APPENDIX P: Air Quality

Congestion Management Process Disclosure Statement

Spur 399 Extension

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

Texas Department of Transportation, Dallas District

June 2022

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 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

1.0 Introduction

The congestion management process 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 North Central Texas Council of Government's (NCTCOG) Congestion Management Process (CMP), which meets all requirements of 23 CFR 450.320 and 500.109, as applicable. The CMP was adopted by the NCTCOG 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 the NCTCOG; they are included in the financially constrained Metropolitan Transportation Plan (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 the 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 Transportation Improvement Program (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 system reliability improvements including addition of new travel lanes, frontage roads, shared-use paths, and interchange and intersection improvements.

2.0 Project Description

The project would extend existing Spur 399 from its current terminus near the junction of US 75/Sam Rayburn Tollway (SRT) SRT-State Highway (SH) 121 and along the current shared alignment along SH 5 to a point south of Farm to Market (FM) 546/Harry McKillop Boulevard where it turns east on new location. From this departure from the existing SH 5 corridor, the project would continue along one of two studied new location alignments extending east and north to connect to US 380 east of McKinney.

The Preferred Alternative -- Orange Alternative -- would modify the existing (2022) 4-lane divided section of SH 5 and the widening of SH 5 prior to construction of the Spur 399 Extension proposed under the SH 5 Improvement Project (CSJs 0047-05-054, 0047-09-034, and 0364-04-049). The Orange Alternative would restripe the pavement constructed as an extended shoulder/additional lane width under the SH 5 Improvement Project to create a fifth 12-foot-wide mainlane in each direction along SH 5 from US 75 to just past Stewart Road where the Orange Alternative turns east on new location to parallel FM 546/Harry McKillop Boulevard. An additional eastbound fifth mainlane would also be striped west of Medical Center Drive. 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, 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.

In addition, a project to improve US 380 east of McKinney from Airport Drive to CR 458 (CSJs 0135-03-046 and 0135-04-033), the northern terminus of the proposed Spur 399 Extension, 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 ROW. This US 380 project was environmentally cleared on January 15, 2020, and is anticipated to let for construction in February 2024.

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, 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 from SH 5 past Couch Drive on an elevated structure. Because of several constraints constricting the amount of available space to accommodate the freeway in this area, FM 546/Harry McKillop Boulevard would serve as the frontage road and no shared-use paths (SUPs) would be constructed.

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, the freeway would be built on sloped earthen fill with grade-separated interchanges at Airport Drive and FM 546 (the 'Harry McKillop Boulevard' name is dropped east of Airport Drive), 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 of the Trinity River, its tributaries and associated wetlands, and McKinney Future Parkland south of US 380. 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 on the outside 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.

Committed congestion reduction strategies and operational improvements within the study area boundary will consist of traffic signal and ITS/communication improvements, interchange/grade separations, the addition of travel lanes and frontage roads, access management improvements along frontage roads (e.g., turn-lanes, signalized intersections, driveway/crossroad closures), and construction of SUPs along the outside of frontage roads to provide connectivity to existing and proposed sidewalk and trail networks. Individual projects are listed in **Table 1**.

Table 1: Congestion Management Strategies for the Preferred Alternative

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 TMA is on file and available for review at the NCTCOG's office in Arlington, Texas.

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Attachments

Attachment 1	CMP Implementation Form
Attachment 2	CMP Corridor Fact Sheet
Attachment 3	CMP Deficiency Form
Attachment 4	Screening Criteria

Attachment 1 – CMP Implementation Form

NCTCOG CMP
PROJECT IMPLEMENTATION FORM

Submitter Name: Christine Polito
Agency Name: TxDOT Dallas District
Agency Address: 4777 E. Highway 80, Mequite TX 75150-6643
Email: christine.polito@txdot.gov
Telephone Number: (214) 320-6141

Date: 5/10/2022

Please answer the following questions

Project Name Spur 399 Extension
Project Limits (From) US 75
Project Limits (To) US 380
CSJ Number 0364-04-051, 0047-05-058, 0047-10-002
Project Description (Including Travel Demand Management or Transportation System Management & Operations components)

The proposed project would construct an 8-lane freeway primarily on new location extending existing Spur 399 from US 75/Sam Rayburn Tollway (SH-121) to US 380,
a distance of between 4.8 miles to 6.5 miles depending on the selected alignment. The typical section of the proposed freeway would consist of 4 10-foot-wide travel
lanes in each direction with 10-foot-wide inside and outside shoulders. Grade-separated interchanges would include 14-foot-wide ramps with 2-foot-wide inside shoulders and 6-foot wide outside shoulders. One-way frontage roads would be constructed along each side except bewteen SH 5 and Airport Drive where existing
FM 546 would function as the frontage road.

2. Does this project add roadway capacity? (IF NOT, THIS FORM IS NOT REQUIRED)

YES

3. Are complementary Travel Demand Management (TDM) or Transportation System Management & Operations (TSM&O) projects within the corridor in the TIP?
If "yes," enter the project name(s), TIP Code(s) and/or CSJ number(s) in table below.
This information can be verified at the following link: Transportation Improvement Program Information System (TIPINS)
*For a list of TDM and TSM&O project types see: Appendix A - TDM and TSM&O Strategies

YES

Project Name	Citywide Signal System, Video Detectors & Communication ITS	**TIP Code**	11455.00	**CSJ#**	[Enter Here]
Project Name	Interchange/Grade-Separation Spur 399 @ SH 5	**TIP Code**	55156.00	**CSJ#**	[Enter Here]
Project Name	McDonald at Medical Center: Phase 1 - Signal Communication Software & Traffic Control Center, Phase 2 - Synchronize Signal Clocks	**TIP Code**	11842.00	**CSJ#**	[Enter Here]
Project Name	[Enter Here]	**TIP Code**	[Enter Here]	**CSJ#**	[Enter Here]

3b. Are there any other projects not included in the TIP that may complement the project?
If "yes," enter the project name(s) and implementing agency in table below.

YES

Project Name	US 380 Coit Road to FM 1827 (submitted for listing in the MTP Update with Spur 399 Extension)	**Implementing Agency**	TxDOT Dallas District
Project Name	[Enter Here]	**Implementing Agency**	[Enter Here]
Project Name	[Enter Here]	**Implementing Agency**	[Enter Here]
Project Name	[Enter Here]	**Implementing Agency**	[Enter Here]

4. Are the project limits within a corridor included in the current Metropolitan Transportation Plan?
This information can be verified in the Mobility Options found here: Freeways / Tollways / RSA's Non RAS's
If "yes," enter the MTP Reference #(s) in table below

YES

MTP Reference #	23.20.1
MTP Reference #	1.680.300
MTP Reference #	NRSA1-DAL-204
MTP Reference #	[Enter Here]

5. Are the project limits within a corridor included in the current CMP Corridor Analysis?
The complete inventory of corridor fact sheets can be found here: Appendix C - CMP Corridor Fact Sheet

NO

*If "yes," please proceed to question six.
*If "no," please evaluate corridor to determine if improvements are needed by completing the Fact Sheet Form in Step 2 in the tab below, before proceeding to question six.

6. Is the corridor identified as deficient in any category?

PLEASE SELECT

*If "yes," please proceed to questions seven.
*If "no," please proceed to question 11.

7. Identify corridor deficiencies as specified in the current CMP Corridor Analysis or in the CMP Roadway Deficiency Form. (Check all that apply)

- ☐ Alternative Roadway Infrastructure
- ☑ Modal Options
- ☐ System Demand
- ☑ System Reliability

8. Review Appendix A of the current CMP or other available resources to identify possible congestion mitigation strategies to correct the deficiency. (Check all that apply)
Appendix A - TDM and TSM&O Strategies

- ☑ Commuter Transportation Options
- ☑ Sustainable Development Improvements
- ☐ Freight Management Activities
- ☐ System Management and Operations Improvements
- ☑ Incentive to Use Alternative Modes
- ☐ Transit System Efficiency Improvements
- ☐ In-Vehicle System Efficiency Improvements
- ☑ Traveler Information Services

NCTCOG CMP
PROJECT IMPLEMENTATION FORM

- ☑ Roadway Incident and Emergency Management Options
- ☑ Work Zone/Construction Management Operations
- ☑ Roadway Infrastructure Improvements

NCTCOG CMP
PROJECT IMPLEMENTATION FORM

9. Specify deficiency-correcting congestion mitigation strategy that will be implemented as part of the project.

Roadway Infrastructure Improvements - construction of new freeway capacity on new location with shared-use paths within the proposed ROW

10. If not implementing a congestion mitigation strategy, please explain reason.

N/A

11. Submit completed form to NCTCOG - CMP Team at: equintana@nctcog.org

*Submit button will auto generate email to NCTCOG with completed excel document attached.
Please finalize step by sending the email.

SUBMIT FORM

If you have questions, please contact Eric Quintana at **equintana@nctcog.org / 817-608-2381** or Natalie Bettger at **nbettger@nctcog.org / 817-695-9280**

Attachment 2 – CMP Corridor Fact Sheet

CMP CORRIDOR ANALYSIS - FACT SHEET

ROADWAY NAME	SPUR 399 EXTENSION

HIGHWAY	LIMITS	LENGTH	DIRECTION	MAINLANES
SP399	US 75 TO US 380	BTWN 4.8 MI AND 6.5 MI	N-S	8

CORRIDOR FACTS (WITHIN 1 MILE)

Functional Class	FREEWAY	**Direct Connections**	NO
HOV Lanes	NO	**Truck Lane Restriction**	NO
Parrallel Freeways (within 5 miles)	YES	**Hazmat Route**	NO
Shoulders	YES	**Population**	21,310
Frontage Roads	YES	**Number of Employees**	7,000
Bike Options	YES	**FIM Training Participants**	NA
Available Transit	NO	**Crash Rate (Use Most Recent Year)**	NA
Park and Ride	NO	**Construction Status**	SCHEMATIC

PARRALLEL ARTERIALS (ENTIRE LIMITS)

PARRALLEL ARTERIALS (PARTIAL LIMITS)

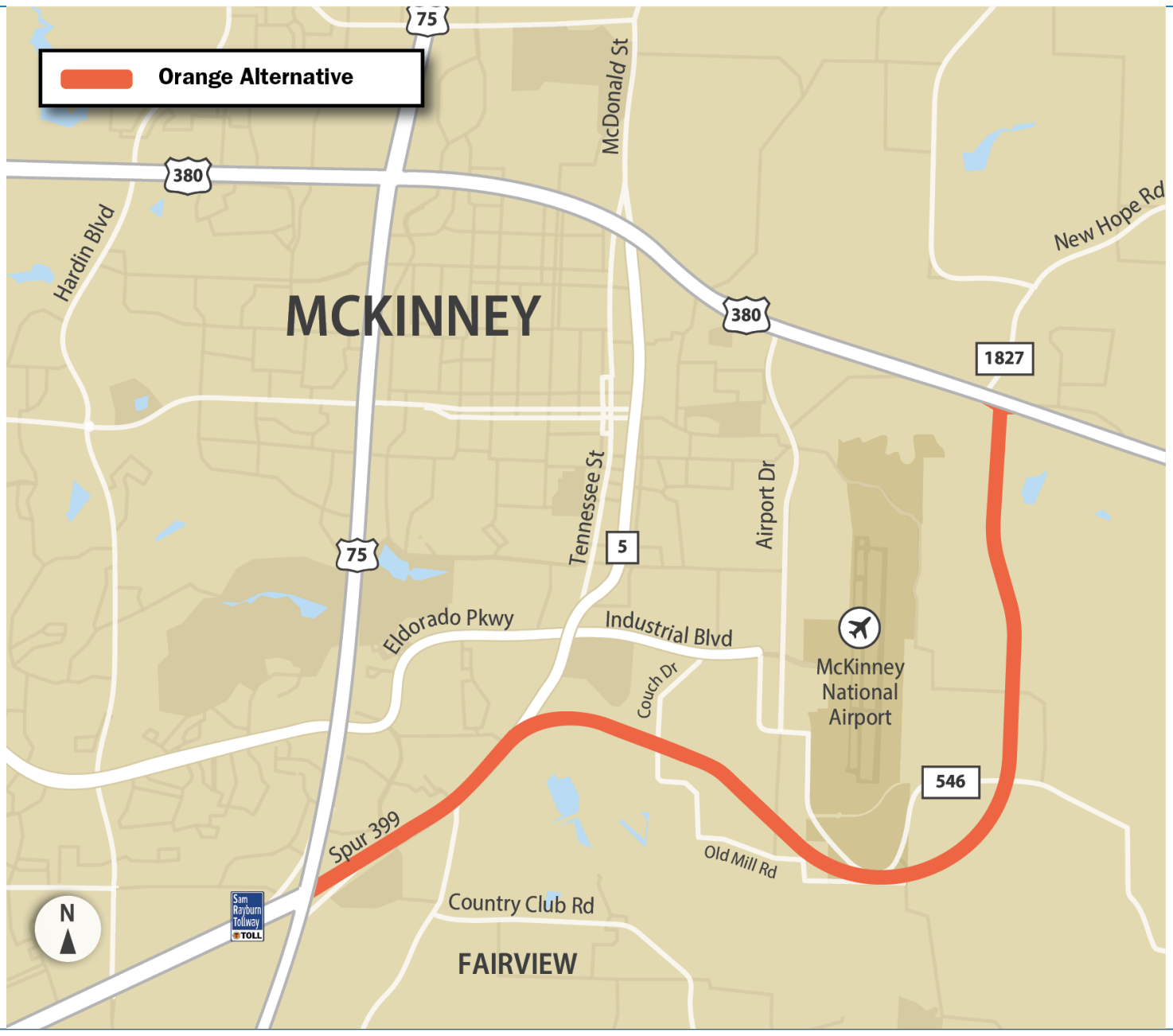
SH 5 - US 75/SRT-SH 121 to US 380
US 75 - SRT/SH 121 to US 380

CORRIDOR SCORE (Results from Step 3 - CMP Deficiency Form)

ROADWAY	MODAL OPTIONS	SYSTEM DEMAND	SYSTEM RELIABILITY	SCORE
20	1	15	8	44

CONCLUSIONS/RECOMMENDATIONS

[ENTER HERE]



DEFICIENCY FORM IS REQUIRED WITH THIS SHEET
PLEASE COMPLETE BY GOING TO TAB 3 (STEP 3. DEFICIENCY FORM)
CLICK HERE

Attachment 3 – CMP Deficiency Form

Project Name:	Spur 399 Extension
Project Limits (From and To):	US 75 to US 380
Agency Name:	TxDOT Dallas District
Submitter Name:	Christine Polito
Telephone:	2143206141
Email:	christine.polito@txdot.gov
Date Submitted:	05/10/22

Alternative Roadway Corridor Deficiency

The factors that influence alternative roadway infrastructure include the presence of parallel freeways, frontage roads, parallel arterials, and direct connections or interchanges.

	Click Cell To Select Answer	Score
1. Does the roadway facility have a parallel freeway or toll road within five miles?	Yes	12
2. Does the roadway facility include a frontage road system?	Yes, partial limits	3
3. Does the roadway facility have a parallel arterial within two miles?	Yes, entire limits	3
4. Does the roadway network include a direct connection or non-signalized interchange to another highway?	Yes	2
Total Points Received in Alternative Roadway Infrastructure Category		**20**

If total score is 14 or below, then improvements are needed in this category. Please see Appendix A of the current CMP to identify possible congestion mitigation strategies to correct the deficiency.

Modal Options Deficiency

The factors that influence modal options include the presence of transit options (bus and/or rail), park-and-ride facilities, HOV/Managed Lanes, and bicycle/pedestrian options.

	Click Cell To Select Answer	Score
1. Does the roadway facility have established transit service?	No	0
2. Is a park-and-ride facility located along the roadway corridor?	No	0
3. Are HOV or Managed lanes available along the roadway corridor?	No	0
4. Are bike trails or other bike options available along the roadway corridor?	Yes, partial limits	1
Total Points Received in Modal Options Category		**1**

If total score is 14 or below, then improvements are needed in this category. Please see Appendix A of the current CMP to identify possible congestion mitigation strategies to correct the deficiency.

System Demand (Recurring) Deficiency

The factors that influence system demand include traffic volume, truck volume/percentage, number of employees along the roadway corridor block, and residential population.

	Click Cell To Select Answer	Score
1. Is the peak hour volume capacity above or below the current average Peak V/C of 0.692?	Please Select	0
2. Is the truck volume percentage along the corridor above or below the current average of 9%?	Below or Equal to the Average	7
3. Is the total number of employees along the corridor above or below the current average of 82,549 (by TSZ)?	Below or Equal to the Average	5
4. Is the population along the corridor above or below the current average of 74,611 (by TSZ)?	Below or Equal to the Average	3
Total Points Received in System Demand Category		**15**

If total score is 14 or below, then improvements are needed in this category. Please see Appendix A of the current CMP to identify possible congestion mitigation strategies to correct the deficiency.

System Reliability (Non-Recurring) Deficiency

The factors that influence system reliability include facility crash rates, agencies that participate in incident management training, truck lane restrictions, roadway shoulders, and the presence of Intelligent Transportation Systems (ITS) technology.

	Click Cell To Select Answer	Score
1. Is the crash rate for the corridor below or above the current crash rate average of 75.19?*	Please Select	0
2. Does the roadway facility have paved shoulders?	Yes, full outside and inside shoulders	6
3. Have emergency response agencies (police and fire) along the corridor participated in Freeway Incident Management (FIM) training?**	Yes, partial limits	1
4. Have truck lane restrictions been implemented along the corridor?	No	0
5. Is Intelligent Transportation Systems (ITS) technology being utilized along the corridor?	Yes, partial limits	1
Total Points Received in System Reliability Category		**8**

If total score is 14 or below, then improvements are needed in this category. Please see Appendix A of the current CMP to identify possible congestion mitigation strategies to correct the deficiency.

Notes:
*Please use most recent crash year if available.
**FIM attendance information is maintained by NCTCOG Safety staff. Please call 817-695-9245 to request information.
CMP 2013 - Appendix A

Attachment 4 – Screening Criteria

Screening Criteria

Construction	Under Construction and Funded Future Construction	This will be used as a screening process when assigning points to a corridor. If the corridor is under/planned construction then it can be exempt from being scored since a solution is currently being proposed.

Points Description	The maximum number of points a corridor can receive is 100. This means that the corridor is functioning at a sufficient level based on the four scoring categories. If the corridor receives a low score, then improvements should be considered in the four scoring categories.

Category	Inventory	Measure	Points	Max Number of Points
Alternative Roadway Infrastructure (Services)	Parallel Freeway/Toll Roads[1] (5 mi)	Yes	12	**25**
		None	0	
	Frontage Roads[1]	Entire Limits	7	
		Partial Limits	3	
		None	0	
	Parallel Arterials[1]	Entire and Partial Limits	4	
		Entire Limits	3	
		Partial Limits	1	
		None	0	
	Direct Connections (Interchanges)[1]	Yes	2	
		None	0	
Modal Options (Services)	Transit[2]	Bus and Rail	10	**25**
		Rail	7	
		Bus	5	
		None	0	
	Park-and-Ride[3]	Yes	7	
		None	0	
	HOV Lanes[1]	Yes	5	
		None	0	
	Bike Options[3]	Entire Limits	3	
		Partial Limits	1	
		None	0	
System Demand (Recurring)	Peak V/C[3]	Below or Average	10	**25**
		Average - 0.692		
		Above	3	
	Truck Volume Percentage[3]	Below or Average	7	
		Average - 9%		
		Above	1	
	Number of Employees (by TSZ)[4]	Below or Average	5	
		Average - 82,549		
		Above	1	
	Population (by TSZ)[4]	Below or Average	3	
		Average - 74,611		
		Above	1	
System Reliability (Non Recurring)	2012 Crash Rate[3]	Below or Average	10	**25**
		Regional Rate Average - 75.19		
		Above	3	
	Shoulders[1]	Full Outside and Inside	6	
		Partial Shoulders	3	
		One Shoulder	1	
		None	0	
	FIM Attendance/Training[3]	Entire Limits	3	
		Partial Limits	1	
		None	0	
	Truck Lane Restrictions[3]	Entire Limits	3	
		Partial Limits	1	
		None	0	
	Intelligent Transportation Systems[3]	Entire Limits	3	
		Partial Limits	1	
		None	0	

Carbon Monoxide Traffic Air Quality Analysis

Spur 399 Extension
CSJ 0364-04-051, 0047-05-058, 0047-10-002

From US 75 to US 380

Collin County

Texas Department of Transportation, Dallas District

June 2022

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 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

Table of Contents

1.0 Project Background 1

1.1 Existing Facility 1
1.2 Proposed Facility 2

2.0 Carbon Monoxide Traffic Air Quality Analysis 3

2.1 Background Information 3
2.2 Analysis Methodology 3
2.3 Receptor Determination 6
2.4 CO Modeling Results 8

Tables

Table 1: Build Traffic Volumes by Link 4
Table 2: CO Emission Factors by Link 5
Table 3: CAL3QHC Modeling Parameters 6
Table 4: Queuing Parameters 6
Table 5: Additional CAL3QHC Modeling Parameters 7
Table 6: Carbon Monoxide Modeling Results 8

Attachments

Attachment A: Exhibits

Exhibit 1- Project Location Map

Exhibit 2- Typical Sections

Exhibit 3- Affected Network Links

Exhibit 4- Receptor Location Map

Attachment B: Modeling Data

Attachment C: Traffic Data used in the Analysis

1.0 Project Background

In 2020, the Texas Department of Transportation (TxDOT) completed the *US 380 Collin County Feasibility Study* that recommended the development of a new freeway facility extending across the county from the Denton County 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. The project evaluated as part of the analysis is as follows in this report. (See **Attachment A, Exhibit 1**: Project Location Map)

1.1 Existing Facility

The existing highway system consists of US 75/Sam Rayburn Tollway (SRT)-State Highway (SH) SH 121, SH 5, and US 380. These roadways provide the primary connections between the northern and eastern portions of Collin County and the rest of the Dallas Metroplex. In 2022, SH 5 from the intersection with existing Spur 399 to Farm to Market (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.

A project to improve SH 5 from South of FM 1378 (Country Club Road) to South of County Road (CR) 275 (CSJs 0047-05-054, 0047-09-034, and 0364-04-049), cleared in 2020, is anticipated to be under construction in June 2027 before the Spur 399 Extension. These SH 5 improvements would reconstruct the 4-lane divided roadway 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. The mainlanes would transition from 11-feet-wide to 12-feet-wide after the Wilson Creek Bridges. The two existing bridges over Wilson Creek would be replaced with two wider bridges with three mainlanes in each direction and extended shoulders/additional lane width (unstriped) on the outside to accommodate future capacity. The intersection at Stewart Road would be grade-separated with no signals 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 corner clips along the corridor.

In addition, a project to improve US 380 east of McKinney from Airport Drive to CR 458 has also been approved within the Spur 399 Extension study area (CSJs 0135-03-046 and 0135-04-033). This approved US 380 project 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 ROW. The project was environmentally cleared on January 15, 2020, and is anticipated to let for construction in February 2024.

1.2 Proposed Facility

The Preferred Alternative (Orange Alternative) would construct an 8-lane freeway with frontage roads connecting US 75 (southern terminus) and US 380 (northern terminus) around the southeastern quadrant of McKinney, Texas. The future build (2050) scenario adds 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. The 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. The current Preferred Alternative (analyzed in this document for air toxics) continues east on new location (no current alignment) crossing Airport Drive/Old Mill Road, and continuing further east and south around the southern end of the McKinney National Airport, then turning north near CR 317 to connect to US 380 east of the Airport, 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 of the 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 Preferred Alternative would vary from 165 feet-wide to 696 feet-wide.

The typical sections proposed along the project are shown in **Exhibit 3** in **Attachment A**.

The Project is expected to occur with an Estimated Time to Complete (ETC) year of 2030; while the full build-out or Design year is 2050. Based on initial discussions with TxDOT, both the ETC and Design year of the project were reviewed as a part of this Carbon Monoxide Traffic Air Quality Analysis (CO TAQA).

2.0 Carbon Monoxide Traffic Air Quality Analysis

This CO TAQA was performed in accordance with TxDOT's "Environmental Guide: Volume 2 Activity Instructions". The methodology, assumptions, and procedures used in the CO TAQA are discussed in detail in the following sections. The build alternative (described in Section 1.2) was reviewed as a part of the CO TAQA performed for the ETC year (2030) and the Design year (2050).

2.1 Background Information

If a roadway project has Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) involvement, is adding capacity, and has an average annual daily traffic (AADT) greater than 140,000 vehicles per day (vpd) combined volume along the mainlanes and frontage roads, a quantitative CO TAQA is required to be performed for the project. Traffic counts for the Spur 399 Extension within the project corridor for the ETC year (2030) and the Design year (2050) are: 93,400 vpd and 143,300 vpd, respectively. Since the Design year (2050) vehicle volume is predicted to exceed the 140,000 vpd threshold, a quantitative analysis is required for the Project. An Air Quality Consultative Call was held on March 11, 2022, with TxDOT and NCTCOG to discuss the modeling procedure. Because there are signalized intersections included as part of the Project in the area where the daily volume threshold was exceeded, it was determined in the call that the CAL3QHC air dispersion model would be used in the analysis.

2.2 Analysis Methodology

In this CO TAQA analysis, both the ETC and Design years, 2030 and 2050 respectively, were reviewed, even though only the Design year is predicted to exceed the analysis threshold of 140,000 vpd. The Annual Daily Traffic (ADT) was determined from the information received from the TxDOT Transportation Planning and Programming Division and analyzed by HDR, Inc. HDR, Inc. also provided peak hourly traffic volumes for the ETC and Design years using a VISSIM analysis. The roadway links (both existing and future) were determined based on roadway geometries and traffic volumes provided. The ADT was used to determine which cross-sections of the road have the highest traffic counts for the future build scenarios (ETC and Design year). It was determined that the same area has the highest traffic counts for both the ETC and Design year—the section between the intersection with SH 5 and Stewart Road. HDR, Inc. provided AM and PM peak hourly traffic volumes, the maximum of which was chosen for each roadway segment to be modeled. **Table 1** shows the information for the links analyzed in the build scenarios for the ETC and Design year models.

Table 1: Build Traffic Volumes by Link

Modeled Link	Link Type	ETC (2030)		Design Year (2050)	
		ADT	Peak Hour	ADT	Peak Hour
EB 399 North Link	Main Lanes	29,100	1,720	44,600	2,520
EB 399 Middle Link	Main Lanes	18,400	1,240	28,200	1,900
EB 399 South Link	Main Lanes	31,600	2,070	48,500	3,170
WB 399 North Link	Main Lanes	26,500	2,590	40,500	3,980
WB 399 South Link	Main Lanes	39,100	3,370	59,600	5,180
EB SH5 Off Ramp	Ramp	13,200	830	20,300	1,270
EB Stewart On Ramp	Ramp	10,700	480	16,400	690
WB SH5 On Ramp	Ramp	12,600	780	19,100	1,200
SB Frontage North Link	Frontage Road	6,100	310	9,500	600
SB Frontage Middle Link	Frontage Road	7,300	380	11,600	720
WB Frontage South Link	Frontage Road	900	110	1,400	150
EB Frontage North Link	Frontage Road	3,100	150	4,800	280
EB Frontage Middle Link	Frontage Road	13,800	630	21,200	950
EB Frontage South Link	Frontage Road	15,400	710	23,600	1,090
SB Greenville Link	Local Road	6,400	270	10,200	570
SB SH5 Link	Local Road	18,700	1,090	28,600	1,800
WB Stewart West Link	Local Road	3,200	190	4,800	330
WB Stewart Middle Link	Local Road	3,600	190	5,500	360
WB Stewart East Link	Local Road	200	20	400	40
EB Stewart West Link	Local Road	2,900	150	4,700	280
EB Stewart Middle Link	Local Road	2,100	110	3,300	200
EB Stewart East Link	Local Road	300	30	600	50

(a) SB = southbound, FR = frontage road, NB = northbound, ML = mainlane, ADT = average daily traffic, DHV = Design hour volume

In discussions with TxDOT, it was determined the Dallas District Area emission rate look up tables (ERLT) would be used in this analysis to determine the carbon monoxide (CO) emission rates for each of the links. The ERLT were created by TxDOT using MOVES2014; the inputs are discussed and detailed in TxDOT's "Useful Information: Carbon Monoxide (CO) Traffic Air Quality Analysis (TAQA) Emission Rate Lookup Tables (ERLT)" which came into effect June 2016 and were updated in June 2021. The free-flow lookup tables are divided up by roadway type (Urban Unrestricted Access, Urban Restricted Access, Rural Unrestricted Access, and Rural Restricted Access) and vehicle speed. The idling lookup tables provide expected idling emissions for each year starting in 2020 and extending to 2050. Traffic speed information was provided by HDR, Inc. and was used to determine the CO emission factors to use from the ERLT. The emissions used in the CAL3QHC model are listed in **Table 2**.

Table 2: CO Emission Factors by Link

Road Name	2030		2050	
	Average Speed (miles per hour)	CO Emission Factor (grams per mile)	Average Speed (miles per hour)	CO Emission Factor (grams per mile)
EB 399 North Link	71	1.47	71	0.94
EB 399 Middle Link	72	1.57	72	1.01
EB 399 South Link	71	1.47	69	0.84
WB 399 North Link	71	1.47	70	0.87
WB 399 South Link	70	1.37	69	0.84
EB SH5 Off Ramp	58	1.05	57	0.63
EB Stewart On Ramp	43	1.03	42	0.60
WB SH5 On Ramp	49	1.00	50	0.59
SB Frontage North Link	44	1.02	42	0.60
SB Frontage Middle Link	42	1.04	42	0.60
WB Frontage South Link	45	1.01	45	0.59
EB Frontage North Link	43	1.03	42	0.60
EB Frontage Middle Link	43	1.03	42	0.60
EB Frontage South Link	43	1.03	42	0.60
SB Greenville Link	45	1.01	45	0.59
SB SH5 Link	44	1.02	42	0.60
WB Stewart West Link	29	1.26	30	0.71
WB Stewart Middle Link	11	1.93	11	1.08
WB Stewart East Link	13	1.85	13	1.04
EB Stewart West Link	21	1.52	20	0.90
EB Stewart Middle Link	12	1.89	10	1.11
EB Stewart East Link	28	1.27	29	0.71
Idling[a]	N/A	1.43	N/A	0.53

(a) Idling emissions are in grams per vehicle per hour (g/veh-hr)

The TxDOT "Environmental Guide: Volume 2 Activity Instructions" specifies parameters to be used in the CAL3QHC air dispersion model. These parameters are listed in **Table 3**.

Table 3: CAL3QHC Modeling Parameters

Model Parameter	Model Input
Wind Speed	1 m/s
Stability Class	4/Class D (Urban)
Settling Velocity	0 cm/s
Deposition Velocity	0 cm/s
Mixing Height	1000 m
Wind Directions	0 to 360 degrees in 10-degree increments
Surface Roughness	1 cm
Background CO Concentration	1-hour: 1.7 ppm 8-hour: 1.4 ppm

(a) m/s = meter per second, cm/s = centimeter per second, m = meter, cm= centimeter, ppm = parts per million

Because signalized intersections are expected to be constructed between the Spur 399 Extension frontage roads and Stewart Road, a determination was made that CALQ3HC would be used, which requires additional inputs for the queuing lanes. The inputs for Stewart Road and the Spur 399 Extension frontage roads are shown in **Table 4**. It was assumed that the queuing parameters would not change between the ETC year (2030) and Design year (2050); these parameters are utilized in both modeling scenarios.

Table 4: Queuing Parameters

Model Parameter	Model Input
Average Total Signal Cycle Length	90 seconds
Average Red Total Signal Length	Frontage Road: 40 seconds Stewart Road: 50 seconds
Clearance Lost time	2 seconds[a]
Approach Volume	Peak Hourly Volume
Saturation Flow Rate	1,600[a]
Signal Type	Pre-timed[a]
Arrival Rate	Average progression[a]
Number of Travel Lanes in queue link	Frontage Road: 2 Stewart Road: 1

(a) Denotes default parameters used in the model

2.3 Receptor Determination

ADT traffic counts for the build (ETC and Design year) scenarios were analyzed to determine the areas where the cross-sections have the largest traffic counts. The same area was determined to have the highest traffic counts for both the ETC and Design year build scenarios: the section of the Spur 399 Extension between the intersection with SH 5 and Stewart Road. Once this area was determined, receptors were placed at either end of the thinnest cross-section of the roadway, at the location of the closest expected ambient area. The receptor locations can

be seen in **Exhibit 4** located in **Attachment A**. The modeled roadways, design hourly volume (DHV) of each roadway, distance to receptor, speed, number of lanes, and emission factors are shown in **Table 5**.

Table 5: Additional CAL3QHC Modeling Parameters

Modeled Road[a]	Peak Traffic Count (veh/hr)	Link Types Included in Model	Number of Lanes	Mixing Width (ft)	Speed (mph)	CO Emission Factor (g/mile)
ETC (2030) Build						
EB 399 North Link	1,720	AG, BR	5	70	72	1.4
EB 399 Middle Link	1,240	BR, FL, AG	4	58	72	1.7
EB 399 South Link	2,070	AG	5	70	72	1.7
WB 399 North Link	2,590	AG, BR	4	22	72	1.57
WB 399 South Link	3,370	BR, FL, AG	5	22	71	1.57
EB SH5 Off Ramp	830	AG, FL, BR	2	70	58	1.57
EB Stewart On Ramp	480	AG, BR	1	58	43	1.57
WB SH5 On Ramp	780	AG, BR	2	22	46	1.47
SB Frontage North Link	310	AG	3	46	44	1.05
SB Frontage Middle Link	380	FL	3	22	42	1.03
WB Frontage South Link	110	AG	2	22	45	1.00
EB Frontage North Link	150	AG, BR	2	70	43	1.02
EB Frontage Middle Link	630	BR	2	70	43	1.04
EB Frontage South Link	710	AG, BR	3	58	43	1.01
SB Greenville Link	270	AG, DP	2	70	45	1.03
SB SH5 Link	1,090	AG	3	22	44	1.03
WB Stewart West Link	190	AG	1	22	29	1.03
WB Stewart Middle Link	190	AG	1	22	11	1.01
WB Stewart East Link	20	AG	1	22	13	1.02
EB Stewart West Link	150	AG	1	58	21	1.26
EB Stewart Middle Link	110	AG	1	58	12	1.89
EB Stewart East Link	30	AG	1	58	28	1.27
Design Year (2050) Build						
EB 399 North Link	2520	AG, BR	5	70	72	1.01
EB 399 Middle Link	1900	BR, FL, AG	4	58	72	1.01
EB 399 South Link	3170	AG	5	70	71	0.94
WB 399 North Link	3980	AG, BR	4	22	71	0.94
WB 399 South Link	5180	BR, FL, AG	5	22	70	0.87
EB SH5 Off Ramp	1270	AG, FL, BR	2	70	58	0.64
EB Stewart On Ramp	690	AG, BR	1	58	42	0.60
WB SH5 On Ramp	1200	AG, BR	2	22	46	0.59
SB Frontage North Link	600	AG	3	46	42	0.60
SB Frontage Middle Link	720	FL	3	22	42	0.60
WB Frontage South Link	150	AG	2	22	45	0.59
EB Frontage North Link	280	AG, BR	2	70	42	0.60
EB Frontage Middle Link	950	BR	2	70	42	0.60
EB Frontage South Link	1090	AG, BR	3	58	42	0.60
SB Greenville Link	570	AG, DP	2	70	45	0.59

Modeled Road[a]	Peak Traffic Count (veh/hr)	Link Types Included in Model	Number of Lanes	Mixing Width (ft)	Speed (mph)	CO Emission Factor (g/mile)
SB SH5 Link	1800	AG	3	22	42	0.60
WB Stewart West Link	330	AG	1	22	10	1.11
WB Stewart Middle Link	360	AG	1	22	10	1.11
WB Stewart East Link	40	AG	1	22	13	1.04
EB Stewart West Link	280	AG	1	58	20	0.90
EB Stewart Middle Link	200	AG	1	58	9	1.14
EB Stewart East Link	50	AG	1	58	28	0.71

(a) SB = southbound, EB = eastbound, WB = westbound, AG = at grade, BR = on bridge, FL = on fill, DP = depressed, ft = feet, mph = miles per hour, g/mile = gram per mile

The tables used to create the input files, as well as the modeling files (both input and output), are included in **Attachment B**. The traffic data used to perform the CO TAQA is included in **Attachment C**.

2.4 CO Modeling Results

Based on the information discussed above, CAL3QHC was run for the area of concern for both the ETC year (2030) and the 2050 Design year. The 1-hour and 8-hour CO concentrations are listed in **Table 6**.

Table 6: Carbon Monoxide Modeling Results

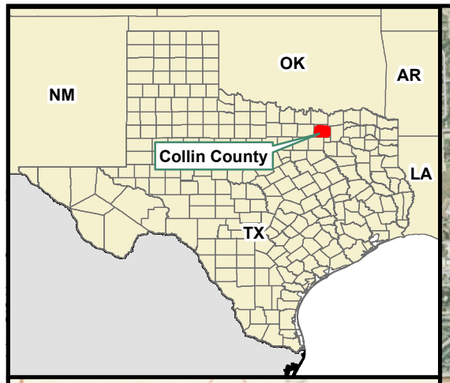
Receptor Name	2030 Build Concentration (ppm[A])			2050 Build Concentration (ppm[A])			NAAQS[A] (ppm)
	Modeled Concentration	Background Value	Total	Modeled Concentration	Background Value	Total	
1-hour Results							
Receptor 1	0.1	1.7	1.8	0.1	1.7	1.8	35
Receptor 2	0.1	1.7	1.8	0.1	1.7	1.8	35
8-hour Results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

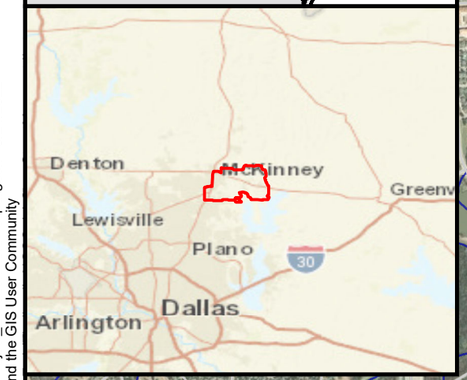
(A) ppm = parts per million, NAAQS = National Ambient Air Quality Standards

None of the modeled concentrations exceeded the 1-hour or 8-hour National Ambient Air Quality Standards (NAAQS) for CO. The modeled 8-hour concentrations are between 26.7 percent and 27.8 percent of the standard. The 1-hour concentrations were modeled to be approximately 5 percent of the standard. CO concentrations are expected to remain the same between the 2030 scenario to the 2050 scenario. This is due the expectation that air pollutant emissions from vehicles would continue to decrease as more electric vehicles enter the roadways and new technologies are introduced to reduce the release of the pollutants from internal combustion engines. Therefore, while the number of vehicles using the Spur 399 Extension is expected to increase between the ETC (2030) build scenario and the Build (2050) build scenario, the CO concentrations from the vehicles are not expected to increase.

Therefore, it is not expected that CO concentrations predicted in any of the modeled scenarios would cause significant ambient air impacts along the project corridor.

ATTACHMENT A: EXHIBITS





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1827
380
GREENVILLE RD
ELM ST
5
S AIRPORT DR
ENLOE RD
Big Branch
546
INDUSTRIAL BLVD
ELDORADO PKWY
STEWART RD
COUNTRY LN
COUNTY ROAD 722
OLD MILL RD
COUNTY ROAD 317
US 75
Sloan Creek
Barkdale Creek
East Fork Trinity River
Fairview

Common Alignment for the Build Alternatives
Orange Alternative
Purple Alternative
Project Logical Termini
Streams and Rivers
McKinney National Airport Property

NORTH
0 0.5 1
Miles

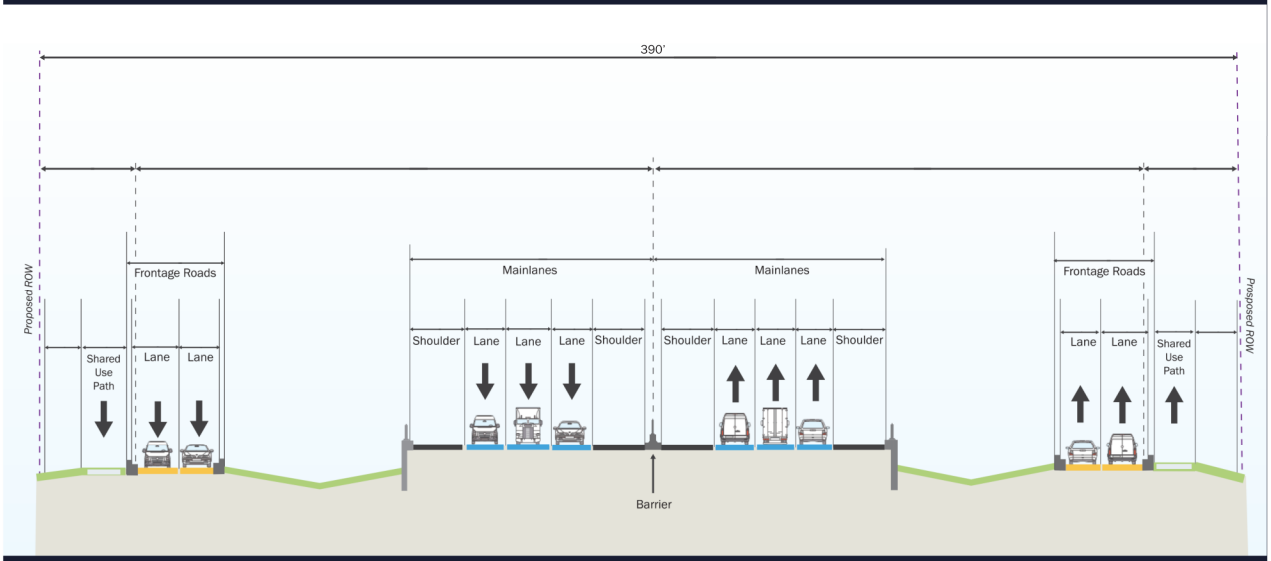
Texas Department of Transportation

Exhibit 1
Project Area Location Map
Spur 399 Extention
US 75 to US 380
CSJs 0364-04-051, 0047-05-058, 0047-10-002
Collin County

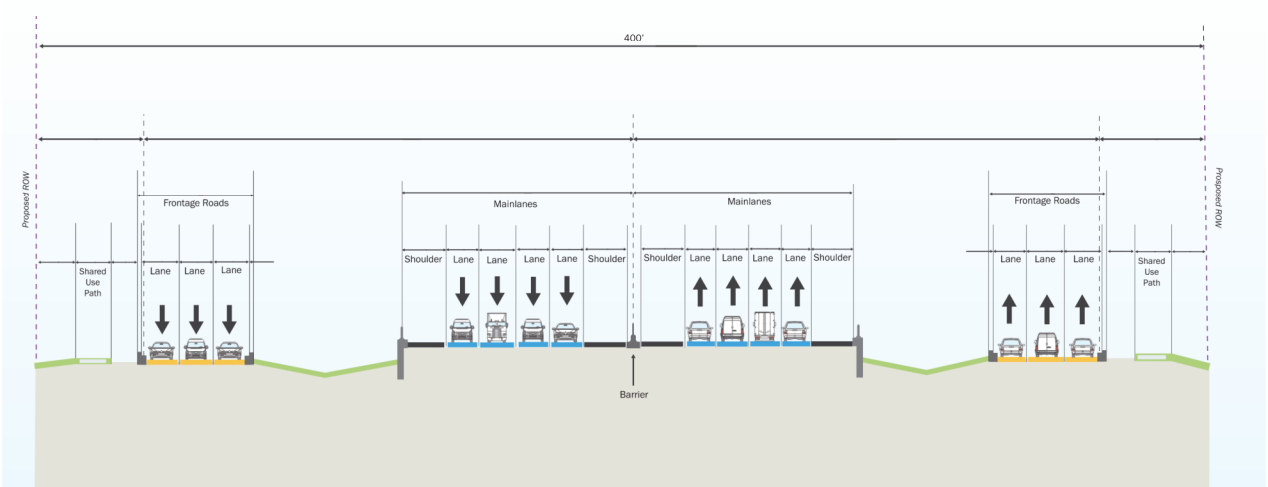
Issued: 3/24/2022

Path: C:\Users\sspurgeon\OneDrive - Burns & McDonnell\Desktop\Projects\US 380\DataFiles\ArcDocs\Spur 399 DEIS\Spur399_Project_Location.mxd sspurgeon 3/24/2022
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

6-LANE TYPICAL SECTION

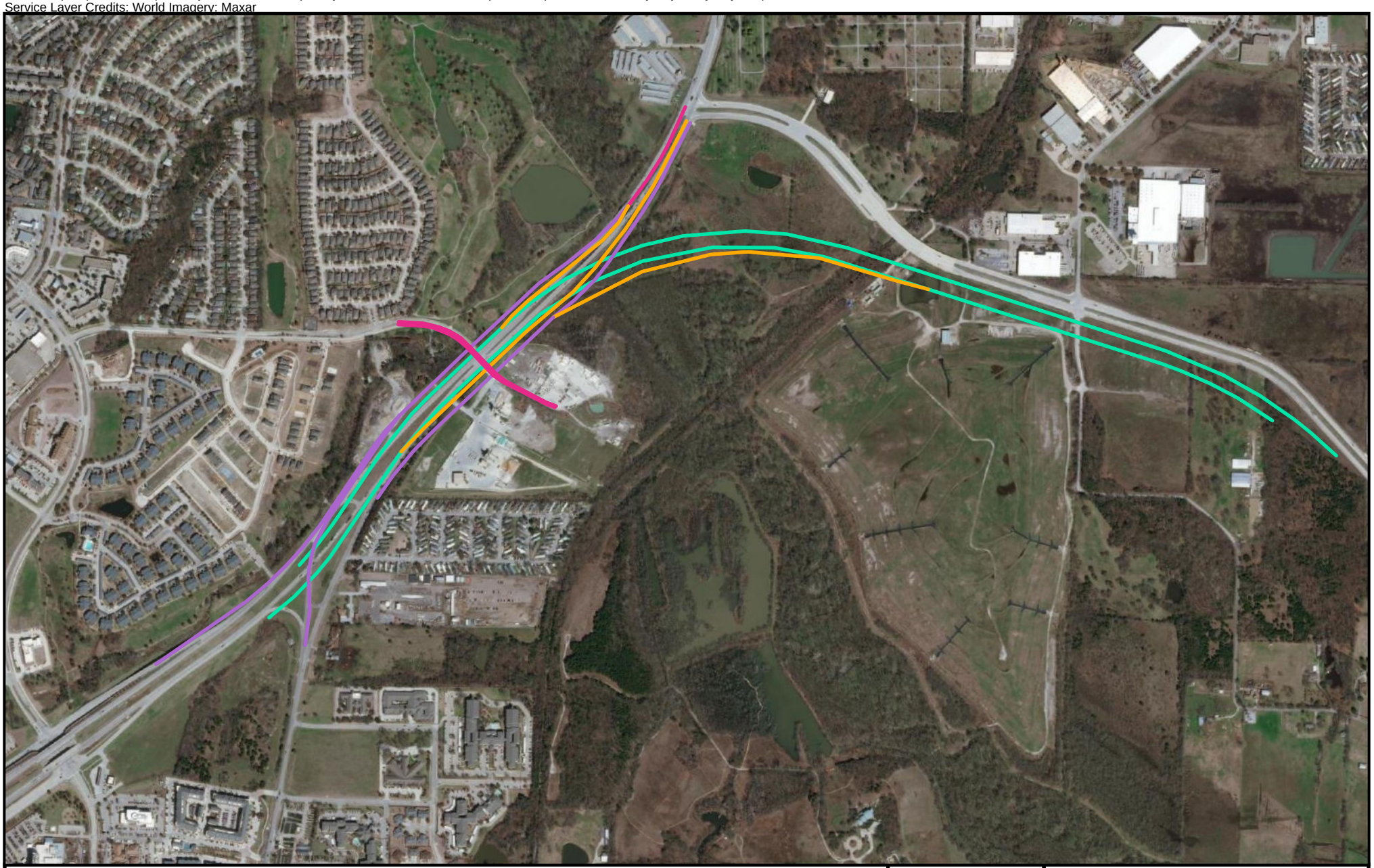


8-LANE TYPICAL SECTION



*RIGHT-OF-WAY (ROW) WIDTHS MAY VARY IN SOME LOCATIONS AND IS SUBJECT TO CHANGE.

Path: \\calpuff-prod-fs1\Calpuff\Projects\Air-Noise Dept\Project Files\TxDOT\Air Data\Spur-399\Spur399 Air Data\MyProject\MyProject.aprx tfuller 5/8/2022
Service Layer Credits: World Imagery: Maxar



Mainlanes
Ramps
Frontage Roads
Local Roads

NORTH

2,000 1,000 0 2,000

Scale in Feet

Texas Department of Transportation

Exhibit 3
Road Alignments
Spur 399 Extension
US 75 to US 380
CSJs 0364-04-051, 0047-05-058, 0047-10-002
Collin County

Issued: 5/8/2022

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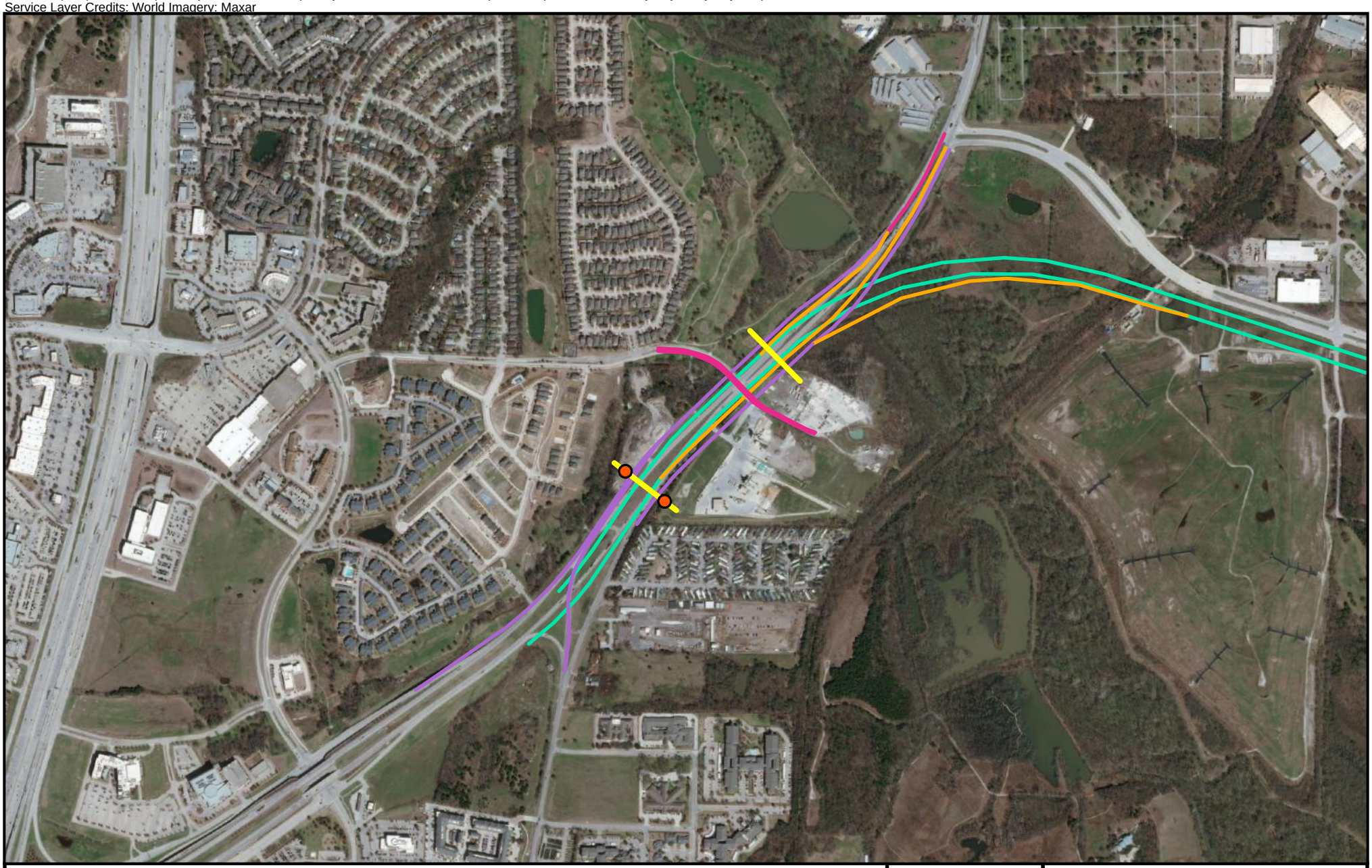

Mainlanes
Ramps
Frontage Roads
Local Roads
Cross Sections Analyzed
Receptor Location

NORTH

2,000 1,000 0 2,000

Scale in Feet

Texas Department of Transportation

Exhibit 4
Roadway Cross Sections and Receptor Locations
Spur 399 Extension
US 75 to US 380
CSJs 0364-04-051, 0047-05-058, 0047-10-002
Collin County

Issued: 5/8/2022

ATTACHMENT B: MODELING FILES

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'CS2'      1161.52   3318.001   9.9
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'EB_Ramp_10' 'AG'   3288.58 4652.67     3815.18 4784.24 480     1.026885107 -30 22
1
'EB_Ramp_11' 'BR'   3815.18 4784.24     4100.02 4805.60 480     1.026885107 -25 22
1
'EB_Ramp_12' 'BR'   4100.02 4805.60     4648.66 4758.13 480     1.026885107 -15 22
1
'EB_Ramp_13' 'BR'   4648.66 4758.13     5261.35 4577.04 480     1.026885107 -5  22
1
'EB_Ramp_14' 'BR'   5261.35 4577.04     5492.05 4516.08 480     1.026885107 0   22
1
'WB_Ramp_1' 'AG'   3180.55 5158.50      3108.51 5031.16 780     1.004734761 -30 34
1
'WB_Ramp_2' 'AG'   3108.51 5031.16      2986.74 4895.64 780     1.004734761 -29 34
1
'WB_Ramp_3' 'BR'   2986.74 4895.64      2406.21 4424.34 780     1.004734761 -20 34
1
'WB_Ramp_4' 'BR'   2406.21 4424.34      2286.87 4311.47 780     1.004734761 -10 34
1
'WB_Ramp_5' 'BR'   2286.87 4311.47      2209.06 4220.87 780     1.004734761 0   34
1
'SB_Front_1' 'AG'   3180.55 5158.50     3071.94 5037.02 310     1.016581118 -30 46
1
'SB_Front_2' 'AG'   3071.94 5037.02     2923.34 4891.84 310     1.016581118 -27 46
1
'SB_Front_3' 'AG'   2923.34 4891.84     2711.10 4721.02 310     1.016581118 -28 46
1
'SB_Front_4' 'AG'   2711.10 4721.02     2493.44 4561.38 310     1.016581118 -30 46
1
'SB_Front_5' 'AG'   2493.44 4561.38     1962.93 4066.06 310     1.016581118 -27 46
1
'SB_Front_6' 'FL'   1962.93 4066.06     1421.00 3544.97 380     1.037679762 -10 46
1
'SB_Front_7' 'AG'   1421.00 3544.97     1303.64 3387.95 270     1.006735084 12  34
1
'SB_Front_8' 'AG'   1303.64 3387.95     864.07 2737.21  270     1.006735084 5   34
1
'SB_Front_9' 'DP'   864.07 2737.21      769.57 2557.23  270     1.006735084 0   34
1
'SB_Front_10' 'DP'   769.57 2557.23     719.38 2297.79  270     1.006735084 0   34
1
'SB_Front_11' 'DP'   719.38 2297.79     730.08 2049.49  270     1.006735084 10  34
1
'SB_Front_12' 'AG'   730.08 2049.49     695.37 1777.47  270     1.006735084 30  34
1
'WB_Front_1' 'AG'   1421.00 3544.97     1315.12 3430.57 110     1.006735084 20  34
1
'WB_Front_2' 'AG'   1315.12 3430.57     1222.85 3311.27 110     1.006735084 12  34
1
'WB_Front_3' 'AG'   1222.85 3311.27     801.13 2688.24  110     1.006735084 16  34
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1
'WB_Front_4' 'AG'   801.13 2688.24      675.66 2530.15  110     1.006735084 15  34
1
'WB_Front_5' 'AG'   675.66 2530.15      552.43 2393.44  110     1.006735084 11  34
1
'WB_Front_6' 'AG'   552.43 2393.44      409.69 2254.46  110     1.006735084 7   34
1
'WB_Front_7' 'AG'   409.69 2254.46      238.43 2110.81  110     1.006735084 9   34
1
'WB_Front_8' 'AG'   238.43 2110.81      -454.94 1629.57 110     1.006735084 6   34
1
'EB_Front_1' 'AG'   1251.02 2909.48     1371.44 3083.58 710     1.026885107 14  46
1
'EB_Front_2' 'AG'   1371.44 3083.58     1538.67 3282.79 710     1.026885107 12  46
1
'EB_Front_3' 'AG'   1538.67 3282.79     1694.57 3439.57 710     1.026885107 19  46
1
'EB_Front_4' 'BR'   1694.57 3439.57     2145.92 3865.80 710     1.026885107 -19 46
1
'EB_Front_5' 'BR'   2145.92 3865.80     2604.63 4300.36 630     1.026885107 -19 34
1
'EB_Front_6' 'BR'   2604.63 4300.36     2766.22 4432.17 150     1.026885107 -20 34
1
'EB_Front_7' 'BR'   2766.22 4432.17     2926.55 4591.48 150     1.026885107 -25 34
1
'EB_Front_8' 'BR'   2926.55 4591.48     3034.89 4732.14 150     1.026885107 -30 34
1
'EB_Front_9'  'BR'   3034.89 4732.14    3294.61 5114.66 150     1.026885107 -30 34
1
'EB_Front_10' 'AG'   3294.61 5114.66    3406.49 5299.46 150     1.026885107 -30 34
1
'EB_Front_11  ' 'AG'   3406.49 5299.46  3659.46 5797.20 150     1.026885107 -30 34
1
'EB_Stewart_1 ' 'AG'   1410.44 4244.90  1605.93 4233.42 150     1.521520187 -8  22
1
'EB_Stewart_ 2 ' 'AG'   1605.93 4233.42 1671.10 4222.68 150     1.521520187 -12 22
1
'EB_Stewart_3 ' 'AG'   1671.10 4222.68  1805.89 4169.36 150     1.521520187 -18 22
1
'EB_Stewart_4 ' 'AG'   1805.89 4169.36  1870.13 4129.28 150     1.521520187 -21 22
1
'EB_Stewart_5 ' 'AG'   1870.13 4129.28  1933.20 4074.70 150     1.521520187 -24 22
1
'EB_Stewart_6 ' 'AG'   2144.27 3851.99  1933.20 4074.70 110     1.888713436 -25 22
1
'EB_Stewart_7 ' 'AG'   2144.27 3851.99  2212.58 3804.60 30      1.268981683 -25 22
1
'EB_Stewart_8 ' 'AG'   2212.58 3804.60  2547.21 3633.73 30      1.268981683 -25 22
1
'EB_Stewart_9 ' 'AG'   2547.21 3633.73  2616.63 3608.12 30      1.268981683 -28 22
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1
'WB_Stewart_1 ' 'AG'   2626.36 3617.36  2551.71 3645.30 20      1.850542028 -29 22
1
'WB_Stewart_2 ' 'AG'   2551.71 3645.30  2237.70 3809.34 20      1.850542028 -28 22
1
'WB_Stewart_3 ' 'AG'   2237.70 3809.34  2161.39 3868.59 20      1.850542028 -25 22
1
'WB_Stewart_4 ' 'AG'   2161.39 3868.59  1962.06 4074.80 190     1.9338251 -25   22
1
'WB_Stewart_5 ' 'AG'   1962.06 4074.80  1893.08 4140.84 190     1.264285795 -25 22
1
'WB_Stewart_6 ' 'AG'   1893.08 4140.84  1852.18 4168.06 190     1.264285795 -26 22
1
'WB_Stewart_7 ' 'AG'   1852.18 4168.06  1803.15 4195.57 190     1.264285795 -26 22
1
'WB_Stewart_8 ' 'AG'   1803.15 4195.57  1724.09 4225.28 190     1.264285795 -25 22
1
'WB_Stewart_9 ' 'AG'   1724.09 4225.28  1599.99 4254.87 190     1.264285795 -20 22
1
'WB_Stewart_10' 'AG'   1599.99 4254.87  1415.07 4265.89 190     1.264285795 -12 22
1
'SB_SH5_1' 'AG'         3621.95 5920.17 3490.01 5630.10 1090    1.016581118 -25 46
1
'SB_SH5_2' 'AG'         3490.01 5630.10 3430.93 5521.89 1090    1.016581118 -30 46
1
'SB_SH5_3' 'AG'         3430.93 5521.89 3325.73 5354.76 1090    1.016581118 -30 46
1
'SB_SH5_4' 'AG'         3325.73 5354.76 3180.55 5158.50 1090    1.016581118 -30 46
  2
'SB_Front_Queue_5'  'AG'   2493.44  4591.38  1962.93  4066.06   -27  36   2
        90        40       2.0 310 1.434 0 1 0
  2
'EB_Front_Queue_4'  'AG'   1694.57  3439.57  2145.92  3865.8   -19  36   2
        90        40       2.0 710 1.434 0 1 0
  2
'EB_Stewart_Queue_5' 'AG'  1870.13  4129.28 1933.20  4074.7    -25  12   1
        90        50       2.0 150 1.434 0 1 0
  2
'EB_Stewart_Queue_6' 'AG'  2144.27  3851.99 1933.20  4074.7    -25  12   1
        90        50       2.0 110 1.434 0 1 0
  2
'WB_Stewart_Queue_3' 'AG'  2237.70  3809.34 2161.39  3868.59   -25  12   1
        90        50       2.0  20 1.434 0 1 0
  2
'WB_Stewart_Queue_4' 'AG'  2161.39  3868.59 1962.06  4074.80   -25  12   1
        90        50       2.0 190 1.434 0 1 0
 1.0 00. 4 1000. 0  'Y' 10  0 36
```

JOB: Spur399 CO TAQA 2030 RUN: Spur 399 Future 2030 Run

DATE : 5/19/22
TIME : 16:22: 4

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 1. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. EB_Main_L1	*	415.5	1987.9	611.9	2152.2	*	256.	50.	AG	2070.	1.6	23.0	70.0		
2. EB_Main_L2	*	611.9	2152.2	784.3	2331.1	*	248.	44.	AG	2070.	1.6	20.0	70.0		
3. EB_Main_L3	*	784.3	2331.1	887.3	2457.0	*	163.	39.	AG	2070.	1.6	18.0	70.0		
4. EB_Main_L4	*	887.3	2457.0	1433.6	3266.1	*	976.	34.	AG	2070.	1.6	10.0	70.0		
5. EB_Main_L5	*	1433.6	3266.1	1726.3	3607.2	*	449.	41.	AG	1240.	1.6	2.0	58.0		
6. EB_Main_L6	*	1726.3	3607.2	2503.9	4324.2	*	1058.	47.	FL	1240.	1.6	6.0	58.0		
7. EB_Main_L7	*	2503.9	4324.2	2892.8	4569.6	*	460.	58.	BR	1240.	1.6	10.0	58.0		
8. EB_Main_L8	*	2892.8	4569.6	3290.8	4732.6	*	430.	68.	BR	1240.	1.6	5.0	58.0		
9. EB_Main_L9	*	3290.8	4732.6	3829.6	4839.7	*	549.	79.	BR	1240.	1.6	0.0	58.0		
10. EB_Main_L10	*	3829.6	4839.7	4302.8	4836.7	*	473.	90.	BR	1240.	1.6	0.0	58.0		
11. EB_Main_L11	*	4302.8	4836.7	4684.5	4768.2	*	388.	100.	BR	1240.	1.6	0.0	58.0		
12. EB_Main_L12	*	4684.5	4768.2	5492.0	4516.1	*	846.	107.	BR	1240.	1.6	5.0	58.0		
13. EB_Main_L13	*	5492.0	4516.1	7291.1	3942.2	*	1888.	108.	BR	1240.	1.6	5.0	58.0		
14. EB_Main_L14	*	7291.1	3942.2	7439.6	3887.6	*	158.	110.	BR	1720.	1.6	5.0	58.0		
15. EB_Main_L15	*	7439.6	3887.6	7659.9	3791.4	*	240.	114.	BR	1720.	1.6	10.0	70.0		
16. EB_Main_L16	*	7659.9	3791.4	7872.5	3680.1	*	240.	118.	BR	1720.	1.6	10.0	70.0		
17. EB_Main_L17	*	7872.5	3680.1	8140.7	3505.7	*	320.	123.	AG	1720.	1.6	13.0	70.0		
18. EB_Main_L18	*	8140.7	3505.7	8633.2	3236.2	*	561.	119.	AG	1720.	1.6	12.0	70.0		

19. WB_Main_1	*	7872.5	3680.1	8140.7	3505.7	*	320.	123. AG	2590.	1.6	10.0	58.0
20. WB_Main_2	*	8633.2	3236.2	8436.1	3412.1	*	264.	312. AG	2590.	1.6	13.0	58.0
21. WB_Main_3	*	8436.1	3412.1	8310.3	3513.1	*	161.	309. AG	2590.	1.6	8.0	58.0
22. WB_Main_4	*	8310.3	3513.1	8047.3	3695.6	*	320.	305. AG	2590.	1.6	13.0	58.0
23. WB_Main_5	*	8047.3	3695.6	7766.7	3854.1	*	322.	299. BR	2590.	1.6	10.0	58.0
24. WB_Main_6	*	7766.7	3854.1	7322.3	4041.2	*	482.	293. BR	2590.	1.6	10.0	58.0
25. WB_Main_7	*	7322.3	4041.2	4862.5	4837.5	*	2585.	288. BR	2590.	1.6	5.0	58.0
26. WB_Main_8	*	4862.5	4837.5	4402.8	4941.3	*	471.	283. BR	2590.	1.6	0.0	58.0
27. WB_Main_9	*	4402.8	4941.3	4081.1	4965.0	*	323.	274. BR	2590.	1.6	0.0	58.0
28. WB_Main_10	*	4081.1	4965.0	3604.9	4927.2	*	478.	265. BR	2590.	1.6	5.0	58.0
29. WB_Main_11	*	3604.9	4927.2	3291.2	4854.2	*	322.	257. BR	2590.	1.6	10.0	58.0
30. WB_Main_12	*	3291.2	4854.2	2985.2	4741.4	*	326.	250. BR	2590.	1.6	10.0	58.0
31. WB_Main_13	*	2985.2	4741.4	2702.8	4598.2	*	317.	243. BR	2590.	1.6	5.0	58.0
32. WB_Main_14	*	2702.8	4598.2	2437.9	4421.0	*	319.	236. BR	2590.	1.6	10.0	58.0
33. WB_Main_15	*	2437.9	4421.0	2208.6	4220.4	*	305.	229. BR	2590.	1.5	10.0	70.0
34. WB_Main_16	*	2208.6	4220.4	1639.3	3684.5	*	782.	227. FL	3370.	1.5	10.0	70.0
35. WB_Main_17	*	1639.3	3684.5	1513.7	3554.6	*	181.	224. AG	3370.	1.5	6.0	70.0
36. WB_Main_18	*	1513.7	3554.6	1273.8	3252.1	*	386.	218. AG	3370.	1.5	9.0	70.0
37. WB_Main_19	*	1273.8	3252.1	909.4	2710.3	*	653.	214. AG	3370.	1.5	9.0	70.0
38. WB_Main_20	*	909.4	2710.3	799.7	2565.1	*	182.	217. AG	3370.	1.5	14.0	70.0
39. WB_Main_21	*	799.7	2565.1	649.2	2392.3	*	229.	221. AG	3370.	1.5	15.0	70.0
40. EB_Ramp_1	*	1433.6	3266.1	1605.0	3442.8	*	246.	44. AG	830.	1.0	10.0	34.0
41. EB_Ramp_2	*	1605.0	3442.8	2390.5	4185.2	*	1081.	47. FL	830.	1.0	0.0	34.0
42. EB_Ramp_3	*	2390.5	4185.2	2759.4	4498.1	*	484.	50. BR	830.	1.0	7.0	34.0
43. EB_Ramp_4	*	2099.9	3909.4	2929.5	4685.4	*	1136.	47. BR	830.	1.0	12.0	34.0
44. EB_Ramp_5	*	2759.4	4498.1	2929.5	4685.4	*	253.	42. BR	830.	1.0	17.0	34.0

JOB: Spur399 CO TAQA 2030 RUN: Spur 399 Future 2030 Run

DATE : 5/19/22
TIME : 16:22: 4

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)			(G/MI)	(FT)	(FT)		(VEH)

45. EB_Ramp_6	*	2929.5	4685.4	3159.8	4979.8 *	374.	38.	BR	830.	1.0	10.0	34.0
46. EB_Ramp_7	*	3159.8	4979.8	3377.5	5315.3 *	400.	33.	AG	830.	1.0	0.0	34.0
47. EB_Ramp_8	*	3377.5	5315.3	3630.1	5812.3 *	558.	27.	AG	830.	1.0	-25.0	34.0
48. EB_Ramp_9	*	2604.6	4300.4	3288.6	4652.7 *	769.	63.	AG	480.	1.0	-30.0	22.0
49. EB_Ramp_10	*	3288.6	4652.7	3815.2	4784.2 *	543.	76.	AG	480.	1.0	-30.0	22.0
50. EB_Ramp_11	*	3815.2	4784.2	4100.0	4805.6 *	286.	86.	BR	480.	1.0	-25.0	22.0
51. EB_Ramp_12	*	4100.0	4805.6	4648.7	4758.1 *	551.	95.	BR	480.	1.0	-15.0	22.0
52. EB_Ramp_13	*	4648.7	4758.1	5261.4	4577.0 *	639.	106.	BR	480.	1.0	-5.0	22.0
53. EB_Ramp_14	*	5261.4	4577.0	5492.0	4516.1 *	239.	105.	BR	480.	1.0	0.0	22.0
54. WB_Ramp_1	*	3180.6	5158.5	3108.5	5031.2 *	146.	209.	AG	780.	1.0	-30.0	34.0
55. WB_Ramp_2	*	3108.5	5031.2	2986.7	4895.6 *	182.	222.	AG	780.	1.0	-29.0	34.0
56. WB_Ramp_3	*	2986.7	4895.6	2406.2	4424.3 *	748.	231.	BR	780.	1.0	-20.0	34.0
57. WB_Ramp_4	*	2406.2	4424.3	2286.9	4311.5 *	164.	227.	BR	780.	1.0	-10.0	34.0
58. WB_Ramp_5	*	2286.9	4311.5	2209.1	4220.9 *	119.	221.	BR	780.	1.0	0.0	34.0
59. SB_Front_1	*	3180.6	5158.5	3071.9	5037.0 *	163.	222.	AG	310.	1.0	-30.0	46.0
60. SB_Front_2	*	3071.9	5037.0	2923.3	4891.8 *	208.	226.	AG	310.	1.0	-27.0	46.0
61. SB_Front_3	*	2923.3	4891.8	2711.1	4721.0 *	272.	231.	AG	310.	1.0	-28.0	46.0
62. SB_Front_4	*	2711.1	4721.0	2493.4	4561.4 *	270.	234.	AG	310.	1.0	-30.0	46.0
63. SB_Front_5	*	2493.4	4561.4	1962.9	4066.1 *	726.	227.	AG	310.	1.0	-27.0	46.0
64. SB_Front_6	*	1962.9	4066.1	1421.0	3545.0 *	752.	226.	FL	380.	1.0	-10.0	46.0
65. SB_Front_7	*	1421.0	3545.0	1303.6	3388.0 *	196.	217.	AG	270.	1.0	12.0	34.0
66. SB_Front_8	*	1303.6	3388.0	864.1	2737.2 *	785.	214.	AG	270.	1.0	5.0	34.0
67. SB_Front_9	*	864.1	2737.2	769.6	2557.2 *	203.	208.	DP	270.	1.0	0.0	34.0
68. SB_Front_10	*	769.6	2557.2	719.4	2297.8 *	264.	191.	DP	270.	1.0	0.0	34.0
69. SB_Front_11	*	719.4	2297.8	730.1	2049.5 *	249.	178.	DP	270.	1.0	10.0	34.0
70. SB_Front_12	*	730.1	2049.5	695.4	1777.5 *	274.	187.	AG	270.	1.0	30.0	34.0
71. WB_Front_1	*	1421.0	3545.0	1315.1	3430.6 *	156.	223.	AG	110.	1.0	20.0	34.0
72. WB_Front_2	*	1315.1	3430.6	1222.8	3311.3 *	151.	218.	AG	110.	1.0	12.0	34.0
73. WB_Front_3	*	1222.8	3311.3	801.1	2688.2 *	752.	214.	AG	110.	1.0	16.0	34.0
74. WB_Front_4	*	801.1	2688.2	675.7	2530.1 *	202.	218.	AG	110.	1.0	15.0	34.0
75. WB_Front_5	*	675.7	2530.1	552.4	2393.4 *	184.	222.	AG	110.	1.0	11.0	34.0
76. WB_Front_6	*	552.4	2393.4	409.7	2254.5 *	199.	226.	AG	110.	1.0	7.0	34.0
77. WB_Front_7	*	409.7	2254.5	238.4	2110.8 *	224.	230.	AG	110.	1.0	9.0	34.0
78. WB_Front_8	*	238.4	2110.8	-454.9	1629.6 *	844.	235.	AG	110.	1.0	6.0	34.0
79. EB_Front_1	*	1251.0	2909.5	1371.4	3083.6 *	212.	35.	AG	710.	1.0	14.0	46.0
80. EB_Front_2	*	1371.4	3083.6	1538.7	3282.8 *	260.	40.	AG	710.	1.0	12.0	46.0
81. EB_Front_3	*	1538.7	3282.8	1694.6	3439.6 *	221.	45.	AG	710.	1.0	19.0	46.0
82. EB_Front_4	*	1694.6	3439.6	2145.9	3865.8 *	621.	47.	BR	710.	1.0	-19.0	46.0
83. EB_Front_5	*	2145.9	3865.8	2604.6	4300.4 *	632.	47.	BR	630.	1.0	-19.0	34.0
84. EB_Front_6	*	2604.6	4300.4	2766.2	4432.2 *	209.	51.	BR	150.	1.0	-20.0	34.0
85. EB_Front_7	*	2766.2	4432.2	2926.6	4591.5 *	226.	45.	BR	150.	1.0	-25.0	34.0
86. EB_Front_8	*	2926.6	4591.5	3034.9	4732.1 *	178.	38.	BR	150.	1.0	-30.0	34.0

87. EB_Front_9	*	3034.9	4732.1	3294.6	5114.7	*	462.	34.	BR	150.	1.0	-30.0 34.0
88. EB_Front_10	*	3294.6	5114.7	3406.5	5299.5	*	216.	31.	AG	150.	1.0	-30.0 34.0
89. EB_Front_11	*	3406.5	5299.5	3659.5	5797.2	*	558.	27.	AG	150.	1.0	-30.0 34.0
90. EB_Stewart_1	*	1410.4	4244.9	1605.9	4233.4	*	196.	93.	AG	150.	1.5	-8.0 22.0
91. EB_Stewart_ 2	*	1605.9	4233.4	1671.1	4222.7	*	66.	99.	AG	150.	1.5	-12.0 22.0
92. EB_Stewart_3	*	1671.1	4222.7	1805.9	4169.4	*	145.	112.	AG	150.	1.5	-18.0 22.0
93. EB_Stewart_4	*	1805.9	4169.4	1870.1	4129.3	*	76.	122.	AG	150.	1.5	-21.0 22.0
94. EB_Stewart_5	*	1870.1	4129.3	1933.2	4074.7	*	83.	131.	AG	150.	1.5	-24.0 22.0
95. EB_Stewart_6	*	2144.3	3852.0	1933.2	4074.7	*	307.	317.	AG	110.	1.9	-25.0 22.0

JOB: Spur399 CO TAQA 2030 RUN: Spur 399 Future 2030 Run

DATE : 5/19/22
TIME : 16:22: 4

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)			(G/MI)	(FT)	(FT)		(VEH)
96. EB_Stewart_7	*	2144.3	3852.0	2212.6	3804.6	*	83.	125.	AG	30.	1.3	-25.0	22.0		
97. EB_Stewart_8	*	2212.6	3804.6	2547.2	3633.7	*	376.	117.	AG	30.	1.3	-25.0	22.0		
98. EB_Stewart_9	*	2547.2	3633.7	2616.6	3608.1	*	74.	110.	AG	30.	1.3	-28.0	22.0		
99. WB_Stewart_1	*	2626.4	3617.4	2551.7	3645.3	*	80.	291.	AG	20.	1.9	-29.0	22.0		
100. WB_Stewart_2	*	2551.7	3645.3	2237.7	3809.3	*	354.	298.	AG	20.	1.9	-28.0	22.0		
101. WB_Stewart_3	*	2237.7	3809.3	2161.4	3868.6	*	97.	308.	AG	20.	1.9	-25.0	22.0		
102. WB_Stewart_4	*	2161.4	3868.6	1962.1	4074.8	*	287.	316.	AG	190.	1.9	-25.0	22.0		
103. WB_Stewart_5	*	1962.1	4074.8	1893.1	4140.8	*	95.	314.	AG	190.	1.3	-25.0	22.0		
104. WB_Stewart_6	*	1893.1	4140.8	1852.2	4168.1	*	49.	304.	AG	190.	1.3	-26.0	22.0		
105. WB_Stewart_7	*	1852.2	4168.1	1803.2	4195.6	*	56.	299.	AG	190.	1.3	-26.0	22.0		
106. WB_Stewart_8	*	1803.2	4195.6	1724.1	4225.3	*	84.	291.	AG	190.	1.3	-25.0	22.0		
107. WB_Stewart_9	*	1724.1	4225.3	1600.0	4254.9	*	128.	283.	AG	190.	1.3	-20.0	22.0		
108. WB_Stewart_10	*	1600.0	4254.9	1415.1	4265.9	*	185.	273.	AG	190.	1.3	-12.0	22.0		
109. SB_SH5_1	*	3621.9	5920.2	3490.0	5630.1	*	319.	204.	AG	1090.	1.0	-25.0	46.0		
110. SB_SH5_2	*	3490.0	5630.1	3430.9	5521.9	*	123.	209.	AG	1090.	1.0	-30.0	46.0		
111. SB_SH5_3	*	3430.9	5521.9	3325.7	5354.8	*	197.	212.	AG	1090.	1.0	-30.0	46.0		
112. SB_SH5_4	*	3325.7	5354.8	3180.6	5158.5	*	244.	216.	AG	1090.	1.0	-30.0	46.0		

113. SB_Front_Queue_5	*	2493.4	4591.4	2469.4	4567.5	*	34.	225.	AG	3.	100.0	-27.0	36.0
0.19	1.7												
114. EB_Front_Queue_4	*	1694.6	3439.6	1751.0	3492.9	*	78.	47.	AG	3.	100.0	-19.0	36.0
0.43	3.9												
115. EB_Stewart_Queue_5	*	1870.1	4129.3	1901.1	4102.4	*	41.	131.	AG	2.	100.0	-25.0	12.0
0.23	2.1												
116. EB_Stewart_Queue_6	*	2144.3	3852.0	2123.6	3873.8	*	30.	317.	AG	2.	100.0	-25.0	12.0
0.17	1.5												
117. WB_Stewart_Queue_3	*	2237.7	3809.3	2233.4	3812.7	*	5.	308.	AG	2.	100.0	-25.0	12.0
0.03	0.3												
118. WB_Stewart_Queue_4	*	2161.4	3868.6	2125.3	3905.9	*	52.	316.	AG	2.	100.0	-25.0	12.0
0.30	2.6												

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
113. SB_Front_Queue_5	*	90	40	2.0	310	1600	1.43	1	3
114. EB_Front_Queue_4	*	90	40	2.0	710	1600	1.43	1	3
115. EB_Stewart_Queue_5	*	90	50	2.0	150	1600	1.43	1	3
116. EB_Stewart_Queue_6	*	90	50	2.0	110	1600	1.43	1	3
117. WB_Stewart_Queue_3	*	90	50	2.0	20	1600	1.43	1	3
118. WB_Stewart_Queue_4	*	90	50	2.0	190	1600	1.43	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. CS1	*	1463.8	3086.3	36.9	*
2. CS2	*	1161.5	3318.0	9.9	*

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2
0.	0.0	0.0
10.	0.0	0.0
20.	0.0	0.0
30.	0.0	0.0
40.	0.0	0.0
50.	0.0	0.1
60.	0.0	0.1
70.	0.0	0.1
80.	0.0	0.1
90.	0.0	0.1
100.	0.0	0.1
110.	0.0	0.1
120.	0.0	0.0
130.	0.0	0.1
140.	0.0	0.1
150.	0.0	0.1
160.	0.0	0.1
170.	0.0	0.1
180.	0.0	0.1
190.	0.0	0.1
200.	0.0	0.1
210.	0.0	0.0
220.	0.0	0.0
230.	0.1	0.0
240.	0.0	0.0
250.	0.0	0.0
260.	0.0	0.0

270.	*	0.0	0.0
280.	*	0.0	0.0
290.	*	0.0	0.0
300.	*	0.0	0.0
310.	*	0.0	0.0
320.	*	0.0	0.0
330.	*	0.0	0.0
340.	*	0.0	0.0
350.	*	0.0	0.0
360.	*	0.0	0.0
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MAX	*	0.1	0.1
DEGR.	*	230	50

THE HIGHEST CONCENTRATION OF 0.10 PPM OCCURRED AT RECEPTOR REC2 .

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'Spur399 CO TAQA 2050' 60. 0.75 0. 0.  2   0.3048 1 1
'CS1'      1463.786  3086.325   36.9
'CS2'      1161.52   3318.001   9.9
'Spur 399 Future 2050 Run'   118  1  0  'C'
  1
'EB_Main_L1'    'AG'  415.49  1987.86   611.91  2152.20 3170    0.941898963  23 70
  1
'EB_Main_L2'    'AG'  611.91  2152.20   784.26  2331.10 3170    0.941898963  20 70
  1
'EB_Main_L3'    'AG'  784.26  2331.10   887.26  2456.97 3170    0.941898963  18 70
  1
'EB_Main_L4'    'AG'  887.26  2456.97  1433.56  3266.11 3170    0.941898963  10 70
  1
'EB_Main_L5'    'AG'  1433.56 3266.11  1726.30  3607.19 3170    1.010543897  2  58
  1
'EB_Main_L6'    'FL'  1726.30 3607.19   2503.87 4324.20 1900    1.010543897  6  58
  1
'EB_Main_L7'    'BR'  2503.87 4324.20   2892.79 4569.64 1900    1.010543897  10 58
  1
'EB_Main_L8'    'BR'  2892.79 4569.64   3290.84 4732.63 1900    1.010543897  5  58
  1
'EB_Main_L9'    'BR'  3290.84 4732.63   3829.64 4839.74 1900    1.010543897  0  58
  1
'EB_Main_L10'   'BR'  3829.64 4839.74   4302.77 4836.67 1900    1.010543897  0  58
  1
'EB_Main_L11'   'BR'  4302.77 4836.67   4684.46 4768.19 1900    1.010543897  0  58
  1
'EB_Main_L12'   'BR'  4684.46 4768.19   5492.05 4516.08 1900    1.010543897  5  58
  1
'EB_Main_L13'   'BR'  5492.05 4516.08   7291.12 3942.19 1900    1.010543897  5  58
  1
'EB_Main_L14'   'BR'  7291.12 3942.19   7439.65 3887.60 1900    1.010543897  5  58
  1
'EB_Main_L15'   'BR'  7439.65 3887.60   7659.94 3791.45 2520    1.010543897  10 70
  1
'EB_Main_L16'   'BR'  7659.94 3791.45   7872.48 3680.06 2520    1.010543897  10 70
  1
'EB_Main_L17'   'AG'  7872.48 3680.06   8140.69 3505.70 2520    1.010543897  13 70
  1
'EB_Main_L18'    'AG'  8140.69 3505.70  8633.16 3236.21 2520    1.010543897  12 70
  1
'WB_Main_1'     'AG'  7872.48 3680.06   8140.69 3505.70 3980    0.941898963  10 58
  1
'WB_Main_2'     'AG'  8633.16 3236.21   8436.10 3412.06 3980    0.941898963  13 58
  1
'WB_Main_3'     'AG'  8436.1  3412.06   8310.35 3513.08 3980    0.941898963  8  58
  1
'WB_Main_4'     'AG'  8310.35 3513.08   8047.34 3695.63 3980    0.941898963  13 58
  1
'WB_Main_5'     'BR'  8047.34 3695.63   7766.71 3854.12 3980    0.941898963  10 58
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  1
'WB_Main_6'     'BR'  7766.71 3854.12   7322.29 4041.22 3980    0.941898963  10 58
  1
'WB_Main_7'     'BR'  7322.29 4041.22   4862.51 4837.51 3980    0.941898963  5  58
  1
'WB_Main_8'     'BR'  4862.51 4837.51   4402.78 4941.25 3980    0.941898963  0  58
  1
'WB_Main_9'     'BR'  4402.78 4941.25   4081.08 4964.95 3980    0.941898963  0  58
  1
'WB_Main_10'    'BR'  4081.08 4964.95   3604.87 4927.24 3980    0.941898963  5  58
  1
'WB_Main_11'    'BR'  3604.87 4927.24   3291.17 4854.15 3980    0.941898963  10 58
  1
'WB_Main_12'    'BR'  3291.17 4854.15   2985.16 4741.36 3980    0.941898963  10 58
  1
'WB_Main_13'    'BR'  2985.16 4741.36   2702.75 4598.17 3980    0.941898963  5  58
  1
'WB_Main_14'    'BR'  2702.75 4598.17   2437.87 4420.99 3980    0.941898963  10 58
  1
'WB_Main_15'    'BR'  2437.87 4420.99   2208.60 4220.43 3980    0.871292746  10 70
  1
'WB_Main_16'    'FL'  2208.6  4220.43   1639.29 3684.48 3980    0.871292746  10 70
  1
'WB_Main_17'    'AG'  1639.29 3684.48   1513.73 3554.56 5180    0.871292746  6  70
  1
'WB_Main_18'    'AG'  1513.73 3554.56   1273.81 3252.15 5180    0.871292746  9  70
  1
'WB_Main_19'    'AG'  1273.81 3252.15    909.41 2710.26 5180    0.871292746  9  70
  1
'WB_Main_20'    'AG'   909.41 2710.26    799.65 2565.05 5180    0.871292746  14 70
  1
'WB_Main_21'     'AG'   799.65 2565.05   649.15 2392.32 5180    0.871292746  15 70
  1
'EB_Ramp_1'     'AG'  1433.56 3266.11   1604.98 3442.80 1270    0.639464299 010 34
  1
'EB_Ramp_2'     'FL'  1604.98 3442.80   2390.47 4185.16 1270    0.639464299 0   34
  1
'EB_Ramp_3'     'BR'  2390.47 4185.16   2759.38 4498.14 1270    0.639464299 07  34
  1
'EB_Ramp_4'     'BR'  2099.85 3909.40   2929.53 4685.35 1270    0.639464299 012 34
  1
'EB_Ramp_5'     'BR'  2759.38 4498.14   2929.53 4685.35 1270    0.639464299 017 34
  1
'EB_Ramp_6'     'BR'  2929.53 4685.35   3159.79 4979.78 1270    0.639464299 010 34
  1
'EB_Ramp_7'     'AG'  3159.79 4979.78   3377.52 5315.29 1270    0.639464299 00  34
  1
'EB_Ramp_8'     'AG'  3377.52 5315.29   3630.14 5812.34 1270    0.639464299 -25 34
  1
'EB_Ramp_9'     'AG'  2604.63 4300.36   3288.58 4652.67 690     0.602769996 -30 22
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  1
'EB_Ramp_10'    'AG'  3288.58 4652.67   3815.18 4784.24 690     0.602769996 -30 22
  1
'EB_Ramp_11'    'BR'  3815.18 4784.24   4100.02 4805.60 690     0.602769996 -25 22
  1
'EB_Ramp_12'    'BR'  4100.02 4805.60   4648.66 4758.13 690     0.602769996 -15 22
  1
'EB_Ramp_13'    'BR'  4648.66 4758.13   5261.35 4577.04 690     0.602769996  -5 22
  1
'EB_Ramp_14'    'BR'  5261.35 4577.04   5492.05 4516.08 690     0.602769996  0  22
  1
'WB_Ramp_1'     'AG'  3180.55 5158.50   3108.51 5031.16 1200    0.589913561 -30 34
  1
'WB_Ramp_2'     'AG'  3108.51 5031.16   2986.74 4895.64 1200    0.589913561 -29 34
  1
'WB_Ramp_3'     'BR'  2986.74 4895.64   2406.21 4424.34 1200    0.589913561 -20 34
  1
'WB_Ramp_4'     'BR'  2406.21 4424.34   2286.87 4311.47 1200    0.589913561 -10 34
  1
'WB_Ramp_5'     'BR'  2286.87 4311.47   2209.06 4220.87 1200    0.589913561  0  34
  1
'SB_Front_1'    'AG'  3180.55 5158.50   3071.94 5037.02 600     0.602769996 -30 46
  1
'SB_Front_2'    'AG'  3071.94 5037.02   2923.34 4891.84 600     0.602769996 -27 46
  1
'SB_Front_3'    'AG'  2923.34 4891.84   2711.10 4721.02 600     0.602769996 -28 46
  1
'SB_Front_4'    'AG'  2711.1  4721.02   2493.44 4561.38 600     0.602769996 -30 46
  1
'SB_Front_5'    'AG'  2493.44 4561.38   1962.93 4066.06 600     0.602769996 -27 46
  1
'SB_Front_6'    'FL'  1962.93 4066.06   1421.00 3544.97 720     0.602769996 -10 46
  1
'SB_Front_7'    'AG'  1421    3544.97   1303.64 3387.95 570     0.588868164  12 34
  1
'SB_Front_8'    'AG'  1303.64 3387.95    864.07 2737.21 570     0.588868164  5  34
  1
'SB_Front_9'    'DP'  864.07  2737.21   769.57  2557.23 570     0.588868164  0  34
  1
'SB_Front_10'   'DP'  769.57  2557.23   719.38  2297.79 570     0.588868164  0  34
  1
'SB_Front_11'   'DP'  719.38  2297.79   730.08  2049.49 570     0.588868164  10 34
  1
'SB_Front_12'   'AG'  730.08  2049.49   695.37  1777.47 570     0.588868164  30 34
  1
'WB_Front_1'    'AG'  1421    3544.97   1315.12 3430.57 150     0.588868164  20 34
  1
'WB_Front_2'    'AG'  1315.12 3430.57   1222.85 3311.27 150     0.588868164  12 34
  1
'WB_Front_3'    'AG'  1222.85 3311.27   801.13  2688.24 150     0.588868164  16 34
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  1
'WB_Front_4'    'AG'  801.13  2688.24   675.66  2530.15 150     0.588868164  15 34
  1
'WB_Front_5'    'AG'  675.66  2530.15   552.43  2393.44 150     0.588868164  11 34
  1
'WB_Front_6'    'AG'  552.43  2393.44   409.69  2254.46 150     0.588868164  7  34
  1
'WB_Front_7'    'AG'  409.69  2254.46   238.43  2110.81 150     0.588868164  9  34
  1
'WB_Front_8'    'AG'  238.43  2110.81  -454.94  1629.57 150     0.588868164  6  34
  1
'EB_Front_1'    'AG'  1251.02 2909.48   1371.44 3083.58 1090    0.602769996  14 46
  1
'EB_Front_2'    'AG'  1371.44 3083.58   1538.67 3282.79 1090    0.602769996  12 46
  1
'EB_Front_3'    'AG'  1538.67 3282.79   1694.57 3439.57 1090    0.602769996  19 46
  1
'EB_Front_4'    'BR'  1694.57 3439.57   2145.92 3865.80 1090    0.602769996 -19 46
  1
'EB_Front_5'    'BR'  2145.92 3865.80   2604.63 4300.36 950     0.602769996 -19 34
  1
'EB_Front_6'    'BR'  2604.63 4300.36   2766.22 4432.17 280     0.602769996 -20 34
  1
'EB_Front_7'    'BR'  2766.22 4432.17   2926.55 4591.48 280     0.602769996 -25 34
  1
'EB_Front_8'    'BR'  2926.55 4591.48   3034.89 4732.14 280     0.602769996 -30 34
  1
'EB_Front_9'    'BR'  3034.89 4732.14   3294.61 5114.66 280     0.602769996 -30 34
  1
'EB_Front_10'   'AG'  3294.61 5114.66   3406.49 5299.46 280     0.602769996 -30 34
  1
'EB_Front_11'   'AG'  3406.49 5299.46   3659.46 5797.20 280     0.602769996 -30 34
  1
'EB_Stewart_1'  'AG'  1410.44 4244.90   1605.93 4233.42 280     0.904343283  -8 22
  1
'EB_Stewart_2'  'AG'  1605.93 4233.42   1671.10 4222.68 280     0.904343283 -12 22
  1
'EB_Stewart_3'  'AG'  1671.1  4222.68   1805.89 4169.36 280     0.904343283 -18 22
  1
'EB_Stewart_4'  'AG'  1805.89 4169.36   1870.13 4129.28 280     0.904343283 -21 22
  1
'EB_Stewart_5'  'AG'  1870.13 4129.28   1933.20 4074.70 280     0.904343283 -24 22
  1
'EB_Stewart_6'  'AG'  2144.27 3851.99   1933.20 4074.70 200     1.138964905 -25 22
  1
'EB_Stewart_7'  'AG'  2144.27 3851.99   2212.58 3804.60 50      0.712287204 -25 22
  1
'EB_Stewart_8'  'AG'  2212.58 3804.60   2547.21 3633.73 50      0.712287204 -25 22
  1
'EB_Stewart_9'  'AG'  2547.21 3633.73   2616.63 3608.12 50      0.712287204 -28 22
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```
  1
'WB_Stewart_1'   'AG'   2626.36 3617.36   2551.71 3645.30 40      1.042708778 -29 22
  1
'WB_Stewart_2'   'AG'   2551.71 3645.30   2237.70 3809.34 40      1.042708778 -28 22
  1
'WB_Stewart_3'   'AG'   2237.7  3809.34   2161.39 3868.59 40      1.042708778 -25 22
  1
'WB_Stewart_4'   'AG'   2161.39 3868.59   1962.06 4074.80 360     1.10677988 -25  22
  1
'WB_Stewart_5'   'AG'   1962.06 4074.80   1893.08 4140.84 330     1.10677988 -25  22
  1
'WB_Stewart_6'   'AG'   1893.08 4140.84   1852.18 4168.06 330     1.10677988 -26  22
  1
'WB_Stewart_7'   'AG'   1852.18 4168.06   1803.15 4195.57 330     1.10677988 -26  22
  1
'WB_Stewart_8'   'AG'   1803.15 4195.57   1724.09 4225.28 330     1.10677988 -25  22
  1
'WB_Stewart_9'   'AG'   1724.09 4225.28   1599.99 4254.87 330     1.10677988 -20  22
  1
'WB_Stewart_10' 'AG'   1599.99 4254.87   1415.07 4265.89 330     1.10677988 -12  22
  1
'SB_SH5_1'       'AG'   3621.95 5920.17   3490.01 5630.10 1800    0.602769996 -25 46
  1
'SB_SH5_2'       'AG'   3490.01 5630.10   3430.93 5521.89 1800    0.602769996 -30 46
  1
'SB_SH5_3'       'AG'   3430.93 5521.89   3325.73 5354.76 1800    0.602769996 -30 46
  1
'SB_SH5_4'       'AG'   3325.73 5354.76   3180.55 5158.50 1800    0.602769996 -30 46
  2
'SB_Front_Queue_5'   'AG'    2493.44  4591.38  1962.93  4066.06   -27  36   2
        90        40       2.0 600 0.532276968 0 1 0
  2
'EB_Front_Queue_4'   'AG'    1694.57  3439.57  2145.92  3865.8    -19  36   2
        90        40       2.0 1090 0.532276968 0 1 0
  2
'EB_Stewart_Queue_5' 'AG'   1870.13  4129.28 1933.20  4074.7     -25  12   1
        90        50       2.0 280 0.532276968 0 1 0
  2
'EB_Stewart_Queue_6' 'AG'   2144.27  3851.99 1933.20  4074.7     -25  12   1
        90        50       2.0 200 0.532276968 0 1 0
  2
'WB_Stewart_Queue_3' 'AG'   2237.70  3809.34 2161.39  3868.59    -25  12   1
        90        50       2.0  40 0.532276968 0 1 0
  2
'WB_Stewart_Queue_4' 'AG'   2161.39  3868.59 1962.06  4074.80    -25  12   1
        90        50       2.0 360 0.532276968 0 1 0
1.0 00. 4 1000. 0  'Y' 10  0 36
```

JOB: Spur399 CO TAQA 2050 RUN: Spur 399 Future 2050 Run

DATE : 5/19/22
TIME : 16:22: 4

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 1. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. EB_Main_L1	*	415.5	1987.9	611.9	2152.2	*	256.	50.	AG	3170.	0.9	23.0	70.0		
2. EB_Main_L2	*	611.9	2152.2	784.3	2331.1	*	248.	44.	AG	3170.	0.9	20.0	70.0		
3. EB_Main_L3	*	784.3	2331.1	887.3	2457.0	*	163.	39.	AG	3170.	0.9	18.0	70.0		
4. EB_Main_L4	*	887.3	2457.0	1433.6	3266.1	*	976.	34.	AG	3170.	0.9	10.0	70.0		
5. EB_Main_L5	*	1433.6	3266.1	1726.3	3607.2	*	449.	41.	AG	3170.	1.0	2.0	58.0		
6. EB_Main_L6	*	1726.3	3607.2	2503.9	4324.2	*	1058.	47.	FL	1900.	1.0	6.0	58.0		
7. EB_Main_L7	*	2503.9	4324.2	2892.8	4569.6	*	460.	58.	BR	1900.	1.0	10.0	58.0		
8. EB_Main_L8	*	2892.8	4569.6	3290.8	4732.6	*	430.	68.	BR	1900.	1.0	5.0	58.0		
9. EB_Main_L9	*	3290.8	4732.6	3829.6	4839.7	*	549.	79.	BR	1900.	1.0	0.0	58.0		
10. EB_Main_L10	*	3829.6	4839.7	4302.8	4836.7	*	473.	90.	BR	1900.	1.0	0.0	58.0		
11. EB_Main_L11	*	4302.8	4836.7	4684.5	4768.2	*	388.	100.	BR	1900.	1.0	0.0	58.0		
12. EB_Main_L12	*	4684.5	4768.2	5492.0	4516.1	*	846.	107.	BR	1900.	1.0	5.0	58.0		
13. EB_Main_L13	*	5492.0	4516.1	7291.1	3942.2	*	1888.	108.	BR	1900.	1.0	5.0	58.0		
14. EB_Main_L14	*	7291.1	3942.2	7439.6	3887.6	*	158.	110.	BR	1900.	1.0	5.0	58.0		
15. EB_Main_L15	*	7439.6	3887.6	7659.9	3791.4	*	240.	114.	BR	2520.	1.0	10.0	70.0		
16. EB_Main_L16	*	7659.9	3791.4	7872.5	3680.1	*	240.	118.	BR	2520.	1.0	10.0	70.0		
17. EB_Main_L17	*	7872.5	3680.1	8140.7	3505.7	*	320.	123.	AG	2520.	1.0	13.0	70.0		
18. EB_Main_L18	*	8140.7	3505.7	8633.2	3236.2	*	561.	119.	AG	2520.	1.0	12.0	70.0		

19. WB_Main_1	*	7872.5	3680.1	8140.7	3505.7	*	320.	123. AG	3980.	0.9	10.0	58.0
20. WB_Main_2	*	8633.2	3236.2	8436.1	3412.1	*	264.	312. AG	3980.	0.9	13.0	58.0
21. WB_Main_3	*	8436.1	3412.1	8310.3	3513.1	*	161.	309. AG	3980.	0.9	8.0	58.0
22. WB_Main_4	*	8310.3	3513.1	8047.3	3695.6	*	320.	305. AG	3980.	0.9	13.0	58.0
23. WB_Main_5	*	8047.3	3695.6	7766.7	3854.1	*	322.	299. BR	3980.	0.9	10.0	58.0
24. WB_Main_6	*	7766.7	3854.1	7322.3	4041.2	*	482.	293. BR	3980.	0.9	10.0	58.0
25. WB_Main_7	*	7322.3	4041.2	4862.5	4837.5	*	2585.	288. BR	3980.	0.9	5.0	58.0
26. WB_Main_8	*	4862.5	4837.5	4402.8	4941.3	*	471.	283. BR	3980.	0.9	0.0	58.0
27. WB_Main_9	*	4402.8	4941.3	4081.1	4965.0	*	323.	274. BR	3980.	0.9	0.0	58.0
28. WB_Main_10	*	4081.1	4965.0	3604.9	4927.2	*	478.	265. BR	3980.	0.9	5.0	58.0
29. WB_Main_11	*	3604.9	4927.2	3291.2	4854.2	*	322.	257. BR	3980.	0.9	10.0	58.0
30. WB_Main_12	*	3291.2	4854.2	2985.2	4741.4	*	326.	250. BR	3980.	0.9	10.0	58.0
31. WB_Main_13	*	2985.2	4741.4	2702.8	4598.2	*	317.	243. BR	3980.	0.9	5.0	58.0
32. WB_Main_14	*	2702.8	4598.2	2437.9	4421.0	*	319.	236. BR	3980.	0.9	10.0	58.0
33. WB_Main_15	*	2437.9	4421.0	2208.6	4220.4	*	305.	229. BR	3980.	0.9	10.0	70.0
34. WB_Main_16	*	2208.6	4220.4	1639.3	3684.5	*	782.	227. FL	3980.	0.9	10.0	70.0
35. WB_Main_17	*	1639.3	3684.5	1513.7	3554.6	*	181.	224. AG	5180.	0.9	6.0	70.0
36. WB_Main_18	*	1513.7	3554.6	1273.8	3252.1	*	386.	218. AG	5180.	0.9	9.0	70.0
37. WB_Main_19	*	1273.8	3252.1	909.4	2710.3	*	653.	214. AG	5180.	0.9	9.0	70.0
38. WB_Main_20	*	909.4	2710.3	799.7	2565.1	*	182.	217. AG	5180.	0.9	14.0	70.0
39. WB_Main_21	*	799.7	2565.1	649.2	2392.3	*	229.	221. AG	5180.	0.9	15.0	70.0
40. EB_Ramp_1	*	1433.6	3266.1	1605.0	3442.8	*	246.	44. AG	1270.	0.6	10.0	34.0
41. EB_Ramp_2	*	1605.0	3442.8	2390.5	4185.2	*	1081.	47. FL	1270.	0.6	0.0	34.0
42. EB_Ramp_3	*	2390.5	4185.2	2759.4	4498.1	*	484.	50. BR	1270.	0.6	7.0	34.0
43. EB_Ramp_4	*	2099.9	3909.4	2929.5	4685.4	*	1136.	47. BR	1270.	0.6	12.0	34.0
44. EB_Ramp_5	*	2759.4	4498.1	2929.5	4685.4	*	253.	42. BR	1270.	0.6	17.0	34.0

JOB: Spur399 CO TAQA 2050 RUN: Spur 399 Future 2050 Run

DATE : 5/19/22
TIME : 16:22: 4

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)			(G/MI)	(FT)	(FT)		(VEH)

45. EB_Ramp_6	*	2929.5	4685.4	3159.8	4979.8	*	374.	38.	BR	1270.	0.6	10.0	34.0
46. EB_Ramp_7	*	3159.8	4979.8	3377.5	5315.3	*	400.	33.	AG	1270.	0.6	0.0	34.0
47. EB_Ramp_8	*	3377.5	5315.3	3630.1	5812.3	*	558.	27.	AG	1270.	0.6	-25.0	34.0
48. EB_Ramp_9	*	2604.6	4300.4	3288.6	4652.7	*	769.	63.	AG	690.	0.6	-30.0	22.0
49. EB_Ramp_10	*	3288.6	4652.7	3815.2	4784.2	*	543.	76.	AG	690.	0.6	-30.0	22.0
50. EB_Ramp_11	*	3815.2	4784.2	4100.0	4805.6	*	286.	86.	BR	690.	0.6	-25.0	22.0
51. EB_Ramp_12	*	4100.0	4805.6	4648.7	4758.1	*	551.	95.	BR	690.	0.6	-15.0	22.0
52. EB_Ramp_13	*	4648.7	4758.1	5261.4	4577.0	*	639.	106.	BR	690.	0.6	-5.0	22.0
53. EB_Ramp_14	*	5261.4	4577.0	5492.0	4516.1	*	239.	105.	BR	690.	0.6	0.0	22.0
54. WB_Ramp_1	*	3180.6	5158.5	3108.5	5031.2	*	146.	209.	AG	1200.	0.6	-30.0	34.0
55. WB_Ramp_2	*	3108.5	5031.2	2986.7	4895.6	*	182.	222.	AG	1200.	0.6	-29.0	34.0
56. WB_Ramp_3	*	2986.7	4895.6	2406.2	4424.3	*	748.	231.	BR	1200.	0.6	-20.0	34.0
57. WB_Ramp_4	*	2406.2	4424.3	2286.9	4311.5	*	164.	227.	BR	1200.	0.6	-10.0	34.0
58. WB_Ramp_5	*	2286.9	4311.5	2209.1	4220.9	*	119.	221.	BR	1200.	0.6	0.0	34.0
59. SB_Front_1	*	3180.6	5158.5	3071.9	5037.0	*	163.	222.	AG	600.	0.6	-30.0	46.0
60. SB_Front_2	*	3071.9	5037.0	2923.3	4891.8	*	208.	226.	AG	600.	0.6	-27.0	46.0
61. SB_Front_3	*	2923.3	4891.8	2711.1	4721.0	*	272.	231.	AG	600.	0.6	-28.0	46.0
62. SB_Front_4	*	2711.1	4721.0	2493.4	4561.4	*	270.	234.	AG	600.	0.6	-30.0	46.0
63. SB_Front_5	*	2493.4	4561.4	1962.9	4066.1	*	726.	227.	AG	600.	0.6	-27.0	46.0
64. SB_Front_6	*	1962.9	4066.1	1421.0	3545.0	*	752.	226.	FL	720.	0.6	-10.0	46.0
65. SB_Front_7	*	1421.0	3545.0	1303.6	3388.0	*	196.	217.	AG	570.	0.6	12.0	34.0
66. SB_Front_8	*	1303.6	3388.0	864.1	2737.2	*	785.	214.	AG	570.	0.6	5.0	34.0
67. SB_Front_9	*	864.1	2737.2	769.6	2557.2	*	203.	208.	DP	570.	0.6	0.0	34.0
68. SB_Front_10	*	769.6	2557.2	719.4	2297.8	*	264.	191.	DP	570.	0.6	0.0	34.0
69. SB_Front_11	*	719.4	2297.8	730.1	2049.5	*	249.	178.	DP	570.	0.6	10.0	34.0
70. SB_Front_12	*	730.1	2049.5	695.4	1777.5	*	274.	187.	AG	570.	0.6	30.0	34.0
71. WB_Front_1	*	1421.0	3545.0	1315.1	3430.6	*	156.	223.	AG	150.	0.6	20.0	34.0
72. WB_Front_2	*	1315.1	3430.6	1222.8	3311.3	*	151.	218.	AG	150.	0.6	12.0	34.0
73. WB_Front_3	*	1222.8	3311.3	801.1	2688.2	*	752.	214.	AG	150.	0.6	16.0	34.0
74. WB_Front_4	*	801.1	2688.2	675.7	2530.1	*	202.	218.	AG	150.	0.6	15.0	34.0
75. WB_Front_5	*	675.7	2530.1	552.4	2393.4	*	184.	222.	AG	150.	0.6	11.0	34.0
76. WB_Front_6	*	552.4	2393.4	409.7	2254.5	*	199.	226.	AG	150.	0.6	7.0	34.0
77. WB_Front_7	*	409.7	2254.5	238.4	2110.8	*	224.	230.	AG	150.	0.6	9.0	34.0
78. WB_Front_8	*	238.4	2110.8	-454.9	1629.6	*	844.	235.	AG	150.	0.6	6.0	34.0
79. EB_Front_1	*	1251.0	2909.5	1371.4	3083.6	*	212.	35.	AG	1090.	0.6	14.0	46.0
80. EB_Front_2	*	1371.4	3083.6	1538.7	3282.8	*	260.	40.	AG	1090.	0.6	12.0	46.0
81. EB_Front_3	*	1538.7	3282.8	1694.6	3439.6	*	221.	45.	AG	1090.	0.6	19.0	46.0
82. EB_Front_4	*	1694.6	3439.6	2145.9	3865.8	*	621.	47.	BR	1090.	0.6	-19.0	46.0
83. EB_Front_5	*	2145.9	3865.8	2604.6	4300.4	*	632.	47.	BR	950.	0.6	-19.0	34.0
84. EB_Front_6	*	2604.6	4300.4	2766.2	4432.2	*	209.	51.	BR	280.	0.6	-20.0	34.0
85. EB_Front_7	*	2766.2	4432.2	2926.6	4591.5	*	226.	45.	BR	280.	0.6	-25.0	34.0
86. EB_Front_8	*	2926.6	4591.5	3034.9	4732.1	*	178.	38.	BR	280.	0.6	-30.0	34.0

87. EB_Front_9	*	3034.9	4732.1	3294.6	5114.7	*	462.	34.	BR	280.	0.6	-30.0 34.0
88. EB_Front_10	*	3294.6	5114.7	3406.5	5299.5	*	216.	31.	AG	280.	0.6	-30.0 34.0
89. EB_Front_11	*	3406.5	5299.5	3659.5	5797.2	*	558.	27.	AG	280.	0.6	-30.0 34.0
90. EB_Stewart_1	*	1410.4	4244.9	1605.9	4233.4	*	196.	93.	AG	280.	0.9	-8.0 22.0
91. EB_Stewart_2	*	1605.9	4233.4	1671.1	4222.7	*	66.	99.	AG	280.	0.9	-12.0 22.0
92. EB_Stewart_3	*	1671.1	4222.7	1805.9	4169.4	*	145.	112.	AG	280.	0.9	-18.0 22.0
93. EB_Stewart_4	*	1805.9	4169.4	1870.1	4129.3	*	76.	122.	AG	280.	0.9	-21.0 22.0
94. EB_Stewart_5	*	1870.1	4129.3	1933.2	4074.7	*	83.	131.	AG	280.	0.9	-24.0 22.0
95. EB_Stewart_6	*	2144.3	3852.0	1933.2	4074.7	*	307.	317.	AG	200.	1.1	-25.0 22.0

JOB: Spur399 CO TAQA 2050 RUN: Spur 399 Future 2050 Run

DATE : 5/19/22
TIME : 16:22: 4

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)			(G/MI)	(FT)	(FT)		(VEH)
96. EB_Stewart_7	*	2144.3	3852.0	2212.6	3804.6	*	83.	125.	AG	50.	0.7	-25.0	22.0		
97. EB_Stewart_8	*	2212.6	3804.6	2547.2	3633.7	*	376.	117.	AG	50.	0.7	-25.0	22.0		
98. EB_Stewart_9	*	2547.2	3633.7	2616.6	3608.1	*	74.	110.	AG	50.	0.7	-28.0	22.0		
99. WB_Stewart_1	*	2626.4	3617.4	2551.7	3645.3	*	80.	291.	AG	40.	1.0	-29.0	22.0		
100. WB_Stewart_2	*	2551.7	3645.3	2237.7	3809.3	*	354.	298.	AG	40.	1.0	-28.0	22.0		
101. WB_Stewart_3	*	2237.7	3809.3	2161.4	3868.6	*	97.	308.	AG	40.	1.0	-25.0	22.0		
102. WB_Stewart_4	*	2161.4	3868.6	1962.1	4074.8	*	287.	316.	AG	360.	1.1	-25.0	22.0		
103. WB_Stewart_5	*	1962.1	4074.8	1893.1	4140.8	*	95.	314.	AG	330.	1.1	-25.0	22.0		
104. WB_Stewart_6	*	1893.1	4140.8	1852.2	4168.1	*	49.	304.	AG	330.	1.1	-26.0	22.0		
105. WB_Stewart_7	*	1852.2	4168.1	1803.2	4195.6	*	56.	299.	AG	330.	1.1	-26.0	22.0		
106. WB_Stewart_8	*	1803.2	4195.6	1724.1	4225.3	*	84.	291.	AG	330.	1.1	-25.0	22.0		
107. WB_Stewart_9	*	1724.1	4225.3	1600.0	4254.9	*	128.	283.	AG	330.	1.1	-20.0	22.0		
108. WB_Stewart_10	*	1600.0	4254.9	1415.1	4265.9	*	185.	273.	AG	330.	1.1	-12.0	22.0		
109. SB_SH5_1	*	3621.9	5920.2	3490.0	5630.1	*	319.	204.	AG	1800.	0.6	-25.0	46.0		
110. SB_SH5_2	*	3490.0	5630.1	3430.9	5521.9	*	123.	209.	AG	1800.	0.6	-30.0	46.0		
111. SB_SH5_3	*	3430.9	5521.9	3325.7	5354.8	*	197.	212.	AG	1800.	0.6	-30.0	46.0		
112. SB_SH5_4	*	3325.7	5354.8	3180.6	5158.5	*	244.	216.	AG	1800.	0.6	-30.0	46.0		

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     113. SB_Front_Queue_5    *   2493.4    4591.4    2446.8    4545.2 *      66.   225. AG      1. 100.0 -27.0 36.0
0.37   3.3
     114. EB_Front_Queue_4    *   1694.6    3439.6    1781.2    3521.4 *     119.    47. AG      1. 100.0 -19.0 36.0
0.67   6.1
     115. EB_Stewart_Queue_5  *   1870.1    4129.3    1928.0    4079.2 *      77.   131. AG      1. 100.0 -25.0 12.0
0.44   3.9
     116. EB_Stewart_Queue_6  *   2144.3    3852.0    2106.7    3891.7 *      55.   317. AG      1. 100.0 -25.0 12.0
0.31   2.8
     117. WB_Stewart_Queue_3  *   2237.7    3809.3    2229.1    3816.0 *      11.   308. AG      1. 100.0 -25.0 12.0
0.06   0.6
     118. WB_Stewart_Queue_4  *   2161.4    3868.6    2093.0    3939.4 *      98.   316. AG      1. 100.0 -25.0 12.0
0.56   5.0
```


JOB: Spur399 CO TAQA 2050 RUN: Spur 399 Future 2050 Run

DATE : 5/19/22
TIME : 16:22: 4

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
113. SB_Front_Queue_5	90	40	2.0	600	1600	0.53	1	3
114. EB_Front_Queue_4	90	40	2.0	1090	1600	0.53	1	3
115. EB_Stewart_Queue_5	90	50	2.0	280	1600	0.53	1	3
116. EB_Stewart_Queue_6	90	50	2.0	200	1600	0.53	1	3
117. WB_Stewart_Queue_3	90	50	2.0	40	1600	0.53	1	3
118. WB_Stewart_Queue_4	90	50	2.0	360	1600	0.53	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. CS1	1463.8	3086.3	36.9
2. CS2	1161.5	3318.0	9.9

JOB: Spur399 CO TAQA 2050 RUN: Spur 399 Future 2050 Run

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2
0.	0.0	0.0
10.	0.0	0.0
20.	0.0	0.0
30.	0.0	0.0
40.	0.0	0.0
50.	0.0	0.0
60.	0.0	0.1
70.	0.0	0.1
80.	0.0	0.1
90.	0.0	0.1
100.	0.0	0.1
110.	0.0	0.1
120.	0.0	0.0
130.	0.0	0.1
140.	0.0	0.1
150.	0.0	0.1
160.	0.0	0.1
170.	0.0	0.1
180.	0.0	0.1
190.	0.0	0.1
200.	0.0	0.1
210.	0.0	0.0
220.	0.0	0.0
230.	0.1	0.0
240.	0.0	0.0
250.	0.0	0.0
260.	0.0	0.0

270.	*	0.0	0.0
280.	*	0.0	0.0
290.	*	0.0	0.0
300.	*	0.0	0.0
310.	*	0.0	0.0
320.	*	0.0	0.0
330.	*	0.0	0.0
340.	*	0.0	0.0
350.	*	0.0	0.0
360.	*	0.0	0.0
MAX	*	0.1	0.1
DEGR.	*	230	60

THE HIGHEST CONCENTRATION OF 0.10 PPM OCCURRED AT RECEPTOR REC2 .

ATTACHMENT C: TRAFFIC DATA

Table C: Provided Traffic Data from HDR, Inc. Used in CO TAQA Quantitative Analysis

Road Type	Road Name	Shortened Name	Traffic Direction	Link_ID	Mixing Width (ft)	2030 AM Peak Volume (veh/hr)	2030 AM Peak Speed (mph)	2030 PM Peak Volume (veh/hr)	2030 PM Peak Speed (mph)	2050 AM Peak Volume (veh/hr)	2050 AM Peak Speed (mph)	2050 PM Peak Volume (veh/hr)	2050 PM Peak Speed (mph)	Segment Length (feet)
Mainlanes	EB Stewart ONR to Airport OFR	EB 399 North Link	EB	9	70	1250	71.4	1720	71.3	1900	71.3	2520	70.9	2847.036621
Mainlanes	EB SH 5 OFR to Stewart ONR	EB 399 Middle Link	EB	7	58	800	71.7	1240	71.6	1210	71.7	1900	71.4	4657.742042
Mainlanes	EB Medical Center ONR to SH 5 OFR	EB 399 South Link	EB	5	70	1350	71.2	2070	70.7	2060	70.6	3170	68.4	1643.659058
Mainlanes	WB Airport ONR to SH 5 ONR	WB 399 North Link	WB	32	22	2590	70.9	1680	71.5	3980	70	2610	71	6998.547469
Mainlanes	WB SH 5 ONR to Medical Center OFR	WB 399 South Link	WB	34	22	3370	70.3	2210	70.6	5180	68.2	3410	69.9	2413.549312
Ramps	EB SH 5 OFR	EB SH5 Off Ramp	EB	6	70	550	57.9	830	57.7	850	57.6	1270	56.9	3395.724041
Ramps	EB Stewart ONR	EB Stewart On Ramp	EB	8	58	450	43	480	43.5	690	42.7	620	43.3	3030.076274
Ramps	WB SH 5 ONR	WB SH5 On Ramp	WB	33	22	780	49.7	530	46.4	1200	48.8	800	46.1	1360.713022
Frontage Roads	SB SH 5 ONR to Stewart SB	SB Frontage North Link	SB	69	46	310	44.1	290	44.2	600	42.2	410	43.8	1639.128099
Frontage Roads	SB Stewart to Greenville DC	SB Frontage Middle Link	SB	70	22	380	42.7	310	42.5	720	42.4	490	42.3	751.977641
Frontage Roads	WB Greenville DC to Medical Center OFR	WB Frontage South Link	SB	72	22	110	45.3	90	45.2	150	45.2	130	45.2	2711.980616
Frontage Roads	EB SH 5 DC	EB Frontage North Link	NB	44	70	150	43.3	150	43.4	260	42.8	280	43	1848.740889
Frontage Roads	EB Stewart to SH 5 DC	EB Frontage Middle Link	NB	43	70	600	43.3	630	43.4	950	42.8	900	43	631.872864
Frontage Roads	EB Stewart OFR to Stewart EB	EB Frontage South Link	NB	42	58	690	43.5	710	43.1	1060	43.1	1090	42.6	1313.81859
Frontage Roads	SB Greenville DC	SB Greenville Link	SB	71	70	270	45.1	220	45.2	570	45	360	45.1	1973.39427
Local Road	SB SH 5 to SH 5 ONR	SB SH5 Link	SB	68	22	1090	44.1	820	44.2	1800	42.2	1210	43.8	883.689781
Local Road	WB Stewart - 3	WB Stewart West Link	WB	85	22	170	29.3	190	29.2	270	10.6	330	29.2	598.413838
Local Road	WB Stewart - 2	WB Stewart Middle Link	WB	86	22	190	11.8	180	11.8	290	29.2	360	10.2	286.798653
Local Road	WB Stewart	WB Stewart East Link	WB	84	22	20	13.2	20	14.5	40	13	40	14.1	530.594329
Local Road	EB Stewart	EB Stewart West Link	EB	87	58	150	21.8	140	22.1	280	20.2	230	20.9	566.056035
Local Road	EB Stewart - 2	EB Stewart Middle Link	EB	88	58	100	12.8	110	12.6	200	10	180	9.9	306.834002
Local Road	EB Stewart - 3	EB Stewart East Link	EB	89	58	20	28.7	30	28.1	40	28.4	50	28.1	532.867964

Mobile Source Air Toxics Technical Report

Spur 399 Extension
CSJ 0364-04-051, 0047-05-058, 0047-10-002

From US 75 to US 380

Collin County

Texas Department of Transportation, Dallas District

July 2022

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 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

Table of Contents

1.0 Project Background 1
1.1 Existing Facility 1
1.2 Proposed Facility 2
2.0 Mobile Source Air Toxics 2
2.1 Qualitative Analysis 3
2.1.1 Background Information 3
2.1.2 Project Specific MSAT Information 5
2.2 Quantitative Analysis 7
2.2.1 Analysis Results 14
2.2.2 Conclusion 16

Tables

Table 2-1: VMT per Day by Road Type and Design Scenario 8
Table 2-2: Peak and Off-Peak Speeds Used for MSAT Analysis 9
Table 2-3: Existing Emission Factors by Road Type for Peak and Off-peak Hours 11
Table 2-4: 2050 No-Build Emission Factors by Road Type for Peak and Off-peak Hours 12
Table 2-5: 2050 Build Emission Factors by Road Type for Peak and Off-peak Hours 13
Table 2-6: Mass of MSAT Emissions in Tons per Year and Percent Change in 2050 (Build) Compared to the 2020 Base Scenario 14

Graphs

Figure 2-1: FHWA Projected National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways Using EPA's MOVES2014a Model 4
Graph 2-2: Priority MSAT Emissions and VMT 15
Graph 2-3: Total MSAT Emissions and VMT per Scenario 15

Attachments

Attachment A: Exhibits

Exhibit 1- Project Location Map

Exhibit 2- Typical Sections

Exhibit 3- Affected Network Links

Exhibit 4- Traffic Data

Attachment B: Coordination Meeting Minutes

1.0 Project Background

In 2020, the Texas Department of Transportation (TxDOT) completed the *US 380 Collin County Feasibility Study* that recommended the development of a new freeway facility extending across the county from the Denton County to the 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. The Project location and termini are shown in the Project Location Map provided in **Appendix A**. 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.

Roadway projects may be subject to a quantitative Mobile Source Air Toxics (MSAT) analysis if the project will add capacity, is a Federal Highway Administration (FHWA) and/or Federal Transit Administration (FTA) project, has a design year annual average daily traffic (AADT) greater than 140,000 vehicles per day (vpd), affects a major intermodal facility or port located in proximity to a populated area, or public concern has been raised regarding MSAT emissions. The proposed project would increase capacity and the AADT in the design year is above 140,000 vpd; therefore, a quantitative MSAT analysis is required. This assessment is based on the issues discussed and the resolutions agreed upon during a conference call with TxDOT ENV, the North Central Texas Council of Governments (NCTCOG), and Burns & McDonnell on March 11, 2022 and the discussion on May 20, 2022, regarding vehicle miles traveled (VMT) and the affected roadway network. Notes from these coordination calls may be found in **Attachment B**.

1.1 Existing Facility

The existing highway system consists of US 75/Sam Rayburn Tollway (SRT)-State Highway (SH) SH 121, SH 5, and US 380. These roadways provide the primary connections between the northern and eastern portions of Collin County and the rest of the Dallas Metroplex. In 2022, SH 5 from the intersection with existing Spur 399 to Farm to Market (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 right-of-way (ROW) width varies from 150 feet to 320 feet. The section contains a bridge crossing of Wilson Creek.

A project to improve SH 5 from South of Farm to Market (FM) 1378 (Country Club Road) to South of County Road (CR) 275 (CSJs 0047-05-054, 0047-09-034, and 0364-04-049), cleared in 2020, is anticipated to be under construction in June 2027 before the Spur 399 Extension. These SH 5 improvements would reconstruct the 4-lane divided roadway 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. The mainlanes would transition from 11-feet-wide to 12-feet-wide after the Wilson Creek Bridges. The two existing bridges over Wilson Creek would be replaced

with two wider bridges with three mainlanes in each direction and extended shoulders/additional lane width (unstriped) on the outside to accommodate future capacity. The intersection at Stewart Road would be grade-separated with no signals on the frontage road. The improvements would be accomplished primarily within existing ROW with minor new ROW acquisition in areas around Stewart Road, and various corner clips along the corridor.

In addition, a project to improve US 380 east of McKinney from Airport Drive to CR 458 has also been approved within the Spur 399 Extension study area (CSJs 0135-03-046 and 0135-04-033). This approved US 380 project 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 ROW. The project was environmentally cleared on January 15, 2020, and is anticipated to let for construction in February 2024.

1.2 Proposed Facility

The Preferred Alternative (Orange Alternative) would construct an 8-lane freeway with frontage roads connecting US 75 (southern terminus) and US 380 (northern terminus) around the southeastern quadrant of McKinney, Texas. The future build (2050) scenario adds 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. The 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. The current Preferred Alternative (analyzed in this document for air toxics) continues east on new location (no current alignment) crossing Airport Drive/Old Mill Road, and continuing further east and south around the southern end of the McKinney National Airport, then turning north near CR 317 to connect to US 380 east of the Airport, 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 of the 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 Preferred Alternative would vary from 165 feet-wide to 696 feet-wide.

2.0 Mobile Source Air Toxics

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 75 and US 380 including frontage roads and grade-separated interchanges. This MSAT Analysis was performed in accordance with TxDOT's "Environmental Guide: Volume 2 Activity Instructions", "Quantitative MSAT Technical Report Documentation Standard", and "Review

Standard for a Quantitative MSAT Technical Report", available on the TxDOT Environmental Toolkit and the TxDOT Air Quality Toolkit websites. The methodology, assumptions, and procedure used in the MSAT analysis are discussed in detail in the following sections. The existing year (2020), design year (2050) Build, and No-Build scenarios were analyzed as part of the MSAT analysis.

2.1 Qualitative Analysis

2.1.1 Background Information

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS)[1]. In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA)[2]. These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

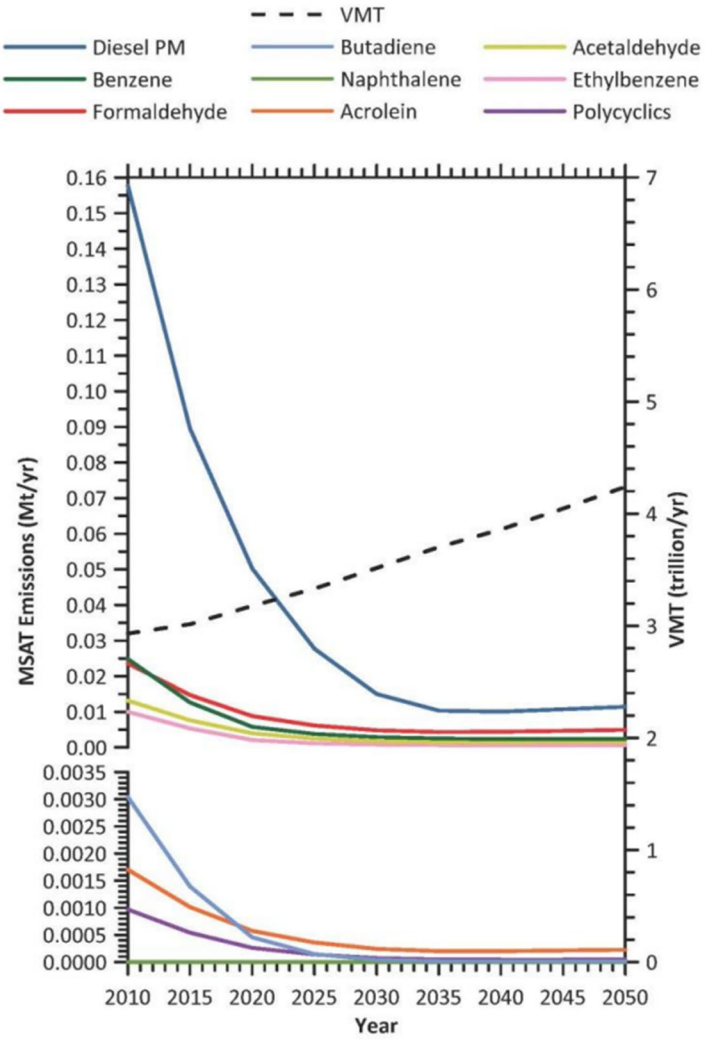
2.1.1.1 Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and VMT data. MOVES2014 incorporates the effects of three new Federal emissions standard rules not included in MOVES2010. These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017 (79 FR 60344), heavy-duty greenhouse gas regulations that phase in during model years 2014-2018 (79 FR 60344), and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025 (79 FR 60344). Since the release of MOVES2014, EPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide[3], EPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions. The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014.

[1] https://www.epa.gov/iris
[2] https://www.epa.gov/national-air-toxics-assessment
[3] https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNR0.txt

Using EPA's MOVES2014a model, as shown in **Figure 2-1**, 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.

Figure 2-1: FHWA Projected National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways Using EPA's MOVES2014a Model[4]



Source: EPA MOVES2014a model runs conducted by FHWA, September 2016.
Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorological, and other factors.

Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT

[4] https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm#fig1

projections than MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

2.1.1.2 MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

2.1.2 Project Specific MSAT Information

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*[5].

Under the Build scenario/Preferred Alternative in the design year (2050), it is expected there would be reduced MSAT emissions in the immediate area of the Project, relative to the No Build Alternative, due to the reduced VMT associated with more direct routing. Under the Build scenario/Preferred 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 to connect the existing SH 5/Spur 399 and US 380, around the McKinney Airport. However, the magnitude and the 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 (Build or No-Build), 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. 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.

2.1.3 Incomplete or Unavailable Information for Project Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process

[5]https://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm

through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action. Consistent with 40 CFR 1502.22 (regarding incomplete and unavailable information) FHWA does not conduct MSAT health impacts for the reasons described below.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the CAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects".[6] Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the HEI. A number of HEI studies are summarized in Appendix D of FHWA's *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*.[7] Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations[8] or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI[9]. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently

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6 EPA, http://www.epa.gov/iris/

7 https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

8 HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects

9 Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects

confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk[10]."

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable[11] .

Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable. Because of the limitations in the methodologies for forecasting the health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, which are better suited for quantitative analysis.

In this document, a quantitative MSAT assessment is provided relative to the various alternatives and has acknowledged that the Preferred Alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

2.2 Quantitative Analysis

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. For the purposes of this MSAT analysis, the affected network links for the 2020 Existing and 2050 scenarios were considered to be all of the links within the study area, SH 5, US 380, US 75, and Airport Drive (**Exhibit 3** of **Attachment A**). The analysis was performed in accordance with the methodology established during the Air Quality Consultative Call with TxDOT on March 11, 2022 and further clarified and discussed in the call on May

10 EPA IRIS database, Diesel Engine Exhaust, Section II.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642_summary.pdf

11 https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf

20, 2022. In additional to the methodology discussed in these calls, the analysis was conducted in accordance with Environmental Guide: Volume 2 Activity Instructions (July 2021).

MSAT emissions are calculated by multiplying the applicable emission factor for each priority MSAT by the VMT for each time period for each network link. The aggregated VMT for each of the affected network links is used to determine the total VMT for the network, and the aggregated emission for each priority MSAT is the total MSAT emissions of the affected network.

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) from the line diagrams provided by HDR, Inc. (2050 No-Build and 2050 Build scenarios) and the NCTCOG (2020 Existing Scenarios). The 2050 No-Build and Build traffic volumes provided by HDR, Inc. were derived from TxDOT Dallas District approved traffic volumes (Traffic Analysis for Highway Design [THAD] reports received on October 27, 2021 [Orange] and November 9, 2021 [Purple]). The future build and future no-build traffic volumes for US 380 and US 75 were estimated by Burns & McDonnell utilizing the methodology discussed in the conference call on May 20, 2022 and approved by the Dallas District. These values were estimated by determining the expected percentage increase of traffic for the area and calculating the increases for these segments based on the NCTCOG data provided for the existing year. No specific ramp data was provided in the 2050 No-Build Alternative, so the ramp VMT was ratioed based on the ramp, frontage road, and restricted mainlane data compiled for the Base Year scenario analyzed. The total VMT within the study area for the 2020 Existing scenario is 369,129,889. The total VMT for the 2050 No-Build scenario is 542,112,650, and the VMT in the 2050 Build scenario is 398,341,093. The VMT totals by road type category are shown in **Table 2-2**. Traffic data utilized in the MSAT analysis is listed in **Exhibit 4**.

Table 2-1: VMT per Day by Road Type and Design Scenario

Road Type	Base (Existing) Year 2020	No Build 2050	Build 2050
	VMT per day	VMT per day	VMT per day
Frontage Roads	62,712	83,196	119,985
On/Off Ramps	20,098	33,117	65,279
Main Lanes-Restricted	308,528	528,527	624,397
Main Lanes-Unrestricted	570,025	498,153	112,978
Local roads	49,951	342,247	168,706
Annual Total	369,129,889	542,112,650	398,341,093

Both peak (congested) and off-peak (free flowing) hours were included in the quantitative MSAT analysis because MSAT emissions are higher at slower speeds. To conservatively account for peak-hour traffic, it was assumed that the entire network experiences 6 hours of congestion per day. The remaining 18 hours per day are assumed to experience free-flowing traffic at the posted speeds plus 5 miles per hour (mph). Where the congested speeds were not known it was assumed to be the posted speed minus 5 mph.

For the purposes of the MSAT analysis, representative speeds were used for each road type category (frontage roads, ramps, main lanes, and local roads) during both peak and off-peak hours. Average peak hour speeds for the frontage roads, ramps, mainlanes, and local roads were obtained from the VISSIM traffic simulation models developed by HDR. A conservative value for peak-hour frontage road speeds was also provided by HDR. As mentioned above, the most representative posted speed for each road type was used for off-peak hour traffic speeds. The speeds used in the MSAT analysis for each road type, year, and traffic condition are shown in **Table 2-2**.

Table 2-2: Peak and Off-Peak Speeds Used for MSAT Analysis

Road Type	Base Year		No Build 2050		Build 2050	
	Peak Hours Speed (mph)	Off-Peak Hours Speed (mph)	Peak Hours Speed (mph)	Off-Peak Hours Speed (mph)	Peak Hours Speed (mph)	Off-Peak Hours Speed (mph)
Frontage Roads	35	60	30	60	42	60
On/Off Ramps	42	55	42[B]	55[B]	52	50
Mainlanes	54	65	46[A]	65[A]	68[A]	65[A]
Local Roads	27	50	29	50	19	50

a) Values shown are for SH5 and the proposed Spur 399. US 380 and US 75 Peak Speed was estimated to be 65 mph and off-peak hours speed was estimated to be 75 mph
b) Ramp speeds for the 2050 No Build Scenario were assumed to match the Base Year data provided.

MSAT emission factors were taken from emission rate look-up tables (ERLT) provided by TxDOT for the Dallas District Area. These emission factors were generated using MOVES2014 by TxDOT for use in these analyses. MOVES2014 is a modeling software that estimates emission rates of MSATs and other pollutants by using project-specific information such as traffic volumes, age distribution of vehicles, vehicle type distribution, fuel composition, and other region-specific data. The MSAT emission rates generally decrease from year to year because of several factors. These include decreased emissions from more efficient internal combustion engines and increasing numbers of electric vehicles. The Dallas District Area ERLT provided by TxDOT includes emission factors in grams per mile for each MSAT for years 2020 through 2050 at speeds of 2.5 mph and 3 mph to 75 mph in 1 mph increments. Emission factors for 2020 were used for the Existing scenario and emission factors from the year 2050 were used for the 2050 Build and 2050 No-Build scenarios. For the Existing (2020) Scenario, the Urban Restricted emission factors were utilized for US 75 and US 399 since the freeways have frontage roads and ramps that allow for access onto and off of the freeways. Urban unrestricted emission factors were utilized for the remaining roadways included in the analysis (US 380, SH 5, and local roads) since these facilities do not currently have frontage roads or ramps to access the roadway.

A project to improve SH 5 was cleared in 2020 (CSJs 0047-05-054, 0047-09-034, and 0364-04-049) These improvements will reconstruct SH 5 between existing Spur 399 and Industrial Boulevard (FM 546) from a 4-lane divided roadway to a 6-lane divided urban roadway with a 17-foot-wide curbed median transitioning to a narrow median with a center concrete barrier. In addition to adding mainlane capacity, frontage roads and ramps would be constructed within this section of SH 5 between US 75 and the crossing of Wilson Creek. These improvements would be part of the future No-Build and Build scenarios. Additionally, a project to improve US 380 east of McKinney from Airport Drive to CR 458 (CSJs 0135-03-046 and 0135-04-033) has also been approved within

the Spur 399 Extension study area. This approved project 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 ROW. The project was environmentally cleared on January 15, 2020, and is anticipated to let for construction in February 2024. This project will not add ramps and frontage roads to US 380. Therefore, Urban restricted emission factors were utilized for US 75, SH 5, and Spur 399, as ramps are required to enter and exit the freeways. Since no frontage roads exist or are planned for US 380, that roadway used the unrestricted emission factors provided in the ERLT.

MSAT emission factors for the road types, speeds, and scenarios listed in **Table 2-2** were taken from the Dallas District Area ERLT. The corresponding emission factors along with detailed calculations can be found in **Table 2-3**, **Table 2-4**, and **Table 2-5**.

Table 2-3: Existing Emission Factors by Road Type for Peak and Off-peak Hours

Traffic Conditions	Road Type	Speed (mph)	BENZ (g/mi)	NAP (g/mi)	BUTA (g/mi)	FORM (g/mi)	ACROL (g/mi)	Diesel PM (g/mi)	POM (g/mi)	ACE (g/mi)	ETB (g/mi)
Peak	Frontage Roads	35	1.06E-03	1.07E-04	1.06E-04	9.64E-04	5.55E-05	2.82E-03	4.91E-05	4.76E-04	7.84E-04
Peak	Ramps	42	9.39E-04	9.50E-05	9.46E-05	8.52E-04	4.91E-05	2.53E-03	4.39E-05	4.21E-04	6.79E-04
Peak	Main Lanes - Unrestricted	54	8.46E-04	8.54E-05	8.31E-05	7.61E-04	4.42E-05	2.10E-03	3.99E-05	3.76E-04	5.81E-04
Peak	Main Lanes - Restricted	54	8.90E-04	1.47E-04	9.80E-05	1.42E-03	8.64E-05	6.51E-03	6.03E-05	6.30E-04	5.96E-04
Peak	Local Roads	27	1.27E-03	1.27E-04	1.29E-04	1.15E-03	6.59E-05	3.56E-03	5.81E-05	5.68E-04	9.67E-04
Off-Peak	Frontage Roads	60	8.43E-04	8.25E-05	8.06E-05	7.31E-04	4.22E-05	1.90E-03	3.87E-05	3.63E-04	5.60E-04
Off-Peak	Ramps	55	8.43E-04	8.49E-05	8.24E-05	7.56E-04	4.39E-05	2.06E-03	3.97E-05	3.74E-04	5.76E-04
Off-Peak	Main Lanes - Unrestricted	65	8.86E-04	8.25E-05	8.12E-05	7.25E-04	4.14E-05	1.89E-03	3.87E-05	3.62E-04	5.64E-04
Off-Peak	Main Lanes - Restricted	65	9.15E-04	1.35E-04	9.34E-05	1.29E-03	7.78E-05	5.85E-03	5.51E-05	5.78E-04	5.73E-04
Off-Peak	Local Roads	50	8.62E-04	8.73E-05	8.57E-05	7.80E-04	4.52E-05	2.25E-03	4.07E-05	3.86E-04	6.04E-04

(a) BENZ = benzene; NAP = naphthalene; BUTA = butadiene; FORM = formaldehyde; ACROL = acrolein; PM = particulate matter; POM = polycyclic organic matter; ACE = acetaldehyde; ETB = ethylbenzene

Table 2-4: 2050 No-Build Emission Factors by Road Type for Peak and Off-peak Hours

Traffic Conditions	Road Type	Speed (mph)	BENZ (g/mi)	NAP (g/mi)	BUTA (g/mi)	FORM (g/mi)	ACROL (g/mi)	Diesel PM (g/mi)	POM (g/mi)	ACE (g/mi)	ETB (g/mi)
Peak	Frontage Roads	30	2.82E-04	3.19E-05	1.06E-06	3.66E-04	1.70E-05	6.23E-04	1.15E-05	1.25E-04	3.06E-04
Peak	Ramps	42	2.17E-04	2.52E-05	8.37E-07	2.89E-04	1.34E-05	4.57E-04	9.62E-06	9.85E-05	2.25E-04
Peak	Main Lanes - Restricted	46	2.34E-04	5.55E-05	2.33E-06	6.93E-04	3.20E-05	1.66E-03	1.24E-05	2.27E-04	2.18E-04
Peak	Local Roads	29	2.86E-04	3.27E-05	1.09E-06	3.75E-04	1.74E-05	6.30E-04	1.16E-05	1.28E-04	3.15E-04
Peak	US 380	65	2.08E-04	2.06E-05	6.00E-07	2.27E-04	1.06E-05	3.47E-04	9.55E-06	7.90E-05	1.71E-04
Peak	US 75	65	2.19E-04	4.28E-05	1.70E-06	5.24E-04	2.42E-05	1.23E-03	1.14E-05	1.74E-04	1.74E-04
Peak	US 75 Frontage Roads	45	2.08E-04	2.40E-05	7.94E-07	2.75E-04	1.28E-05	4.42E-04	9.38E-06	9.38E-05	2.12E-04
Off-Peak	Frontage Roads	60	1.96E-04	2.09E-05	6.46E-07	2.34E-04	1.09E-05	3.47E-04	9.19E-06	8.06E-05	1.74E-04
Off-Peak	Ramps	55	1.95E-04	2.17E-05	6.97E-07	2.46E-04	1.14E-05	3.69E-04	9.17E-06	8.45E-05	1.83E-04
Off-Peak	Main Lanes	65	2.08E-04	2.06E-05	6.00E-07	2.27E-04	1.06E-05	3.47E-04	9.55E-06	7.90E-05	1.71E-04
Off-Peak	Local Roads	50	1.99E-04	2.27E-05	7.41E-07	2.58E-04	1.20E-05	4.06E-04	9.23E-06	8.84E-05	1.95E-04
Off-Peak	US 380	75	3.00E-04	2.38E-05	5.37E-07	2.44E-04	1.14E-05	3.57E-04	1.24E-05	8.80E-05	1.93E-04
Off-Peak	US 75	75	3.12E-04	4.30E-05	1.48E-06	5.00E-04	2.32E-05	1.30E-03	1.43E-05	1.70E-04	1.96E-04
Off-Peak	US 75 Frontage Roads	55	1.95E-04	2.17E-05	6.97E-07	2.46E-04	1.14E-05	3.69E-04	9.17E-06	8.45E-05	1.83E-04

(a) BENZ = benzene; NAP = naphthalene; BUTA = butadiene; FORM = formaldehyde; ACROL = acrolein; PM = particulate matter; POM = polycyclic organic matter; ACE = acetaldehyde; ETB = ethylbenzene

Table 2-5: 2050 Build Emission Factors by Road Type for Peak and Off-peak Hours

Traffic Conditions	Road Type	Speed (mph)	BENZ (g/mi)	NAP (g/mi)	BUTA (g/mi)	FORM (g/mi)	ACROL (g/mi)	Diesel PM (g/mi)	POM (g/mi)	ACE (g/mi)	ETB (g/mi)
Peak	Frontage Roads	42	2.17E-04	2.52E-05	8.37E-07	2.89E-04	1.34E-05	4.57E-04	9.62E-06	9.85E-05	2.25E-04
Peak	Ramps	52	1.97E-04	2.23E-05	7.22E-07	2.53E-04	1.18E-05	3.90E-04	9.20E-06	8.68E-05	1.90E-04
Peak	Main Lanes - Restricted	68	2.42E-04	4.25E-05	1.63E-06	5.13E-04	2.38E-05	1.24E-03	1.21E-05	1.71E-04	1.79E-04
Peak	Local Roads	19	3.77E-04	4.48E-05	1.55E-06	5.21E-04	2.42E-05	7.51E-04	1.51E-05	1.77E-04	4.58E-04
Peak	US 380	65	2.08E-04	2.06E-05	6.00E-07	2.27E-04	1.06E-05	3.47E-04	9.55E-06	7.90E-05	1.71E-04
Peak	US 75	65	2.19E-04	4.28E-05	1.70E-06	5.24E-04	2.42E-05	1.23E-03	1.14E-05	1.74E-04	1.74E-04
Peak	US 75 Frontage Roads	45	2.08E-04	2.40E-05	7.94E-07	2.75E-04	1.28E-05	4.42E-04	9.38E-06	9.38E-05	2.12E-04
Peak	Airport Drive	40	2.24E-04	2.60E-05	8.69E-07	2.99E-04	1.39E-05	4.69E-04	9.79E-06	1.02E-04	2.35E-04
Off-Peak	Frontage Roads	60	1.96E-04	2.09E-05	6.46E-07	2.34E-04	1.09E-05	3.47E-04	9.19E-06	8.06E-05	1.74E-04
Off-Peak	Ramps	50	1.99E-04	2.27E-05	7.41E-07	2.58E-04	1.20E-05	4.06E-04	9.23E-06	8.84E-05	1.95E-04
Off-Peak	Main Lanes - Restricted	65	2.19E-04	4.28E-05	1.70E-06	5.24E-04	2.42E-05	1.23E-03	1.14E-05	1.74E-04	1.74E-04
Off-Peak	Local Roads	50	1.99E-04	2.27E-05	7.41E-07	2.58E-04	1.20E-05	4.06E-04	9.23E-06	8.84E-05	1.95E-04
Off-Peak	US 380	75	3.00E-04	2.38E-05	5.37E-07	2.44E-04	1.14E-05	3.57E-04	1.24E-05	8.80E-05	1.93E-04
Off-Peak	US 75	75	3.12E-04	4.30E-05	1.48E-06	5.00E-04	2.32E-05	1.30E-03	1.43E-05	1.70E-04	1.96E-04
Off-Peak	US 75 Frontage Roads	55	1.95E-04	2.17E-05	6.97E-07	2.46E-04	1.14E-05	3.69E-04	9.17E-06	8.45E-05	1.83E-04
Off-Peak	Airport Drive	50	1.99E-04	2.27E-05	7.41E-07	2.58E-04	1.20E-05	4.06E-04	9.23E-06	8.84E-05	1.95E-04

(a) BENZ = benzene; NAP = naphthalene; BUTA = butadiene; FORM = formaldehyde; ACROL = acrolein; PM = particulate matter; POM = polycyclic organic matter; ACE = acetaldehyde; ETB = ethylbenzene

2.2.1 Analysis Results

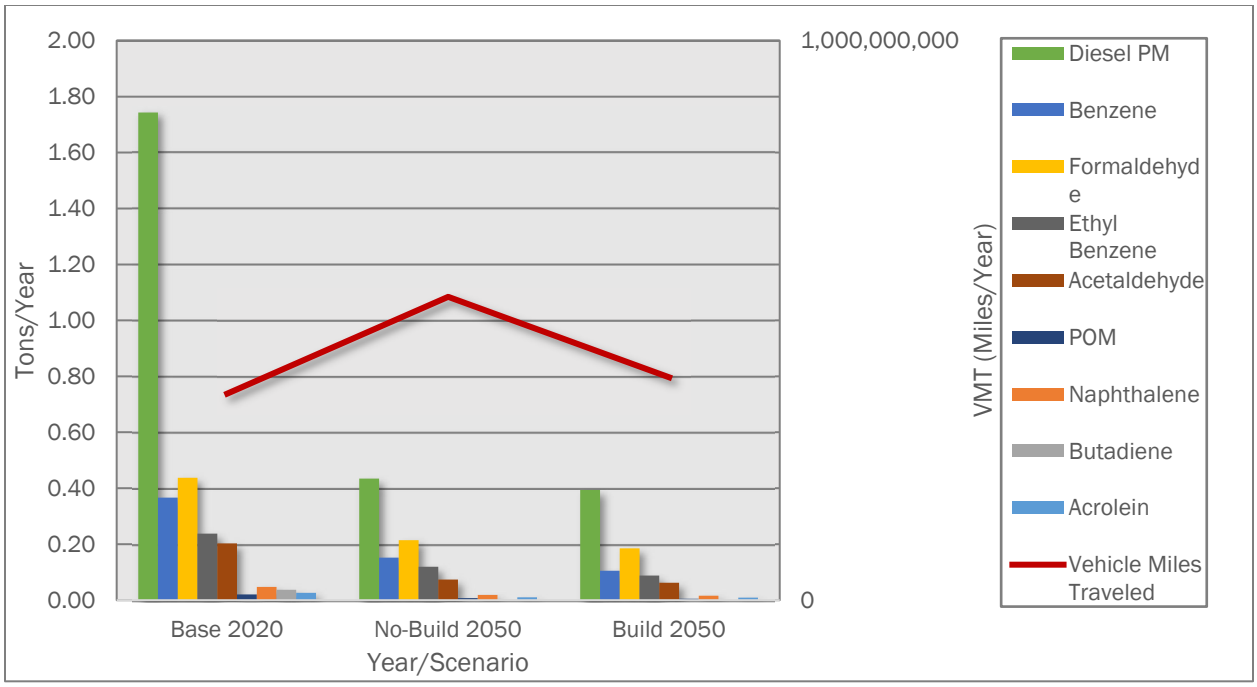
MSAT emissions in the study area were calculated for the 2020 Existing, 2050 No-Build, and 2050 Build scenarios. The total mass of MSAT emissions in the 2050 Build scenario were the lowest of the three scenarios analyzed. The calculations show that the MSAT emissions decreased 72 percent from the 2020 Existing scenario to the 2050 Build scenario; with a VMT increase of 8 percent. Although the VMT is increasing, the MSAT emissions are decreasing due to improved 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 **Table 2-6**.

Table 2-6: 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	-75%	6.88E-03	-66%
Millions VMT	369	398	8%	542	47%
Total MSAT	3.12	0.86	-72%	1.03	-67%

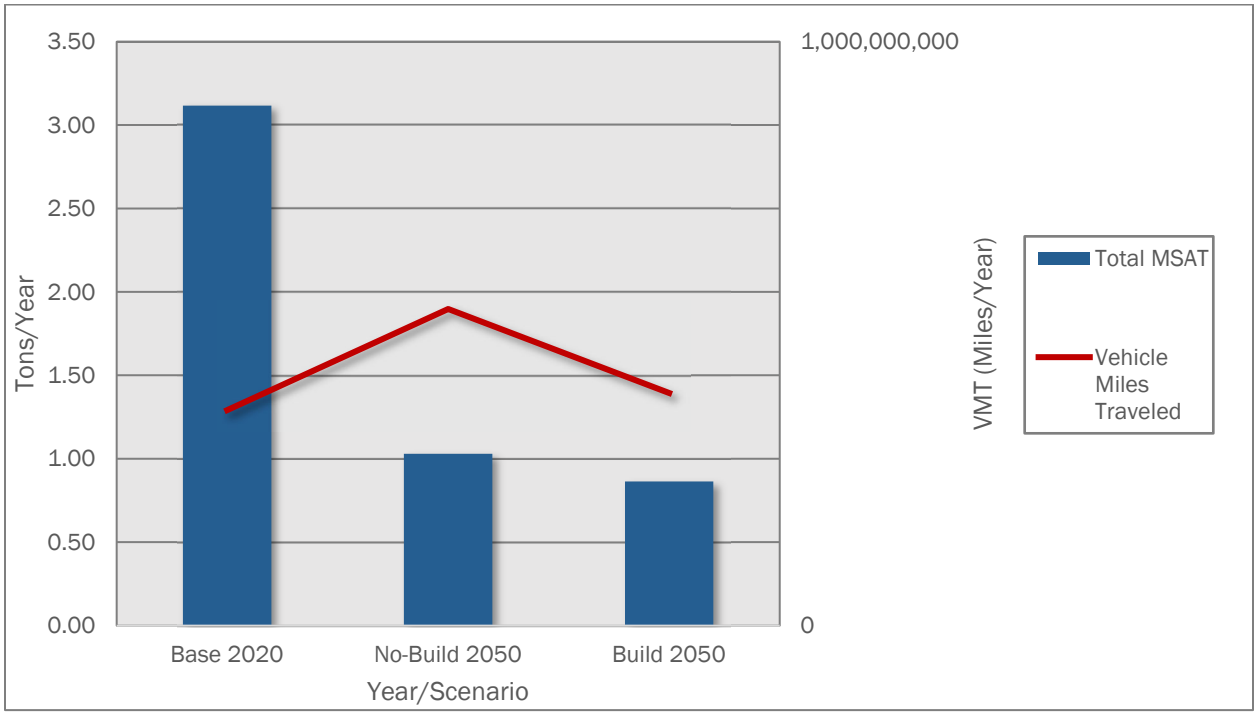
As shown in **Table 2-7**, a decrease in overall MSAT emissions is predicted for the 2050 Build scenario. The total tons per year of MSAT emissions in 2020 Existing are 3.12 and the MSAT emissions for the 2050 Build scenario are 0.86. Under the 2050 No-Build scenario, an overall reduction in MSAT emissions 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 the emissions decreased 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 area. This trend is true for both new and existing roadways; even though 2050 travel volumes along US 380, US 75, and SH 5 are expected to increase, MSATs along these roadways are anticipated to decrease between the Build (2050) and No Build (2050) scenarios. **Graph 2-2** shows the priority MSAT emissions and VMT for each scenario.

Graph 2-2: Priority MSAT Emissions and VMT



The results show that there will be a decrease in MSAT emissions for the 2050 Build scenario when compared to the base year (2020 Existing) scenario, as shown in **Graph 2-3**.

Graph 2-3: Total MSAT Emissions and VMT per Scenario

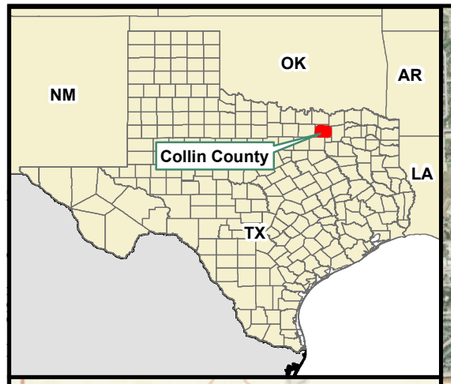


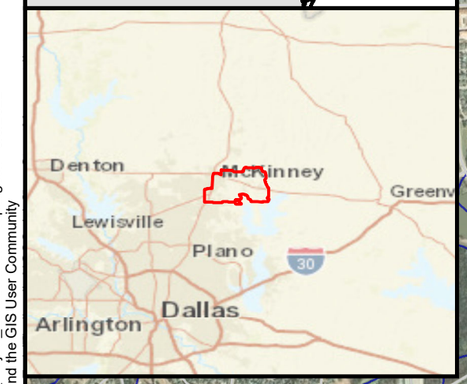
2.2.2 Conclusion

With implementation of the Preferred Alternative, VMT in 2050 of Spur 399 and 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 utilize the roadway network analyzed due to population growth in the area and the diversion of traffic from the local roadway network to the new Spur 399 freeway, which is a slightly longer route. While the VMT for the Preferred 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 combustion engines, as well as the electrification of the U.S. fleet. Meanwhile, 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 leads to longer travel routes of 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 Alternative will also divert traffic from existing roadways, reducing congestion and increasing traffic speeds, reducing the amount of MSATs emitted. while the total MSAT emissions are predicted to decrease by approximately 67 percent, from 3.12 to 1.03 tons per year.

The 2050 Build scenario predicts lower overall MSAT emissions than the 2050 No-Build scenario. The FHWA has projected that VMT at the national level are projected to increase by approximately 45 percent between 2010 and 2050; while priority MSATs would decrease between 63 percent (Ethylbenzene) and 99 percent (1,3-butadiene) during this same time period.

ATTACHMENT A: EXHIBITS





Common Alignment for the Build Alternatives
Orange Alternative
Purple Alternative
Project Logical Termini
Streams and Rivers
McKinney National Airport Property

NORTH
0 0.5 1
Miles

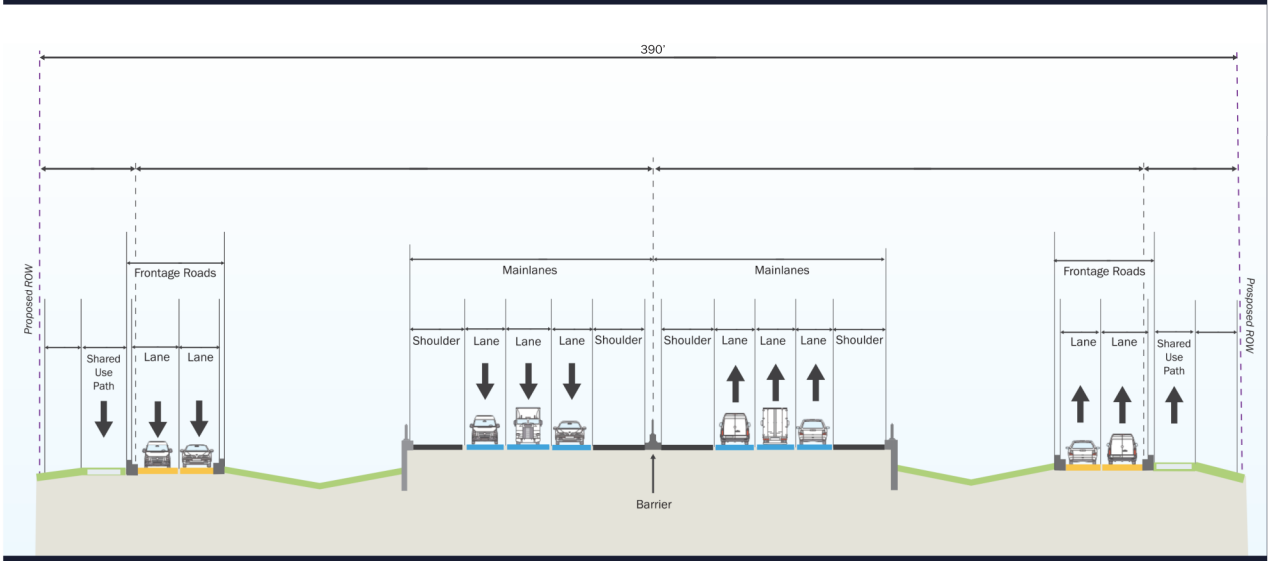
Texas Department of Transportation

Exhibit 1
Project Area Location Map
Spur 399 Extention
US 75 to US 380
CSJs 0364-04-051, 0047-05-058, 0047-10-002
Collin County

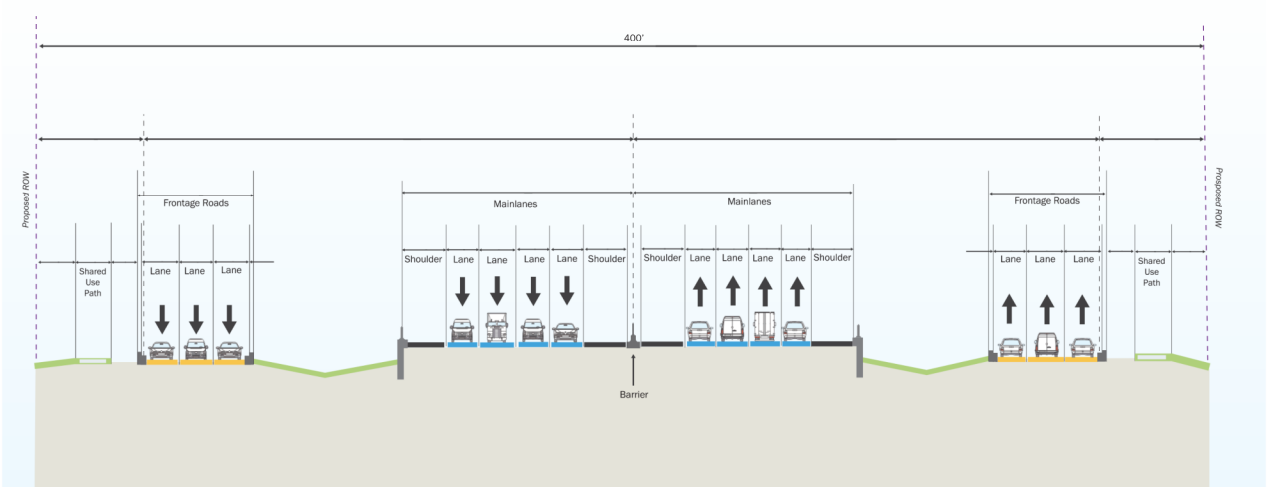
Issued: 5/9/2022

Path: C:\Users\sspurgeon\OneDrive - Burns & McDonnell\Desktop\Projects\US 380\DataFiles\ArcDocs\Spur 399 DEIS\Spur399_Project_Location.mxd sspurgeon 5/9/2022
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

6-LANE TYPICAL SECTION



8-LANE TYPICAL SECTION



*RIGHT-OF-WAY (ROW) WIDTHS MAY VARY IN SOME LOCATIONS AND IS SUBJECT TO CHANGE.

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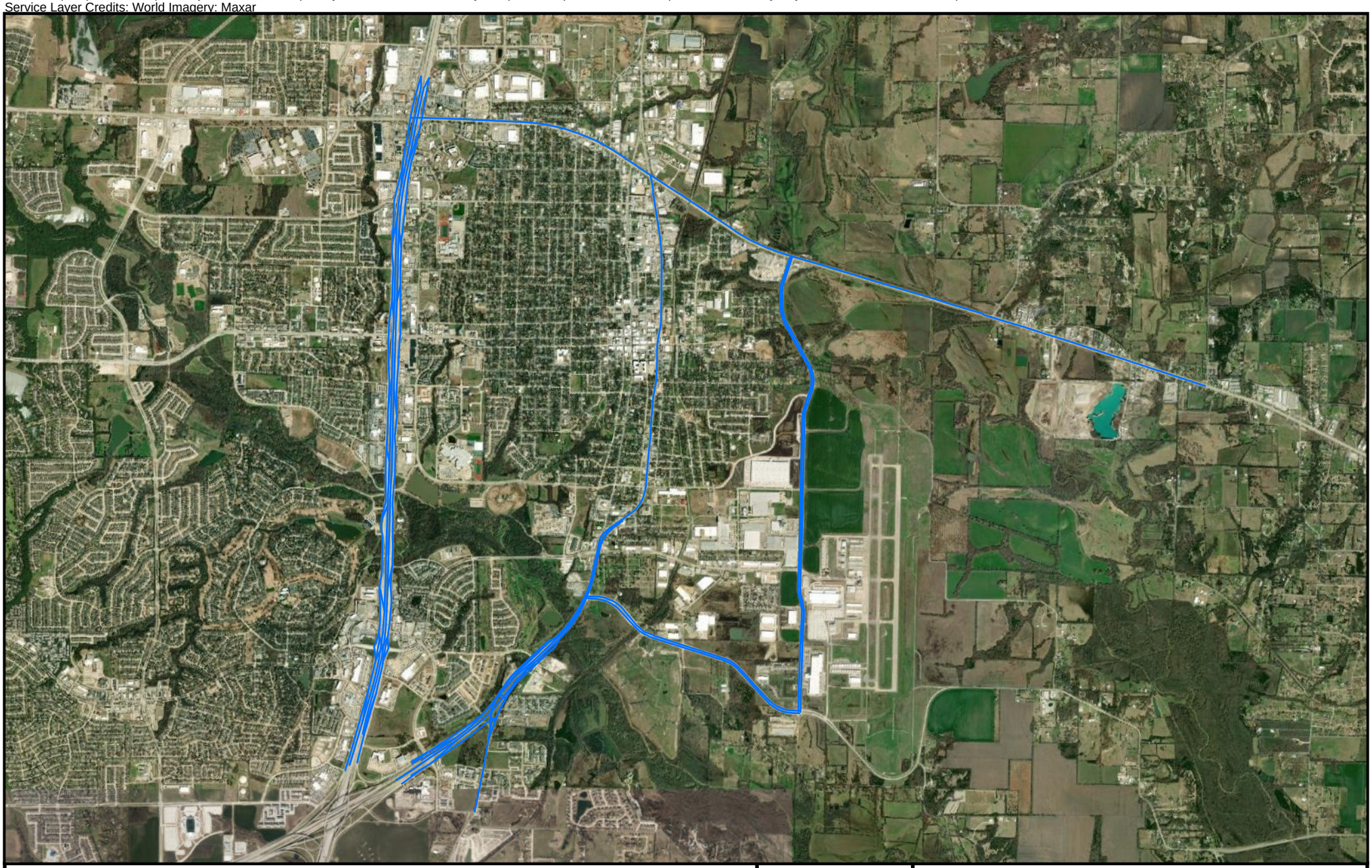
Service Layer Credits: World Imagery: Maxar



Surrounding Roads Analyzed

NORTH

4,000 2,000 0 4,000

Scale in Feet

Texas Department of Transportation

Exhibit 3
Existing and Future No Build (2050)
Analyzed Links for MSAT Analysis
US 75 to US 380
CSJs 0364-04-051, 0047-05-058, 0047-10-002
Collin County

Issued: 6/30/2022

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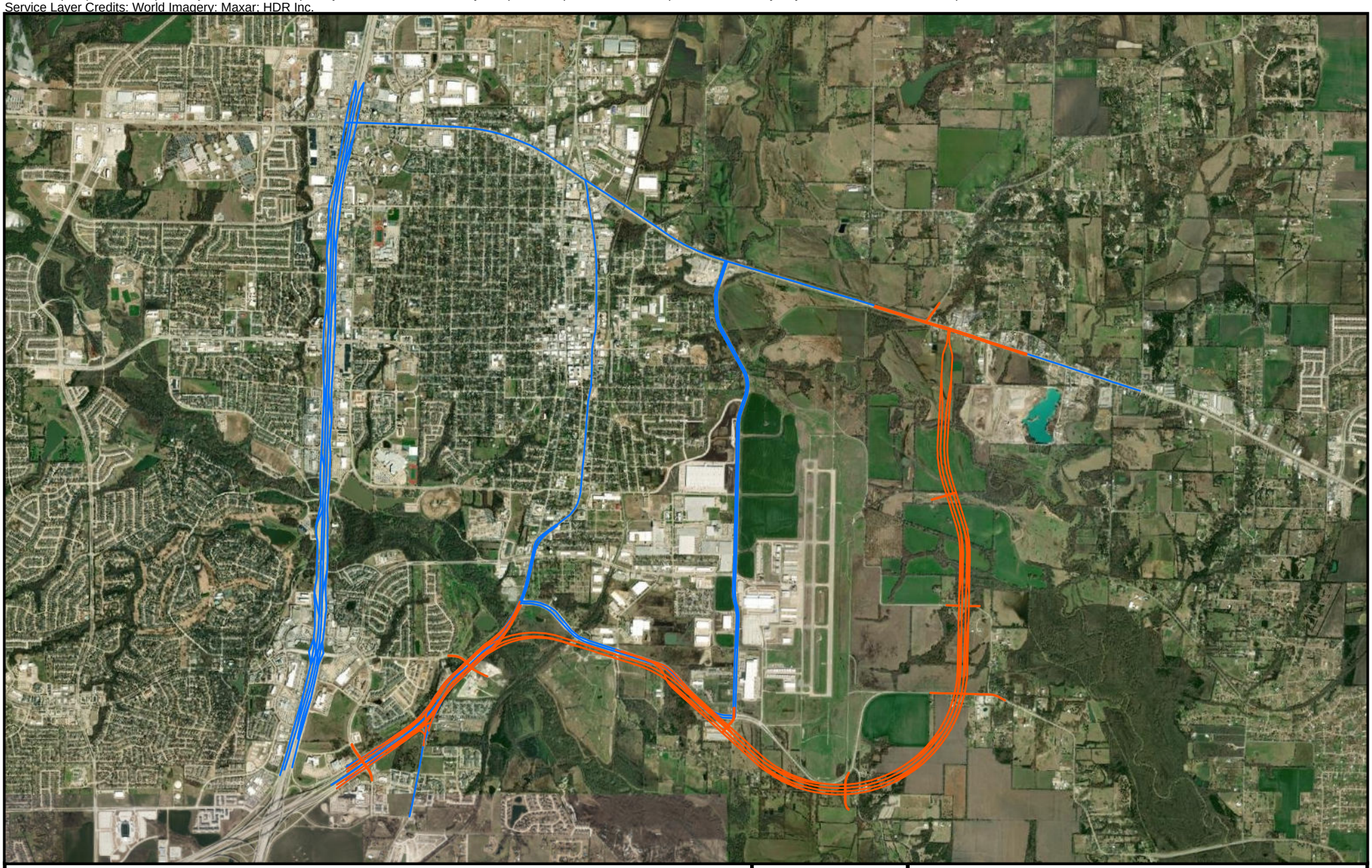
Service Layer Credits: World Imagery: Maxar; HDR Inc.



Future Build (2050) Affected Links
Surrounding Roads Analyzed

NORTH

4,000 2,000 0 4,000

Scale in Feet

Texas Department of Transportation

Exhibit 3
Future Build (2050)
Analyzed Links for MSAT Analysis
US 75 to US 380
CSJs 0364-04-051, 0047-05-058, 0047-10-002
Collin County

Issued: 6/30/2022

Table 4a: Provided Traffic for the Existing Scenario

Road Type	Road Name	Segment Length (miles)	Daily Traffic Volume	Morning Congested Vehicle Volume	Afternoon Congested Vehicle Volume	Daily Congested VMT	Daily Free-Flow VMT	Daily Total VMT
Local Road	AIRPORT DR	0.43	4722.44	590.31	590.31	507.66	1522.99	2030.65
Local Road	AIRPORT DR	1.18	17272.22	2159.03	2159.03	5095.30	15285.91	20381.22
Local Road	AIRPORT DR	0.72	25938.83	3242.35	3242.35	4668.99	14006.97	18675.96
Local Road	AIRPORT DR	0.40	4722.44	590.31	590.31	473.81	1421.43	1895.24
Local Road	AIRPORT DR	1.48	4722.44	590.31	590.31	1742.10	5226.31	6968.41
Mainlane - Unrestricted	SH5	0.76	53688.09	6711.01	6711.01	10200.74	30602.21	40802.95
Mainlane - Unrestricted	SH5	0.44	15542.64	1942.83	1942.83	1709.69	5129.07	6838.76
Mainlane - Unrestricted	SH5 MCDONALD ST	0.28	13224.27	1653.03	1653.03	925.70	2777.10	3702.80
Mainlane - Unrestricted	SH5 MCDONALD ST	0.58	21655.69	2706.96	2706.96	3140.08	9420.23	12560.30
Mainlane - Unrestricted	SH5 MCDONALD ST	0.09	20886.63	2610.83	2610.83	469.95	1409.85	1879.80
Mainlane - Unrestricted	SH5 MCDONALD ST	0.05	22104.76	2763.10	2763.10	276.31	828.93	1105.24
Mainlane - Unrestricted	SH5 MCDONALD ST	0.09	28348.35	3543.54	3543.54	637.84	1913.51	2551.35
Mainlane - Unrestricted	SH5 MCDONALD ST	0.13	28349.29	3543.66	3543.66	921.35	2764.06	3685.41
Mainlane - Unrestricted	SH5 MCDONALD ST	0.08	31769.33	3971.17	3971.17	635.39	1906.16	2541.55
Mainlane - Unrestricted	SH5 MCDONALD ST	0.53	33100.2	4137.53	4137.53	4385.78	13157.33	17543.11
Mainlane - Unrestricted	SH5 MCDONALD ST	0.28	37777.08	4722.14	4722.14	2644.40	7933.19	10577.58
Mainlane - Unrestricted	SH5 NB	0.07	19221.61	2402.70	2402.70	336.38	1009.13	1345.51
Mainlane - Unrestricted	SH5 NB	0.13	17786.28	2223.29	2223.29	578.05	1734.16	2312.22
Mainlane - Unrestricted	SH5 NB	0.11	7788.94	973.62	973.62	214.20	642.59	856.78
Mainlane - Unrestricted	SH5 NB	0.15	26164.49	3270.56	3270.56	981.17	2943.51	3924.67
Mainlane - Unrestricted	SH5 NB	0.13	10485.3	1310.66	1310.66	340.77	1022.32	1363.09
Mainlane - Unrestricted	SH5 NB	0.15	10042.26	1255.28	1255.28	376.58	1129.75	1506.34
Mainlane - Unrestricted	SH5 SB	0.12	21601.93	2700.24	2700.24	648.06	1944.17	2592.23
Mainlane - Unrestricted	SH5 SB	0.1	19990.8	2498.85	2498.85	499.77	1499.31	1999.08
Mainlane - Unrestricted	SH5 SB	0.3	27759.25	3469.91	3469.91	2081.94	6245.83	8327.78
Mainlane - Unrestricted	SH5 SB	0.07	6519.18	814.90	814.90	114.09	342.26	456.34
Mainlane - Unrestricted	SH5 SB	0.03	9215.54	1151.94	1151.94	69.12	207.35	276.47
Mainlane - Unrestricted	SH5 SB	0.06	7753.7	969.21	969.21	116.31	348.92	465.22
Mainlane - Unrestricted	SH5 SB	0.07	6519.18	814.90	814.90	114.09	342.26	456.34
Mainlane - Unrestricted	SH5 SB	0.03	28201.17	3525.15	3525.15	211.51	634.53	846.04
Mainlane - Restricted	SS399 EB	0.11	16121.11	2015.14	2015.14	443.33	1329.99	1773.32
Mainlane - Restricted	SS399 EB	0.11	18817.47	2352.18	2352.18	517.48	1552.44	2069.92
Mainlane - Restricted	SS399 EB	0.13	16122.22	2015.28	2015.28	523.97	1571.92	2095.89
Mainlane - Restricted	SS399 NB	0.42	19659.64	2457.46	2457.46	2064.26	6192.79	8257.05
Frontage Road	SRT FRTG NB	0.15	721.4	90.18	90.18	27.05	81.16	108.21
Frontage Road	SRT FRTG SB	0.10	5018.89	627.36	627.36	125.47	376.42	501.89
Mainlane - Restricted	SS399 SB	0.23	21112.43	2639.05	2639.05	1213.96	3641.89	4855.86
Mainlane - Restricted	SS399 EB	0.16	20052	2506.50	2506.50	802.08	2406.24	3208.32
Mainlane - Restricted	SS399 WB	0.32	21682	2710.25	2710.25	1734.56	5203.68	6938.24
Mainlane - Unrestricted	US380	0.16	25784.56	3223.07	3223.07	1031.38	3094.15	4125.53
Mainlane - Unrestricted	US380	0.19	27093.22	3386.65	3386.65	1286.93	3860.78	5147.71
Mainlane - Unrestricted	US380	0.32	24711.95	3088.99	3088.99	1976.96	5930.87	7907.82
Mainlane - Unrestricted	US380	0.22	23165.5	2895.69	2895.69	1274.10	3822.31	5096.41
Mainlane - Unrestricted	US380	0.08	22367.59	2795.95	2795.95	447.35	1342.06	1789.41
Mainlane - Unrestricted	US380	0.08	21858.74	2732.34	2732.34	437.17	1311.52	1748.70
Mainlane - Unrestricted	US380	0.13	21637.27	2704.66	2704.66	703.21	2109.63	2812.85
Mainlane - Unrestricted	US380	0.49	32492.43	4061.55	4061.55	3980.32	11940.97	15921.29

Table 4a: Provided Traffic for the Existing Scenario

Road Type	Road Name	Segment Length (miles)	Daily Traffic Volume	Morning Congested Vehicle Volume	Afternoon Congested Vehicle Volume	Daily Congested VMT	Daily Free-Flow VMT	Daily Total VMT
Mainlane - Unrestricted	US380	0.46	38418.98	4802.37	4802.37	4418.18	13254.55	17672.73
Mainlane - Unrestricted	US380	1.22	47255.43	5906.93	5906.93	14412.91	43238.72	57651.62
Mainlane - Unrestricted	US380	1.31	36405.13	4550.64	4550.64	11922.68	35768.04	47690.72
Mainlane - Unrestricted	US380	0.24	30592.36	3824.05	3824.05	1835.54	5506.62	7342.17
Mainlane - Unrestricted	US380	0.07	44348.63	5543.58	5543.58	776.10	2328.30	3104.40
Frontage Road	US75 FRTG NB	0.16	0.23	0.03	0.03	0.01	0.03	0.04
Frontage Road	US75 FRTG NB	0.18	10453.44	1306.68	1306.68	470.40	1411.21	1881.62
Frontage Road	US75 FRTG NB	0.1	10317.8	1289.73	1289.73	257.95	773.84	1031.78
Frontage Road	US75 FRTG NB	0.12	16163.03	2020.38	2020.38	484.89	1454.67	1939.56
Frontage Road	US75 FRTG NB	0.1	15898.77	1987.35	1987.35	397.47	1192.41	1589.88
Frontage Road	US75 FRTG NB	0.29	5564.65	695.58	695.58	403.44	1210.31	1613.75
Frontage Road	US75 FRTG NB	0.29	4554.48	569.31	569.31	330.20	990.60	1320.80
Frontage Road	US75 FRTG NB	0.19	3595.01	449.38	449.38	170.76	512.29	683.05
Frontage Road	US75 FRTG NB	0.28	11874.97	1484.37	1484.37	831.25	2493.74	3324.99
Frontage Road	US75 FRTG NB	0.06	11874.97	1484.37	1484.37	178.12	534.37	712.50
Frontage Road	US75 FRTG NB	0.26	13766.75	1720.84	1720.84	894.84	2684.52	3579.36
Frontage Road	US75 FRTG NB	0.28	13766.75	1720.84	1720.84	963.67	2891.02	3854.69
Frontage Road	US75 FRTG NB	0.41	6591.37	823.92	823.92	675.62	2026.85	2702.46
Frontage Road	US75 FRTG NB	0.13	0.11	0.01	0.01	0.00	0.01	0.01
Frontage Road	US75 FRTG NB	0.25	8184.74	1023.09	1023.09	511.55	1534.64	2046.19
Frontage Road	US75 FRTG NB	0.20	11099.62	1387.45	1387.45	554.98	1664.94	2219.92
Frontage Road	US75 FRTG NB	0.42	165.33	20.67	20.67	17.36	52.08	69.44
Frontage Road	US75 FRTG NB	0.24	6279.15	784.89	784.89	376.75	1130.25	1507.00
Frontage Road	US75 FRTG NB	0.08	13012.87	1626.61	1626.61	260.26	780.77	1041.03
Frontage Road	US75 FRTG SB	0.29	8362.64	1045.33	1045.33	606.29	1818.87	2425.17
Frontage Road	US75 FRTG SB	0.24	4225.62	528.20	528.20	253.54	760.61	1014.15
Frontage Road	US75 FRTG SB	0.15	8457.51	1057.19	1057.19	317.16	951.47	1268.63
Frontage Road	US75 FRTG SB	0.18	9434.27	1179.28	1179.28	424.54	1273.63	1698.17
Frontage Road	US75 FRTG SB	0.21	5219.46	652.43	652.43	274.02	822.06	1096.09
Frontage Road	US75 FRTG SB	0.29	4966.96	620.87	620.87	360.10	1080.31	1440.42
Frontage Road	US75 FRTG SB	0.11	4113.19	514.15	514.15	113.11	339.34	452.45
Frontage Road	US75 FRTG SB	0.23	6276.57	784.57	784.57	360.90	1082.71	1443.61
Frontage Road	US75 FRTG SB	0.03	8737.75	1092.22	1092.22	65.53	196.60	262.13
Frontage Road	US75 FRTG SB	0.16	1442.44	180.31	180.31	57.70	173.09	230.79
Frontage Road	US75 FRTG SB	0.27	2410.74	301.34	301.34	162.72	488.17	650.90
Frontage Road	US75 FRTG SB	0.25	11341.33	1417.67	1417.67	708.83	2126.50	2835.33
Frontage Road	US75 FRTG SB	0.14	11340.54	1417.57	1417.57	396.92	1190.76	1587.68
Frontage Road	US75 FRTG SB	0.28	9197.73	1149.72	1149.72	643.84	1931.52	2575.36
Frontage Road	US75 FRTG SB	0.15	2893.79	361.72	361.72	108.52	325.55	434.07
Frontage Road	US75 FRTG SB	0.19	18032.77	2254.10	2254.10	856.56	2569.67	3426.23
Frontage Road	US75 FRTG SB	0.19	9718.69	1214.84	1214.84	461.64	1384.91	1846.55
Frontage Road	US75 FRTG SB	0.25	947.33	118.42	118.42	59.21	177.62	236.83
Frontage Road	US75 FRTG SB	0.25	8248.3	1031.04	1031.04	515.52	1546.56	2062.08
Frontage Road	US75 FRTG SB	0.25	15990.44	1998.81	1998.81	999.40	2998.21	3997.61
Mainlane - Restricted	US75 NB	0.41	71917.31	8989.66	8989.66	7371.52	22114.57	29486.10
Mainlane - Restricted	US75 NB	0.41	66072.08	8259.01	8259.01	6772.39	20317.16	27089.55
Mainlane - Restricted	US75 NB	0.52	76406.21	9550.78	9550.78	9932.81	29798.42	39731.23

Table 4a: Provided Traffic for the Existing Scenario

Road Type	Road Name	Segment Length (miles)	Daily Traffic Volume	Morning Congested Vehicle Volume	Afternoon Congested Vehicle Volume	Daily Congested VMT	Daily Free-Flow VMT	Daily Total VMT
Mainlane - Restricted	US75 NB	0.5	68126.24	8515.78	8515.78	8515.78	25547.34	34063.12
Mainlane - Restricted	US75 NB	0.18	68126.24	8515.78	8515.78	3065.68	9197.04	12262.72
Mainlane - Restricted	US75 NB	0.48	68126.24	8515.78	8515.78	8175.15	24525.45	32700.60
Mainlane - Restricted	US75 NB	0.77	75301.62	9412.70	9412.70	14495.56	43486.69	57982.25
Mainlane - Restricted	US75 NB	0.44	59069.77	7383.72	7383.72	6497.67	19493.02	25990.70
Mainlane - Restricted	US75 SB	0.27	80199.31	10024.91	10024.91	5413.45	16240.36	21653.81
Mainlane - Restricted	US75 SB	0.19	73558.14	9194.77	9194.77	3494.01	10482.03	13976.05
Mainlane - Restricted	US75 SB	0.58	69326.26	8665.78	8665.78	10052.31	30156.92	40209.23
Mainlane - Restricted	US75 SB	0.36	73541.07	9192.63	9192.63	6618.70	19856.09	26474.79
Mainlane - Restricted	US75 SB	0.48	71377.69	8922.21	8922.21	8565.32	25695.97	34261.29
Mainlane - Restricted	US75 SB	0.26	78673.01	9834.13	9834.13	5113.75	15341.24	20454.98
Mainlane - Restricted	US75 SB	0.62	69742.42	8717.80	8717.80	10810.08	32430.23	43240.30
Mainlane - Restricted	US75 SB	0.65	71885.23	8985.65	8985.65	11681.35	35044.05	46725.40
Mainlane - Restricted	US75 SB	0.59	58515.03	7314.38	7314.38	8630.97	25892.90	34523.87
Ramp	RAMP	0.04	2696.37	337.05	337.05	26.96	80.89	107.85
Ramp	RAMP	0.03	443.04	55.38	55.38	3.32	9.97	13.29
Ramp	RAMP	0.04	441.92	55.24	55.24	4.42	13.26	17.68
Ramp	RAMP	0.19	569.57	71.20	71.20	27.05	81.16	108.22
Ramp	RAMP	0.19	392.36	49.05	49.05	18.64	55.91	74.55
Ramp	RAMP	0.09	10334.13	1291.77	1291.77	232.52	697.55	930.07
Ramp	RAMP	0.13	7175.38	896.92	896.92	233.20	699.60	932.80
Ramp	RAMP	0.07	4705.85	588.23	588.23	82.35	247.06	329.41
Ramp	RAMP	0.07	1885.41	235.68	235.68	32.99	98.98	131.98
Ramp	RAMP	0.25	2914.88	364.36	364.36	182.18	546.54	728.72
Ramp	RAMP	0.19	12847.54	1605.94	1605.94	610.26	1830.77	2441.03
Ramp	RAMP	0.07	8662.17	1082.77	1082.77	151.59	454.76	606.35
Ramp	RAMP	0.07	4199.37	524.92	524.92	73.49	220.47	293.96
Ramp	RAMP	0.07	6900.14	862.52	862.52	120.75	362.26	483.01
Ramp	RAMP	0.14	4231.88	528.99	528.99	148.12	444.35	592.46
Ramp	RAMP	0.14	2163.38	270.42	270.42	75.72	227.15	302.87
Ramp	RAMP	0.10	8930.59	1116.32	1116.32	223.26	669.79	893.06
Ramp	RAMP	0.08	11006.68	1375.84	1375.84	220.13	660.40	880.53
Ramp	RAMP	0.08	4132.31	516.54	516.54	82.65	247.94	330.58
Ramp	RAMP	0.08	537.08	67.14	67.14	10.74	32.22	42.97
Ramp	RAMP	0.08	5766.86	720.86	720.86	115.34	346.01	461.35
Ramp	RAMP	0.1	17906.89	2238.36	2238.36	447.67	1343.02	1790.69
Ramp	RAMP	0.1	5845.23	730.65	730.65	146.13	438.39	584.52
Ramp	RAMP	0.16	8279.97	1035.00	1035.00	331.20	993.60	1324.80
Ramp	RAMP	0.11	4214.81	526.85	526.85	115.91	347.72	463.63
Ramp	RAMP	0.08	7295.31	911.91	911.91	145.91	437.72	583.62
Ramp	RAMP	0.14	2142.81	267.85	267.85	75.00	225.00	299.99
Ramp	RAMP	0.17	8314.08	1039.26	1039.26	353.35	1060.05	1413.39
Ramp	RAMP	0.16	15043.11	1880.39	1880.39	601.72	1805.17	2406.90
Ramp	RAMP	0.06	8795.24	1099.41	1099.41	131.93	395.79	527.71

Exhibit 4b: Provided Traffic Data for the Future No-Build (2050) Scenario

Road Type	Road Name	Traffic Direction	Sement Length (feet)	Peak AM Volume (hourly)	Peak PM Volume (hourly)	Morning Congested Vehicle Volume	Afternoon Congested Vehicle Volume	Daily Congested VMT	Daily Free-Flow VMT	Daily Total VMT
Frontage Roads	WB SH 5 to Stewart	WB	914.6566	1058	1311	3174	3933	1,231	2,845	4,076
Frontage Roads	SB Stewart to Greenville DC	WB	751.977641	1610	1587	4830	4761	1,366	3,157	4,523
Frontage Roads	WB Greenville DC to Medical Center	WB	3713.222315	897	644	2691	1932	3,251	7,514	10,765
Frontage Roads	EB Medical Center ONR to Greenville SB	EB	1051.591899	529	1012	1587	3036	921	2,128	3,049
Frontage Roads	EB Greenville NB to Stewart	EB	2129.843569	1219	1610	3657	4830	3,423	7,912	11,335
Frontage Roads	EB Stewart to SH 5	EB	1009.15833	1173	1426	3519	4278	1,490	3,444	4,934
Frontage Roads	Medical Center EB	EB	1135.428504	1242	2116	3726	6348	2,166	5,007	7,173
Frontage Roads	WB Medical Center to WB	WB	523.736178	1886	1794	5658	5382	1,095	2,531	3,626
Frontage Roads	EB Medical Center ONR to Greenville SB	EB	650.811029	299	552	897	1656	315	727	1,042
Local Road	Harry Mckillop WB - 2	WB	4261.352642	1219	575	3657	1725	4,344	10,038	14,382
Local Road	Airport NB	NB	3768.8736	1311	2369	3933	7107	7,880	18,212	26,092
Local Road	SH 5 NB	NB	1433.982479	3381	4025	10143	12075	6,034	13,945	19,979
Local Road	SH 5 SB	SB	1417.751033	4278	3933	12834	11799	6,614	15,286	21,900
Local Road	SB Greenville DC	SB	1973.39427	713	943	2139	2829	1,857	4,291	6,148
Local Road	EB Greenville SB to Greenville NB	EB	718.170565	46	46	138	138	38	87	124
Local Road	NB Greenville	NB	259.661917	1173	1564	3519	4692	404	933	1,337
Local Road	Airport SB	SB	3777.505532	2576	1633	7728	4899	9,034	20,878	29,911
Local Road	Harry Mckillop EB - 2	EB	4278.979992	253	1311	759	3933	3,802	8,788	12,590
Local Road	SH 5 SB - 5	SB	1631.548454	5313	4025	15939	12075	8,656	20,006	28,662
Local Road	SH 5 NB - 5	NB	1578.394742	3358	4876	10074	14628	7,384	17,066	24,450
Local Road	SH 5 SB - 2	SB	947.045844	2323	2875	6969	8625	2,797	6,464	9,261
Local Road	SH 5 NB - 2	NB	569.752211	1863	2507	5589	7521	1,415	3,269	4,684
Local Road	Airport SB - 5	SB	2113.786022	598	506	1794	1518	1,326	3,064	4,390
Local Road	Airport NB - 5	NB	2119.168087	184	414	552	1242	720	1,664	2,384
Local Road	Airport SB - 4	SB	2275.687014	736	437	2208	1311	1,517	3,505	5,022
Local Road	Airport NB - 4	NB	2249.94516	506	897	1518	2691	1,794	4,145	5,939
Local Road	Airport SB - 3	SB	2482.81205	2070	1311	6210	3933	4,770	11,023	15,792
Local Road	Airport NB - 3	NB	2508.040876	1403	2806	4209	8418	5,998	13,861	19,859
Local Road	Airport NB - 2	NB	3721.57835	1380	2760	4140	8280	8,754	20,231	28,985
Local Road	Airport SB - 2	SB	3731.930291	2599	1587	7797	4761	8,876	20,513	29,389
Local Road	SH 5 NB - 4	NB	358.668415	1587	2185	4761	6555	769	1,776	2,545
Local Road	SH 5 SB - 4	SB	366.770369	2047	2530	6141	7590	954	2,204	3,158
Local Road	Harry Mckillop WB - 3	WB	3507.860061	1265	598	3795	1794	3,713	8,581	12,294
Local Road	Harry Mckillop EB - 3	EB	3512.161373	207	1357	621	4071	3,121	7,213	10,334
Local Road	SH 5 NB - 3	NB	321.93565	1863	2484	5589	7452	795	1,838	2,633
Mainlanes -Restricted	Spur 399 SB	SB	1831.427065	4255	2714	12765	8142	7,252	16,759	24,011
Mainlanes -Restricted	SH 5 Extenstion to US 380	NB	11140.8	1587	2185	4761	6555	23,877	55,180	79,057
Mainlanes -Restricted	SH 5 Extenstion to US 380	SB	11140.8	2047	2530	6141	7590	28,972	66,957	95,929
Mainlanes -Restricted	Spur 399 NB	NB	1925.573937	2185	3450	6555	10350	6,165	14,248	20,413
Ramps	All Ramps[a]	N/A	17318.4	--	--	--	--	--	--	33,117

(a) No ramp data was available for the future no-build scenario. The daily total VMT is based on the Daily VMT for the existing scenario and were ratioed up based on the restricted highway and frontage road traffic volumes for the future no build and existing scenarios.

Exhibit 4c: Provided Traffic Data for the Future Build (2050) Scenario

Road Type	Road Name	Traffic Direction	Sement Length (feet)	Peak AM Volume (hourly)	Peak PM Volume (hourly)	Average Daily Traffic	Morning Congested Vehicle Volume	Afternoon Congested Vehicle Volume	Daily Congested VMT	Daily Free-Flow VMT	Daily Total VMT
Mainlanes - Restricted	EB Stewart ONR to Airport OFR	EB	2847.036621	1900	2520	44600	5700	7560	7,150	16,899	24,049
Mainlanes - Restricted	EB Airport OFR to CR 317 OFR	EB	3816.977802	1700	2220	40300	5100	6660	8,501	20,632	29,133
Mainlanes - Restricted	EB CR 317 OFR to CR 317 ONR	EB	6410.718706	1010	1370	23900	3030	4110	8,669	20,349	29,018
Mainlanes - Restricted	EB CR 317 ONR to Enloe Rd OFR	EB	1933.954189	1220	1670	28200	3660	5010	3,176	7,153	10,329
Mainlanes - Restricted	EB Enloe Rd OFR to FM 546 ONR	EB	4724.690607	1110	1520	25700	3330	4560	7,060	15,937	22,997
Mainlanes - Restricted	EB FM 546 ONR to Spur 399	EB	4734.135574	1630	2100	35300	4890	6300	10,033	21,617	31,651
Local Road	University NB	NB	1422.244202	1740	2240	37200	5220	6720	3,216	6,804	10,020
Local Road	University SB	SB	1397.905258	3490	2630	35200	10470	7890	4,861	4,458	9,319
Mainlanes - Restricted	WB Spur 399 Start to FM 546 OFR	WB	5012.771898	3340	2430	32600	10020	7290	16,434	14,516	30,950
Mainlanes - Restricted	WB FM 546 OFR to Enloe ONR	WB	4820.533888	2880	1740	22200	8640	5220	12,654	7,614	20,268
Mainlanes - Restricted	WB Enloe ONR to CR 317 OFR	WB	1403.16233	3080	1970	25800	9240	5910	4,026	2,830	6,856
Mainlanes - Restricted	WB CR 317 OFR to CR 317 ONR	WB	6209.224802	2940	1790	22500	8820	5370	16,687	9,772	26,460
Mainlanes - Restricted	WB CR 317 ONR to SH 5 OFR	WB	1287.116993	4260	2850	45800	12780	8550	5,200	5,965	11,165
Mainlanes - Restricted	WB SH 5 OFR to Airport Dr ONR	WB	2140.807222	3780	2510	38200	11340	7530	7,651	7,837	15,488
Mainlanes - Restricted	WB Airport ONR to SH 5 ONR	WB	6998.547469	3980	2610	40500	11940	7830	26,205	27,477	53,682
Frontage Roads	EB Harry Mckillop to Airport OFR	EB	3372.291007	270	360	6000	810	1080	1,207	2,625	3,832
Ramps	EB Airport OFR	EB	1507.845158	200	300	4300	600	900	428	800	1,228
Frontage Roads	EB Airport OFR to Airport EB	EB	854.874197	470	660	10300	1410	1980	549	1,119	1,668
Frontage Roads	EB Airport to CR 317 OFR	EB	3050.972474	480	660	10400	1440	1980	1,976	4,033	6,009
Ramps	EB CR 317 OFR	EB	1578.267595	690	850	16400	2070	2550	1,381	3,521	4,902
Frontage Roads	EB CR 317 OFR to CR 317 EB	EB	1357.500197	1170	1500	26800	3510	4500	2,059	4,831	6,890
Frontage Roads	EB CR 317 to CR 317 ONR	EB	1535.104438	740	930	16200	2220	2790	1,457	3,253	4,710
Ramps	EB CR 317 ONR	EB	2054.706549	210	300	4300	630	900	595	1,078	1,673
Frontage Roads	EB CR 317 ONR to FM 546 NB	EB	3619.7595	530	630	11900	1590	1890	2,386	5,772	8,158
Frontage Roads	NB FM 546 to Enloe OFR	NB	2196.889596	570	610	9800	1710	1830	1,473	2,605	4,078
Ramps	EB Enloe Rd OFR	EB	1751.726703	110	150	2500	330	450	259	571	829
Frontage Roads	NB Enloe OFR to Old Enloe NB	NB	519.087279	680	760	12300	2040	2280	425	785	1,209
Frontage Roads	NB Old Enloe to FM 546 ONR	NB	439.79677	680	760	12300	2040	2280	360	665	1,025
Ramps	EB FM 546 ONR	EB	2035.254554	520	580	9600	1560	1740	1,272	2,428	3,700
Frontage Roads	NB FM 546 to Enloe NB	NB	3121.307502	160	180	2700	480	540	603	993	1,596
Frontage Roads	NB Enloe to University NB	NB	3626.981772	110	140	1900	330	420	515	790	1,305
Frontage Roads	SB University to Enloe SB	SB	3769.894834	150	200	2600	450	600	750	1,107	1,856
Frontage Roads	SB Enloe to FM 546 OFR	SB	3104.428468	150	150	2200	450	450	529	764	1,294
Ramps	WB FM 546 OFR	WB	1859.292601	460	690	10400	1380	2070	1,215	2,447	3,662
Frontage Roads	SB Enloe ONR to FM 546 SB	SB	1950.661957	410	610	9100	1230	1830	1,130	2,231	3,362
Ramps	WB Enloe ONR	WB	1836.942668	200	230	3600	600	690	449	804	1,252
Frontage Roads	SB Old Enloe to Enloe ONR	SB	766.787319	610	840	12700	1830	2520	632	1,213	1,844
Frontage Roads	SB FM 546 OFR to Old Enloe SB	SB	356.056028	610	840	12600	1830	2520	293	556	850
Frontage Roads	SB FM 546 to CR 317 OFR	SB	2552.299774	670	620	11600	2010	1860	1,871	3,737	5,607
Ramps	WB CR 317 OFR	WB	1341.987552	140	180	3300	420	540	244	595	839
Frontage Roads	WB CR 317 OFR to CR 317 WB	WB	2141.637984	810	800	14900	2430	2400	1,959	4,085	6,044
Frontage Roads	WB CR 317 to CR 317 ONR	WB	729.13572	1770	1830	33600	5310	5490	1,491	3,149	4,640
Ramps	WB CR 317 ONR	WB	1876.58764	1320	1060	23300	3960	3180	2,538	5,743	8,281
Frontage Roads	WB CR 317 ONR to Airport WB	WB	3443.083175	460	760	10200	1380	2280	2,387	4,265	6,651
Frontage Roads	WB Airport to Airport ONR	WB	539.930427	430	460	6900	1290	1380	273	433	706
Frontage Roads	WB Airport ONR to SH 5 OFR	WB	2909.722452	230	360	4600	690	1080	975	1,560	2,535
Ramps	WB Airport ONR	WB	1287.844249	200	100	2300	600	300	220	341	561
Local Road	University WB	WB	2508.899588	5010	3830	51400	15030	11490	12,602	11,822	24,424
Local Road	New Hope EB	EB	1654.89749	3990	5360	62600	11970	16080	8,792	10,829	19,621
Local Road	University EB - 2	EB	2512.573765	3310	5130	57700	9930	15390	12,049	15,409	27,457

Exhibit 4c: Provided Traffic Data for the Future Build (2050) Scenario

Road Type	Road Name	Traffic Direction	Sement Length (feet)	Peak AM Volume (hourly)	Peak PM Volume (hourly)	Average Daily Traffic	Morning Congested Vehicle Volume	Afternoon Congested Vehicle Volume	Daily Congested VMT	Daily Free-Flow VMT	Daily Total VMT
Local Road	New Hope WB - 2	WB	1650.641728	4220	3710	57600	12660	11130	7,437	10,570	18,007
Local Road	CR 317 SB	SB	369.29438	140	150	2300	420	450	61	100	161
Local Road	Airport SB - 2	NB	597.461246	370	640	9500	1110	1920	343	732	1,075
Local Road	FM 546 EB	EB	715.897031	470	510	9600	1410	1530	399	903	1,302
Local Road	FM 546 WB	WB	1261.668964	860	780	14400	2580	2340	1,176	2,265	3,441
Mainlanes - Restricted	EB Stewart OFR to Medical Center ONR	EB	1311.186747	1830	2830	43100	5490	8490	3,472	7,231	10,703
Mainlanes - Restricted	EB Medical Center ONR to SH 5 OFR	EB	1643.659058	2060	3170	48500	6180	9510	4,884	10,214	15,098
Mainlanes - Restricted	EB SH 5 OFR to Stewart ONR	EB	4657.742042	1210	1900	28200	3630	5700	8,230	16,646	24,877
Mainlanes - Restricted	WB SH 5 ONR to Medical Center OFR	WB	2413.549312	5180	3410	59600	15540	10230	11,780	15,464	27,244
Mainlanes - Restricted	WB Medical Center OFR to Spur 399 WB	WB	2921.056426	4260	2720	47200	12780	8160	11,585	14,528	26,112
Ramps	EB SH 5 OFR	EB	3395.724041	850	1270	20300	2550	3810	4,090	8,965	13,056
Local Road	SB SH 5 to SH 5 ONR	SB	883.689781	1800	1210	28600	5400	3630	1,511	3,275	4,787
Frontage Roads	SB SH 5 ONR to Stewart SB	SB	1639.128099	600	410	9500	1800	1230	941	2,009	2,949
Frontage Roads	SB Stewart to Greenville DC	SB	751.977641	720	490	11600	2160	1470	517	1,135	1,652
Frontage Roads	WB Greenville DC to Medical Center OFR	SB	2711.980616	150	130	1400	450	390	431	288	719
Ramps	WB Medical Center OFR	WB	1346.062528	920	690	12400	2760	2070	1,231	1,930	3,161
Frontage Roads	SB Greenville DC	SB	1973.39427	570	360	10200	1710	1080	1,043	2,769	3,812
Frontage Roads	EB SH 5 DC	NB	1848.740889	260	280	4800	780	840	567	1,113	1,681
Ramps	EB Stewart ONR	EB	3030.076274	690	620	16400	2070	1860	2,255	7,156	9,412
Frontage Roads	WB Medical Center OFR to Medical Center W	SB	1001.241699	1070	820	13800	3210	2460	1,075	1,542	2,617
Ramps	EB Stewart OFR	EB	2576.952199	130	220	2900	390	660	512	903	1,415
Ramps	EB Medical Center ONR	EB	974.32377	230	340	5400	690	1020	316	681	996
Frontage Roads	EB Medical Center to Medical Center ONR	EB	947.794569	530	1020	12500	1590	3060	835	1,409	2,244
Frontage Roads	EB Medical Center ONR to Greenville SB	EB	754.608359	300	680	7100	900	2040	420	595	1,015
Local Road	EB RT to Greenville SB	EB	525.111173	250	630	6400	750	1890	263	374	636
Frontage Roads	EB Greenville SB to Greenville NB	EB	718.170565	130	220	700	390	660	143	(48)	95
Local Road	NB Greenville	NB	259.661917	880	820	20000	2640	2460	251	733	984
Frontage Roads	EB Greenville NB to Stewart OFR	NB	816.024979	930	870	20700	2790	2610	835	2,365	3,199
Frontage Roads	EB Stewart OFR to Stewart EB	NB	1313.81859	1060	1090	23600	3180	3270	1,605	4,267	5,872
Frontage Roads	EB Stewart to SH 5 DC	NB	631.872864	950	900	21200	2850	2700	664	1,873	2,537
Ramps	WB SH 5 ONR	WB	1360.713022	1200	800	19100	3600	2400	1,546	3,376	4,922
Mainlanes - Restricted	EB Spur 399 to Stewart OFR	EB	1663.505347	1960	3050	46000	5880	9150	4,735	9,757	14,493
Frontage Roads	Medical Center EB	EB	1135.428504	1240	2120	25800	3720	6360	2,168	3,380	5,548
Frontage Roads	WB Medical Center to WB	WB	523.736178	2060	1960	27900	6180	5880	1,196	1,571	2,767
Local Road	NB Medical Center - 3	NB	492.240148	890	1450	17800	2670	4350	654	1,005	1,659
Local Road	SB Medical Center	SB	494.736012	680	730	9800	2040	2190	396	522	918
Local Road	NB Medical Center	NB	446.528479	1380	1690	20900	4140	5070	779	989	1,768
Local Road	SB Medical Center - 3	SB	423.900506	890	930	12100	2670	2790	438	533	971
Local Road	WB Stewart - 3	WB	598.413838	270	330	4800	810	990	204	340	544
Local Road	EB Stewart	EB	566.056035	280	230	4700	840	690	164	340	504
Local Road	WB Stewart	WB	530.594329	40	40	400	120	120	24	16	40
Local Road	EB Stewart - 3	EB	532.867964	40	50	600	120	150	27	33	61
Local Road	NB Medical Center - 2	NB	371.604613	1470	2020	24900	4410	6060	737	1,016	1,752
Local Road	SB Medical Center - 2	SB	369.979115	500	570	7600	1500	1710	225	308	533
Local Road	WB SH 5 OFR to Harry Mckillop	WB	665.881161	710	700	12200	2130	2100	533	1,005	1,539
Local Road	EB Stewart - 2	EB	306.834002	200	180	3300	600	540	66	126	192
Local Road	Airport SB	SB	573.789203	350	340	6300	1050	1020	225	460	685
Local Road	Airport NB	NB	317.412012	220	270	4300	660	810	88	170	258
Local Road	Airport SB - 2	SB	311.591888	230	270	4400	690	810	89	171	260
Ramps	WB SH 5 OFR	WB	3742.896337	480	340	7600	1440	1020	1,744	3,644	5,388

Exhibit 4c: Provided Traffic Data for the Future Build (2050) Scenario

Road Type	Road Name	Traffic Direction	Sement Length (feet)	Peak AM Volume (hourly)	Peak PM Volume (hourly)	Average Daily Traffic	Morning Congested Vehicle Volume	Afternoon Congested Vehicle Volume	Daily Congested VMT	Daily Free-Flow VMT	Daily Total VMT
Local Road	SB Greenville	NB	303.705837	820	990	16600	2460	2970	312	642	955
Local Road	CR 317 SB - 2	SB	334.016739	170	230	3500	510	690	76	145	221
Local Road	CR 317 NB - 2	NB	331.401471	1090	1230	21600	3270	3690	437	919	1,356
Local Road	CR 317 SB - 3	SB	498.537068	810	930	17700	2430	2790	493	1,178	1,671
Local Road	CR 317 NB	NB	480.884817	1300	1360	25200	3900	4080	727	1,568	2,295
Local Road	FM 546 EB - 3	EB	1259.516407	740	880	17600	2220	2640	1,159	3,039	4,198
Local Road	CR 317 NB - 3	NB	361.48145	100	120	1700	300	360	45	71	116
Local Road	FM 546 WB - 3	WB	715.897031	290	420	6000	870	1260	289	525	814
Local Road	FM 546 EB - 2	EB	370.962528	450	560	10500	1350	1680	213	525	738
Local Road	FM 546 WB - 2	WB	369.972965	530	480	9400	1590	1440	212	446	659
Local Road	Old Enloe EB - 2	EB	337.327626	20	20	200	60	60	8	5	13
Local Road	Old Enloe WB	WB	337.26294	20	20	200	60	60	8	5	13
Local Road	Old Enloe EB	EB	386.909155	20	20	300	60	60	9	13	22
Local Road	Old Enloe WB - 2	WB	388.479668	20	20	200	60	60	9	6	15
Local Road	Enloe Rd EB - 2	EB	302.169767	50	60	800	150	180	19	27	46
Local Road	Enloe WB	WB	302.180542	100	100	1600	300	300	34	57	92
Local Road	Enloe Rd EB	EB	486.972676	100	90	1700	300	270	53	104	157
Local Road	Enloe WB - 2	WB	484.592119	150	180	2900	450	540	91	175	266
Local Road	New Hope SB	SB	717.601575	1380	1230	20800	4140	3690	1,064	1,763	2,827
Local Road	New Hope NB	NB	709.496185	260	350	21500	780	1050	246	2,643	2,889
Local Road	New Hope WB	WB	745.713885	3770	3350	48300	11310	10050	3,017	3,805	6,822
Local Road	University EB	EB	743.311306	3820	5040	52600	11460	15120	3,742	3,663	7,405
Mainlanes - Restricted	SH 5 Extended to US 380	NB	13358.4	1800	1210	28600	5400	3630	22,846	49,512	72,358
Mainlanes - Restricted	SH 5 Extended to US 380	SB	13358.4	850	1270	20300	2550	3810	16,091	35,268	51,359
Local Road	WB Stewart - 2	WB	286.798653	290	360	5500	870	1080	106	193	299

Table 4d: Future Surrounding Network Traffic Data

Roadways			ADT for 2050			Segment length		2050 VMT / Day		Congested VMT/Day		Free Flow VMT/Day	
			No-Build	Build				No-Build	Build	No-Build	Build	No-Build	Build
US 75 Restricted mainlane	NB	Frontage	4009	909		4.04		16,196	3,672	4,049	918	12,147	2,754
		Mainline	40093	9093		3.71		148,745	33,735	37,186	8,434	111,559	25,301
	SB	Frontage	4009	909		4.11		16,477	3,736	4,119	934	12,358	2,802
		Mainline	40093	9093		4		160,372	36,372	40,093	9,093	120,279	27,279
SH 5 - Restricted			--	2273		6.56		--	14,911	--	3,728	--	11,183
Airport Dr			--	455		4.18		--	1,902	--	476	--	1,426
US 380 - Unrestricted			100232	22732		4.97		498,153	112,978	124,538	28,245	373,615	84,733

ATTACHMENT B: MEETING MINUTES

Spur 399 Extension EIS
MSAT Conference Call

Spur 399 Extension – US 75 to US 380
CSJs 0364-04-051, 0047-05-058, 0047-10-002

March 11, 2022

Discussion Agenda

Welcome, Introductions, and Opening Remarks - *Stephen Endres, PE – TxDOT PM and attendees*

TxDOT Invitees:
- Stephen Endres, PE – Dallas District PM
- Christine Polito – Dallas District Environmental Manager
- Dan Perge – Assistant APD Engineer
- Michelle Lueck – ENV Project Delivery Manager
- Tim Wright – Dallas District Traffic Specialist
- Tim Wood – ENV Lead Air Quality Specialist
- Glendora Lopez – ENV Air Quality Subject Matter Expert/Reviewer

NCTCOG Invitees:
- Jeff Neal – Senior Program Manager, Streamlined Project Delivery and Data Management
- Berrien Barks – Program Manager, Roadway Corridor and Subarea Studies
- Samuel Simmons – Senior Transportation Planner, Transportation Planning
- Nathan Drozd – Principal Transportation Planner
- Sandy Wesch, PE, AICP – Principal Transportation Planner

Burns & McDonnell Invitees:
- Josh Robertson, PE – Schematic/Environmental PM
- Shari Cannon-Mackey, CEP, ENV SP – NEPA Lead
- Tess Fuller – Air Quality Lead

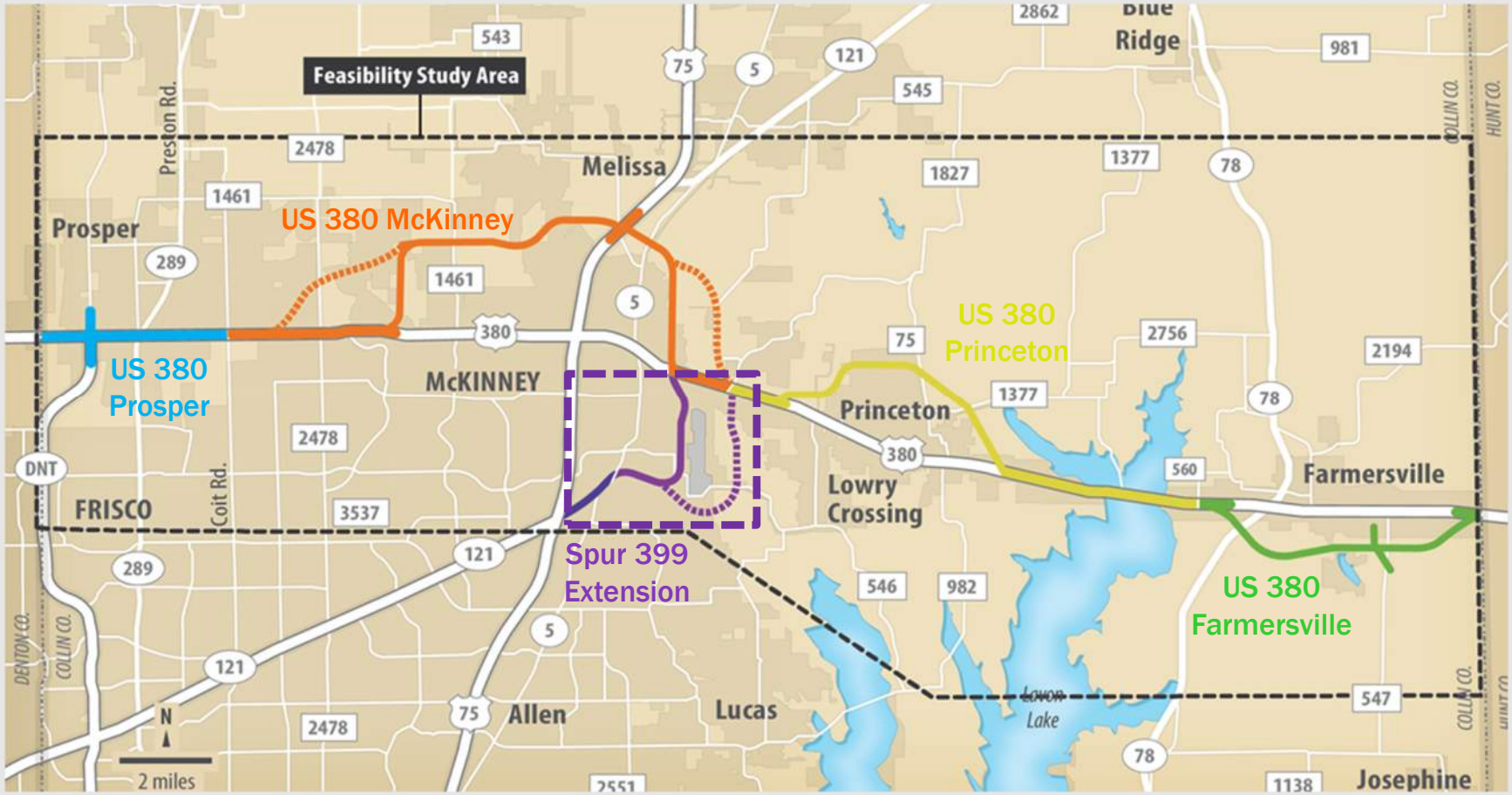
Project Description - *Stephen Endres*

Reason for Initiating the MSAT Conference Call – *Shari Cannon-Mackey – NEPA Lead, Burns & McDonnell*
Josh Robertson, PE – PM, Burns & McDonnell

Status of Current Schematic/Environmental Process for the Spur 399 Extension Project
- *Shari Cannon-Mackey / Josh Robertson*

Discussion and Adjournment - *All*

Project Description – US 380 Feasibility Study – 5 Independent Projects



Spur 399 Extension EIS – Study Process and Schedule

Spur 399 Extension EIS – US 75 to US 380

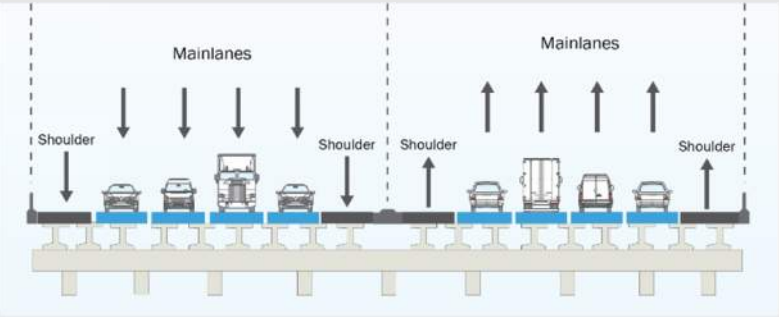
Milestone	Date
Agency Scoping	December 10, 2020
NOI – Published in Federal Register	January 11, 2021
Public Scoping	February 23-March 10, 2021
Public Meeting	October 21, 2021
Public Hearing	June-July 2022
ROD (target)*	February 2023

Project Description

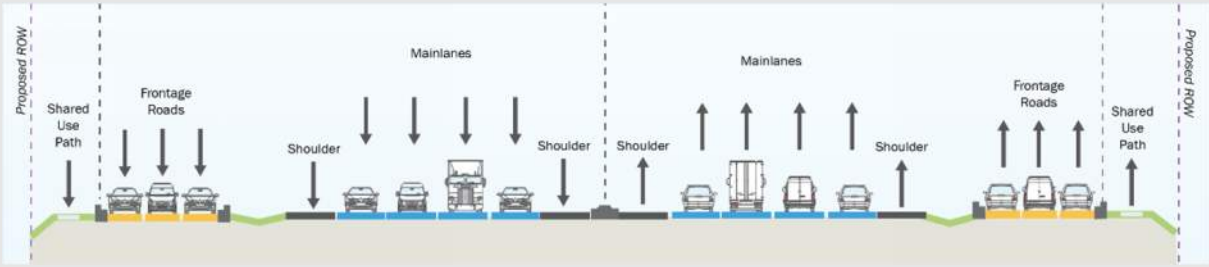
The proposed Spur 399 Extension is comprised of improvements within the existing section of SH 5 between US 75 and Stewart Road, and new location improvements from Stewart Road to US 380 east of McKinney. Within the section of SH 5 between US 75 and Stewart Road, one new travel lane in each direction would be striped and an exit ramp would be constructed within the existing ROW established by the recently cleared SH 5 project (CSJs 0135-03-046 and 0135-04-033).

From Stewart Road to US 380, the Spur 399 Extension would be constructed on new location as an eight-lane, access-controlled freeway with one-way frontage roads on each side within an anticipated right-of-way width ranging from 330 to 400 feet depending on location. Frontage roads may be eliminated, and the primary travel lanes may be elevated (on bridge/viaduct) to minimize impacts on sensitive resources. The freeway facility would also 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.

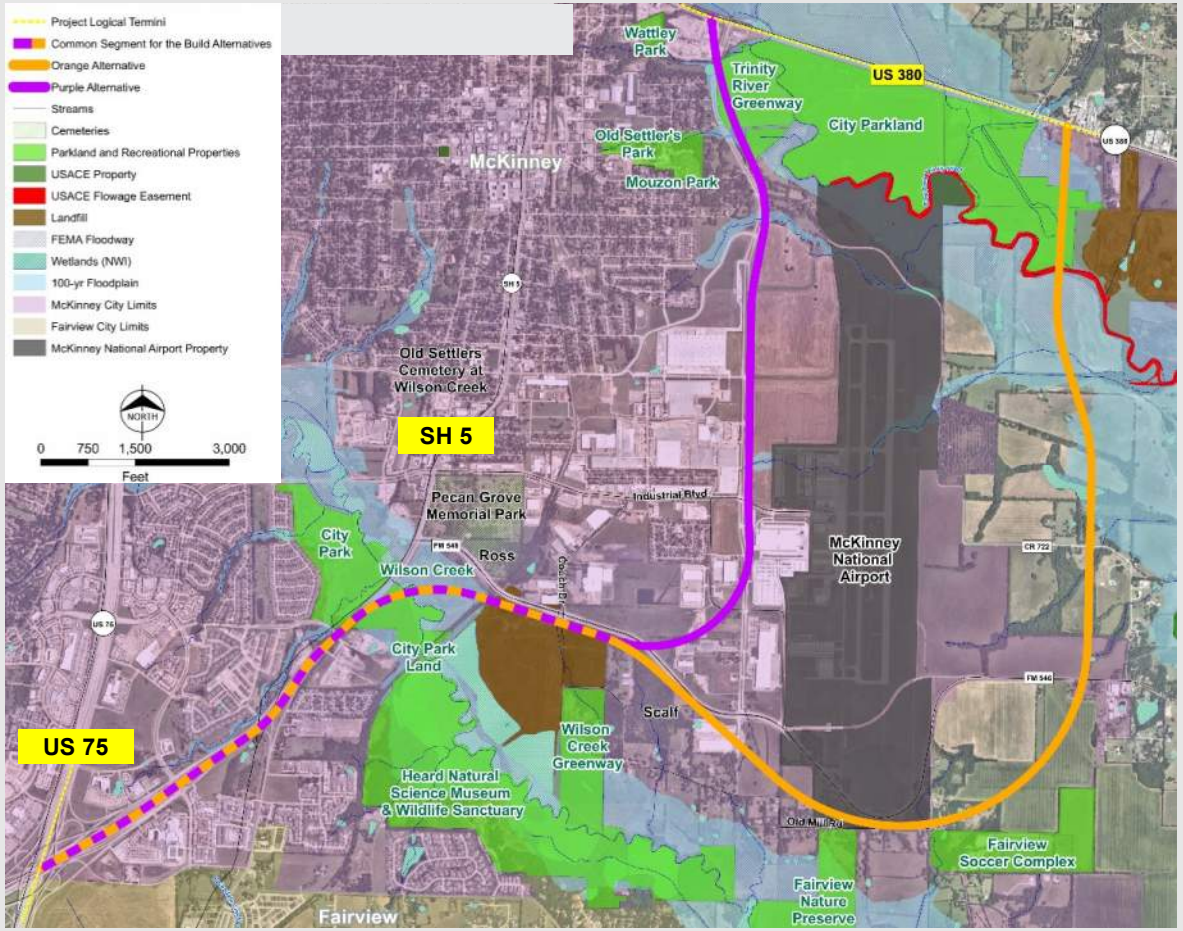
Elevated Typical Section, No FR



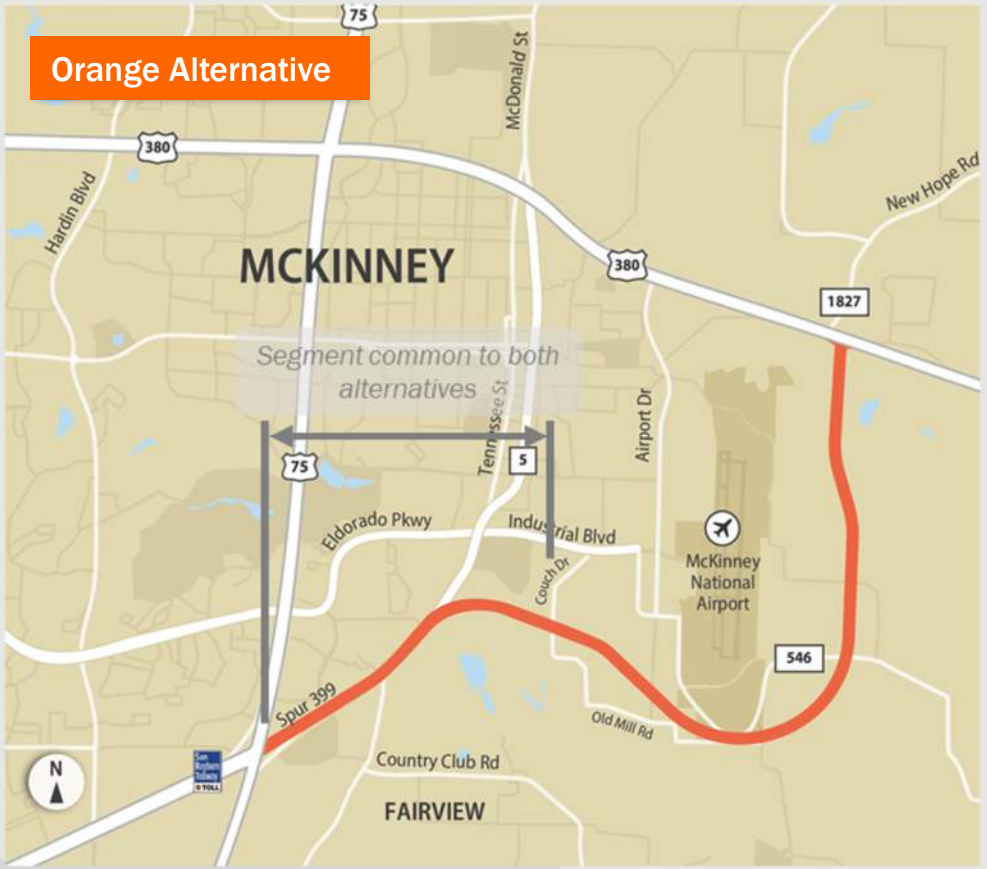
At-Grade Typical Section



Spur 399 Extension Study Area



Spur 399 Extension– Reasonable Alternatives



Modifications may continue to be made to the alignments as the study progresses.

Spur 399 Extension– Purpose and Need

PURPOSE

CONNECTIVITY FOR AREAS OF RAPID GROWTH AND THAT LACK ARTERIAL ROADWAYS

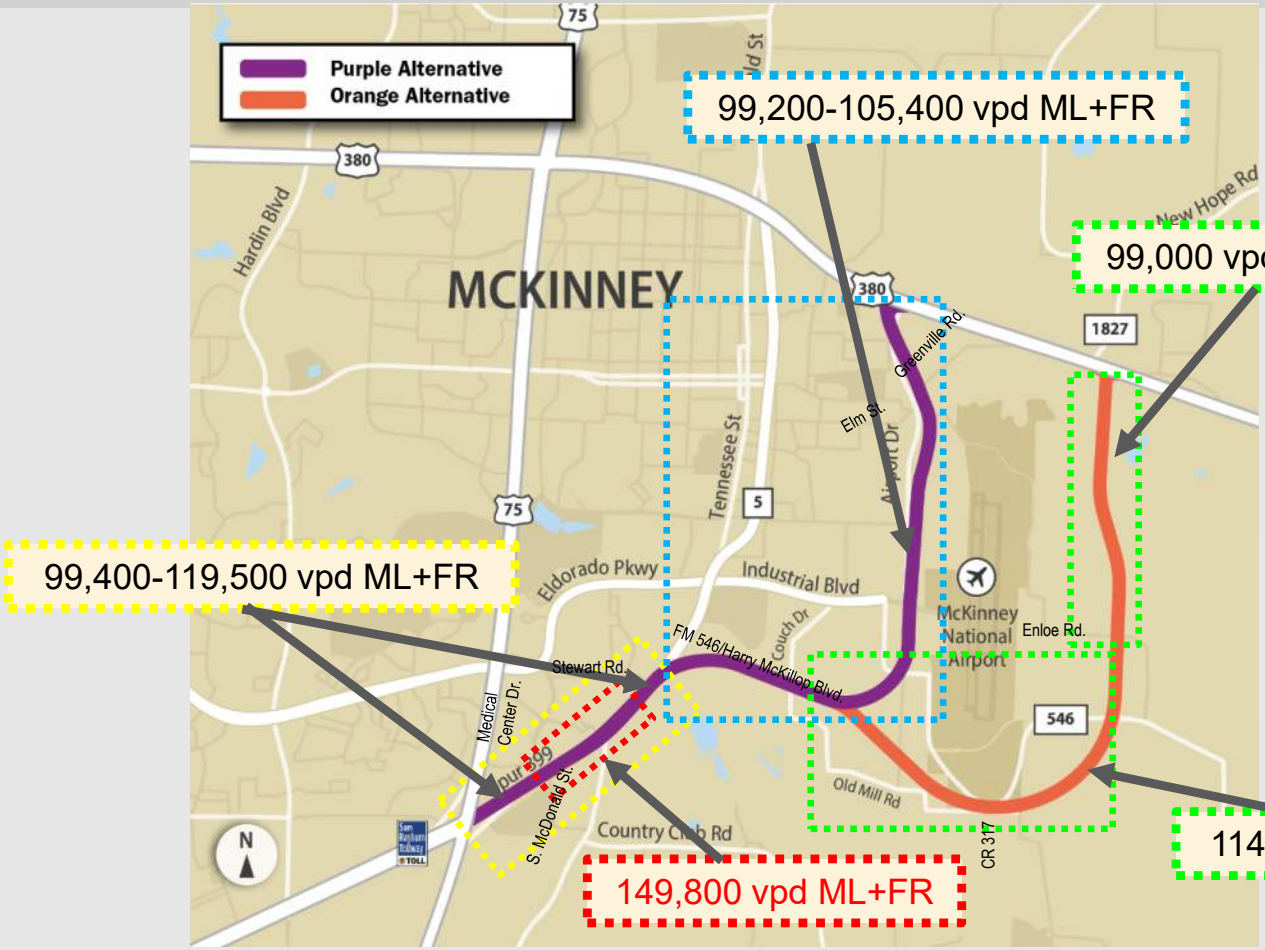
IMPROVE NORTH-SOUTH MOBILITY

NEED

The lack of Regionally Significant Arterials reduce mobility and limit connectivity for travelers between the northern and eastern portions of Collin County and destinations south of McKinney, including the majority of the Dallas Metroplex core. Mobility is further reduced because the existing deficient arterial roadway network cannot address current travel demands and the burden forecasted population growth will continue to place on the existing transportation system.

Spur 399 Extension – Traffic Data

Design Year = 2050



TPP Approved Traffic Volumes (TAHD and ESALs) received 27-OCT-2021 (Orange/East) and 9-NOV-2021 (Purple/West)

Spur 399 Extension – Traffic Data

PURPLE 2050 (West1 Scenario)	WITHIN EXISTING SH 5 CORRIDOR				NEW LOCATION	
	US 75 to DCs	DCs to Ramps NE of Medical Center Dr.	NE of Medical Center Dr. to Steward Rd	Steward Dr. to Private Dr.	Private Dr. to E. University Dr.to N of Greenville Rd.	
MAINLANES	45,700	93,200	108,100	85,100	65,600	
FRONTAGE ROADS	US 75 to Medical Center Dr.	Medical Center to SH 5	SH 5 to SH 5 /McDonald	S. Industrial to Private Dr.	Private to Future Elm St.	Future Elm to N of Future Elm
	53,700	26,300	41,700	20,700	33,600	11,400

PURPLE 2050 (West2 Scenario)	WITHIN EXISTING SH 5 CORRIDOR				NEW LOCATION	
	US 75 to DCs	DCs to Ramps NE of Medical Center Dr.	NE of Medical Center Dr. to Steward Rd	Steward Dr. to Private Dr.	Private Dr. to E. University Dr.	
MAINLANES	45,700	93,200	108,100	85,100	71,800	
FRONTAGE ROADS	US 75 to Medical Center Dr.	Medical Center to SH 5	SH 5 to SH 5 /McDonald	S. Industrial to Private Dr.	Private to Future Elm St.	Future Elm to N of Future Elm
	53,700	26,300	41,700	20,700	33,600	7,800

ORANGE 2050	WITHIN EXISTING SH 5 CORRIDOR				NEW LOCATION		
	US 75 to DCs	DCs to Ramps NE of Medical Center Dr.	NE of Medical Center Dr. to Steward Rd	Steward Dr. to Harry McKillop Blvd E	Harry McKillop Blvd E to Old Enloe Rd.	Old Enloe Rd to N of Enloe Rd.	
MAINLANES	45,700	93,200	108,100	87,800	54,000	67,900	
FRONTAGE ROADS	US 75 to Medical Center Dr.	Medical Center to SH 5	SH 5 to SH 5 /McDonald	Harry McKillop W to Harry McKillop E	Harry McKillop E to FM 546/CR 317	FM 546/CR 317 to ramps N of Old Enloe Rd.	Ramps N of Old Enloe Rd to N of Enloe Rd.
	53,700	26,300	35,200	20,600	60,400	31,100	4,900

- ✓ Letting Year = 2026
- ✓ ETC Year = 2030
- ✓ Design Year = 2050

- ✓ No-Build Traffic Volumes 2040 (~49,000 vpd, derived from the SH 5 project cleared in 2020 CSJs 0135-03-046 and 0135-04-033)

- ✓ Emission Rate (ERLT) Look-up tables are available for Collin County

- ✓ Methodology to determine VMT

Spur 399 Extension - MSAT Quantitative Analysis

- ❑ Traffic data
- ❑ Obtaining VMT breakdowns for various timeframes
- ❑ Obtaining congested speeds for each timeframe
- ❑ Anticipated project schedule, including environmental approval date and ETC year
- ❑ MSAT analysis base year, design year, interim year (if recommended)
- ❑ Emissions model to be used
- ❑ MSAT emission rate tables/methodology for developing emission rates

- ✓ Letting Year = 2026
- ✓ ETC Year = 2030
- ✓ Design Year = 2050

- ✓ No-Build Traffic Volumes 2040 (~49,000 vpd, derived from the SH 5 project cleared in 2020 CSJs 0135-03-046 and 0135-04-033)

- ✓ Emission Rate (ERLT) Look-up tables are available for Collin County

- ✓ Methodology to determine VMT

Final Thoughts & Discussion

Additional questions or concerns
regarding the Spur 399 Extension Project?

Texas Department of Transportation
125 EAST 11TH STREET | AUSTIN, TEXAS 78701-2483 | (512) 463-8588 | WWW.TXDOT.GOV

March 27, 2023

Transmitted Via E-mail

Mrs. Barbara C. Maley, AICP
Env/Tranp Plan Coord & Air Quality Specialist
Barbara.Maley@dot.gov

Re: Request for Project-Level Conformity Determination
Collin County
CSJs 0364-04-051, 0047-05-058, 0047-10-002
Spur 399/SH 5

Dear Mrs. Maley:

Attached is the copy of the Transportation Conformity Report Form for your review and concurrence.

A project-level conformity determination is requested from you. If you have any questions regarding this project, please contact me at (512) 840-9720.

Sincerely,

DocuSigned by:
Glendora Lopez
D7144948868E4E9...

Glendora Lopez
Air Specialist
Environmental Affairs Division

Attachment(s)

Transportation Conformity Report Form

Project Facility Name: Spur 399/SH 5

MPO Project IDs: RSA1-1.680.315, FT1-4.10.1, FT1-4.15.1, FT1-4.20.1

Project CSJ Numbers: 0364-04-051, 0047-05-058, 0047-10-002

Project Limits

From: US 75

To: US 380

Project Sponsor: TxDOT Dallas District

Project Description[1]: Spur 399 from US 75 to SH 5 will be reconstructed and widened from a 4-lane freeway to an 8-lane freeway and construct 4/8 discontinuous to 4/8 continuous lane frontage roads.

SH 5 from SH 5/Spur 399 to Stewart Road will be reconstructed and widened from a 4-lane arterial to a 6-lane arterial (ultimate 8-lane freewy) and construct 0 to 4/6 lane frontage roads.

Spur 399 from Stewart Road to US 380 will be a new location extension. The extension will be a 6/8-lane freeway with 4/6-lane discontinuous frontage roads.

The construction time frame on this project exceeds 2 years because it entails phased construction on existing SS 399/SH 5 and on the SP 399 extension. The frontage roads will be completed and opened to traffic prior to the reconstruction and widening of the main lanes. This will minimize traffic disruptions and aide in traffic handling during construction.

Date of anticipated environmental decision/re-evaluation: March 2023

Let Year: 2026

ETC[2] Year: 2030

Conformity Year[3]: 2036

Total Project Cost: $467M ,see Interoffice Memorandum regarding TPC.

Adding Capacity? ☒ Yes ☐ No

Counties: Collin

Project Classification: ☐ CE ☐ EA ☒ EIS ☐ Re-evaluation

Important Information

[1] Project description, project details, and other project information should include enough detail in order to make a determination of project consistency with the MTP, TIP, STIP, and corresponding transportation conformity determination.

[2] The ETC or estimated time of completion year is the date the entire project as described in the environmental review document will be open to traffic.

[3] If this project is NOT considered regionally significant by the MPO, enter “N/A – non-regionally significant”. In addition, note that the conformity year is sometimes referred to as the network year. When a MTP identifies a specific timeframe during which a project will be operational, the last year of that timeframe is the conformity year.

A determination of project-level conformity is not permanent. It is recommended that conformity be checked early and often in the project development process, but that this specific form be coordinated within 60 days of the anticipated environmental decision to avoid coordinating the form more than once. The following events would require a project's conformity determination to be reevaluated.

1. Changes to the project's design concept, scope, limit, funding, or estimated time of completion (ETC) year
2. Changes to the project's listing in the MTP, TIP, or STIP related to design concept, scope and limits; funding or ETC year
3. New conformity determinations on the applicable MTP, TIP, or STIP (even if it occurs after the FHWA/FTA project-level conformity determination has been made)

In particular, if there is a planned MTP update/amendment and associated transportation conformity determination expected to be completed on or near the time of project approval, it is recommended that the project sponsor prepare this conformity determination after the plan update/amendment and associated transportation conformity determination is completed, if the update/amendment will affect the project as specified in item 1 above. Consult with ENV air specialist if further assistance is needed.

Instructions

Check the appropriate box for each question, using the most current information available, and be aware that the answers will dictate which questions must be answered for each specific project. Start with Step One, and follow the instructions included in each step, if any additional instructions are provided.

The information displayed between carets, <like this> represents a field that should be customized with project specific information. In the electronic file, these fields are highlighted in grey. Content prompts, like ***Choose an item****,* represent dropdown menus, which also must be customized with project specific information.

If the form requires the preparer to "STOP" because something is lacking, then it is recommended that the time it would take to make the necessary changes to the MTP, TIP, or project should be re-evaluated against the project's proposed letting date (i.e., letting date may need to be adjusted).

Step 1: Is this a federal project with a federal lead other than FHWA/FTA?

☐ **Yes – STOP. Transportation conformity does not apply to the project, however, general conformity may apply.**

Consult the ENV air specialist regarding this project and potential general conformity requirements.

☒ No – Continue to Step 2.

Step 2: Is this a FHWA/FTA project[4]?

☒ Yes – Proceed to Step 4.

☐ No – Continue to Step 3.

[4] Note that this includes projects which may not have federal funding but would otherwise require federal approval.

Step 3: Is this project considered regionally significant[5] in accordance with 40 CFR 93.101 or 30 TAC 114.260(d)(2)(iv)?

☒ Yes – Continue to Step 4.

☐ No – **STOP. In accordance with 40 CFR 93.102(a)(2), a project level transportation conformity determination is not required for non-regionally significant, non-FHWA/FTA projects.**

Step 4: Is the project located in a nonattainment or maintenance area6 for ozone7, nitrogen dioxide (NO2), carbon monoxide (CO), particulate matter (PM2.5 or PM10)?

☒ Yes – **Transportation conformity rules apply.** The project is located in the EPA designated **9**-county DFW **severe non**attainment[8] area for **2008 8-hour ozone** NAAQS and moderate nonattainment for the 2015 ozone NAAQS. Continue to Step 5.

☐ No – **STOP. Transportation conformity does not apply to the project.**

Step 5: Is the project exempt[9] from conformity in accordance with 40 CFR 93.126[10] or 40 CFR 93.128[11]?

☐ Yes – **STOP. Transportation conformity does not apply to the project.** This project falls under the following exemption: ***Choose an item.***

☒ No – Continue to Step 6.

Step 6: Is the project exempt from the regional conformity analysis in accordance with 40 CFR 93.127?

☐ Yes – **The project is exempt from regional conformity requirements.** This project falls under the following exemption: ***Choose an item.*** Proceed to Step 16.

☒ No – Continue to Step 7.

Step 7: Does the project fall within the boundaries[12] of an MPO?

☒ Yes – Proceed to Step 9.

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[5] If a project is on the MPO's NON-regionally significant project list, it is not regionally significant. Each MPO may have different criteria for designating a project as regionally significant.

[6] If unsure about the nonattainment or maintenance status, it can be checked in multiple locations, including: the EPA Greenbook, the TCEQ website, or the applicable table in the Air Quality toolkit.

[7] Note the 1997 ozone standard was revoked by EPA.

[8] Area classifications can be either maintenance, marginal nonattainment, moderate nonattainment, serious nonattainment, severe nonattainment, or extreme nonattainment

[9] Most added capacity projects will not be exempt, whereas most non-added capacity projects will be exempt.

[10] Ultimately, the interpretation of what projects types meet these exemption criteria is under the purview of the federal lead agency. For example, although it could be interpreted to meet some of the exemption project types, a project changing from general purpose to managed lanes is NOT considered to be exempt from conformity.

[11] Grouped CSJ projects, by rule, must be exempt under these criteria.

[12] i.e., within a Metropolitan Planning Area (MPA)

☐ No – Continue to Step 8.

Step 8: Is the project design concept, scope and limits, conformity analysis year, and funding consistent with an approved[13] regional conformity analysis for an isolated rural area that meets the requirements of 40 CFR 93.109?

☐ Yes – **The project is consistent with an approved regional conformity determination that meets the requirements of 40 CFR 93.109 for isolated rural areas.** Proceed to Step 16.

☐ No **– STOP. The project is not consistent with a regional conformity determination for an isolated rural area. TxDOT will not take final action until the project is consistent with an approved regional conformity determination that meets the requirements of 40 CFR 93.109 for isolated rural areas.**

Do not sign this form. Please ensure that the project is included in and consistent with an approved regional conformity determination then reevaluate the project using this form.

Step 9: Are all of the project phases[14] for the entire project described in the environmental document included in the fiscally constrained portion of the MTP?

☒ Yes – Continue to Step 10.

☐ No **– STOP. The project was not included in the area's regional conformity determination, and, therefore, is not consistent with it.** The MTP needs to be amended to include this project and a new conformity determination needs to be made on the MTP before consistency can be determined for the project, or the project needs to be revised to be consistent with the existing MTP.

Consult with the district TP&D and MPO on how to proceed.

Step 10: Is at least one phase of the project beyond the NEPA study (corridor study) included in either the appropriate year of the conforming TIP[15] or in Appendix D (if will not be let within the timeframe of the TIP)?

☒ Yes – Continue to Step 11.

☐ No **– STOP. The project is not included in the conforming TIP and is therefore not consistent with it.** At least one phase of the project must be added to the conforming TIP before consistency can be determined.

Consult with the district TP&D and MPO on how to proceed.

[13] The consultation partners are responsible for approving regional conformity analyses.

[14] A project phase is a separate portion of a project such as: NEPA study, ROW acquisition, final design, construction, and/or partial construction.

[15] In Texas, a conforming TIP is one that has been included into the STIP, so projects must be in the STIP in order to show that they come from a conforming TIP.

Step 11: Are the current project limits the same[16] or do they fall within the project limits listed in the MTP and STIP?

☒ Yes – Continue to Step 12.

☐ No – **STOP. The project is not consistent with the conforming MTP and TIP**. Either the MTP and TIP, or the project needs to be revised before consistency can be **determined.**

Consult with the district TP&D and MPO on how to proceed.

Step 12: Is the activity being proposed the same as that in the MTP and STIP project description in both type[17] of facility and number[18] of lanes?

☒ Yes – Continue to Step 13.

☐ No – **STOP. The project is not consistent with the conforming MTP and TIP.** Either the MTP and TIP, or the project needs to be revised before consistency can be determined.

Consult with the district TP&D and MPO on how to proceed.

***S*tep 13:** Does the project's ETC year fall between its identified conformity year[19] in the MTP and the previous conformity year identified in the MTP?

☒ Yes – Continue to Step 14.

☐ No – **STOP. The project is not consistent with the conforming MTP and TIP.** Either the MTP and TIP or the project needs to be revised before consistency can be determined.

Consult with the district TP&D and MPO on how to proceed.

☐ N/A – This project is non-regionally significant. Continue to Step 14.

Step 14: Is the estimated total project cost or the cost identified in the MTP greater than $1,500,000?

☒ Yes – Proceed to Step 15.

☐ No – Fiscal constraint requirements do not apply. This project is consistent with the currently conforming MTP and TIP. Proceed to Step 16.

---

[16] The limits are considered the same if the logical termini noted in the environmental document fall within the limits of the project noted in the MTP or the logical termini noted in the environmental document are not significantly greater (~1mile) than the limits noted in the MTP due to transition areas for safety or other factors required to be considered when establishing logical termini for environmental document purposes.

[17] The type of activity refers to the type of enhancement, such as: main lanes, frontage roads, HOV lanes, direct connectors, bridge replacement, etc…

[18] The number refers to the amount of each activity type, such as: number of main lanes or number of frontage lanes.

[19] For the purposes of this determination, the term conformity year is synonymous with the network analysis year for the MTP.

Step 15: Does the estimated project cost exceed what is contained in the MTP by more than 50%[20]?

☐ Yes – **STOP. The project is not consistent with the MTP and TIP because it is not fiscally constrained.** Either the MTP and TIP, or the project needs to be revised before consistency can be determined or a case-by-case decision will need to be made by FHWA.

Consult with the district TP&D and MPO on how to proceed.

☒ No – **This project is consistent with the currently conforming MTP and TIP**. Continue to Step 16. Please see the Interoffice Memorandum regarding TPC.

Step 16: Is the project located in either a CO, $PM_{2.5}$, or PM_{10} nonattainment or maintenance area?[21]

☐ Yes – Continue to Step 17.

☒ No – **Hot-spot conformity requirements do not apply.** Proceed to Step 21.

Step 17: Is this a state or local project with NO federal funding and NO federal decision required?

☐ Yes – **Hot-spot conformity requirements do not apply.** Proceed to Step 21.

☐ No – **Hot-spot conformity requirements apply.** Request the local MPO to initiate a consultation call with the Consultation Partners.

Fill out the Hot-Spot Analysis Data for a Consultation Partner Decision Form to present the project data to the Consultation Partners for review prior to the consultation call.

Continue to Step 18.

Step 18: Did the consultation partners determine that this is a project of air quality concern (POAQC)?

☐ Yes – **A hot-spot analysis is required and must be approved by the consultation partners.**

Conduct a hot-spot analysis in accordance with the methodology approved by the consultation partners, and use the applicable EPA hot-spot guidance.

Continue to Step 19.

☐ No – **A hot-spot analysis is not required because the project is not a POAQC. The consultation partners made this determination on <insert date>.**

Proceed to Step 21.

[20] Multiply the MTP cost by 1.5. The current estimated total project cost should not exceed this amount.

[21] Note that this currently only applies to projects in El Paso.

Step 19: Does the approved hot-spot analysis verify that the project will not cause, contribute to, or worsen a violation of applicable CO, $PM_{2.5}$, or PM_{10} NAAQS or that the project will at least improve conditions from that of the no-build alternative?

☐ Yes – **The project is not anticipated to cause, contribute to, or worsen a violation of the applicable NAAQS.** Continue to Step 20.

☐ **No – STOP. The project, as it is currently presented, does not comply with conformity requirements because it is anticipated to cause, contribute to, or worsen a violation of the applicable NAAQS.**

Identify and get consultation partner agreement upon mitigation measures to offset project impacts to air quality. Reevaluate this project using this form once these mitigation measures have been identified and committed to.

Step 20: Have all the agreed upon mitigation measures as well as any applicable SIP control measures received a written commitment?

☐ Yes – Continue to Step 21.

☐ **No – STOP.**

Do not proceed until there are written commitments to implement all the agreed upon mitigation measures and any applicable SIP control measures. Reevaluate this project using this form once these commitments have been made in writing.

☐ N/A because no mitigation is required and there are no applicable SIP control measures which affect this project, Continue to Step 21.

Step 21: The transportation conformity evaluation is complete.

Attach applicable pages of the MTP and TIP, or the STIP, project schematics, typical sections, hot-spot analyses and determinations, and any conformity related public comment and response. Implement the following processing instructions as applicable.

☐ This is a regionally significant State-only project with no FHWA/FTA action required (the answer to Steps 3 is yes); therefore:

Submit this form to the ENV air specialist. If ENV concurs that all project level conformity requirements have been met, ENV shall sign the form below. Coordination with FHWA/FTA is not required.

Retain this form in the project file.

☒ This is a FHWA/FTA non-exempt project (the answer to Steps 2 and 4 is yes, and the answer to Steps 5 and 6 is no); therefore:

Submit this form to the ENV air specialist. After ENV air specialist review, ENV will coordinate this form with FHWA/FTA for a project level conformity determination. If FHWA/FTA agrees that all project level conformity requirements have been met, they shall sign the project level conformity determination line below. A project level conformity determination is not complete and project clearance cannot be given until FHWA/FTA signs this form.

Retain this form and any coordination with FHWA/FTA in the project file.

TxDOT ENV Transportation Conformity Validation Complete:

Project CSJ Numbers: 0364-04-051, 0047-05-058, 0047-10-002

Signature DocuSigned by: Glendora Lopez D7144948868E4E9... _____

Name: Glendora Lopez

Title: Environmental Specialist

Date: 3/27/2023

FHWA/FTA Determination of the Project-level Conformity:

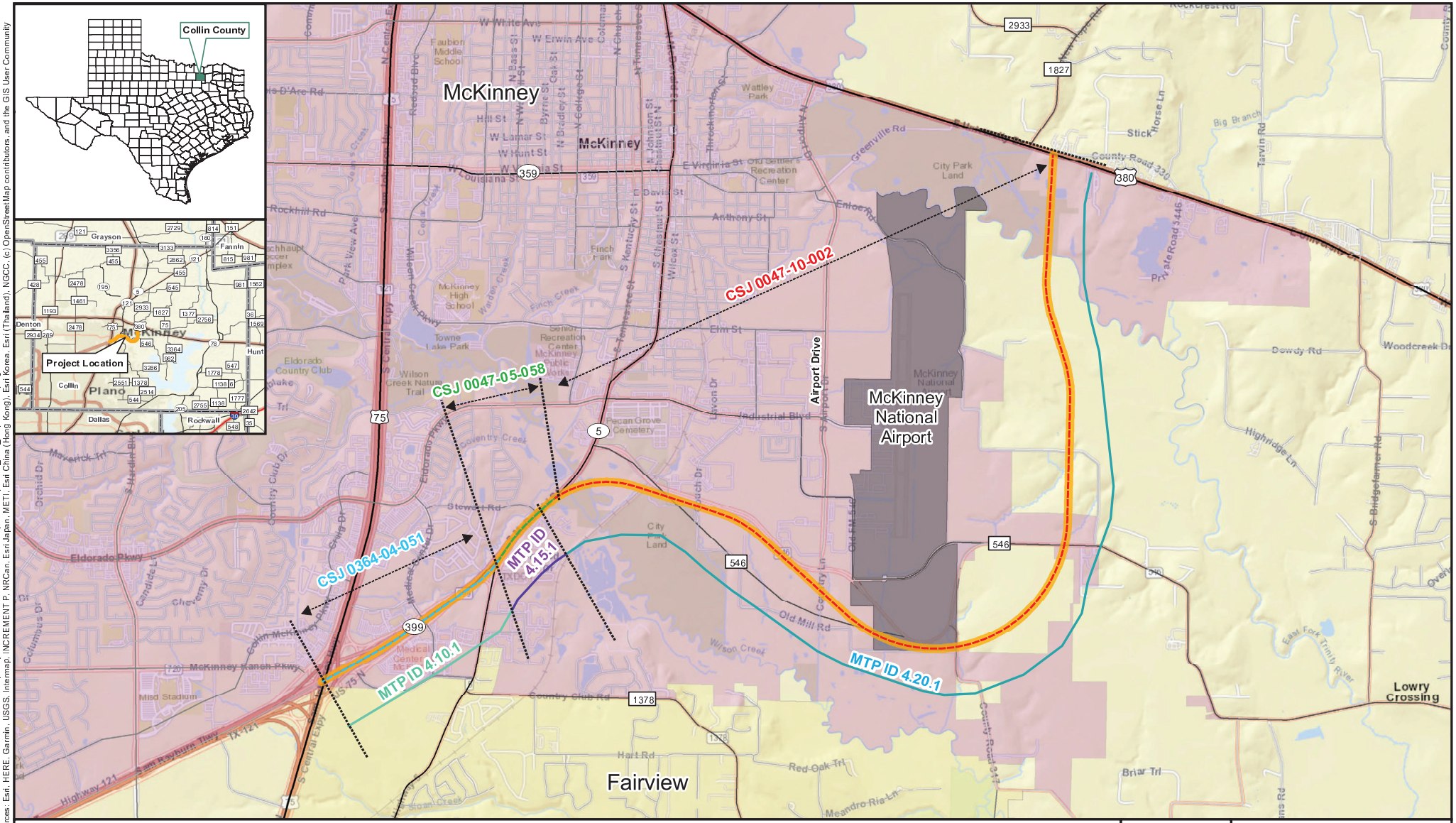
Signature BARBARA C MALEY Digitally signed by BARBARA C MALEY Date: 2023.03.29 09:33:14 -05'00' _____

Name: _____

Title: Air Quality Specialist and Transportation Planner

Date: _____

NOTE: FHWA project-level conformity determination is based upon clarification provided by TxDOT (attached).



Path: C:\Users\spurgeon\OneDrive - Burns & McDonnell\Desktop\Projects\US 380\Data Files\ArcDocs\Spur 399\Spur399_CSJ_Map.mxd sspurgeon 2/22/2023
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Source:ESRI, TxDOT, Burns & McDonnell Engineering Comapny, Inc.

Issued: 2/22/2023

Mobility 2045 – 2022 Update

Regionally Significant Arterials Improvements Summary

February 6, 2023

RSA ID	Agency	County	Facility	From	To	2023 Lanes	2026 Lanes	2036 Lanes	2045 Lanes	Total Project Cost*
1.557.200	NTTA	Collin	Dallas Parkway**	CR 60	FM 428	2 (Frtg)	2 (Frtg)	N/A	N/A	Included w/ Freeways/Tollways
1.557.250	NTTA	Collin	Dallas Parkway**	FM 428	North of US 380	2/2 (Frtg)	2/2 (Frtg)	N/A	N/A	Included w/ Freeways/Tollways
1.605.200	TxDOT Dallas	Collin	SH 289 Preston Road	CR 107/CR 60	BU 289	2	2	4	6	$28,221,787
1.605.225	TxDOT Dallas	Collin	SH 289 Preston Road	BU 289	FM 455	4	4	4	6	$12,500,000
1.605.240	TxDOT Dallas	Collin	SH 289 Preston Road	FM 455	FM 1461	4	4	4	6	$20,000,000
1.605.425	TxDOT Dallas	Collin	SH 289 Preston Road	Plano Parkway	President George Bush Turnpike	6	6	6	8	$1,000,000
1.605.475	TxDOT Dallas	Collin	SH 289 Preston Road	Mapleshade Drive	Frankford Road	6	6	8	8	$5,385,000
1.645.200	TxDOT Dallas	Collin	Shiloh Road/Spring Creek Parkway	Parker Road	FM 544 14th Street	2	2	4	4	$14,934,400
1.645.210	TxDOT Dallas	Collin	Shiloh Road	FM 544 14th Street	Renner Road	6	6	6	4	$6,500,000
1.660.225	TxDOT Dallas	Collin	FM 1378 Country Club Road	North of Stacy Road	FM 2786 Stacy Road	2	2	4	4	$4,523,400
1.660.250	TxDOT Dallas	Collin	FM 1378 Country Club Road	FM 2786 Stacy Road	Rock Ridge Road	2	2	4	6	$4,750,000
1.660.275	TxDOT Dallas	Collin	FM 1378 Country Club Road	Rock Ridge Road	FM 2514 Parker Road	2	2	4	4	$62,500,000
1.660.400	TxDOT Dallas	Collin	Merritt Road	Sachse Road	PGBT	2	4	4	4	$30,298,693
1.680.200	TxDOT Dallas	Collin	SH 5	CR 375 (Grayson County)	FM 455	2	2	4	4	$32,395,657
1.680.210	TxDOT Dallas	Collin	SH 5	FM 455	SH 121	2	4	4	6	$65,109,690
1.680.225	TxDOT Dallas	Collin	SH 5	SH 121	North of Tennessee Street	2	4	4	6	$131,659,696
1.680.250	TxDOT Dallas	Collin	SH 5	North of Tennessee Street	North of Industrial Blvd/Eldorado Parkway	4	4	4	4	$37,135,658
1.680.275	TxDOT Dallas	Collin	SH 5	North of Industrial Blvd/Eldorado Parkway	Industrial Blvd/Eldorado Parkway	2/2	2/2	2/2	2/2	$5,141,840
1.680.300	TxDOT Dallas	Collin	SH 5	Industrial Blvd/Eldorado Parkway	Stewart Road	4	4	6	6	$38,205,892
1.680.315	TxDOT Dallas	Collin	SH 5**	Stewart Road	SP 399	2/2	2/2	N/A	N/A	Included w/ Freeways/Tollways

(Frtg): Frontage Lanes

*Total Project Cost based on Year of Expenditure

**Staged facilities reported as "N/A" indicate project is no longer classified as an arterial, and future lanes will be reported in the Freeway/Tollway Recommendations listing instead

NOTE: 2/2 – Directional lanes (facility serves as either a couplet or facility with wide median); 4 – Total lanes of both directions

Mobility 2045 – 2022 Update

Freeway, Tollway, Express/HOV/Tolled Managed Lanes Recommendations Summary

February 6, 2023

FT Corridor	MTP ID	Facility	From	To	2023 Lanes	2026 Lanes	2036 Lanes	2045 Lanes	Asset Optimization Description	Total Project Cost
47 - Southern Gateway	7.90.1	IH 35E	US 67	Ann Arbor Avenue	6 (Frwy), 2 SB (Frtg-D)	6 (Frwy), 2 SB (Frtg-D)	6 (Frwy), 2 SB (Frtg-D)	6 (Frwy) + 1 (ExL-R), 2/3 SB (Frtg-D)		$705,500,000
47 - Southern Gateway	7.90.2	IH 35E	Ann Arbor Avenue	IH 20	6 (Frwy), 4 (Frtg-C)	6 (Frwy), 4 (Frtg-C)	6 (Frwy), 4 (Frtg-C)	6 (Frwy), 4/6 (Frtg-C)		Included w/ 7.90.1
47 - Southern Gateway	28.50.6	IH 30	IH 35E (West)	IH 35E (East)	5 (Frwy) + 6/7 CD	5 (Frwy) + 4/7 CD	5 (Frwy) + 4/7 CD	5 (Frwy) + 4/7 CD		Included w/ 7.90.1
47 - Southern Gateway	38.10.1	US 67	IH 35E	IH 20	6 (Frwy) + 1 (ExL-R), 2/6 (Frtg-D)	6 (Frwy) + 1 (ExL-R), 2/6 (Frtg-D)	6 (Frwy) + 1 (ExL-R), 2/6 (Frtg-D)	6 (Frwy) + 1/2 (ExL-R), 4/6 (Frtg-D)		Included w/ 7.90.1
48 - Spur 399	4.10.1	Spur 399	US 75	SH 5	4 (Frwy), 4/8 (Frtg-D)	4 (Frwy), 4/8 (Frtg-C)	8 (Frwy), 4/8 (Frtg-C)	8 (Frwy), 4/8 (Frtg-C)		$15,100,000
48 - Spur 399	4.15.1	Spur 399 Extension	SH 5	Stewart Road			8 (Frwy), 4/6 (Frtg-C)	8 (Frwy), 4/6 (Frtg-C)		$24,892,000
48 - Spur 399	4.20.1	Spur 399 Extension	Stewart Road	US 380			6/8 (Frwy), 4/6 (Frtg-D)	6/8 (Frwy), 4/6 (Frtg-D)		$288,290,000
49 - State Loop 12	17.20.1	State Loop 12	SH 183	SH 356	6 (Frwy), 4 (Frtg-D)	6 (Frwy), 4/6 (Frtg-D)	8 (Frwy) + 2 (ML/T-R), 4/6 (Frtg-C)	8 (Frwy) + 2 (ML/T-R), 4/6 (Frtg-C)		$925,000,000
49 - State Loop 12	17.20.2	State Loop 12	SH 356	IH 30	8 (Frwy), 4 (Frtg-D)	8 (Frwy), 4 (Frtg-D)	8 (Frwy) + 2 (ML/T-R), 4/6 (Frtg-C)	8 (Frwy) + 2 (ML/T-R), 4/6 (Frtg-C)		Included w/ 17.20.1

(Frwy): Freeway Lanes; (Toll): Tolled Lanes; (Frtg-D): Discontinuous Frontage Lanes; (Frtg-C): Continuous Frontage Lanes; CD: Collector-Distributor Lanes; (ML/T-C): Tolled Concurrent Managed Lanes; (ML/T-R): Tolled Reversible Managed Lanes; (Tech-C): Concurrent Technology Lanes; (ExL-R): Reversible Express Lanes; (Rural): Rural highways with some grade-separated intersections but also allow some roads and/or driveways direct access to the facility.

NB, SB, EB, WB: Directional Lanes; X/Y Lanes: X is the minimum and Y is the maximum number of lanes (for both directions).

*Temporary use of shoulder lanes during the peak periods to add additional capacity in interim years before ultimate improvements.

NOTE: Asset Optimization improvements are typically low-cost improvements implemented prior to, or in lieu of, ultimate capacity improvement. These types of improvements are targeted to address location-specific operation, safety, and bottleneck issues within the corridor, and do not affect Transportation Conformity.

STIP Portal

Logged in as Glendora Lopez | Log Out

Project Management | Reports | Support

Project Management > Area List > STIPs (M-NCTCOG) > Revisions () > TIP Instances (Unassigned) > Highway Projects (Unassigned) > Project Details

Color Key: ☐ - Business rule violation ☐ - Value changed in current session ☐ - Different from DCIS or latest approved copy

Data

Statewide ☐ STIP Revision: None

District: DALLAS County: COLLIN

MPO: NCTCOG Highway: SH 5

CSJ: 0047 - 05 - 058 TIP FY: 2023

Phase: ☐ Construction ☑ Engineering ☐ Environmental ☑ Engineering ☑ Right-of-Way ☑ Acquisition ☐ Utilities ☐ Transfer

Revision Date: 07/2022

Project Sponsor: TXDOT-DALLAS

MPO Proj Number: 13072

MTP Reference: FT1-4.15.1, RSA1-1.680.315

City: MCKINNEY

Limits From: SH 5/SPUR 399

Limits To: SPUR 399 EXTENSION

Project Description: RECONSTRUCT AND WIDEN 4 LANE ARTERIAL TO 6 LANE ARTERIAL (ULTIMATE 8 LANE FREEWAY) AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS

P7 Remarks:

Project History: REGIONAL 10-YEAR PLAN PROJECT

NOX (Kg /D): 0.0000

VOC (Kg /D): 0.0000

PM10 (Kg /D): 0.0000

PM2.5 (Kg /D): 0.0000

CO (Lbs /D):

Total Project Cost Information

Prelim Engineering	$990,000
ROW Purchase	$6,600,000
Construction Cost	$21,952,000
Const Engineering	$811,236
Contingencies	$1,254,400
Indirect Costs	$604,778
Bond Financing	$0
Potential Chg Ord	$0
Total Project Cost	$32,212,414
YOE Cost	
Toll	☐
TCM	☐

Authorized Funding by Category/Share

Category	Federal	State	Regional	Local Match	Local Contributions	Total
SW PE	$0	$990,000	$0	$0	$0	$990,000
SW ROW	$5,280,000	$660,000	$0	$660,000	$0	$6,600,000
Total	$5,280,000	$1,650,000	$0.00	$660,000	$0.00	$7,590,000

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0047-05-058	2023	SH 5	E,ENG,R,ACQ	MCKINNEY	$ 7,590,000

LIMITS FROM: SH 5/SPUR 399
LIMITS TO: SPUR 399 EXTENSION
PROJECT DESCR: RECONSTRUCT AND WIDEN 4 LANE ARTERIAL TO 6 LANE ARTERIAL (ULTIMATE 8 LANE FREEWAY) AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS
REMARKS P7:
PROJECT HISTORY: REGIONAL 10-YEAR PLAN PROJECT
PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 07/2022
MPO PROJ NUM: 13072
FUNDING CAT(S): SW PE, SW ROW

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 990,000
ROW PURCH:	$ 6,600,000
CONST COST:	$ 21,952,000
CONST ENG:	$ 811,236
CONTING:	$ 1,254,400
INDIRECT:	$ 604,778
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 32,212,414

COST OF APPROVED PHASES $ 7,590,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 990,000	$ 0	$ 0	$ 0	$ 990,000
SW ROW	$ 5,280,000	$ 660,000	$ 0	$ 660,000	$ 0	$ 6,600,000
TOTAL	$ 5,280,000	$ 1,650,000	$ 0	$ 660,000	$ 0	$ 7,590,000

TIP History

2023-2026 STIP	07/2022 Revision: Approved 03/24/2023

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0047-05-058	2023	SH 5	E,ENG,R,ACQ	MCKINNEY	$ 7,590,000

LIMITS FROM: SH 5/SPUR 399
LIMITS TO: SPUR 399 EXTENSION
PROJECT DESCR: RECONSTRUCT AND WIDEN 4 LANE ARTERIAL TO 6 LANE ARTERIAL (ULTIMATE 8 LANE FREEWAY) AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS

PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 07/2022
MPO PROJ NUM: 13072
FUNDING CAT(S): SW PE, SW ROW

REMARKS P7:

PROJECT HISTORY: REGIONAL 10-YEAR PLAN PROJECT

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 990,000
ROW PURCH:	$ 6,600,000
CONST COST:	$ 21,952,000
CONST ENG:	$ 811,236
CONTING:	$ 1,254,400
INDIRECT:	$ 604,778
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 32,212,414

COST OF APPROVED PHASES $ 7,590,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 990,000	$ 0	$ 0	$ 0	$ 990,000
SW ROW	$ 5,280,000	$ 660,000	$ 0	$ 660,000	$ 0	$ 6,600,000
TOTAL	$ 5,280,000	$ 1,650,000	$ 0	$ 660,000	$ 0	$ 7,590,000

Comment History

Time	User	Comment	Related Approval
2023/03/24 12:44:17	**Barbara Maley**	Approved. Approval based on Mobility 2045 2022 Update as found conforming on December 15, 2022. Approval also based on March 9 2023 RTC Federal Functional Classification approval action and March 23 2023 FHWA Texas Division Federal Functional Classification approval action.	**07/2022: Approved**
2022/11/11 10:35:05	**Barbara Maley**	Not approved due to Plan to Program inconsistencies.	**07/2022: Not Approved**

STIP Portal

Logged in as Glendora Lopez | Log Out

Project Management | Reports | Support

Project Management > Area List > STIPs (M-NCTCOG) > Revisions () > TIP Instances (Unassigned) > Highway Projects (Unassigned) > Project Details

Color Key: ☐ - Business rule violation ☐ - Value changed in current session ☐ - Different from DCIS or latest approved copy

Data

Statewide ☐ STIP Revision None

District DALLAS County COLLIN

MPO NCTCOG Highway SS 399

CSJ 0364 - 04 - 051 TIP FY 2023

Phase: ☐ Construction ☑ Engineering ☐ Environmental ☑ Engineering ☑ Right-of-Way ☑ Acquisition ☐ Utilities ☐ Transfer

Revision Date 07/2022

Project Sponsor TXDOT-DALLAS

MPO Proj Number 13071

MTP Reference FT1-4.10.1

City MCKINNEY

Limits From US 75

Limits To SH 5

Project Description RECONSTRUCT AND WIDEN 4 LANE FREEWAY TO 8 LANE FREEWAY AND CONSTRUCT 4/8 DISCONTINUOUS TO 4/8 CONTINUOUS LANE FRONTAGE ROADS

P7 Remarks

Project History REGIONAL 10-YEAR PLAN PROJECT

NOX (Kg /D): 0.0000

VOC (Kg /D): 0.0000

PM10 (Kg /D): 0.0000

PM2.5 (Kg /D): 0.0000

CO (Lbs /D):

Total Project Cost Information

Prelim Engineering	$450,000
ROW Purchase	$3,000,000
Construction Cost	$9,968,000
Const Engineering	$527,249
Contingencies	$881,990
Indirect Costs	$283,678
Bond Financing	$0
Potential Chg Ord	$0
Total Project Cost	$15,110,917
YOE Cost	
Toll	☐
TCM	☐

Authorized Funding by Category/Share

Category	Federal	State	Regional	Local Match	Local Contributions	Total
SW PE	$0	$450,000	$0	$0	$0	$450,000
SW ROW	$2,400,000	$300,000	$0	$300,000	$0	$3,000,000
Total	$2,400,000	$750,000	$0.00	$300,000	$0.00	$3,450,000

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0364-04-051	2023	SS 399	E,ENG,R,ACQ	MCKINNEY	$ 3,450,000

LIMITS FROM: US 75
LIMITS TO: SH 5
PROJECT DESCR: RECONSTRUCT AND WIDEN 4 LANE FREEWAY TO 8 LANE FREEWAY AND CONSTRUCT 4/8 DISCONTINUOUS TO 4/8 CONTINUOUS LANE FRONTAGE ROADS
REMARKS P7:
PROJECT HISTORY: REGIONAL 10-YEAR PLAN PROJECT
PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 07/2022
MPO PROJ NUM: 13071
FUNDING CAT(S): SW PE, SW ROW

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 450,000
ROW PURCH:	$ 3,000,000
CONST COST:	$ 9,968,000
CONST ENG:	$ 527,249
CONTING:	$ 881,990
INDIRECT:	$ 283,678
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 15,110,917

COST OF APPROVED PHASES $ 3,450,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 450,000	$ 0	$ 0	$ 0	$ 450,000
SW ROW	$ 2,400,000	$ 300,000	$ 0	$ 300,000	$ 0	$ 3,000,000
TOTAL	$ 2,400,000	$ 750,000	$ 0	$ 300,000	$ 0	$ 3,450,000

TIP History

2023-2026 STIP	07/2022 Revision: Approved 01/20/2023

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0364-04-051	2023	SS 399	E,ENG,R,ACQ	MCKINNEY	$ 3,450,000

LIMITS FROM: US 75
LIMITS TO: SH 5
PROJECT DESCR: RECONSTRUCT AND WIDEN 4 LANE FREEWAY TO 8 LANE FREEWAY AND CONSTRUCT 4/8 DISCONTINUOUS TO 4/8 CONTINUOUS LANE FRONTAGE ROADS.

PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 07/2022
MPO PROJ NUM: 13071
FUNDING CAT(S): SW PE, SW ROW

REMARKS P7:

PROJECT HISTORY: REGIONAL 10-YEAR PLAN PROJECT

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 450,000
ROW PURCH:	$ 3,000,000
CONST COST:	$ 9,968,000
CONST ENG:	$ 527,249
CONTING:	$ 881,990
INDIRECT:	$ 283,678
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 15,110,917

COST OF APPROVED PHASES $ 3,450,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 450,000	$ 0	$ 0	$ 0	$ 450,000
SW ROW	$ 2,400,000	$ 300,000	$ 0	$ 300,000	$ 0	$ 3,000,000
TOTAL	$ 2,400,000	$ 750,000	$ 0	$ 300,000	$ 0	$ 3,450,000

Comment History

Time	User	Comment	Related Approval
2023/01/20 08:23:11	**Krystal Lastrape**	Approval based on Mobility 2045 2022 Update as found conforming on December 15, 2022.	**07/2022: Approved**
2022/11/11 13:37:26	**Barbara Maley**	Not approved due to Plan to Program inconsistencies.	**07/2022: Not Approved**

STIP Portal

Please see Interoffice Memorandum regarding TPC for CSJ 0047-10-002.

Logged in as Glendora Lopez | Log Out

Project Management | Reports | Support

Project Management > Area List > STIPs (M-NCTCOG) > Revisions () > TIP Instances (Unassigned) > Highway Projects (Unassigned) > Project Details

Color Key: ☐ - Business rule violation ☐ - Value changed in current session ☐ - Different from DCIS or latest approved copy

Data

Statewide	☐	STIP Revision	None
District	DALLAS	County	COLLIN
MPO	NCTCOG	Highway	SS 399
CSJ	0047 - 10 - 002	TIP FY	2023
Revision Date	11/2022		
Project Sponsor	TXDOT-DALLAS		
MPO Proj Number	55287		
MTP Reference	FT1-4.20.1		
City	MCKINNEY		
Limits From	SH 5		
Limits To	US 380		
Project Description	CONSTRUCT 0 TO 6/8 LANE FREEWAY AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS		
P7 Remarks	INCREASE ROW FUNDING		
Project History	REGIONAL 10-YEAR PLAN PROJECT		

Phase: ☐ Construction; ☑ Engineering; ☐ Environmental; ☑ Engineering; ☑ Right-of-Way; ☑ Acquisition; ☐ Utilities; ☐ Transfer

NOX (Kg /D):	0.0000
VOC (Kg /D):	0.0000
PM10 (Kg /D):	0.0000
PM2.5 (Kg /D):	0.0000
CO (Lbs /D):	

Total Project Cost Information

Prelim Engineering	$11,430,000
ROW Purchase	$120,000,000
Construction Cost	$254,240,000
Const Engineering	$34,669,680
Contingencies	$53,609,107
Indirect Costs	$25,846,291
Bond Financing	$0
Potential Chg Ord	$0
Total Project Cost	$499,795,078
YOE Cost	
Toll	☐
TCM	☐

Authorized Funding by Category/Share

Category	Federal	State	Regional	Local Match	Local Contributions	Total
SW PE	$0	$11,430,000	$0	$0	$0	$11,430,000
SW ROW	$96,000,000	$12,000,000	$0	$12,000,000	$0	$120,000,000
Total	$96,000,000	$23,430,000	$0.00	$12,000,000	$0.00	$131,430,000

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0047-10-002	2023	SS 399	E,ENG,R,ACQ	MCKINNEY	$ 131,430,000

LIMITS FROM: SH 5
LIMITS TO: US 380
PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 11/2022
MPO PROJ NUM: 55287
FUNDING CAT(S): SW PE,SW ROW
PROJECT DESCR: CONSTRUCT 0 TO 6/8 LANE FREEWAY AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS
REMARKS P7: INCREASE ROW FUNDING
PROJECT HISTORY: REGIONAL 10-YEAR PLAN PROJECT

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 11,430,000
ROW PURCH:	$ 120,000,000
CONST COST:	$ 254,240,000
CONST ENG:	$ 34,669,680
CONTING:	$ 53,609,107
INDIRECT:	$ 25,846,291
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 499,795,078

COST OF APPROVED PHASES $ 131,430,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 11,430,000	$ 0	$ 0	$ 0	$ 11,430,000
SW ROW	$ 96,000,000	$ 12,000,000	$ 0	$ 12,000,000	$ 0	$ 120,000,000
TOTAL	$ 96,000,000	$ 23,430,000	$ 0	$ 12,000,000	$ 0	$ 131,430,000

TIP History

2023-2026 STIP	11/2022 Revision: Approved 03/24/2023

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0047-10-002	2023	SS 399	E,ENG,R,ACQ	MCKINNEY	$ 131,430,000

LIMITS FROM: SH 5
LIMITS TO: US 380
PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 11/2022
PROJECT DESCR: CONSTRUCT 0 TO 6/8 LANE FREEWAY AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS
MPO PROJ NUM: 55287
FUNDING CAT(S): SW PE,SW ROW
REMARKS P7: INCREASE ROW FUNDING
PROJECT HISTORY: REGIONAL 10-YEAR PLAN PROJECT

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 11,430,000
ROW PURCH:	$ 120,000,000
CONST COST:	$ 254,240,000
CONST ENG:	$ 34,669,680
CONTING:	$ 53,609,107
INDIRECT:	$ 25,846,291
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 499,795,078

COST OF APPROVED PHASES $ 131,430,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 11,430,000	$ 0	$ 0	$ 0	$ 11,430,000
SW ROW	$ 96,000,000	$ 12,000,000	$ 0	$ 12,000,000	$ 0	$ 120,000,000
TOTAL	$ 96,000,000	$ 23,430,000	$ 0	$ 12,000,000	$ 0	$ 131,430,000

2023-2026 STIP **07/2022 Revision: Not Approved 11/11/2022**

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0047-10-002	2023	SS 399	E,ENG,R,ACQ	MCKINNEY	$ 62,230,000

LIMITS FROM: SH 5
LIMITS TO: US 380
PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 07/2022
PROJECT DESCR: CONSTRUCT 0 TO 6/8 LANE FREEWAY AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS
MPO PROJ NUM: 55287
FUNDING CAT(S): SW PE, SW ROW
REMARKS P7:
PROJECT HISTORY:

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 11,430,000
ROW PURCH:	$ 50,800,000
CONST COST:	$ 227,000,000
CONST ENG:	$ 9,395,439
CONTING:	$ 14,528,000
INDIRECT:	$ 7,004,312
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 320,157,751

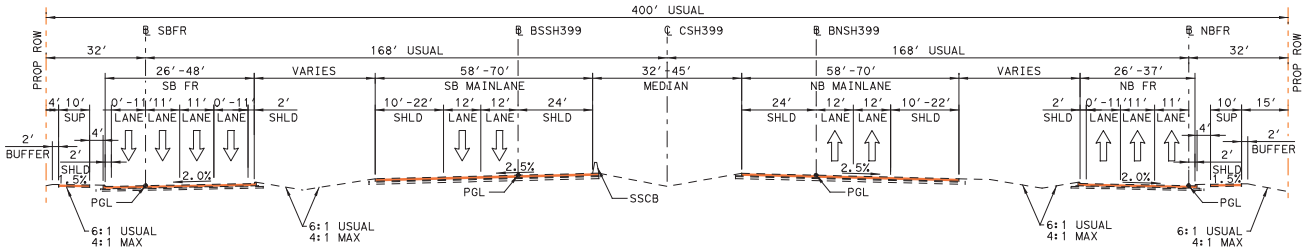
COST OF APPROVED PHASES $ 62,230,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 11,430,000	$ 0	$ 0	$ 0	$ 11,430,000
SW ROW	$ 40,640,000	$ 5,080,000	$ 0	$ 5,080,000	$ 0	$ 50,800,000
TOTAL	$ 40,640,000	$ 16,510,000	$ 0	$ 5,080,000	$ 0	$ 62,230,000

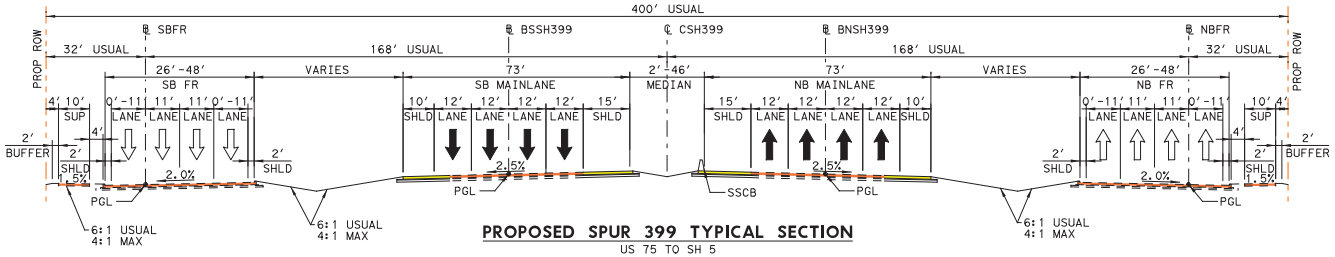
Comment History

Time	User	Comment	Related Approval
2023/03/24 12:47:34	**Barbara Maley**	Approved. Approval based on Mobility 2045 2022 Update as found conforming on December 15, 2022. Approval also based on March 9 2023 RTC Federal Functional Classification approval action and March 23 2023 FHWA Texas Division Federal Functional Classification approval action.	**11/2022: Approved**
2023/01/16 13:48:36	**Barbara Maley**	Not approved. Not approved due to Plan to Program TPC inconsistencies. Also, pending FFCS confirmation.	**11/2022: Not Approved**
2022/11/11 13:22:12	**Barbara Maley**	Not approved due to Plan to Program inconsistencies.	**07/2022: Not Approved**



EXISTING SH 5/SPUR 399 TYPICAL SECTION

US 75 TO STEWART ROAD
*FRONTAGE ROADS ARE DISCONTINUOUS



PROPOSED SPUR 399 TYPICAL SECTION

US 75 TO SH 5

PRELIMINARY
FOR INTERIM REVIEW ONLY. NOT FOR PERMITTING, BIDDING, OR CONSTRUCTION.

HDR
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SPUR 399 EXTENSION TYPICAL SECTIONS

SHEET 1 OF 2

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			SH 399
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS	COLLIN	1
CONTROL	SECTION	JOB	
0364	04	051	

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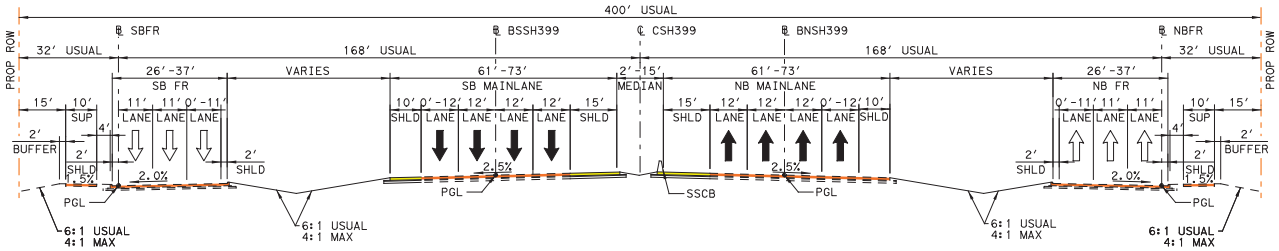
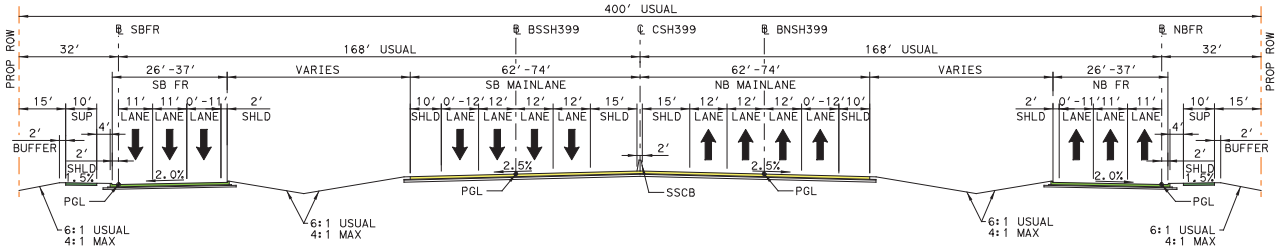


PROPOSED SPUR 399 TYPICAL SECTION

SH 5 TO STEWART ROAD



PROPOSED SPUR 399 EXTENSION TYPICAL SECTION

NEW LOCATION - STEWART ROAD TO US 380

*FRONTAGE ROADS ARE DISCONTINUOUS

PRELIMINARY

FOR INTERIM REVIEW ONLY. NOT FOR PERMITTING, BIDDING, OR CONSTRUCTION.

HDR
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SPUR 399 EXTENSION TYPICAL SECTIONS

SHEET 2 OF 2

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			SH 399
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS	COLLIN	2
CONTROL	SECTION	JOB	
0364	04	051	

PLOT DRIVER: TXDOT_PDF_COLOR.pltcfg PENTABLE: t022544f.tbl
USER: DWRIGHT DATE: 3/8/2023 TIME: 12:58:17 PM SCALE: 1:200
FILE: \

Texas Department of Transportation

MEMO

March 27, 2023

To: Glendora Lopez
Environmental Specialist, ENV

From: Dan Perge, P.E.
District Advance Project Development Director, DAL

DS DP

Subject: Transportation Conformity Report Form
SS 399/SH 5
CSJs: 0364-04-051, 0047-05-058, 0047-10-002

In preparing the Transportation Conformity Report Form for the abovementioned project, our office noticed an unintentional inflation in the Construction Engineering, Contingency, and Indirect Cost shown in the STIP Portal for CSJ:0047-10-002. This reporting error resulted in the Total Project Cost exceeding the allowed 50% over run of the amount shown in the Mobility 2045 – 2022 Plan Update. The inconsistency between the original 2023-2026 STIP entry and the November 2022 Revision for CSJ: 0047-10-002 is shown below:

2023-2026 STIP (original)

2023-2026 STIP — **07/2022 Revision: Not Approved 11/11/2022**

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0047-10-002	2023	SS 399	E,ENG,R,ACQ	MCKINNEY	$ 62,230,000

LIMITS FROM: SH 5
LIMITS TO: US 380
PROJECT DESCR: CONSTRUCT 0 TO 6/8 LANE FREEWAY AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS
REMARKS P7:
PROJECT HISTORY:
PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 07/2022
MPO PROJ NUM: 55287
FUNDING CAT(S): SW PE, SW ROW

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 11,430,000
ROW PURCH:	$ 50,800,000
CONST COST:	$ 227,000,000
CONST ENG:	$ 9,395,439
CONTING:	$ 14,528,000
INDIRECT:	$ 7,004,312
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 320,157,751

COST OF APPROVED PHASES $ 62,230,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 11,430,000	$ 0	$ 0	$ 0	$ 11,430,000
SW ROW	$ 40,640,000	$ 5,080,000	$ 0	$ 5,080,000	$ 0	$ 50,800,000
TOTAL	$ 40,640,000	$ 16,510,000	$ 0	$ 5,080,000	$ 0	$ 62,230,000

2023-2026 (November Revision)

2023-2026 STIP — **11/2022 Revision: Approved 03/24/2023**

DISTRICT	MPO	COUNTY	CSJ	TIP FY	HWY	PHASE	CITY	YOE COST
DALLAS	NCTCOG	COLLIN	0047-10-002	2023	SS 399	E,ENG,R,ACQ	MCKINNEY	$ 131,430,000

LIMITS FROM: SH 5
LIMITS TO: US 380
PROJECT DESCR: CONSTRUCT 0 TO 6/8 LANE FREEWAY AND CONSTRUCT 0 TO 4/6 LANE FRONTAGE ROADS
REMARKS P7: INCREASE ROW FUNDING
PROJECT HISTORY: REGIONAL 10-YEAR PLAN PROJECT
PROJECT SPONSOR: TXDOT-DALLAS
REVISION DATE: 11/2022
MPO PROJ NUM: 55287
FUNDING CAT(S): SW PE,SW ROW

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$ 11,430,000
ROW PURCH:	$ 120,000,000
CONST COST:	$ 254,240,000
CONST ENG:	$ 34,669,680
CONTING:	$ 53,609,107
INDIRECT:	$ 25,846,291
BOND FIN:	$ 0
POT CHG ORD:	$ 0
TOTAL COST:	$ 499,795,078

COST OF APPROVED PHASES $ 131,430,000

AUTHORIZED FUNDING BY CATEGORY/SHARE

CATEGORY	FEDERAL	STATE	REGIONAL	LOCAL MATCH	LC	TOTAL
SW PE	$ 0	$ 11,430,000	$ 0	$ 0	$ 0	$ 11,430,000
SW ROW	$ 96,000,000	$ 12,000,000	$ 0	$ 12,000,000	$ 0	$ 120,000,000
TOTAL	$ 96,000,000	$ 23,430,000	$ 0	$ 12,000,000	$ 0	$ 131,430,000

The Mobility 2045 – 2022 Plan Update reference for CSJ: 0047-10-002 is under FT1-4.20.1 as shown below. The Total Project Cost (TPC) is $288,290,000. With a 50% over run, the allowable TPC is $432,435,000.

Mobility 2045 – 2022 Update

FT Corridor	MTP ID	Facility	From	To	2023 Lanes	2026 Lanes	2036 Lanes	2045 Lanes	Asset Optimization Description	Total Project Cost
48 - Spur 399	4.20.1	Spur 399 Extension	Stewart Road	US 380			6/8 (Frwy). 4/6 (Frtg.D)	6/8 (Frwy). 4/6 (Frtg.D)		$288,290,000

The actual TPC of CSJ: 0047-10-002 is $419,992,400 as shown in the table below:

The (unintentional) inflation

	TIP/STIP TPC (original)	TIP/STIP TPC (Nov rev inflated figures)	TIP/STIP TPC (correct/uninflated figures)
Prelim Eng	$ 11,430,000	$ 11,430,000	$ 11,430,000
ROW Purchase	$ 50,800,000	$120,000,000	$120,000,000
Const Cost	$227,000,000	$254,240,000	$254,240,000
Const Eng	$ 9,395,439	$ 34,669,680	$ 10,169,600
Conting	$ 14,528,000	$ 53,609,107	$ 16,525,600
Indirect	$ 7,004,312	$ 25,846,291	$ 7,627,200
TOTAL	$320,157,751	$499,795,078	$419,992,400

As a result, our office would like to request consideration of the correct/uninflated TPC for CSJ:0047-10-002 when reviewing the Transportation Conformity Report Form for this project.

CC: Barbara Maley, FHWA
Christine Polito, DAL

CLARIFICATION

From: Glendora Lopez <Glendora.Lopez@txdot.gov>
Sent: Wednesday, March 29, 2023 8:51 AM
To: Maley, Barbara (FHWA) <Barbara.Maley@dot.gov>
Subject: RE: Spur 399/SH 5

Good morning Barbara,

As per our conversation, I have attached the corrected page 3, with Step 3. Please note that the page with Step 2 was not included since it appears correct. Also, note that for Step 4, "9-county DFW severe nonattainment area" was revised to "DFW severe nonattainment area" for conciseness and correctness.

Thank you,

Glendora Lopez
TxDOT ENV
512-840-9720

Step 3: Is this project considered regionally significant[5] in accordance with 40 CFR 93.101 or 30 TAC 114.260(d)(2)(iv)?

☐ Yes – Continue to Step 4.

☐ No – **STOP. In accordance with 40 CFR 93.102(a)(2), a project level transportation conformity determination is not required for non-regionally significant, non-FHWA/FTA projects.**

Step 4: Is the project located in a nonattainment or maintenance area6 for ozone7, nitrogen dioxide (NO2), carbon monoxide (CO), particulate matter (PM2.5 or PM10)?

☒ Yes – **Transportation conformity rules apply.** The project is located in the EPA designated **DFW** severe nonattainment [8] area for **2008 8-hour ozone NAAQS and moderate nonattainnment for the 2015 ozone NAAQS**. Continue to Step 5.

☐ No – **STOP. Transportation conformity does not apply to the project.**

Step 5: Is the project exempt[9] from conformity in accordance with 40 CFR 93.126[10] or 40 CFR 93.128[11]?

☐ Yes – **STOP. Transportation conformity does not apply to the project.** This project falls under the following exemption: ***Choose an item.***

☒ No – Continue to Step 6.

Step 6: Is the project exempt from the regional conformity analysis in accordance with 40 CFR 93.127?

☐ Yes – **The project is exempt from regional conformity requirements.** This project falls under the following exemption: ***Choose an item.*** Proceed to Step 16.

☒ No – Continue to Step 7.

Step 7: Does the project fall within the boundaries[12] of an MPO?

☒ Yes – Proceed to Step 9.

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[5] If a project is on the MPO's NON-regionally significant project list, it is not regionally significant. Each MPO may have different criteria for designating a project as regionally significant.

[6] If unsure about the nonattainment or maintenance status, it can be checked in multiple locations, including: the EPA Greenbook, the TCEQ website, or the applicable table in the Air Quality toolkit.

[7] Note the 1997 ozone standard was revoked by EPA.

[8] Area classifications can be either maintenance, marginal nonattainment, moderate nonattainment, serious nonattainment, severe nonattainment, or extreme nonattainment

[9] Most added capacity projects will not be exempt, whereas most non-added capacity projects will be exempt.

[10] Ultimately, the interpretation of what projects types meet these exemption criteria is under the purview of the federal lead agency. For example, although it could be interpreted to meet some of the exemption project types, a project changing from general purpose to managed lanes is NOT considered to be exempt from conformity.

[11] Grouped CSJ projects, by rule, must be exempt under these criteria.

[12] i.e., within a Metropolitan Planning Area (MPA)