within the CIA Study Area is provided in **Appendix K**.

[22] According to the Draft EA under review and the Public Notice published for the proposed extension of Runway 18 at the McKinney National Airport, CR 722/Enloe Road would be closed where it enters Airport property on both the east and west sides of the facility. Emergency responder access would be accommodated by the Airport perimeter road system.

Purple Alternative

The Purple Alternative is proposed to follow the alignment of existing Airport Drive, through a developed commercial/light industrial area. The neighborhoods west of Airport Drive are somewhat separated from the roadway corridor by the industrial development. Because the neighborhoods and community facilities are located west of the proposed alignment, construction of the Purple Alternative would not introduce a new barrier would intensify the physical and visual barrier created by Airport Drive by elevating and widening the roadway corridor as a freeway further separating the neighborhoods west of Airport Drive from the Trinity River Greenway and McKinney Future Parkland to the east making it more difficult to access those community facilities. Residents employed at businesses along Airport Drive would be able to get to work using local streets and the frontage road system. SUPs built adjacent to the frontage roads along both sides of the freeway could be used by pedestrians and bicyclists to access the businesses along Airport Drive and parklands near US 380.

The CIA Study Area along the Common Alignment contains a mix of residential uses and densities including a small single-family neighborhood south of El Dorado Boulevard and another, more affluent single-family neighborhood south of Spur 399 on Country Club Lane. This part of the CIA Study Area also contains apartment and condominium complexes (existing and under development), the High Point Manufactured Housing Community, a cluster of senior living communities, the McKinney Medical Center, and part of the Wilson Creek Greenbelt. Cohesion within the individual residential developments is most likely higher than it is across this portion of the CIA Study Area because of the varied mix of land uses and the presence of the SH 5 corridor that bisects the area.

Orange Alternative

Two areas along the Orange Alternative appear to have the potential for high levels of community cohesion – a rural single-family community along Old Mill Road, south of the alignment along FM 546, including a church at FM 546 and CR 722/Enloe Road, and the neighborhood along CR 722/Enloe Road east of the Airport.

Construction of the new location freeway would introduce a roadway where one currently does not exist. These small rural residential developments may see the roadway as a physical and visual barrier and experience a sense of separation from surrounding developments as well as the loss of aspects of their rural quality of life. Although the freeway would provide convenient and efficient access to services (e.g., medical, education, grocery stores, entertainment, etc.) within McKinney and the Dallas Metroplex core, it would introduce traffic noise, exhaust emissions, lighting, and activity that would disrupt the relatively quiet nature of the area. The SUPs built along the frontage roads could be used by pedestrians and bicyclists, but at this time, there are no existing trail or sidewalk systems east of the Airport where connections could be made. As noted above, the Orange Alternative would have little effect on the cohesion of the neighborhoods along the Common Alignment shared with the Purple Alternative.

The Cornerstone Ranch, a community facility that serves special needs adults, is in the southeast corner of the CIA Study Area, adjacent to and south of the Fairview Soccer Complex. The 42-acre facility has a 10,000 square-foot residence that can accommodate seven adults with disabilities and two care giving families. The Fairview Soccer Park property separates this facility from the Orange Alternative, with the main buildings approximately 0.25 mile southeast of the proposed ROW. No changes in access to the facility would occur and the proposed frontage road would tie into FM 546 and CR 317 north and west of the soccer park.

3.6.5 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations". EO 12898 also directs agencies to develop a strategy for implementing environmental justice (EJ).

Environmental justice populations within the CIA Study Area occur mostly west of Airport Drive. Isolated minority census blocks occur south and east of the Airport and one low-income census block group occurs within the CIA Study Area (High Point Manufactured Home Community along SH 5). Neither Build Alternative displaces a business that specifically serves minority or low-income populations. No community facilities would be displaced by construction of either Build Alternative. Neither Build Alternative would displace a low-income residence.

Environmental justice populations within the CIA Study Area would not experience disproportionately high and adverse impacts compared to the impacts borne by non-EJ populations. The proposed project would improve mobility and connectivity and provide access to employment, education, health care, and commerce centers within the core of the Dallas Metroplex for all users of the transportation system. The Orange Alternative would support resiliency and redundancy within the transportation network benefitting all travelers by leaving Airport Drive in place. The inclusion of ADA-accessible SUPs along the outside of the frontage roads would provide connectivity to existing and planned sidewalks and trail networks and support the safe use of alternative modes of travel for those individuals lacking access to a personal vehicle. Neither Build Alternative encroaches into or bisects EJ neighborhoods. None of the residential displacements resulting from the Orange Alternative are located within a minority census block or low-income block group. The Common Alignment of both Build Alternatives includes a noise barrier (Barrier #3 – see **Section 3.14.2.4**) adjacent to the High Point Manufactured Home Community along SH 5 to reduce traffic noise for that neighborhood. This noise barrier is included under the No-Build Alternative with the proposed SH 5 Improvements planned for completion prior to implementation of the Spur 399 Extension project. None of the businesses displaced by either Build Alternative specifically serve low-income or minority populations. Because of the capacity and travel speeds provided by the proposed freeway facility, either Build Alternative would attract traffic that currently cuts through the Lively/La Loma and Central/Mouzon neighborhoods west of Airport Drive, reducing the traffic and safety burden on those minority communities – a result that would not occur with the No-Build Alternative. The Orange Alternative would not alter Airport Drive, therefore access either by vehicle or on foot between the neighborhoods west of Airport Drive and the businesses, employers, and recreational lands east of Airport Drive would be maintained.

3.6.6 Limited English Proficiency

EO 13166*, Improving Access to Services for Persons with Limited English Proficiency*, requires federal agencies to examine the services they provide, identify needs for services to LEP persons, and develop and implement a system to provide LEP persons with meaningful access to those services, including those recipients of federal financial assistance.

According to the census data reviewed, LEP persons in the CIA Study Area primarily speak Spanish (14 percent) and other Indo-European, Asian, and Pacific Island languages. LEP persons comprise 17 percent to 33 percent of the population within the CIA Study Area, with approximately 27 percent of the total population speaking English "less than very well."

Purple Alternative

During the field survey, signs in Spanish and Vietnamese were observed in association with businesses and places of worship in the Lively Hill/La Loma and Central/Mouzon neighborhoods west of the Purple Alternative. A Vietnamese language sign was observed north of the northern terminus of the Purple Alternative associated with the Thượng Hạnh Buddhist Monastery (place of worship). Korean language signs were observed primarily near the southern terminus of the Common Alignment in front of and on buildings within a cluster of places of worship (Good Seed United Methodist Church/First Korean United Methodist Church).

Orange Alternative

Approximately 10 Spanish language signs were observed during the field survey, one east of and adjacent to the alignment associated with the Kingdom Hall of Jehovah's Witnesses/Salon del Reino de los Testigos de Jehova. The Korean language signs associated with the places of worship observed near the project's south terminus also apply to the Orange Alternative.

At the October 2021 public meeting, a Spanish interpreter was available to assist the public. Notices for public involvement efforts were published in English and Spanish and indicated that special accommodations would be made as necessary. In planning for the public hearing, TxDOT will provide notices in Vietnamese in addition to English and Spanish to accommodate the language needs of populations within the Study Area. Vietnamese and Spanish translators will be provided at the public hearing.

3.6.7 Effects on Parcel Values and Development

The City of McKinney and Collin County requested TxDOT conduct an economic analysis to determine the effect the Build Alternatives may have on land use and the approximate change in land value due to the amount of ROW that would be acquired potentially affecting the amount of land available for development. The No-Build Alternative was used as the baseline for comparison of the two Build Alternatives. The No-Build scenario assumed that (1) the change in use of an available parcel was based on the future land use category indicated in the ONE McKinney 2040 Comprehensive Plan, and (2) existing access provided by Airport Drive and FM 546/Harry McKillop Boulevard would be sufficient to support development of land parcels along these roadways whether a freeway was built or not. Under these assumptions the No-Build and Purple Alternative would change the use of adjacent parcels in the same manner because neither alternative would provide new access. The Orange Alternative would potentially cause greater changes in land use in the future over how the land is used today (agriculture) due to the area being planned for industrial and airport-related uses.

After establishing parcel values, the potential change in parcel value was calculated based on the amount of ROW needed from the parcel for either of the Build Alternatives, and the resulting change in its value due to the reduction in parcel size. While the Purple Alternative only had the potential to change or convert parcels adjacent to Airport Drive and FM 546/Harry McKillop Drive, the Orange Alternative had the potential to change or convert additional parcels south and east of the Airport. Although ROW would be taken from some parcels by

the Orange Alternative, the remaining parcel and adjacent parcels were found to increase in value and would result in increased tax revenues coming to the city. Based on this high-level analysis, construction of the Orange Alternative is estimated to result in a net increase in parcel values of approximately $107M in contrast to the net decrease in parcel values of approximately $34M anticipated to result from construction of the Purple Alternative. The Economic Capacity Evaluation Memo is included in **Appendix K**.

3.6.8 Community Impacts Summary

No-Build Alternative

The No-Build Alternative would result in no residential, business, or other relocations, including loss of employment due to displaced businesses. The No-Build Alternative would not result in direct impacts to neighborhoods and community cohesion, public facilities, or bicycle and pedestrian access.

The No-Build Alternative would not result in disproportionately high or adverse impacts to EJ populations. Under the No-Build Alternative, the entire community, including minority and low-income populations, would not experience impacts related to construction and operation of the proposed project. However, the community would also not experience the benefits of decreased traffic congestion, improved mobility, and improved safety conditions resulting from improvements to the transportation network.

Purple Alternative

The Purple Alternative would improve mobility and connectivity for all populations but would intensify the physical and visual barrier created by Airport Drive by elevating and widening the roadway corridor as a freeway further separating the minority communities (Lively Hill/La Loma and Central/Mouzon) west of Airport Drive from the Trinity River Greenway and McKinney Future Parkland east of Airport Drive. By replacing Airport Drive with the freeway facility, additional travel capacity would be lost along with the opportunity to provide resiliency and redundancy within the transportation network. It would not displace any community facilities but would encroach into the Trinity River Greenway property, reducing the land available for future recreational development. The Purple Alternative would include a noise barrier (Barrier #3) adjacent to the High Point Manufactured Home Community along SH 5 to reduce traffic noise for that low-income neighborhood. The noise barrier was proposed as part of the SH 5 Improvements under the No-Build Alternative. The Purple Alternative would improve connectivity for all populations to the employment, education, health care, and commerce centers within the center of the Dallas Metroplex. Land uses may change to a minor degree and parcel values would be reduced because the Purple Alternative does not open access to new developable properties. The Purple Alternative displaces the Amazon Delivery Station Distribution Warehouse on Airport Drive and has the potential to negatively affect the operations of other businesses along Airport Drive.

Orange Alternative - Preferred Alternative

The Orange Alternative would improve mobility and connectivity for all populations while not creating an additional physical and visual barrier between the minority communities (Lively Hill/La Loma and Central/Mouzon) west of Airport Drive and the Trinity River Greenway and McKinney Future Parkland east of Airport Drive. The Orange Alternative would include a noise barrier (Barrier #3) adjacent to the High Point Manufactured Home Community along SH 5 to reduce traffic noise for that low-income neighborhood. The noise barrier was proposed as part of the SH 5 Improvements under the No-Build Alternative. The Orange

Alternative would provide capacity and support resiliency and redundancy within the highway network to improve emergency response times and the efficiency of school bus routes by moving freeway through traffic more efficiently while allowing local traffic to use Airport Drive, US 75, SH 5, and the local street network. The Orange Alternative would improve connectivity for all populations to the employment, education, health care, and commerce centers within the center of the Dallas Metroplex. The Orange Alternative would potentially increase parcel values adjacent to the alignment and promote development and redevelopment that would benefit the city's tax base. The Orange Alternative would not displace any community facilities, or displace or negatively affect the operations of businesses along Airport Drive, but would support regional travel and improve access to existing and planned developments. Outreach will continue predominantly in English with public notices and translation support provided at the public hearing in Spanish and Vietnamese.

3.7 Visual/Aesthetic Impacts

Certain design characteristics (e.g., elevated structures/bridges, roadway signs, and safety lighting) would change the visual/aesthetic character of the Study Area and views from features and of features along each Build Alternative.

Purple Alternative

Beyond the Common Alignment, the Purple Alternative would introduce a new elevated roadway structure south of and parallel to FM 546/Harry McKillop Boulevard between SH 5 and Airport Drive. As illustrated in **Figure 3-16**, the 8-lane freeway would create a substantial signature across the southwest portion of McKinney. The mainlanes would be elevated on structure (open underneath) approximately 18.5 feet above the ground, closer to 24 feet where the freeway would cross the DART line. FM 546/Harry McKillop Boulevard would act as the frontage road system for this section of the freeway, remaining at-grade to connect to local roadways such as Old Mill Road, and to provide access to the NTMWD/McKinney Landfill to the south and nearby businesses.

As the freeway alignment turns north to run along the current alignment of Airport Drive, the mainlanes would remain elevated but most of the roadway would be built on fill material with retaining walls (approximately 18.5 feet-tall) along the frontage roads that would start near the intersection of existing Airport Drive and Old FM 546, just north of Simpson Strong-Tie. Openings under the freeway would be provided to accommodate cross-street connections, including U-turns, to the adjacent frontage roads built at-grade to accommodate local roadway and property access. These openings in the roadway embankment would occur at Industrial Boulevard (north of the Amazon Delivery Station Distribution Warehouse) and (relocated) Elm Street, north of Encore Wire. At Greenville Drive, the freeway would be built on structure to span the East Fork Trinity River floodplain.

Figure 3-16: View of the Purple Alternative from SH 5 to Airport Drive

As shown in **Figure 3-17**, the elevated mainlanes and at-grade frontage roads would continue north along the alignment of Airport Drive transitioning to an at-grade, signalized intersection with US 380. Although the Airport Drive area is built-up and dominated by light-industrial uses (primarily large 2 to 3 story warehouse-type structures and concrete parking lots), the elevated freeway would obstruct views from the Lively Hill/La Loma and Central/Mouzon neighborhoods looking east towards the open lands and wooded areas north of the Airport and within the Trinity River Greenway and the McKinney Future Parkland as these areas gently slope north and east toward the East Fork Trinity River. Users of the Airport and the businesses along the east side of Airport Drive would also have their westerly views obstructed by the freeway. Along the Airport Drive portion of the freeway alignment, safety lighting and signage would be installed per TxDOT design standards, as well as traffic signals at the Industrial Boulevard and Elm Street crossings.

Figure 3-17: View of the Purple Alternative from Airport Drive to US 380

Orange Alternative

Beyond the Common Alignment and like the Purple Alternative, the Orange Alternative would introduce a new elevated roadway structure south of and roughly parallel to FM 546/Harry McKillop Boulevard between SH 5 and the south end of the Airport. As illustrated in **Figure 3-18**, the 8-lane freeway would create a substantial signature past Airport Drive and around the Airport. The mainlanes would be elevated on structure approximately 18.5 feet above the ground from SH 5 to west of Old Mill Road to accommodate local roadway connections to the frontage roads. FM 546/Harry McKillop Boulevard would act as the frontage road system from SH 5 to just west of Airport Drive, where frontage roads would begin to extend along both sides of the mainlanes for the remainder of the freeway to its connection with US 380. The frontage roads would remain at-grade to connect to local roadways such as Country Lane, CR 317, and CR 722/Enloe Road. East of Old Mill Road, the freeway would still be elevated but on an earthen embankment as it curves around the south end of the Airport and turns north toward US 380. Approximately 600 feet north of CR 722/Enloe Road, the freeway and frontage roads would be built on structure to span the broad floodplain associated with the East Fork Trinity River. The freeway and frontage roads would transition to an at-grade, signalized intersection at US 380. Near the middle of the elevated floodplain section, the frontage roads would dip to create an at-grade U-turn under the elevated freeway section.

The elevated freeway would obstruct views from neighboring properties across the alignment in an area that is rural in character, relatively flat, and heavily wooded along tributaries of the East Fork Trinity River. Users of the public lands associated with Lavon Lake to the east may be able to see the freeway from the edges of that property. Users of the Airport would have obstructed views to the east, and residents living east of the Airport would have views both east and/or west obstructed depending on which side of the freeway their property is located. Safety lighting and signage would be installed along the Orange Alternative per TxDOT design

standards. Traffic signals would be installed at the frontage road intersections with Airport Drive/Country Lane, FM 546/CR 317, and FM 546 (as the alignment turns north).

Figure 3-18: View of the Orange Alternative from near Airport Drive to the South end of the Airport

No-Build Alternative

Under the No-Build Alternative, no elevated structures or roadways on new location would be built nor would signage or safety lighting be introduced in areas where roadways do not exist today. However, growth across the county will continue to result in more rooftops, parking lots, shopping centers, and business complexes being built that will need to be served by roads and utilities, changing the visual environment in a much less controlled manner.

Orange Alternative - Preferred Alternative

The Orange Alternative would introduce a new roadway where one does not exist today, creating a substantial change in the visual environment, especially views of the corridor by area residents. The relative flatness of the area is desirable for airport development but lacks the topography that is useful in shielding views and sounds and creating visual softness against a concrete and steel structure. As additional design detail is developed for the Orange Alternative, options to introduce context sensitive solutions into the highway design may be beneficial from a public acceptance standpoint while also helping to blend the facility into the surrounding landscape. Consideration may be given to sustainable landscaping, wildflower planting, and aesthetic treatments to lessen the harshness and increase the visual appeal of the elevated structures, noise barriers, guard rails, etc.

3.8 Cultural Resources

The effects of the proposed project on cultural resources were reviewed under Section 106 of the National Historic Preservation Act (NHPA) in accordance with the Programmatic Agreement among FHWA, TxDOT, the Texas State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) Regarding the Implementation of Transportation Undertakings.

3.8.1 Archeological Resources

This section summarizes the potential effects of the Purple and Orange Alternatives on archeological resources within the Area of Potential Effect (APE). The archeology APE is defined as the footprint of each Build Alternative to the maximum depth of impact, including all easements and project specific locations. The *Archeological Background Study* completed for the Project (provided in **Appendix L-1**) assessed the potential for impacts to archeological resources and cemeteries within the archeology APE and a 150-foot buffer extending from the APE. The Texas Historical Commission (THC) issued Antiquities Permit #30310 to AmaTerra (Principal Investigator Sunshine Thomas) on September 9, 2021 (**Appendix L-2**). The results of archeological surveys where rights-of-entry (right-of-entry) were obtained are provided in the Archeological Survey Report, approved by TxDOT on March 14, 2022, in (**Appendix L-3**) and are summarized below. Potential effects to National Register of Historic Places (NRHP)-eligible cemeteries outside of the archeology APE were also evaluated as part of the historic resources survey effort and are discussed separately in **Section 3.8.3**.

In accordance with the Programmatic Agreement and Memorandum of Understanding (MOU) between TxDOT and the THC (43 TAC §§2.251-2.278), Section 106 Consultation was initiated on April 8, 2022, with submittal of the Archeological Survey Report. On April 22, 2022, the THC concurred with a "no historic properties affected" finding. On October 19, 2021, the Comanche Nation indicated "No Properties" had been identified in their review of the project information compared to their site files. On May 14, 2022, Section 106 Consultation was continued with the federally recognized Tribes with a potential interest in the proposed action. Correspondence is included in **Appendix E**.

Purple Alternative

The *Archeological Background Study* identified one previously recorded archeological site, 41COL168, within the Purple Alternative APE. The site is a historic-age farmstead destroyed by the construction of Airport Drive and was determined not eligible for the NRHP. A site visit during the current survey confirmed profound disturbance from the construction of Airport Drive, underground utility installation, culvert construction, and other drainage improvements. One shovel test was placed within 30 meters (approximately 98.4 feet) of the recorded site boundary, west of the site; however, no cultural materials and no remaining features were observed within the APE. The site is recommended not eligible for inclusion in the NRHP or designation as a State Antiquities Landmark (SAL) as previously determined by the THC.

The *Archeological Background Study* indicated a moderate to high potential for shallowly buried historic era and prehistoric deposits within portions of the Purple Alternative archeology APE. Archeological surveys were recommended for undeveloped portions of the archeology APE with moderate to high shallow archeological potential according to TxDOT's Potential Archeological Liability Map (PALM) that have not been previously surveyed or disturbed. One new archeological site, 41COL358, was identified during the current survey. Site

41COL358 is a late-1960s to early 1970s surface artifact scatter located southeast of FM 546. During the survey, archeologists recorded one rectangular sardine can, one round food can, disarticulated lumber containing wire nails, one grape soda bottle, and approximately 20 beverage cans. The site appears to represent a general discard deposit on the landscape with no evident associated cultural features. Archival research indicates no evidence of occupation on the site, and thus no historic associations with agricultural or community development in the area (Criterion A) or significant individuals (Criterion B). The site does not have qualities that would contribute important information to history (Criterion D). It maintains integrity but does not embody distinctive characteristics of type, period, or construction (Criterion C). The site is recommended not eligible for inclusion in the NRHP or designation as a SAL. The PALM also indicated potential for deeply buried Holocene deposits within the Purple Alternative archeology APE.

Orange Alternative

One previously recorded archeological site, 41COL176, has been documented within the Orange Alternative archeology APE. Site 41COL776 was a historic period farmstead located within the ROW of FM 546. The site was recorded on sloped landform overlooking an area drainage, and recording archeologists noted it lacked integrity due to destruction by mechanical equipment. Previously recorded artifacts included a range of ceramic, glass, and metal materials. Within the current APE, the landform on which the site was located has been cut and excavated for the construction of FM 546, further altered for drainage, and subject to underground utility installation. The site is recommended not eligible for inclusion in the NRHP or designation as a SAL as previously determined by the THC.

Although previous surveys have been conducted along portions of the Orange Alternative archeology APE, most of the areas of high archeological potential have not been previously surveyed. The *Archeological Background Study* indicated a moderate to high potential for shallowly buried historic era and prehistoric deposits within portions of the Orange Alternative archeology APE. Archeological surveys were recommended for undeveloped portions of the archeology APE with moderate to high shallow archeological potential according to TxDOT's PALM that have not been previously surveyed or disturbed. No new archeological sites have been identified within the Orange Alternative archeology APE during the surveys conducted to date. The PALM also indicated potential for deeply buried Holocene deposits within the Orange Alternative archeology APE.

No-Build Alternative

The No-Build Alternative would not involve construction or ROW acquisition; therefore, the No-Build Alternative would have no effect on archeological resources.

Orange Alternative - Preferred Alternative

No archeological sites were identified through surveys conducted to date for the Orange Alternative. Rights-of-entry to approximately 38.1 acres of proposed ROW for the Orange Alternative were denied for the purpose of conducting surficial archeological surveys. Shovel tests would need to be completed for all 38.1 acres prior to initiating construction. Because no rights-of-entry were granted to conduct deep testing in areas of moderate to high potential for deeply buried deposits, deep trenching would need to be conducted across approximately 162.7 acres of the approximate 243.3 acres of new ROW needed for the project. TxDOT would complete the remaining shovel tests and deep testing following issuance of the ROD and after the ROW is acquired for the Orange Alternative. TxDOT would coordinate with the THC regarding potential NRHP eligibility and effects

determinations, if relevant, of any sites found. Following the completion of surveys, in the event unanticipated archeological deposits are encountered during construction, work in the immediate area would cease, and TxDOT archeological staff would be contacted to initiate post-review discovery procedures.

3.8.2 Historic Properties

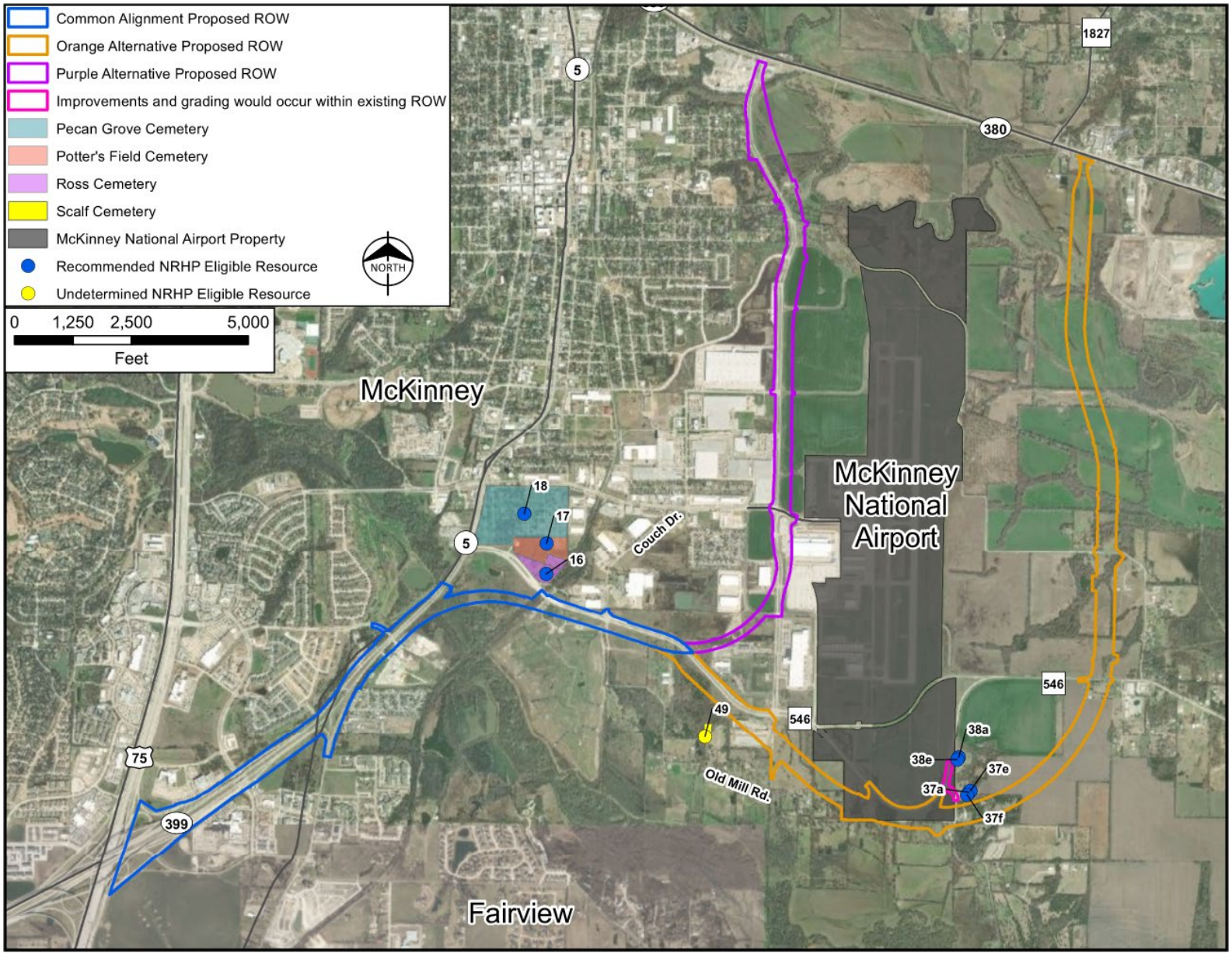
The effects of the Purple and Orange Alternatives on non-archaeological historic resources in the historic resources variable APE are discussed in this section. A Project Coordination Request (PCR) and Historical Studies Research Design were approved by TxDOT ENV in June 2021, initiating the review of historic resources and establishing the variable APE defined for the proposed action. The PCR and Research Design are included in **Appendix L-4** and **Appendix L-5**, respectively. A draft Historical Resources Survey Report (HRSR) was submitted to TxDOT in August 2021. TxDOT comments to the draft HRSR were received September 3, 2021, and a revised HRSR was submitted to TxDOT in November 2021. The revised HRSR (approved December 2, 2021) included in **Appendix L-6** provides the details regarding the HRSR and documentation efforts. The final intensive survey, approved March 18, 2022, is also included in **Appendix L-7**.

A reconnaissance survey conducted within a historic resources variable APE for both Build Alternatives identified a total of 80 individual historic-age resources associated with 49 properties. No NRHP-listed resources or districts and no state-designated resources (Recorded Texas Historic Landmark) were identified within the historic resources variable APE. Five of the properties identified included resources recommended NRHP eligible, including three cemeteries discussed in **Section 3.8.3**. The properties are shown on **Figure 3-19**. The (non-physical) historic resources variable APE for both Build Alternatives extended 300 feet beyond the proposed ROW in areas where a new location roadway was proposd and 150 feet beyond the proposed ROW in areas following an existing roadway (e.g., SH 5), including all parcels partially or wholly therein.

3.8.2.1 NRHP-Eligible Resources

Near the southeast corner of the Airport (see **Figure 3-19**), Resource 37 is a 53-acre agricultural parcel with a ca. 1910 bungalow dwelling (37a), a small ca. 1940 wood-framed outbuilding (37e), and a ca. 1930 concrete storm cellar (37f) recommended NRHP-eligible, and three additional outbuildings (37b-37d) recommended not eligible/non-contributing. The dwelling (37a) represents an intact and significant example of an early-twentieth-century bungalow recommended NRHP-eligible under Criterion C at the local level, in the area of architecture. The small early-twentieth-century outbuilding (Resource 37e) and storm cellar (Resource 37f) are recommended as contributing resources to the recommended NRHP-eligible dwelling.

Figure 3-19: Historic Resources and Cemeteries



Resource 38 is a 39-acre agricultural parcel near the southeast corner of the Airport with a ca. 1900 dwelling (38a), a ca. 1930 concrete storm cellar (38e), and three outbuildings (38b-38d) that are recommended not eligible/non-contributing. The dwelling (38a) represents a significant example of a turn-of-the-century National Folk-style dwelling recommended NRHP-eligible under Criterion C at the local level, in the area of architecture. The associated storm cellar (Resource 38e) is recommended as a contributing resource to the recommended NRHP-eligible dwelling.

The three NRHP-eligible cemeteries, Ross Cemetery (Resource 16), Pecan Grove Memorial Park Cemetery (Resource 18), and Potter's Field Cemetery (Resource 17), are discussed in **Section 3.8.3.**

3.8.2.2 Resources Requiring Intensive Survey

The Enloe Farm (Resources 44a-44g) is a 200-acre family farm associated with early area settler Abe Enloe and in continual agricultural use and single-family ownership for more than 100 years. The property includes a ca. 1870s dwelling (44a), a ca. 1980 equipment shed (44b), a ca. 1920 gabled outbuilding (44c), the remains of a ca. 1940 barn and dairy shed (44d), a ca. 1925 storm cellar (44e), a ca. 1920 well house (44f), 1920 former store/outbuilding (44g) that was relocated to the site from downtown McKinney ca. 1970, and two additional small outbuildings not visible from the ROW. Upon completion of the original survey, Resources 44a-44g were recommended not NRHP eligible due to lack of integrity and significance. The Enloe Farm and adjacent portions of the historic resources APE were also recommended not eligible for NRHP inclusion as a rural historic district or landscape due to lack of integrity and significance. TxDOT concurred the area was not eligible as a landscape; however, they requested additional information and intensive survey of the Enloe Farm property.

The project team met with family members on October 5, 2021, to update them on the study process since receiving several comments regarding the property during public scoping (February-March 2021); spoke with them during the public meeting on October 21, 2021, encouraging them to share information about the history of the property; and has met with them monthly into 2022 as the study proceeds.

With right-of-entry granted by the property owners, TxDOT conducted an intensive survey in February 2022 to further evaluate the Enloe Farm for potential NRHP eligibility. As a result of additional survey and research, on March 17, 2022, TxDOT determined the Enloe Farm was not eligible for listing on the NRHP. While research confirmed the Enloe Farm possesses significance as an early farmstead in Collin County, it no longer retains integrity. The main historic-age residence does not reflect its historic character due to enclosure of the front porch and removal of original windows. Further, a two-story barn, kitchen, smokehouse, the Nell house, and the Enloe School historically located on the property are no longer extant. Therefore, because of the changes to and loss of the buildings historically comprising the farm complex, TxDOT determined the Enloe Farm, while significant, does not retain the integrity needed to convey that significance and thus does not qualify for NRHP inclusion.

Scalf Cemetery, of undetermined NRHP eligibility, is discussed separately in **Section 3.8.3.** Additionally, the historic-age neighborhoods of Lively Hill/La Loma and Central/Mouzon west of Airport Drive are of undetermined NRHP eligibility. Additional research and documentation of these neighborhoods in their entirety (outside of the scope of the reconnaissance-level survey) would be required to fully evaluate the communities for potential NRHP eligibility as a historic district.

Purple Alternative

None of the recommended NRHP-eligible historic resources are within the Purple Alternative historic resources APE; therefore, the Purple Alternative would have no effect on the recommended NRHP-eligible historic properties 37a, 37e, 37f, 38a, and 38e.

Orange Alternative

Recommended NRHP-eligible resources 37a, 37e, 37f, 38a, and 38e are within the Orange Alternative historic resources APE. The resources are on the western portion of both properties adjacent to CR 317 and FM 546 where improvements would be made within the existing ROW of both roadways to connect to the frontage road at a new grade-separation at CR 317. Additionally, ROW would be acquired from both parcels to build the new location portion of the freeway through the eastern portions of both parcels outside of the proposed NRHP boundary of each property. The recommended NRHP-eligible resources would not be demolished, relocated, or otherwise altered by project activities, and the existing tree line on both properties would provide visual screening of the resources from the new freeway. The Orange Alternative would have no adverse effect on NRHP-eligible resources 37a, 37e, 37f, 38a, and 38e.

No-Build Alternative

The No-Build Alternative would not involve construction or ROW acquisition; therefore, the No-Build Alternative would have no effect on historic properties.

Orange Alternative - Preferred Alternative

Although ROW would be needed from the parcels containing NRHP-eligible resources 37a, 37e, 37f, 38a, and 38e, TxDOT determined the NRHP boundaries of these properties are limited to the immediate vicinity of the buildings. Resources 37a, 37e, 37f, 38a, and 38e are separated from the proposed ROW by a dense tree line. The Orange Alternative would not impact the NRHP-eligible buildings directly, or adversely affect their integrity or character-defining features, or require "use" of these resources under Section 4(f). Therefore, no further consideration of historic-age non-archeological resources is required for the Orange Alternative.

3.8.3 Cemeteries

This section summarizes the potential for effects of the Purple and Orange Alternatives on cemeteries. As noted in **Section 3.8.1**, based on additional research conducted on the cemeteries in the historic resources APE, the Ross Cemetery (Resource 16), Pecan Grove Memorial Park Cemetery (Resource 18) (including a Potter's Field – Resource 17) are recommended NRHP-eligible.

Ross Cemetery (Resource 16) dates to ca. 1892 when a 3-acre parcel was established as the "Colored People Cemetery" for African Americans. The cemetery reportedly contains over 1,100 graves, including the burials of African American veterans from Buffalo Soldiers to the Vietnam War. Ross Cemetery was designated as a Historic Texas Cemetery in 2021 and is recommended NRHP-eligible under Criterion A, NRHP Criteria Consideration D, in the areas of community planning and development and ethnic heritage, at the local level.

Pecan Grove Memorial Park Cemetery (Resource 18) represents a nineteenth-century cemetery that remains in active use. The cemetery reflects elements of the Rural Cemetery Movement, a widespread American phenomenon in the mid- to late nineteenth century advocating for the creation of burial grounds in "rural"

areas and for the incorporation of romantic, bucolic settings reminiscent of English country gardens. Pecan Grove Memorial Park Cemetery is recommended NRHP-eligible under Criterion A, NRHP Criteria Consideration D, in the area of community planning and development, and Criterion C, NRHP Criteria Consideration D, landscape architecture, at the local level.

Potter's Field Cemetery (Resource 17) includes a small number of identified markers from the late nineteenth century, but most burials span the decades of the mid- to late twentieth century. It historically served as a burial ground for paupers or indigents. It also contains many Hispanic burials and was known locally as the "Mexican Cemetery." Potter's Field Cemetery is recommended NRHP-eligible under Criterion A, NRHP Criteria Consideration D, in the areas of community planning and development and ethnic heritage, at the local level.

A fourth, Scalf Cemetery (Resource 49), was identified during pre-field records review and coordination with consulting parties. It represents a small cemetery established by the Scalf family, early area settlers, in the mid- to late nineteenth century. The cemetery reportedly contains approximately 37 burials. The last known burial occurred in 1959, but most graves are no longer marked. The cemetery was not visible or accessible during the field survey. Its mapped location is adjacent to but outside of the historic resources APE, but the extent of the cemetery boundary is not known. Therefore, the cemetery boundary may extend into a portion of the historic resources APE. Additional research and documentation would be required to determine if it merits NRHP consideration for its historic associations under Criteria A or C, Criteria Consideration D.

Purple Alternative

All four cemeteries are outside the 150-foot buffer of the archeology APE of the Purple Alternative. Ross Cemetery (Resource 16) and Pecan Grove Memorial Park Cemetery/Potter's Field (Resources 18 and 17) are north of FM 546/Harry McKillop Boulevard and east of SH 5, separated from the proposed Spur 399 Extension alignment and outside of the historic resources APE. No ROW or permanent or temporary easements would be required from them for construction of the Purple Alternative. Construction of the Purple Alternative would have no effect on the three recommended NRHP-eligible properties. Scalf Cemetery (Resource 49) is not within or adjacent to the alignment of the Purple Alternative and would not be affected.

Orange Alternative

The three accessible cemeteries are outside the 150-foot buffer of the archeology APE of the Orange Alternative. Ross Cemetery (Resource 16) and Pecan Grove Memorial Park Cemetery/Potter's Field (Resources 18 and 17) are north of FM 546/Harry McKillop Boulevard and east of SH 5, separated from the proposed Spur 399 Extension alignment and outside of the historic resources APE. No ROW or permanent or temporary easements would be required from them for construction of the Orange Alternative. Scalf Cemetery (Resource 49) is approximately 400 feet beyond the southern extent of the archeology APE and outside of the historic resources APE of the Orange Alternative, but because the extent of the cemetery is not known, it may extend into the (non-physical) historic resources APE of the Orange Alternative. Construction of the Orange Alternative would have no effect on Ross Cemetery and Pecan Grove Memorial Park Cemetery/Potter's Field and should have no effect on Scalf Cemetery.

No-Build Alternative

The No-Build Alternative would not involve construction or ROW acquisition; therefore, the No-Build Alternative would have no effect on cemeteries.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternative would not require ROW from Ross Cemetery, Pecan Grove Memorial Park, or Potter's Field Cemetery. Although it is not anticipated to affect Scalf Cemetery because of its location approximately 400 feet beyond the southern extent of the archeology APE (and estimated to be approximately 350 feet beyond the proposed ROW), additional investigation to confirm the boundaries of Scalf Cemetery may be conducted if right-of-entry can be obtained before issuance of the ROD. If right-of-entry can be obtained, the results of that effort and NRHP assessment of the Scalf Cemetery would be included in the FEIS, otherwise it would be assessed following issuance of the ROD if changes are made to the Orange Alternative in the vicinity of the Scalf Cemetery.

3.9 Protected Lands

Protected lands include the following property types:

- **Section 4(f) properties** include publicly owned, significant and accessible parks, recreation areas, and wildlife and waterfowl refuges; and significant historic and archeological sites, regardless of whether they are publicly or privately owned. [Section 4(f) of the Department of Transportation Act]
- **Section 6(f) properties** were acquired or developed, partially or wholly, with Land and Water Conservation Fund (LWCF) assistance from the National Park Service. [Section 6(f) of the Land and Water Conservation Fund Act]
- **Chapter 26 properties** are parks, recreation areas, scientific areas, wildlife refuges, or historic sites used for public recreational purposes at the time of the proposed TxDOT project. [Chapter 26 of the Texas Parks and Wildlife Code]

Three properties within and adjacent to the Spur 399 Extension Project Area meet the definitions of protected public lands and recreational facilities described in this section. No historic or archeological sites protected under Section 4(f) are in the Project Area. **Figure 3-20** lists these properties and indicates the regulatory protections that apply along with the anticipated impacts resulting from the proposed project. The locations of these properties are depicted in **Figure 3-21** and on the Resource-Specific Maps for the Purple and Orange Alternatives provided in **Appendix D**.

Figure 3-20: Protected Lands in the Spur 399 Extension Study Area

Publicly Owned Lands and Recreational Facilities Within Project Area	Section 4(f) Property	Section 6(f) Property	Chapter 26 Property	Alternative Potentially Affecting the Property	Resulting Use under Section 4(f)?
Wilson Creek Greenbelt	YES	NO	YES	Purple Alternative Orange Alternative	YES
Trinity River Greenway	YES	NO	NO	Purple Alternative	YES
Future McKinney Parkland	YES	NO	NO	Purple Alternative Orange Alternative	NO
Fairview Soccer Park[1]	NO	NO	NO	Orange Alternative	NO
Fairview Nature Preserve[1]	NO	NO	NO	Orange Alternative	NO

1 - Fairview Soccer Park and Fairview Nature Preserve are owned by the Town of Fairview. Neither property is open for public use.

3.9.1 Section 4(f) of the Department of Transportation Act of 1966

3.9.1.1 Public Park and Recreational Facilities Protected by Section 4(f)

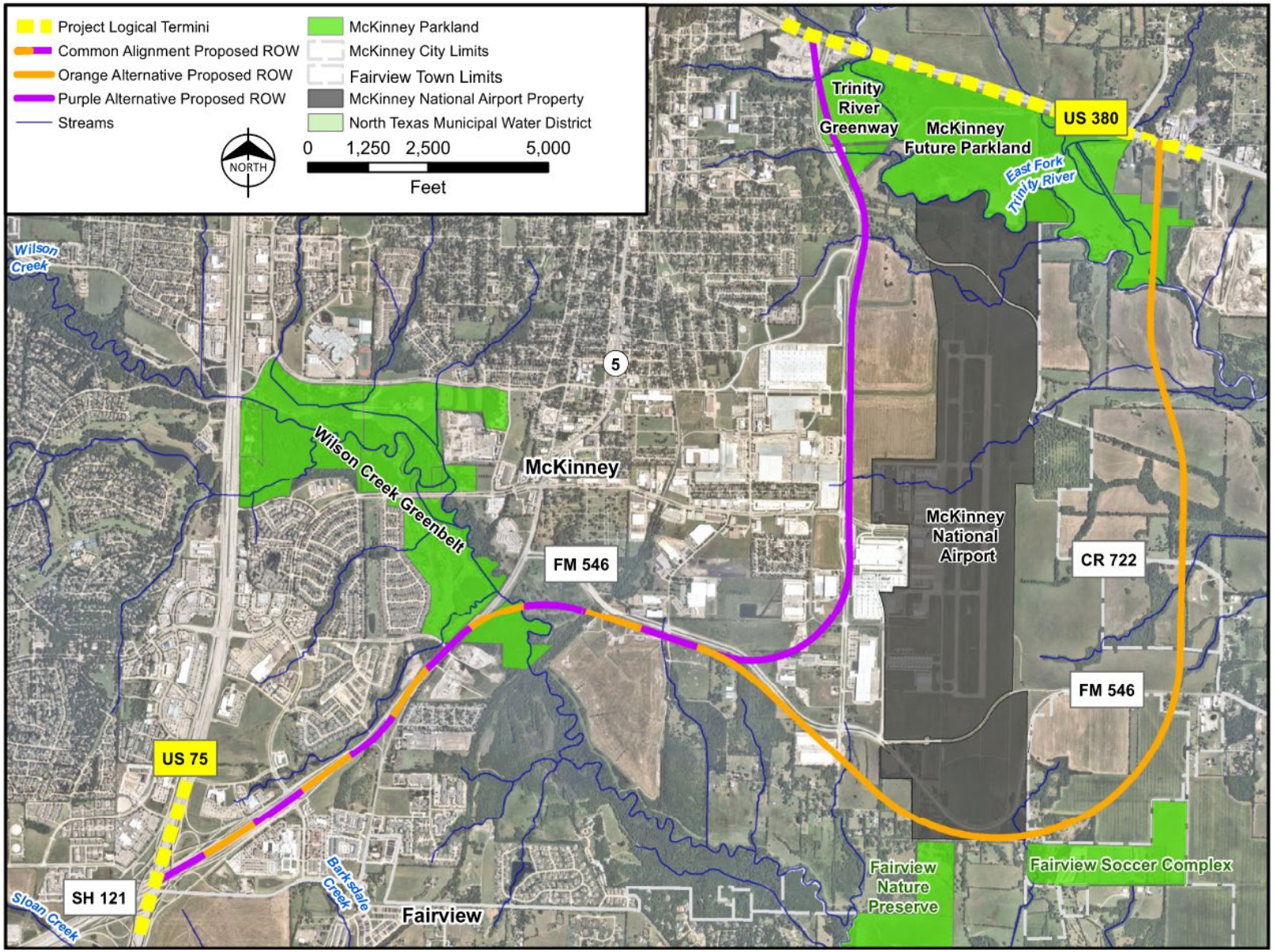
Wilson Creek Greenbelt, Trinity River Greenway, and the McKinney Future Parkland listed in **Figure 3-20** are the only publicly owned properties within or adjacent to the Purple and Orange Alternatives. All three properties are owned by the City of McKinney and are either currently in recreational use or planned for such use in the future.

Purple Alternative

The Common Alignment section of the Purple and Orange Alternatives crosses a 27.4-acre tract of land within the Wilson Creek Greenbelt adjacent to and east of SH 5. Construction of the Purple Alternative would be on structure over approximately 7.0 acres of land currently in public recreational use to provide a transportation use; therefore, resulting in a "use" under Section 4(f). This section of the Purple Alternative would be built on an elevated structure (e.g., bridge) to tie into the elevated SH 5 alignment. The use of the Wilson Creek Greenbelt parcel is considered minimal or *de minimis* as it would not affect the features, attributes, or activities that qualify the property for protection under Section 4(f).

The Trinity River Greenway property is unimproved but reserved by the City of McKinney for future public recreational use as future demand warrants. The property totals approximately 55.2 acres, with approximately 46.6 acres owned by the City of McKinney (north of Greenville Road) and approximately 8.6 acres owned by the NTMWD (see **Figure 3-22**). The city-owned portion south of Greenville Road contains the NTMWD North McKinney Lift Station discussed in **Section 3.4**. The city has no immediate plans for developing the property but is considering its suitability for a future indoor sports facility. The Purple Alternative would acquire approximately 13.2 acres of ROW from the total greenway property resulting in a "use" under Section 4(f).

Figure 3-21: Map of Protected Lands in the Spur 399 Extension Study Area



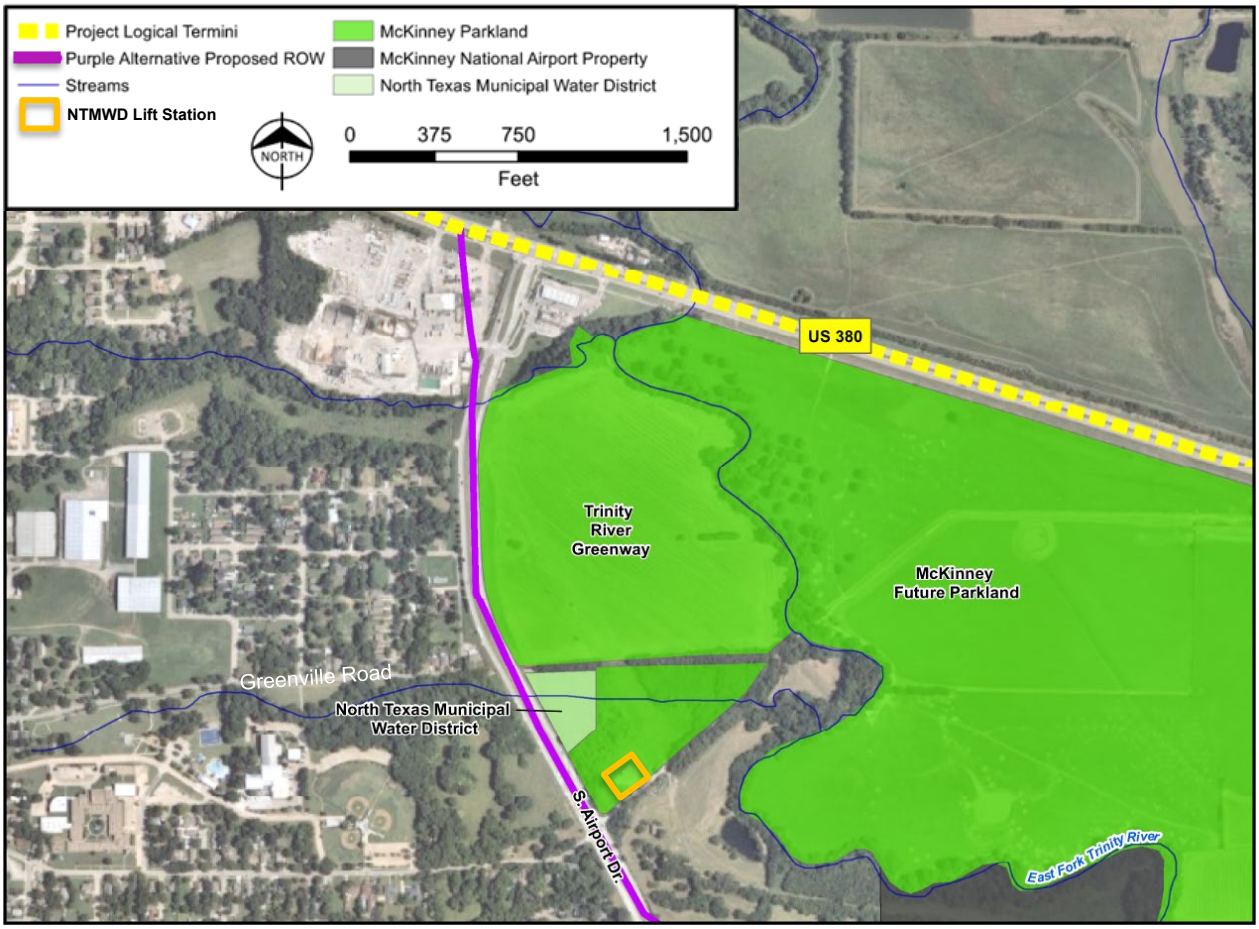
The use of the Trinity River Greenway is considered minimal or *de minimis* as it would not affect the features, attributes, or activities that qualify the property for protection under Section 4(f).

For both the Wilson Creek Greenbelt and the Trinity River Greenway, coordination with the City of McKinney as the Official with Jurisdiction over both Section 4(f) will continue to obtain written concurrence on the *de minimis* findings for the Purple Alternative, if needed, prior to issuance of the ROD. TxDOT and the City of McKinney will consider any public comments received on this DEIS prior to making a final *de minimis* determination.

Orange Alternative

As described under the Purple Alternative, construction of the Orange Alternative would affect the same parcel of the Wilson Creek Greenbelt, crossing on structure over approximately 7.0 acres of land currently in public recreational use to provide a transportation facility; thereby, resulting in a "use" under Section 4(f). The use of the Wilson Creek Greenbelt parcel is considered minimal or *de minimis* as it would not affect the features, attributes, or activities that qualify the property for protection under Section 4(f).

Figure 3-22: Trinity River Greenway Ownership



The approximately 301.3-acre "Douglas Tract" portion of the McKinney Future Parkland carries a Blanket Easement providing for *the continuous ingress and egress in, upon, over, and across [an identified*

tract]…together with the right to…perpetually maintain a future roadway's intersection with US Highway 380.[23] Although the Orange Alternative would require approximately 15.3 acres of the future parkland to construct the roadway, this Blanket Easement designates a portion of the property for transportation use, therefore, construction of the Orange Alternative across the Douglas Tract portion of the McKinney Future Parkland property would not result in a "use" under Section 4(f). The city has no immediate plans to develop the McKinney Future Parkland property, but may consider developing hike/bike trails and other improvements as the need arises.[24]

The Orange Alternative takes minimal amounts of ROW from the Fairview Soccer Park and Fairview Nature Preserve (0.29 acres and 0.04 acres, respectively), both owned by the Town of Fairview. The Fairview Soccer Park is leased to AYSES Soccer Club, an elite soccer association that uses the facility for practices and tournaments. The property is not open to the public. The Fairview Nature Preserve is fenced, gated, and not accessible to the public. The Town of Fairview is considering future public use of the nature preserve property, but has yet not made a decision.[25] Because neither Fairview-owned property is open for use by the public, protection under Section 4(f) does not apply.

Historic Resources Protected by Section 4(f) – Four non-archeological historic properties are within the physical and non-physical APE for the Orange Alternative.

Purple Alternative

The Purple Alternative would not result in the "use" of any historic resources protected under Section 4(f).

Orange Alternative

Two properties determined to contain non-archeological historic resources recommended eligible for listing on the NRHP are in the APE for the Orange Alternative as described in further detail in **Section 3.8**. The two properties, referred to a Resource 37 and Resource 38 contain domestic dwellings and associated outbuildings. The recommended NRHP-eligible resources – 37a, 37e, 37f, 38a, and 38e – are adjacent to CR 317 and FM 546 where improvements would be made within the existing ROW of both roadways to accommodate connections to the proposed Orange Alternative. No new ROW would be acquired from the NRHP-eligible portion of either property. Therefore, no adverse effect would occur under Section 106 and no "use" would occur nor would a *de minimis* determination be applicable under Section 4(f).

The Scalf Cemetery (Resource 49) may extend into the non-physical APE for the Orange Alternative as described in **Section 3.8**. The presumed boundary of the cemetery is approximately 400 feet away from the Orange Alternative and no ROW would be acquired from the property. Therefore, no adverse effect is anticipated under Section 106, and no "use" would occur nor would a *de minimis* determination be applicable under Section 4(f).

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23 McKy East Fork (Douglas) – Blanket Easement, 10/18/2013. A copy of the covenant is included in **Appendix M-1**

24 Input received from Jenny Baker, Parks Planning & Development Manager, City of McKinney, Parks & Recreation Department, August 23, 2021.

25 Email from Julie Couch, Town Manager, Town of Fairview TX; December 3, 2021.

No-Build Alternative

The No-Build Alternative would not result in construction or the acquisition of ROW, therefore, the No-Build Alternative would have no impact on properties protected under Section 4(f).

Orange Alternative - Preferred Alternative

The Orange Alternative would result in a *de minimis* Section 4(f) for the crossing on an elevated structure over the Wilson Creek Greenbelt. Based on the schematic design layout of the bridge piers/columns through the greenbelt parcel, the structure would occupy approximately 974 square feet within the greenbelt parcel between existing SH 5 ROW and the Wilson Creek channel. The trail and other improvements within the greenbelt parcel would be avoided. No connections between the trail and the Spur 399 Extension or SH 5 would be constructed so the greenbelt would not be accessible from the freeway. With the Blanket Easement in place, the acquisition of ROW from the McKinney Future Parkland property would not result in a "use" under Section 4(f). As described in **Section 3.5**, SUPs constructed along the frontage roads to be built east of Airport Drive may provide opportunities to increase connectivity to other city parks and trails.

3.9.2 Section 6(f) of the Land and Water Conservation Fund Act

As presented in **Figure 3-20**, none of the public park or recreational facility properties in the Spur 399 Extension Project Area were acquired or developed using Land and Water Conservation Funds. Therefore, the Build Alternatives considered, the No-Build Alternative, and the Preferred Alternative would have no effect on Section 6(f) properties.

3.9.3 Chapter 26 of the Texas Parks and Wildlife Code

Purple and Orange Alternatives

As described in **Section 3.9.1**, the Common Alignment portion of the Purple and Orange Alternatives crosses part of the Wilson Creek Greenbelt adjacent to and east of SH 5. The subject parcel is currently developed with trails and used for recreational purposes. None of the other publicly owned park parcels affected by either Build Alternative are in current public use. Therefore, both the Purple and Orange Alternatives would affect a property protected under Chapter 26.

As part of both the Chapter 26 and Section 4(f) processes, the project team would continue to coordinate with the City of McKinney as the Official with Jurisdiction to obtain their written concurrence on the Section 4(f) *de minimis* finding and to resolve any design issues that could further reduce impacts to the Wilson Creek Greenbelt parcel prior to issuance of the ROD.

No-Build Alternative

The No-Build Alternative would not result in construction or the acquisition of ROW from any property in public use; therefore, the no-Build Alternative would have no effect on properties protected under Chapter 26.

Orange Alternative - Preferred Alternative

Two public park and recreational facility properties protected by Section 4(f) are within the proposed ROW of the Preferred Alternative, but construction of the Preferred Alternative would not result in a Section 4(f) "use" of the "Douglas Tract" portion of the McKinney Future Parkland, and would result in only a *de minimis* use to a

portion of the Wilson Creek Greenbelt. This portion of the Wilson Creek Greenbelt is also protected under Chapter 26. This section of the Preferred Alternative would cross the Wilson Creek Greenbelt on-structure, avoiding impacts to existing trail improvements, and supporting connectivity to other parklands. As the schematic design progresses for the Orange Alternative, further design refinements would be considered that could further reduce the use of or impacts to the greenbelt. Construction of the Orange Alternative would avoid any use of the Trinity River Greenway, therefore avoiding disruption of any future planned recreational development of that property by the City of McKinney.

Two historic resources (Resource 37 and Resource 38) protected under Section 4(f) are within the APE of the Orange Alternative, while its construction would not result in a use or adverse effect to these resources. The Scalf Cemetery may extend into the non-physical APE of the Orange Alternative, but the presumed boundary of the cemetery is approximately 400 feet away from the southern limit of the proposed ROW needed for construction of the Orange Alternative. The evolving schematic design of the Orange Alternative would take into consideration the existing and proposed improvements within the Wilson Creek Greenbelt parcel to minimize conflicts.

3.10 Water Resources

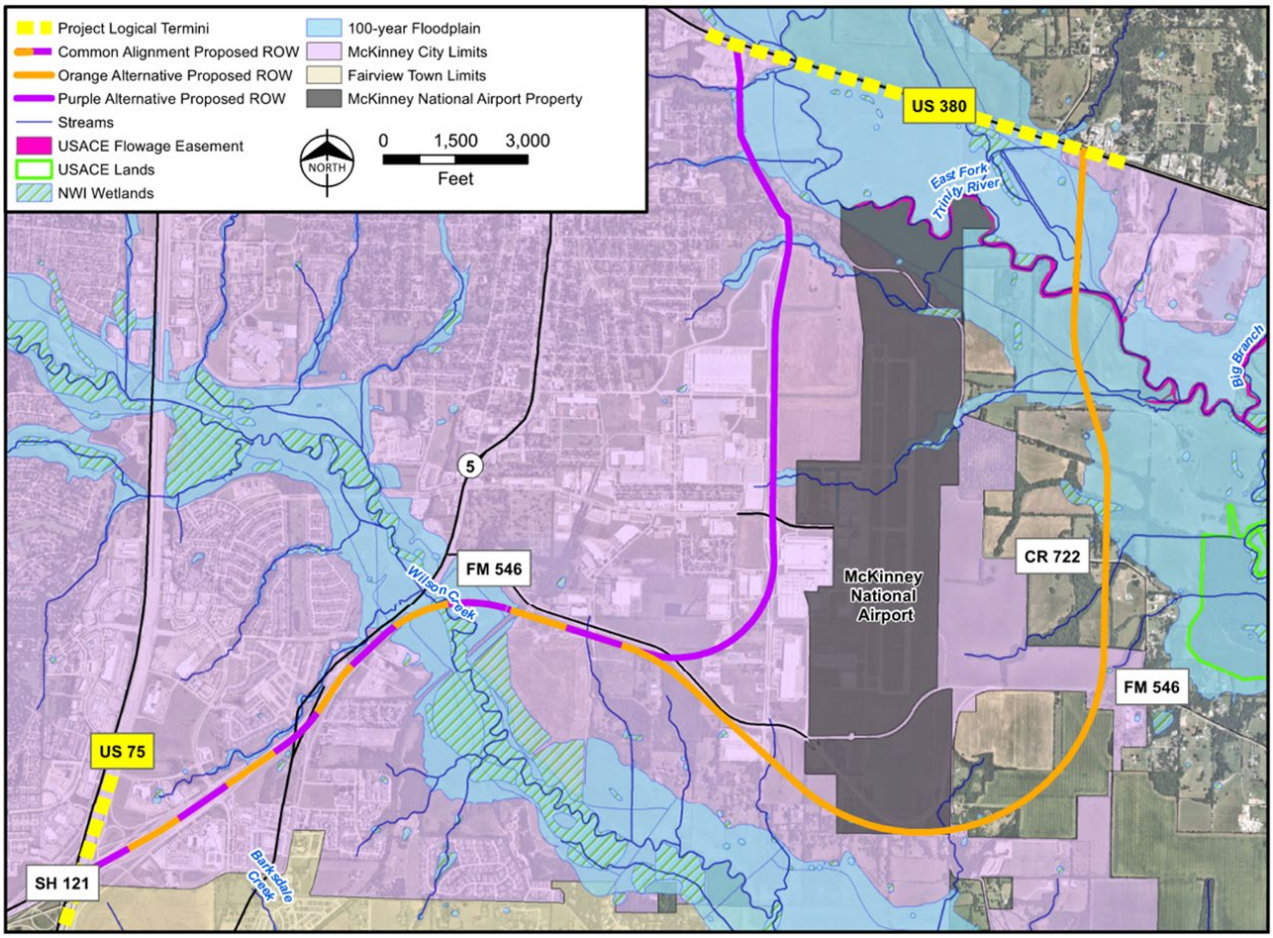
This section discusses and compares the potential impacts to water resources, including surface water, groundwater, wetlands, coastal resources, and floodplains for the alternatives considered.

Hydrologic Setting - The Study Area is located within the Southwestern Prairies Cotton and Forage Land Resource Region of the Great Plains; more specifically located in Major Land Resource Area 86A (Texas Blackland Prairie, Northern Part). It is characterized by level to gently sloping and dissected plains with steep slopes along river and creek valleys, meander belts associated with major streams, and wide floodplains along stream terraces (NRCS, 2006). Geology in this area consists of Cretaceous chalk, claystone, marl, and shale with Quaternary alluvium deposits within the floodplains and terraces of major drainages.

The northern portion of the Study Area is within the East Fork Trinity River-Lake Lavon Watershed, Clemons Creek-East Fork Trinity River Sub Watershed; and the southern portion of the Study Area is within the Wilson Creek Sub Watershed, of the Trinity River Basin (Hydrologic Unit Code 8: 12030106). The Study Area consists of existing ROW, residential development, pastures, rangelands, and forested and emergent wetlands.

Wetlands and Surface Waters - TxDOT field delineated water features on August 28; September 8, 10, 11, 24, 25; October 12, 13, 14, 15; and December 1 and 3, 2020; and June 8, August 16, and September 22, 2021. The delineations were performed to evaluate water features and identify their boundaries within the Environmental Footprint, and conducted according to the applicable USACE regulatory guidance. Wetlands were classified according to the Cowardin Classification System used for the USFWS's National Wetlands Inventory (NWI). The Study Area contains ephemeral, intermittent, and perennial stream tributaries, palustrine forested and emergent wetlands, open water features (e.g., ponds), excavated upland ponds, swales, ditches, water-filled depressions associated with road construction, and stormwater retention ponds and wetlands, some of these features are visible on **Figure 3-23**. The Water Features Delineation Report is provided in **Appendix N**.

Figure 3-23: Water Resources within the Spur 399 Extension Study Area



As illustrated in **Figure 3-23**, the USACE maintains a flowage easement along a section of the East Fork Trinity River through the Study Area (pink area along the channel) allowing them to maintain water flow to Lavon Lake, the main body of which is approximately three miles southeast of the Study Area. See **Section 3.10.4** for further discussion of the flowage easement.

Floodplains and Floodways – Low-lying lands along the East Fork Trinity River and Wilson Creek are subject to flooding. The Federal Emergency Management Agency (FEMA) has delineated the base floodplain elevation and floodways along both of these streams within the Study Area as shown on **Figure 3-23** and discussed further in **Section 3.10.7**.

Other Water Resources - No navigable waterways cross the Study Area. No coastal resources or protected aquifers or recharge areas are in the Study Area.

3.10.1 Clean Water Act Section 404

Purple and Orange Alternatives

Construction of either Build Alternative would involve activities within waters regulated under Section 404 of the Clean Water Act, otherwise referred to as Waters of the United States (WOTUS). **Figure 3-24** (Purple Alternative) and **Figure 3-25** (Orange Alternative) indicate the water features anticipated to be jurisdictional

under Section 404 were evaluated for a regulated activity (e.g., placement of dredged or fill material) based on the conceptual schematic design for each alternative. It also indicates whether the impacts are anticipated to be authorized under a non-reporting nationwide permit (i.e., no pre-construction notification required), or if it is anticipated that a nationwide permit (NWP) with pre-construction notification (PCN), Individual Standard Permit, Letter of Permission, or Regional General Permit would be required. **Figure 3-24** and **Figure 3-25** list the water features associated with each Build Alternative and are also illustrated in Attachment 1, Figures 8-1 through 8-14 of the Water Features Delineation Report provided in **Appendix N**.

Figure 3-24: Water Features within the Purple Alternative

PURPLE ALTERNATIVE Crossing Number	Name of the Water Feature	Water Feature Type	Water Feature Location (Lat/Lon)	Covered by Non-reporting NWP under Section 404?	NWP w/PCN, Individual Standard Permit, Letter of Permission, or Regional General Permit under Section 404?
CROSSING 1					
1A	3*	Ephemeral stream	33.161168, -96.641351	N/A	N/A
1B	4*	Ephemeral Stream	33.166914, -96.630355		
CROSSING 2					
2	5	Ephemeral Stream	33.164526, -96.642213	N/A	N/A
CROSSING 3					
3A	6A*	Intermittent stream	33.166753, -96.630500	N/A	N/A
3B	7*	Ephemeral stream	33.170044, -96.628353		
CROSSING 4					
4A	6B*	Intermittent stream	33.164761, -96.631175	N/A	N/A
4B	8*	Ephemeral stream	33.169584, -96.626335		
4C	9*	Perennial stream	33.170896, -96.626128		
4D	10A	Perennial stream	33.171331, -96.625606		
CROSSING 5					
5A	12	Ephemeral stream	33.172715, -96.622777	Yes	No
5B	13	Pond/Impoundment	33.172422, -96.622261		

Figure 3-24 continued: Water Features within the Purple Alternative

PURPLE ALTERNATIVE Crossing Number	Name of the Water Feature	Water Feature Type	Water Feature Location (Lat/Lon)	Covered by Non-reporting NWP under Section 404?	NWP w/PCN, Individual Standard Permit, Letter of Permission, or Regional General Permit under Section 404?
CROSSING 6					
6A	10B	Perennial stream	33.172031, -96.622076	Yes	No
6B	14	Perennial stream	33.173425, -96.621130		
6C	15	Intermittent stream	33.172391, -96.620405		
CROSSING 7					
7A	16	Palustrine emergent wetland	33.172833, -96617456	No	NWP 14 with PCN
7B	17	Palustrine forested wetland	33.172524, -96.617385		
7C	18	Intermittent stream	33.172691, -96.615773		
CROSSING 8					
8	20	Ephemeral stream	33.170985, -96.610544	Yes	No
CROSSING 9					
9	21	Intermittent stream	33.179995, -96.597478	Yes	No
CROSSING 10					
10	25	Intermittent stream	33.193435, -96.596189	Yes	No
CROSSING 11					
11	26	Perennial stream	33.195836, -96.593573	N/A	N/A
CROSSING 12					
12	27*	Ephemeral stream	33.196549, -96.597218	N/A	N/A
CROSSING 13					
13A	30	Ephemeral stream	33.197814, -96.597755	No	NWP 14 with PCN
13B	32	Palustrine forested	33.197805, -96.597506		
13C	33	Ephemeral stream	33.198135, -96.597761		
13D	34	Palustrine forested	33.198125, -96.597553		

Figure 3-24 continued: Water Features within the Purple Alternative

PURPLE ALTERNATIVE Crossing Number	Name of the Water Feature	Water Feature Type	Water Feature Location (Lat/Lon)	Covered by Non-reporting NWP under Section 404?	NWP w/PCN, Individual Standard Permit, Letter of Permission, or Regional General Permit under Section 404?
CROSSING 13 continued					
13E	35*	Ephemeral stream	33.198151, -96.597863		
CROSSING 14					
14A	36	Intermittent stream	33.198516, -96.598396	Yes	No
14B	37*	Intermittent stream	33.198439, -96.599698		
CROSSING 15					
15A	38*	Perennial stream	33.202213, -96.600338		
15B	39	Perennial stream	33.202817, -96.598338	No	NWP 14 with PCN
15C	40	Perennial stream	33.203347, -96.596554		
CROSSING 16					
16	41	Intermittent stream	33.204744, -96.598906	N/A	N/A
CROSSING 17					
17A	46*	Intermittent stream	33.200781, -96.584406		
17B	47	Intermittent stream	33.199761, -96.584386	N/A	N/A
17C	49	Ephemeral stream	33.199615, -96.583051		
CROSSING 18					
18A	50*	Intermittent stream	33.198593, -96.579630	N/A	N/A
18B	51	Intermittent stream	33.199136, -96.578274		

*Photo-interpreted
N/A Not applicable
Because the impacts provided in the table are based on the Geometric Schematic Design submitted January 2022, and permitting will occur after the design is further refined, permitting needs may change. All necessary permits will be obtained based on the final design. SOURCE: Spur 399 Extension Water Features Delineation Report, April 2022

Approximately 9.5 acres of water features, including streams, are mapped within the Environmental Footprint (an area initially established to identify water features that is larger than the proposed ROW) evaluated for the Purple Alternative, including Wilson Creek and the East Fork Trinity River and their respective tributaries.

Figure 3-25: Water Features within the Orange Alternative

ORANGE ALTERNATIVE Crossing Number	Name of the Water Feature	Water Feature Type	Water Feature Location (Lat/Lon)	Covered by Non-reporting NWP under Section 404?	NWP w/PCN, Individual Standard Permit, Letter of Permission, or Regional General Permit under Section 404?
CROSSING 1					
1A	3*	Ephemeral stream	33.161168, -96.641351	N/A	N/A
1B	4*	Ephemeral Stream	33.166914, -96.630355		
CROSSING 2					
2	5	Ephemeral Stream	33.164526, -96.642213	N/A	N/A
CROSSING 3					
3A	6A*	Intermittent stream	33.166753, -96.630500	N/A	N/A
3B	7*	Ephemeral stream	33.170044, -96.628353		
CROSSING 4					
4A	6B*	Intermittent stream	33.164761, -96.631175	N/A	N/A
4B	8*	Ephemeral stream	33.169584, -96.626335		
4C	9*	Perennial stream	33.170896, -96.626128		
4D	10A	Perennial stream	33.171331, -96.625606		
CROSSING 5					
5A	12	Ephemeral stream	33.172715, -96.622777	Yes	No
5B	13	Pond/Impoundment	33.172422, -96.622261		
CROSSING 6					
6A	10B	Perennial stream	33.172031, -96.622076	Yes	No
6B	14	Perennial stream	33.173425, -96.621130		
6C	15	Intermittent stream	33.172391, -96.620405		

Figure 3-25 continued: Water Features within the Orange Alternative

ORANGE ALTERNATIVE Crossing Number	Name of the Water Feature	Water Feature Type	Water Feature Location (Lat/Lon)	Covered by Non-reporting NWP under Section 404?	NWP w/PCN, Individual Standard Permit, Letter of Permission, or Regional General Permit under Section 404?
CROSSING 7					
7A	16	Palustrine emergent wetland	33.172524, -96.617456	No	NWP 14 with PCN
7B	17	Palustrine forested wetland	33.172524, -96.617385		
7C	18	Intermittent stream	33.172691, -96.615773		
CROSSING 8					
8	20	Ephemeral stream	33.170985, -96.610544	Yes	No
CROSSING 9					
9	52*	Ephemeral stream	33.164171, -96.598187	No	NWP 14 with PCN
CROSSING 10					
10A	57	Ephemeral stream	33.158742, -96.586122	Yes	No
10B	58*	Ephemeral stream	33.159099, -96.586518		
10C	59	Ephemeral stream	33.157379, -96.585613		
10D	60*	Ephemeral stream	33.156620, -96.586265		
CROSSING 11					
11A	62	Ephemeral stream	33.168470, -96.575379	No	NWP 14 with PCN
11B	63	Ephemeral stream	33.168889, -96.575029		
CROSSING 12					
12A	65	Perennial stream	33.173965, -96.575261	No	NWP 14 with PCN
12B	66	Ephemeral stream	33.173355, -96.575367		
12C	67	Ephemeral stream	33.173500, -96.576277		

Figure 3-25 continued: Water Features within the Orange Alternative

ORANGE ALTERNATIVE Crossing Number	Name of the Water Feature	Water Feature Type	Water Feature Location (Lat/Lon)	Covered by Non-reporting NWP under Section 404?	NWP w/PCN, Individual Standard Permit, Letter of Permission, or Regional General Permit under Section 404?
CROSSING 13					
13A	69	Palustrine emergent	33.177019, -96.574545	No	NWP 14 with PCN
13B	70	Palustrine forested	33.177301, -96.574543	No	NWP 14 with PCN
13C	71	Perennial stream	33.178192, -96.575152		
CROSSING 14					
14	75	Intermittent stream	33.184532, -96.576455	Yes	No
CROSSING 15					
15	77	Palustrine emergent	33.185750, -96.577583	No	NWP 14 with PCN
CROSSING 16					
16A	79	Perennial stream	33.190432, -96.577086	Yes	No
16B	80	Intermittent stream	33.190741, -96.576669		
16C	83	Pond/Impoundment	33.191981, -96.576895		
16D	85	Pond/Impoundment	33.192739, -96.577013		
16E	87	Pond/Impoundment	33.192350, -96.578094		
16F	88	Palustrine forested	33.193188, -96.578276		
16G	89	Pond/Impoundment	33.193789, -96.578028		
16H	91	Pond/Impoundment	33.194060, -96.578004		
CROSSING 17					
17	99*	Ephemeral stream	33.196049, -96.570272	N/A	N/A

*Photo-interpreted
N/A Not applicable
Because the impacts provided in the table are based on the Geometric Schematic Design submitted January 2022, and permitting will occur after the design is further refined, permitting needs may change. All necessary permits will be obtained based on the final design.
SOURCE: Spur 399 Extension Water Features Delineation Report, April 2022

Approximately 11.54 acres of water features, including streams, are mapped within the Environmental Footprint (an area initially established to identify water features that is larger than the proposed ROW) initially evaluated for the Orange Alternative, including Wilson Creek and the East Fork Trinity River and their respective tributaries.

TxDOT submitted the Water Feature Delineation Report to the USACE Fort Worth District for review and concurrence on the water feature classification types on December 1, 2021. The USACE concurred with the assessment in the report on January 11, 2022 (see correspondence in **Appendix E**).

An initial impact assessment (see **Appendix N**) was conducted based on the Geometric Schematic Design including the proposed ROW developed for the Purple and Orange Alternatives. The Purple Alternative would result in temporary impacts of 1.00 acre (1,527 linear feet [LF]) and permanent impacts of 0.20 acre (767 LF) to WOTUS. The Orange Alternative would result in temporary impacts of 1.73 acres (2,854 LF) and permanent impacts of 0.38 acre (2,997 LF) to WOTUS. Total permanent and temporary impacts to WOTUS would be greater for the Orange Alternative compared to the Purple Alternative. **Figure 3-26** below summarizes these impacts by water feature type.

Figure 3-26: Summary of Water Features Impacts for the Purple and Orange Alternatives

Water Feature Type	Type of Impact	Purple Alternative	Orange Alternative	No-Build Alternative
Ephemeral Stream	Permanent	0.00 ac (6 LF)	0.21 ac (1,751 LF)	N/A
	Temporary	0.05 ac (573 LF)	0.11 ac (791 LF)	N/A
Intermittent Stream	Permanent	0.09 ac (538 LF)	N/A	N/A
	Temporary	0.10 ac (681 LF)	0.14 ac (906 LF)	N/A
Perennial Stream	Permanent	0.11 ac (223 LF)	0.17 ac (1,246 LF)	N/A
	Temporary	0.19 ac (273 LF)	0.72 ac (1,157 LF)	N/A
Palustrine Forested Wetland	Permanent	0.00 ac	N/A	N/A
	Temporary	0.26 ac	0.03 ac	N/A
Palustrine Emergent Wetland	Permanent	0.00 ac	0.00 ac	N/A
	Temporary	0.37 ac	0.43 ac	N/A
Pond/Impoundment	Permanent	N/A	0.00 ac	N/A
	Temporary	0.03 ac	0.30 ac	N/A
TOTALS	Permanent	0.20 ac (767 LF)	0.38 ac (2,997 LF)	N/A
	Temporary	1.00 ac (1,527 LF)	1.73 ac (2,854 LF)	N/A

SOURCE: Appendix N – Section 404/10 Impact Table (updated April 2022)

Discharges of dredged or fill material into WOTUS, including wetlands, require permit authorization from the USACE under Section 404 of the Clean Water Act (CWA) prior to the initiation of project activities involving discharges.

Typically for linear transportation projects, if no more than 0.50 acre of loss of non-tidal WOTUS occurs at a single and complete crossing, the impacts to any WOTUS, including wetlands could be authorized under NWP 14. A loss of greater than 0.50 acre would require an Individual Standard Permit. For NWP 14, a loss that exceeds 0.10 acre of discharge into a special aquatic site, including wetlands, would require a PCN. Based on the initial impact assessment described above, both the Purple and Orange Alternatives would meet the terms and conditions of NWP 14 with a PCN for the crossings of the East Fork Trinity River, Wilson Creek, and their respective tributaries, as a result of minimal loss of these water features. The NWP 14 PCN for this project would likely be submitted under the 2021 NWPs. All permitting would be consistent with the 2021-NWP general conditions and the 2021 Combined Texas Regional Conditions described below and summarized by water feature in **Figure 3-27**.

Mitigation will be required for the following:

1) Loss of wetlands that exceed 0.10 acre at a single and complete crossing and triggers a PCN [General Condition (GC) 23(c)].
2) Loss of streams that exceeds 0.03 acre at a single and complete crossing and triggers a PCN [GC 23(d)].
3) Loss that exceeds 0.010 acre, including open water features, to ensure that adverse environmental effects are no more than minimal [GC 23(b)].
4) Loss of streams that exceed 0.03 acre at a single and complete crossing and do not, in and of themselves at that particular single and complete crossing, trigger a PCN, so long as one or more of the single and complete crossings on the linear transportation project do trigger a PCN [GC 23(d)], and
5) In cases where loss of forested or scrub shrub wetlands are converted to emergent wetlands, mitigation may be required [GC 23(i)].

Figure 3-27: Applicable General Conditions for Mitigation Measures Required for Impacts to Water Features for the Purple and Orange Alternative

Alternative	Water Feature ID Number	Applicable General Conditions
PURPLE ALTERNATIVE	25	GC 23(d)
	32	GC 23(i)
	39	GC 23(c) and (d)
ORANGE ALTERNATIVE	52	GC 23(d)
	62	GC 23(c) and (d)
	63	GC 23(c) and (d)
	65	GC 23(c) and (d)
	66	GC 23(c) and (d)
	67	GC 23(c) and (d)

Per the 2008 Final Compensatory Mitigation Rule, TxDOT would pursue the purchase of appropriate mitigation credits from an approved mitigation bank to compensate for the unavoidable loss of aquatic resources. USACE prefers the use of mitigation banks over permittee-responsible mitigation when a project impacts WOTUS,

including wetlands. TxDOT would follow their standard operating procedure for acquiring and/or purchasing Section 404 compensatory mitigation credits for these affected features.

Temporary impacts to WOTUS would constitute a regulated activity and require authorization from the USACE under Section 404 of the CWA. Temporary impacts would include, but are not limited to, activities such as the effects of heavy equipment use or temporary placement of a culvert within a wetland boundary or below the ordinary high water mark (OHWM) of a stream where the area is returned to pre-construction contours and revegetated as appropriate upon completion. For both the Purple and Orange Alternatives, temporary construction impacts would be minimal with implementation of best management practices (BMPs) or activities (e.g., use of work platforms, coffer dams, temporary access roads, etc.) designed to minimize impacts to existing waters features.

The need for an Individual Standard Permit under Section 404 is not anticipated for either Build Alternative. If it is determined at a later date that an Individual Standard Permit under Section 404 is needed, compliance with the U.S. Environmental Protection Agency (EPA)'s Section 404(b)(1) Guidelines would be confirmed prior to submittal of the Individual Standard Permit application.

No-Build Alternative

Under the No-Build Alternative, no construction activity or ROW acquisition would occur; therefore, no direct effects on WOTUS or other water resources would occur. Water bodies within or traversing existing ROW would continue to be maintained to expedite the conveyance of storm water flows. Vegetated riparian areas adjacent to water bodies within existing ROW would likely persist in their present condition.

Orange Alternative - Preferred Alternative

The Orange Alternative would involve regulated activity in jurisdictional waters and therefore would require authorization under Section 404. **Figure 3-25** shows the waters that are anticipated to be jurisdictional in which regulated activity is anticipated to take place for the Orange Alternative. It also indicates whether the impacts are anticipated to be authorized under Section 404 by a non-reporting NWP (i.e., no PCN required), or if it is anticipated that a NWP with PCN, Individual Standard Permit, Letter of Permission, or Regional General Permit would be required.

As summarized in **Figure 3-26**, the Orange Alternative would permanently impact 0.38 acre (2,997 linear feet) and temporarily impact 1.73 acres (2,854 linear feet) of WOTUS. Mitigation measures would be required for impacts to Water Features 52, 62, 63, 65, 66, and 67 as indicated in **Figure 3-27**. Compensatory mitigation is proposed to be accomplished through the purchase of mitigation credits from USACE-approved wetland and stream mitigation banks within the service area of the project. Because of the highly variable nature of mitigation bank ratios and credit availability, the exact number of credits needed for the project would be determined as the final design evolves. The number of credits to be purchased would be based on appropriate mitigation ratios as approved by the USACE, or outlined in the individual mitigation bank instrument. The need for an Individual Standard Permit under Section 404 is not anticipated. If during final design it is determined that an Individual Standard Permit under Section 404 is needed, compliance with EPA's Section 404(b)(1) Guidelines would be confirmed prior to submittal of the Individual Standard Permit application.

3.10.2 Clean Water Act Section 401

Purple and Orange Alternatives

Either Build Alternative would require authorization under a NWP in some form from the USACE as discussed in **Section 3.10.1**. Regardless of whether the NWP is non-reporting, or requires the submission of a PCN, TxDOT complies with Section 401 of the CWA by implementing TCEQ conditions for NWPs. For projects that require authorization under an Individual Standard Permit under Section 404, TxDOT will coordinate the Section 401 water quality certification with TCEQ. TCEQ will either approve or deny the Section 401 water quality certification or issue a waiver. The TCEQ Section 401 water quality certification decision must be submitted to the USACE before an Individual Standard Permit decision can be made.

No-Build Alternative

No construction would occur; therefore, the No-Build Alternative would have no direct effects on wetlands or WOTUS, and no permits under Section 404 or compliance under Section 401 would be required.

Orange Alternative - Preferred Alternative

The Orange Alternative would require authorization under a NWP from the USACE. TxDOT would comply with Section 401 of the CWA by implementing TCEQ conditions for the NWPs. A combination of temporary and permanent BMPs and general construction-phase BMPs may be implemented to minimize impacts to water quality including but not limited to: permanent upstream stormwater detention ponds, vegetated filter strips, erosion control measures (e.g., hydro-seeding, mulching, erosion-control blankets), and sediment control through the use of structures and vegetative measures to stabilize soil.

3.10.3 Executive Order 11990 Wetlands

Executive Order 11990 mandates that federal agencies *take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands*. EO 11990 applies to actions undertaken and/or funded by federal agencies; therefore, EO 11990 applies to the proposed Spur 399 Extension. EO 11990 prohibits new construction in wetlands unless (1) there is no practicable alternative to such construction, and (2) the project includes all practicable measures to minimize harm to wetlands.

3.10.3.1 No Practicable Alternative

The proposed action is needed to enhance connectivity and improve the mobility provided by the existing transportation system, requiring it to connect to the only existing highway arterials located along the western and northern edges of the Study Area (US 75, SH 5, and US 380, respectively). The alignments of the Purple and Orange Alternatives are constrained by residential neighborhoods, parklands, landfills, the Airport, floodplains/floodways associated with Wilson Creek and the East Fork Trinity River, and USACE-managed lands surrounding Lavon Lake east of the Study Area as illustrated on **Figure 3-23** and on the resources maps for each Build Alternative in **Appendix D**, Due to the proximity of Wilson Creek and the East Fork Trinity River and their tributaries to the SH 5 and US 380 corridors, crossing of both water features cannot be avoided by either Build Alternative. Therefore, no practicable alternative exists to the crossing of either stream feature and the complete avoidance of wetlands within the Study Area.

3.10.3.2 Project Includes All Practicable Measures to Minimize Harm to Wetlands

The design of both alternatives includes the use of bridges and elevated roadway sections over stream crossings and wetland areas, including minimizing the clearing of riparian vegetation and forested wetlands and spanning stream channels to avoid the placement of bridge piers below the OHWM. The placement of permanent fill materials within jurisdictional areas would be minimized to the greatest extent possible while balancing the effect on project construction costs, and BMPs would be implemented during construction to minimize harm to streams, wetlands, and water quality.

As the schematic design evolved and the hydraulic analysis was completed, additional design improvements were made to avoid and minimize impacts on wetlands where feasible. Based on the physical constraints described, the presence of wetlands and other water features that cross the proposed ROW, and the relation of the proposed project to the existing transportation system, no practicable alternatives exist to completely avoid impacts to wetlands.

3.10.3.3 Orange Alternative – Preferred Alternative

There is no practicable alternative to construction in wetlands. Complete avoidance is not practicable due to the orientation of the Orange Alternative, the channel orientation of Wilson Creek, East Fork Trinity River and their tributaries, and the need to connect to existing north-south (US 75 and SH 5) and east-west (US 380) highway corridors. The alignment of the Orange Alternative includes all practicable measures to minimize harm including the use of bridges and elevated roadway sections to span wetland areas, stream channels, and floodplains and floodways, where feasible. To cross the East Fork Trinity River, fill would be placed below the 100-year floodplain water surface elevation requiring the needs for additional flood storage within the proposed ROW (see **Section 3.10.7**). Areas excavated within the floodplain and ROW could also become wetland habitats through recolonization or planting. The additional costs of spanning areas beyond stream channels and floodplains would be evaluated against the benefits of the project as the design of the Orange Alternative progresses.

3.10.4 Rivers and Harbors Act

Purple and Orange Alternatives

Neither Build Alternative would require a Section 10 permit from the USACE or a Section 9 permit from the U.S. Coast Guard (USCG) under the Rivers and Harbors of Act. None of the rivers crossed by the Build Alternatives are considered navigable.

Section 14 of the Rivers and Harbors Act (commonly referred to as Section 408 because it is codified in USC Title 33, Chapter 9, Subchapter I, Section 408) applies to any TxDOT activity that involves alterations to, or temporarily or permanently occupies or uses, any USACE federally authorized civil works project (e.g., sea walls, bulkheads, reservoirs, levees, wharfs, or other federal civil works projects, or associated federal land [fee simple] or easements). As depicted in **Figure 3-23**, the flowage easement mapped along the East Fork Trinity River is managed by the USACE's Real Estate Division and is not considered a civil works project; therefore, Section 14 of the Rivers and Harbors Act (Section 408) does not apply to any bridging of or encroachment into the easement caused by the Orange Alternative. The Purple Alternative does not cross the

main channel of the East Fork Trinity River nor the USACE flowage easement and would have no effect on the easement.

No-Build Alternative

The No-Build Alternative involves no construction and does not cross any navigable waterways.

Orange Alternative - Preferred Alternative

The Orange Alternative would not require a Section 10 permit from the USACE or a Section 9 permit from the USCG. The Orange Alternative would not require a Section 408 permit from the USACE.

3.10.5 Clean Water Act Section 303(d)

Section 303(d) of the Clean Water Act is a mechanism to list impaired, or threatened to be impaired, waters and set Total Maximum Daily Loads (TMDLs) for these waterbodies. Impaired waters are those that do not meet state water quality standards. A TMDL establishes the maximum amount of a pollutant, from point sources and non-point sources, that can occur within the waterbody and still meet state water quality standards.

Purple and Orange Alternatives

Segment 0821C of Wilson Creek and Segment 0821D of the "East Fork Trinity River above Lake Lavon" are both impaired in the "East Fork Trinity River-Lake Lavon" watershed, as noted in **Figure 3-28**. The impairment of both segments is due to bacteria in the water. Both the Purple and Orange Alternatives are within five linear miles (not stream miles) of, is within the watershed of, and drains to, these impaired assessment units under Section 303(d) of the CWA.

Figure 3-28: Impaired Assessment Units within Five Linear Miles of the Spur 399 Extension Project

Watershed	Segment Name	Segment Number	Assessment Unit Number
East Fork Trinity River-Lake Lavon	East Fork Trinity River Above Lake Lavon	0821D	0821D_01
East Fork Trinity River-Lake Lavon	Wilson Creek	0821C	0821C_01

SOURCE: Section 303(d) list consulted October 2021; published May 20, 2020.

No-Build Alternatives

The No-Build Alternative involves no construction and does not cross any impaired waterways.

Orange Alternative - Preferred Alternative

The Orange Alternative is within five aerial miles of, the watershed of, drains to, and crosses both identified impaired waterway segments. To date, TCEQ has not identified (through either a total maximum daily load [TMDL] or the review of projects under the TCEQ MOU) a need to implement control measures beyond those required by the Construction General Permit (CGP) on road construction projects. Therefore, compliance with the project's CGP, along with coordination under the TCEQ MOU for certain transportation projects, collectively meets the need to address impaired waters during the environmental review process. As required by the CGP,

the Preferred Alternative and associated activities would be implemented, operated, and maintained using BMPs to control the discharge of pollutants from the project site.

Additional wetland and stream protection BMPs could include, but may not be limited to the following:

- Establish and/or maintain buffers around known or discovered recharge features.
- Locate, design, construct, and maintain stream crossings to provide maximum erosion protection.
- Maintain existing road ditches, culverts, and turnouts to ensure proper drainage and minimize the potential for the development of ruts and mud holes and other erosion-related problems.
- Stabilize, seed, and mulch eroded roadsides and new road cuts with native grasses and legumes, where feasible, in a timely manner to minimize impacts to water bodies.
- Implement erosion and sediment controls where appropriate. Maintain protective vegetative covers over all compatible areas, especially on steep slopes. Where necessary, gravel, fabrics, mulch, riprap, or other materials that are environmentally safe and compatible with the location may be used, as appropriate, for erosion control in problem areas.
- Water quality protection BMPs would have multiple levels of oversight to ensure their continued proper function. In addition to contractor inspectors who are responsible for daily monitoring of BMPs, TxDOT inspectors would conduct weekly inspections and would submit compliance reports to the project engineer. Additional oversight would be provided by the TxDOT project manager (who would be on site each day) and staff from the District Environmental Office, including the district environmental quality coordinator.

3.10.6 Clean Water Act Section 402

Purple and Orange Alternatives

Because Texas Pollutant Discharge Elimination System (TPDES) CGP authorization and compliance (and the associated documentation) occur outside of the environmental clearance process, compliance is ensured by the policies and procedures that govern the design and construction phases of the project. The Project Development Process Manual and the Plans, Specifications, and Estimates (PS&E) Preparation Manual require a storm water pollution prevention plan (SW3P) be included in the plans of all projects that disturb one or more acres. This requirement would apply to both Build Alternatives. The Construction Contract Administration Manual requires that the appropriate CGP authorization documents (notice of intent or site notice) be completed, posted, and submitted, when required by the CGP, to TCEQ and the municipal separate storm sewer system operator. It also requires that projects be inspected to ensure compliance with the CGP.

The PS&E Preparation Manual requires that all projects include Standard Specification Item 506 (Temporary Erosion, Sedimentation, and Environmental Controls), and the "Required Specification Checklists" require Special Provision 506-003 on all projects that need authorization under the CGP. These documents require the project contractor to comply with the CGP and SW3P, and to complete the appropriate authorization documents."

No-Build Alternative

Because no land disturbance or construction activities causing stormwater discharges would occur, the No-Build Alternative would not require authorization under TPDES CGP or the development and implementation of a SW3P.TxDOT would obtain the appropriate permit authorizations for planned maintenance and other improvements.

Orange Alternative - Preferred Alternative

As described in Section 3.17.5, erosion controls and BMPs detailed in the SW3P will be implemented to minimize, to the extent practicable, the discharge of pollutants in stormwater associated with construction activity and (certain) non-stormwater discharges. The contractor would be responsible for filing the Notice of Intent with TCEQ for coverage under the CGP and would develop and implement the SW3P to minimize the discharge of pollutants in stormwater from construction activities. The contractor would also file the Notice of Termination within 30 days following final stabilization of all disturbed areas of the project. As noted in Section 3.10.5 under the Preferred Alternative, contractor inspectors would be responsible for daily monitoring of BMPs and TxDOT inspectors would conduct weekly inspections and submit compliance reports to the project engineer. Additional oversight would be provided by the TxDOT project manager (who would be on site each day) and staff from the District Environmental Office, including the district environmental quality coordinator.

3.10.7 Floodplains

Purple and Orange Alternatives

The Purple and Orange Alternatives cross FEMA floodplains depicted and summarized in **Figure 3-29** and **Figure 3-30,** respectively. Coordination with the FEMA local floodplain administrator (W. Kyle Odom, CFM, RS – City of McKinney) would continue through any refinement of the Preferred Alternative including final design. A combination of proposed culverts and bridges are being designed to minimize/avoid impacts to the floodplains where the proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances.

Both Build Alternatives along the Common Alignment would be elevated above the Wilson Creek floodplain and floodway where impacts would be minimized through the placement of bridge piers/fill above the 100-year water surface elevation and structures would span the floodway. The Purple Alternative would also cross unnamed tributaries of the East Fork Trinity River with mapped floodplains. Bridges and culverts would be used to minimize impacts. The proposed ROW for the Purple Alternative encompasses approximately 77.5 acres of floodplain and approximately 37.4 acres of floodway. The Orange Alternative would be on bridge over two unnamed tributaries and the main channel of the East Fork Trinity River. The floodway is relatively wide through this area. The proposed ROW for the Orange Alternative encompasses approximately 86.9 acres of floodplain and approximately 43.3 acres of floodway.

Based on the above considerations, no practicable alternative exists to the proposed construction in floodplains and both Build Alternatives include all practicable measures to minimize harm to floodplains which may result from such use.

Figure 3-29: FEMA Floodplain Map for the Project Area

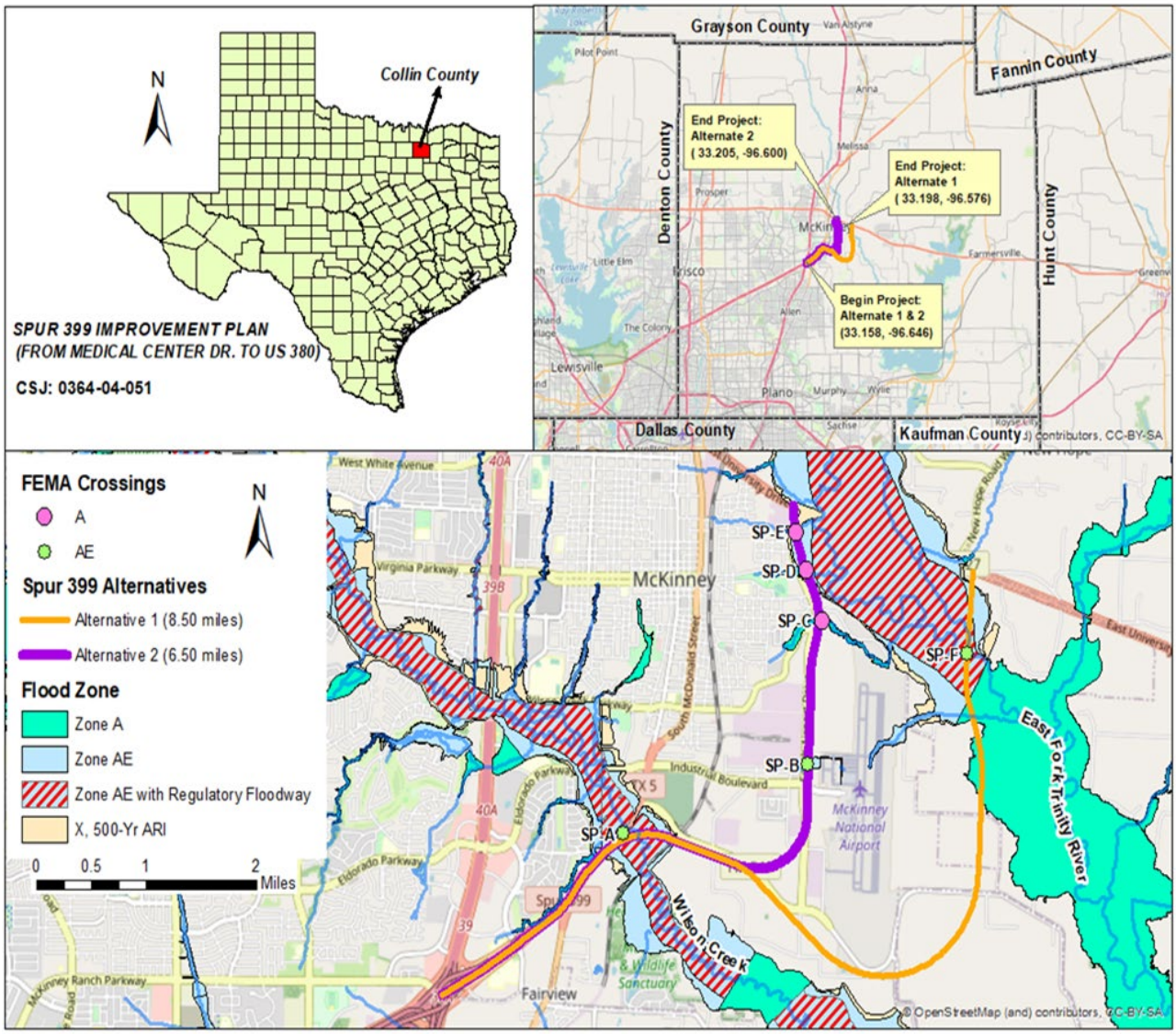


Figure 3-30: FEMA Crossing Locations

Build Alternative	Crossing	Waterway	FEMA Floodplain	FIRM No.	FIS No.
ORANGE ALTERNATIVE	SP-A	Wilson Creek	Zone AE w/ Floodway	48085C0290J Eff.: 6/2/2009	48085CV001B Rev. 6/7/2017
PURPLE ALTERNATIVE	SP-A	Wilson Creek	Zone AE w/ Floodway	48085C0290J Eff.: 6/2/2009	48085CV001B Rev. 6/7/2017
PURPLE ALTERNATIVE	SP-B	East Fork Trinity River Tributary 4	Zone AE w/o Floodway	48085C0290J Eff.: 6/2/2009	N/A
PURPLE ALTERNATIVE	SP-C	East Fork Trinity River Tributary 6	Zone A no Floodway	48085C0280J Eff.: 6/2/2009	N/A
PURPLE ALTERNATIVE	SP-D	East Fork Trinity River Tributary 7	Zone AE w/o Floodway	48085C0280J Eff.: 6/2/2009	48085CV001B Rev. 6/7/2017
PURPLE ALTERNATIVE	SP-E	East Fork Trinity River Tributary 8	Zone AE w/o Floodway	48085C0280J Eff.: 6/2/2009	48085CV001B Rev. 6/7/2017
ORANGE ALTERNATIVE	SP-F	East Fork Trinity River	Zone AE w/ Floodway	48085C0280J Eff.: 6/2/2009	48085CV001B Rev. 6/7/2017

Zone A/Zone AE – 100-year floodplain, areas subject to inundation by the 1-percent-annual-chance flood event.

3.10.7.1 Executive Order 11988

This project is federally funded and therefore is subject to EO 11988, *Floodplain Management*, and will involve a significant encroachment into the floodplain. EO 11988, directs federal agencies to:

1. assert leadership in reducing flood losses and losses to environmental values served by floodplains;
2. avoid actions located in or adversely affecting floodplains unless there is no practicable alternative;
3. take action to mitigate losses if avoidance is not practicable; and
4. establish a process for flood hazard evaluation based upon the 100-year base flood standard of the National Flood Insurance Program (NFIP). It also directs federal agencies to issue implementing procedures; provides a consultation mechanism for developing the implementing procedures; and provides oversight mechanisms.

The explanation of how the proposed project will comply with EO 11988 is provided below:

How the project has been designed to minimize potential harm to or within the floodplain - Both alternatives include extensive bridging across floodplain areas to minimize impacts where feasible. The floodway would be spanned and pier placements within the floodplain would be planned to minimize hydraulic impacts. The use of other bridged or elevated sections versus the use of earthen fill embankment would continue to be evaluated in consideration of project costs versus impacts to wetlands and WOTUS, natural habitats, and the effect of the

hydraulic function on the stream system for the Preferred Alternative. Additional modeling would determine if compensatory storage will be required.

Reasons why the proposed action must be located in the floodplain - Because of the orientation of the water features across the Study Area and the need for the proposed project to connect to the only major highway arterials located along the western and northern edges of the Study Area, crossing the floodplain and regulatory floodways associated with Wilson Creek and the East Fork Trinity River is unavoidable. Additional physical constraints including residential and industrial development, landfills, USACE-managed lands to the east, and the presence of the Airport in the center of the Study Area, limit consideration of other locations or alignments for the proposed freeway.

Alternatives considered and why they were not practicable – Development of Build Alternatives was constrained by the presence of residential neighborhoods, industrial development, parklands, the Airport, two landfills, and USACE-managed lands surrounding Lavon Lake. While the floodplains associated with Wilson Creek and the East Fork Trinity River were avoided to the greatest extent practicable, the orientation of the streams and rivers adjacent to the existing highways made it impossible to avoid crossing floodplains. Taking into consideration these constraints and the average 400-foot-wide ROW needed to accommodate the proposed improvements through the floodplain/floodway areas, the Purple and Orange Alternatives would each result in a significant encroachment into the floodplain. Based on the physical constraints described, the orientation of the streams and associated floodplains, and the relationship of the proposed project to the existing transportation system, no practicable alternatives exist to completely avoid impacts to floodplains.

The proposed action conforms to applicable state or local floodplain protection standards - Under the Constitution, a federal agency does not have to obtain local community permits to develop property within the community. However, all federal agencies are responsible for implementing EO 11988 through their own regulations. EO 11988 states that, at a minimum, federal agencies must comply with NFIP regulations.

From TxDOT's Hydraulic Design Manual (09/2019), 23 CFR 650 Subpart A:

> *When a TxDOT project with participation by the FHWA involves an encroachment on the 1% Annual Exceedance Probability (100-yr event) floodplain, the location and design of the project must comply with FHWA Policy 23 CFR 650, Subpart A. Compliance with this regulation is required when a proposed project includes a new or expanded encroachment on a floodplain regulated by FEMA, or contains the potential for adversely impacting private property or insurable buildings on or near a floodplain. The FHWA has prepared a non-regulatory supplement, 23 CFR 650, Subpart A, Attachment 2, which explains the requirements for coordination with FEMA and the local community responsible for administering the NFIP under different floodplain encroachment scenarios. Chapter 5 of this manual explains TxDOT procedures for compliance with these requirements*.

The proposed project will comply with the standards in the TxDOT Hydraulic Design Manual.

No-Build Alternative

The No-Build Alternative involves no construction or changes in the existing crossings of floodplains and floodways mapped in the Project Area. Therefore, the No-Build Alternative would have no effect on floodplains or floodways.

Orange Alternative - Preferred Alternative

The Orange Alternative includes extensive bridging across floodplain areas to minimize impacts where feasible. The proposed schematic design was unable to completely avoid the placement of approximately 1,800 to 2,000 cubic yards of fill (piers) below the 100-year floodplain water surface elevation of the East Fork Trinity River. This amount of fill within the floodplain could be offset within the proposed ROW by creating shallow ditches or swales within the floodplain but outside of any wetland features. The hydraulic and hydrological analyses for the final design will also need to take into account the proposed changes in the 100-year floodplain and water surface elevation that may occur as a result of the CLOMR being filed by the McKinney National Airport to support the extension of Runway 18 into the floodplain of the East Fork Trinity River upstream of the proposed crossing of the Orange Alternative. The City of McKinney anticipates approving the CLOMR in September 2022. Any design changes made subsequent to environmental clearance will minimize, to the extent practicable, impacts on floodplains. Pier placement within the floodplain along with options to span floodways would be refined to further minimize hydraulic impacts and further minimize the need for compensatory storage. The use of bridged or elevated sections beyond the East Fork Trinity River area versus the use of earthen fill embankment will continue to be evaluated in consideration of project costs versus impacts to wetlands and streams, to protect the natural and beneficial values of floodplains, and reduce the project's hydraulic effect on the stream system.

3.10.8 Wild and Scenic Rivers

Texas has just one river segment that is designated as wild or scenic under the federal Wild and Scenic Rivers Act and it is located along the Rio Grande on the border between the United States and Mexico. The Spur 399 Extension would not affect the Rio Grande; therefore, the Preferred Alternative would have no effect on rivers protected under the federal Wild and Scenic Rivers Act. No further analysis is required.

3.10.9 Coastal Barrier Resources

The extension of Spur 399 is proposed in an interior area of Texas without coastal resources. Therefore, protections under the Coastal Barrier Resources Act do not apply to the Preferred Alternative. No further analysis is required.

3.10.10 Coastal Zone Management

The extension of Spur 399 is proposed in an interior area of Texas without coastal resources. The Preferred Alternative is not located within the Texas Coastal Management Plan boundary. Therefore, a consistency determination is not required.

3.10.11 Edwards Aquifer

The extension of Spur 399 is proposed in Collin County outside of the recharge, contributing, or transition zones of the Edwards Aquifer. Therefore, coordination with the EPA Region 6 is not required under the MOU between EPA Region 6 and TxDOT Regarding EPA's Review of Projects Potentially Affecting the Edwards Aquifer. The TCEQ Edwards Aquifer Rules also do not apply to the Preferred Alternative.

3.10.12 International Boundary Water Commission

The extension of Spur 399 is proposed in an interior area of Texas and would not encroach upon the floodway of the International Boundary Water Commission (IBWC) ROW or an IBWC flood control project. Therefore, the Preferred Alternative would be allowed to proceed without obtaining such a license.

3.10.13 Drinking Water Systems

In accordance with TxDOT's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Item 103, Disposal of Wells), any drinking water wells would need to be properly removed and disposed of during construction of the project.

3.11 Biological Resources

3.11.1 Impacts to Vegetation

The Ecological Mapping Systems of Texas (EMST) was used to identify the vegetation communities within the proposed ROW of the Purple and Orange Alternatives. **Figure 3-31** provides a quantitative comparison of the vegetation community types identified within the proposed ROW based on field observations and review of current aerial imagery, where appropriate. Field visits were conducted in August 2020, and again in June 2021, although right-of-entry permissions were not obtained for all parcels reviewed; therefore, field verification of vegetation communities was not possible for all areas. Additional detail including the EMST mapping for both Build Alternatives is provided in **Appendix O**.

Purple Alternative

Construction of the Purple Alternative requires approximately 263.4 acres of proposed ROW, of which approximately 179 acres (68 percent) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. The loss or disturbance of vegetative communities would not occur within these areas during construction. As depicted in **Figure 3-31**, the remaining 84 acres consists of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous (associated with Wilson Creek and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, and row crops. The Purple Alternative crosses no Edwards Plateau nor open water EMST types. No protected or rare vegetation communities were identified within the proposed ROW during field investigations.

Orange Alternative

Construction of the Orange Alternative requires approximately 366.1 acres of ROW, of which approximately 151 acres (41 percent) is developed as Urban Low Intensity and Urban High Intensity, including existing roadways. The loss or disturbance of vegetative communities would not occur in these areas during construction. The majority of the Orange Alternative crosses rural areas with open, undeveloped, and agricultural lands, with approximately 215 acres dominated by a mix of Blackland Prairie/grassland, Edwards Plateau oak woodland/savannah, floodplain/riparian forest and herbaceous riparian vegetation (associated with Wilson Creek and the East Fork Trinity River and their tributaries), native invasive/deciduous woodland, and row crops. No protected or rare vegetation communities were identified within the proposed ROW during field investigations.

Figure 3-31: Vegetation Community Impact Comparison of the Purple and Orange Alternatives

EMST Common Name	EMST ID	Purple Alternative		Orange Alternative	
		Acres	Percent of Total Proposed ROW	Acres	Percent of Total Proposed ROW
Blackland Prairie: Disturbance or Tame Grassland	207	9.1	3.5%	53.6	14.6%
Edwards Plateau: Deciduous Oak - Evergreen Motte and Woodland	1103	0.0	0.0%	0.6	0.2%
Edwards Plateau: Oak - Hardwood Motte and Woodland	1104	0.0	0.0%	5.9	1.6%
Edwards Plateau: Savanna Grassland	1107	0.0	0.0%	0.6	0.2%
Central Texas: Floodplain Hardwood Forest	1804	7.5	2.8%	10.5	2.9%
Central Texas: Floodplain Herbaceous Vegetation	1807	5.8	2.2%	13.9	3.8%
Central Texas: Riparian Hardwood Forest	1904	1.5	0.6%	8.1	2.2%
Central Texas: Riparian Herbaceous Vegetation	1907	2.3	0.9%	0.0	0.0%
Barren	9000	1.3	0.5%	0.0	0.0%
Native Invasive: Deciduous Woodland	9104	15.1	5.7%	42.2	11.5%
Row Crops	9307	41.4	15.7%	78.3	21.4%
Urban High Intensity	9410	10.2	3.9%	7.2	2.0%
Urban Low Intensity	9411	169.2	64.2%	143.69	39.2%
Open Water	9600	0.0	0.0%	1.5	0.4%
Total Acres within Proposed ROW		263.4	100%	366.1	100%

Source: Burns & McDonnell, March 2022.

No-Build Alternative

Under the No-Build Alternative, no impacts to vegetation would occur.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternative would unavoidably impact vegetative communities within areas of the proposed ROW. Construction activities would permanently remove vegetative communities within the limits of construction and replace them with impervious surfaces and maintained herbaceous species. Construction of

the Preferred Alternative would not remove any protected or rare plant communities. Additionally, long sections of the Orange Alternative would be built on-elevated structure minimizing temporary and permanent impacts to vegetation and allowing many plant communities to become re-established under the elevated roadway over time.

During construction, areas of exposed soil within the proposed ROW would be revegetated with herbaceous species to minimize the erosion of soils into receiving waters. Following construction, landscaping or seeding of the proposed ROW may occur in accordance with EO 13122 (Invasive Species) and under the guidance of *TxDOT's Roadside Vegetation Management Manual* and *Landscape and Aesthetics Design Manual* (see **Section 3.11.3**) and the Executive Memorandum on Environmentally and Economically Beneficial Landscaping (further described in **Section 3.11.4**). Vegetation within the proposed ROW would be maintained in accordance with TxDOT standard practices on an ongoing basis.

3.11.2 Impacts to Wildlife and Habitat

The Spur 399 Extension Study Area is within the Texan Biotic Province, which provides both terrestrial and aquatic habitats supporting a wide range of fishes, birds, mammals, reptiles and amphibians, and invertebrates. No endemic wildlife species occur within the Study Area and vertebrate fauna is typical of that found over most of the Texan Biotic Province.

Purple Alternative

Potential impacts to wildlife can be attributed to the loss of wildlife habitat, habitat fragmentation, noise interference, interaction of wildlife with construction machinery, and wildlife/vehicle collision mortalities. The Purple Alternative primarily follows existing roadways through a built-up environment with limited natural habitat and would cross streams and other water features close to existing development limiting the removal of available habitats and resulting fragmentation. Traffic noise from the Purple Alternative would have a lesser disruptive effect on wildlife because of the existing built-up environment present, particularly the industrial development and vehicular activity within the Airport Drive corridor. Construction of the Purple Alternative would directly affect animals that reside within the path of the roadway alignment.

In addition to direct, construction-related mortality or injury, wildlife populations often suffer impacts associated with displacement into adjacent habitats, which may already be at or near carrying capacity for the same or related species. Wildlife living within the proposed ROW would need to relocate to adjacent habitats, located primarily east of the Airport, during vegetation clearing and earth-moving activities to survive. Heavy machinery and other construction equipment may cause the mortality of wildlife species that are slow moving or species that seek cover in debris and fallen vegetation. Construction-related impacts would be short-term and would primarily occur during initial ROW clearing activities. Wildlife populations near the project would also be impacted by construction noise and activity that can cause stress or cause them to seek refuge away from the Project Area. Wildlife/vehicle collisions can occur along roadways and could increase when adjacent to areas of disturbance. The elevated freeway mainlanes and grade-separated interchanges at cross streets should help separate vehicles from wildlife in some instances.

The Purple Alternative crosses three perennial streams and five wooded habitat areas. The perennial stream crossings could provide suitable habitat for the Texas fawnsfoot (*Truncilla macrodon*) and alligator snapping

turtle (*Macrochelys temminckii*), both state-listed as threatened and both proposed for federal listing as threatened. The perennial stream crossings could also provide suitable habitat for the Louisiana pigtoe (*Pleurobema riddellii*), Texas heelsplitter (*Potamilus amphichaenus*), and potentially the White-faced Ibis (*Plegadis chihi*) and Wood Stork (*Mycteria americana*), all state-listed as threatened. The wooded habitats could support Species of Greatest Conservation Need (SGCN), including the big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), tricolored bat (*Perimyotis subflavus*), eastern spotted skunk (*Spilogale putorius*), western hog-nosed skunk (*Conepatus leuconotus*), long-tailed weasel (*Mustela frenata*), swamp rabbit (*Sylvilagus aquaticus*), eastern box turtle (*Terrepene carolina*), western box turtle (*Terrapene ornata*), slender glass lizard (*Ophisaurus attenuatus*), and timber rattlesnake (*Crotalus horridus*). Other SGCN species that may be impacted by this alternative include the southern crawfish frog (*Lithobates areolatus areolatus*), Strecker's chorus frog (*Pseudacris streckeri*), Woodhouse's toad (*Anaxyrus woodhousii*), Chestnut-collared Longspur (*Calcarius arnatus*), Western Burrowing Owl (*Athene cunicularia hypugaea*), a cave obligate isopod (*Caecidotea bilineata*), mountain lion (*Puma concolor*), muskrat (*Ondatra zibethicus*), and Texas garter snake (*Thamnophis sirtalis annectens*). Because it avoids the East Fork Trinity River, no suitable habitat for the Bald Eagle, a SGCN, occurs along the Purple Alternative. The monarch butterfly (*Danaus plexippus*), a federal candidate species, may also be impacted. **Section 3.11.10** provides more information on the effect/impact determinations of state and federally listed species.

Impacts to fish and wildlife would be minimized through initial project design considerations, avoidance and minimization of vegetation removal and stream channel disturbance, and implementation of stormwater and TPWD best management practices (TPWD BMPs). TPWD BMPs are identified in the TPWD BMP form provided in **Appendix O** and are listed below. TPWD BMPs would be implemented because of potential impacts to state-listed species and SGCN. Construction activities would disturb only those areas necessary to construct the proposed project, including minimizing disturbance to important microhabitats (e.g., snags, brush piles), if present. The removal of native vegetation would be avoided to the greatest extent practicable and seeding mixes and plantings would be installed to restore cleared areas and minimize colonization by invasive species.

The following TPWD BMPs would be implemented for the Purple Alternative:

- Freshwater Mussel BMP
- Water Quality BMP
- Stream Crossing BMP
- Bird BMP
- Species-specific BMPs for the following:
  - *Alligator snapping turtle*
  - *Southern crawfish frog*
  - *Strecker's chorus frog*
  - *Woodhouse's toad*
  - *Eastern box turtle*
  - *Slender glass lizard*
  - *Texas garter snake*
  - *Timber (canebrake) rattlesnake*
  - *Western box turtle*
- Aquatic Amphibian and Reptile BMP

- Terrestrial Amphibian and Reptile BMP
- Vegetation BMP
- Aquatic Invertebrate BMP
- Bat BMP
- General Design and Construction BMP

Orange Alternative

The majority of the Orange Alternative crosses through a rural, sparsely developed area dominated by pastures, woodlots, fence rows, and water features including farm ponds, wetland complexes, and streams and tributaries. The Orange Alternative crosses a wide portion of the East Fork Trinity River floodplain/floodway which provides a mixture of grassland/floodplain herbaceous and floodplain/riparian forest habitats that connect to Lavon Lake and lands managed by the USACE east of the Study Area. Collectively, these habitats support numerous wildlife species and serve as wildlife travel corridors.

The Orange Alternative would have greater potential to fragment habitat, cause noise interference, and result in wildlife mortality as the result of wildlife/vehicle collisions because of its rural location. Construction of the Orange Alternative would directly impact animals that reside within the path of the roadway alignment, resulting in construction-related mortality or injury. Wildlife living within the proposed ROW would need to relocate to adjacent, more abundant habitats in the eastern portion of the Study Area to avoid vegetation clearing and earth-moving activities. Heavy machinery and other construction equipment may cause the mortality of wildlife species that are slow moving or species that seek cover in debris and fallen vegetation. Construction-related direct impacts would primarily occur during initial ROW clearing activities. Wildlife populations close to the project would also be impacted by construction noise and activity that can cause stress or cause them to seek refuge away from the Project Area.

The Orange Alternative crosses four perennial streams and 14 wooded habitat areas (as opposed to three perennial streams and five wooded habitat areas for the Purple Alternative) that would be evaluated in further detail to determine if further minimization of impacts is possible if this alternative is selected as the Preferred Alternative. The perennial stream crossings could provide suitable habitat for the Texas fawnsfoot and alligator snapping turtle, both state-listed as threatened and both proposed for federal listing as threatened. The perennial stream crossings could also provide suitable habitat for the Louisiana pigtoe, Texas heelsplitter, and potentially the White-faced Ibis and Wood Stork, all state-listed as threatened. The wooded habitats could support SGCN species such as the big brown bat, eastern red bat, hoary bat, tricolored bat, eastern spotted skunk, western hog-nosed skunk, long-tailed weasel, swamp rabbit, eastern box turtle, western box turtle, slender glass lizard, and timber rattlesnake. Other SGCN species that may be impacted by this alternative include the southern crawfish frog, Strecker's chorus frog, Woodhouse's toad, Bald Eagle (*Haliaeetus leucocephalus*), Chestnut-collared Longspur, Western Burrowing Owl, a cave obligate isopod, mountain lion, muskrat, and Texas garter snake. The monarch butterfly, a federal candidate species, may also be impacted. **Section 3.11.10** provides more information on the effect/impact determinations of state and federally listed species.

Impacts to fish and wildlife would be minimized through initial project design considerations, avoidance and minimization of vegetation removal and stream channel disturbance, and implementation of stormwater and TPWD BMPs are identified in the TPWD BMP form provided in **Appendix O** and are listed below. To

avoid/minimize the placement of fill materials within wetlands and stream channels, most of the Orange Alternative within the floodplain areas would be constructed on structure (e.g., bridge or elevated structure) which would also minimize the amount of vegetation clearing and land disturbance in this area. Construction activities would disturb only those areas necessary to construct the proposed project, including minimizing disturbance to important microhabitats (e.g., snags, brush piles), if present. The removal of native vegetation would be avoided to the greatest extent practicable and seeding mixes and plantings would be installed to restore cleared areas and minimize colonization by invasive species.

The following BMPs would be implemented for the Orange Alternative:

- Freshwater Mussel BMP
- Water Quality BMP
- Stream Crossing BMP
- Bird BMP
- Species-specific BMPs for the following:
  - *Alligator snapping turtle*
  - *Southern crawfish frog*
  - *Strecker's chorus frog*
  - *Woodhouse's toad*
  - *Eastern box turtle*
  - *Slender glass lizard*
  - *Texas garter snake*
  - *Timber (canebrake) rattlesnake*
  - *Western box turtle*
- Aquatic Amphibian and Reptile BMP
- Terrestrial Amphibian and Reptile BMP
- Vegetation BMP
- Aquatic Invertebrate BMP
- Bat BMP
- General Design and Construction BMP

No-Build Alternative

Under the No-Build Alternative, no construction or ground disturbance would occur, therefore no impacts to wildlife or wildlife habitat would occur.

Orange Alternative - Preferred Alternative

Detailed assessments of the stream crossings and potential mussel/bat habitats, and evaluation of the temporary and permanent effects of construction of the Orange Alternative on possible habitats in the Project Area used by the alligator snapping turtle and monarch butterfly may be conducted during the FEIS/ROD. Initially impacts would be minimized through project design considerations. Prior to, during, and following construction, stormwater and TPWD BMPs would be implemented to avoid/minimize impacts on state and federally listed species and their habitats including fish and wildlife and avoidance and minimization of vegetation removal and stream channel disturbance where practicable and feasible.

3.11.3 Executive Order 13122 on Invasive Species

This project is subject to and will comply with federal EO 13112 on Invasive Species. TxDOT implements this EO on a programmatic basis through its *Roadside Vegetation Management Manual* and *Landscape and Aesthetics Design Manual*.

3.11.4 Executive Memorandum on Environmentally and Economically Beneficial Landscaping

This project is subject to and would comply with the federal Executive Memorandum on Environmentally and Economically Beneficial Landscaping, effective April 26, 1994. TxDOT implements this Executive Memorandum on a programmatic basis through its *Roadside Vegetation Management Manual and Landscape and Aesthetics Design Manual*.

3.11.5 Migratory Bird Protections

Purple and Orange Alternatives

Construction of either Build Alternative will comply with applicable provisions of the Migratory Bird Treaty Act (MBTA) and Texas Parks and Wildlife Code Title 5, Subtitle B, Chapter 64, Birds. It is TxDOT's policy to avoid removal and destruction of active bird nests except through federal or state approved options. In addition, it is TxDOT's policy to, where appropriate and practicable:

- Use measures to prevent or discourage birds from building nests on man-made structures within portions of the Project Area planned for construction.
- Schedule construction activities outside the typical nesting season.

No-Build Alternative

The No-Build Alternative would not involve construction but may involve ongoing maintenance of existing bridges and culverts that may support migratory bird nests. As noted under the Build Alternatives above, it is TxDOT's policy to avoid removal and destruction of active bird nests except through federal or state approved options. Where appropriate and practicable, TxDOT also uses measures to prevent or discourage birds from building nests on man-made structures and schedule maintenance and construction activities outside the typical nesting season. The No-Build Alternative would comply with the applicable provisions of the MBTA and Texas Parks and Wildlife Code Title 5, Subtitle B, Chapter 64, Birds.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternative will comply with applicable provisions of the MBTA and Texas Parks and Wildlife Code Title 5, Subtitle B, Chapter 64, Birds. It is TxDOT's policy to avoid removal and destruction of active bird nests except through federal or state approved options. TxDOT would work with contractors to develop and implement measures to prevent or discourage birds from building nests on man-made structures within portions of the Project Area planned for construction and to schedule construction activities outside of the typical nesting season when practicable and feasible.

3.11.6 Fish and Wildlife Coordination Act

Purple and Orange Alternatives

Construction of the Purple or Orange Alternative is anticipated to require a NWP issued by the USACE. Compliance with the Fish and Wildlife Coordination Act would be accomplished by complying with the terms and conditions of the NWP.

No-Build Alternative

The No-Build Alternative would not involve construction and would not require any permits; therefore, compliance with the Fish and Wildlife Coordination Act is not required.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternative is anticipated to require a NWP issued by the USACE. As the final design for the Orange Alternative develops, additional consideration would be given to avoidance and further minimization of placing fill materials, piers, or the effects of temporary construction activities on water features and habitats, particularly within the Wilson Creek and East Fork Trinity River floodplain areas while also balancing design and cost parameters for the project. Compliance with the Fish and Wildlife Coordination Act will be accomplished by complying with the terms and conditions of the NWP issued for the project.

3.11.7 Bald and Golden Eagle Protection Act of 2007

Purple Alternative

The Purple Alternative is not within 660 feet of an active or inactive Bald or Golden Eagle nest. An inactive nest, however, is located along the East Fork Trinity River approximately 1.9 miles east of the Purple Alternative. Therefore, no coordination with USFWS under the Bald and Golden Eagle Protection Act (BGEPA) is required.

Orange Alternative

The Orange Alternative is not within 660 feet of an active or inactive Bald or Golden Eagle nest. An inactive nest, however, is located along the East Fork Trinity River approximately 0.6 miles east of the Orange Alternative. Approximately 0.6 miles upstream of the inactive nest where the Orange Alternative crosses the East Fork Trinity River, trees may provide perching habitat. However, the trees in this area along the shallow reach of the East Fork Trinity River are most likely too far from Lavon Lake, the nearest large waterbody that would provide foraging habitat for eagles. Therefore, no coordination with USFWS under the BGEPA is required.

No-Build Alternative

The No-Build Alternative does not include activities, nor make improvements within 660 feet of an active or inactive Bald or Golden Eagle nest. Therefore, no coordination with the USFWS under the BGEPA is required.

Orange Alternative - Preferred Alternative

The Orange Alternative would not be constructed within 660 feet of an active or inactive Bald or Golden Eagle nest and is not likely to affect roosting or perching habitat near open waterbodies used for foraging such as Lavon Lake. No coordination with the USFWS under BGEPA is required for the Orange Alternative.

3.11.8 Magnuson-Stevens Fishery Conservation Management Act

The Magnuson–Stevens Fishery Conservation and Management Act is the primary law that governs marine fisheries management in United States federal waters. The Essential Fish Habitat/Magnuson-Stevens Fishery Conservation and Management Act does not apply to either of the Build Alternatives considered including the Preferred Alternative because the Project Area does not contain marine waters.

3.11.9 Marine Mammal Protection Act

The Project Area for the Preferred Alternative contains no suitable habitat for marine mammals.

3.11.10 Threatened, Endangered, and Candidate Species

The purpose of the Endangered Species Act (ESA), passed by Congress in 1973, is to protect and provide for the recovery of imperilled species and the ecosystems upon which they depend. The ESA is administered by the USFWS and the National Marine Fisheries Service (NMFS). An endangered species is one that is in danger of extinction throughout all or a significant portion of its natural range, while a threatened species is one likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Candidate and proposed species are ones that are currently in the assessment process to determine if listing is appropriate using the listing factors in Section 4 of the ESA.

An analysis of the proposed ROW for the Purple and Orange Alternatives was performed to determine their potential to affect state or federally listed threatened, endangered, and candidate species. Field investigations were conducted in August 2020 and June 2021.

Purple and Orange Alternatives

Based on review of TPWD Texas Natural Diversity Database (TXNDD) and field review of the habitat within and adjacent to the proposed ROW, neither the Purple nor the Orange Alternative would affect federally listed species or designated critical habitats. However, both alternatives may affect the Texas fawnsfoot and the alligator snapping turtle, two species proposed for federal listing as threatened (as well as being state-listed as threatened), and the monarch butterfly, a federal candidate species. The proposed ROW for each Build Alternative is within the range of and contains suitable habitats for all three species. The Freshwater Mussel BMP would be implemented for the Texas fawnsfoot and species-specific BMPs would be implemented for the alligator snapping turtle. Section 7 consultation/conference with USFWS would be completed under either alternative should the species be listed.

Both the Purple and Orange Alternatives would involve roadway construction on new location and would not be completed prior to fiscal year 2024, the year USFWS intends to propose listing the monarch butterfly. If this species is proposed for listing prior to or during construction of the project, the effects to monarch butterflies would be reevaluated to determine the appropriate course of action, which may include conference or consultation with USFWS. TxDOT has determined construction of either the Purple or Orange Alternative would have no effect on all other federally listed species that may occur in the Project Area.

Both alternatives may impact the following four state-listed (as threatened) species: White-faced Ibis, Wood Stork, Louisiana pigtoe, and Texas heelsplitter. The proposed ROW for both Build Alternatives is within the

range of these four species and contains suitable habitat for each. Construction of either the Purple or Orange Alternative would have no impact on all other state-listed species that may occur in the Project Area.

Appendix O provides the Species Analysis Spreadsheet, Species Analysis Form, and the TPWD Best Management Practices Form, approved by TxDOT on September 29, 2021, containing additional information regarding threatened, endangered, and candidate species and information regarding potential impacts to SGCN. The Species Analysis Spreadsheet and Species Analysis Form are also available for review at the TxDOT Dallas District Office. The TPWD Best Management Practices Form is also included in **Appendix E**.

No-Build Alternative

Under the No-Build Alternative, no impact to threatened, endangered, or candidate species would occur.

Orange Alternative - Preferred Alternative

Construction of the Orange Alternatives would occur primarily on new location and would not be completed prior to fiscal year 2024, the year USFWS intends to propose listing the monarch butterfly. If this species is proposed for listing prior to or during construction of the project, the effects to monarch butterflies would be reevaluated to determine the appropriate course of action, which may include conference or consultation with USFWS. TxDOT has determined construction of the Orange Alternative would have no effect on all other federally listed species that may occur in the Project Area. The proposed ROW for the Orange Alternative contains suitable habitats for the following four state-listed as threatened species: White-faced Ibis, Wood Stork, Louisiana pigtoe, and Texas heelsplitter. TPWD BMPs would be implemented to avoid/minimize impacts to these and other state-listed and SGCN species. Construction of the Orange Alternative would have no impact on all other state-listed species that may occur in the Project Area. Impacts to protected species and species that may become listed as state or federally protected prior to construction of the Preferred Alternative would be avoided or minimized through implementation of TPWD BMPs, as described in **Section 3.11.2**, and provided in **Appendix O.** If species, including the Texas fawnsfoot or alligator snapping turtle, both currently proposed for federal listing as threatened, become federally listed prior to or during construction of the proposed project, section 7 consultation/conference with USFWS would be completed upon listing. Implementation of water quality and wetland/stream BMPs, as described in **Sections 3.10.1** and **3.10.2**, would additionally serve to avoid or minimize impacts to threatened, endangered, and candidate species and sensitive aquatic resources.

3.11.11 Texas Parks and Wildlife Coordination

Coordination with TPWD was initiated by TxDOT on November 19, 2021. Coordination is ongoing and, when complete, all coordination documentation would be included in **Appendix E** of the FEIS/ROD.

In accordance with the 2021 MOU between TxDOT and TPWD, TPWD has provided a set of recommended BMPs in a document titled, *"Beneficial Management Practices – Avoiding, Minimizing, and Mitigating Impacts of Transportation Projects on State Natural Resources,"* which is available on TxDOT's Natural Resources Toolkit at https://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/natural-resources.html. The MOU provides that application of specific TPWD BMPs to individual projects will be determined by TxDOT at its discretion. The TPWD-recommended BMPs that will be applied to this project are indicated in the Form *"Documentation of Texas Parks and Wildlife Department Best Management Practices"* prepared for the project, which is included in **Appendix E**.

The state-listed species and SGCNs impacted by and the TPWD BMPs applicable to implementation of the Purple or Orange Alternatives are described in **Section 3.11.2**.

3.12 Air Quality

3.12.1 Transportation Conformity

Purple and Orange Alternatives

The proposed Spur 399 Extension is a regionally significant project providing additional travel capacity primarily on new location within Collin County. This proposed project is within the nine-county Dallas-Fort-Worth (DFW) area including Collin County that was designated nonattainment and classified marginal under the 2008 and 2015 eight-hour ozone National Ambient Air Quality Standards (NAAQS), effective August 3, 2018;[26] therefore, transportation conformity rules apply. On October 1, 2015, the EPA lowered the primary and secondary eight-hour ozone NAAQS to 0.070 parts per million. Conformity for older standards is satisfied by conformity to the more stringent 2008 and 2015 ozone NAAQS, as applicable. Collin County and the remainder of the DFW area are in attainment/unclassifiable for the following criteria pollutants: carbon monoxide (CO), nitrogen dioxide, particulate matter (PM [2.5 and 10], and sulfur dioxide.

No-Build Alternative

The No-Build Alternative would not create any additional transportation capacity and is not subject to EPA's transportation conformity rules.

Orange Alternative - Preferred Alternative

Approval of transportation conformity is a two-step process involving (1) NCTCOG making its initial transportation conformity determination at the local level in the MTP, and (2) obtaining a joint conformity determination from FTA/FHWA at the federal level. Upon favorable approval, the projects, programs, and policies in the MTP and TIP may move forward toward implementation. The Orange Alternative as the Preferred Alternative for the Spur 399 Extension is included in the NCTCOG's *Mobility 2045 Update* and the 2023–2026 TIP, both approved by the RTC on June 9, 2022, making the Spur 399 Extension consistent with both plans. The STIP will be updated in November 2022 with TxDOT anticipating FTA/FHWA approvals shortly thereafter, making the project consistent with the STIP. Both the previous MTP and the TIP, as amended, were initially found to conform to the TCEQ State Implementation Plan (SIP) by FHWA and FTA on June 14, 2018, and July 22, 2021, respectively. The revised SIP is anticipated to be adopted by TCEQ in October 2022, and reviewed and approved by the EPA by December 2022. TxDOT will not take final action on this environmental document until a project level conformity determination has been obtained from FHWA, as applicable.

3.12.2 Carbon Monoxide Traffic Air Quality Analysis (CO TAQA)

The traffic modeled for the estimated time of completion (ETC) year [2030] and the design year [2050] for one section of the proposed freeway (within the existing SH 5 corridor) would be approximately 93,400 vpd and

[26] https://www.tceq.texas.gov/airquality/sip/dfw/dfw-status; accessed December 6, 2021. The DFW nonattainment area includes 9 of the 10 counties designated nonattainment under the 2008 8-hour ozone but does not include Rockwall County, which was designated attainment/unclassifiable. The attainment date for the DFW marginal nonattainment area was August 3, 2021, with a 2020 attainment year.

approximately 143,300 vpd, respectively; triggering the need for a carbon monoxide traffic air quality analysis (CO TAQA). The traffic data used in the analysis was developed and approved by the TxDOT Dallas District. Carbon monoxide concentrations for the section of the SH 5 corridor where design volumes exceed the 140,000 vpd threshold were modeled using CAL3QHC and EPA's Motor Vehicle Emissions Simulator (MOVES) 2014a (MOVES2014a), and factoring in adverse meteorological conditions and sensitive receptors at the ROW line. Local concentrations of carbon monoxide are not expected to exceed national standards at any time.

Within the model, receptors were placed at either end of the thinnest cross-section of the roadway where the highest traffic volumes are forecasted to occur, for this analysis that was determined to be between the intersection with SH 5 and Stewart Road applicable to both Build Alternatives. The modeled roadways, design hourly volume (DHV) of each roadway, distance to the receptors, speed, number of lanes, and emission factors use are described in Table 5 of the CO TAQA Technical Report included in **Appendix P**. The results from the CO TAQA modeling are shown in **Figure 3-32**. None of the modeled concentrations exceeded the 1-hour or 8-hour NAAQS for carbon monoxide.

Figure 3-32: Project Carbon Monoxide Modeling Results

Receptor Name	2030 Build Concentration (ppm[A])			2050 Build Concentration (ppm[A])			NAAQS[A] (ppm)
	Modeled Concentration	Background Value	Total	Modeled Concentration	Background Value	Total	
1-hour Results							
Receptor 1	0.1	1.7	1.8	0.1	1.7	1.8	35
Receptor 2	0.1	1.7	1.8	0.1	1.7	1.8	35
8-hour Results							
Receptor 1	0.07	1.4	1.47	0.07	1.4	1.47	9
Receptor 2	0.07	1.4	1.47	0.07	1.4	1.47	9

(A) ppm = parts per million, NAAQS = National Ambient Air Quality Standards

No-Build Alternative

The No-Build Alternative would not create any additional transportation capacity and is, therefore, not subject to CO TAQA requirements.

Orange Alternative - Preferred Alternative

As described above, the CO TAQA analysis indicates local concentrations of carbon monoxide are not expected to exceed national standards at any time.

3.12.3 Mobile Source Air Toxics (MSAT)

The purpose of this project is to improve north-south mobility and connectivity for travelers in the Study Area by constructing an 8-lane freeway on new location between US 380 and US 75 including frontage roads and grade-separated interchanges. Based on the traffic volumes forecasted at ETC and in the design year for the Build Alternatives, this project has been determined to trigger a quantitative mobile source air toxics (MSAT) analysis. Although travel demand is forecasted to increase within the Study Area due to population growth and with the added capacity provided by the Spur 399 Extension, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now

in effect, an analysis of national trends with EPA's MOVES2014a model forecasts a combined reduction of over 90 percent in the total annual emissions rate for the priority MSAT from 2010 to 2050 while vehicle miles traveled (VMT) are projected to increase by over 45 percent.[27] This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project. The MSAT Technical Report provided in **Appendix P** provides additional background on EPAs MOVES2014a model, FHWA Projected National MSAT Emission Trends for 2021-2050, and additional MSAT research.

3.12.3.1 Qualitative Analysis - Purple and Orange Alternatives

In the design year (2050) under both Build Alternatives, reduced MSAT emissions are expected within the immediate area of the project, relative to the No-Build Alternative, due to the reduced VMT associated with more direct routing. Under each Build Alternative there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections that would be built along the current alignment of Airport Drive (Purple Alternative) and along FM 546/Harry McKillop Boulevard and SH 5 (Purple and Orange Alternatives) where they tie into existing SH 5.

However, the magnitude and duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent from 2010 to 2050.[28] Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the Study Area are likely to be lower in the future in virtually all locations.

3.12.3.2 Quantitative MSAT Analysis –Preferred (Orange) Alternative

A quantitative analysis of MSAT emissions was performed to assess the difference in MSAT emissions between the 2020 Existing, 2050 Build (proposed), and 2050 No-Build scenarios for the affected network links including SH 5, US 75, US 380, and Airport Drive. The VMT for each link was aggregated by road type categories (frontage roads, ramps, mainlanes, and local roads) for the 2020 Existing, 2050 Build, and 2050 No-Build scenarios based on link lengths and average daily traffic (ADT) no-build traffic volumes developed by TxDOT for the project. The total VMT within the Study Area for the 2020 Existing scenario was determined to be 369,129,889; the total VMT for the 2050 No-Build scenario 542,112,650, and the VMT in the 2050 Build scenario 398,341,093.

MSAT emissions in the Study Area were calculated for the 2020 Existing, 2050 No-Build, and 2050 Build scenarios. The total mass of MSAT emissions in the 2050 Build scenario were the lowest of the three scenarios analyzed. The calculations show that the MSAT emissions decreased 72 percent from the 2020 Existing scenario to the 2050 Build scenario; with a VMT increase of 8 percent. Although the VMT is increasing, the

[27] Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 2016 - http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

[28] Ibid.

MSAT emissions are decreasing due to improved engine combustion efficiencies, higher average vehicle speed, and the electrification of the US fleet. The VMT and predicted MSAT emissions for each scenario are shown in **Figure 3-33**.

Figure 3-33: Mass of MSAT Emissions in Tons per Year and Percent Change in 2050 (Build) Compared to the 2020 Base Scenario

Pollutant	Base (Existing) 2020 (ton/yr)	Build 2050 (ton/yr)	Percent Change of Build 2050 to 2020	No-Build 2050 (ton/yr)	Percent Change of No-Build 2050 Compared to 2020
Acrolein	2.61E-02	8.57E-03	-67%	9.97E-03	-62%
Acetaldehyde	0.20	0.06	-69%	0.07	-64%
Benzene	0.37	0.11	-71%	0.15	-58%
Butadiene	0.04	5.69E-04	-98%	6.21E-04	-98%
Diesel PM	1.74	0.39	-77%	0.43	-75%
Ethylbenzene	0.24	0.09	-63%	0.12	-50%
Formaldehyde	0.44	0.18	-58%	0.21	-51%
Naphthalene	0.05	0.02	-67%	1.87E-02	-60%
POM	2.01E-02	5.00E-03	-72%	6.88E-03	-66%
Millions VMT	369	398	8%	542	47%
Total MSAT	3.12	0.86	-72%	1.03	-67%

Source: Table 2-6, *Mobile Source Air Toxics Technical Report*; July 2022; Appendix P

As shown in **Figure 3-33**, a decrease in overall MSAT emissions is predicted for the 2050 Build scenario. The total tons per year of MSAT emissions in 2020 Existing are 3.12 and the MSAT emissions for the 2050 Build scenario are 0.86. Under the 2050 No-Build scenario, an overall reduction in MSAT emissions is expected to be seen. The 2050 Build scenario would result in a 72 percent decrease in MSAT emissions even though VMT increases 8 percent over the existing scenario. The 2050 No-Build scenario would result in a 67 percent reduction in MSAT emissions. The reductions in both 2050 scenarios are due to increases in combustion efficiency of engines and the electrification of the US fleet. In conjunction with these two factors, the future Build scenario is diverting traffic from the surrounding roadways, reducing congestion and increasing vehicle speeds, which also reduces the expected MSAT emissions from the Study Area. This trend is true for both new and existing roadways; even though 2050 travel volumes along SH 5, US 75, and US 380 are expected to increase, MSAT along these roadways are anticipated to decrease between the Build (2050) and No-Build (2050) scenarios.

Using EPA's MOVES2014a model for projected national MSAT trends, [29] FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period. For the Spur 399 Extension, the 2050 Build scenario predicts lower overall MSAT emissions than the 2050 No-Build scenario. The Build scenario

[29] FHWA Projected National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways, Using EPA's MOVES2014A Model (September 2016); Spur 399 Extension MSAT Technical Report, Figure 2-1, Appendix P.

indicates priority MSAT would decrease between 63 percent (Ethylbenzene) and 99 percent (1,3-butadiene) during this same time period.

As the Preferred Alternative for the Spur 399 Extension, VMT in 2050 along the Orange Alternative and the rest of the local roadway network would increase by approximately 8 percent compared to 2020 (No-Build). This slight increase is due to higher volumes of traffic expected to use the roadway network analyzed because of population growth in the area and the diversion of traffic from the local roadway network to the new Spur 399 Extension, a slightly longer route. While the VMT for the Preferred (Orange) Alternative are expected to increase slightly, the total MSAT emissions are predicted to decrease by approximately 72 percent, from 3.12 to 0.86 tons per year. This reduction of MSAT emissions within the network area is due to higher combustion efficiencies of vehicle engines and the electrification of the US fleet. If the proposed improvements are not implemented, the VMT under the 2050 No-Build scenario would increase by approximately 47 percent compared to the 2020 (No-Build) scenario. The higher VMT and MSAT emissions in the Future No-Build (2050) when compared to the Future Build (2050) can be attributed to a congested local roadway network which would lead to longer travel routes and traffic circumnavigating the local roadway network (e.g. traffic on US 75 driving up to US 380 to go east to New Hope Road West) in the future No-Build (2050) scenario. In addition to reducing the travel distances required, the Preferred (Orange) Alternative would divert traffic from existing roadways, reducing congestion and increasing travel speeds, reducing the amount of MSAT emitted, while total MSAT emissions are predicted to decrease by approximately 67 percent, from 3.12 to 1.03 tons per year.

3.12.4 Congestion Management Process (CMP)

The congestion management process (CMP) is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs. The project was developed from the NCTCOG's CMP, which meets all requirements of 23 CFR 450.320 and 500.109, as applicable. The CMP Update was adopted by NCTCOG Regional Transportation Council in August 2021.

The region commits to operational improvements and travel demand reduction strategies at two levels of implementation: program level and project level. Program level commitments are inventoried in the regional CMP, which was adopted by NCTCOG; they are included in the financially constrained MTP, and future resources are reserved for their implementation. The CMP element of the plan carries an inventory of all project commitments (including those resulting from major investment studies) that details type of strategy, implementing responsibilities, schedules, and expected costs. At the project's programming stage, travel demand reduction strategies and commitments will be added to the regional TIP or included in the construction plans. The regional TIP provides for programming of these projects at the appropriate time with respect to the single occupancy vehicle (SOV) facility implementation and project-specific elements.

Committed congestion reduction strategies and operational improvements within the study boundary will consist of providing additional capacity and implementing access management through development of the limited access freeway with frontage roads, and inclusion of SUPs along the frontage roads connecting to existing and planned trails and sidewalk networks. Individual projects are listed in **Figure 3-34.**

Figure 3-34: Congestion Management Process Strategies for the Preferred (Orange) Alternative

Operational Improvements in Travel Corridor		
Location	**Type**	**Implementation Date**
Citywide Signal System, Video Detectors and Communication ITS	Travel Time Index Travel Time Reliability	2007-ongoing
Interchange/Grade Separation for Spur 399 at SH 5	Grade Separation	2017
McDonald at Medical Center: Phase 1 Signal Communication Software and Traffic Control; Phase 2 Synchronize Signal Clocks	Travel Time Index Travel Time Reliability	Undetermined
SH5 Improvements from South of FM 1378 to South of CR 275)	Addition of Travel Lanes	Existing Condition (presumed w/implementation of the SH 5 Improvement Project by June 2027)
US 380 Widening from Airport Drive to CR 458	Addition of Travel Lanes	Existing Condition (presumed w/implementation of the US 380 Widening Project by February 2024)
Spur 399 Extension Airport Drive to US 380	Bike/Ped Improvements (shared-use paths)	2027 (proposed project)
SH 5 from US 75/SRT-SH-121 to Stewart Road and FM 546/Harry McKillop Boulevard	Addition of Travel Lanes	2027 (proposed project)
Spur 399 Extension from SH5 to Airport Drive/Old Mill Road	Addition of Lanes	2027 (proposed project)
Spur 399 Extension from Airport Drive/Old Mill Road to US 380	Access Management Improvements (turn lanes, close driveways, and signalized intersections along frontage roads)	2027 (proposed project)
Airport Drive "Parkway Trail" from SH 5 to US 380 (City of McKinney)	Bike/Ped Improvements	Undetermined
US 380 McKinney Improvements Coit Road to FM 1827	Addition of Travel Lanes	Submitted for listing in the MTP Update with the Spur 399 Extension

Source: TxDOT Dallas District, www.keepitmovingdallas.com; *City of McKinney Proposed City-Wide Trail Master Plan, Conceptual Trail Network Plan, May 21, 2021; NCTCOG Transportation Improvement Program Information System (TIPINS).*

In an effort to reduce congestion and the need for SOV lanes in the region, TxDOT and NCTCOG will continue to promote appropriate congestion reduction strategies through the Congestion Mitigation and Air Quality Improvement (CMAQ) program, the CMP, and the MTP. The congestion reduction strategies considered for this project would help alleviate congestion in the SOV study boundary, but would not eliminate it.

Therefore, the proposed project is justified. The CMP analysis for added SOV capacity projects in the Transportation Management Area is on file and available for review at the NCTCOG.

3.12.5 Construction Emissions

During the construction phase of the proposed project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site

preparation (e.g., land clearing, grading), and the primary construction-related emissions of MSAT are diesel PM from diesel-powered construction equipment and vehicles.

The potential effect of these temporary increases in PM emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found on TCEQ's TERP website.[30]

However, considering the temporary and transient nature of construction-related emissions, the use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements; it is not anticipated that emissions from construction of this project (implementation of either Build Alternative) would have a substantial effect on air quality in the Study Area.

3.13 Hazardous Materials

This section summarizes the baseline conditions and potential environmental impacts or effects of hazardous materials to the Purple and Orange Alternatives and the No-Build alternative. The information presented has been summarized from the *Hazardous Materials Initial Site Assessment* (ISA), approved on October 1, 2021, and TCEQ File Review Report, dated January 18, 2022, provided in **Appendix Q**.

The term "hazardous materials" refers to a broad category of hazardous wastes, hazardous substances, and toxic chemicals with the potential to negatively impact human health or the environment. Examples of hazardous material sites or issues commonly encountered for transportation projects include, but are not limited to, industrial sites, petroleum storage tank (PST) sites, oil and gas well sites, landfills, pipelines, structures with asbestos- or lead-containing materials, and other sites impacted by soil and/or groundwater contamination.

The ISA was performed to determine the potential for hazardous materials issues within and adjacent to the proposed ROW and included regulatory database reviews, desktop analyses, and site surveys. The list of data sources reviewed, and protocols followed are described in the ISA (**Appendix Q**). The regulatory database search identified records within the defined search distances for the Purple and Orange Alternatives, and only sites and parcels located within and adjacent to the proposed ROW and where construction activity is proposed to occur were the focus of the evaluation, in addition to consideration of current and past land uses, previous regulatory actions, and current regulatory status of the affected parcels.

Sites were assigned an estimated level of risk (low, moderate, or high) of encountering hazardous materials issues during the construction phase of the proposed project based on the following criteria:

- Low – The issue has a low potential to impact the proposed project and no further investigations are required.

[30] https://www.tceq.texas.gov/airquality/terp

- Moderate – Not enough information is currently known about the project and/or issue to determine potential impacts. Further investigation and/or additional project design and ROW information is required.
- High – The issue has a high potential to impact the proposed project and further investigations, coordination, or contingencies may be required.

Purple Alternative

Three sites of moderate potential and one site of high potential environmental risk along the Purple Alternative are described in **Figure 3-35**.

Figure 3-35: Hazardous Materials Sites of Moderate and High Potential Environmental Risk Along the Purple Alternative

	Site Information	Site Identification	Potential to Impact Project
PURPLE ALTERNATIVE	McKinney LFG Facility/ NTMWD Landfill/ Wilson Creek LS (ISA Map ID 96) Closed (inactive) landfill facility located within proposed ROW of Common Alignment	Regulatory records review	High
	Chemical Lime Co/ WW Weber/ Texas Custom Pools/ TXI McKinney Ready Mix/ TXI Operations/ LHoist North America/ John Marriott (ISA Map ID 143) Lime, limestone, and clay products supplier located within and adjacent to proposed ROW of Common Alignment	Regulatory records review	Moderate
	Site 1, Project site survey Site of discarded debris and 55-gallon drums located within and adjacent to proposed ROW of Common Alignment	Project site survey observations	Moderate
	Site 2, Project site survey Site of spoil and aggregate piles located within and adjacent to proposed ROW of the Purple Alternative	Project site survey observations	Moderate

McKinney LFG Facility/NTMWD Landfill (NTMWD/McKinney Landfill) - a closed (inactive) landfill facility (ISA Map ID 96) is located within and adjacent to the proposed Common Alignment shared by the Purple and Orange Alternatives east of SH 5. The site was determined to be a high environmental risk due to its past use and the need for ROW from the property to construct the Purple Alternative. The facility appears to have accepted waste from at least 1980 to 2009 and is currently inactive as a landfill facility. Additionally, the facility formerly contained two 10,000-gallon diesel underground storage tanks (USTs) that were installed in 1980 and removed in 2004, and one 3,300-gallon diesel aboveground storage tank (AST) is currently used on-site. TCEQ records indicate multiple prior environmental violations at the site. Observations during the project site survey included ASTs without secondary containment, various trash and debris, and stockpiled materials.

Chemical Lime Co., et. al. - a large site (ISA Map ID 143) with multiple current and past industrial uses located within and adjacent to the proposed Common Alignment shared by the Purple and Orange Alternatives. The site is on the east side of SH 5 and includes three parcels. The facility is currently used to store and supply

limestone, lime and clay products, produce cement, and provide fleet refueling with large amounts of chemicals stored on-site. Two out-of-use aboveground PSTs and one currently in-use 4,500-gallon diesel AST are listed as being located on-site. One release was reported having occurred in 2009 with impacts to groundwater, but no additional information was available. Regulatory records also indicate presence of two small (6-acre) former landfill listings at this site, closed in 1990. The site was determined as a moderate environmental risk due it its current and past uses and the need for ROW from the property to construct the Purple Alternative.

Site 1, identified during the site survey within and adjacent to the proposed Common Alignment shared by the Purple and Orange Alternatives. The site is on the east side of SH 5 and was observed to contain trash, debris, and one 55-gallon drum (appeared to be sealed with unknown contents). This accumulation of items appeared to be the result of flooding events; but based on the uncertainty of contents of the drum and debris, the site was determined as a moderate environmental risk to the construction of the Purple Alternative.

Site 2, identified during the site survey, was observed to contain numerous spoil piles of soil, asphalt, and aggregate of various sizes. Because of the unknown origin and contents of the deposits, this site was determined as a moderate environmental risk to the Purple Alternative.

Further investigation was performed on the moderate environmental risk sites in October 2021 by TxDOT ENV Division Hazardous Materials Management (ENV-HMM). ENV-HMM determined, for site survey locations, no visible surface staining was observed and any trash and debris would be removed during the ROW acquisition process, therefore, these locations pose a low potential to impact the proposed project. For Chemical Lime Co. site (ISA Map ID 143), ENV-HMM determined the facility would pose a low potential to impact the project based on the limited amount of ROW acquisition proposed.

For the high environmental risk site, NTMWD/McKinney Landfill (ISA Map ID 96), TCEQ files were reviewed by LCA Environmental, Inc. (LCA). A File Review report, dated January 18, 2022, was submitted to TxDOT and provided additional information on the NTMWD/McKinney Landfill. The LCA TCEQ Records File Review Report is maintained in the TxDOT Dallas District project files. A copy of the report is included in **Appendix Q**.

LCA determined a portion of the proposed project would be constructed within the permitted boundary of the NTMWD/McKinney Landfill and significant grading and fill activities had occurred in these sectors from at least 1994 through 2005. The TCEQ files also identified groundwater contamination on the landfill property. LCA recommended further investigation to determine the extent of the buried waste materials as well as the extent of groundwater contamination in the area of the proposed project.

Two natural gas pipelines cross the Common Alignment shared by the Purple and Orange Alternatives. A 10.75-inch diameter natural gas pipeline parallels SH 5 then crosses south of the junction of existing Spur 399 and SH5; and a 20-inch diameter natural gas pipeline crosses SH 5 just north of Stewart Road and continues eastward paralleling the Common Alignment for a short distance before crossing the proposed alignment approximately 1,700 feet west of the intersection of FM 546 and Couch Drive (Old Mill Road). The same pipeline parallels FM 546 east of Couch Drive and continuing on to the Orange Alternative (see description below). Based on the contents of these pipelines, they are not considered to be an environmental concern to the Purple Alternative. Utilities are discussed further in **Section 3.4.**

Orange Alternative

Four sites of moderate potential and one site of high potential for environmental risk to the Orange Alternative are described in **Figure 3-36**.

Figure 3-36: Hazardous Materials Sites of Moderate and High Potential Environmental Risk Along the Orange Alternative

	Site Information	Site Identification	Potential to Impact Project
ORANGE ALTERNATIVE	McKinney LFG Facility/ NTMWD Landfill/ Wilson Creek LS (ISA Map ID 96) Closed (inactive) landfill facility located within proposed ROW of Common Alignment	Regulatory records review	High
	Chemical Lime Co/ WW Weber/ Texas Custom Pools/ TXI McKinney Ready Mix/ TXI Operations/ LHoist North America/ John Marriott (ISA Map ID 143) Lime, limestone, and clay products supplier located within and adjacent to proposed ROW of Common Alignment	Regulatory records review	Moderate
	Site 1, Project site survey Site of discarded debris and 55-gallon drums located within and adjacent to proposed ROW of Common Alignment	Project site survey observations	Moderate
	Sports Moore/ Osttend Landfill/ Strata Materials/ Construction Recycling & Waste Landfill/Metro Environmental Management Landfill (ISA Map ID 20) Currently active landfill located adjacent to proposed ROW of Orange Alternative	Regulatory records review	Moderate
	Site 4, Project site survey Site of discarded PSTs, debris, and 55-gallon drums located within proposed ROW of Orange Alternative	Project site survey observations	Moderate

McKinney LFG Facility/NTMWD Landfill (NTMWD/McKinney Landfill) – as described under the Purple Alternative, the site (ISA Map ID 96) was determined to be of high potential environmental concern due to its past use. ROW would also be needed from the property to construct the Orange Alternative.

Chemical Lime Co. et. al.– as described under the Purple Alternative, the site (ISA Map ID 143) would pose a moderate environmental risk due it its current use. ROW would also be needed from the property to construct the Orange Alternative.

Site 1, described under the Purple Alternative, was determined to be a moderate environmental risk to the construction of the Orange Alternative.

Sports Moore - a large site (ISA Map ID 20) with multiple current and past landfill uses adjacent to the Orange Alternative. Records indicate historical use of the eastern and western portions of the site as stone quarries. Records indicate the site is currently used as a construction and demolition debris landfill which began accepting waste in 2019. The total permitted landfill area is approximately 147 acres with 57 acres designated as non-fill area. Multiple in-use underground and aboveground PSTs are present on-site, and no releases have

been reported associated with the PSTs. The site was determined to be a moderate environmental risk because of its past and current uses and proximity to the proposed ROW.

Site 4, identified during the project site survey, was observed to contain various discarded or abandoned containers and materials. Old PSTs and fuel dispensers were observed and appeared to be empty, but it is unknown whether releases have occurred on the site. Refuse and other debris, including a 55-gallon drum of unknown contents, were observed in an old barn. Based on the presence of these items, the site was determined to be a moderate environmental risk to the Orange Alternative.

As noted under the Purple Alternative, further investigation was performed on the moderate environmental risk sites in October 2021 by TxDOT ENV-HMM. ENV-HMM determined, for site survey locations, no visible surface staining was observed and any trash, debris and other materials would be removed during the ROW acquisition process, therefore, these locations pose a low potential to impact the proposed project. For Chemical Lime Co. site (ISA Map ID 143), ENV-HMM determined the facility would pose a low potential to impact the project based on the limited amount of ROW acquisition proposed. For the Sports Moore (ISA Map ID 20), ENV-HMM determined that since no ROW acquisition is proposed from this facility and the type of waste it receives (construction and demolition), this facility poses a low potential to impact the project.

For the high environmental risk site, NTMWD/McKinney Landfill (ISA Map ID 96), the same potential for impact as well as additional investigations as described under the Purple Alternative also apply to the Orange Alternative.

A 20-inch diameter pipeline parallels the Purple and Orange Alternatives Common Alignment along FM 546 east of Couch Drive and continues along the Orange Alternative crossing it twice, first to the west of Airport Drive and the second to the east of Airport Drive. The pipeline continues east-northeast crossing the Orange Alternative a final time west of Enloe Road to the north of FM 546. Based on the contents of this pipeline, it is not considered to be an environmental concern to the Orange Alternative. Utilities are discussed further in **Section 3.4**.

No-Build Alternative

Under the No-Build Alternative, no ROW acquisition, demolition, or development would occur, and therefore no effect to the identified hazardous materials sites would occur.

Orange Alternative - Preferred Alternative

Through development of the Hazardous Materials ISA (**Appendix Q**) and subsequent investigation of selected sites by TxDOT ENV-HMM, it was determined a single site (the NTMWD/McKinney Landfill; ISA Map ID 96) posed potential environmental risk for the Preferred (Orange) Alternative. Additional coordination with NTMWD on February 18, 2022, determined the northern landfill permitted boundary would need to be relocated southward and outside of the proposed ROW for the Orange Alternative in addition to relocation of existing drainage infrastructure, plugging of existing and installation of new groundwater monitoring wells, and relocation of the gas flare. The landfill permitted boundary would need to be moved prior to TxDOT acquiring the ROW to build the Orange Alternative. The TCEQ permitting process to relocate the landfill boundary as well as the monitoring wells and drainage features may take between two to four years. After the landfill permitted boundary is moved, TxDOT would conduct Phase II subsurface investigations within the proposed ROW to

determine if any waste or other contamination is present prior to initiating roadway construction. All other previously identified sites have been determined to pose a low potential to impact the Orange Alternative.

While there are no other sites expected to pose greater than a low potential to impact the Orange Alternative, special provisions or contingency language would be included in the project plans, specifications, and estimates to handle any hazardous materials that may be encountered during construction of the Orange Alternative. Plans would include language for, but not limited to, the handling and disposal of petroleum contamination, asbestos-containing materials, and additional hazardous materials according to applicable federal and state regulations.

3.14 Traffic Noise

A traffic noise analysis was conducted in accordance with TxDOT's (FHWA–approved) Guidelines for Analysis and Abatement of Roadway Traffic Noise and Construction Noise (TxDOT 2019). A *DEIS Reasonable Alternatives Traffic Noise Analysis Technical Report – Spur 399 Extension* was completed for the proposed project in May 2022. This report is included as **Appendix R**.

3.14.1 Background Information

The predominant land uses in the vicinity of the Study Area are residential, commercial, and transportation. The Study Area follows the proposed ROW of the Orange and Purple Alternatives of Spur 399.

Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Prediction of future noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur (**Figure 3-37**).

Figure 3-37: Noise Abatement Criteria

Activity Category	FHWA (dB(A) Leq)	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[31]	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

Source: *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (TxDOT 2019)

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

Absolute criterion: The predicted noise level at a receptor approaches, equals, or exceeds the NAC. Approach is defined as 1 dB(A) below the NAC. For example, a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dB(A) or above.

Relative criterion: The predicted noise level substantially exceeds the existing noise level at a receptor even though the predicted noise level does not approach, equal, or exceed the NAC. Substantially exceeds is defined as more than 10 dB(A). For example, a noise impact would occur at a Category B residence if the existing noise level is 54 dB(A) and the predicted noise level is 65 dB(A) (11 dB(A) increase).

When a traffic noise impact occurs, noise-abatement measures must be considered. A noise-abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

The FHWA traffic noise modeling software (TNM 2.5) was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

[31] As of Oct 1, 2021, Category B receptors include permitted new residential development for Meridian at Southgate and NewGrowth McKinney. Development permits issued after Oct 1, 2021, were not included in the analysis.

3.14.2 Environmental Consequences

Existing and predicted traffic noise levels were modeled at representative land use activity areas (receptors) adjacent to the project that might be impacted by traffic noise and would potentially benefit from feasible and reasonable noise abatement. The proposed Build Alternatives would result in traffic noise impacts to receptors, as described in the following sections. Noise abatement measures including traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers were considered.

Noise abatement measures were considered and analyzed for each impacted receptor location. Abatement measures, typically noise barriers, must provide a minimum noise reduction, or benefit, at or above the threshold of 5 dB(A). A barrier is not acoustically feasible unless it reduces noise levels by at least 5 dB(A) at greater than 50 percent of first-row impacted receptors and benefits a minimum of two impacted receptors. To be reasonable, the barrier must not exceed the cost reasonableness allowance of 1,500 square feet per benefited receptor and must meet the noise reduction design goal of 7 dB(A) for at least one receptor.

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) per mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

Alteration of horizontal and/or vertical alignments: any alteration of the existing alignment would displace existing businesses and residences, require additional ROW and not be cost effective/reasonable.

Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Traffic noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receptor locations. It was then determined whether noise barriers would be reasonable and feasible.

3.14.2.1 Noise Contours for Land Use Planning

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, that no new activities are planned or constructed along or within the following predicted (2050) noise impact contours shown in **Figure 3-38**.

Impact contours are one dB(A) lower than the NAC per category to reflect impacts that would occur as a result of approaching the NAC for the respective contours. Permit research was conducted using the best available online data from the City of McKinney as of October 1, 2021. This research was based on available online permit search and address information from the Collin Central Appraisal District database.

Figure 3-38: Noise Contours for Land Use Planning

Land Use	Impact Contour	Distance from Right-of-Way
NAC Category B & C	66 dB(A)	≈370 feet
NAC Category E	71 dB(A)	≈224 feet

Source: *DEIS Reasonable Alternatives Traffic Noise Analysis Technical Report – Spur 399 Extension*; May 2022. Appendix R

3.14.2.2 Construction Noise

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

3.14.2.3 Alternative Results

Existing and predicted traffic noise levels were modeled at receptor locations that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement. **Figure 3-39** (Purple Alternative) and **Figure 3-54** (Orange Alternative) summarize the change in dB(A) that would be expected at each receiver location for the Purple Alternative and Orange Alternative, respectively. **Figures 3-40** through **3-53** and **Figures 3-55** through **3-78** show the locations of each receiver as well as proposed noise barriers for the Purple Alternative and Orange Alternative, respectively. Detailed results of the traffic noise analysis are in the *DEIS Reasonable Alternatives Traffic Noise Analysis Technical Report – Spur 399 Extension* in **Appendix R**.

Purple Alternative

The Purple Alternative results in 183 impacted receptors (**Figure 3-39**), of which, 52 receptors had substantial increases in noise levels and 26 receptors would benefit from feasible and reasonable barriers. Receptors and barriers are shown on **Figures 3-40** through **3-53** and in **Appendix R, Attachment 1, Figures 1-1 through 1-14**.

Orange Alternative

The Orange Alternative results in 164 impacted receptors (**Figure 3-56**), of which, 49 receptors had substantial increases in noise levels and 26 receptors would benefit from feasible and reasonable barriers. Receptors and barriers are depicted on **Figures 3-55** through **3-78** and in **Appendix R, Attachment 1, Figures 2-1 through 2-22.**

Figure 3-39: Summary of Predicted Traffic Noise Level Changes for the Purple Alternative

Noise Impact	NAC Activity Category / Acceptable db(A) Leq	Change (+/-)	Representative Receptors
NO	B / 67 dB(A)	-2 to 0	R-020, R-022, R-023, R-024
		+1 to +5	R-108, R-110, R-112, R-127
		+6	R-113, R-125, R-126, R-173, R-210, R-211, R-247, R-248, R-252
		+7	R-106, R-107, R-109, R-171, R-172, R-208, R-209, R-212, R-213, R-214, R-215, R-216, R-217, R-218, R-245, R-246, R-249, R-250, R-251, R-253, R-254, R-255, R-256, R-257, R-258, R-260, R-261, R-291, R-299
		+8	R-176, R-207, R-219, R-220, R-221, R-222, R-233, R-237, R-241, R-242, R-244, R-259, R-262, R-263, R-290, R-296, R-297, R-298
		+9	R-175, R-178, R-180, R-204, R-205, R-206, R-223, R-224, R-225, R-226, R-227, R-228, R-229, R-230, R-231, R-232, R-234, R-235, R-236, R-238, R-239, R-240, R-243
		+10	R-174, R-179, R-181
YES	B / 67 dB(A)	-2 to 0	R-016, R-017, R-019, R-021
		+1 to +5	R-015, R-018, R-111, R-116, R-170
		+6	R-014, R-032, R-034, R-035, R-036, R-037, R-039, R-169, R-287, R-288
		+7	R-025, R-027, R-028, R-030, R-031, R-033, R-038, R-040, R-041, R-042, R-045, R-122, R-269, R-270, R-271, R-272, R-273, R-274, R-275, R-276, R-277, R-278, R-279, R-283, R-284, R-285, R-286, R-294, R-295
		+8	R-007, R-008, R-009, R-026, R-029, R-043, R-044, R-046, R-047, R-050, R-051, R-052, R-053, R-054, R-068, R-070, R-121, R-124, R-177, R-264, R-265, R-266, R-267, R-268, R-280, R-281, R-292, R-293
		+9	R-011, R-012, R-013, R-048, R-049, R-055, R-057, R-058, R-059, R-066, R-069, R-071, R-088, R-092, R-095, R-096, R-097, R-098, R-099, R-119, R-123, R-202, R-203, R-282, R-289
		+10	R-010, R-056, R-060, R-061, R-062, R-063, R-064, R-065, R-067, R-072, R-073, R-075, R-076, R-079, R-080, R-081, R-082, R-083, R-084, R-085, R-086, R-087, R-091, R-093, R-094, R-117, R-118
		+11	R-074, R-077, R-078, R-089, R-090, R-114, R-115, R-120, R-159, R-162, R-163, R-164, R-165

Figure 3-39 continued: Summary of Predicted Traffic Noise Level Changes for the Purple Alternative

Noise Impact	NAC Activity Category / Acceptable db(A) Leq	Change (+/-)	Representative Receptors
YES	B / 67 dB(A) continued	+12	R-160, R-161, R-166, R-168
		+13	R-145
		+14	R-130, R-131, R-132, R-133, R-134, R-146, R-147, R-148, R-149, R-150, R-167
		+15 to +20	R-128, R-129, R-135, R-136, R-137, R-138, R-139, R-140, R-141, R-142, R-143, R-144, R-151, R-152, R-153, R-154, R-155, R-156, R-158, R-157
YES	C / 67 dB(A)	+2 to +10	R-305, R-309, R-310
		+11 to +20	R-300, R-304, R-306

Source: Table 2, *DEIS Reasonable Alternatives Traffic Noise Analysis Technical Report*, Appendix R.

Figure 3-40: Purple Alternative Modeled Noise Receptors and Barrier Locations – Spur 399 at McKinney Medical Center

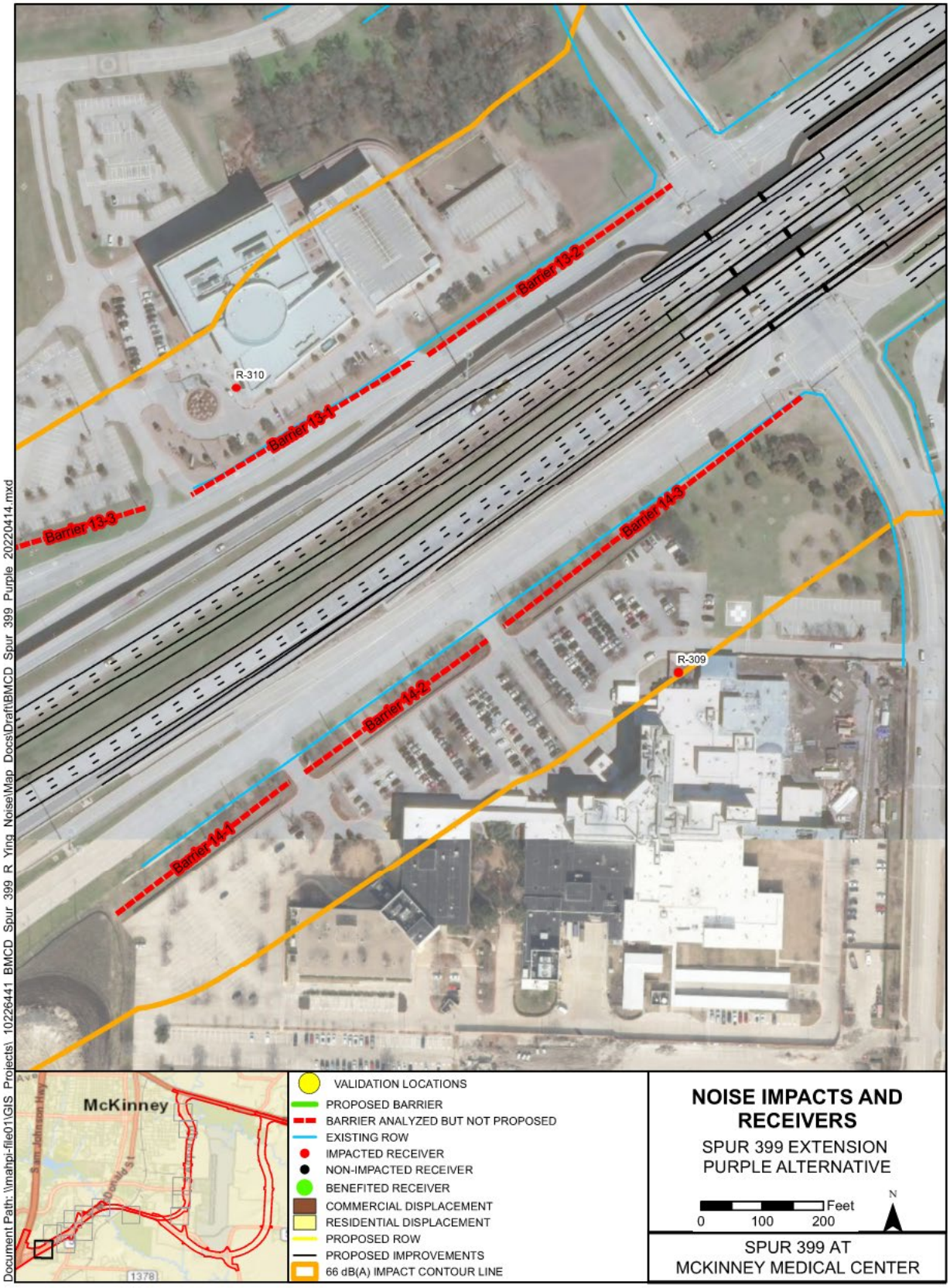


Figure 3-41: Purple Alternative Modeled Noise Receptors and Barrier Locations – Spur 399/SH 5 at Medical Center Drive

Figure 3-42: Purple Alternative Modeled Noise Receptors and Barrier Locations – Spur 399/SH 5 at McKinney Village

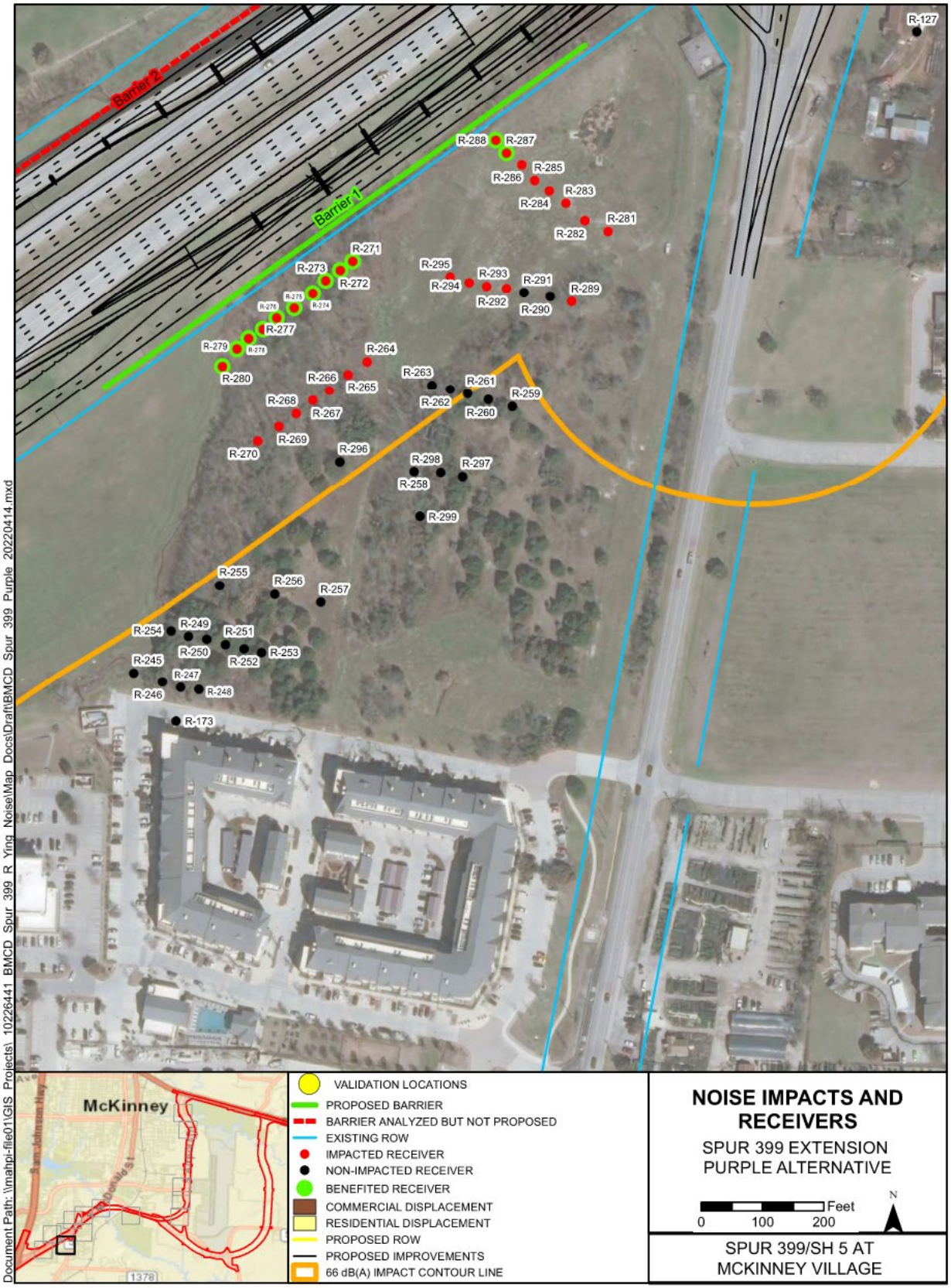


Figure 3-43: Purple Alternative Modeled Noise Receptors and Barrier Locations – Spur 399/SH 5 at South McDonald Street

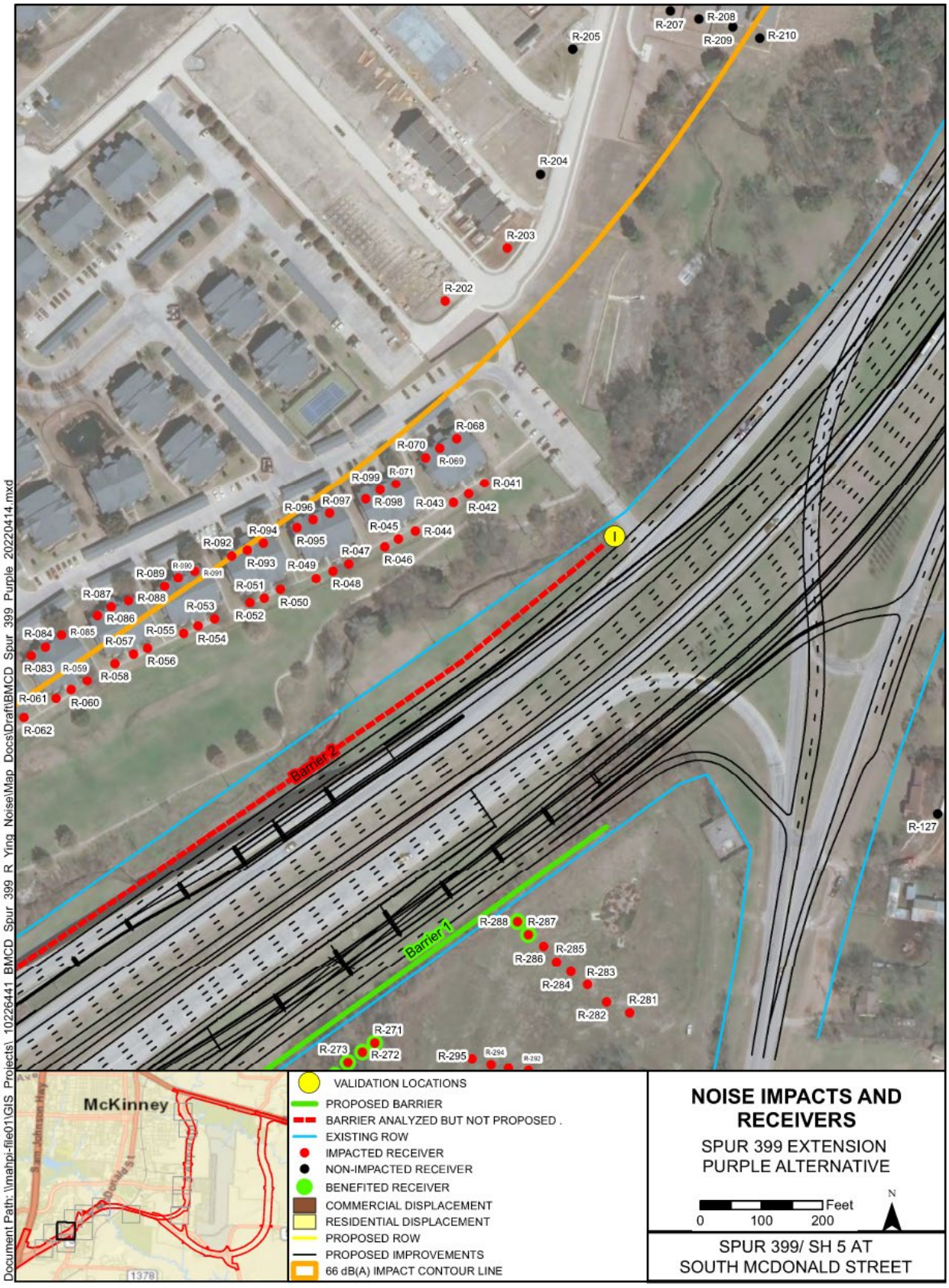


Figure 3-44: Purple Alternative Modeled Noise Receptors and Barrier Locations – SH 5 at High Point Manufactured Home Community

Figure 3-45: Purple Alternative Modeled Noise Receptors and Barrier Locations – SH 5 North of HighPoint Manufacured Home Community

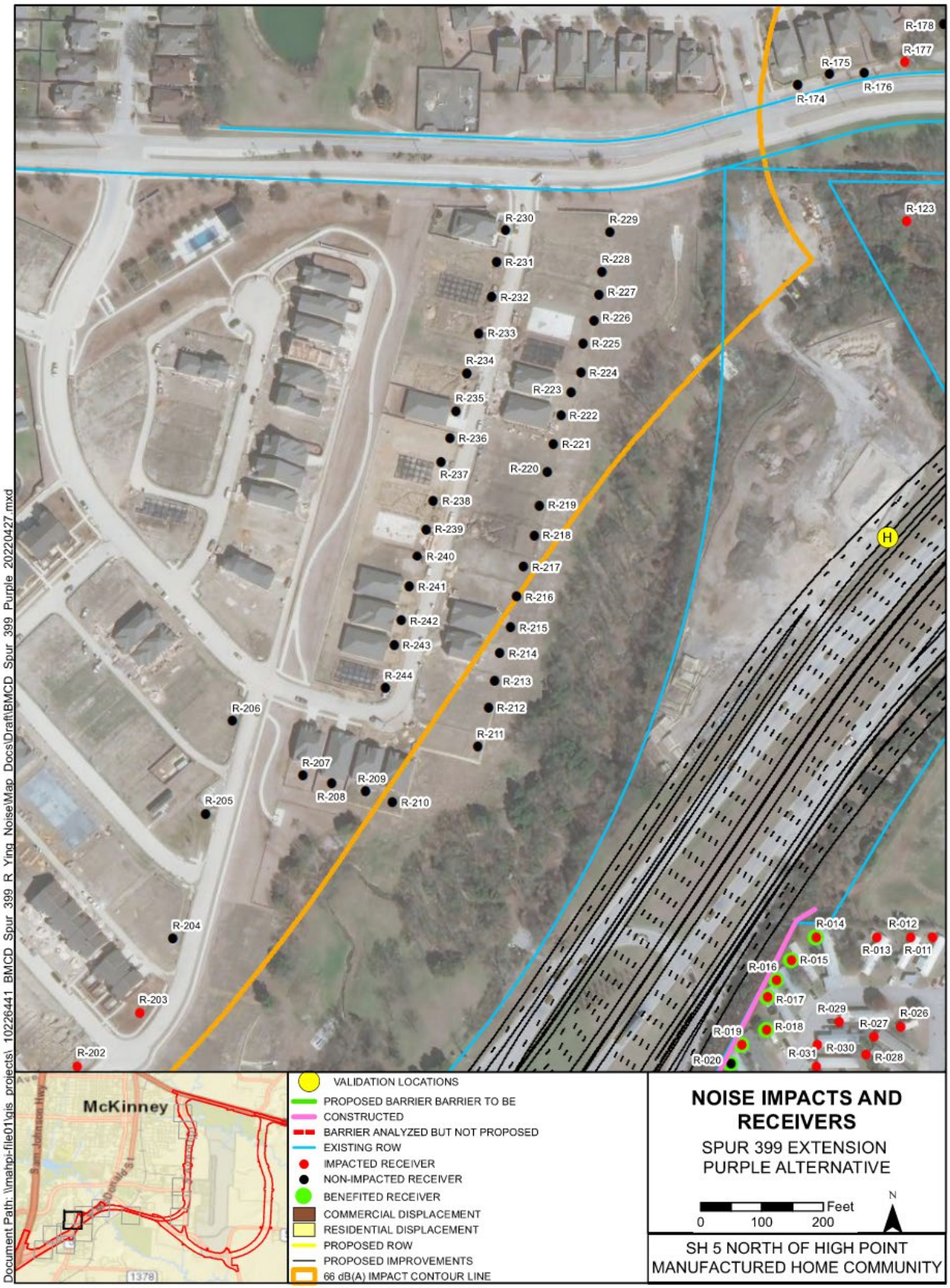


Figure 3-46: Purple Alternative Modeled Noise Receptors and Barrier Locations – SH 5 at Stewart Road

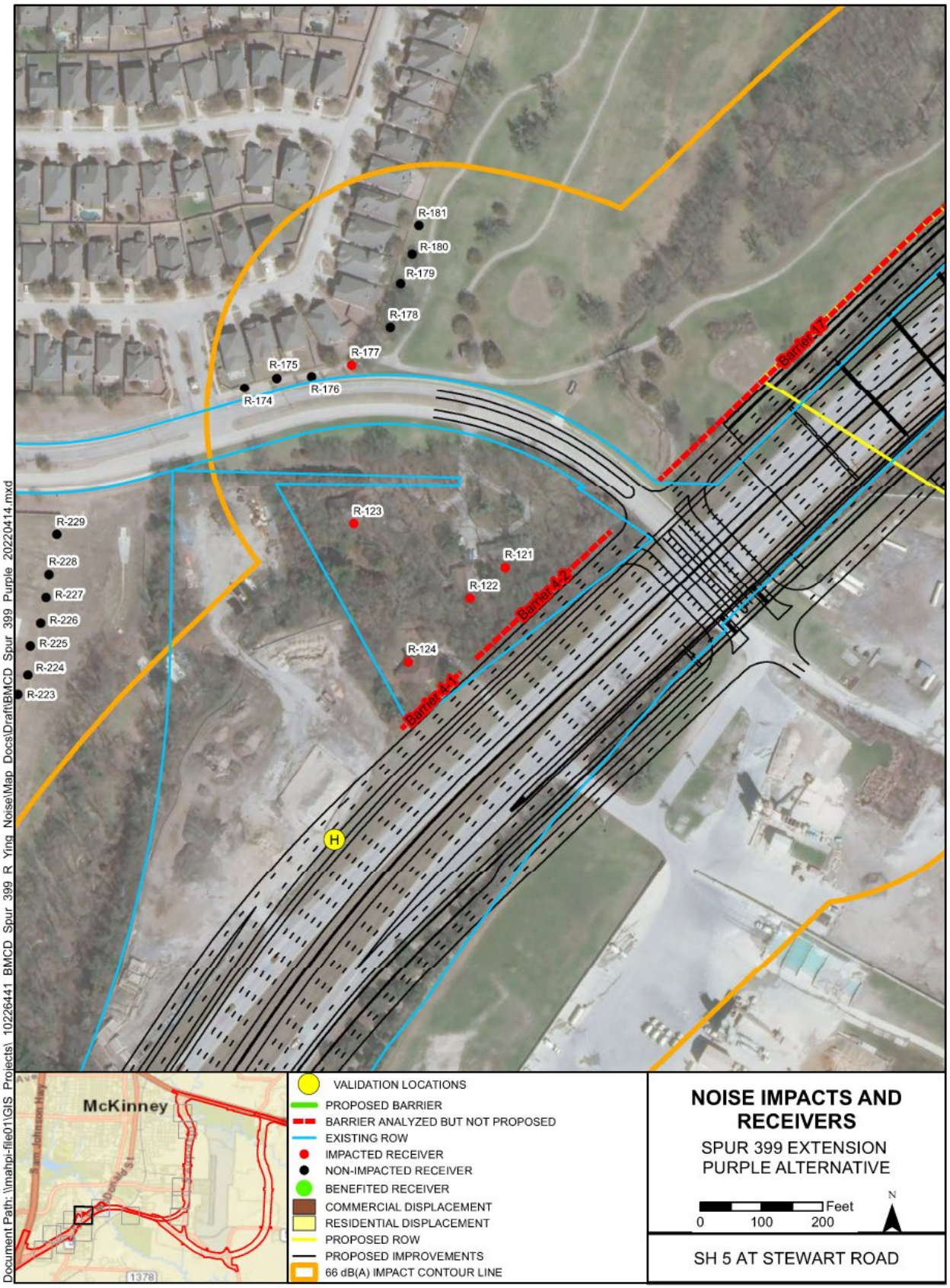


Figure 3-47: Purple Alternative Modeled Noise Receptors and Barrier Locations – SH 5 at Wilson Creek Greenbelt

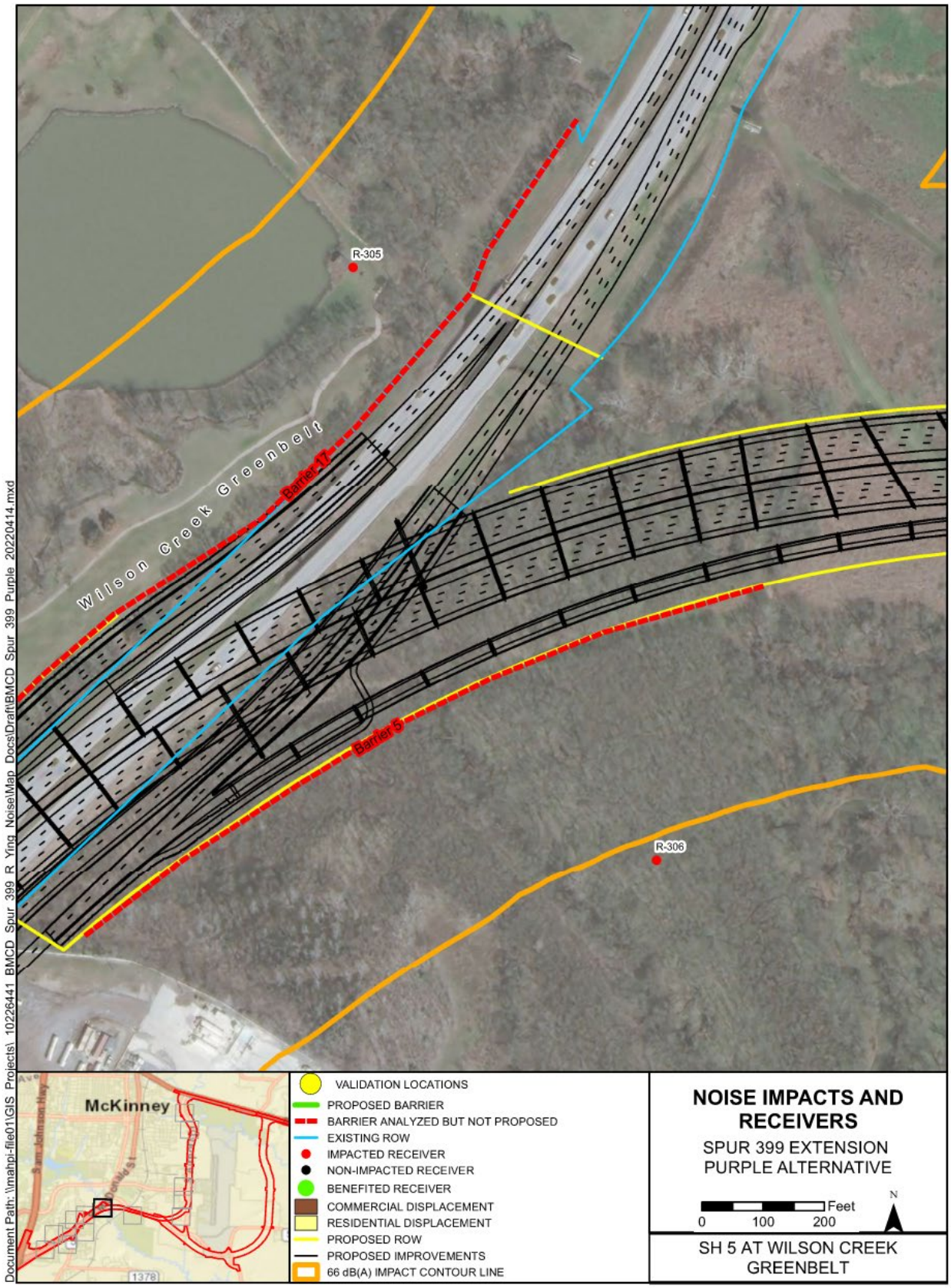


Figure 3-48: Purple Alternative Modeled Noise Receptors and Barrier Locations – FM 546/Harry McKillop Boulevard and NTMWD/McKinney Landfill

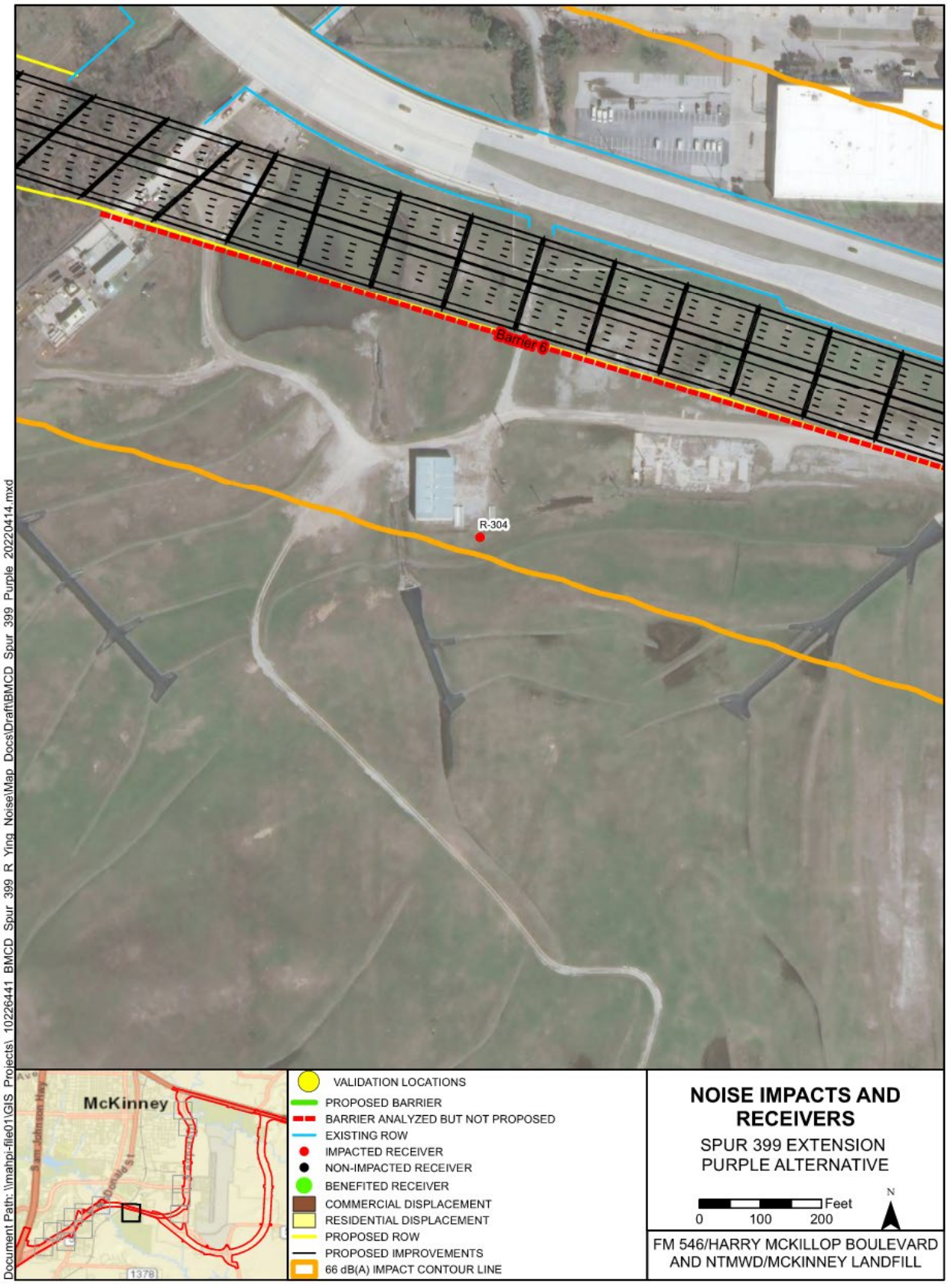


Figure 3-49: Purple Alternative Modeled Noise Receptors and Barrier Locations – Airport Drive and Wattley Way

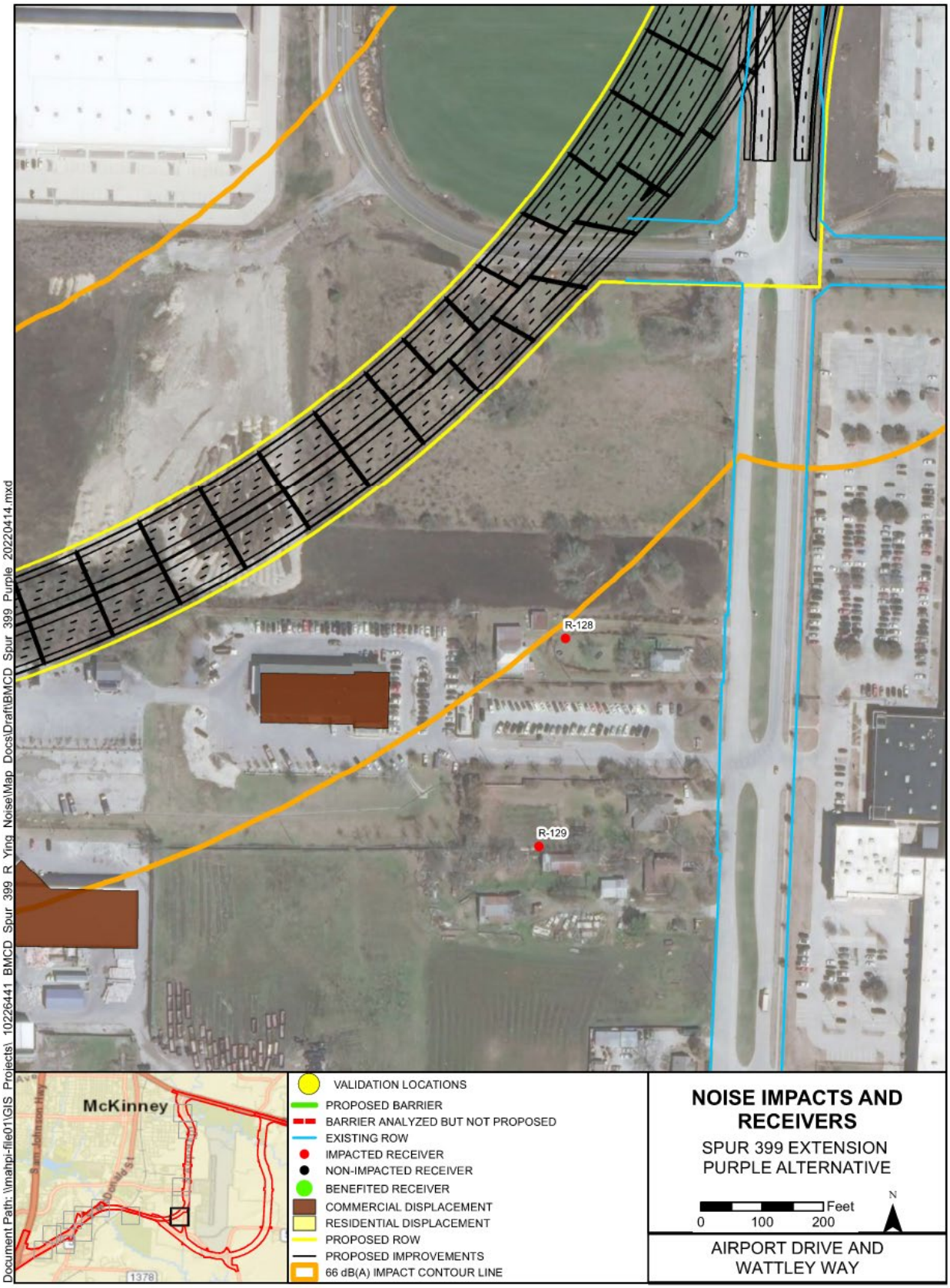


Figure 3-50: Purple Alternative Modeled Noise Receptors and Barrier Locations – Airport Drive North of Wattley Way

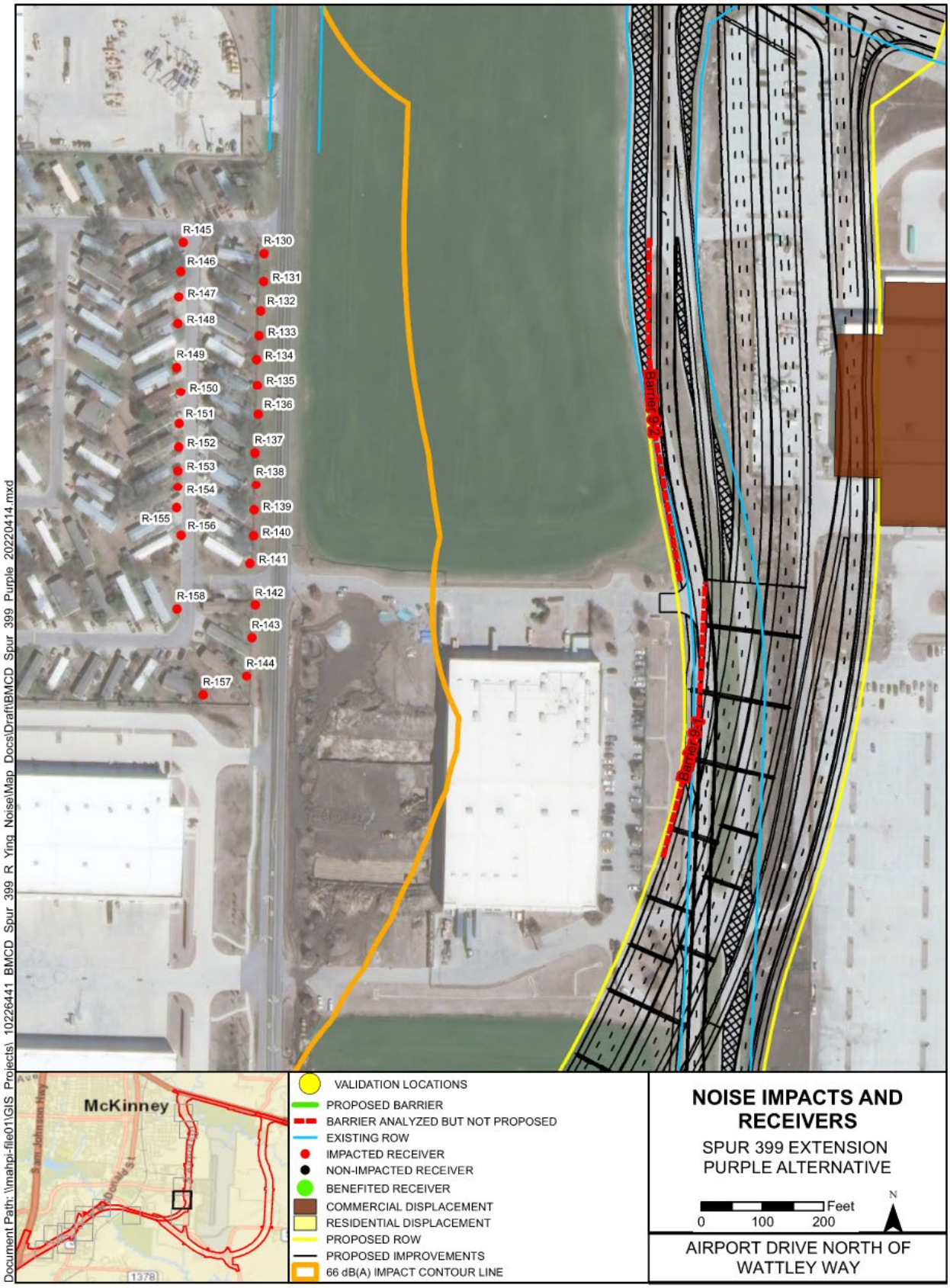


Figure 3-51: Purple Alternative Modeled Noise Receptors and Barrier Locations – Airport Drive and Industrial Boulevard

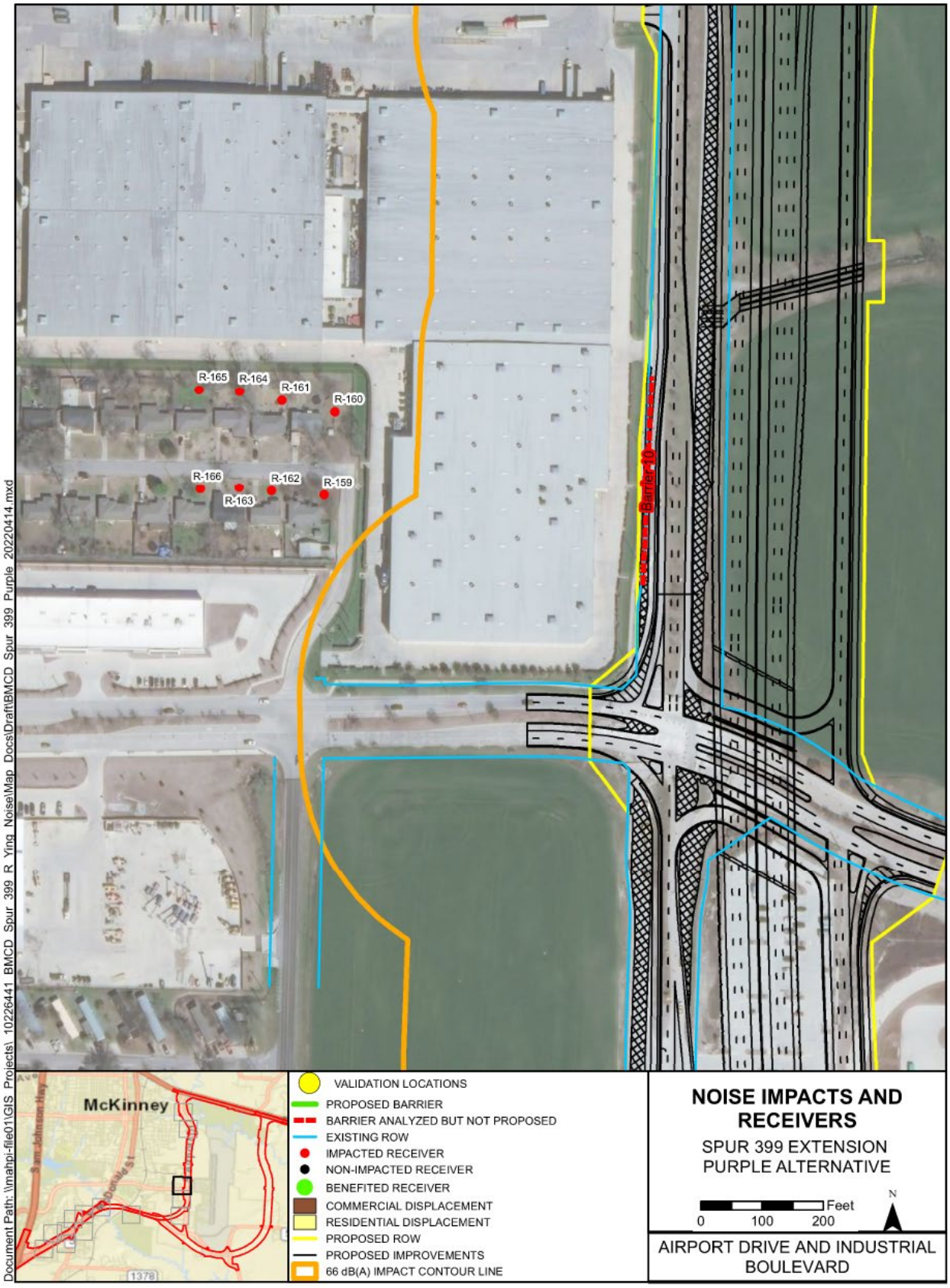


Figure 3-52: Purple Alternative Modeled Noise Receptors and Barrier Locations – Airport Drive and Elm Street

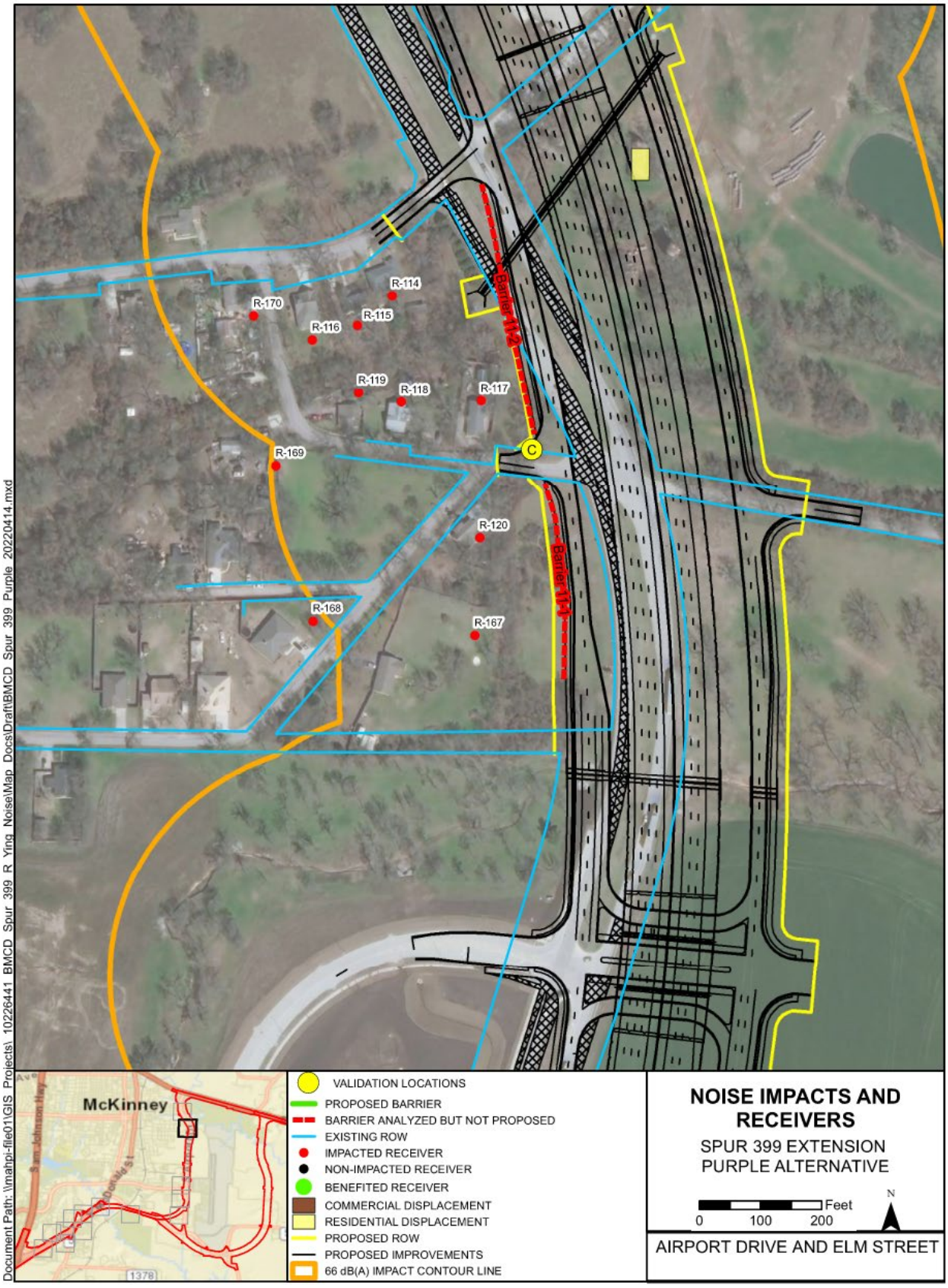


Figure 3-53: Purple Alternative Modeled Noise Receptors and Barrier Locations – Lively Hill/La Loma Neighborhood/Trinity River Greenway

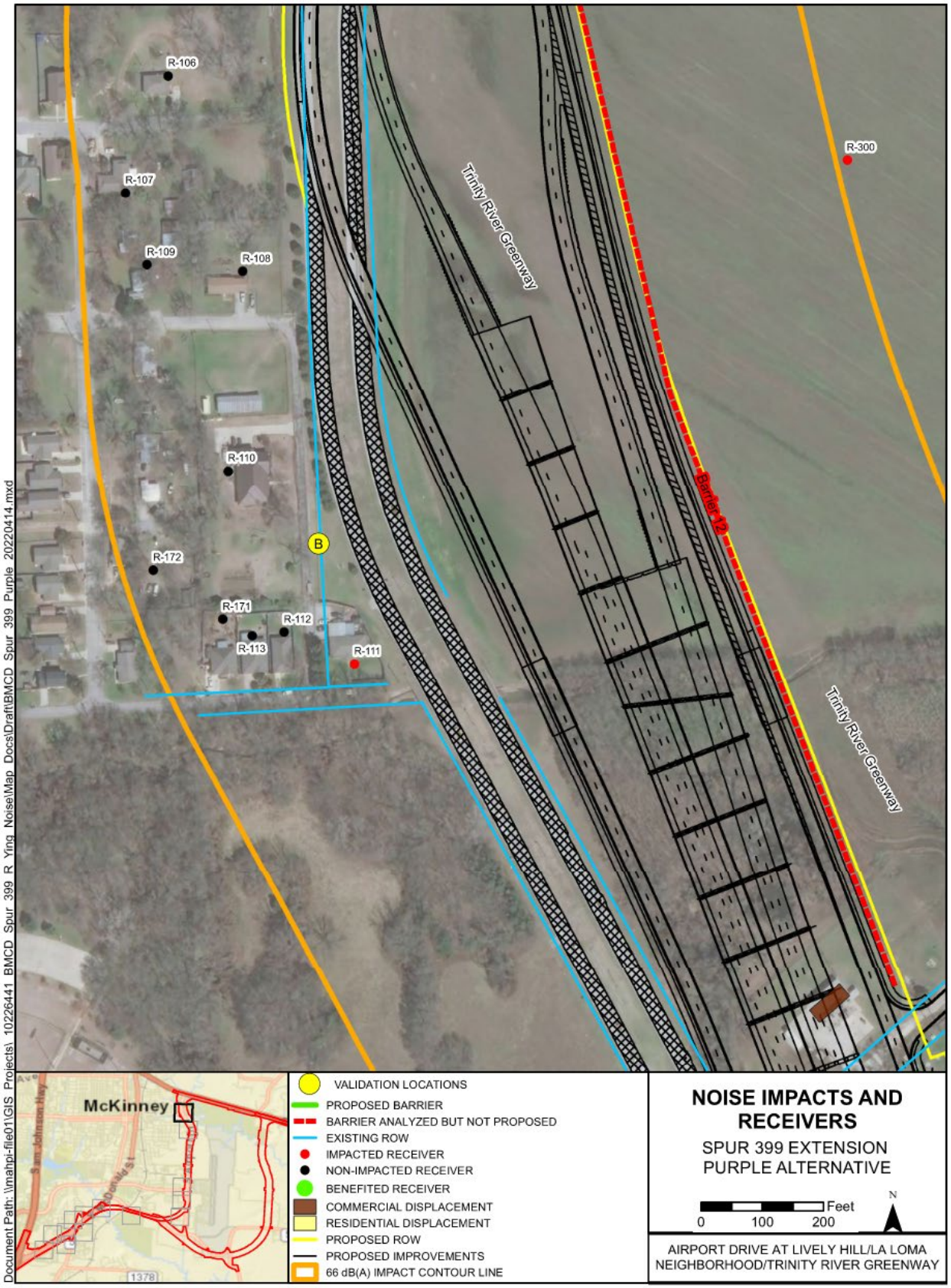


Figure 3-54: Summary of Predicted Traffic Noise Level Changes for the Orange Alternative

Noise Impact	NAC Activity Category / Acceptable db(A) Leq	Change (+/-)	Representative Receptors
NO	B / 67 dB(A)	-2	R-020, R-022, R-023, R-024
		+2 to +6	R-002, R-125, R-126, R-127, R-173, R-194, R-195, R-196, R-315, R-316, R-210, R-211, R-248, R-252
		+7	R-128, R-199, R-208, R-209, R-212, R-213, R-214, R-215, R-216, R-217, R-218, R-245, R-246, R-247, R-249, R-250, R-253, R-254, R-256, R-257, R-258, R-260, R-299
		+8	R-176, R-183, R-207, R-219, R-220, R-221, R-222, R-233, R-241, R-242, R-244, R-251, R-255, R-261, R-262, R-263, R-296, R-297, R-298
		+9	R-129, R-175, R-178, R-185, R-197, R-198, R-204, R-205, R-206, R-223, R-224, R-225, R-226, R-227, R-228, R-229, R-230, R-231, R-232, R-234, R-235, R-237, R-238, R-239, R-240, R-243, R-259
		+10	R-174, R-179, R-180, R-181, R-236
YES	B / 67 dB(A)	-2 to 0	R-016, R-017, R-019, R-021
		+1 to +5	R-015, R-018, R-201
		+6	R-014, R-032, R-034, R-035, R-036, R-037, R-039, R-287
		+7	R-001, R-025, R-027, R-028, R-030, R-031, R-033, R-038, R-040, R-045, R-122, R-269, R-270, R-271, R-272, R-273, R-275, R-276, R-277, R-278, R-279, R-284, R-285, R-286, R-288, R-294
		+8	R-007, R-008, R-009, R-026, R-029, R-041, R-042, R-043, R-044, R-046, R-100, R-121, R-124, R-177, R-264, R-265, R-266, R-267, R-268, R-274, R-280, R-281, R-283, R-291, R-292, R-293, R-295
		+9	R-011, R-012, R-013, R-047, R-048, R-049, R-050, R-051, R-052, R-053, R-054, R-068, R-070, R-096, R-097, R-098, R-099, R-123, R-203, R-282, R-289, R-290
		+10	R-010, R-055, R-056, R-057, R-058, R-059, R-065, R-066, R-067, R-069, R-071, R-072, R-075, R-076, R-079, R-088, R-091, R-092, R-093, R-094, R-095, R-202
		+11 to +26	R-003, R-004, R-005, R-006, R-060, R-061, R-062, R-063, R-064, R-073, R-074, R-077, R-078, R-080, R-081, R-082, R-083, R-084, R-085, R-086, R-087, R-089, R-090, R-101, R-102, R-103, R-104, R-105, R-182, R-184, R-186, R-187, R-188, R-189, R-190, R-191, R-192, R-193, R-200, R-311, R-312, R-313, R-314

Figure 3-54 continued: Summary of Predicted Traffic Noise Level Changes for the Orange Alternative

Noise Impact	NAC Activity Category / Acceptable db(A) Leq	Change (+/-)	Representative Receptors
YES	C / 67 dB(A)	+2	R-310
		+3	R-309
		+5	R-305
		+13	R-306
		+18	R-301
		+19	R-308
		+20	R-304
		+21	R-307

Source: Table 3, *DEIS Reasonable Alternatives Traffic Noise Analysis Technical Report*, Appendix R.

Figure 3-55: Orange Alternative Modeled Noise Receptors and Barrier Locations – Spur 399 at McKinney Medical Center

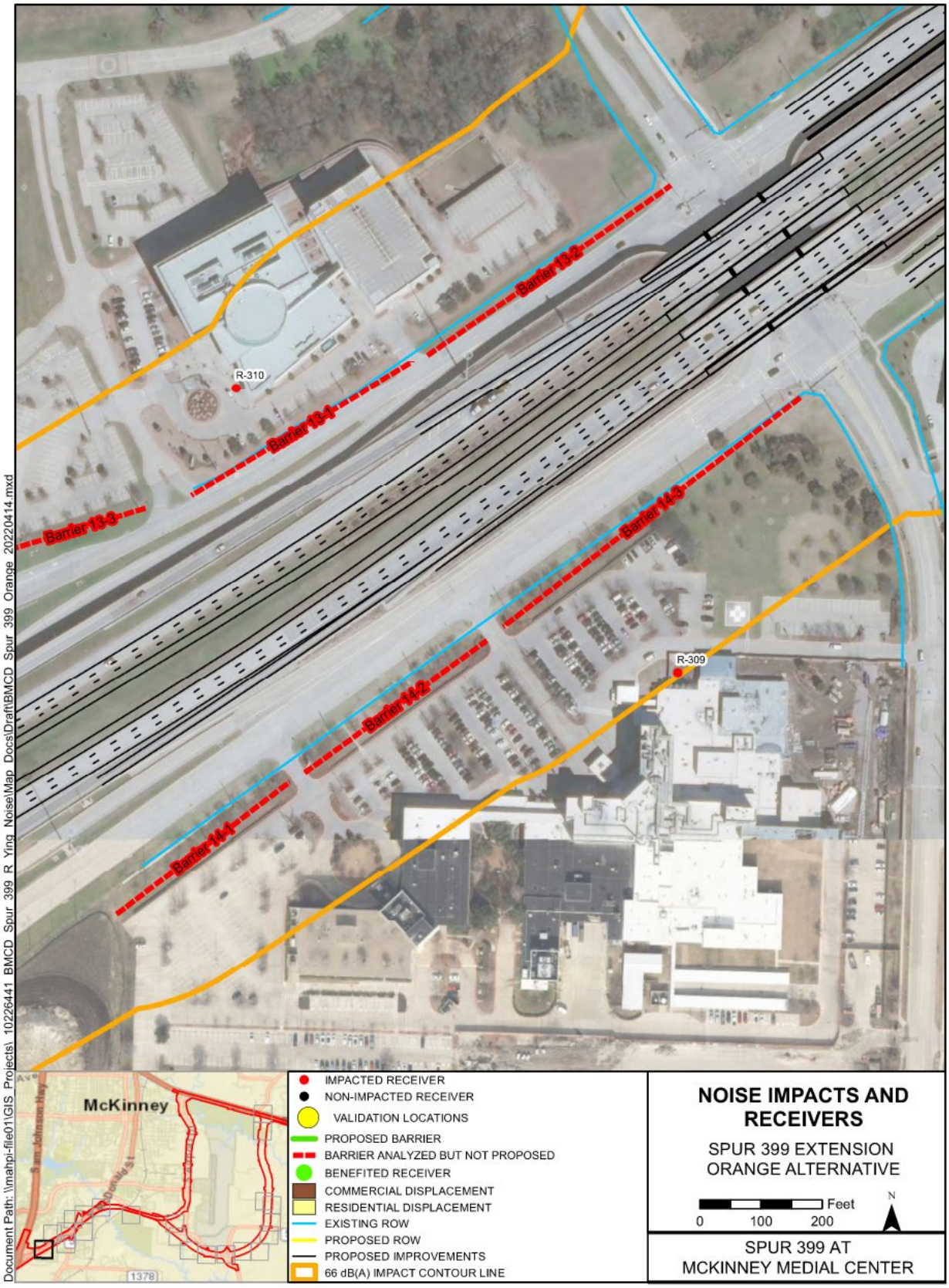


Figure 3-56: Orange Alternative Modeled Noise Receptors and Barrier Locations – Spur 399/SH 5 at Medical Center Drive

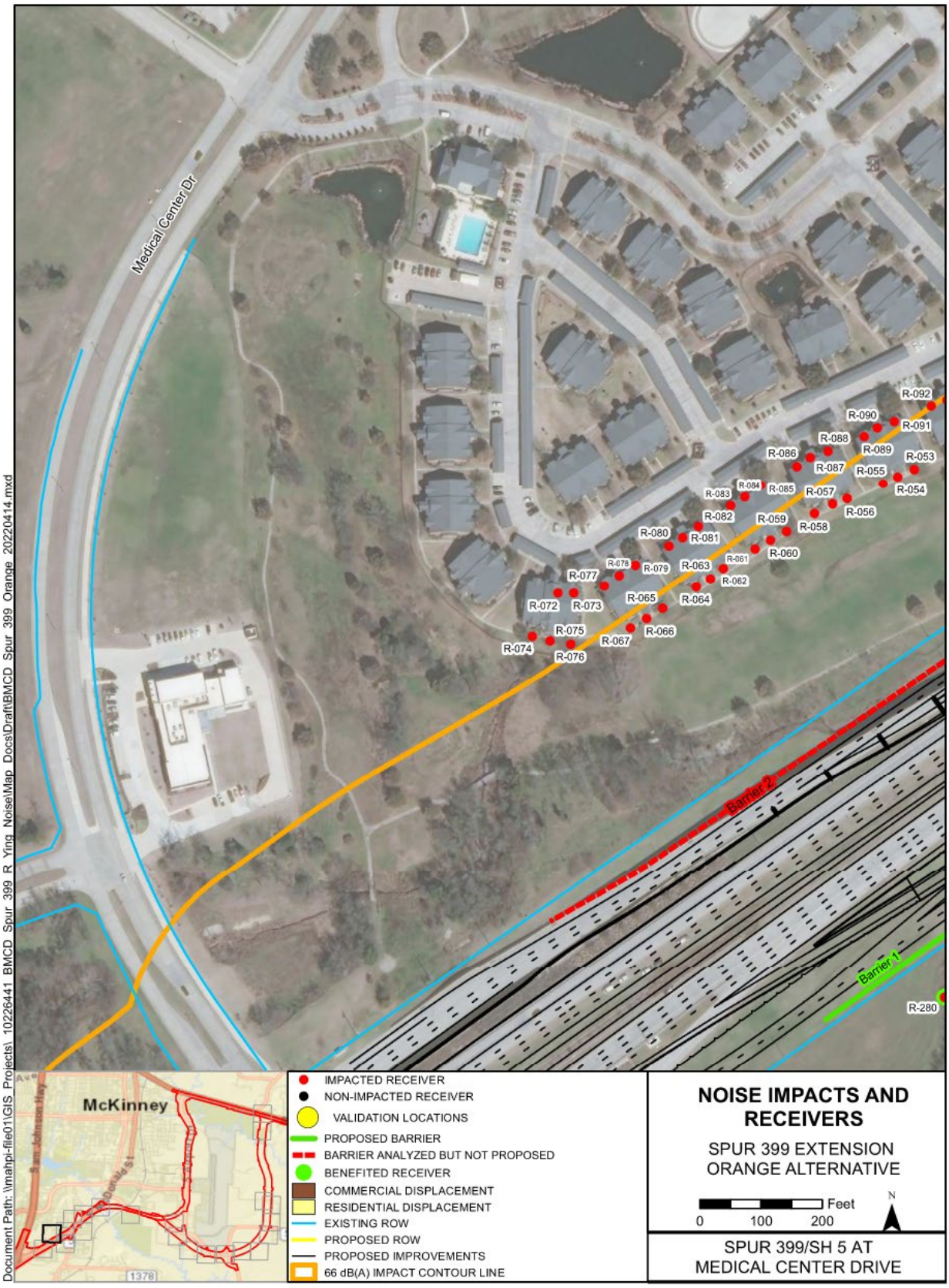


Figure 3-57: Orange Alternative Modeled Noise Receptors and Barrier Locations – Spur 399/SH 5 at McKinney Village

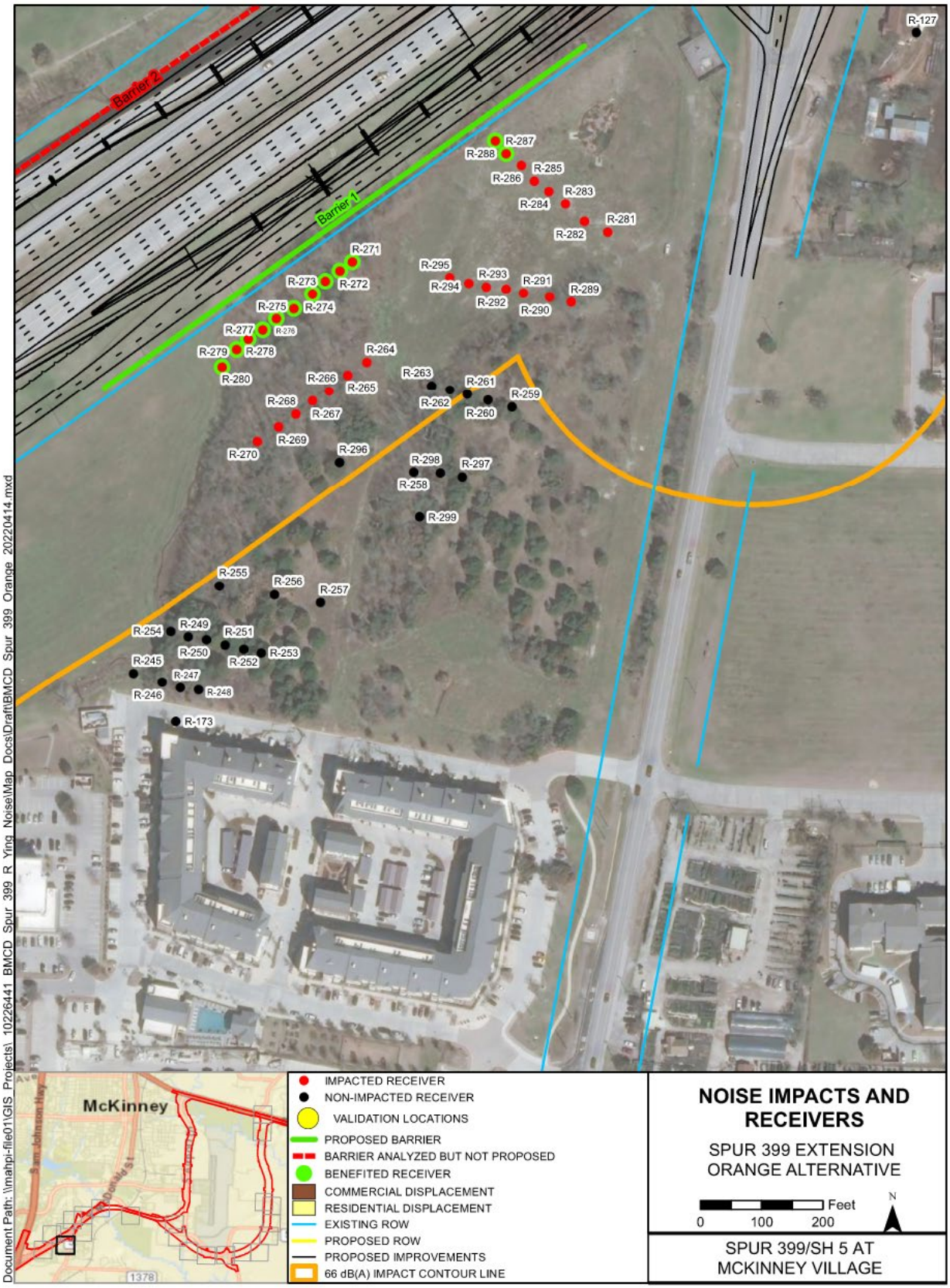


Figure 3-58: Orange Alternative Modeled Noise Receptors and Barrier Locations – Spur 399/SH 5 at South McDonald Street

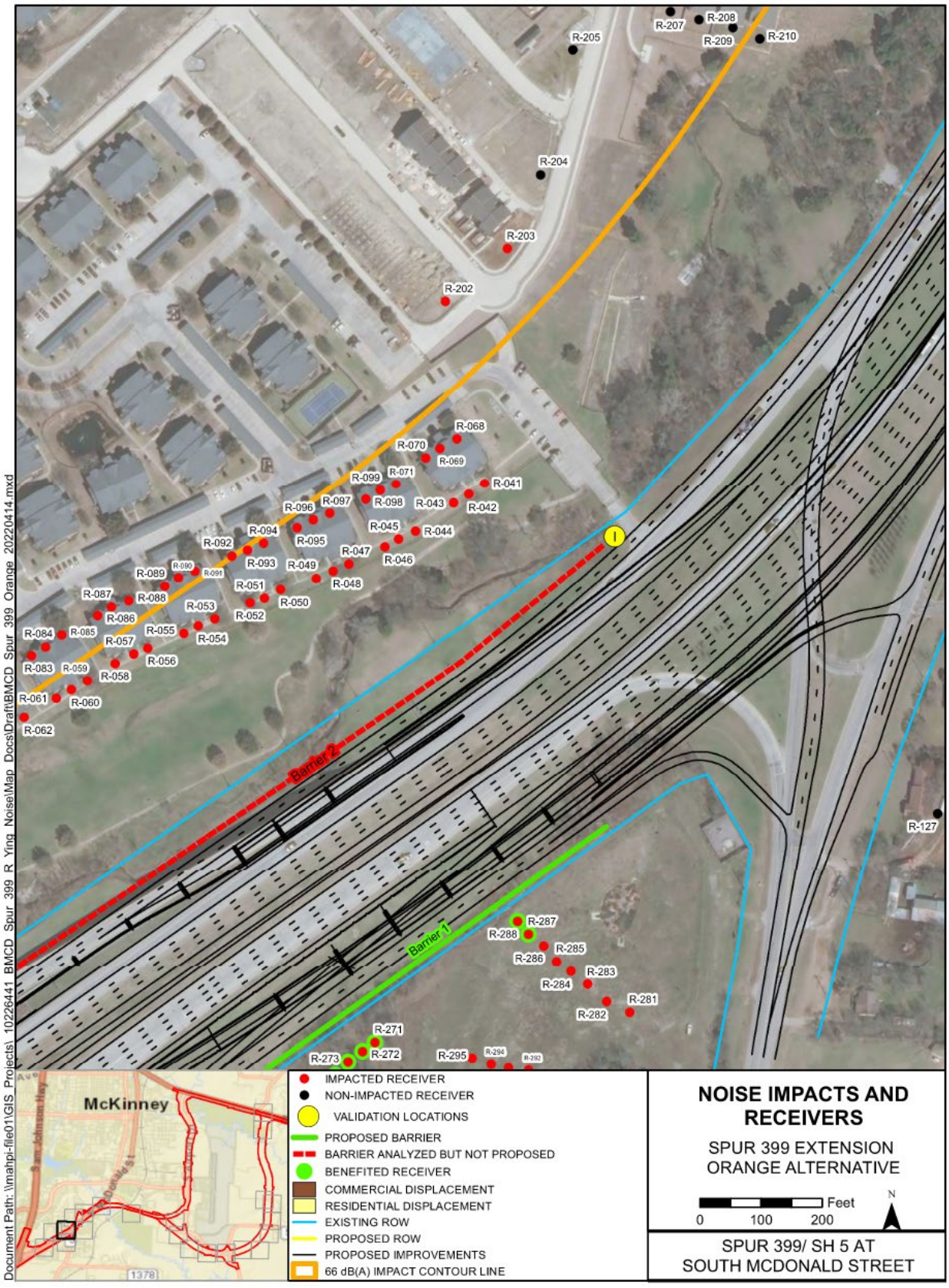


Figure 3-59: Orange Alternative Modeled Noise Receptors and Barrier Locations – SH 5 at High Point Manufactured Home Community

Figure 3-60: Orange Alternative Modeled Noise Receptors and Barrier Locations – SH 5 North of High Point Manufactured Home Community

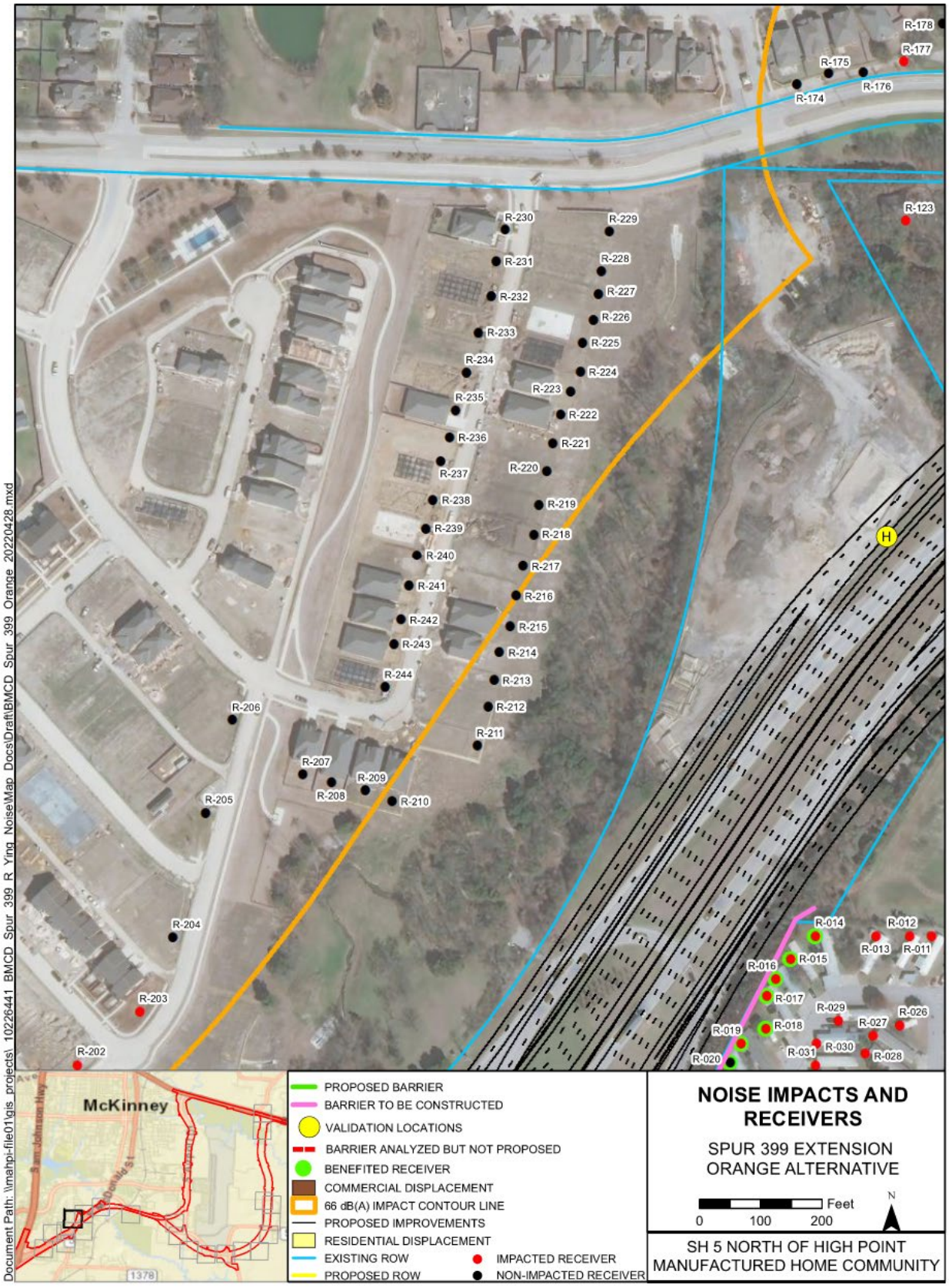


Figure 3-61: Orange Alternative Modeled Noise Receptors and Barrier Locations – SH 5 at Stewart Road

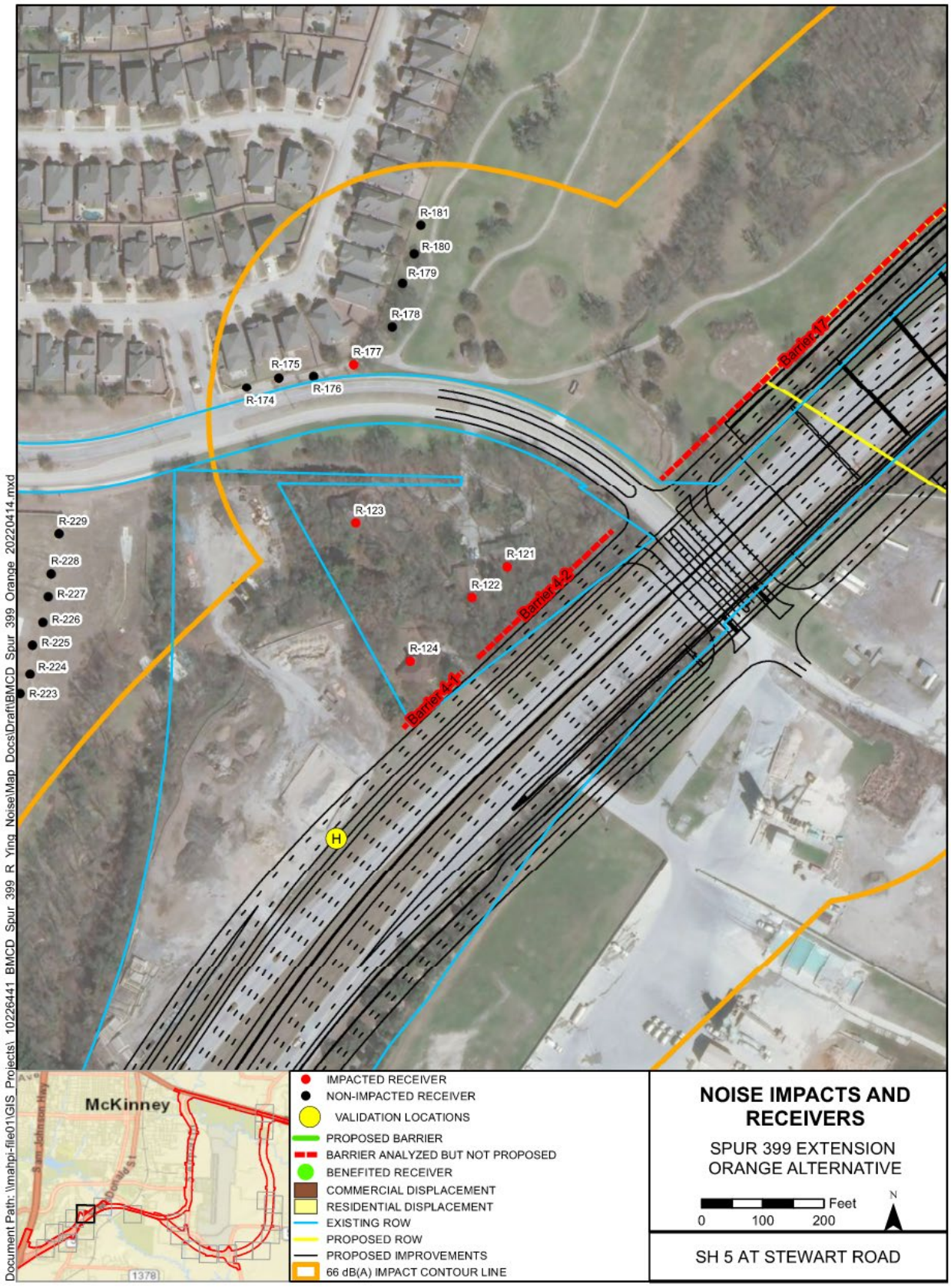


Figure 3-62: Orange Alternative Modeled Noise Receptors and Barrier Locations – SH 5 at Wilson Creek Greenbelt

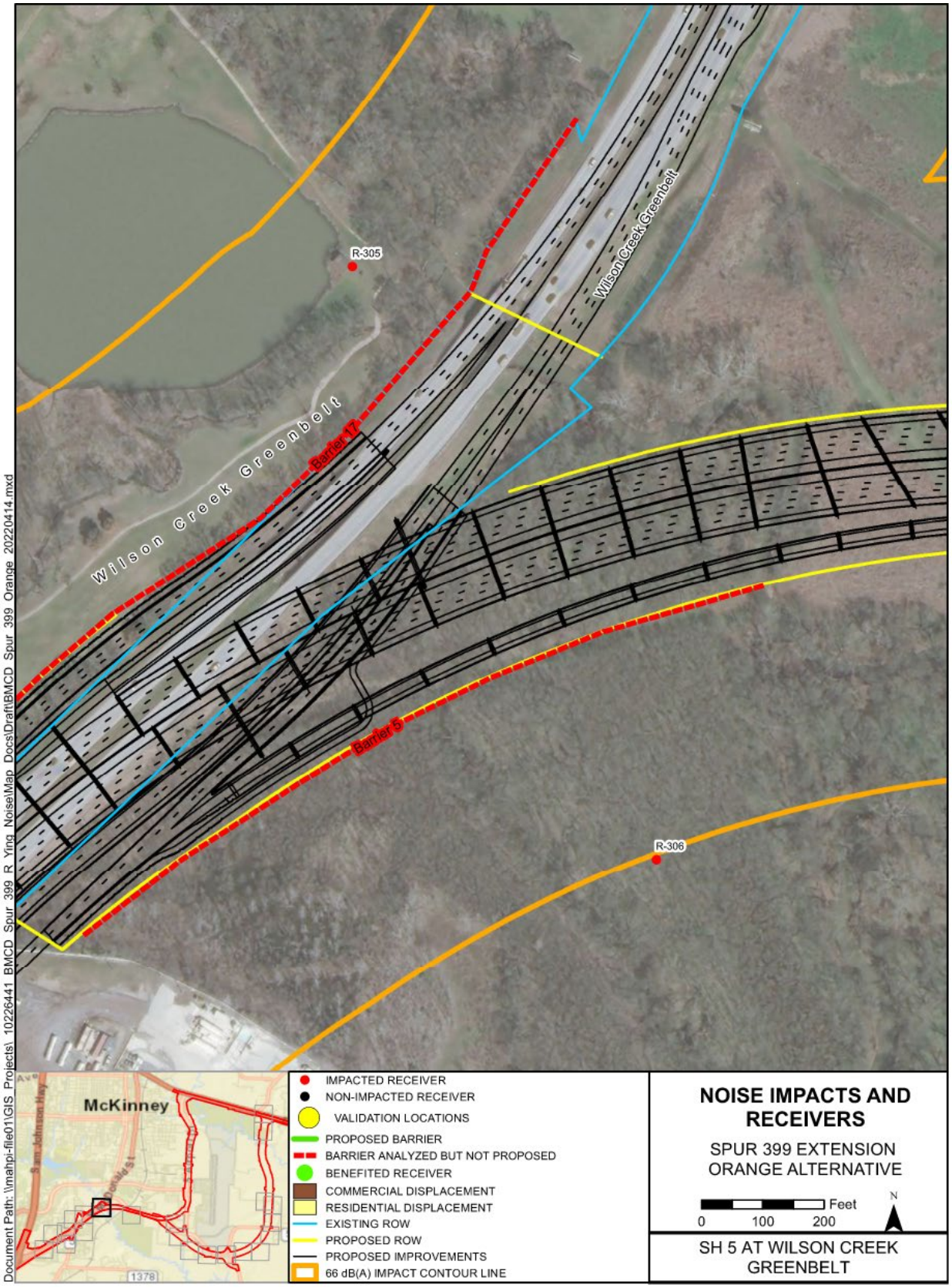


Figure 3-63: Orange Alternative Modeled Noise Receptors and Barrier Locations – FM 546/Harry McKillop Boulevard and the NTMWD/McKinney Landfill

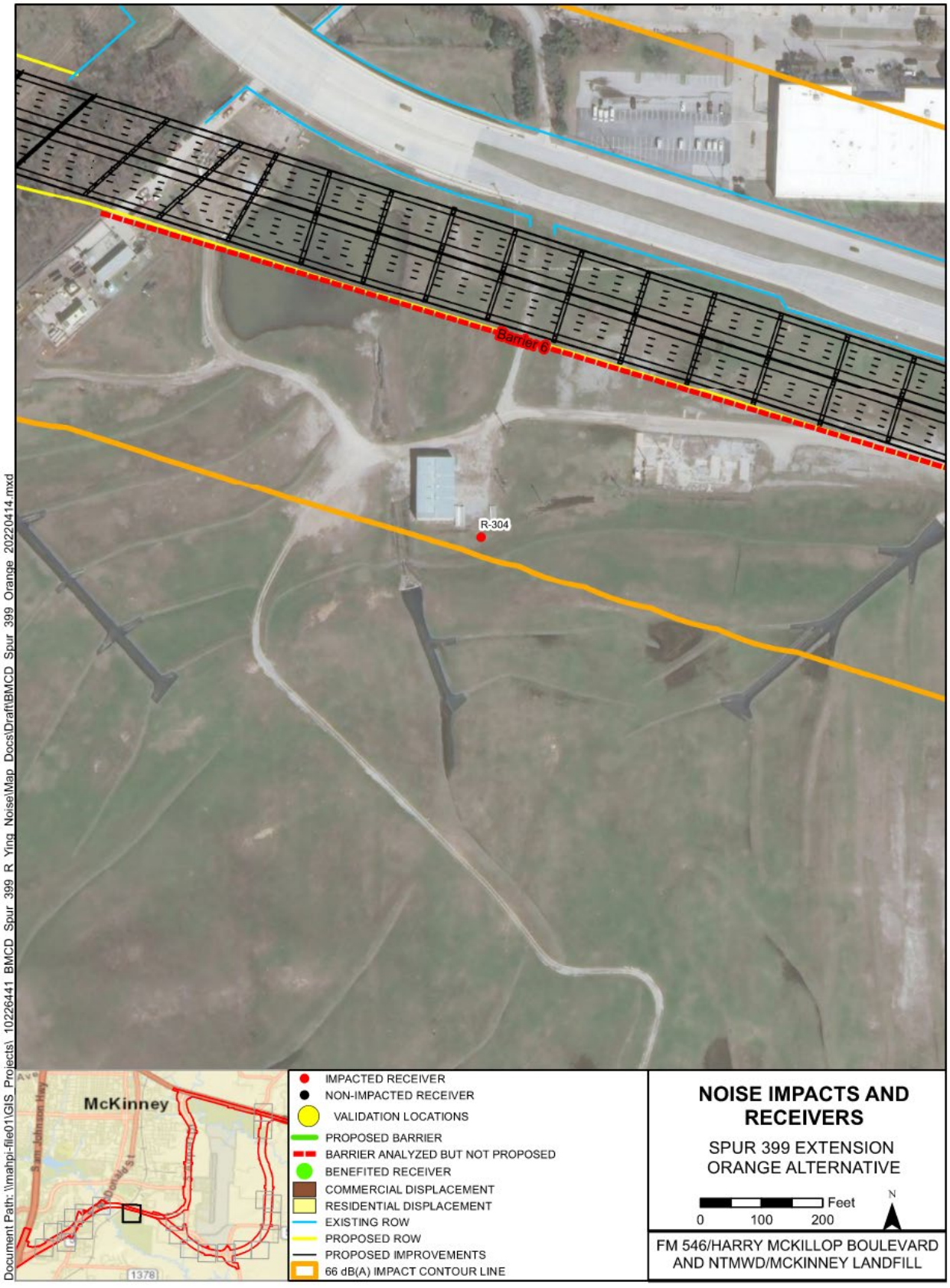


Figure 3-64: Orange Alternative Modeled Noise Receptors and Barrier Locations – FM 546/Harry McKillop Boulevard West of Airport Drive

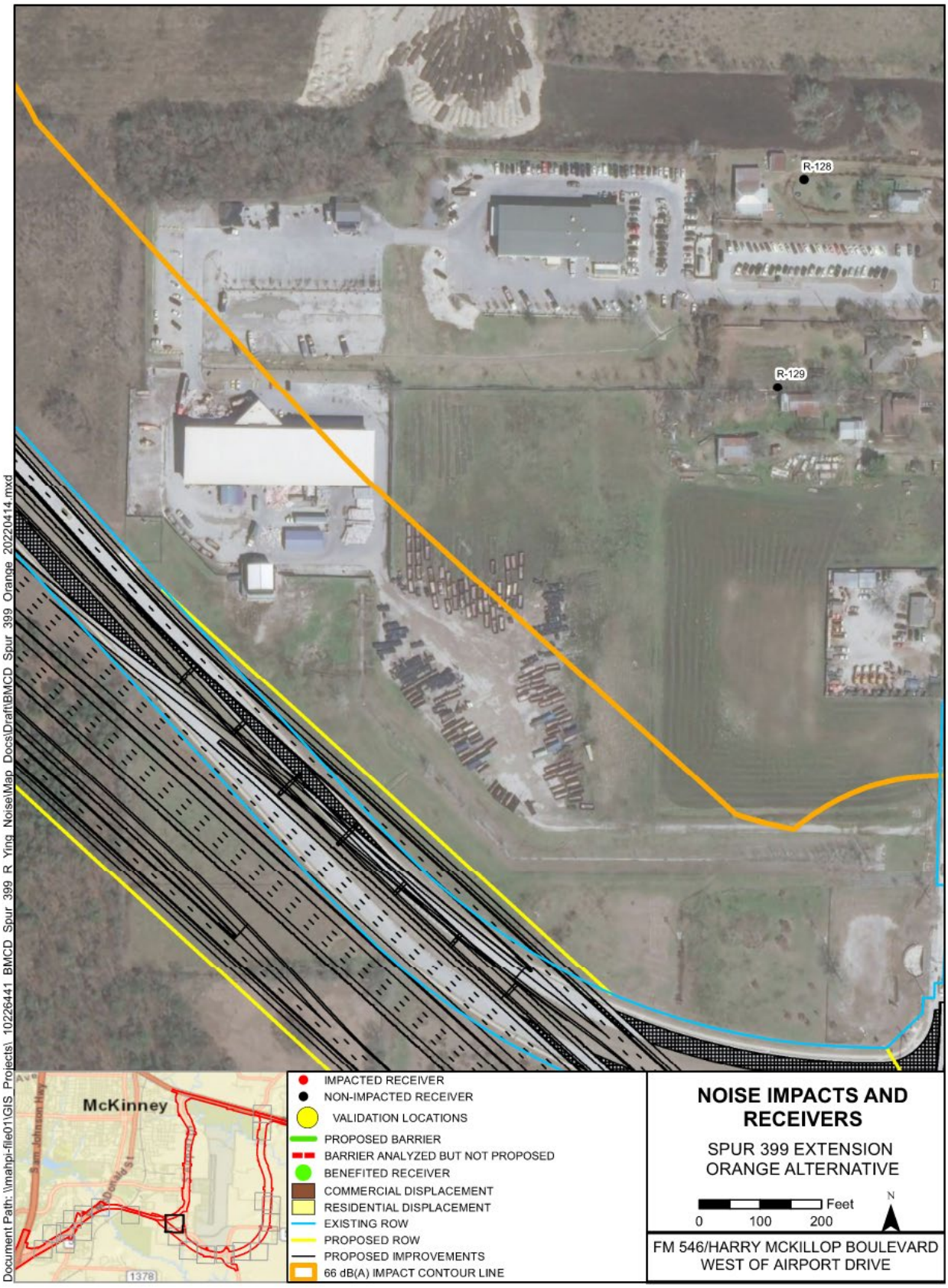


Figure 3-65: Orange Alternative Modeled Noise Receptors and Barrier Locations – FM 546/Harry McKillop Boulevard at Airport Drive

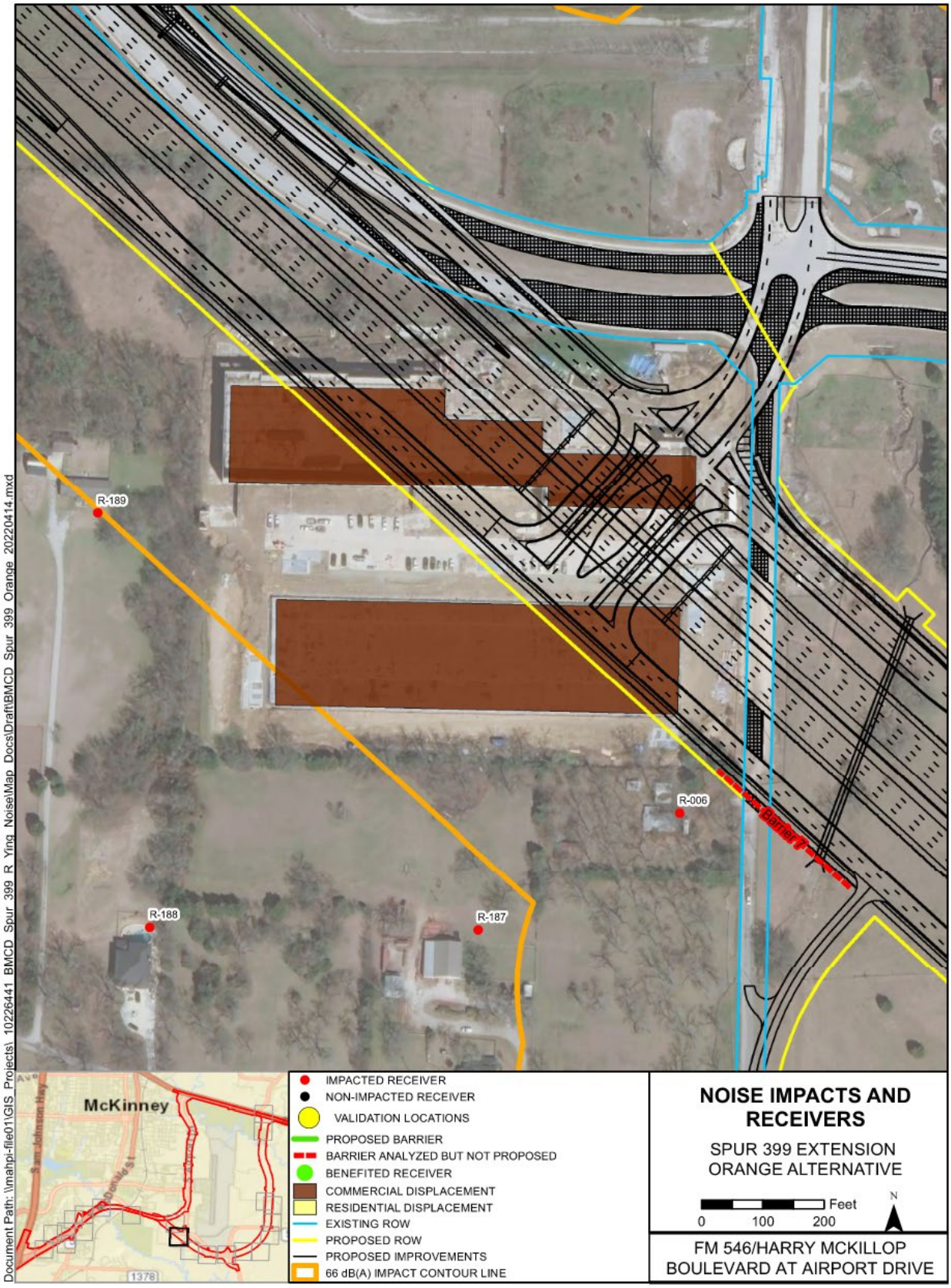


Figure 3-66: Orange Alternative Modeled Noise Receptors and Barrier Locations – Southeast of Airport Drive Near Old Mill Road

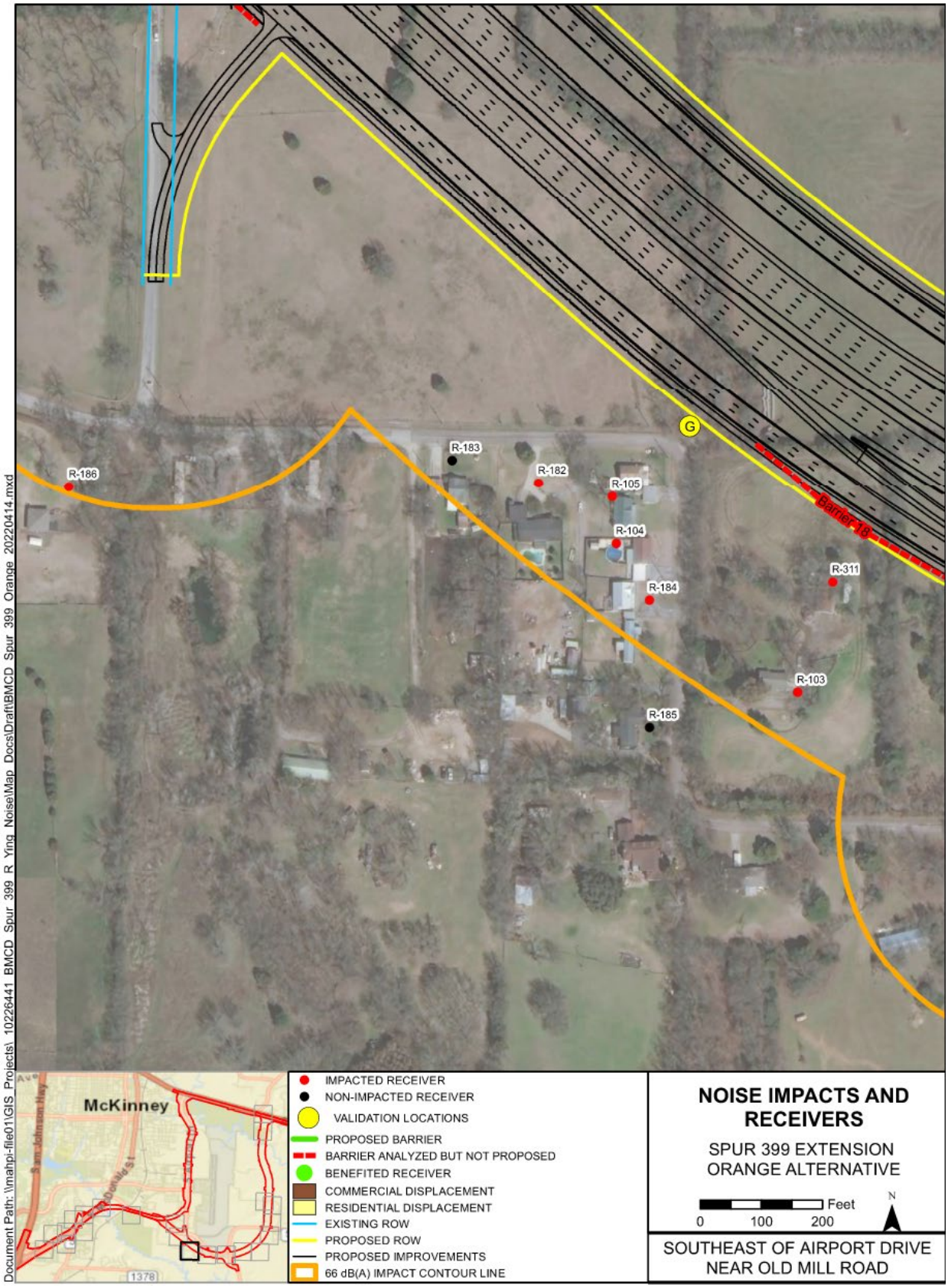


Figure 3-67: Orange Alternative Modeled Noise Receptors and Barrier Locations – South of McKinney National Airport

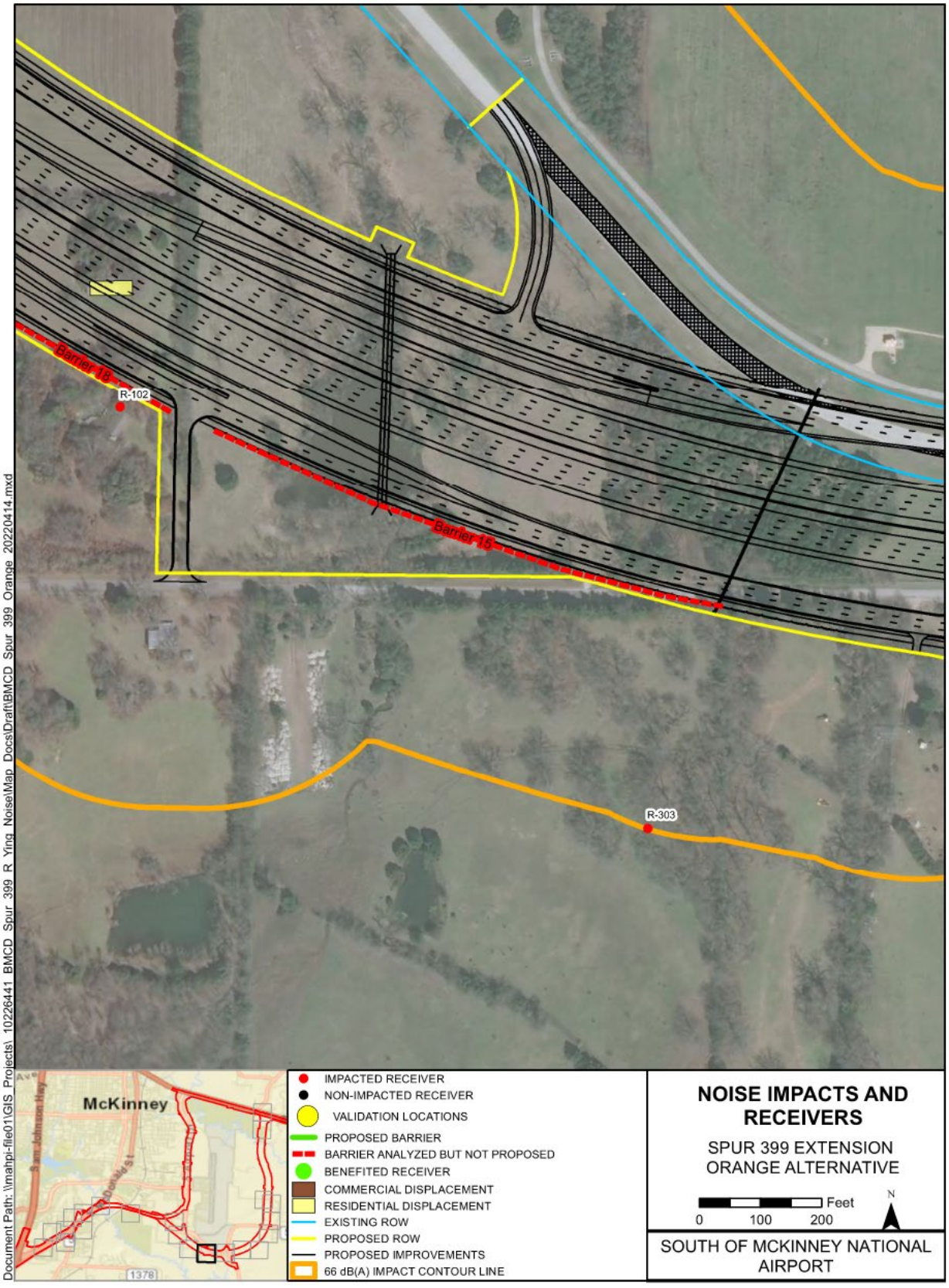


Figure 3-68: Orange Alternative Modeled Noise Receptors and Barrier Locations – FM 546 and CR 317, Southeast of the McKinney National Airport

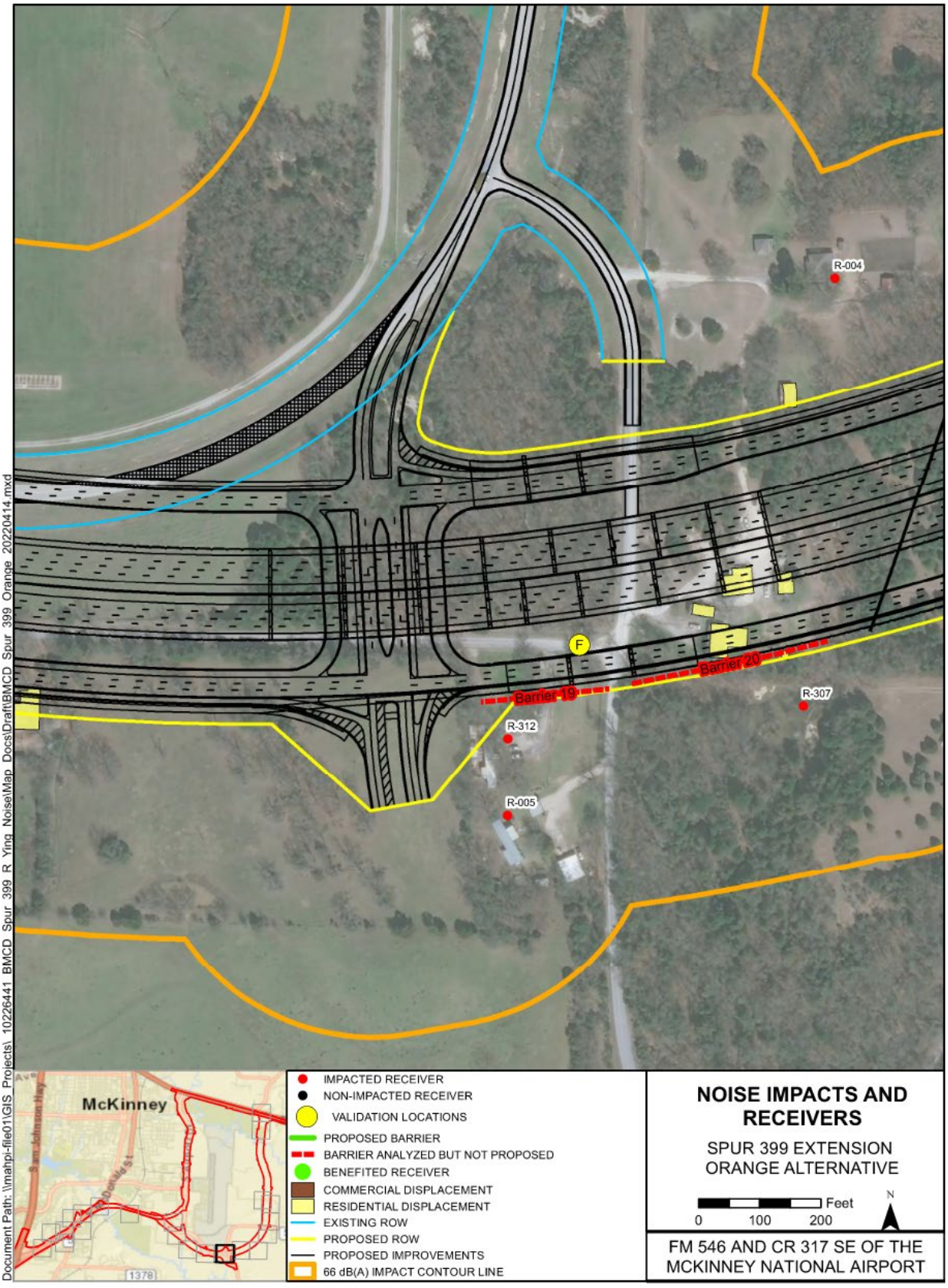


Figure 3-69: Orange Alternative Modeled Noise Receptors and Barrier Locations – North of Fairview Soccer Park

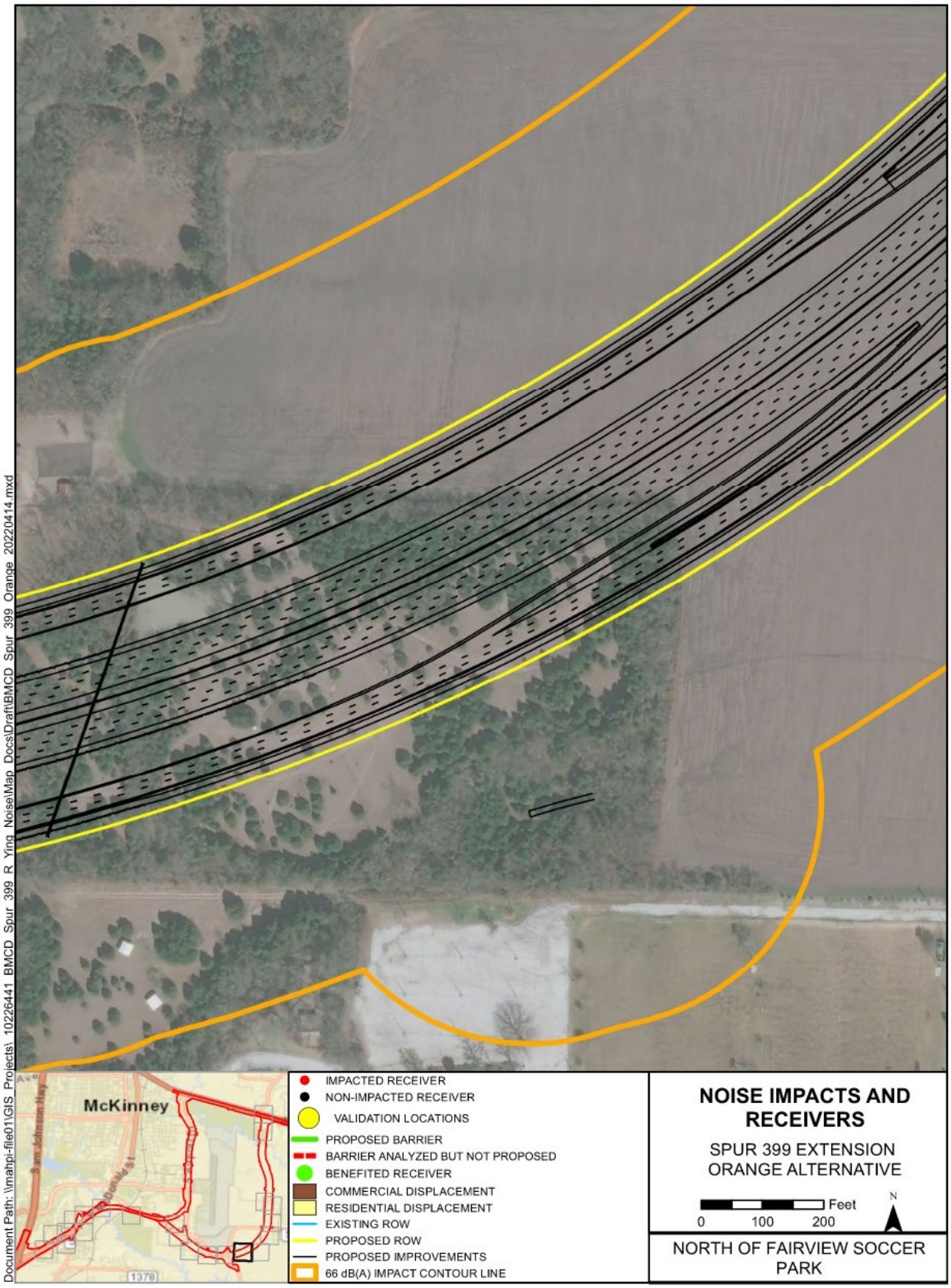


Figure 3-70: Orange Alternative Modeled Noise Receptors and Barrier Locations – Isolated Receptor Southeast of the McKinney National Airport

Figure 3-71: Orange Alternative Modeled Noise Receptors and Barrier Locations – East of the McKinney National Airport, South of FM 546

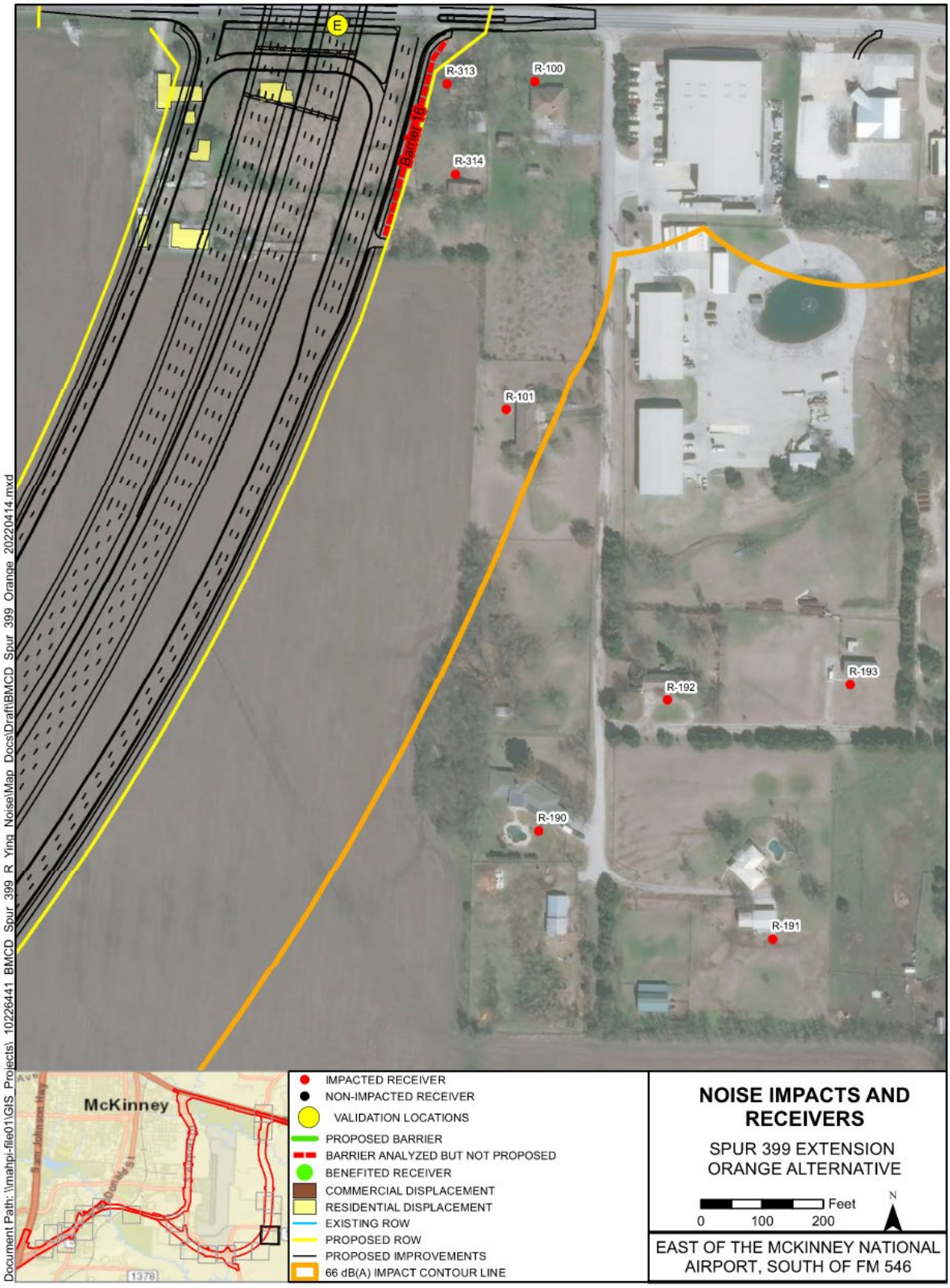


Figure 3-72: Orange Alternative Modeled Noise Receptors and Barrier Locations – East of the McKinney National Airport, North of FM 546

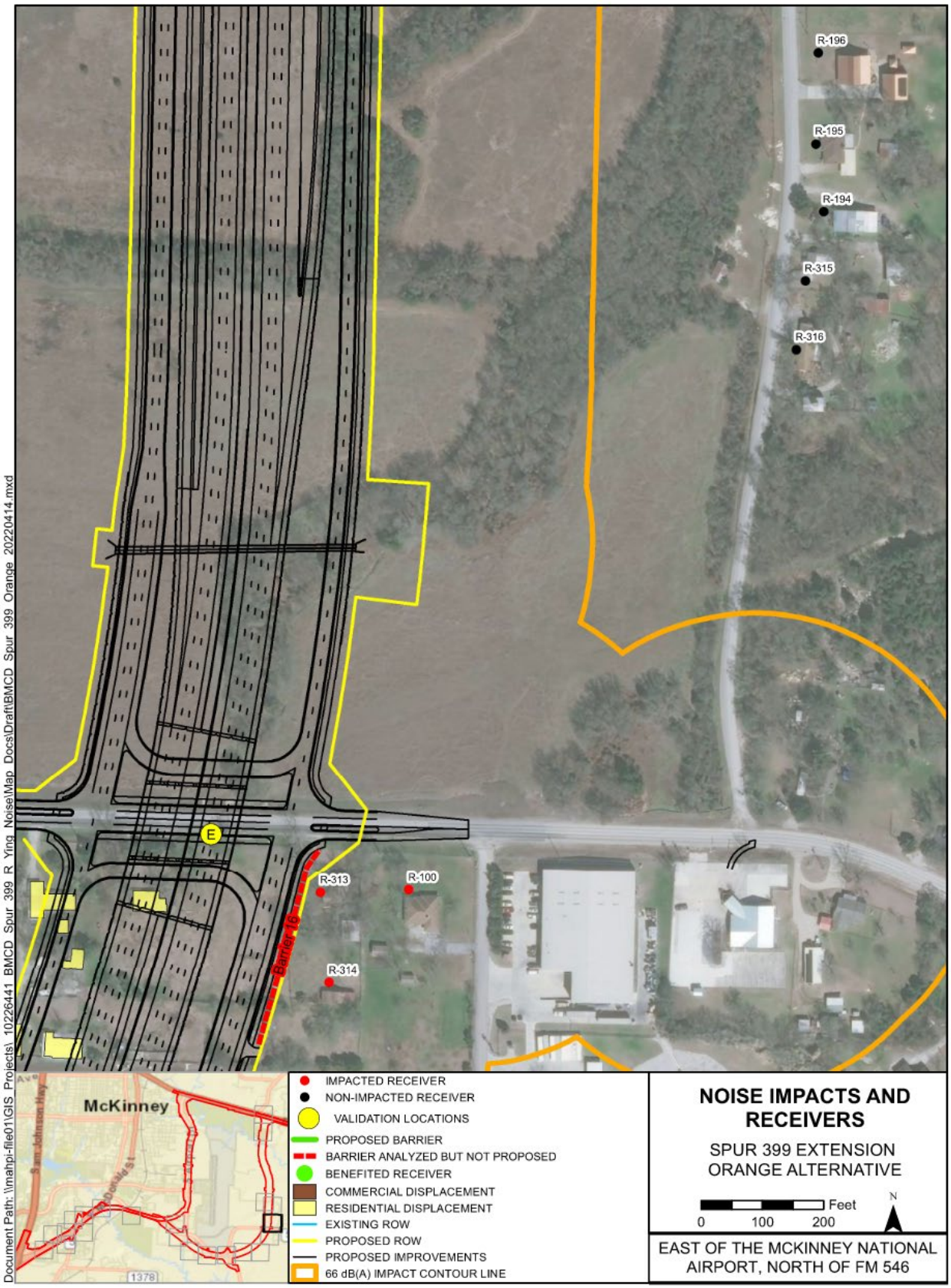


Figure 3-73: Orange Alternative Modeled Noise Receptors and Barrier Locations –CR 722/Enloe Road East

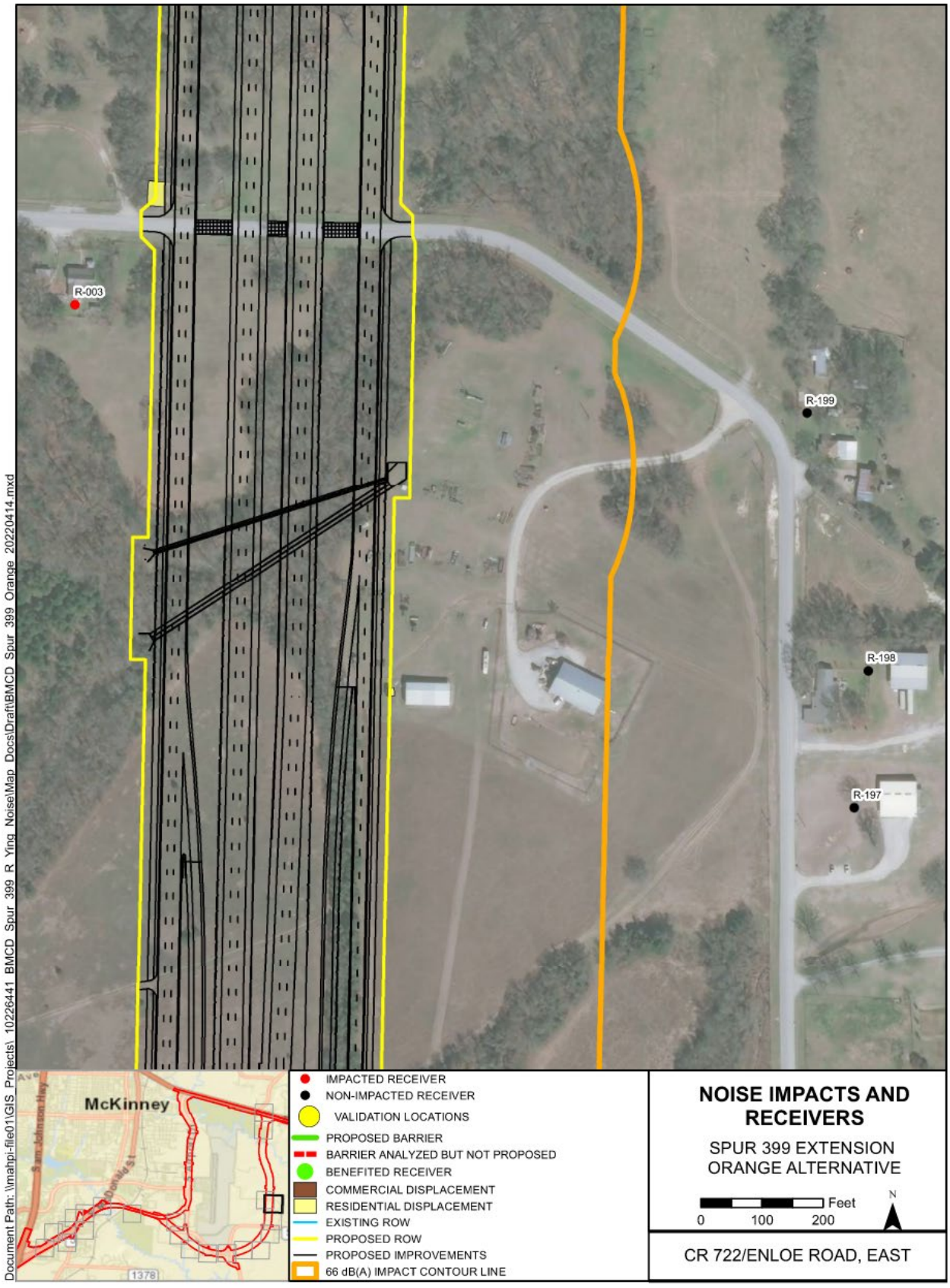


Figure 3-74: Orange Alternative Modeled Noise Receptors and Barrier Locations – CR 722/Enloe Road West

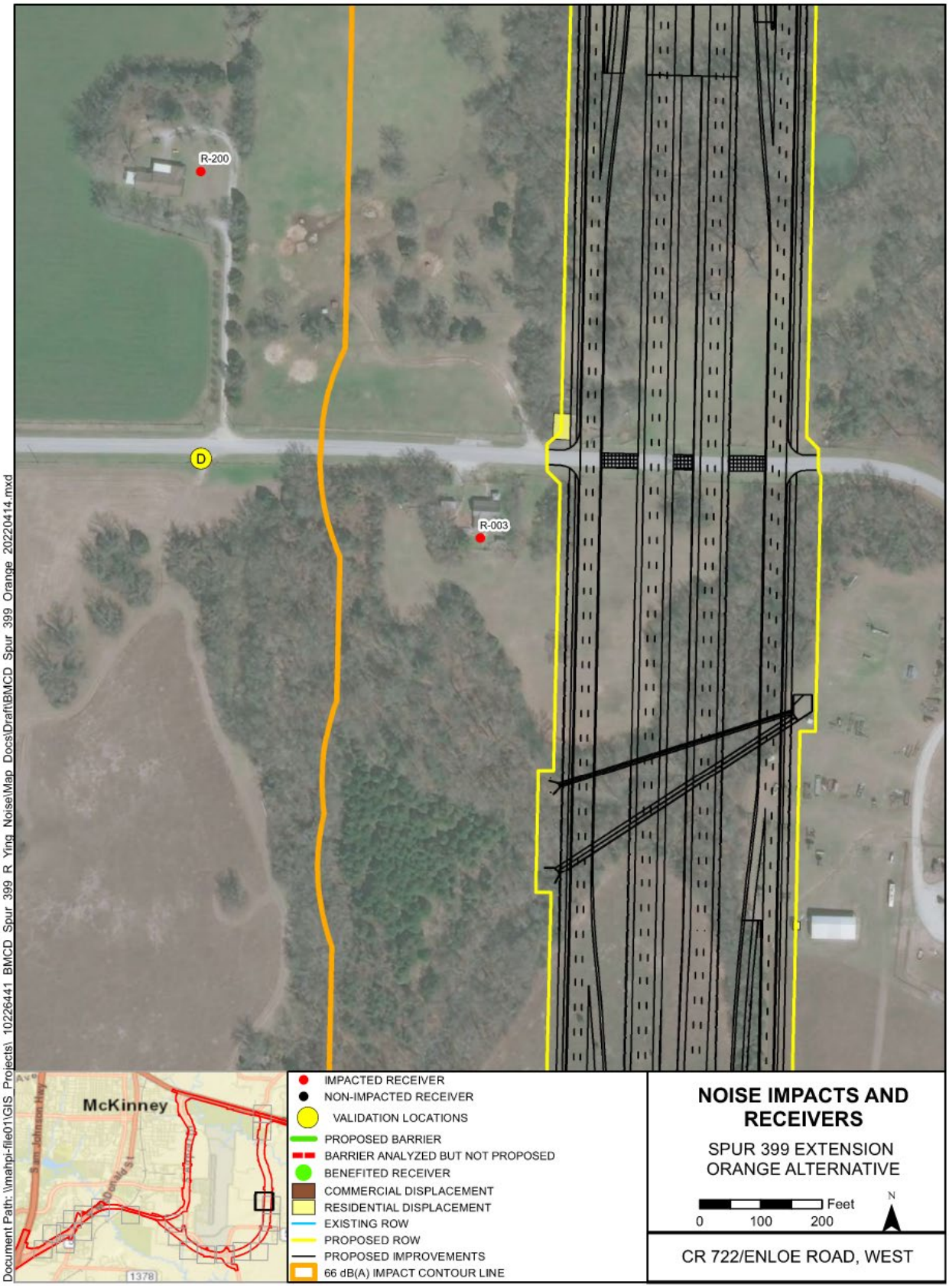


Figure 3-75: Orange Alternative Modeled Noise Receptors and Barrier Locations – East of McKinney Future Parkland

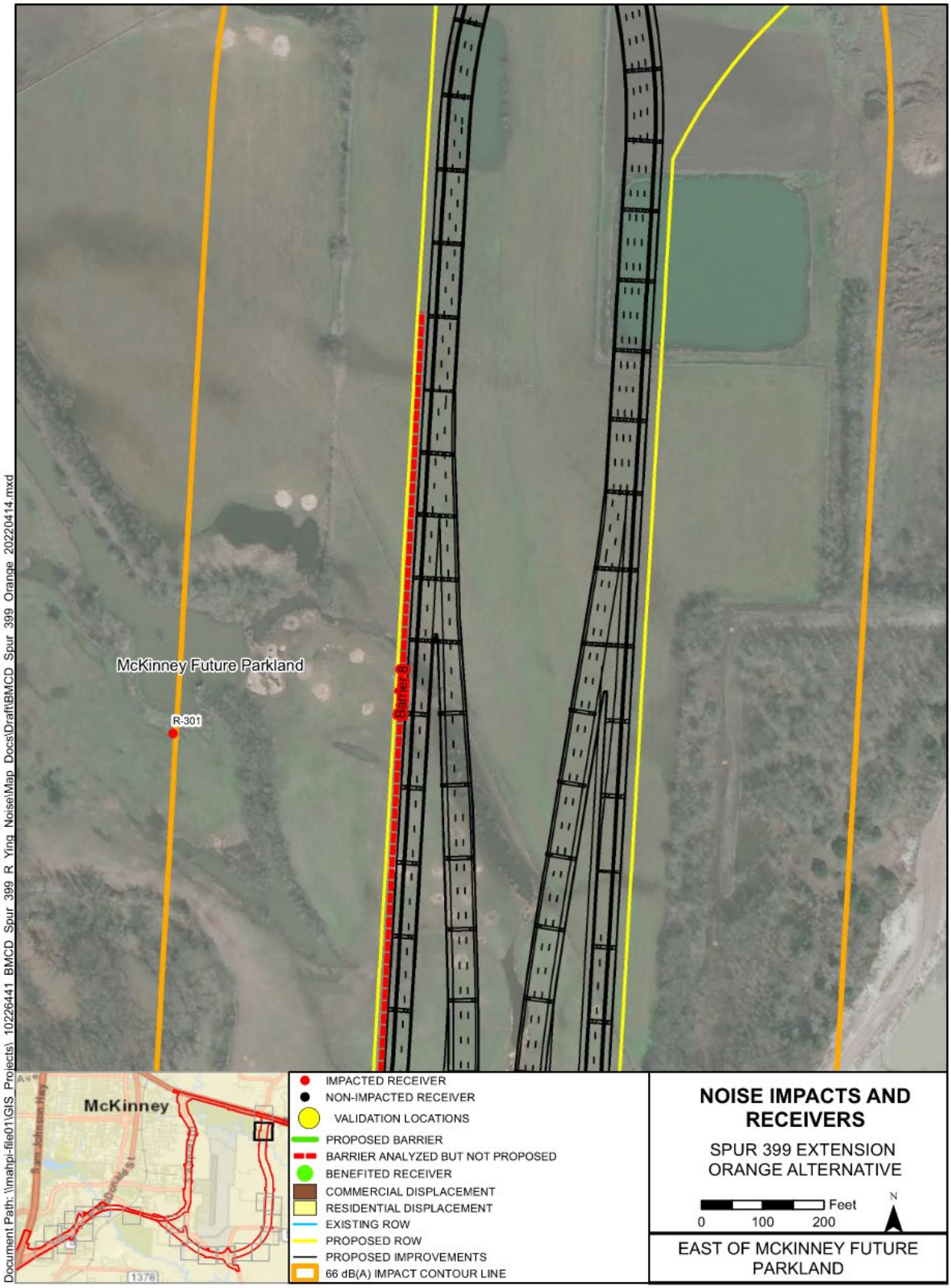


Figure 3-76: Orange Alternative Modeled Noise Receptors and Barrier Locations – US 380

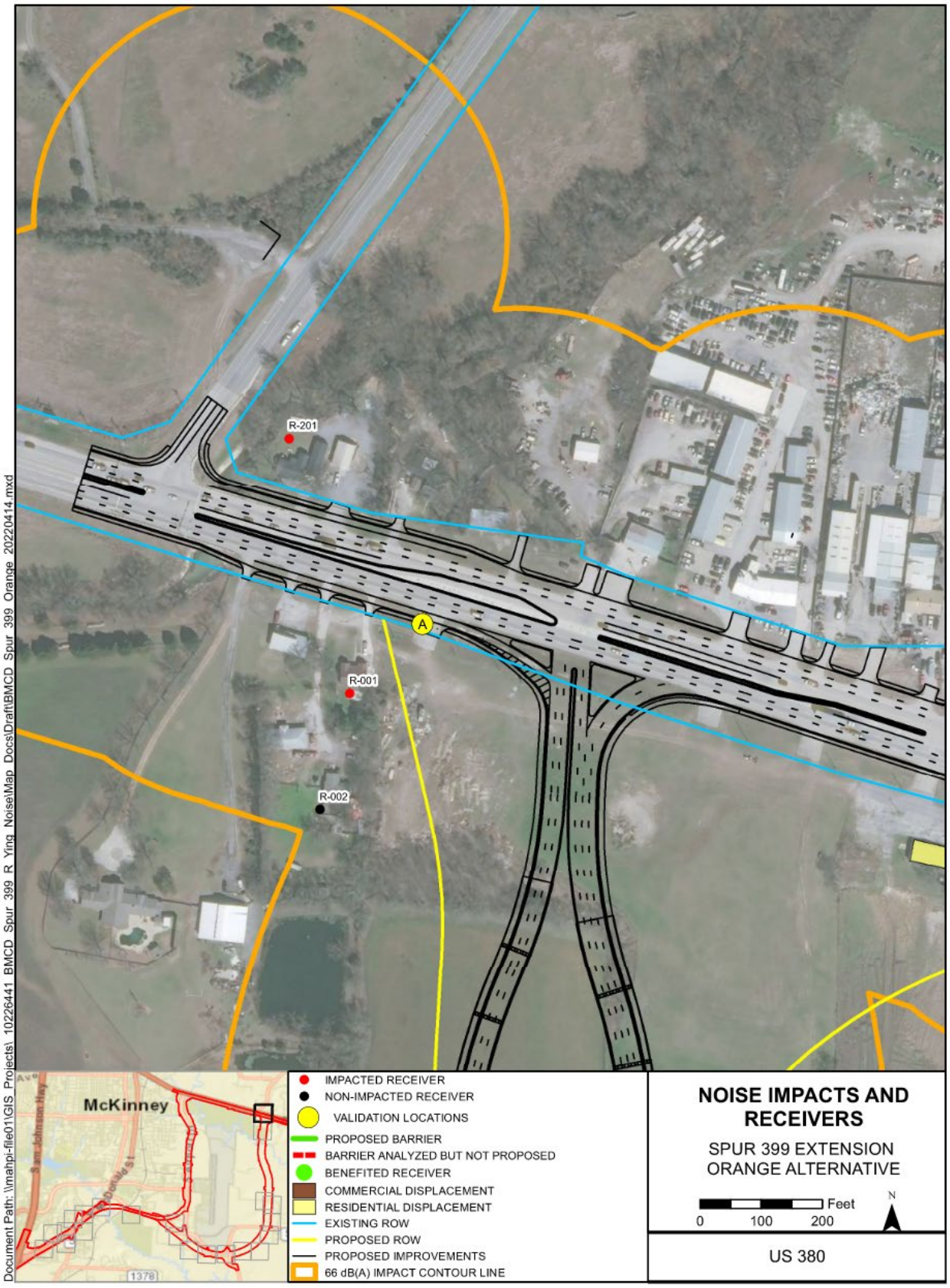


Figure 3-77 summarizes the impacts resulting from both Build Alternatives.

Figure 3-77: Summary of Traffic Noise Impacts of the Purple and Orange Alternatives

Build Alternative	Number of Category B and C Receptors Analyzed	Number of Receptors Impacted	Number of Receptors with Substantial Increases	Number of Receptors Benefitted by Feasible and Reasonable Barriers
PURPLE ALTERNATIVE	273	183	46	26*
ORANGE ALTERNATIVE	251	159	41	26*

Source: *DEIS Reasonable Alternatives Traffic Noise Analysis Technical Report – Spur 399 Extension*; May 2022. HDR

* Includes benefited receptors for Barrier 3, to be constructed under the SH5 Improvement Project within the Common Alignment and also considered as part of the No-Build Alternative.

Noise abatement measures will be considered for each location with predicted noise impacts. Abatement measures, typically noise barriers, must provide a minimum noise reduction, or benefit, at or above the threshold of 5 dB(A). A barrier is not acoustically feasible unless it reduces noise levels by at least 5 dB(A) at greater than 50 percent of first-row impacted receptors and benefits a minimum of two impacted receptors. To be reasonable, the barrier must not exceed the cost reasonableness allowance of 1,500 square feet per benefited receptor and must meet the noise reduction design goal of 7 dB(A) for at least one receptor.

3.14.2.4 Abatement Analysis - Feasible and Reasonable Barriers

One barrier (Barrier 1) is both feasible and reasonable based on the barrier analysis and is recommended for incorporation into the proposed project. In addition, the barrier planned as part of the SH 5 Improvement Project (CSJ 0047-05-054, etc.) and part of the No-Build Alternative, was found to be both feasible and reasonable to abate noise from the proposed Spur 399 Extension. **Figure 3-78** summarizes these two barriers.

Figure 3-78: Noise Barriers Determined to be Feasible and Reasonable

Barrier	Locations	Receptor Number - Type	Number of Benefited Receptors	Length (feet)	Height (feet)	Reasonableness	
1*	Magnolia Ranch Apartments	R-173, R-245 to R-299 Residential	12	961	18	Total Barrier Area (ft^2) 17,298	Length per Benefitted Receiver (ft) 1,442
3**	High Point Manufactured Home Community	R-007 to R-040, R-125 and R-126 Residential	14	629	12	Total Cost $136,128	Cost per Benefitted Receiver $13,613

* Modeled and analyzed using TxDOT's 2019 Traffic Noise Policy

** Modeled and analyzed under TxDOT's 2011 Guidelines for Analysis and Abatement of Roadway Traffic Noise which had different criteria for feasibility and reasonableness. Barrier 3 is the barrier planned as part of the SH 5 Improvement Project.

Barrier 1: R-173, R-245 to R-299 (Figures 3-41 through 3-43 and 3-56 through 3-58)– These receptors represent a total of 30 impacted residences at the permitted Magnolia Ranch Apartments along both Build Alternatives. Based on preliminary calculations, a noise barrier 961 feet long, 18 feet high, and located along the ROW would reduce noise levels by at least 5 dB(A) for 12 benefited receptors and 7 dB(A) (design goal) for at least one of the benefited receptors. With a total area of abatement of 17,298 square feet or 1,442 square

feet per benefited receptor, the barrier would be cost reasonable. Therefore, Barrier 1 is considered acoustically feasible and cost effective.

Barrier 3: R-007 to R-040, R-125 and R-126 (Figures 3-44, 3-45, 3-59, and 3-60) – Barrier 3 would not be modified for this project. This barrier was reevaluated with the new roadway design to confirm that the previously proposed noise barrier (part of the SH Improvement Project, CSJs 0047-05-054, etc.) would meet the TxDOT feasibility and reasonableness requirements. These receivers represented 30 impacted residences at the High Point Manufactured Home Community along northbound SH 5 east of the SH 5/ Spur 399 interchange. As part of the proposed SH 5 Improvement Project, Barrier 3 was placed along the proposed TxDOT ROW on the hill nearer to the top of slope and residences and north and south of Crestwood Road. Barrier 3 is in two sections with a gap required to maintain access to the community at Crestwood Road.

Results of the previous noise traffic analysis for the proposed SH 5 Improvement project indicated that a traffic noise barrier would be both feasible and reasonable. A 12-foot high traffic noise barrier approximately 629 feet long was modeled and benefits 14 receivers, of which 10 were along the first-row receivers, including the 7 dB(A) design goal reduction and 91 percent (10 out of 11) of the impacted first row receivers. Total cost of the barrier would be $136,128 or $13,613 for each benefited receiver. The noise barrier achieves the design goal of 7 dB(A), the minimum feasible reduction of 5 dB(A) and the reasonable, cost-effectiveness criterion of $25,000. Total cost was estimated using $18 per square foot in accordance with TxDOT's 2011 Guidelines for Analysis and Abatement of Roadway Traffic Noise.

3.14.2.5 Abatement Analysis – Barriers Analyzed But Not Proposed

Noise barriers were determined not feasible and reasonable for the remaining impacted representative receptors, and abatement is not proposed for those locations. The following summarizes the reasons why barriers are not proposed at the following locations. Additional details regarding the barrier analysis can be found in the *DEIS Reasonable Alternatives Traffic Noise Analysis Technical Report – Spur 399 Extension,* May 2022 (**Appendix R**).

R-001 (Figure 3-76), R-003 (Figures 3-73 and 3-74), R-004 (Figure 3-68), R-101 (Figure 3-71), R-111 (Figure 3-53), R-128 and R-129 (Figure 3-49), R-182 and R-186 (Figure 3-66), R-188 to R-193 (Figure 3-71), R-200 (Figure 3-74), R-201 (Figure 3-76), and R-308 (Figure 3-70) - These receptors are separate, isolated residences, which are not associated with a neighborhood or subdivision. Because a noise abatement measure must potentially benefit a minimum of two impacted receptors, noise abatement for these locations is not feasible.

Barrier 2: R-041 to R-099, R-202 and R-203 (Figures 3-41, 3-42, 3-43, and Figures 3-56, 3-57, 3-58) - These receptors represent a total of 61 impacted residences in Greens of McKinney neighborhood along the Common Alignment for both Build Alternatives. Based on preliminary calculations, a noise barrier 1,499 feet long, 20 feet high, and located along the ROW would not be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors or the noise reduction design goal of 7 dB(A).

Barrier 4: R-121 to R-124 and R-174 to R-181 (Figure 3-46 and Figure 3-61) - These receptors represent a total of 5 impacted residences in Greens of McKinney neighborhood along the Common Alignment for both Build Alternatives. Based on preliminary calculations, a noise barrier 437 feet long (two segments 303 feet

long and 134 feet long), 20 feet high, and located along the ROW would not be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors or the noise reduction design goal of 7 dB(A).

Barrier 5: R-306 (Figure 3-47 and Figure 3-62)– This receptor represents the centroid of the impacted park areas associated with Wilson Creek Greenbelt along the Common Alignment for both Build Alternatives. The impacted area of the park is predicted to be approximately 21 acres and is equivalent to 77 residential receptors, based on a 12,322 square-foot average residential lot size in the Study Area. Other noise-sensitive areas within the impacted park area include several picnic tables, a gazebo, and a trailhead. A continuous noise barrier 1,259 feet long, 20 feet high, and located along the ROW would not reduce noise levels by at least 5 dB(A) or meet the noise reduction design goal of 7 dB(A) for the receptor representing the centroid of the impacted park area.

Barrier 6: R-304 (Figure 3-48 and Figure 3-63)– This receptor represents the centroid of the impacted area of the proposed park planned over the existing landfill along the Common Alignment for both Build Alternatives. The impacted park area is predicted to be approximately 78 acres and is equivalent to 278 residential receptors, based on a 12,322 square-foot average residential lot size in the Study Area. Based on preliminary calculations, a noise barrier 1,585 feet long, 20 feet high, and located along the ROW would not reduce noise levels by at least 5 dB(A) or meet the noise reduction design goal of 7 dB(A) for the receptor representing the centroid of the impacted proposed park area.

Barrier 7: R-006 and R-187 (Figure 3-65) - These receptors represent two impacted residences in the neighborhood near Country Lane and Old Mill Road along the Orange Alternative. Based on preliminary calculations, a noise barrier 289 feet long, 20 feet high, and located along the ROW would not be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors or the noise reduction design goal of 7 dB(A).

Barrier 8: R-301 (Figure 3-75) – This receptor represents the centroid of the impacted area of the McKinney Future Parkland along the Orange Alternative. The impacted park area is predicted to be approximately 62 acres and is equivalent to 221 residential receptors, based on a 12,322 square-foot average residential lot size in the Study Area. Based on preliminary calculations, a noise barrier 1,666 feet long, 20 feet high, and located along the ROW would not reduce noise levels by at least 5 dB(A) or meet the noise reduction design goal of 7 dB(A) for the receptor representing the centroid of the impacted park area.

Barrier 9: R-131 to R-158 (Figure 3-50) - These receptors represent a total of 29 impacted residences in the Bramblewood Mobile Home Community along the Purple Alternative. It is not feasible to locate a noise barrier here due to intervening land use (commercial/industrial) between the receivers and the barrier.

Barrier 10: R-159 to R-166 (Figure 3-51) - These receptors represent a total of 8 impacted residences in the residential neighborhood near Industrial Boulevard along the Purple Alternative. It is not feasible to locate a noise barrier here due to intervening land use (a large commercial building) between the receivers and the barrier.

Barrier 11: R-114 to R-120 and R-167 to R-170 (Figure 3-52) - These receptors represent a total of 11 impacted residences in the Central/Mouzon neighborhood along the Purple Alternative. Based on preliminary

calculations, a noise barrier 741 feet long (two segments 323 feet long and 418 feet long), 20 feet high, and located along the ROW would not be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors or meet the noise reduction design goal of 7 dB(A).

Barrier 12: R-300 (Figure 3-53) – This receptor represents the centroid of the impacted area of the Trinity River Greenway for the Purple Alternative. The impacted park area is predicted to be approximately 11 acres and is equivalent to 40 residential receptors, based on a 12,322 square-foot average residential lot size in the Study Area. Based on preliminary calculations, a noise barrier 2,073 feet long, 20 feet high, and located along the ROW would not reduce noise levels by at least 5 dB(A) or meet the noise reduction design goal of 7 dB(A) for the receptor representing the centroid of the impacted park area.

Barrier 13: R-310 (Figure 3-40 and Figure 3-55) – This receptor represents four impacted Category C dwelling unit equivalents at the 28 classrooms of the Collin County Community College along the Common Alignment for both Build Alternatives. Based on preliminary calculations, a noise barrier1,298 feet long (three segments 420, 485, and 393 feet long), 20 feet high, and located along the ROW would be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors, but would not meet the 7 dB(A) noise reduction design goal.

Barrier 14: R-309 (Figure 3-42 and Figure 3-57) – This receptor represents 20 impacted Category C dwelling unit equivalents at the 281- bed Medical Center of McKinney along the Common Alignment for both Build Alternatives. Based on preliminary calculations, a noise barrier 1,338 feet long (three segments 356, 368, and 614 feet long), 20 feet high, and located along the ROW would not be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors or meet the noise reduction design goal of 7 dB(A).

Barrier 15: R-303 (Figure 3-67) - This receptor represents the centroid of the impacted area of the Fairview Nature Preserve along the Orange Alternative. The impacted park area is predicted to be approximately 44 acres and is equivalent to 157 residential receptors, based on a 12,322 square-foot average residential lot size in the project area. A continuous noise barrier, 20 feet high and approximately 874 feet long, would not reduce noise levels by at least 5 dB(A) or meet the noise reduction design goal of 7 dB(A) for the receptor representing the centroid of the impacted area.

Barrier 16: R-100, R-313 and R-314 (Figure 3-71) - These receptors represent three impacted residences in the neighborhood near the intersection of Harry McKillop Boulevard and Almeta Lane along the Orange Alternative. Based on preliminary calculations, a noise barrier 335 feet long, 20 feet high, and located along the ROW would reduce noise levels by at least 5 dB(A) for two benefited receptors and achieve the 7 dB(A) noise reduction design goal for one of the benefited receptors. However, with the total surface area of abatement at 6,700 square feet or 3,350 square feet per benefitted receptor, the barrier would exceed the cost-reasonableness criterion of 1,500 square feet per benefited receptor.

Barrier 17: R-305 (Figure 3-47 and Figure 3-62) – This receptor represents the centroid of the impacted area of the Wilson Creek Greenbelt (West of SH 5) along the Common Alignment of both Build Alternatives. The impacted park area is predicted to be approximately 9 acres and is equivalent to 33 residential receptors, based on a 12,322 square-foot average residential lot size in the Study Area. Based on preliminary

calculations, a noise barrier 1,797 feet long, 20 feet high, and located along the ROW would not reduce noise levels by at least 5 dB(A) or meet the noise reduction design goal of 7 dB(A) for the benefited receptors.

Barrier 18 R-102 to R-105, R-184, R-185 and R-311 (Figures 3-66 and 3-67) - These receivers represent six impacted residences in the neighborhood on Old Mill Road along the Orange Alternative. Based on preliminary calculations, a noise barrier 593 feet long, 20 feet high, and located along the ROW would reduce noise levels by at least 5 dB(A) for two benefited receivers and achieve the 7 dB(A) noise reduction design goal for two of the benefited receivers. However, with the total surface area of abatement at 11,860 square feet or 5,930 square feet per benefited receiver, the barrier would exceed the cost-reasonableness criterion of 1,500 square feet per benefited receptor.

Barrier 19 R-005, and R-312 (Figure 3-68) - These receivers represent two impacted residences in the neighborhood along Old Mill Road along the Orange Alternative. Based on preliminary calculations, a noise barrier 183 feet long, 20 feet high, and located along the ROW would not be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors or the noise reduction design goal of 7 dB(A).

Barrier 20 R-307 (Figure 3-68) - This receptor represents the centroid of the impacted area of the Fairview Soccer Complex along the Orange Alternative. The impacted area is predicted to be approximately 50 acres and is equivalent to 177 residential receptors, based on a 12,322 square-foot average residential lot size in the Study Area. A continuous noise barrier, 20 feet high and approximately 327 feet long, would not reduce noise levels by at least 5 dB(A) or meet the noise reduction design goal of 7 dB(A) for the receptor representing the centroid of the impacted area.

3.14.2.6 Statement of Likelihood

Any subsequent project design changes may require a reevaluation of this noise barrier analysis. The final decision to construct a proposed noise barrier will not be made until completion of the project design, utility evaluation, and polling of all benefited and adjacent property owners and residents.

A copy of the traffic noise analysis will be made available to local officials to assist in future land use planning and ensure, to the maximum extent possible, future developments are planned, designed, and programmed in a manner that would avoid traffic noise impacts. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the Preferred Alternative once one is selected.

No-Build Alternative

Under the No-Build Alternative, the proposed project would not be constructed. If the No-Build Alternative is implemented, traffic noise levels would be expected to increase with the associated forecasted increase in traffic volumes. The SH 5 Improvements cleared in July 2020, and anticipated to let for construction in June 2027, would include construction of Barrier 3 that would benefit receivers adversely affected by traffic noise from those improvements.

Purple Alternative

The Purple Alternative had 273 receptors analyzed, 183 receptors would be impacted, and 46 of the receptors would receive substantial noise increases. A total of 26 receptors impacted by noise from the Purple

Alternative would benefit from construction of a noise barrier – proposed Barrier 1 would benefit 12 receivers at the Magnolia Ranch Apartments; and Barrier 3 (part of the No-Build Alternative) would additionally benefit 14 receivers at the High Point Manufactured Home Community.

Orange Alternative - Preferred Alternative

The Orange Alternative is the Preferred Alternative. The Orange Alternative had 251 receptors analyzed, 159 receptors would be impacted, and 41 of the receptors would receive substantial noise increases. A total of 26 receptors impacted by noise from the Orange Alternative would benefit from construction of a noise barrier – proposed Barrier 1 would benefit 12 receivers at the Magnolia Ranch Apartments; and Barrier 3 (part of the No-Build Alternative) would additionally benefit 14 receivers at the High Point Manufactured Home Community.

3.15 Induced Growth

The CEQ defines direct effects as those effects that are "caused by the action and occur at the same time and place."[32] 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 an action and occur 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."[33] .

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

> **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 an area larger and beyond the extent of the direct footprint of the proposed project.
>
> **Encroachment Alteration**: 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*, direct 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. The following sections outline the six-step process in the induced growth impact analysis.

32 40 CFR § 1508.8(a)

33 40 CFR § 1508.8(b)

3.15.1 Define the Methodology

A planning 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). This approach uses professional judgment, data collected from local and regional planning entities, and an assessment of local conditions and trends 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 were used to identify the potential extent of the AOI. The Feasibility Study was also used to identify issues pertaining to future development related to transportation improvements raised by the various jurisdictions involved.

As part of the approach, an Indirect effects Questionnaire, including the defined AOI, was sent via email to planners and city officials with the Town of Fairview, City of McKinney, City of Lowry Crossing, City of Princeton, Town of New Hope, Collin County, NCTCOG, and the NTMWD. The questionnaire presented the following six 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 Spur 399 Extension 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 Spur 399 Extension 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 Spur 399 Extension project? If so, where?
5. What future development would you not expect to be dependent on the proposed Spur 399 Extension 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 Spur 399 Extension project affect or change the type of development within your jurisdiction?

The City of McKinney and NTMWD were the only respondents to the questionnaire. Their responses are discussed in the following steps.

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

An essential objective of the process is to define the scope of the analysis by considering the potential indirect induced growth impacts and their possible geographic range or extent. This is done by considering the attributes and the context of the proposed project and leads to a general assessment of the level of impacts anticipated. In addition, the assessment considers the distance from the project construction footprint necessary for those impacts 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.

3.15.2.1 Geographic Boundary of the Area of Influence

Depicted in **Figure 3-79**, the Spur 399 Extension AOI encompasses approximately 41,233 acres and is bounded by SRT-SH 121, South Hardin Road, and Chelsea Boulevard to the west, McIntyre Road, CR 338, and portions of the jurisdictional boundaries of the Town of New Hope, FM 1827, CR 989, CR 466 to the north, Silver Grove Creek and Lavon Lake to the east, and generally CR 392 and CR 914, Lavon Lake floodplain, and Stacy Road to the south.

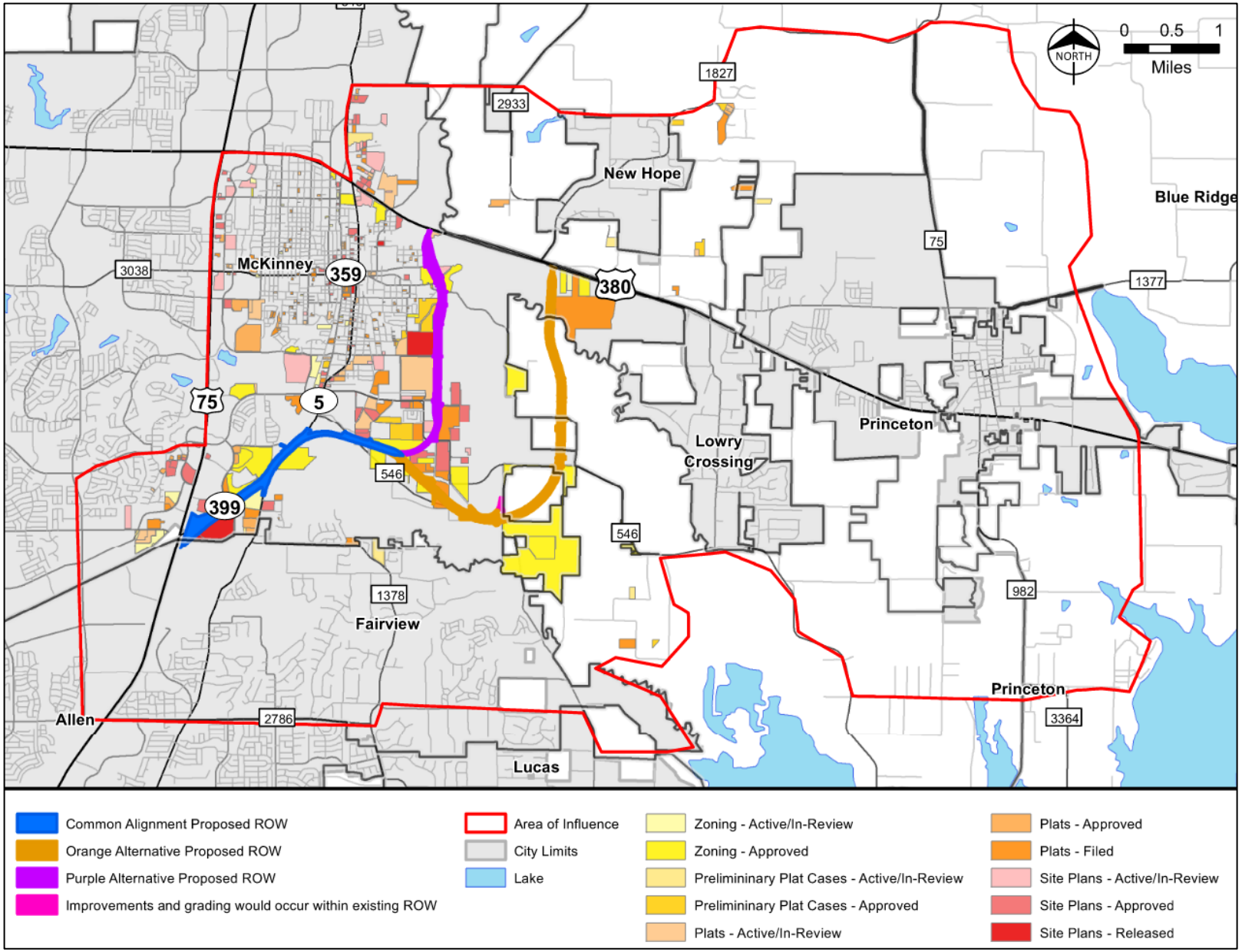
The AOI was defined in consideration of the following factors:

- The neighborhoods and areas best served by the Spur 399 Extension project – mostly potential travelers heading west and then south.
- Areas with potential to be opened for development following construction of the roadway due to increased mobility and ease of area access.
- Natural resources that have the potential to be indirectly affected.

3.15.2.2 Time Frame for Assessing Indirect effects

The time frame for the induced growth effects analysis extends from 2022 (date of the DEIS) to 2045 (the planning horizon year for *Mobility 2045 Update*).

Figure 3-79: Area of Influence



3.15.3 Identify Areas Subject to Induced Growth in the AOI

Vacant land and undevelopable areas (e.g., waterbodies, floodplains, parklands, and existing development) were identified to determine where induced growth could occur within 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. The City of McKinney, Town of Fairview, Town of New Hope, City of Allen, and the City of Princeton have adopted future land use plans.

The total acreage of potentially developable and undevelopable land in the AOI is summarized in **Figure 3-80** and illustrated in **Figure 3-81**.

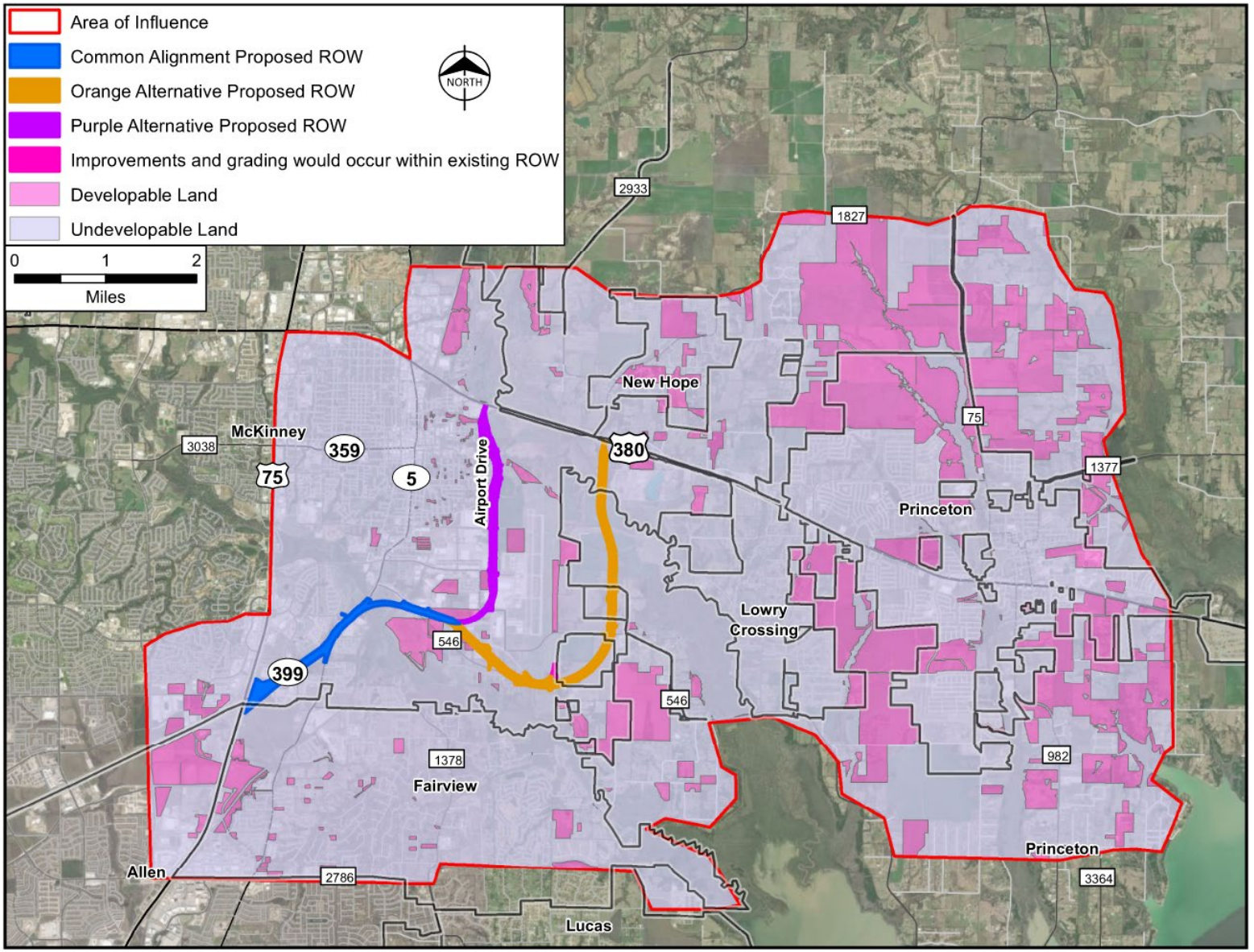
Figure 3-80: Total Acreage of Potentially Developable and Undevelopable Land Within the AOI

Land Type	Acres	Percent of AOI
Total Area of Influence (AOI)	41,233	100%
Undevelopable Land (e.g., (floodplains, waterbodies, parklands, and existing development)	33,432	81%
Developable Land	7,958	19%

Source: NCTCOG, 2018

Developed areas in the AOI include existing and planned development, mostly within the western portion of the AOI in the cities of McKinney and Fairview, and within the eastern portion of the AOI in Princeton. Residential construction is either underway or recently completed in these areas. A substantial portion of the AOI encompasses floodplains along Wilson Creek (western and southern AOI), the East Fork Trinity River (central portion of the AOI), and Ticky Creek (eastern AOI). Development within the 100-year floodplain is not permitted without proper mitigation; so for this analysis these areas are not considered conducive to induced growth.

Figure 3-81: Potentially Developable and Undevelopable Land in the AOI



3.15.3.1 Existing Land Use and Future Land Use in the AOI

City of McKinney - In the western portion of the AOI, west of the Purple Alternative, the City of McKinney is mostly built-out. Future land use is characterized as the Town Center District in the city's Individual District Strategies component of their Comprehensive Plan, which consists of downtown McKinney with commercial, manufacturing and warehousing and historic residential developments. Existing development matches the city's future vision for development. The ONE McKinney 2040 Land Use and Development 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."[34] McKinney's future land use plan has designated the area west of the East Fork Trinity River, as the Oak Hollow District and the Preferred Scenario shows urban and suburban developments, manufacturing and warehousing, and commercial developments. The Spur 399 Extension project has the potential to speed up planned development in this area.

City of Allen - The City of Allen adopted the *2030 Comprehensive Plan* in 2014 including a future land use plan.[35] The area within the AOI includes the following future land use designations: Mixed-Use - Employment Center provides for a mix of office, employment, and residential uses, with some retail, restaurant and service uses that support office development and the employees working in this location. The Commercial/Retail is intended for development of commercial, retail, and service uses. The Public/Institutional includes public and private schools, and institutional uses such as government buildings, hospitals, and religious facilities. Light Industrial/Technology is used to establish major employment centers, provide locations for business parks, and accommodate light industrial, distribution, assembly, technology and research and development uses. Some undeveloped parcels occur in this area of the AOI and the Spur 399 Extension may speed up any planned development.

McKinney National Airport – The Airport is in between the Purple and Orange Alternatives, south of US 380 and north of FM 546. The City of McKinney plans to extend the primary runway and expand the airfield and terminal area. The FAA and TxDOT Aviation Division issued a FONSI/ROD for the proposed action on July 27, 2022, with construction of the runway extension to the south anticipated to begin in December 2022, and construction of the extension to the north 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.

Collin County - East of the Oak Hollow District, development in the northern portion of the AOI is much less dense and includes parcels in unincorporated Collin County to the west and east of New Hope, and north and east of the City of Princeton. According to the Collin County Mobility Plan this area is designated mostly for rural

[34] City of McKinney, *ONE-McKinney 2040 Comprehensive Plan* (2018); https://www.mckinneytexas.org/292/2040-Comprehensive-Plan

[35] City of Allen 2030 Comprehensive Plan. Chapter 4: Land Use & Design. Adopted October 14, 2014. Accessed January 2022 at https://www.cityofallen.org/DocumentCenter/View/5681/4-Land-Use-and-Design-final-draft?bidId= .

and urban residential development, and to a much lesser extent, commercial industrial development.[36] 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 their respective extraterritorial jurisdictions (ETJs). This area is also within McKinney's ETJ and, according to the Preferred Scenario for future land use, the northern portions of AOI are in the East Fork and Agricultural Districts identified in the ONE McKinney Plan. These areas are designated as rural and urban residential, estate residential, neighborhood commercial, and commercial center. Developable parcels exist; however, the Spur 399 Extension would not increase accessibility to this area, and therefore is not likely to induce growth in this area.

Town of New Hope - The north-central portion of the AOI encompasses the Town of New Hope. The town does not have a future land use plan but does have a zoning map available online.[37] The map shows platted residential subdivisions and zoning designations for areas that include single-family residential for 2- to 4-acre lots, manufactured home district, general business district, and municipal district. 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, 2-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 CR 331. The Spur 399 Extension would not measurably increase accessibility to this area, and therefore is not likely to induce growth within New Hope.

City of Princeton - The City of Princeton, in the eastern portion of the AOI, adopted a comprehensive plan with a future land use plan similar to the City of McKinney's future land use plan that designates place types within its ETJ projected out to 2050. Princeton's Future Land Use Plan map shows the preferred distribution of Place Types with the vast majority of future land use within Princeton's ETJ slated for suburban living for single-family homes and large lot single-family homes north and south of US 380.[38] Princeton has the most newly constructed residential developments and currently under-construction residential developments in the AOI. The proposed project improvements would not increase accessibility to this area; however, the Spur 399 Extension may make Princeton more attractive to developers due to the increased mobility in the AOI.

City of Lowry Crossing - The City of Lowry Crossing is in the middle of the AOI and 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 Spur 399 Extension would not increase accessibility to this area, and therefore is not likely to induce growth in this area.

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36 Collin County Mobility Plan (2014). Future Land Use (Build-Out Scenario) Map. Accessed January 2022 at https://www.collincountytx.gov/mobility/Documents/mobility_plan/FutureLandUseMap.pdf.

37 Town of New Hope Zoning Map. Adopted July 22, 2020. Accessed January 2022 at https://drive.google.com/file/d/1VIRDVSYvSlkuF-9utMriyijxCJst9WwE/view..

38 Princeton, Texas Comprehensive Plan. Adopted January 14, 2019. Access January 2022 at https://www.princetontx.gov/DocumentCenter/View/468/Comprehensive-Plan-PDF.

Town of Fairview - The southern portion of the AOI is located within most of the jurisdictional boundaries of the Town of Fairview which adopted a future land use plan in 2014.[39] The Town of Fairview Comprehensive Plan's Future Land Use Plan shows the town is dominated by four distinct development patterns that can be delineated into planning sectors to best address each area. These planning sectors include: the central sector, characterized by development consisting of large lot, single family development, country roads, and limited institutional uses; the eastern sector, characterized by lower density residential neighborhoods, country roads, agricultural land, open space, and floodplain running northwest to southeast along Wilson Creek; Heritage Ranch, a planned active-seniors lifestyle community noted by smaller residential lots overlooking a golf course; and the mixed-use sector, characterized by higher-density residential and commercial development adjacent to US 75, SH 5, and Stacy Road just east of SH 5. Based on citizen feedback, Fairview residents are happy with the community's values of maintaining its rural heritage and large lot residential areas. Based on the town's future land use plan, citizen feedback, and lack of accessibility to this area, the Spur 399 Extension project is not likely to induce growth in this area.

Based on review of future land use plans, developable and undevelopable areas, and accessibility of undeveloped parcels, limited areas in the AOI have the potential for induced growth and/or the potential to speed up planned development because of the Spur 399 Extension. These induced growth areas include undeveloped parcels in a small portion of the City of Allen between existing Spur 399 and US 75 and in the City of McKinney around the Airport. The Spur 399 Extension may also speed up planned development in the City of Princeton.

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

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

3.15.4.1 Regional and Local Growth Trends

Based on population and employment trends, growth is likely to occur in the AOI. The cities of McKinney and Princeton, and Collin County along with the overall Dallas Forth-Worth Metropolitan Planning Area (MPA) have experienced substantial population and employment growth since 2010, while Lowry Crossing and New Hope experienced negative growth during the same period. According to the Texas Water Development Board (TWDB) and NCTCOG, all jurisdictions within the AOI are projected to substantially increase in population by 2040 except for the City of Allen. Population estimates and projections for the jurisdictions in the AOI are summarized in **Figure 3-82**.

[39] Town of Fairview Comprehensive Plan and Future Land Use Plan (2017). Adopted May 27, 2014. Accessed January 2022 at https://fairviewtexas.org/pdf/Planning/Documents/Future%20Land%20Use%20Plan%20-%20As%20Adopted%20May%2027,%202014.pdf

Figure 3-82: Historical and Projected Population Growth

Jurisdictions Within the AOI	Estimate		Projections 2040[c]/2045[d]	Percent Change (2010-2019)	Percent Change (2019-2040/2045)
	2010[a]	2019[b]			
City of McKinney					
Total Population	131,117	182,055	238,474	39%	51%
Employment	60,251	94,726	119,846	52%	31%
City of Allen					
Total Population	77,843	101,669	98,500	31%	-3%
Employment	41,937	55,083	NA	31%	NA
Town of Fairview					
Total Population	7,248	8,832	20,025	22%	127%
Employment	2.814	3,867	NA	37%	NA
City of Lowry Crossing					
Total Population	1,945	1,349	3,000	-31%	122%
Employment	1,515	1,146	NA	-24%	NA
Town of New Hope					
Total Population	614	592	1,195	-4%	102%
Employment	404	304	NA	25%	NA
City of Princeton					
Total Population	6,807	10,846	15,290	59%	41%
Employment	3,358	5,666	NA	69%	NA
Collin County					
Total Population[(d)]	782,341	973,977	1,689,168	24%	73%
Employment[(d)]	383,069	509,180	835,342	33%	64%
Dallas-Fort Worth MPA					
Total Population[(d)]	6,417,724	7,235,508	11,246,531	13%	55%
Employment[(e)11]	2,700,000	4,584,235	7,024,227	70%	53%

Source: (a)US Census 2010; (b) American Community Survey (ACS) 2015-2019; (c) TWDB 2018; (d) NCTCOG 2017; (e) NCTCOG 2005

3.15.4.2 Indirect effects Questionnaire Responses

The City of McKinney's Planning Manager provided responses to each of the seven questions in the Indirect effects Questionnaire.

- Question 1, the past 5 to 10 years has seen "… a strong emphasis on residential development, especially moving north and in infills spots around the City of McKinney. Increasing commercial is being developed at key intersections within the city".
- Question 2, the city responded that "new roadways always induce some kind of development along them, due to new areas that were once unreachable having direct frontage created for them."

However, the city states that any growth in their jurisdiction would occur without the proposed Purple and Orange Alternatives and that they have seen "quite a bit of growth and future interest" in the areas along both proposed alternatives.

- Question 3, the city stated the Purple Alternative would likely affect existing development and once ROW is taken, some parcels would no longer be viable for development. The Orange Alternative would likely open new areas up for development because it is located within the city's ETJ and beyond the Airport.
- Question 4, the city stated the Purple Alternative would result in "quite a bit of redevelopment", because most of the existing development along the proposed alignment would have to be redistributed onto smaller parcels "or move out of the area entirely".
- Question 5, in general the city stated that the Purple Alternative passes through an area of existing warehousing and manufacturing, while the Orange Alternative passes through the city's designated business and aviation district. In the city's opinion, neither of those development types would be entirely dependent on the proposed Spur 399 Extension,
- Question 6, based on the scale of "1-no influence", to "5-strong influence", the city responded by scoring the rate and intensity of development due to the proposed project with a "3."
- Question 7, in general the city stated that the proposed Spur 399 Extension project would not affect or change the type of development envisioned for the area (designated for commercial uses in the comprehensive plan) and that along either proposed alignment commercial businesses would be supported and help the area grow.

The NTMWD did not respond in the questionnaire but did state that they do not have jurisdiction over the development or land use within its service area. NTMWD indicated they have plans for new infrastructure to provide services to its member cities and customers in the Spur 399 Extension Study Area. They also stated they have been in close coordination with TxDOT for the projects both entities have in the area.

3.15.4.3 Potential for induced Development

The areas within the AOI subject to induced growth are confined within the city limits of Allen and McKinney. The potential for each proposed Build Alternative to induce growth is discussed below.

Purple Alternative

The Purple Alternative has the potential to speed up planned development and/or induce development on undeveloped parcels in the City of Allen by improving regional connectivity for persons traveling from northern and eastern Collin County to the core of the Dallas Metroplex and by adding capacity to a somewhat congested regional arterial network. According to the City of Allen's online Development Map, this area does not have any planned development occurring. However, should the Purple Alternative be constructed, the area may become more attractive to developers due to the increased mobility and connectivity provided to the area and the improved travel times afforded by the additional freeway capacity. New development induced by the Purple Alternative in this location would not be substantial as the amount of available land and possible local access issues could hinder some developers. According to the City of McKinney's Planning Department, the Purple Alternative would induce substantial redevelopment along existing Airport Drive in the event existing businesses located there don't feel the new freeway meets their access needs or feel it may affect their facility expansion plans and decide to relocate outside of McKinney, the remaining parcels could be subdivided to be more attractive to a variety of business types. The city has plans to expand the Airport with or without

implementation of the Purple Alternative and would maintain the current Airport access points along Airport Drive.

Orange Alternative

The Orange Alternative would have the same induced growth potential as the Purple Alternative within the City of Allen. Because most of the Orange Alternative would be constructed on new location, it has the potential to open more new areas to development east of the Airport that are currently undeveloped or in agricultural use. The factors limiting how much induced development is likely to occur along the Orange Alternative are the lack of utilities and infrastructure (e.g., water, sewer, natural gas, etc.) and the floodplain associated with the East Fork Trinity River. The Orange Alternative would provide access to the eastern terminal area that is part of the proposed Airport expansion and would provide frontage road access within an area designated for manufacturing, warehousing, and commercial developments that would be compatible with and may desire access to aviation and freeway transport. 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 by the Orange Alternative.

No-Build Alternative

Capacity and access improvements along US 380 and SH 5, already cleared by TxDOT, may encourage limited commercial and industrial growth on vacant parcels and redevelopment of other parcels under the No-Build Alternative. These areas are served by existing utilities that would support redevelopment.

3.15.5 Identify Resources Subject to Induced Growth Impacts

The methodology for assessing induced growth impacts was based on a planning judgment, qualitative analysis approach; therefore, specific resources within the AOI that may be impacted because of induced growth are not quantified for the DEIS. Similar to the way cumulative impacts are evaluated (see **Section 3.16**), the Preferred Alternative recommended for the Spur 399 Extension has the potential for encroachment alteration impacts to floodplains and floodways, water features and surface water quality, wildlife habitat, and the visual and aesthetic environment.

Purple Alternative

Because of the presence of Wilson Creek its associated floodplain, floodways, riparian habitats, and wetlands, encroachment alteration effects within the downstream reaches of the Wilson Creek watershed could occur. The Purple Alternative is designed to avoid where possible and minimize where feasible and practicable the placement of fill materials within WOTUS including the consideration of pier/bent locations within floodplains/floodways to avoid the need for compensatory flood storage. The pier/bent locations also avoid park improvements within the Wilson Creek Greenbelt crossed by the Purple Alternative.

Any induced growth occurring along the alignment would increase the amount of impervious cover, increasing runoff rates and negatively affecting surface water quality. Water features and riparian and floodplain forests support state and federally protected species that may occur in the project and Study Areas 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 Purple Alternative, but to a lesser degree than the Orange Alternative because of the more urban built-up environment along Airport Drive

included in and along the proposed ROW. The introduction of the elevated 8-lane freeway, frontage roads, signage, and traffic signals through the Airport Drive area would change the visual environment but to a lesser degree than if crossing undeveloped land, Redevelopment of parcels along the Purple Alternative would most likely support continued commercial and industrial uses in this part of McKinney due to its proximity to the Airport.

Orange Alternative – Preferred Alternative

Because of the presence of Wilson 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 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. The Orange Alternative is being designed to avoid where possible and minimize where feasible and practicable the placement of fill materials within WOTUS including the consideration of pier/bent locations within floodplains/floodways to avoid/minimize the need to create compensatory flood storage and possibly cause additional water feature impacts. Approximately 1,800 to 2,00 cubic yards of material would be placed below the 100-year floodplain water surface elevation requiring that areas by excavated within the proposed ROW to create additional flood storage. As final design of the Orange Alternative continues, consideration will also be given to the changes in the floodplain and flood elevation caused by the proposed runway extension at the Airport. A CLOMR is being developed to indicate the 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 East Fork Trinity River floodplain to accommodate the runway extension. This action is just upstream of the proposed Orange Alternative crossing of the East Fork Trinity River and floodplain.

Any induced growth occurring along the alignment would increase the amount of impervious cover, increasing runoff rates and negatively affecting surface water quality. The water features and riparian and floodplain forests also support state and federally protected species that may occur in the project and Study Areas 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 Orange Alternative in combination with other areas disturbed to support development induced by the project.

The open landscape where the Orange Alternative 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 area along the proposed alignment is relatively open requiring limited clearing with the exception of large clusters of trees near CR 722/Enloe Road. The limited induced development that would occur along the Orange Alternative would also change 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.

3.15.6 Identify Mitigation if Applicable

Purple and Orange Alternatives

As TxDOT and the FHWA do not have the authority to implement zoning or planning regulations, mitigation for indirect effects to land use or the conversion of undeveloped land to developed land would require the collaborative effort of local, county, and regional planners, the public, and private developers. These parties all have a stake in the ultimate landscape, and only proactive collaborative interaction would provide the optimum blend of natural and developed communities.

All development (public and private) must comply with FEMA flood control regulations and local floodplain administration; the ESA; the CWA, including Section 401 Water Quality Certification requirements and Section 404 permits for projects impacting WOTUS; and other regulations requiring mitigation if effects on species' habitats occur.

Orange Alternative – Preferred Alternative

As previously discussed, the Orange Alternative has the potential to influence or support development in Allen and McKinney where accessibility and mobility would be enhanced. Continued population growth and new and planned residential developments (namely in Princeton) are influencing, and will likely continue influencing, changes in land use patterns and inducing growth within the AOI, rather than construction of the proposed project. According to the City of McKinney, the proposed project would support future commercial development within the AOI; however, the proposed project would not be the primary factor considered in making land use decisions in the area. The Orange Alternative is not anticipated to substantially induce growth; therefore, no mitigation for induced growth impacts is proposed.

No-Build Alternative

Under the No-Build Alternative, minor areas of induced growth would occur along US 380 and FM 546 with redevelopment potentially occurring along Airport Drive if current property owners decide to divest of vacant land. The planned US 380 and SH 5 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, but they would not address the forecasted growth and congestion that affect mobility and access and make properties less desirable for development.

3.16 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 actions regardless of what agency (Federal or non-Federal) or person undertakes such an action." Cumulative effects "can result from individually minor but collectively significant actions taking place over a period of time."[40]

The purpose of a cumulative effects analysis is to view the direct 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 that 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.

[40] 40 CFR §1508.1(g)(3)

Broadening the view of resource effects in this way allows the decision maker an insight into the magnitude of project-related impacts considering the overall health and abundance of selected resources.

This section summarizes the potential cumulative effects of both Build Alternatives when considered with the anticipated effects of other current and future actions planned to occur within a broad Study Area. The analysis was based on the data contained in this DEIS and data and inferences gathered on potential effects of the other actions assessed. Most of the other actions considered are under current study and not as far along in the development of alternatives and assessment of effects as the Spur 399 Extension.

3.16.1 Resource Study Area, Conditions, and Trends

Scoping for the Spur 399 Extension, including cumulative effects, was conducted through outreach to agencies, stakeholders, and the public through agency, public, and stakeholder meetings; and from information obtained after the distribution of an indirect impact questionnaire (see **Section 3.15.1**) to local planning entities. The scoping process, in addition to the direct and indirect effects analyses, led to the identification of key resources for detailed cumulative effects analysis. The resource categories considered for further assessment are listed in **Figure 3-83**.

3.16.2 Direct and Indirect Effects on Each Resource from the Proposed Project

Figure 3-83 summarizes the direct and indirect effects of the Purple and Orange Alternatives, an assessment of the health of the resource, and recommendation on carrying the resource category forward for further evaluation in the cumulative impact assessment.

Figure 3-83: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this 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	- No residential displacements. - 1 potential commercial displacement. - 5 major utility conflicts/relocations. - EJ populations west of the Purple Alternative, not within or adjacent to the Project Area. - Low-income census block adjacent to SH 5. - No residential or community facility displacements, does require ROW from a public park and a planned park. - Traffic noise impacts occur, 1 noise barrier found to be feasible/reasonable along SH 5. - Noise barriers not proposed in the vicinity of the Lively Hill/La Loma and Central/Mouzon neighborhoods. - Does not encroach into neighborhoods with EJ populations west of Airport Drive. Would not create a new physical barrier preventing or making it more difficult for those neighborhoods to access community facilities west of the neighborhoods. Would create a new physical and visual barrier between the neighborhoods and McKinney Future Parkland east of Airport Drive. - SUPs adjacent to the frontage roads provide multi-modal access to businesses and parklands along Airport Drive and near US 380.	Encroachment alteration impacts due to the displacement and relocation of the Amazon Delivery Station Distribution Warehouse would not substantially reduce the City of McKinney's local tax base. Displaced employees would incur longer commute times to other Amazon facilities in the DFW area if transferred there or to other similar businesses. Residential and commercial properties near the Project Area but not physically impacted may experience a change in market value, either positive or negative. Low-income and minority populations living west of the proposed alignment are buffered from the proposed freeway by existing industrial development. The alignment would obstruct westerly views of the Study Area from those neighborhoods because the elevated freeway would create a physical barrier between them and city east of the alignment. The proposed project is not expected to substantially induce growth or result in adverse encroachment-alteration effects on neighborhoods. Businesses along Airport Drive have indicated the proposed improvement would potentially affect their facility operations and expansion plans, and for some, with some businesses considering possible relocation out of the corridor.	No	No. The Amazon Delivery Station Distribution Warehouse is one of six new delivery stations opened in 2021 in the Dallas-Fort Worth area. The other five Amazon facilities are in Arlington, Fort Worth, Mansfield, and Balch Springs. Target announced a new online delivery structure similar to Amazon for package sorting and has leased a 220,000-square-foot warehouse at 2300 Walnut Hill Lane in Dallas. The Purple Alternative would not result in disproportionately high and adverse direct or indirect effects to EJ populations. Moreover, *Mobility 2045 Update* roadway and transit recommendations do not have disparate impacts on protected populations. Neighborhoods located within the Study Area are not considered to be in poor or declining health according to the CIA technical report.

Figure 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this resource in poor or declining health?	Resource included in the Cumulative Effects Analysis? Yes or No Reason for Including/Excluding the Resource
	ORANGE	- 7 potential residential displacements, 2 clusters of 3 houses on same tract, and 1 isolated residence. One cluster of 3 homes associated with potential commercial displacement. - 2 potential commercial displacements. - 1 potential commercial displacement and associated 3 residences are within a minority census block. - Low-income census block adjacent to SH 5. - No low-income or minority residents displaced. - No community facilities displaced, requires ROW from a public park and a planned park, and minor ROW from future nature preserve and private soccer park. - 2 adjacent residential areas have potential for high levels of community cohesion. - Construction of new location freeway would introduce a roadway where one currently does not exist.	Residential and commercial properties located near the Project Area that are not physically impacted by the proposed project may experience a change in market value, either positive or negative. EJ populations are located away from the proposed alignment	No	No. Property acquisition required for the Orange Alternative would be in accordance with the Uniform Act, other applicable federal laws, and TxDOT policies and procedures. No person will be displaced unless and until adequate replacement housing has been provided or is in place. Comparable replacement housing is available in zip code 75069. The Orange Alternative would not result in disproportionately high and adverse direct or indirect effects to EJ populations. Moreover, *Mobility 2045 Update* roadway and transit recommendations do not have disparate impacts on protected populations.
Water Resources – Wetlands/Surface Waters	PURPLE	-Approx. 9.5 acres of water features, including streams, mapped within the footprint evaluated (East Fork Trinity River, Wilson Creek, tributaries). -Approx. 0.2 acres (767 LF) of jurisdictional water features would be permanently filled; approx. 1.0 ac (1,527 LF) would be temporarily impacted. -NWP 14 w/PCN is anticipated for impacts -Mitigation required for impacts to Water Features 25, 32, and 39 under applicable Regional General Conditions.	The Purple Alternative would not induce growth as a most of the adjacent properties are developed or planned for development, or occupied by the former NTMWD/McKinney landfill. Anticipated fill impacts to water features would be limited to within the project footprint. Temporary and permanent impacts to water features would not disrupt natural processes in the vicinity of the project. Encroachment alteration impacts to water features farther removed in time and distance are not anticipated because induced development resulting from this 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 impacts are not anticipated to be substantial. Mitigation would be provided for impacts that exceed the thresholds outlined in 2021 Combined Texas Regional Conditions.

Figure 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this 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/Surface Waters	ORANGE	-Approx. 11.54 acres of water features, including streams, are mapped within the footprint evaluated (East Fork Trinity River, Wilson Creek, tributaries). -Approx. 0.38 acres (2,997 LF) of jurisdictional water features would be permanently filled; approx. 1.73 ac (2,854 LF) would be temporarily impacted. -NWP 14 w/PCN is anticipated for impacts -Mitigation required for impacts to Water Features 52, 62, 63, 65, 66, and 67.	The Orange Alternative would potentially induce more growth because of the amount of undeveloped land crossed by the alignment. Conversion of the land from agricultural use would be restricted by floodplain encroachment in some areas and would require the extension of supporting utilities. Anticipated fill impacts to water features would be limited to within the project footprint. Temporary and permanent impacts to water features would not disrupt natural processes in the vicinity of the project. Encroachment alteration impacts to water features farther removed in time and distance are not anticipated because induced development resulting from this 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 impacts are not anticipated to be substantial. Mitigation would be provided for impacts that exceed the thresholds outlined in 2021 Combined Texas Regional Conditions.
Water Resources – Floodplains and Floodways	PURPLE	-Crosses the floodplain/floodway of Wilson Creek once and the floodplain of 4 tributaries of the East Fork Trinity River. It does not cross the main channel of the East Fork Trinity River. -Where feasible, the alignment would span the floodway and piers would be spaced to minimize hydraulic impacts on the floodplain.	The Purple Alternative crosses floodplains and a regulatory floodway and would increase the amount of impermeable surface within the Study Area. 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. The Purple Alternative would be elevated over the floodplain areas and span the floodway instead of building the roadway on an earthen embankment. As design continues, coordination with the local floodplain administrator would continue 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 Purple Alternative, is recommended as 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 impacts to floodplains where the 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.

Figure 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this 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	ORANGE	-Crosses the floodplain/floodway of Wilson Creek and the floodplain/floodway East Fork Trinity River. - Where feasible, alignment spans the floodway and piers have been spaced to minimize hydraulic impacts on floodplains. -Unavoidable placement of approximately 1,800 to 2,000 cubic yards fill material (piers) below the 100-year floodplain water surface elevation to support crossing the East Fork Trinity River requires compensatory storage to be created within the floodplain of the proposed ROW.	The Orange Alternative would increase the amount of impermeable surface within the Study Area, spans floodplains, and would place fill within the regulatory floodway of the East Fork Trinity River. The McKinney National Airport is pursuing a CLOMR to modify the floodplain within the footprint of the proposed 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 Orange Alternative. Coordination with the local floodplain administrator would continue on a regional approach to address flooding issues in the vicinity of the proposed projects. 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. As design continues, coordination with the local floodplain administrator would continue 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 Orange Alternative, if recommended as 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 impacts to the floodplains where the proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances.

Figure 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this 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 Waters	PURPLE	Both alternatives cross 2 impaired waters - Segment 0821C of "Wilson Creek" and Segment 0821D of the "East Fork Trinity River above Lake Lavon" The impairment is due to bacteria in the water.	Construction of either 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 impacts to surface waters through the implementation of BMPs, and control measures required under the TCEQs CGP, and design elements before, during, and after construction, this resource is not analyzed further in the cumulative impacts analysis
	ORANGE				
Biological Resources - Vegetation	PURPLE	-Of the approx. 263.4 acres of ROW required approx. 179.4 acres (68%) is developed as Urban Low Intensity and Urban High Intensity uses, including existing roadways. - Remaining 84 acres are comprised of a mix of Blackland Prairie/grassland, floodplain/riparian forest and herbaceous, native invasive/ deciduous woodland, and row crops.	Removal of existing vegetation would be moderate as the majority of the alignment is built-up, previously disturbed, and much of it in pavement (Airport Drive) and cultivated for crops. The minimal amount of induced development and/or redevelopment caused by the Purple Alternative could potentially remove more vegetation. With development and redevelopment, native vegetation is being replaced with landscaped lawns and planting beds.	Yes	Yes. Direct and indirect effects to vegetation are anticipated to be marginal as the resource is in decline and, in conjunction with other reasonably foreseeable projects, this resource is included in the analysis.
	ORANGE	Of the approx. 366.1 acres required, approx. 150.8 acres (41.2 %) is developed as Urban Low Intensity and Urban High Intensity, including existing roadways. -The alignment crosses primarily undeveloped, agricultural lands, with approx. 215.3 acres dominated by a mix of Blackland Prairie/grassland, Edwards Plateau oak woodland/savannah, floodplain/ riparian forest and herbaceous, native invasive/deciduous woodland, and row crops.	The loss of vegetation may be substantial due to the undeveloped nature of most of the corridor and the presence of pastures, hay meadows, and native grassland remnants to row crops and riparian and hardwood forests. The location and amount of induced development created by the Orange Alternative is restricted by the presence of floodplain and lack of utilities and supportive infrastructure.	Yes	Yes. Direct 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 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this 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	-Crosses 3 perennial streams providing potential habitat for protected mussels, alligator snapping turtle, and potentially the White-faced Ibis and Wood Stork. -Crosses 5 wooded areas providing potential habitat for SGCN bats and several SGCN reptiles, 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, redevelopment has the potential to be substantial along Airport Drive. The Purple Alternative is not anticipated to have substantial encroachment alteration effects on wildlife and SGCN species. Implementation of TPWD BMPs would occur prior to, during, and after construction to minimize impacts.	Yes	Yes. Although direct 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, this resource is included in the analysis.
	ORANGE	Crosses 4 perennial streams providing potential habitat for protected mussels, alligator snapping turtle, and potentially the White-faced Ibis and Wood Stork. -Crosses 14 wooded areas providing potential habitat for SGCN bats and several SGCN reptiles, 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. In conjunction with other reasonably foreseeable projects on new location in the area, this resource is included in the analysis.

Figure 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this resource in poor or declining health?	Resource included in the Cumulative Effects Analysis? Yes or No Reason for Including/Excluding the Resource
Cultural Resources	PURPLE	-No NRHP-listed resources or districts and no state-designated resources (RTHLs) within the historic resources variable APE. -3 cemeteries recommended NRHP eligible, no direct effects. -Shovel tests determined one archeological site to be not NRHP-eligible. Because rights-of-entry were not granted, deep testing is still warranted in high probability areas.	No direct effects on historical resources, cemeteries, or archeological sites. With potential induced growth along the project limited by current and planned development, the potential for impacts to other historical resources and cemeteries is unlikely.	No	No. Coordination with TxDOT ENV and the THC indicates no effect on historic or archeological resources. No NRHP-eligible or listed properties would be affected (removed or demolished) that would contribute to any trends toward the loss of such sites. Deep testing is warranted to determine the potential presence of sites within the project area.
	ORANGE	-2 NRHP-eligible resources adjacent to CR 317 and FM 546; ROW acquisition required from both parcels, but only from outside of the proposed NRHP boundaries of each property. No adverse effect on the recommended NRHP-eligible resources. -3 cemeteries recommended NRHP eligible, no direct effects. 4th cemetery outside of the alignment but within the APE was not accessible; right-of-entry to establish its extent/boundaries is warranted prior to initiating construction. -Shovel tests determined a previously recorded archeological site to be not NRHP-eligible. Because rights-of-entry were not granted, deep testing is still warranted in high probability areas -Enloe Farm – not NRHP-eligible	No direct effects on historical resources, cemeteries, or archeological sites. With the potential for induced growth to occur along the alignment and on lands not previously disturbed, there is a higher potential for possible impacts to archeological resources.	No	No. Coordination with TxDOT ENV and the THC indicates no effect on historic or archeological resources. No NRHP-eligible or listed properties would be affected (removed or demolished) that would contribute to any trends toward the loss of such sites. Deep testing is warranted to determine the potential presence of sites within the project area.

Figure 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this resource in poor or declining health?	Resource included in the Cumulative Effects Analysis? Yes or No Reason for Including/Excluding the Resource
Farmland	PURPLE	-Total of 166.9 acres of mapped prime and statewide important farmland, 60% of the project corridor is within an Urbanized Area where FPPA does not apply. Approx. 117.8 acres within the total proposed ROW is new ROW.	Induced growth is not anticipated to be substantial. Although portions of the corridor are outside of the Census designated Urban Areas and mapped farmlands would be converted to transportation uses, the land surrounding the Purple Alternative is dedicated to urban development. The City of McKinney has plans to expand the McKinney National Airport and has dedicated lands surrounding the Airport as the "Business & Aviation District".	No	No. Resource is not in decline. The FPPA minimizes the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland.
	ORANGE	-Total 165.7 acres of mapped prime and statewide important farmland; 47% of the project corridor is within an Urbanized Area where FPPA does not apply. -Approx. 243.3 acres within the total proposed ROW is new ROW.	Induced growth is anticipated to be greater than with the Purple Alternative because of the amount of undeveloped land made accessible by the freeway. Although development may be restricted in some areas because of the East Fork Trinity River floodplain, much of the rest of the corridor could see changes in land use. The City of McKinney has plans to expand the McKinney National Airport and has dedicated lands surrounding and to the east of the Airport as the "Business & Aviation District".	No	
Bicycle and Pedestrian Facilities	PURPLE	-Replace Airport Drive where City of McKinney plans to include bike facilities. -10-foot-wide SUP adjacent to, but separated from the frontage roads, where proposed, on both sides of the freeway; would provide connectivity to existing sidewalks or trails, located on public ROW	Induced growth is not anticipated to be substantial. Encroachment alteration impacts are not anticipated because both Build Alternatives would provide SUPs adjacent to the alignments where they do not currently exist, increasing bicycle and pedestrian accessibility as an alternate transportation mode.	No	No. Resource is not in decline. The City of McKinney is developing a city-wide trail network including on-street "Bicycle Boulevards" and off-street systems connecting several of the city's greenbelts and parks. No direct or indirect effects are anticipated.
	ORANGE	-10-foot-wide SUP adjacent to, but separated from the frontage roads, where proposed, on both sides of the freeway; would provide connectivity to existing sidewalks or trails, located on public ROW			

Figure 3-85 continued: Direct Impacts and Indirect Effects of the Reasonable Alternatives

Resource & Alternative		Summary of Direct Impacts	Indirect Effects (Induced Growth and Encroachment Alteration)	Is this 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	-Introduces an elevated freeway facility in areas where one does not currently exist south of and along Airport Drive. -Collective bulk and mass of the elevated roadway would degrade visual quality of area in relation to topography and existing land development patterns. -Viewshed of neighborhoods west of Airport Drive would be obstructed.	The proposed project is not expected to substantially induce growth because of the limited availability of open/undeveloped parcels along the alignment. However, encroachment alteration impacts would occur to the viewshed.	Yes	Yes. The proposed project in conjunction with other reasonably foreseeable projects in the area would impact Study Area viewsheds.
	ORANGE	-Introduces an elevated freeway facility in areas where one does not currently exist, large expanses of open, undeveloped land in agricultural use. -Collective bulk and mass of the elevated roadway would degrade visual quality of area in relation to topography and existing land development patterns.	Induced growth is anticipated to be greater than with the Purple Alternative because of the amount of undeveloped land made accessible by the freeway. With the planned expansion of the McKinney National Airport including the proposal to develop a new terminal along the east side of the Airport accessible from the freeway, the associate changes in land use and development would, over time, change the visual character of the area south and east of the Airport. Encroachment alteration impacts would occur in the viewshed.	Yes	Yes. The proposed project in conjunction with other reasonably foreseeable projects in the area would impact viewsheds and the overall visual and aesthetic character of the Study Area.

3.16.3 Other Actions – Present and Reasonably Foreseeable

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 and TxDOT Aviation Division issued a FONSI/ROD for the proposed action on July 27, 2022. The Airport has received their Section 404 Individual permit and submitted a CLOMR to the City of McKinney for review to address proposed changes in the 100-year floodplain boundary along the East Fork Trinity River to facilitate construction of earthen fill below the 100-year water surface elevation. The Airport anticipates beginning construction of the southern extension in December 2022 and the northern extension 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 two-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.

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 feet and 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 DNT (multi-level interchange) and existing SH 289. The Prosper-Frisco improvements are anticipated to be ready to let for construction in 2026.

US 380 McKinney - Coit Road to FM 1827 (CSJs 0135-02-065, 0135-03-053, and 0135-15-002) – construct an 8-lane, access-controlled freeway with 2-lane, one-way frontage roads on each side connecting Coit Road and existing US 380 on the west in Prosper with FM 1827 and existing US 380 on the east in McKinney. The freeway would be constructed, primarily on new location, within an anticipated ROW width ranging from 350 feet to 450 feet depending on location. The alternatives under consideration range in length from approximately 14.8 miles to approximately 16.3 miles. SUPs would be provided along the outside of the frontage roads. Frontage roads may be eliminated, and the primary travel lanes may be depressed (lowered) or elevated (on bridge/viaduct) to minimize impacts on sensitive resources. The freeway facility would include ramps, direct connector roadways, frontage roads, and arterial roadways to support connectivity to the existing roadway network. A multi-level interchange is proposed at US 75/ SH 5 with grade-separated interchanges at other primary local roadways depending on the alternative. The western end of the project would transition to an at-grade intersection near Coit Road with a grade-separated interchange connecting the east end of the new location alignment to existing US 380 near FM 1827. The US 380 McKinney improvements are anticipated to be ready to let for construction in 2027.

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 mainlanes 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 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 Farmersville improvements are anticipated to be ready to let for construction in 2026.

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

The other reasonably foreseeable actions described in **Section 3.16.3** 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 and the US 380 McKinney project are in the early study stages. The overall cumulative effects of these actions when added to the direct impacts of the Spur 399 Extension, as summarized in **Figure 3-85**, focus on land disturbance, floodplain/floodway encroachment, and effects of vegetation clearing on wildlife species and habitats. 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 Airport requires a CLOMR to address the anticipated hydrologic changes within the East Fork Trinity River, which would affect the ongoing hydraulic modeling being conducted for the Preferred (Orange) Alternative and the need for compensatory flood storage as part of the Spur 399 Extension. The loss of vegetation also lessens the overall quality of the visual environment and the natural contrast and complement it provides against man-made features to make them potentially less visually disruptive.

3.16.5 Mitigation of Cumulative Effects

No-Build Alternative

The No-Build Alternative would not result in ROW acquisition or construction and land disturbance. Ongoing pavement and structure maintenance, slope stabilization, and drainage improvements would have the potential to create minimal areas of ground disturbance, vegetation clearing, and short-term impacts 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 operational activities depending on the season (e.g., nesting or spawning).

Purple Alternative

The Purple Alternative would result in marginal vegetation clearing because of the location of the alignment primarily through developed areas. 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 Purple Alternative is designed to avoid to the extent feasible and practicable floodplain encroachment along Wilson Creek. The design of the Purple Alternative would comply with TxDOT's Hydraulic Design Manual.

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.

Orange Alternative - Preferred Alternative

The Orange Alternative would result in substantial vegetation clearing due to the length and location of the alignment through an undeveloped area dominated by open agricultural lands, wooded areas, grasslands, and floodplains. The alignment is also in relatively close proximity to Lavon Lake and lands managed by the USACE. 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. Based on further development of the Orange Alternative, the placement of approximately 1,800 to 2,000 cubic yards fill (piers) below the 100-year floodplain water surface elevation of the East Fork Trinity River could not be avoided, necessitating the creation of shallow ditches or swales within the proposed ROW and floodplain to offset the water surface rise. The results of the CLOMR for the Airport runway extension (anticipated to be approved in August 2022) will influence the continued design of the Orange Alternative within the East Fork Trinity River floodplain and may affect the amount of compensatory storage required for the project. The design will comply with TxDOT's Hydraulic Design Manual.

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.

3.17 Construction Phase Impacts

Construction of either Build Alternative is anticipated to take 3 to 5 years. Temporary road closures and detours would occur along existing roadways to accommodate utility relocations conducted prior to initiating clearing and grading, and during construction to accommodate equipment and material deliveries and project phasing as different sections of the project would be constructed at different times. Sections of SH 5 and other roadways would need to be demolished or removed before construction of the new roadway components can begin.

The anticipated phasing of construction for each Build Alternative is described below:

Purple Alternative

- Phase I – Purple Alternative
  - Along SH 5 from Medical Center to existing FM 546 - Construct the eastbound mainlane widening and eastbound exit to Stewart Road. Partially construct the eastbound and west bound frontage roads to tie into SH 5 on the north side. Construct temporary pavement as needed to maintain traffic.
  - From Old FM 546 to existing US 380 – Construct the ultimate eastbound frontage roads, Industrial Boulevard and Enloe Road cross streets, eastbound exit ramp to Elm Street, and temporary pavement as needed to maintain traffic including along existing Airport Drive.
- Phase 2 – Purple Alternative (SH 5 reconstruction project to be completed by others prior to initiating Phase 2)
  - From Medical Center to just north of Stewart Road - Complete all planned mainlane, frontage road, and ramp reconstruction and widening per ultimate plans.
  - From Old FM 546 to existing US 380 – Construct the ultimate westbound frontage road.
- Phase 3 – Purple Alternative
  - From SH 5 to US 380 – Complete construction of ultimate mainlanes and ramps.

Orange Alternative

- Phase I - Orange Alternative
  - Along SH 5 from Medical Center to existing FM 546 - Construct the eastbound mainlane widening and eastbound exit to Stewart Road. Partially construct the eastbound and west bound frontage roads to tie into SH 5 on the north side. Construct temporary pavement as needed to maintain traffic.
  - From SH 5 to existing US 380 – Construct the ultimate mainlanes and ramps where possible not disturbing existing FM 546. Construct the ultimate eastbound frontage road from existing FM 546 to US 380. Construct the ultimate westbound frontage road from CR 317 to US 380. Construct Airport Drive and FM 546 cross streets.
- Phase 2 – Orange Alternative (SH 5 reconstruction project to be completed by others prior to initiating Phase 2)
  - From Medical Center to just north of Stewart Road - Complete all planned mainlane, frontage road, and ramp reconstruction and widening per ultimate plans.

- From SH 5 to existing US 380 – Construct the ultimate mainlanes not constructed in PH1. Construct ultimate westbound frontage road and complete connections to FM 546 and CR 317.

- Phase 3 – Orange Alternative
  - From SH 5 to US 380 – Complete construction of ultimate Spur 399 ramps.

The following sections describe construction-phase impacts that would apply to both Build Alternatives.

3.17.1 Traffic Impacts – Construction Phase

Traffic would be disrupted during construction of either Build Alternative. A detailed traffic control plan would be developed prior to construction to describe how access would be maintained for vehicles, pedestrians, and bicyclists using the existing roadways or neighboring facilities during construction. It would also outline the anticipated location and duration of lane closures, detours, and phasing of the project so that information can be shared with the city, county, neighborhoods, and emergency responders. Temporary increases in traffic congestion are expected; however, access to adjacent properties, including residences and businesses, would remain open as much as possible. Changes in traffic patterns would be communicated by roadside signs and displays; these changes would also be communicated to emergency responders (e.g., police, fire, EMS, and others) and public service providers prior to implementing the change. Traffic control during construction would proceed in accordance with the *Texas Manual on Uniform Traffic Control Devices* and *TxDOT's Work Zone Standards*.

3.17.2 Noise Impacts – Construction Phase

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

3.17.3 Air Quality Impacts – Construction Phase

During the construction phase of this project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel PM from diesel-powered construction equipment and vehicles. The potential impacts of PM emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. Considering the temporary and transient nature of construction-related emissions, as well as the mitigative actions to be applied including compliance with applicable regulatory requirements, it is not anticipated that emissions during construction of this project will have a significant impact on air quality in the Study Area.

3.17.4 Biological Resources – Construction Phase

Vegetative communities within and adjacent to the proposed ROW would be removed or disturbed due to construction activities. This would result in habitat loss for resident and migratory species and could result in temporary removal of ground cover that helps prevent erosion. TPWD BMPs would be implemented because of potential impacts to state-listed species and SGCN (see **Section 3.11.2**). Construction activities should disturb only those areas necessary to construct the proposed project, including minimizing disturbance to important microhabitats (e.g., snags, brush piles), if present. Disturbed areas would be restored, re-graded, and reseeded and/or planted according to TxDOT specifications. BMPs to provide temporary erosion control during construction and permanent erosion control following construction would be employed.

3.17.5 Water Resources – Construction Phase

Minor impacts to water resources during construction may occur, including permanent fill impacts to wetlands and streams. However, erosion controls and BMPs detailed in the SW3P will be implemented to minimize, to the extent practicable, the discharge of pollutants in stormwater associated with construction activity and (certain) non-stormwater discharges. Careful refueling practices for construction equipment would limit spills of gasoline and diesel fuels, and oil and other fluid spills should be minimized by frequent checks of construction equipment. The SW3P will include measures to control erosion and limit the discharge of pollutants to surface waters and groundwater. Erosion control measures may include, but are not limited to, the installation of silt fencing or silt socks, erosion control blankets, mulch, and berms.

Additional practices to minimize impacts to surface and groundwater resources would include locating and protecting all temporary storage facilities (e.g., petroleum products, other fuels, and chemicals) to prevent accidental spills from entering streams within the vicinity of the proposed ROW. Avoid disposing of cement sweepings, washings, concrete wash water from concrete trucks, and other concrete mixing equipment, treatment chemicals, or grouting and bonding materials into streams, wetlands, or into any location where water runoff would wash pollutants into streams or wetlands.

3.17.6 Hazardous Materials – Construction Phase

Contaminated soil and/or groundwater could be encountered during construction. Special provisions or contingency language would be included in the project's plans, specifications, and estimates (PS&E) to handle hazardous materials and/or petroleum contamination according to applicable federal and state regulations. TxDOT intends to conduct a Phase II subsurface investigation within the proposed ROW crossing the former NTMWD/McKinney Landfill site after the permitted boundary is moved and prior to initiating any clearing or construction activities.

Construction contractors would be instructed to immediately stop all subsurface activities if potentially hazardous materials are encountered, an odor is identified, or significantly stained soil is visible. Contractors and maintenance personnel would be instructed to follow all applicable regulations regarding discovery and response for hazardous materials encountered during the construction process.

3.17.7 Cultural Resources – Construction Phase

Unknown prehistoric or historic sites may be encountered in areas of deep construction (e.g., drilled shafts, caissons, directional drilling) for either Build Alternative. In the unlikely event the contractor's excavation operation encounters such remains, the contractor or field supervisor will contact the Dallas District and ENV to determine the disposition of discovered artifacts. When directed by ENV, the contractor would excavate the site in such a manner as to preserve the artifacts encountered and the archeologist or their representative would remove the artifacts for delivery to the custody of TxDOT or the THC.

3.17.8 Construction Phase Impacts Summary – Orange Alternative

Construction impacts would be managed for the Preferred (Orange) Alternative as described in the above sections. Prior to construction being initiated, utilities would be relocated through close coordination with the utility owner and the adjacent property owners. TxDOT will also work closely with the NTMWD, the City of McKinney to support the TCEQ permitting process to move the landfill permitted boundary and its associated infrastructure prior to TxDOT acquiring the ROW. As noted above, TxDOT would also conduct a Phase II subsurface Investigation within the proposed ROW area of the landfill once the boundary is moved to determine if any waste or other contamination is present before initiating construction. A Traffic Management Plan would be developed and implemented during construction, focusing on areas where the new freeway ties into existing roadways and where construction access is needed across public roads. Construction activities would be limited to normal daytime hours to minimize impacts on nearby residences. Short-term and temporary increases in PM and MSAT (fuels and dust) would occur during construction and fugitive dust controls and other measures would be employed to manage airborne debris and solid waste. TPWD BMPs would be implemented, where appropriate, and a SW3P would be developed, implemented, and monitored throughout construction to address surface water quality.

3.18 Relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity

Transportation improvements are based on comprehensive planning which considers the need for current and future traffic facilities within the context of present and future land use development. The local short-term impacts and use of resources by the proposed action is consistent with the maintenance and enhancement of long-term productivity for the area. Each of the Build Alternatives identified in **Section 2.2** would involve short-term uses of the environment, as detailed under the previously described resources in this **Chapter 3**. Aside from the construction-phase impacts discussed in **Section 3.17**, which would be temporary, most of the environmental impacts discussed for the Build Alternatives would be, for purposes of this environmental analysis, permanent in the sense that the Build Alternatives considered would be expected to serve the intended transportation function indefinitely. In other words, each of the Build Alternatives would permanently convert the pre-existing natural and man-made resources to a transportation use, and such resources would no longer exist, and therefore would no longer contribute to the maintenance and enhancement of the environment's productivity. The Build Alternatives would, however, enhance the "productivity" of the transportation system, which would have long-term benefits for users, such as connecting and improving mobility between areas of high-growth in Collin County and the rest of the Dallas Metroplex. The Build Alternatives would provide additional capacity to address current and future travel demand, reducing

congestion and travel times within the region, while also providing resiliency within the roadway network to adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions including incidents and construction projects.

Under the No-Build Alternative, no short-term uses of the environment would occur, but neither would any transportation-related benefits. Therefore, the transportation-related problems discussed in **Section 1.1** would persist.

3.19 Irreversible or irretrievable commitments of resources

Implementation of the proposed action commits a range of natural, physical, human, and fiscal resources. As stated elsewhere in **Chapter 3** of this DEIS, each of the Build Alternatives identified in **Section 2.2** would irreversibly and irretrievably commit natural and man-made resources to a transportation use. Land used for the project would be considered an irreversible commitment during the period the land is used for a transportation purpose. This land includes residential and business properties, public parks, actively farmed lands, floodplains, and natural habitats, along with existing roadway ROW that would be redeveloped and incorporated into the proposed freeway. Additionally, each of the Build Alternatives would irreversibly and irretrievably commit energy resources, such as the fossil fuels consumed by construction equipment, in addition to human labor and highway construction materials such as cement, aggregate, and bituminous material. Large amounts of labor and natural resources are also used in the fabrication and preparation of construction materials. These materials are generally not retrievable. Construction will also require a substantial one-time expenditure of both state and federal funds, which are also not retrievable. The decision to commit these resources for construction of the proposed project would be based on the concept that residents in the area and others would benefit from the project through improved connectivity and mobility, reduced roadway congestion on existing highways, and improved travel times for commuters and emergency responders.

The No-Build Alternative would result in minor irreversible or irretrievable commitments of resources in the form of ongoing maintenance and planned improvements to the existing roadway network. Energy, materials, and funds would be expended that are not retrievable, but in a much smaller amount compared to the Build Alternatives. However, those minor irreversible or irretrievable commitments of resources would not result in the transportation-related benefits that would support the purpose and need of the proposed action. Therefore, the transportation-related problems discussed in **Section 1.1** would persist.

3.20 Possible conflicts between the proposed action and the objectives of Federal, regional, State, Tribal, and local land use plans, policies, and controls for the area concerned

None of the reasonable alternatives identified in **Section 2.2** would involve known conflicts with the objectives of Federal, regional, State, Tribal, or local land use plans, policies and controls for the area concerned.

3.21 Energy requirements and conservation potential of various alternatives and mitigation measures

Each of the Build Alternatives identified in **Section 2.2** requires the consumption of energy, both in terms of construction and operation of the project. Energy, in the form of various fossil fuels and electricity, would be

expended during construction, maintenance, and future repair of the project. ROW clearing; road base grading and preparation; construction of bridges; and travel lane and ramp installations would require varying levels of energy inputs. Following construction, routine maintenance of the ROW and travel lanes, and roadway repairs conducted on an as-needed basis, would require energy inputs. Petroleum fuels are currently the primary type of energy used in construction, maintenance, and repair activities. Changing vehicle and fuel technologies such as electric or hydrogen fuel options may alter the use of petroleum fuels in the future. Necessary fuel supplies would be expected to be available from fuel storage or vending sources in the region. Electrical demand to support safety lighting and signage for the Preferred (Orange) Alternative would not affect the electrical supply characteristics of the region.

Regarding operations, traffic would be the largest contributor to energy consumption over the lifetime of the facility. Energy consumption related to use of the facility would be dependent on vehicle efficiency, which includes such variables as roadway geometry, surface conditions, weather conditions, and traffic flows. Vehicle and fuel technologies will likely reduce future drivers' dependency on petroleum products, affecting operational energy requirements in ways that cannot be accurately estimated at this time. However, each Build Alternative would increase energy efficiency over existing conditions by reducing congestion, decreasing travel times, and improving system connectivity and overall mobility within and adjacent to the Study Area. Energy conservation measures implemented for the Preferred (Orange) Alternative would include: use of energy-efficient safety lighting and construction of SUPs adjacent to the frontage roads to promote multi-modal transportation.

Under the No-Build Alternative, no energy would be used for construction; however, energy would continue to be expended in the operation and future maintenance and repair of the existing facility. Additionally, under the No-Build Alternative, no transportation-related benefits would be realized, therefore the transportation-related problems discussed in **Section 1.1** would persist. Additionally, under the No-Build Alternative, reduced congestion, decreased travel times, and an overall improvement in travel would not be realized. The connectivity needed between the high-growth areas and the core of the Dallas Metroplex would not occur, with additional miles traveled each year by vehicles as they take less-direct routes traveling at lower speed to reach their desired destinations. The SUPs would not be built along the frontage roads; therefore, not supporting less energy using, alternate modes of travel.

3.22 Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures

As described in the resource sections above in **Chapter 3**, each of the Build Alternatives identified in **Section 2.2** would deplete natural and depletable resources, including energy such as the fossil fuels consumed by construction equipment used to build the project. Natural or depletable resource conservation requirements that would be implemented include use of newer, fuel efficient construction equipment, minimizing land clearing to what is needed for construction of the project, implementing and maintaining effective stormwater BMPs, and using sustainable materials where feasible and practicable.

Under the No-Build Alternative, no natural or depletable resources would be used for construction, but would be expended for ongoing maintenance and planned improvement of the existing roadway network. However, those uses would not result in the transportation-related benefits that would support the purpose and need of the proposed action. Therefore, the transportation-related problems discussed in **Section 1.1** would persist.

3.23 Urban quality, historic and cultural resources, and the design of the built environment including the reuse and conservation potential of various alternatives and mitigation measures

The project's impacts on urban quality, historic and cultural resources, and the design of the built environment are addressed in **Section 3.6** ("Community Impacts"), **Section 3.7** ("Visual/Aesthetic Impacts"), and **Section 3.8** ("Cultural Resources"). Mitigation measures relating to these areas are discussed in those sections.

3.24 Greenhouse Gas Emissions and Climate Change

TxDOT has prepared a *Statewide On-Road Greenhouse Gas Emissions Analysis and Climate Change Assessment* technical report.[41] The report discloses: (1) an analysis of available data regarding statewide GHG emissions for on-road GHG emissions,[42] (2) TxDOT actions and funding that support reducing GHG emissions, (3) projected climate change effects for the state of Texas and (4) TxDOT's current strategies and plans for addressing the changing climate. A summary of key issues in this section is provided below.

The Earth has gone through many natural changes in climate over time. However, since the industrial revolution began in the 1700s, the atmospheric concentration of GHG emissions has continued to climb, primarily due to humans burning fossil fuel (e.g., coal, natural gas, gasoline, oil and/or diesel) to generate electricity, heat and cool buildings, and power industrial processes, vehicles, and equipment. According to the Intergovernmental Panel on Climate Change, this increase in GHG emissions is projected to contribute to future changes in climate.[43,]

3.24.1 Statewide On-Road Greenhouse Gas

TxDOT prepared a GHG analysis for the statewide on-road transportation system and associated emissions generated by motor vehicle fuels processing called "fuel-cycle emissions." EPA's MOVES2014 emissions model was used to estimate emissions. Texas on-road and fuel cycle GHG emissions are estimated to be 186 million metric tons (MMT) in 2050 and reach a minimum in 2032 at 161 MMT. Future on-road GHG emissions may be affected by changes that may alter where people live and work and how they use the transportation system, including but not limited to: (1) the results of federal policy including tailpipe and fuel controls, (2) market forces and economics, (3) individual choice decisions, (4) acts of nature (e.g., pandemic) or societal changes, and (5) other technological advancements. Such changes cannot be accurately predicted due to the inherent uncertainty in future projections related to demographics, social change, technology, and inability to accurately forecast where people work and live.[44]

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41 Texas Department of Transportation, *Statewide On-Road Greenhouse Gas Emissions Analysis and Climate Change Assessment Technical Report.* Environmental Affairs Division, June 2021. Website: https://ftp.txdot.gov/pub/txdot-info/env/toolkit/725-01-rpt.pdf. Accessed March 17, 2022.

42 Greenhouse gas (GHG) emissions consist of on-road tailpipe emissions and upstream fuel cycle emissions. Upstream fuel cycle emissions are the emissions generated by extracting, shipping, refining, and delivering fuels.

43 *Climate Change 2007: The Physical Science Basis. Working Group I Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*; S.D. Solomon, et. al.; January 2007; *Climate Change 2013: The Physical Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*; T.F. Stocker, et. al.; 2013

44 Transportation Research Board Special Report 288 (2007) *Metropolitan Travel Forecasting Current Practice and Future Direction*.

3.24.2 Mitigation Measures

Strategies that reduce on-road GHG emissions fall under four major categories:

- Federal engine and fuel controls under the Clean Air Act implemented jointly by EPA and USDOT, which includes Corporate Average Fuel Economy standards.
- "Cash for clunker" programs which remove older, higher-emitting vehicles from roads.
- TSM which improves the operational characteristics of the transportation network (e.g., traffic light timing, pre-staged wrecker service to clear accidents faster, or traveler information systems).
- TDM which provides reductions in VMT (e.g., transit, rideshare, and bicycle and pedestrian facilities) and requires personal choice decisions.

TxDOT has implemented programmatic strategies that reduce GHG emissions including: (1) travel demand management projects and funding to reduce VMT, such as bicycle and pedestrian facilities, (2) traffic system management projects and funding to improve the operation of the transportation system, (3) participation in the national alternative fuels corridor program, (4) clean construction activities, (5) clean fleet activities, (6) CMAQ funding, (7) transit funding, and (8) two statewide campaigns to reduce tailpipe emissions.

3.24.3 TxDOT and Changing Climate

TxDOT has strategies that address a changing climate in accordance with TxDOT and FHWA design, asset management, maintenance, emergency response, and operational policies and guidance. The flexibility and elasticity in TxDOT transportation planning, design, emergency response, maintenance, asset management, and operation and maintenance of the transportation system are intended to consider any number of changing scenarios over time. Additional detail is provided in the *Statewide On-Road Greenhouse Gas Emissions Analysis and Climate Change Assessment* technical report.

4.0 Summary of Submitted Alternatives, Information, and Analyses

This section summarizes the agency, public, and stakeholder outreach conducted to-date for the Spur 399 Extension Schematic Design and Environmental Study.

Figure 4-1: Summary of Agency Coordination Conducted During Preparation of the Spur 399 Extension DEIS

Event	Date(s)	Agencies Attending	Number of Comments Received
USACE Fort Worth District Pre-Scoping Meeting (Virtual)	August 19, 2020	USACE Fort Worth District	NA
Agency Scoping Meeting (Virtual)	December 10, 2020	NCTCOG USACE, Fort Worth District USDA-NRCS USCG TCEQ TPWD Collin County City of McKinney Town of Fairview City of Lowry Crossing	2
USACE Fort Worth District Coordination Meeting (Virtual)	May 18, 2021	USACE Fort Worth District	NA

Figure 4-2: Summary of Public Outreach Conducted During Preparation of the Spur 399 Extension DEIS

Event	Date(s)	Number of Attendees	Number of Comments Received
Public Scoping Meeting Virtual/Online	February 23, 2021 through March 10, 2021	508 KeepItMovingDallas Website views 221 YouTube views 335 Consultant Website views 82 Virtual Sign-Ins	167
Public Meeting on Reasonable Alternatives In-Person, Sheraton McKinney Hotel, McKinney TX and Virtual	October 21, 2021 October 21, 2021 through November 5, 2021	128 557 KeepItMovingDallas Website views 207 YouTube views	97
Public Hearing on the DEIS	*November 10, 2022 anticipated*	*TBD*	*TBD*

Figure 4-3: Summary of Stakeholder Outreach Conducted During Preparation of the Spur 399 Extension DEIS

Stakeholder	Date(s)
Enloe Family Meetings	10/5/2021, 12/7/2021, 3/2/2022, 4/8/2022
Collin County	4/27/2020, 6/26/2020, 7/6/2020, 9/11/2020, 4/22/2021, 10/8/2021, 7/7/2022, 9/8/2022
City of McKinney	4/27/2020, 6/26/2020, 7/6/2020, 9/11/2020, 12/8/2020, 4/22/2021, 6/28/2021, 7/20/2021, 7/21/2021, 7/7/2022, 7/25/2022, 8/22/2022. 9/26/2022
City of McKinney, McKinney National Airport	7/21/2021, 9/7/2021, 7/7/2022
Town of Fairview	9/28/2021
NCTCOG	10/29/2020, 6/22/2021
NTMWD	4/27/2020, 6/26/2020, 8/18/2020
NTTA	6/11/2021
Senator Angela Paxton's Office	1/25/2022
Businesses Along Airport Drive:	
Amazon	9/10/2021
Blue Mountain Equipment	9/29/2021
Encore Wire	7/22/2020, 2/12/2021, 6/14/2021
Simpson Strong-Tie	10/8/2021
Stonemont Financial (developer of Amazon and McKinney Airport Center sites)	9/8/2021

4.1 Summary of Alternatives, Information, and Analyses Submitted Prior to Release of the DEIS

To be included in the FEIS.

4.2 Summary of Alternatives, Information, and Analyses Submitted After Release of the DEIS

To be included in the FEIS.

5.0 List of Federal Permits, Licenses, and Other Authorizations Needed for the Preferred (Orange) Alternative

Figure 5-1 lists the preliminary list of federal permits, licenses, and other authorizations that must be obtained to implement the Orange Alternative. Coordination with the required federal agencies is ongoing as the final design schematics are developed for the Orange Alternative. This list will be updated in the FEIS.

Figure 5-1: List of Federal Permits, Licenses, and Other Authorizations Needed for the Preferred (Orange) Alternative

Permit, License, or Authorization	Federal Agency	Reason for Permit, License, or Authorization
Section 404 NWP 14 (w/PCN)	USACE	Placement of fill materials within WOTUS and wetlands.
FEMA No-Rise, CLOMR	FEMA	Inclusion/creation of compensatory storage within the mapped floodplain/floodway.
Air Quality Conformity	FHWA	Determination the proposed project is included in an approved and fiscally constrained transportation plan that is consistent with the state's air quality goals, and to enable the use of federal funds for construction.
Section 7 Consultation	USFWS	In the event additional species become federally listed (e.g., Texas fawnsfoot [mussel], alligator snapping turtle, monarch butterfly).

6.0 Names and Qualifications of Persons Preparing the EIS or Conducting an Independent Evaluation of the EIS

The following persons prepared the DEIS and/or led the technical analyses and developed the supporting technical documentation used to develop the DEIS.

Texas Department of Transportation, Dallas District		
Name & Title	**Years of Experience**	**Role**
Stephen Endres, P.E., Transportation Engineer	24	Project Manager
Christine Polito, Environmental Program Manager	17	District Environmental Lead
Melissa Meyer, Public Involvement Specialist	13	District Public Involvement Lead
Mark Hull, PhD, Environmental Specialist	26	District Water Resources Specialist
Daniel Salazar, Environmental Specialist	10	District Traffic Noise Specialist
Deborah Nixon, Environmental Specialist	20	District Hazardous Materials Specialist
Leslie Mirise, Environmental Specialist	21	District Biologist
Kelley Bayne, Environmental Specialist	15	District Water Resources Specialist
Adam Fouts, Environmental Specialist	10	District Water Resources Specialist
Texas Department of Transportation, Environmental Affairs Division		
Name & Title	**Years of Experience**	**Role**
Doug Booher, Director of Environmental Affairs	25	Document Approver
Patrick Lee, Environmental Program Manager	13	Document Reviewer
Adrienne Boer, Project Delivery Management Section Director	28	Document Reviewer
Michelle Lueck, Project Delivery Manager	23	Document Reviewer
Ray Umscheid, Traffic Noise Specialist	15	Traffic Noise Analysis Review/Approval
Susan M. Shuffield, Environmental Specialist, Water Team Lead	24	Water Resources Analysis/404 Permitting Review/Approval
Rebekah Dobrasko, Environmental Program Manager	18	Historic Resources Survey and Report Reviewer/Approver
Scott Pletka, Archeology Program Manager	19	Archeological Resources Survey, Permitting, and Report Reviewer/Approver
Nicolle Kord, Community Impacts Specialist	10	Community Impacts Assessment Review/Approval
Spencer Ward, Community Impacts Specialist	3	Community Impacts Assessment Review/Approval
Tim Wood, Air Quality Specialist	10	Air Quality Analysis Review/Approval
Glendora Lopez, Air Quality Specialist	1	Air Quality Analysis Review/Approval
Doug Mack, Environmental Program Manager	24	Hazardous Waste Assessment Review/Approval
Stirling Robertson, Ph.D., Environmental Specialist, Biology Team Lead	28	Biological Resource Analysis Review/Approval

Burns & McDonnel Engineering Company, Inc.		
Name & Title	**Years of Experience**	**Role**
Josh Robertson, PE, Department Manager	14	Project Manager, Schematic Design Oversight and QA/QC, Purpose & Need and Alternatives Chapter Co-Author
Paul Plotas, PE, PTOE, Traffic Department Manager	33	Purpose & Need Traffic Section Author, Alternatives Chapter Co-Author
Shari Cannon-Mackey, CEP, ENV SP, Sr. Project Manager	32	NEPA Process and Documentation Lead, Technical Analyses Peer Review and QA/QC
Tom Allemand, Sr. Project Manager	21	Task Lead and Primary Author: CIA, Hazardous Materials ISA, and Induced Growth and Cumulative Impacts
Sarah Holifield, Staff Environmental Scientist	10	Tier 1 Site Assessment; Community Impacts Assessment; Hazardous Materials ISA; Right-of-Entry Coordination and Tracking
Derek Green, Sr. Environmental Scientist	45	Biological Resources Task Lead and Primary Author: Species Analysis, Tier I Site Assessment, EMST, Threatened & Endangered Species, TPWD-listed Species, Biological Resources
Michael Dyke, Section Manager, Natural & Cultural Resources	17	Documentation Peer Review and QA/QC: Water Features, Surface Water Analysis, 404-10 Impact Table; Biological Resources Section
Amanda Breitling, Regional Practice Leader, Environmental Services	23	Documentation Peer Review and QA/QC: Hazardous Materials ISA
Brandy Harris, Sr. Cultural Resources Specialist	17	Documentation Peer Review and QA/QC: Cultural Resources; Section 4(f) Task Lead, Co-Author Protected Lands Section
Elizabeth Porterfield, Sr. Cultural Resources Specialist	16	Principal Investigator: Historic Resources; Primary Author: PCR, Historic Resources Research Design, Historic Resources Survey Report; Co-Author of Cultural Resources Section
Kenneth Gouvion, Staff Environmental Scientist	10	Conducted Hazardous Materials ISA Site Visit
Teleri Smith, Assistant Environmental Scientist	3	Conducted Hazardous Materials ISA Site Visit
Courtney Bartlett, Assistant Environmental Scientist	2	Technical Report Development Support and Field Data Collection and Analysis - CIA, Land Use, Bike-Ped Facilities
Shannon Spurgeon, Staff GIS Specialist	8	Data collection, mapping, and figure development
Chelsey Smith, AICP, Department Manager	20	Public Involvement Lead
Taliyah Clark, Assistant Public Involvement Specialist	2	Public Involvement Support
Sarah Bagwell Rudy, Planning & Policy Project Manager	17	Public Comment-Response, CIA – business displacement analysis

HDR Engineering		
Name & Title	**Years of Experience**	**Role**
David Sutton, PE, Planning Manager	13	Design Support Manager
Dmetrius Wright, PE, Highway Engineer	6	Design Engineer
Matt Deeley, Transportation Designer	25	Model/Design Manager
Kristine Lloyd, Environmental Planner	27	Environmental Task Lead, Noise and Water Resources
Brandon Tate, Environmental Manager	9	Task Lead - Water Resources
Mike Keenan, Environmental Scientist	5	Wetland and Stream Delineation and Impact Analysis
Kelsea Hiebert, Environmental Scientist	4	Wetland and Stream Delineation and Regulatory Document Specialist
Mike Parsons, PE, Traffic Noise Analysis Practice Manager	22	Task Lead - Traffic Noise
Chi Cheung 'Ronald' Ying, PE, Noise Specialist	14	Traffic Noise Modeler
Rodrigo Vizcaino, Sr., PE, Project Manager	21	Hydrology & Hydraulics Technical Lead
Sam Eggleston, Water Resources Coordinator	1.5	Hydrology & Hydraulics Modeler
Pat McNeirney, PE, Water Resources Engineer	22	Hydrology & Hydraulics Modeler
Thaci Rinor, EIT	4	Design Engineer
Minot Suraz, EIT	2	Design Engineer

AmaTerra Environmental, Inc.		
Name & Title	**Years of Experience**	**Role**
Jill Madden, President	38	NEPA Support, QA/QC
Aaron Norment, MA, RPA, Archeologist Program Manager	17	Archeologist, QA/QC
Sunshine Thomas, PhD, RPA	17	Principal Investigator, Archeology
Katherine A. Seikel, PhD, Laboratory Manager	15	Principal Investigator, Archeology
Dan Rose, GIS Analyst	12	GIS Analyst

Lina T. Ramey & Associates		
Name & Title	**Years of Experience**	**Role**
Jason Verner, PE	21	Task Lead – Hydrology & Hydraulics; Co-Author Floodplain Section

Kimley-Horn		
Name & Title	**Years of Experience**	**Role**
Dhruva Lahon, Sr. Project Manager	16	Task Lead - Traffic Projections

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Appendices

Appendix A – Project Location Map

Appendix B – Design Schematics

Appendix C – Typical Sections

Appendix D – Resource-Specific Maps - Purple and Orange Alternatives

Appendix E – Agency Coordination

Appendix F – Comments Received During Scoping Process

Appendix G – Comments Received from Public Hearing/Notice of Availability of DEIS [FEIS only]

Appendix H – Comment/Response Matrix from Public Hearing/Notice of Availability of DEIS [FEIS only]

Appendix I – Traffic Data

Appendix J – Farmland Protection

Appendix K – Community Impacts

Appendix L – Cultural Resources

Appendix M – Protected Lands

Appendix N – Water Resources

Appendix O – Biological Resources

Appendix P – Air Quality

Appendix Q – Hazardous Materials

Appendix R – Traffic Noise