Quantitative Mobile Source Air Toxics (MSAT) Technical Report

Southeast Connector

I-20/I-820/US 287 Interchanges
I-20 from Forest Hill Drive to Park Springs Boulevard
I-820 from I-20 to Brentwood Stair Road
US 287 from Bishop Street to Sublett Road

Tarrant County, Texas
Fort Worth District

CSJ: 0008-13-125, etc.
December 2019

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 16, 2014, and executed by FHWA and TxDOT.

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1. BACKGROUND INFORMATION

1.1 Project Location and Description

The Texas Department of Transportation (TxDOT) is proposing to reconstruct and add capacity to Interstate Highway I-20, I-820 and United States Highway (US) 287 including three major interchanges in southeast Tarrant County within the cities of Arlington, Forest Hill, Fort Worth, and Kennedale. The major interchanges are the I-820/US 287 Interchange, the I-20/I-820 Interchange, and the I-20/US 287 Interchange. This project spans approximately 16 miles and would add main lanes and frontage roads to I-20 from Forest Hill Drive to Park Springs Boulevard, I-820 from I-20 to Brentwood Stair Road, and US 287 from Bishop Street to Sublett Road. New frontage roads would be constructed at various locations, and bicycle and pedestrian accommodations would be provided throughout. The project is collectively referred to as the "Southeast Connector."

Please see the following document and figures that have been uploaded into TXECOS: Project Description (0008-13-125, etc.); Project Location Map (0008-13-125, etc.).pdf, USGS Topographic Map (0008-13-125, etc.).pdf; Aerial Map (0008-13-125, etc.).pdf.

1.2 Projects Subject to a Mobile Source Air Toxics (MSAT) Analysis

The Federal Highway Administration (FHWA) is the proposed project's lead federal agency, and the proposed project is required to comply with the National Environmental Policy Act (NEPA). This compliance requires a project-level MSAT analysis[1].

The proposed project is not exempt from disclosure of an MSAT analysis or discussion under NEPA because it is not subject to categorical exclusion under 23 CFR 771.117(c), and is not exempt from conformity requirements under the Clean Air Act (CAA) pursuant to 40 CFR 93.126. Disclosure of the MSAT analysis is therefore required.

FHWA (2012) developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project conditions:

1. No analysis for projects with no potential for meaningful MSAT effects.
2. Qualitative analysis for projects with low potential MSAT effects.
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

[1] Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016 – https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

1.3 Rationale for Conducting a Quantitative MSAT Analysis for the Proposed Project

Projects with higher potential MSAT effects (Category 3, above) comprise those projects that have the potential for meaningful differences in MSAT emissions among project alternatives. Such projects are those that satisfy at least one of the following three conditions identified in **Table 1**. Whether the proposed project meets each of these conditions is shown in **Table 1**.

Table 1: Quantitative MSAT Analysis Conditions

Quantitative MSAT Analysis Condition (FHWA 2012)		Does the Proposed Project Meet the Condition?
Condition	Description	
Effect on Intermodal Facilities with Significant Increase in Diesel Vehicles	Projects that create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter (PM) in a single location, involving a significant number of diesel vehicles for new projects or accommodating with a significant increase in the number of diesel vehicles for expansion projects.	No. The proposed project does not affect an intermodal facility with a significant number of diesel vehicles.
Added Capacity and an Average Annual Daily Traffic (AADT) in Excess of 140,000 Vehicles Per Day (VPD)	Projects that create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 vpd to 150,000 vpd or greater by the design year.	Yes. The proposed project would add urban highway capacity. The following sections of the proposed project have 2045 AADT volumes greater than 140,000 vpd: I-820 from I-20 to Brentwood Stair Road; I-20 from Park Springs Boulevard to Forest Hill Drive. See **Appendix A**.
Proximity to Populated Areas	Projects that are proposed to be located in proximity to populated areas	Yes. The proposed project would be located in a populated urban area within Tarrant County.

In summary, the proposed project a) would add capacity, b) is expected to result in design year AADT in excess of 140,000 vpd, and c) would be located in a populated area. The project therefore meets conditions requiring a quantitative MSAT analysis.

1.4 MSAT Conference Call

A MSAT conference call between the Federal Highway Administration (FHWA), TxDOT Environmental Affairs (ENV), TxDOT Fort Worth District (TxDOT-FTW), North Central Texas Council of Governments (NCTCOG), Civil Associates, Inc. (CAI), and HDR was conducted on January 14, 2019 to discuss and determine the MSAT methodology and assumptions.

2. QUALITATIVE MSAT ANALYSIS

2.1 Background

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 8,430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS)[2]. 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)[3]. 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.

2.2 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 vehicle miles travelled (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

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[2] http://www.epa.gov/iris/

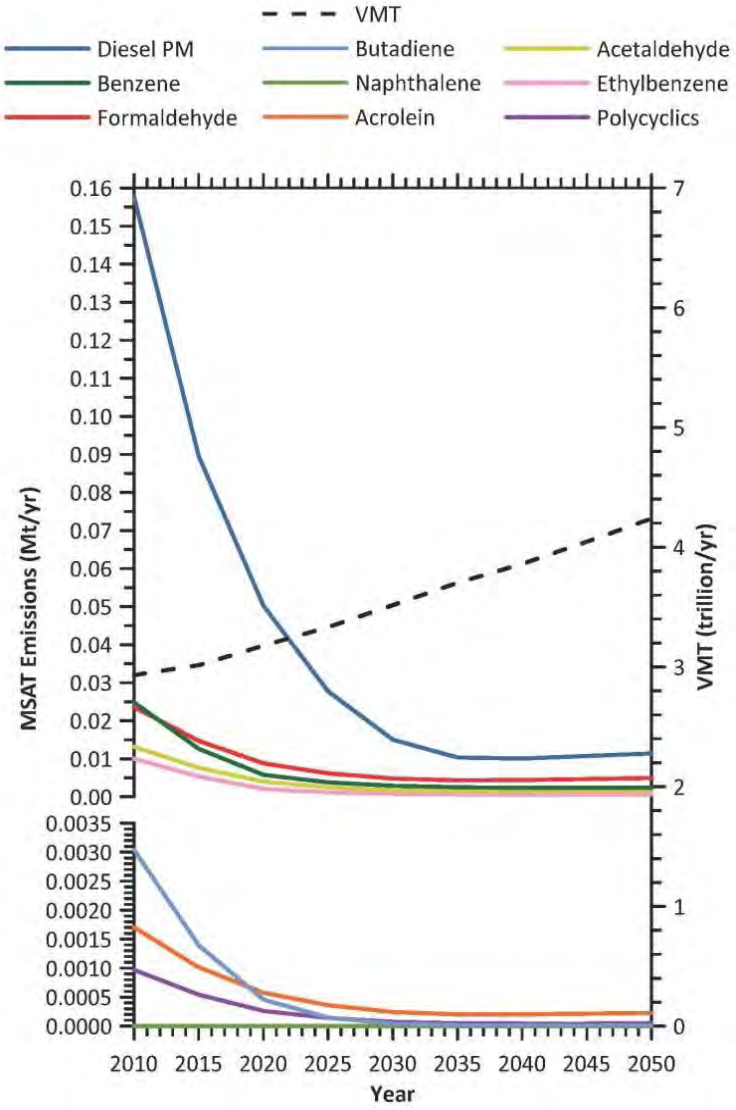
[3] https://www.epa.gov/national-air-toxics-assessment

(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[4], 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.

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

[4] https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNR0.txt

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



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

2.3 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 (HEI), 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.

2.4 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].

The VMT estimated for the Build Alternative is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. The additional travel lanes contemplated as part of the Build Alternative will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at the I-820 at Meadowbrook-Brentwood Stair Road, I-820 at Spur 303, I-820 at Sun Valley, I-20 at Bowman Springs Road, I-20 at Green Oaks Boulevard, I-20 at Mansfield Highway, US 287 at Village Creek Drive, US 287 at Little Road, and US 287 at Willbarger Street and Miller Avenue intersections. However, the magnitude and the duration of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region- wide MSAT levels to be significantly lower than today.

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

2.5 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 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 Clean Air Act 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 the Build Alternative. These difficulties are

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

[7] http://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

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 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 Clean Air Act 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].

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

[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

2.6 Analysis Methodology Coordination

The MSAT analysis methodology, determination, and approval of the analysis years, affected transportation corridor (ATC), and traffic data source(s), emission factors, speeds, and traffic volumes, was coordinated on January 14, 2019 via conference call. Representatives from the FHWA, TxDOT ENV, TxDOT FTW, NCTCOG, CAI, and HDR attended the call.

For the purpose of the MSAT analysis, the proposed project's base and design years were determined to be 2018 and 2045, respectively. An interim analysis year was determined to be unnecessary. The MSAT analysis comprises estimating the emissions from three scenarios and their respective ATC: Base Year 2018 (Existing), Design Year (2045) No Build Alternative, and Design Year (2045) Build Alternative. The ATC is the set of roadway links from which emissions are estimated. This study uses two ATCs: 1) the ATC for the Base Year Existing and 2045 No Build scenarios, consisting of the current configuration of I-820, I-20, and US 287 (**Appendix B: Affected Transportation Corridor Maps**); and, 2) the ATC for the 2045 Build scenario, consisting of the mainlanes and frontage roads as delineated in the Build Alternative schematic. See TXECOS File: Interim 90% Schematic (CSJ: 0008-13-125, etc.).pdf. Sources of analysis parameters and data are provided in **Table 2**.

Table 2: Parameter and Data Sources

Year	2018	2045	
Scenario/Alternative	Base	No Build	Build
Parameter/Data	Sources		
Facility Type	NCTCOG network data[1].		
ADT	TPP approved traffic, see **Appendix A**.		
VMT	Calculation based off of the TPP Traffic data and the link length from the NCTCOG network data.		
Speed	Calculated daily average speeds utilizing the AM Peak Hour Speeds, PM Peak Hour Speeds, and the Off Peak Speeds[2].		
Emission Factors	TxDOT Emissions Rate Lookup Table (January 2017), http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/230-01-fig.xlsx		
Mass Conversion	907,185 grams per ton		
Emissions	Calculated utilizing VMT and lookup table utilizing the year, calculated daily average speeds, and roadway type.		

[1] Existing and proposed NCTCOG networks were reduced to the project corridor that the project traffic covered.

[2] According to NCTCOG, AM Peak lasts for 2.5 hours, PM Peak last for 3.5 hours, and off-peak last for 18 hours.

2.7 TxDOT Transportation Planning and Programming (TPP) Approved Traffic Corridor Methodology

The NCTCOG maintains a network model as required by EPA regulations for regions of non-attainment. They include the existing networks and proposed roadway networks encompassing the projects listed in the Metropolitan Transportation Plan - Mobility 2045. These network shapefiles were utilized to provide link data (length, peak [AM and PM] and off-peak speeds).

The emissions of the nine priority MSATs were analyzed for two ATCs: one for the Base Year Existing (2018) and Design Year (2045) No Build Alternative, and one for the Design Year (2045) Build Alternative. The base year Existing and Design Year No Build ATC is comprised of the existing I-820, I-20, and US 287 roadways within the project limits. The Design Year Build ATC is comprised of the proposed mainlanes and frontage roads. The TxDOT-TPP approved traffic was entered into the NCTCOG links within the project corridor for the two ATCs. Non-project related links were not analyzed.

2.8 MSAT Emission Calculations

MSAT emission factors for each of the nine priority MSATs were generated by the EPA's MOVES2014 emission model. Emission factors were taken from the TxDOT ERLT. All emission factors were composite emission factors calculated for the local vehicle fleet mix operating during the morning peak hour under local winter meteorological conditions.

VMT was calculated for each link in an ATC and then the links were assigned specific emission factors for each of the nine priority MSAT based on the link's MOVES2014a facility type, average speed (weighted average of AM peak, PM peak, and off-peak speeds), and analysis year. Emission factors for all links in each ATC and VMT calculations are summarized in **Table 5**. Priority MSAT emissions produced by each link were calculated as the product of the link-specific VMT and the corresponding nine emission factors. Total ATC emissions for each of the nine priority MSATs were summed by the corresponding emissions from each of the ATCs links calculated to provide tons per year of MSAT emissions.

3. ANALYSIS RESULTS

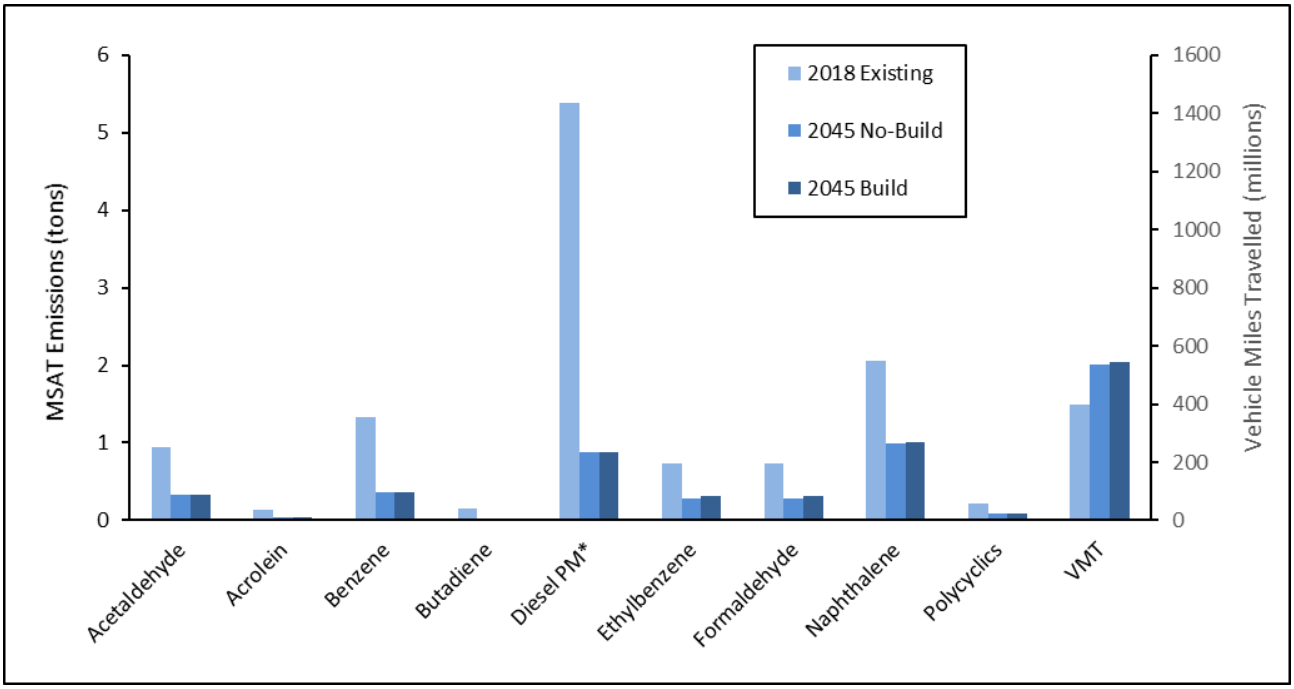
From the base year (2018) to the Design Year (2045), the annual VMT in the ATC was estimated to increase by 34.5 percent in the No Build Alternative, and by 35.7 percent in the Build Alternative (**Table 3, Figures 2** and **3**). Conversely, the total annual priority MSAT emissions in 2045 were estimated to decrease by 76.6 percent in the No Build Alternative, and by 76.3 percent in the Build Alternative, as compared to base year levels (2018) (**Table 3**; **Figures 2** and **3**).

Table 3: Annual Priority MSAT Emissions and VMT

Scenario/Alternative	2018 Base Year	2045 No Build	2045 Build	Percent Change from 2018 vs.	
				2045 No Build	2045 Build
Priority MSAT	Emissions (tons)			Percent Change	
Acetaldehyde	0.948	0.327	0.330	-65.5%	-65.2%
Acrolein	0.133	0.046	0.046	-65.4%	-65.4%
Benzene	1.331	0.355	0.367	-73.3%	-72.4%
Butadiene	0.157	0.003	0.003	-98.1%	-98.1%
Diesel PM	10.769	1.745	1.741	-83.8%	-83.8%
Ethylbenzene	0.727	0.287	0.308	-60.5%	-57.6%
Formaldehyde	2.055	0.989	1.001	-51.9%	-51.3%
Naphthalene	0.222	0.079	0.080	-64.4%	-64.0%
Polycyclics	0.086	0.019	0.019	-77.9%	-77.9%
Total	16.43	3.850	3.900	-76.6%	-76.3%
VMT (millions per year)	999.2	1,343.7	1,356.1	34.5%	35.7%

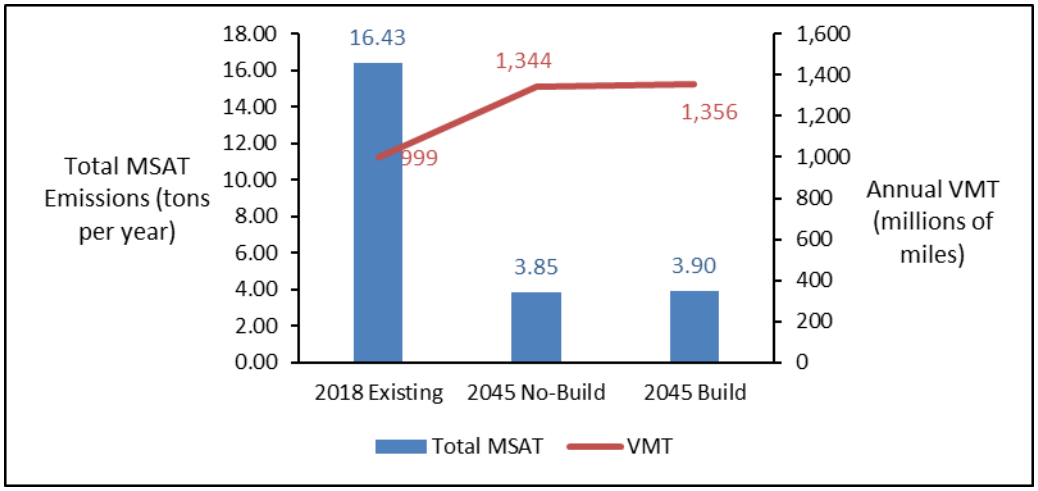
Source: Study Team, (August 2019).

Figure 2: Annual Priority MSAT Emissions



Source: Table 3.
* Diesel PM is plotted as 50% of its actual value for visibility.

Figure 3: Total Annual Priority MSAT Emissions and VMT



Source: Study Team, (August 2019).

Reduced diesel PM accounts for 71.7 and 72.1 percent of the reduction in the total priority MSAT emissions for the 2018 base year versus the 2045 No Build and Build Alternative, respectively. Reduction in total priority MSAT in the 2045 No Build versus the 2045 Build Alternative is due to improved performance of the network (despite a 1.2 percent increase in VMT in the 2045 Build versus 2045 No Build Alternatives).

4. MSAT Conclusions

In summary, a quantitative assessment has been conducted, relative to the proposed project's No Build and Build Alternative, for MSAT emissions. The qualitative assessment has acknowledged that the Build 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. Regardless of whether the No Build Alternative or the Build Alternative is selected for the proposed project, the quantitative assessment indicates that total MSAT emissions are expected to be lower in 2045 No Build and Build Alternative versus 2018 base year.

Appendix A:
TxDOT Transportation Planning and Programming Division Approved Traffic (August 2019)

Texas Department of Transportation

MEMO

August 20, 2019

To: Loyl C. Bussell, P.E., District Engineer
Attention: Ricardo Gonzalez, P.E., Director of TPD

Through: William E. Knowles, P.E.
Traffic Analysis Section Director, TPP

From: Gabe Contreras
Planner, TPP

Subject: Traffic Data
CSJ: 0008-13-125
I-820:
From I-20 to Brentwood Stair Rd.

CSJ: 2374-05-066
I-20:
From I-20/I-820 Interchange
To Park Springs Blvd.

CSJ: 0008-13-206
I-20:
From I-20/I-820 Interchange
To Forest Hill Dr.

CSJ: 0172-06-080
US 287:
From I-820
To Bishop St.

CSJ: 0172-09-028
US 287:
From I-20
To Sublett Rd.

Tarrant County

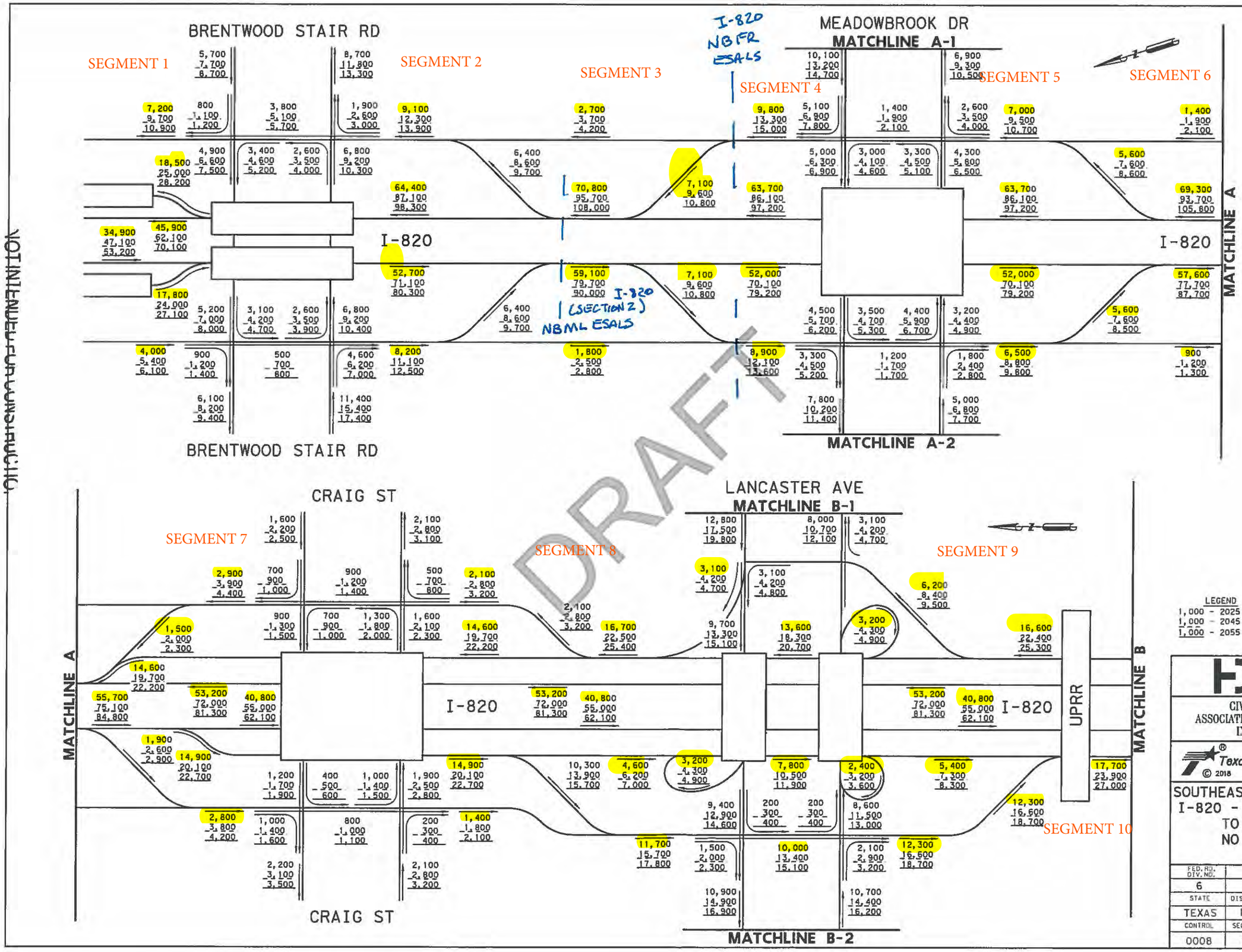
Attached are consultant provided diagrams depicting 2025, 2045 and 2055 average daily traffic volumes and turning movements on the Southeast Connector along I-820, I-20, and US 287 for no build and build conditions. Also attached are tabulations showing traffic analysis for highway design for the 2025 to 2045 twenty year period and 2025 to 2055 thirty year period for the described limits of the route. Also included are tabulations showing data for use in air and noise analysis.

Please refer to your original request dated January 16, 2019.

If you have any questions or need additional information, please contact Gabe Contreras at (512) 486-5180.

Attachments

CC: Curtis Loftis, P.E., Transportation Engineer, Fort Worth District
Design Division



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

CIVIL ASSOCIATES, INC.
9330 LBJ Frwy, Ste. 1150
Dallas, Texas 75243
TBPE Firm Registration No. 6981

Texas Department of Transportation
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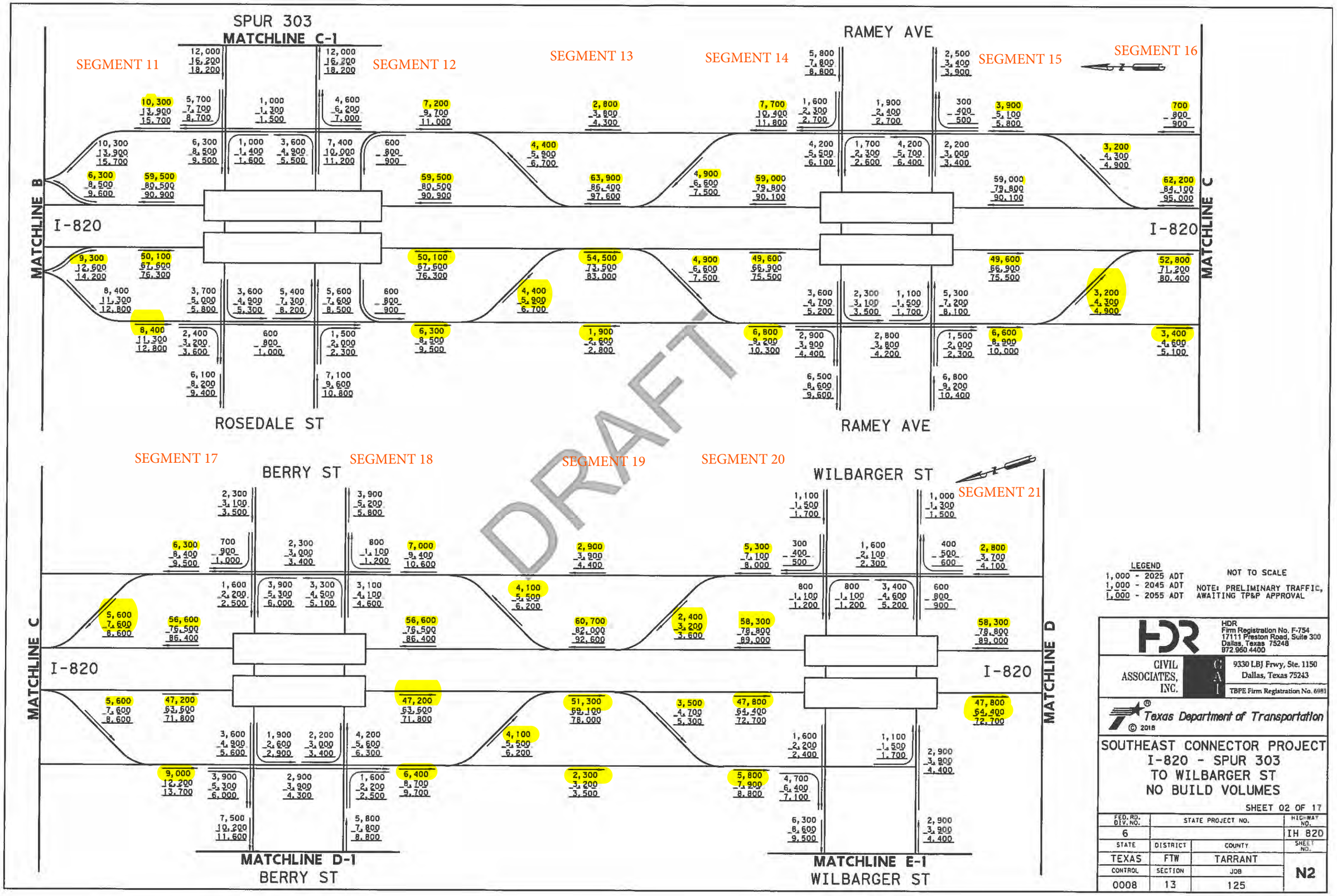
SOUTHEAST CONNECTOR PROJECT
I-820 - BRENTWOOD STAIR RD
TO LANCASTER AVE
NO BUILD VOLUMES

SHEET 01 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N1
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



DRAFT

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

CIVIL ASSOCIATES, INC.
9330 LBJ Frwy, Ste. 1150
Dallas, Texas 75243
TBPE Firm Registration No. 6981

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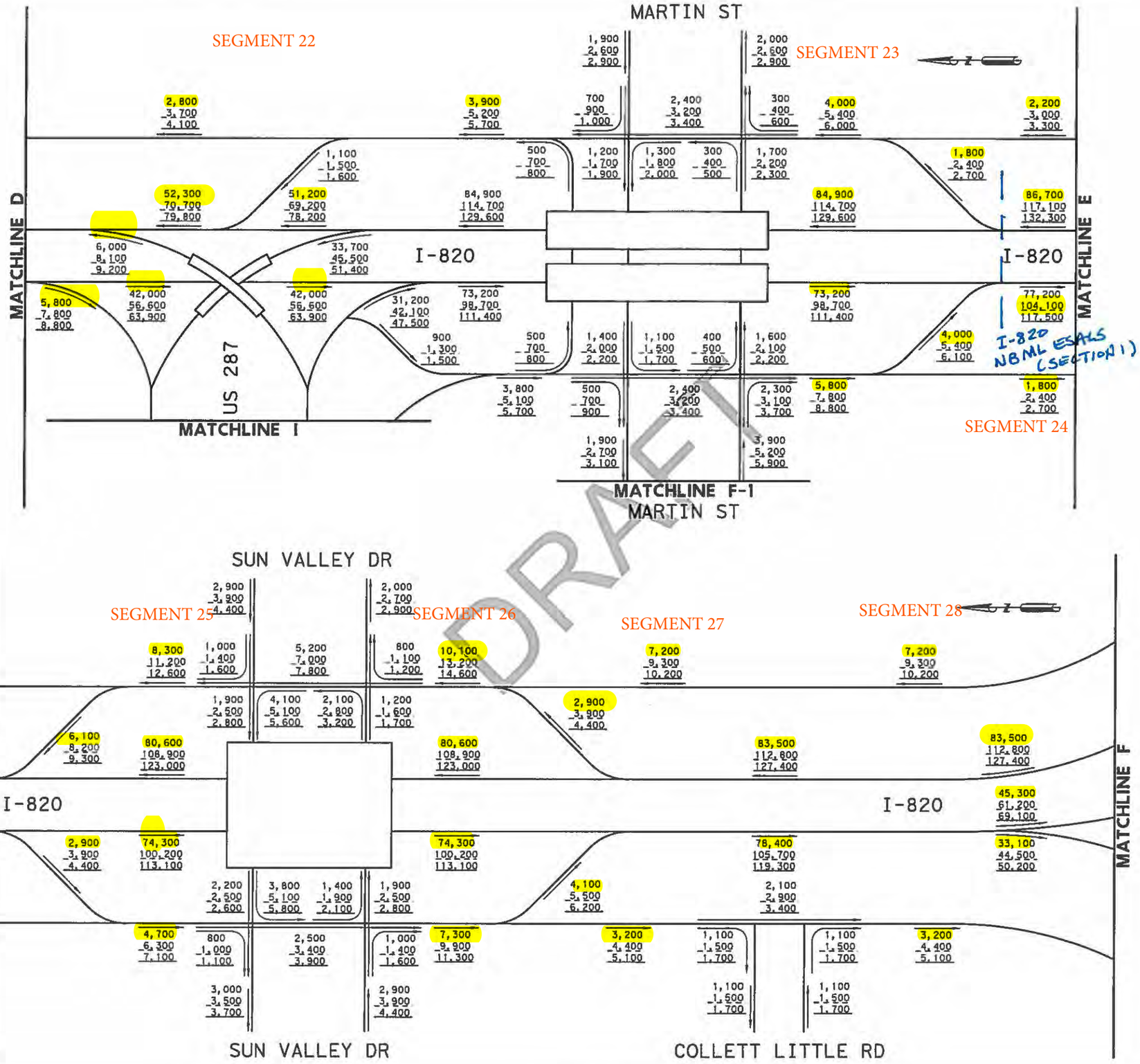
SOUTHEAST CONNECTOR PROJECT
I-820 - SPUR 303
TO WILBARGER ST
NO BUILD VOLUMES

SHEET 02 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N2
CONTROL	SECTION	JOB	
0008	13	125	



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

HDR
Firm Registration No. F-754
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Dallas, Texas 75248
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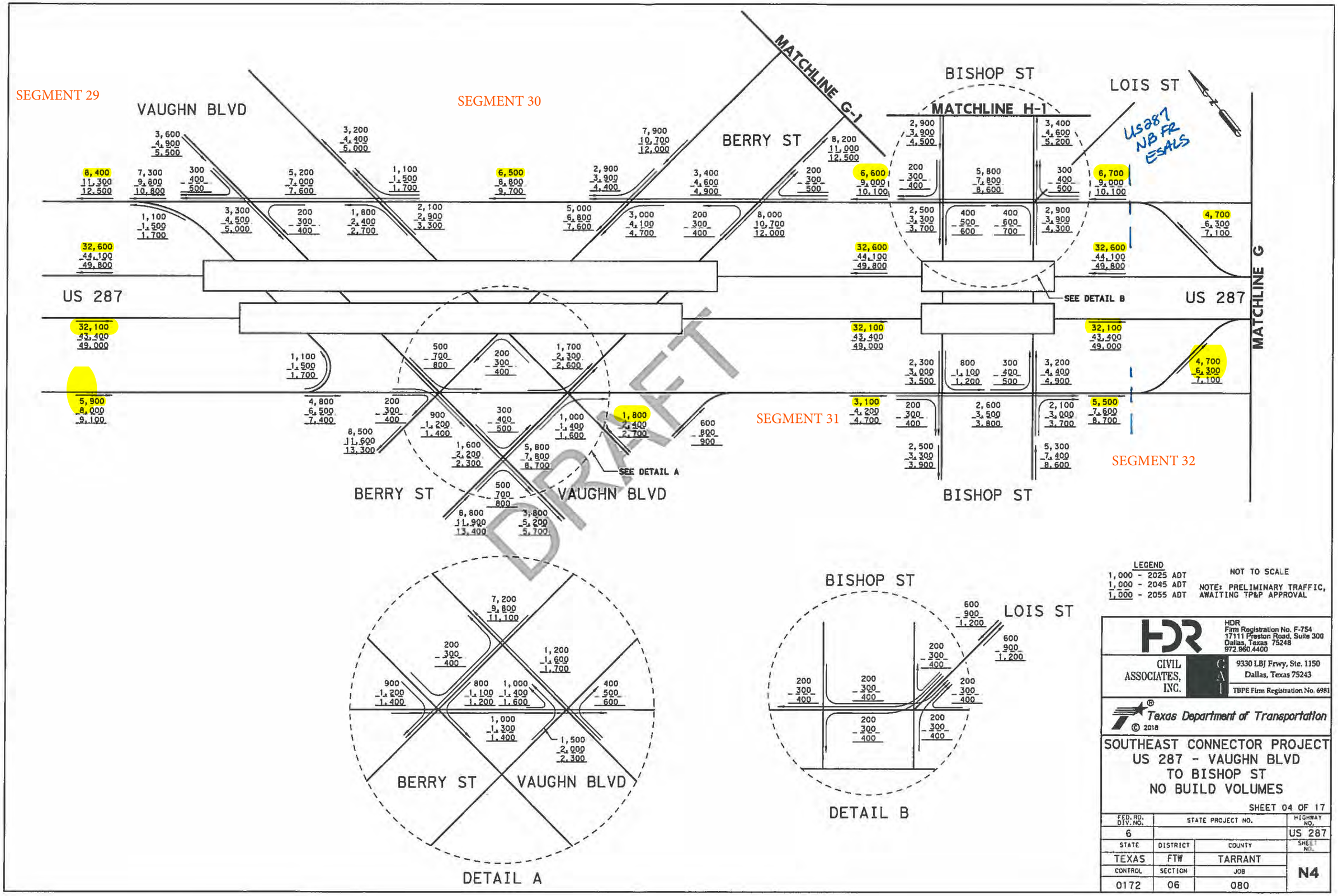
SOUTHEAST CONNECTOR PROJECT
I-820 - US 287 TO
TO I-20
NO BUILD VOLUMES

SHEET 03 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N3
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number Rd 704


SEGMENT 29
SEGMENT 30
SEGMENT 31
SEGMENT 32
VAUGHN BLVD
BERRY ST
BISHOP ST
LOIS ST
MATCHLINE G-1
MATCHLINE H-1
MATCHLINE G
US 287
US287 NB FR ESALS
SEE DETAIL A
SEE DETAIL B
DETAIL A
DETAIL B
DRAFT
LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT
NOT TO SCALE
NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL
HDR
Firm Registration No. F-754
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Dallas, Texas 75248
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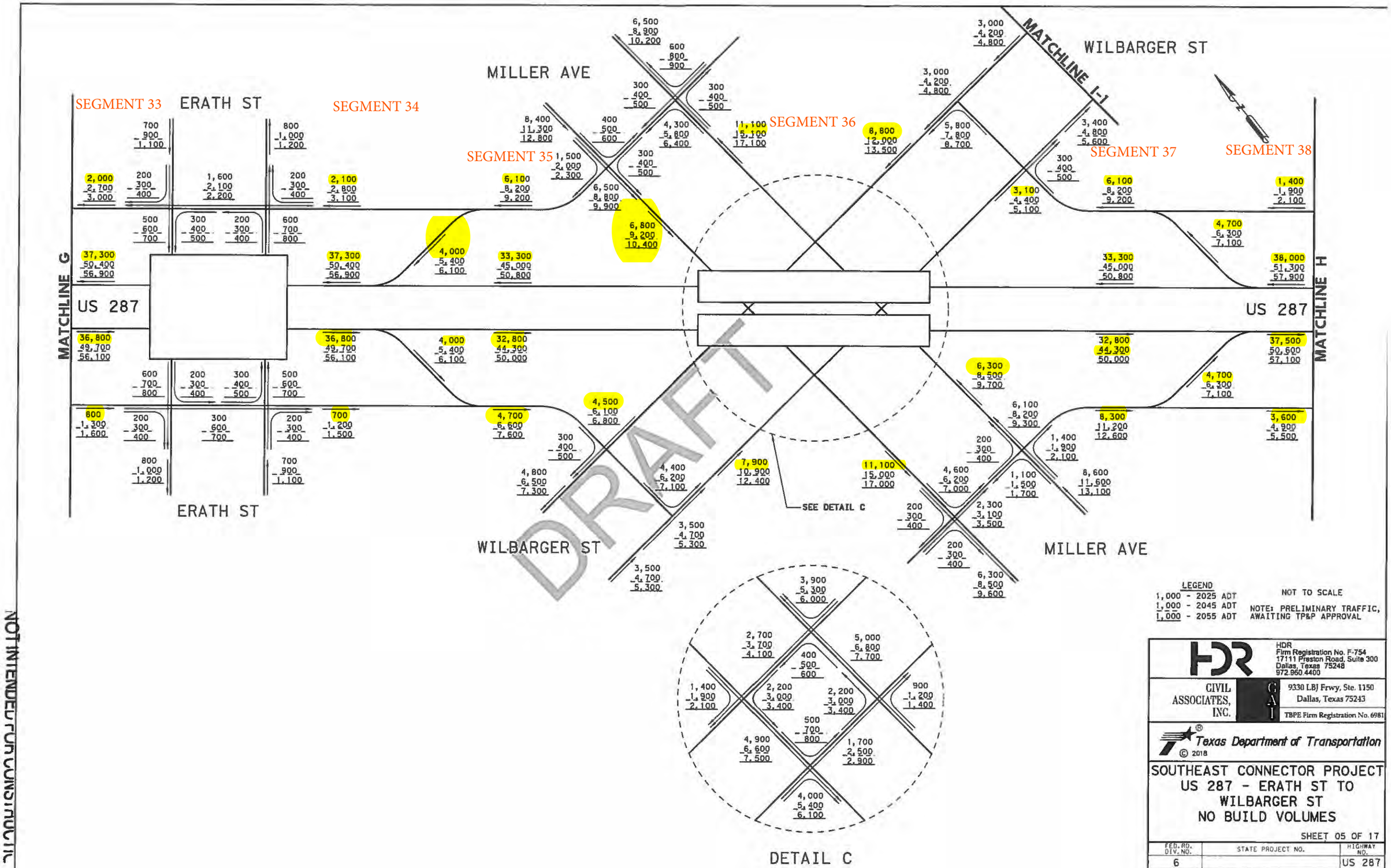
SOUTHEAST CONNECTOR PROJECT
US 287 - VAUGHN BLVD
TO BISHOP ST
NO BUILD VOLUMES
SHEET 04 OF 17
FED. RD. DIV. NO. 6
STATE PROJECT NO.
HIGHWAY NO. US 287
STATE TEXAS
DISTRICT FTW
COUNTY TARRANT
CONTROL 0172
SECTION 06
JOB 080
SHEET NO. N4
NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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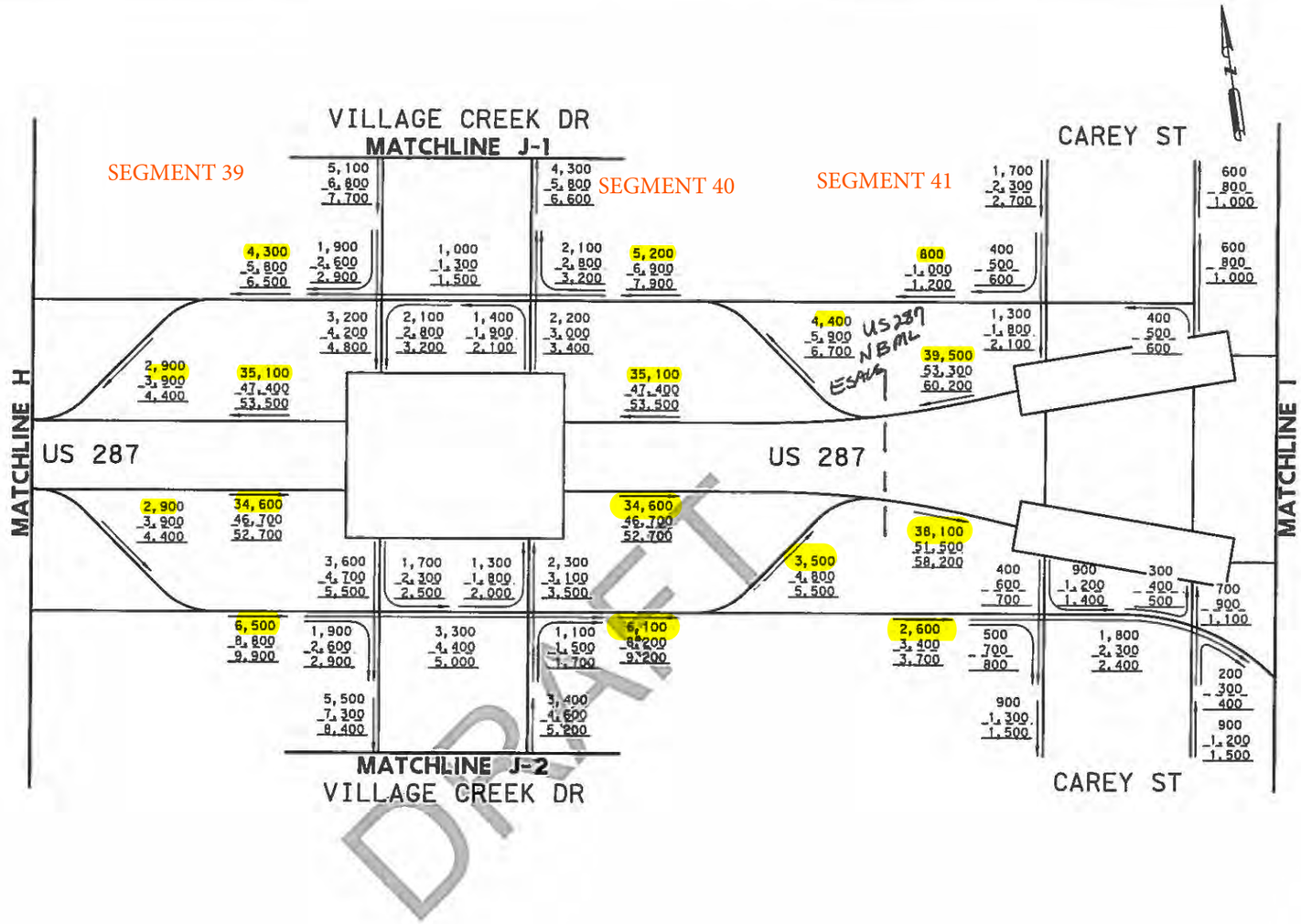
SOUTHEAST CONNECTOR PROJECT
US 287 - ERATH ST TO
WILBARGER ST
NO BUILD VOLUMES

SHEET 05 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			US 287
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N5
CONTROL	SECTION	JOB	
0172	06	080	

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84701



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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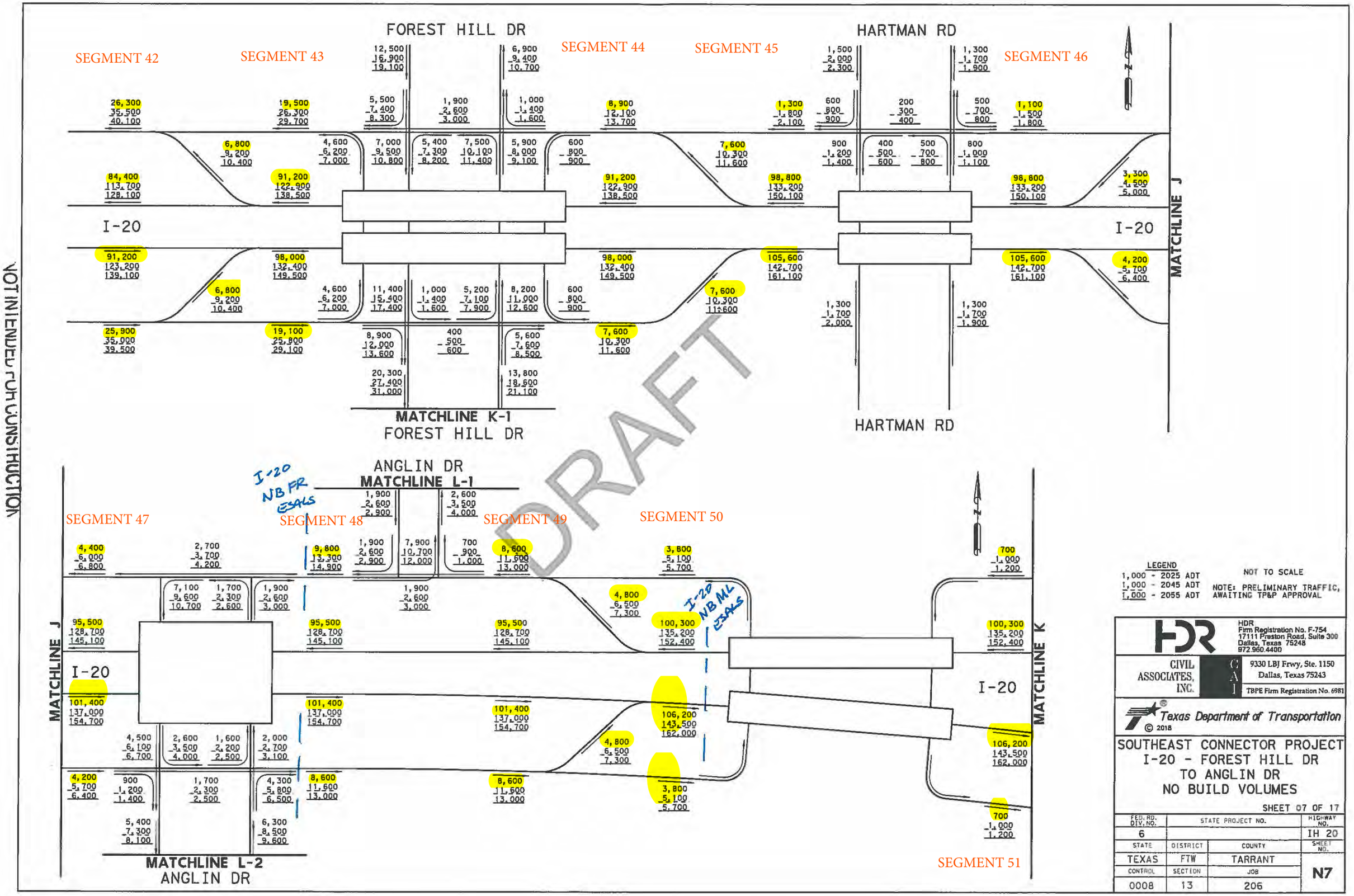
SOUTHEAST CONNECTOR PROJECT
US 287 - VILLAGE CREEK DR
TO CAREY ST
NO BUILD VOLUMES

SHEET 06 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			US 287
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N6
CONTROL	SECTION	JOB	
0172	06	080	

NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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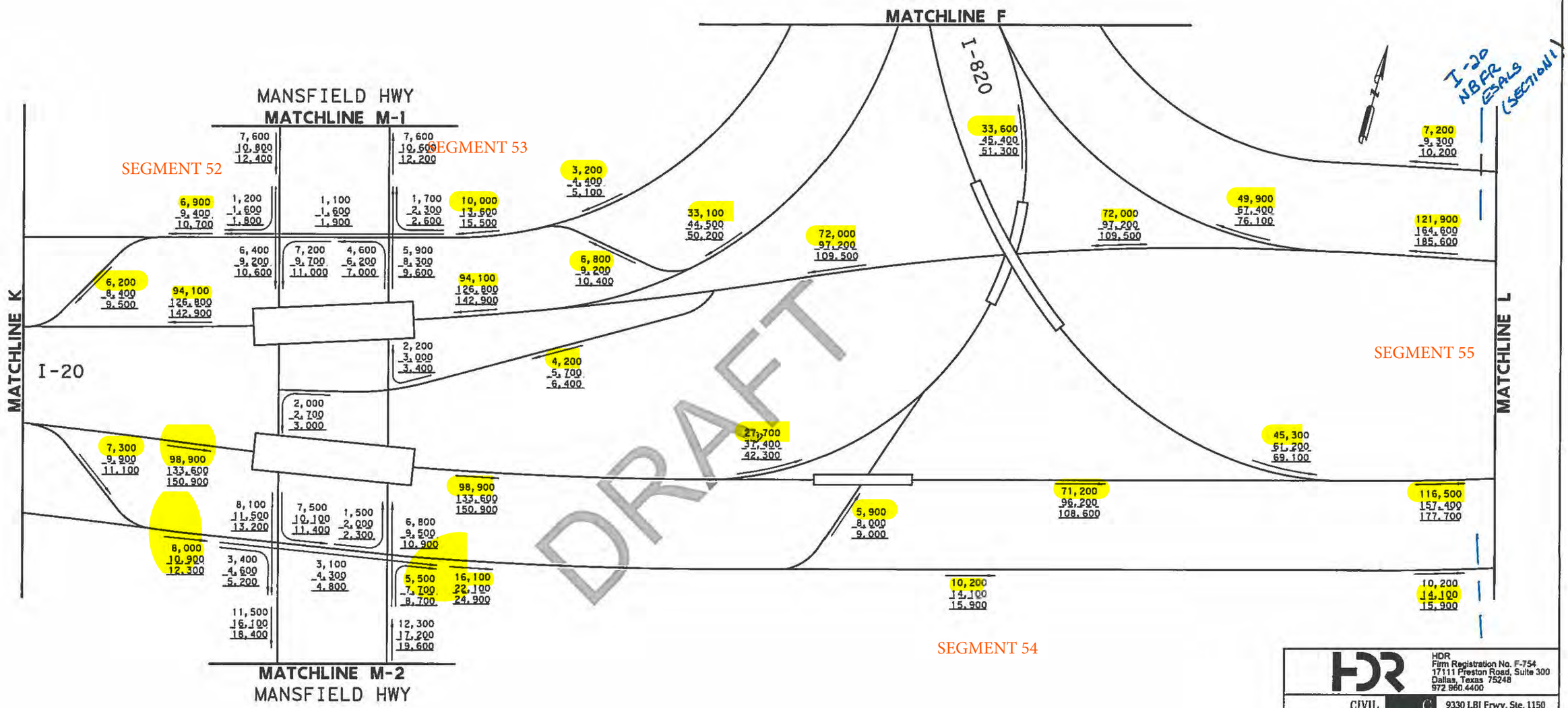
SOUTHEAST CONNECTOR PROJECT
I-20 - FOREST HILL DR
TO ANGLIN DR
NO BUILD VOLUMES

SHEET 07 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 20
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N7
CONTROL	SECTION	JOB	
0008	13	206	

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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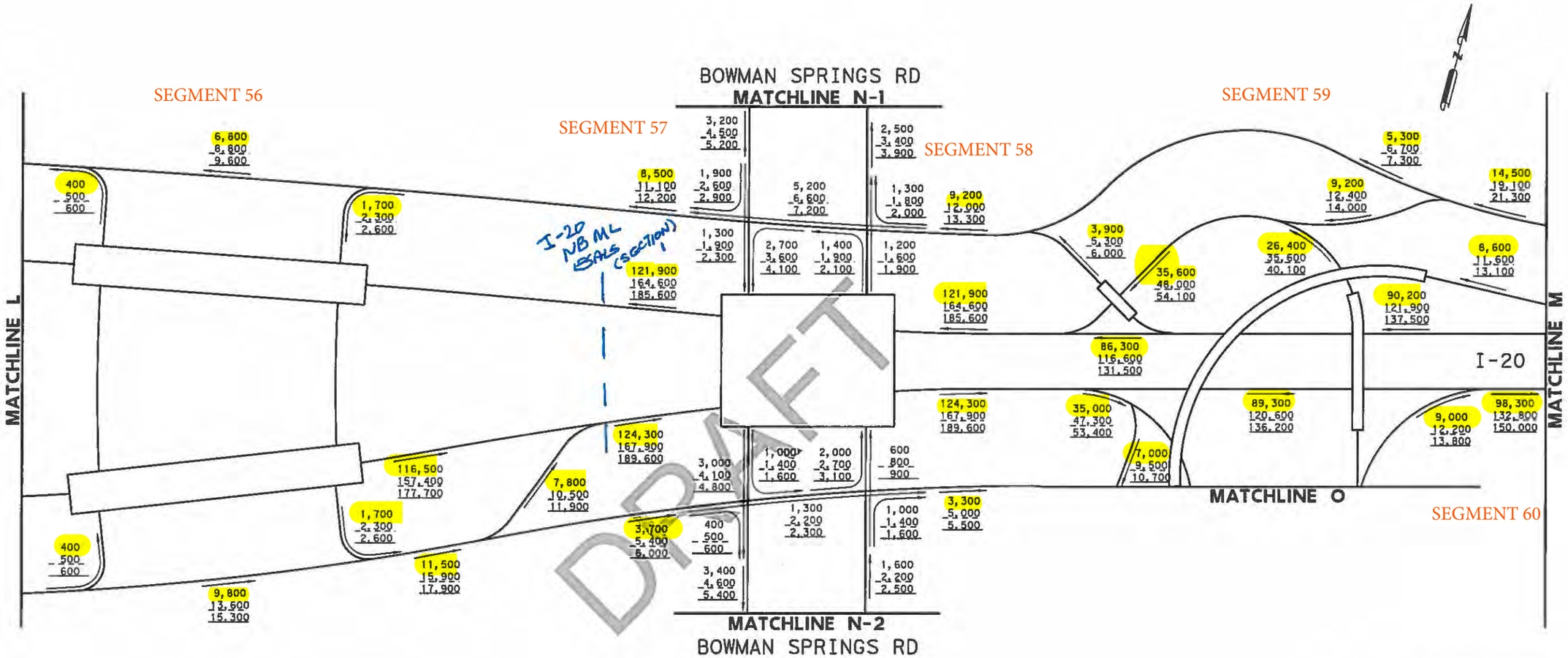
SOUTHEAST CONNECTOR PROJECT
I-20 - MANSFIELD HWY
TO I-820
NO BUILD VOLUMES

SHEET 08 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 20
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N8
CONTROL	SECTION	JOB	
0008	13	206	

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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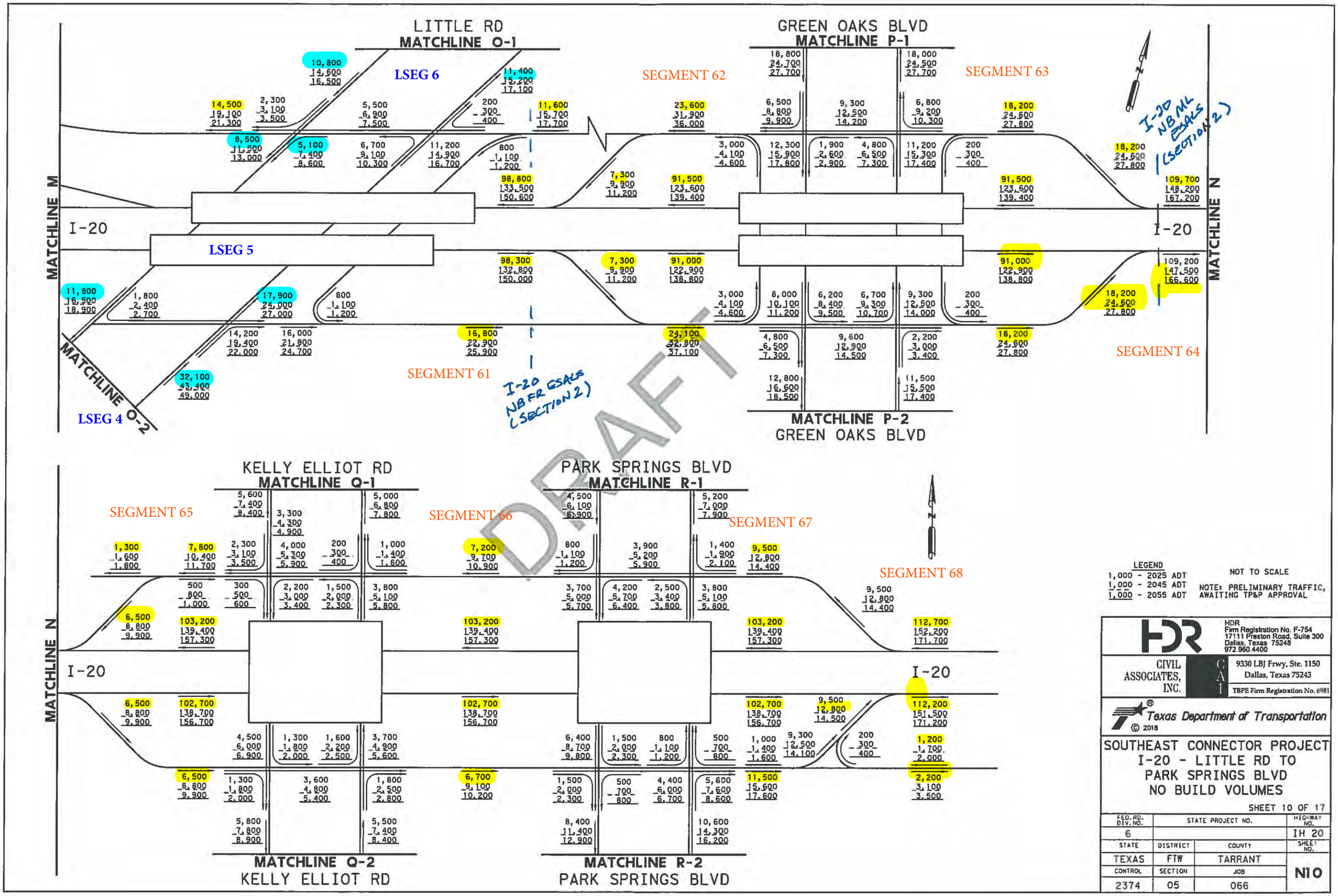
SOUTHEAST CONNECTOR PROJECT
I-20 - I-820 TO
US 287
NO BUILD VOLUMES

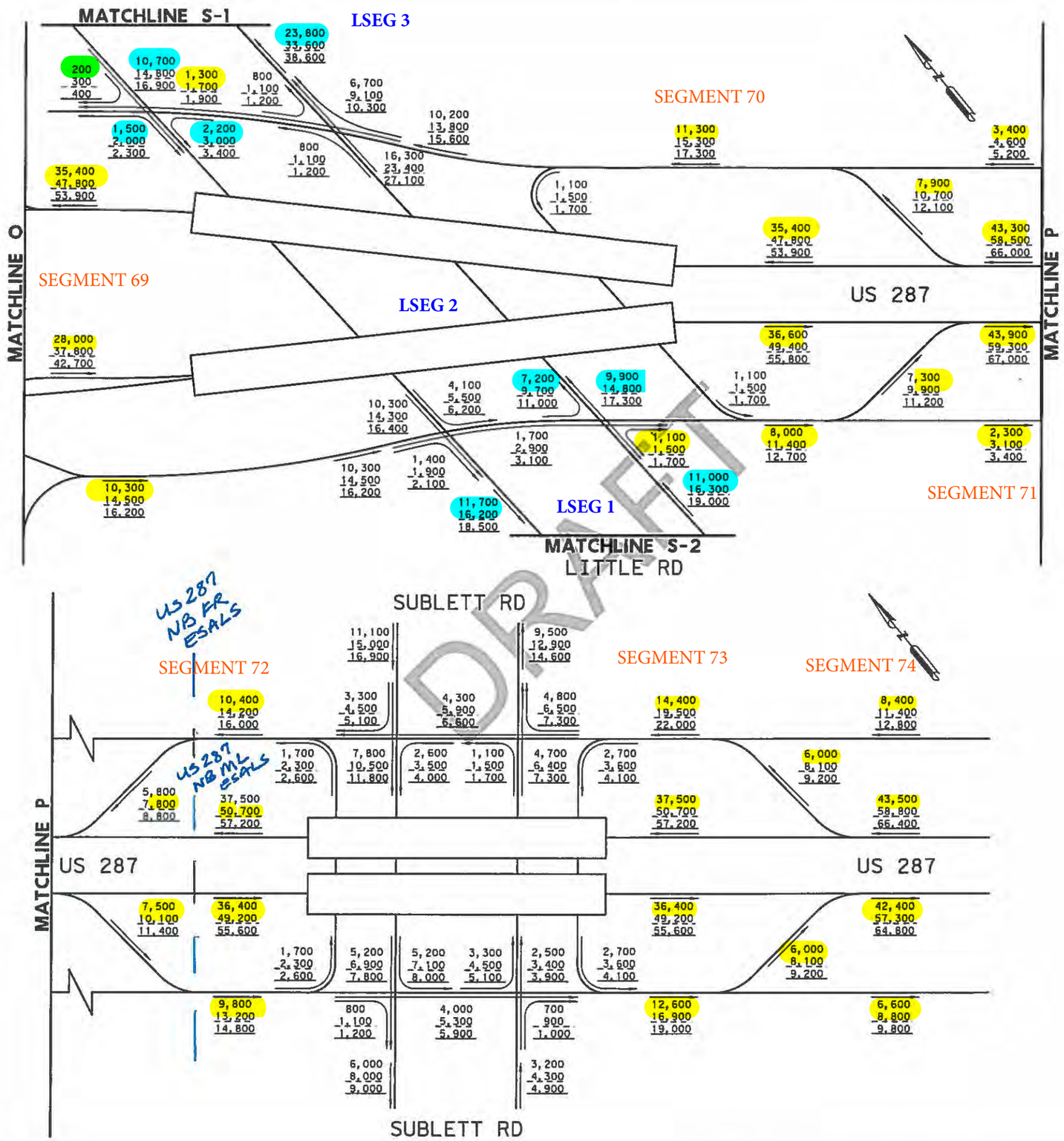
SHEET 09 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 20
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N9
CONTROL	SECTION	JOB	
2374	05	066	

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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SOUTHEAST CONNECTOR PROJECT
US 287 - FROM I-20
TO SUBLETT RD
NO BUILD VOLUMES

SHEET 11 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			US 287
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N11
CONTROL	SECTION	JOB	
0172	09	028	

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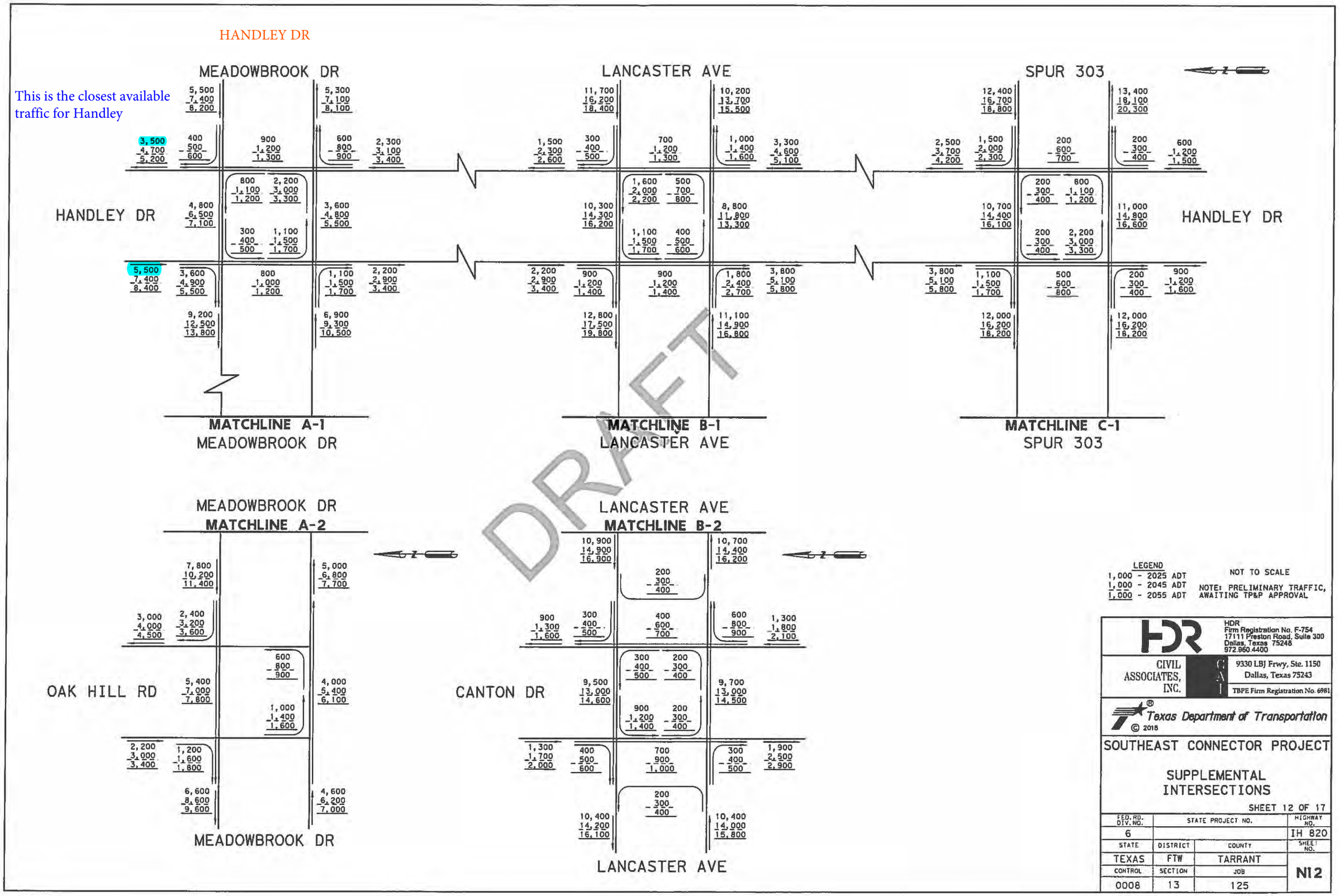
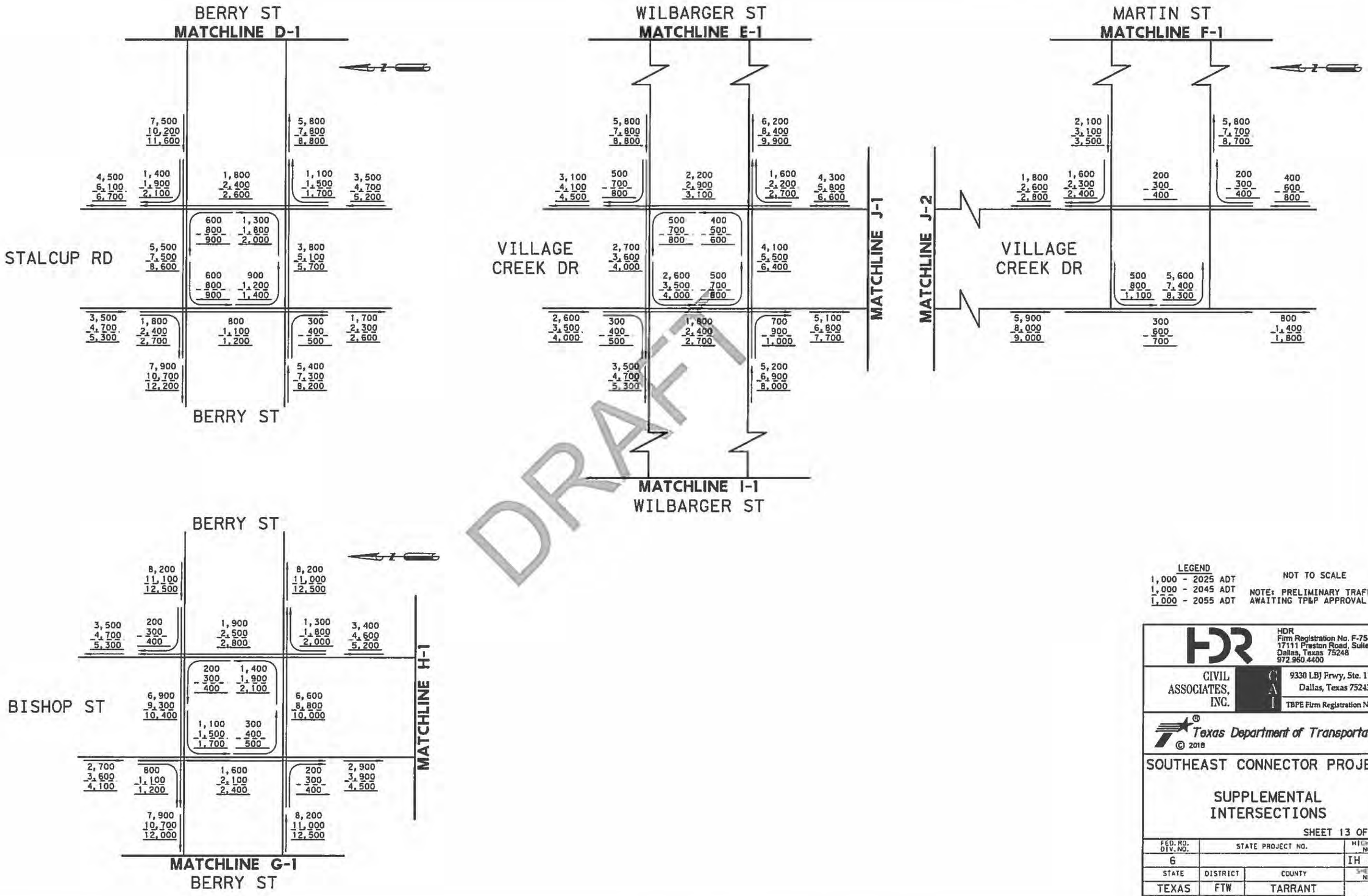
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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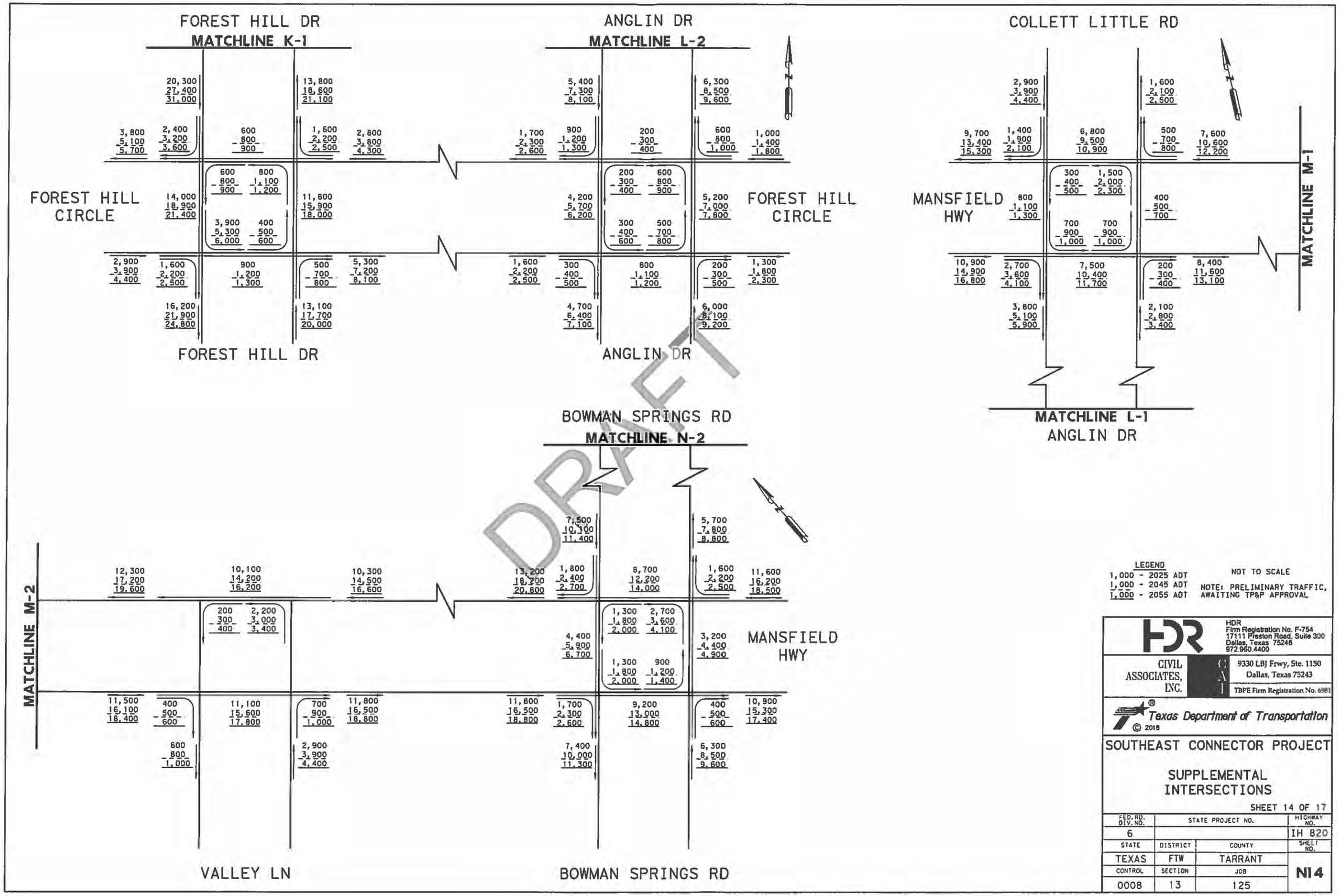
SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 13 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N13
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E



NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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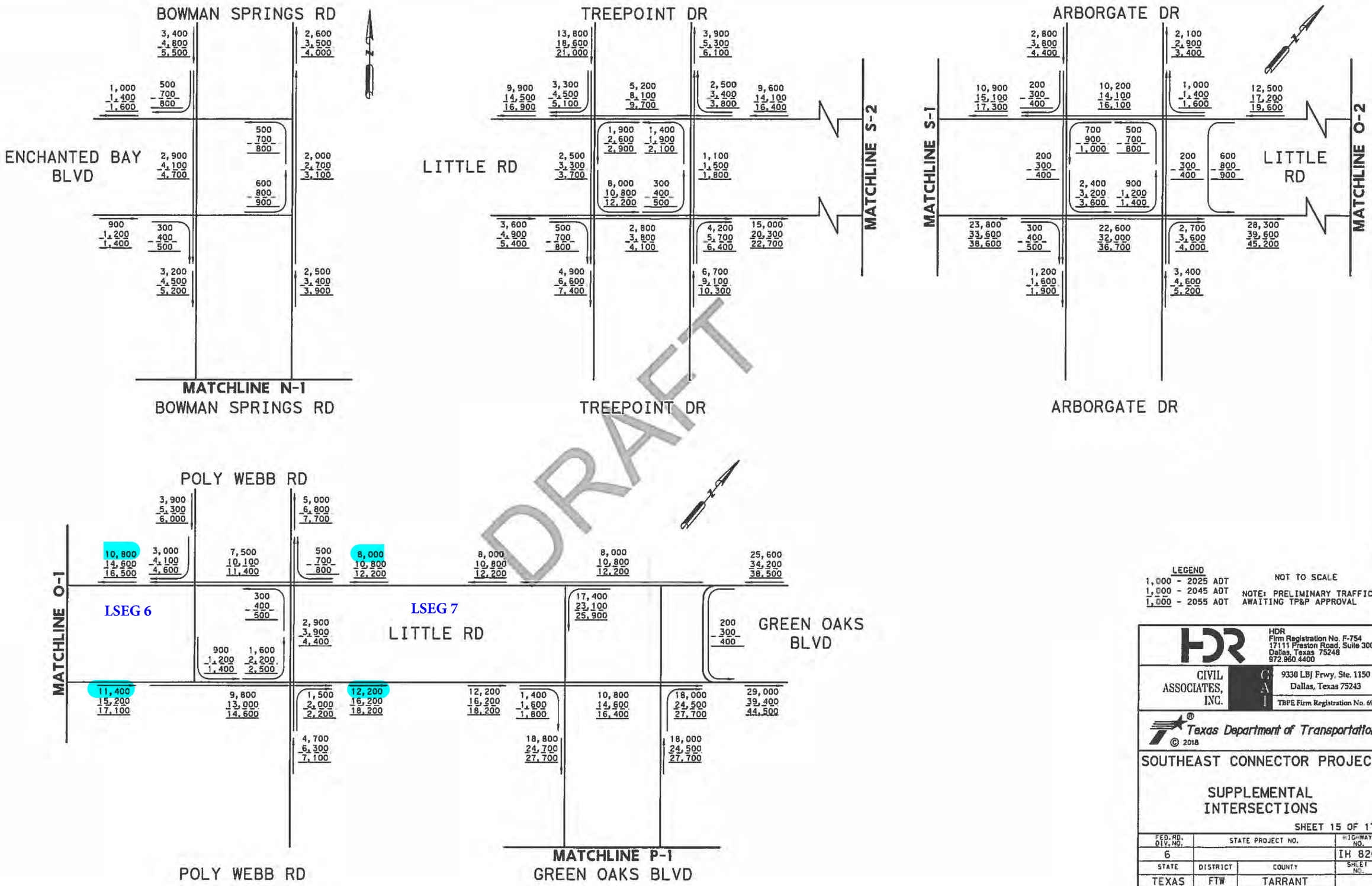
SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 14 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N14
CONTROL	SECTION	JOB	
0008	13	125	



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 15 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N15
CONTROL	SECTION	JOB	
0008	13	125	

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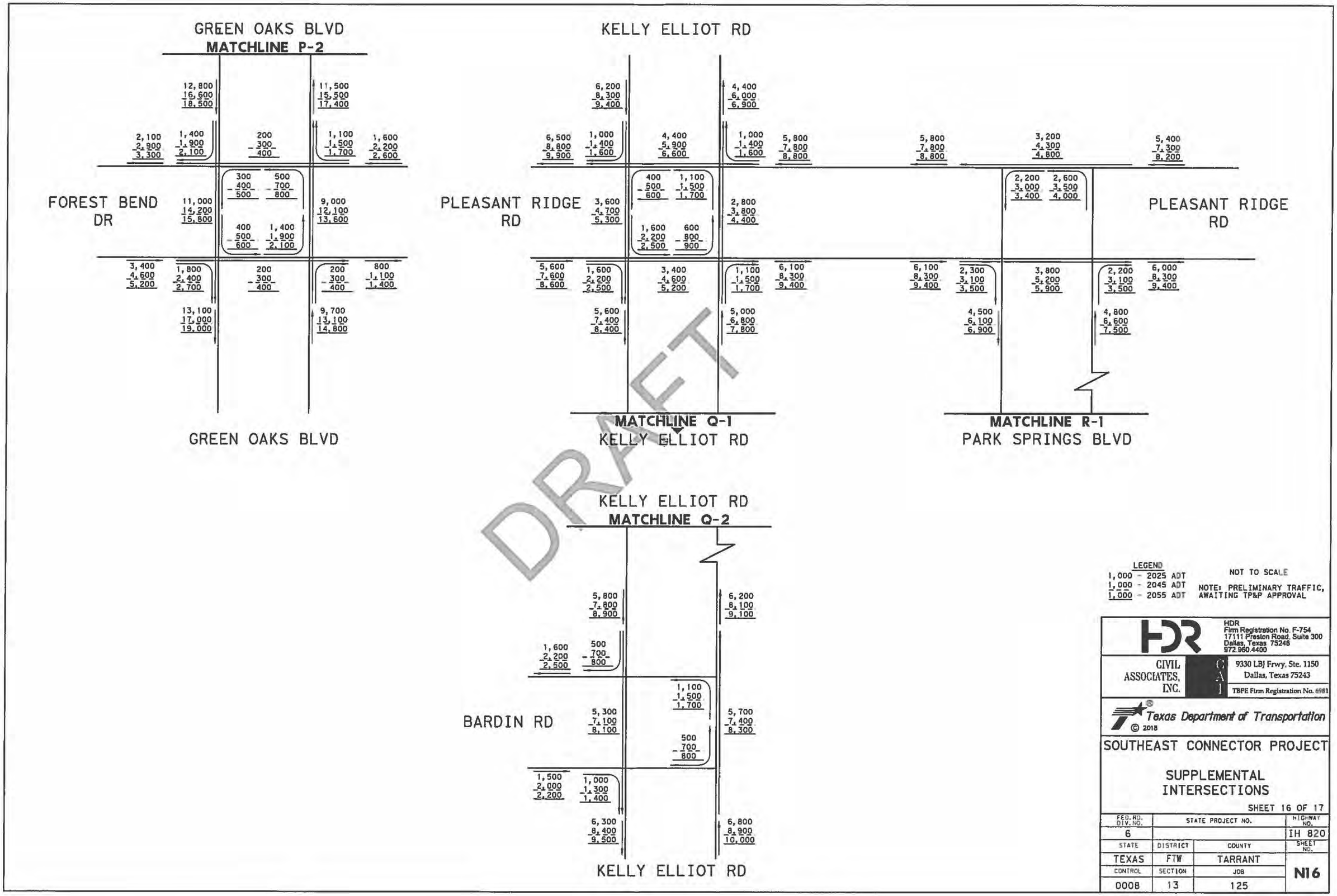
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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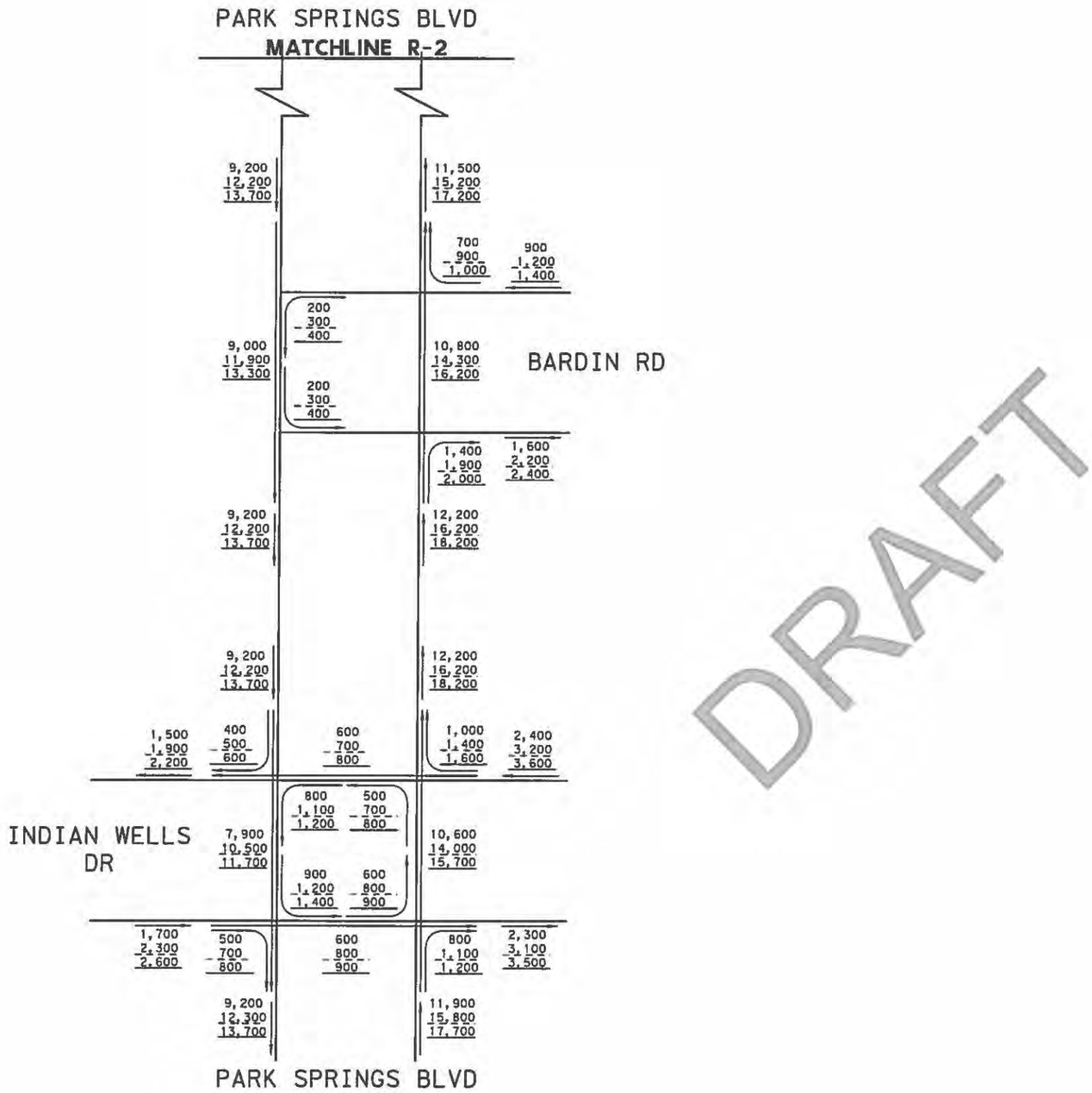
SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 16 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N16
CONTROL	SECTION	JOB	
0008	13	125	

PRELIMINARY FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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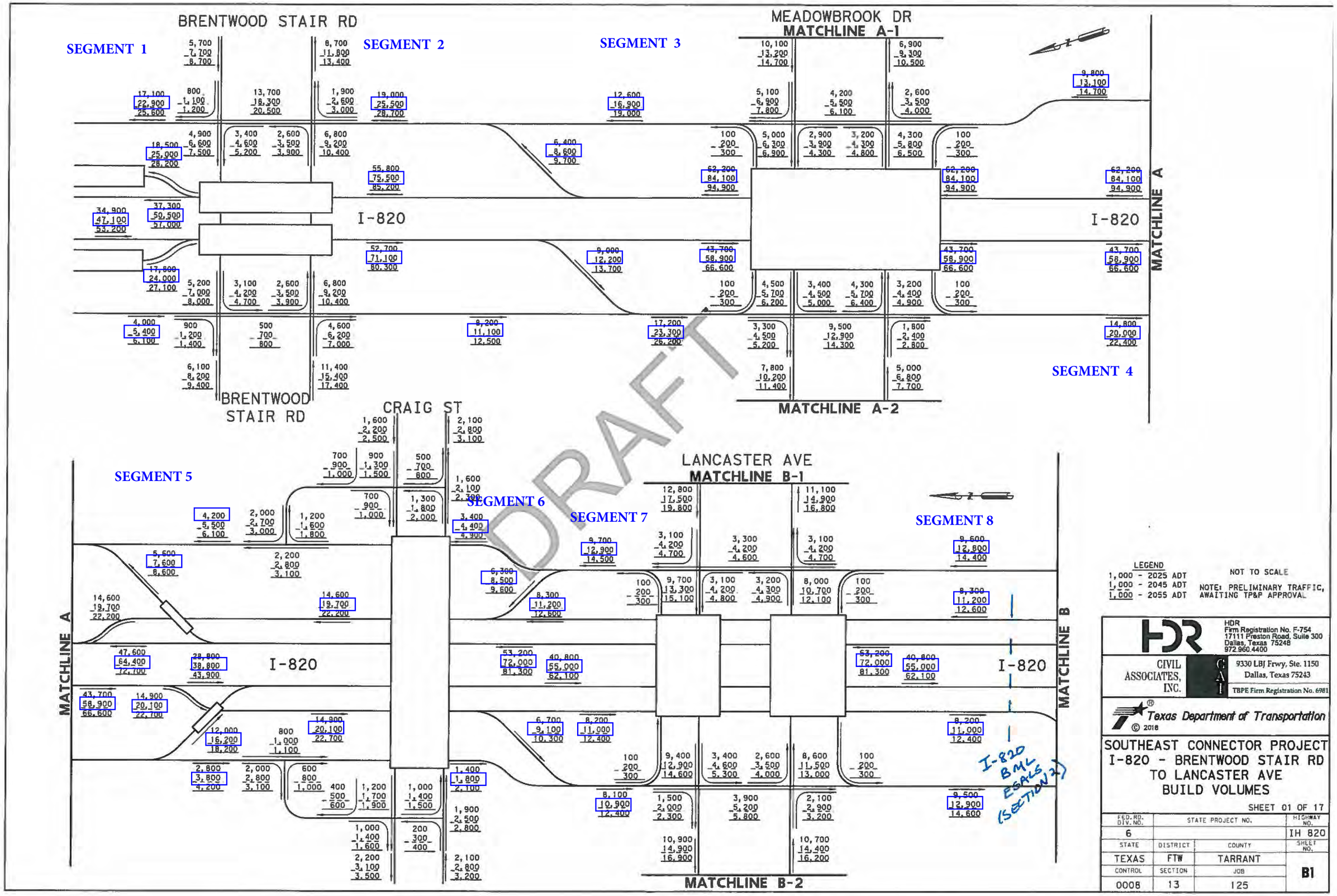
SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 17 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	N17
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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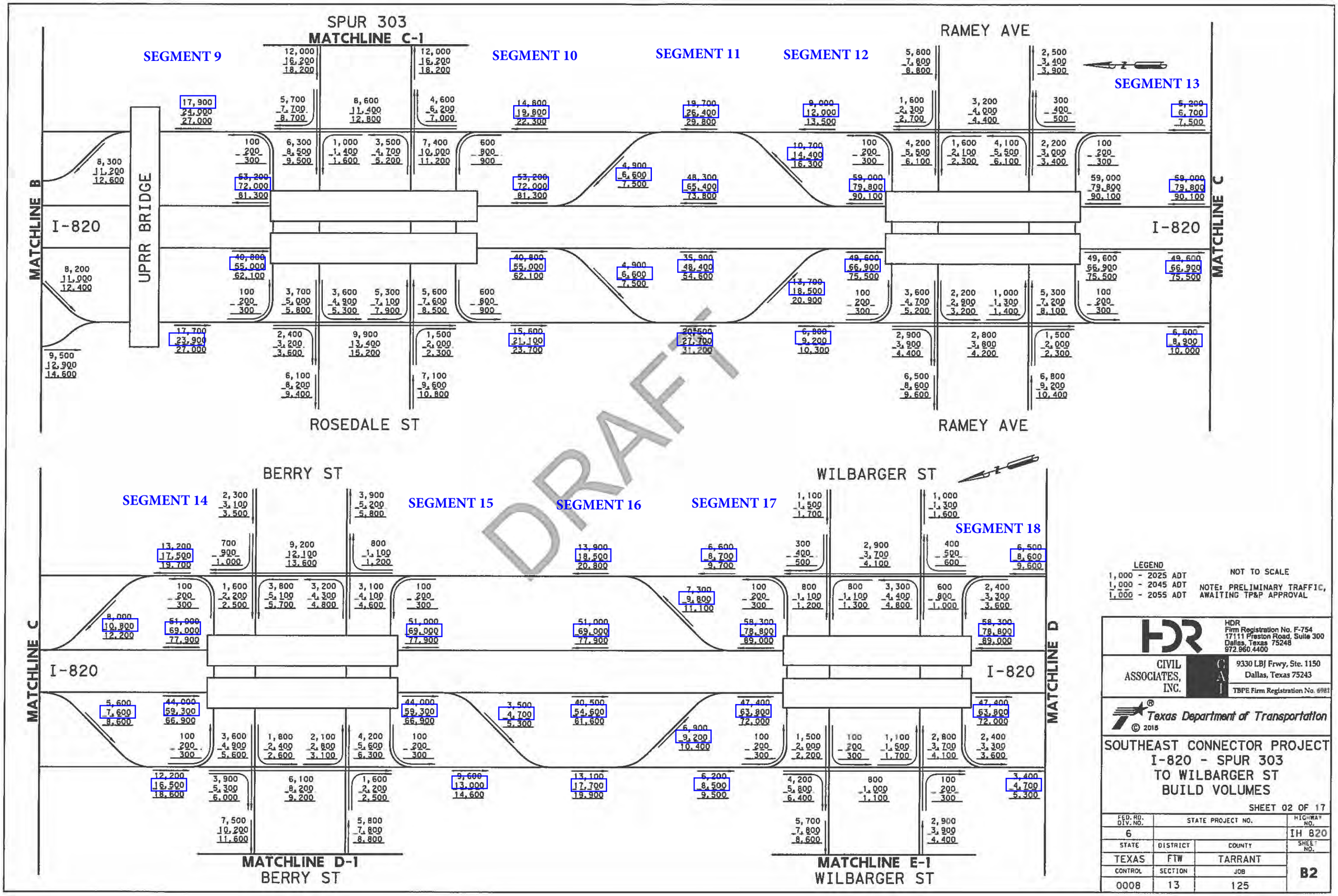
SOUTHEAST CONNECTOR PROJECT
I-820 - BRENTWOOD STAIR RD
TO LANCASTER AVE
BUILD VOLUMES

SHEET 01 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B1
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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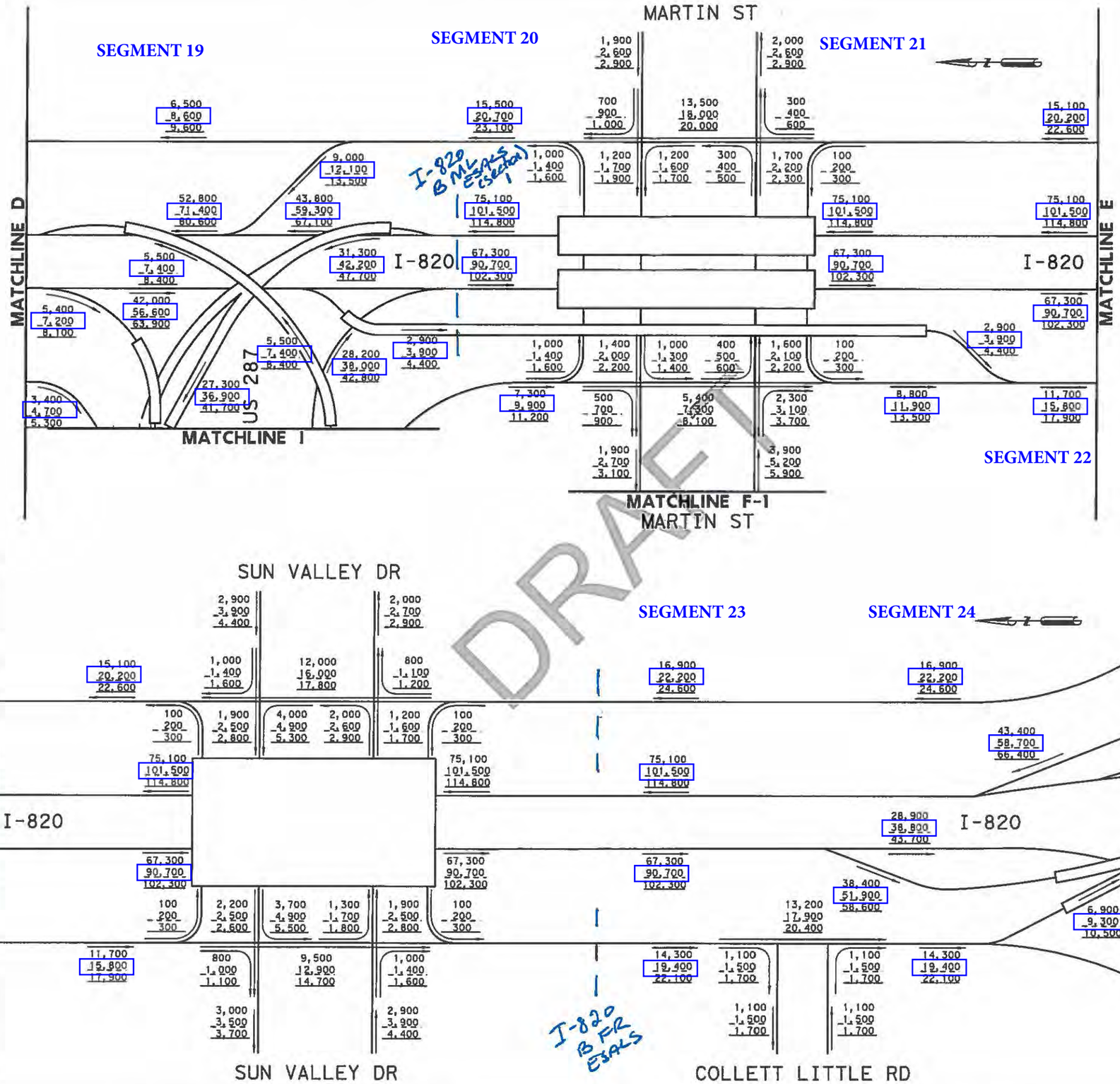
SOUTHEAST CONNECTOR PROJECT
I-820 - SPUR 303
TO WILBARGER ST
BUILD VOLUMES

SHEET 02 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B2
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number 84700



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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Firm Registration No. F-754
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Dallas, Texas 75248
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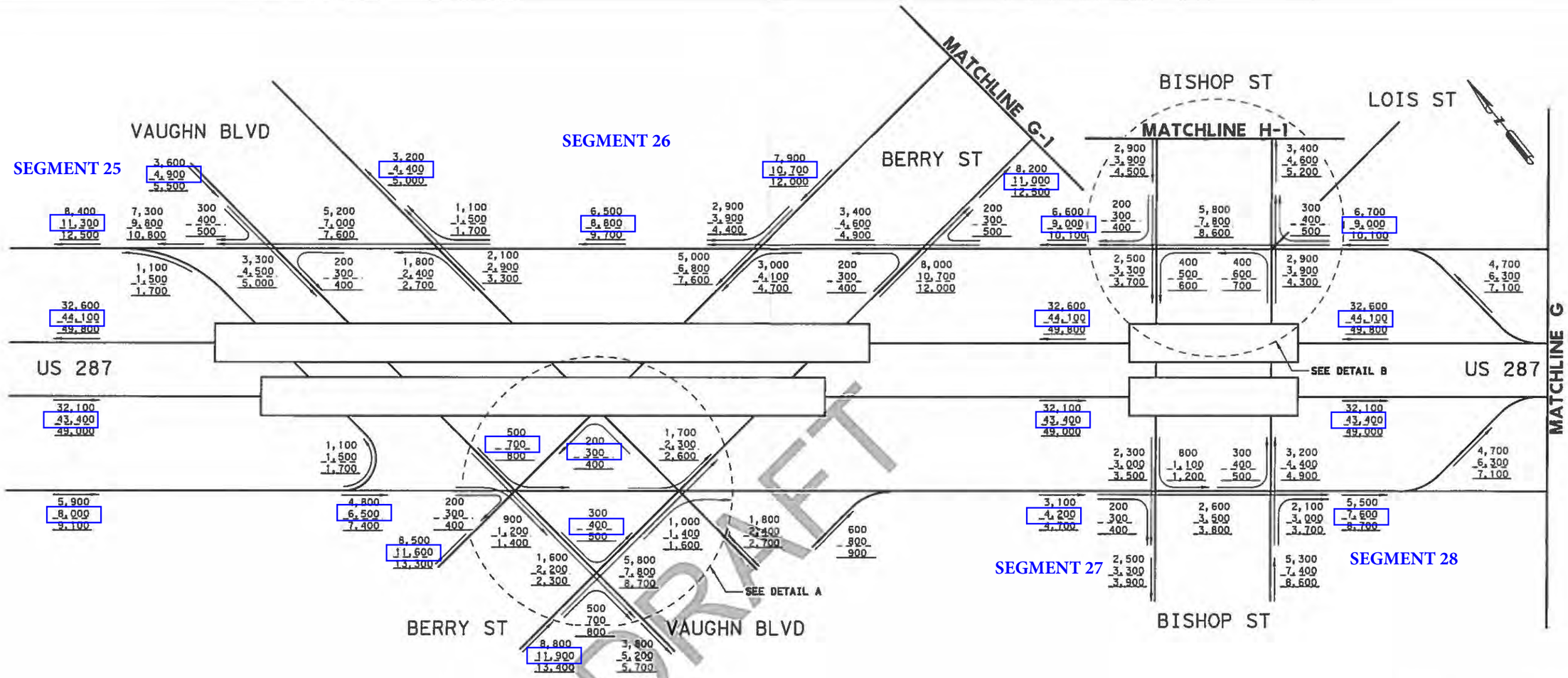
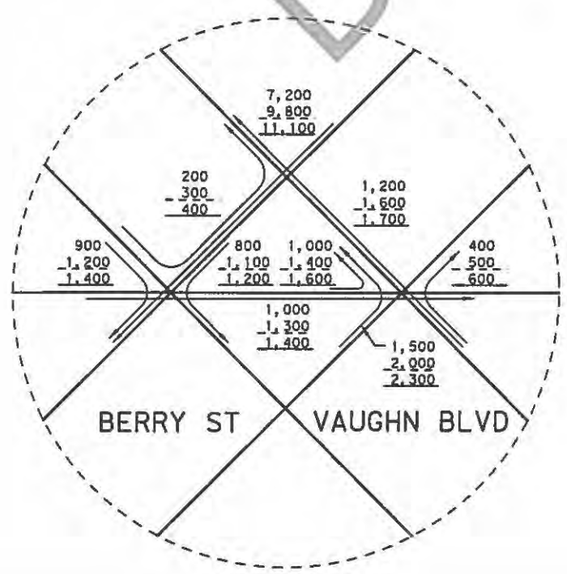
SOUTHEAST CONNECTOR PROJECT
I-820 - US 287 TO
TO I-20
BUILD VOLUMES

SHEET 03 OF 17

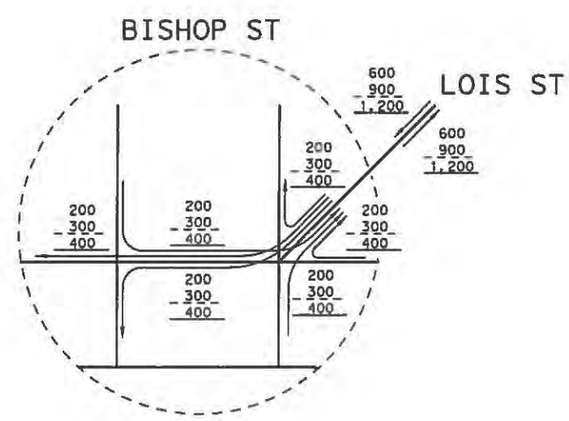
FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B3
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704





DETAIL A



DETAIL B

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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SOUTHEAST CONNECTOR PROJECT
US 287 - VAUGHN BLVD
TO BISHOP ST
BUILD VOLUMES

SHEET 04 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			US 287
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B4
CONTROL	SECTION	JOB	
0172	06	080	

NOT INTENDED FOR CONSTRUCTION
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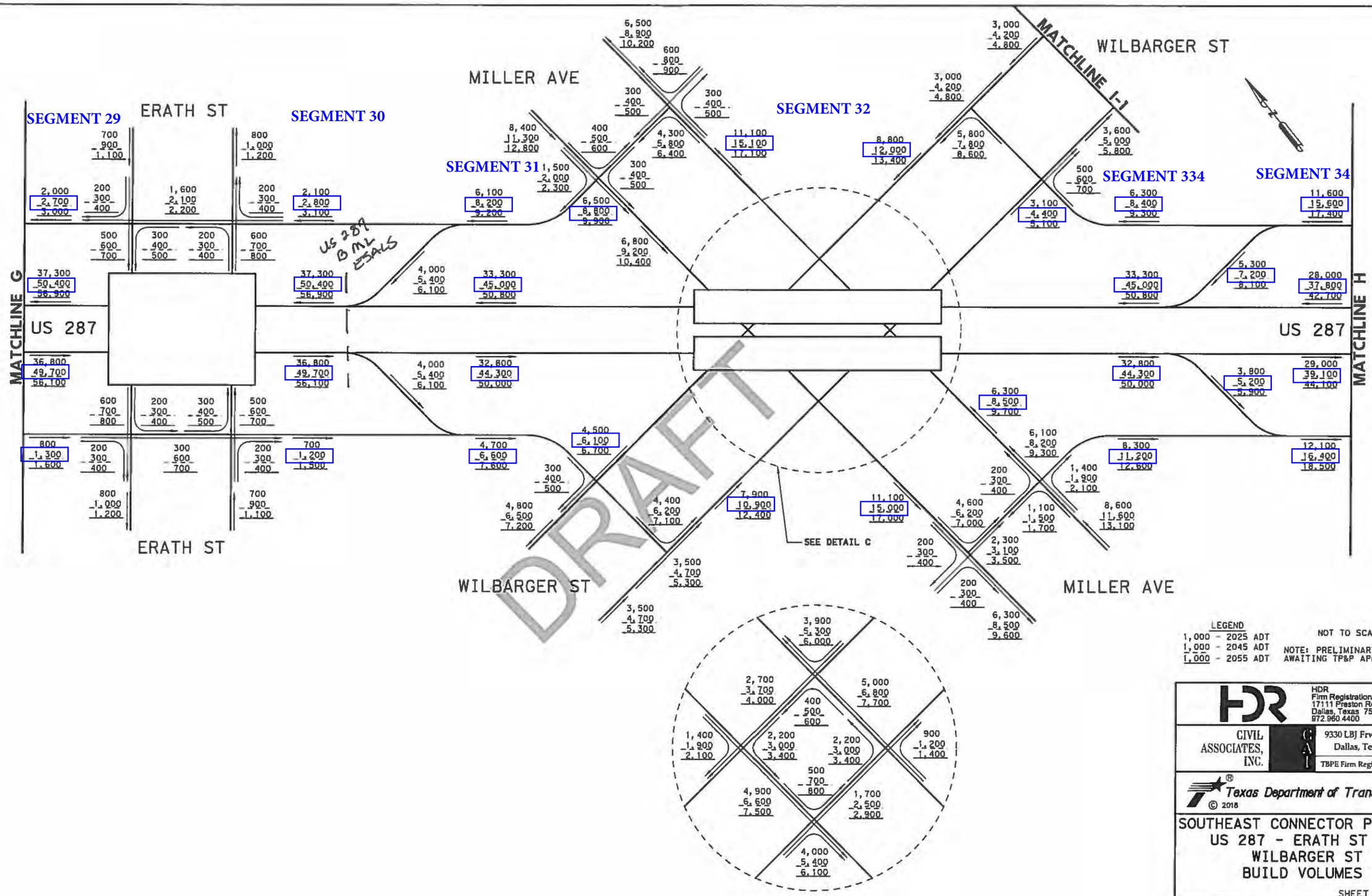
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

CIVIL ASSOCIATES, INC.
9330 LBJ Frwy, Ste. 1150
Dallas, Texas 75243
TBPE Firm Registration No. 6981

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SOUTHEAST CONNECTOR PROJECT
US 287 - ERATH ST TO
WILBARGER ST
BUILD VOLUMES

SHEET 05 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			US 287
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B5
CONTROL	SECTION	JOB	
0172	06	080	

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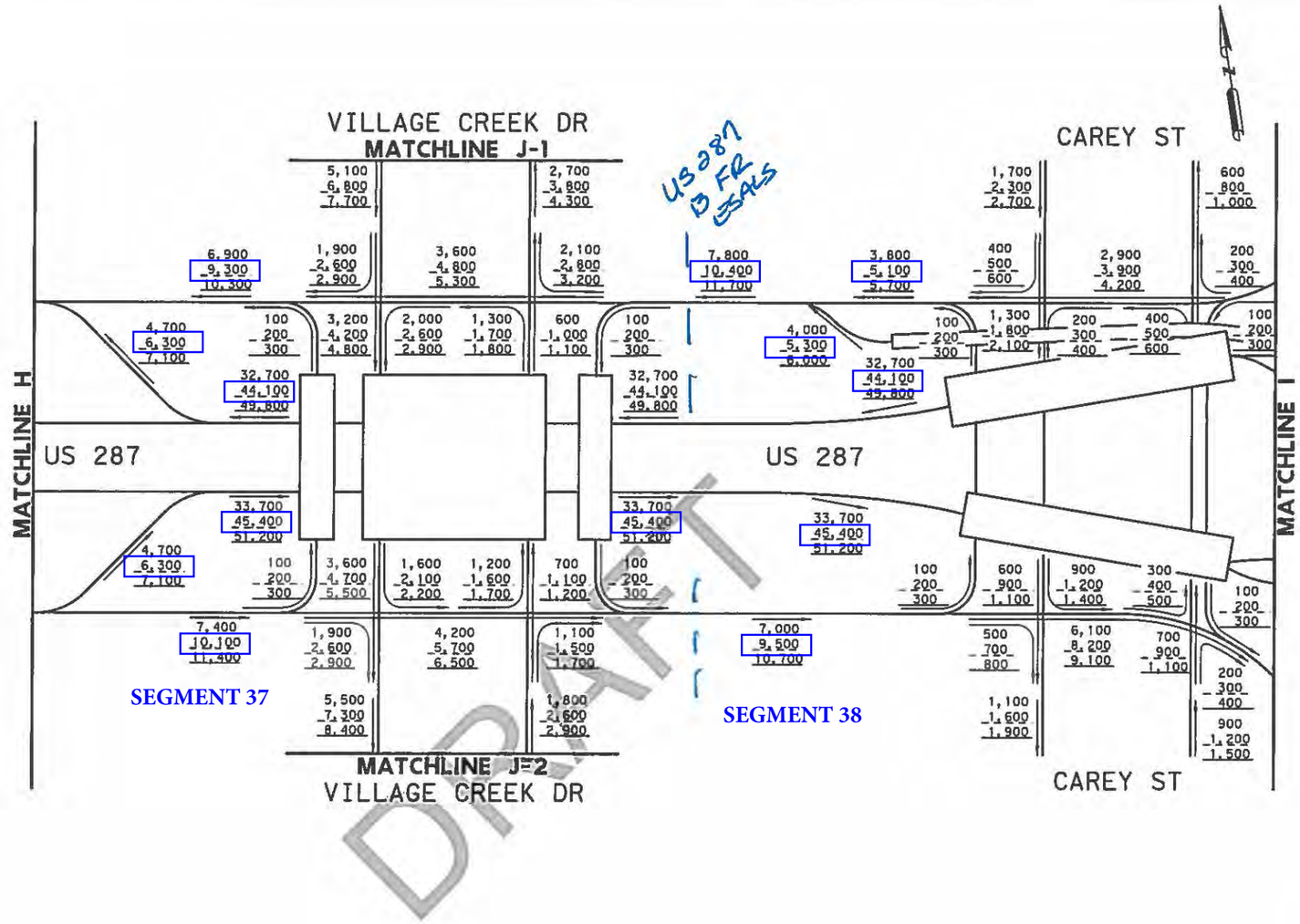
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

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SOUTHEAST CONNECTOR PROJECT
US 287 - VILLAGE CREEK DR
TO CAREY ST
BUILD VOLUMES

SHEET 06 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			US 287
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B6
CONTROL	SECTION	JOB	
0172	06	080	

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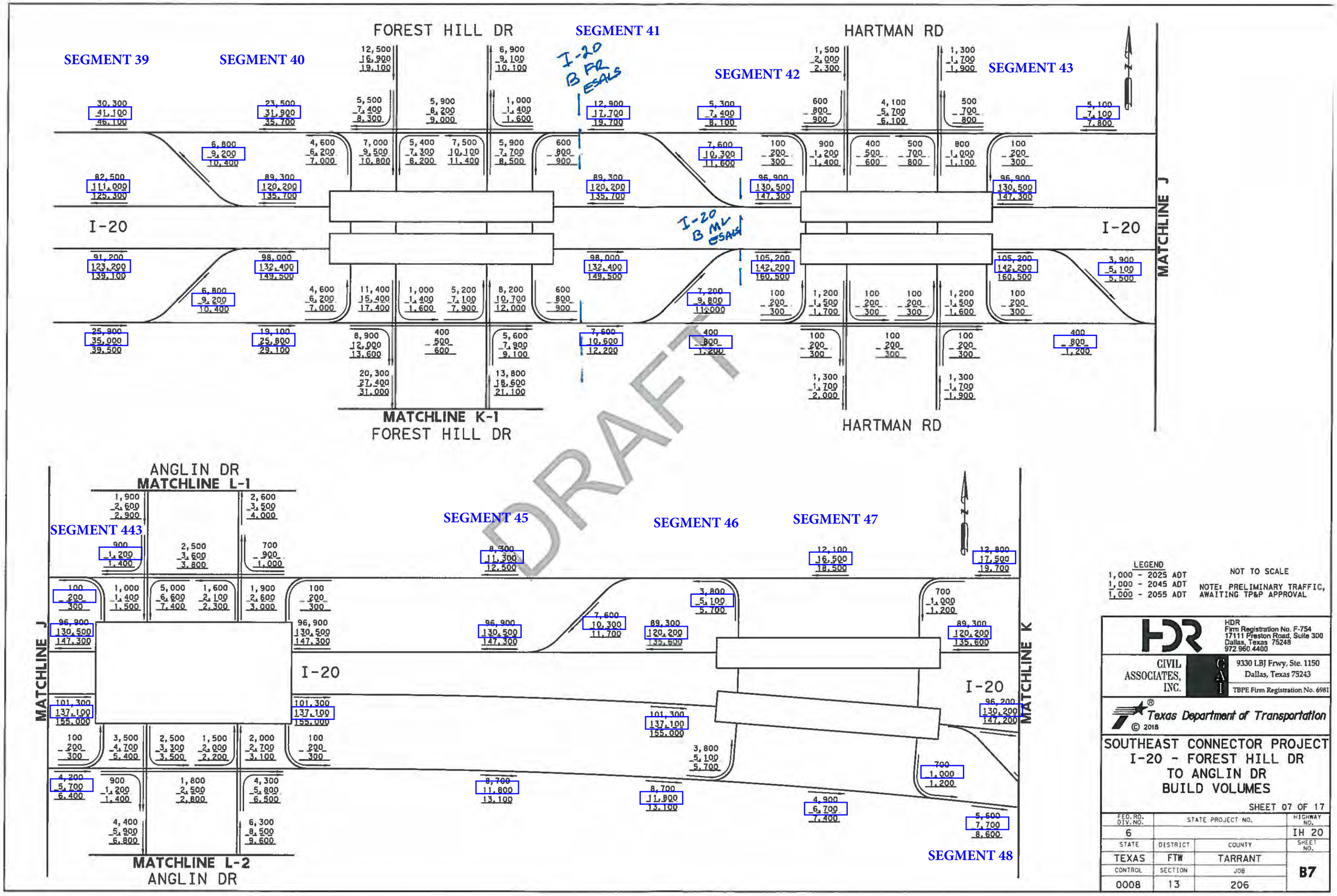
William Erick Knowles, P.E
Serial Number 84704



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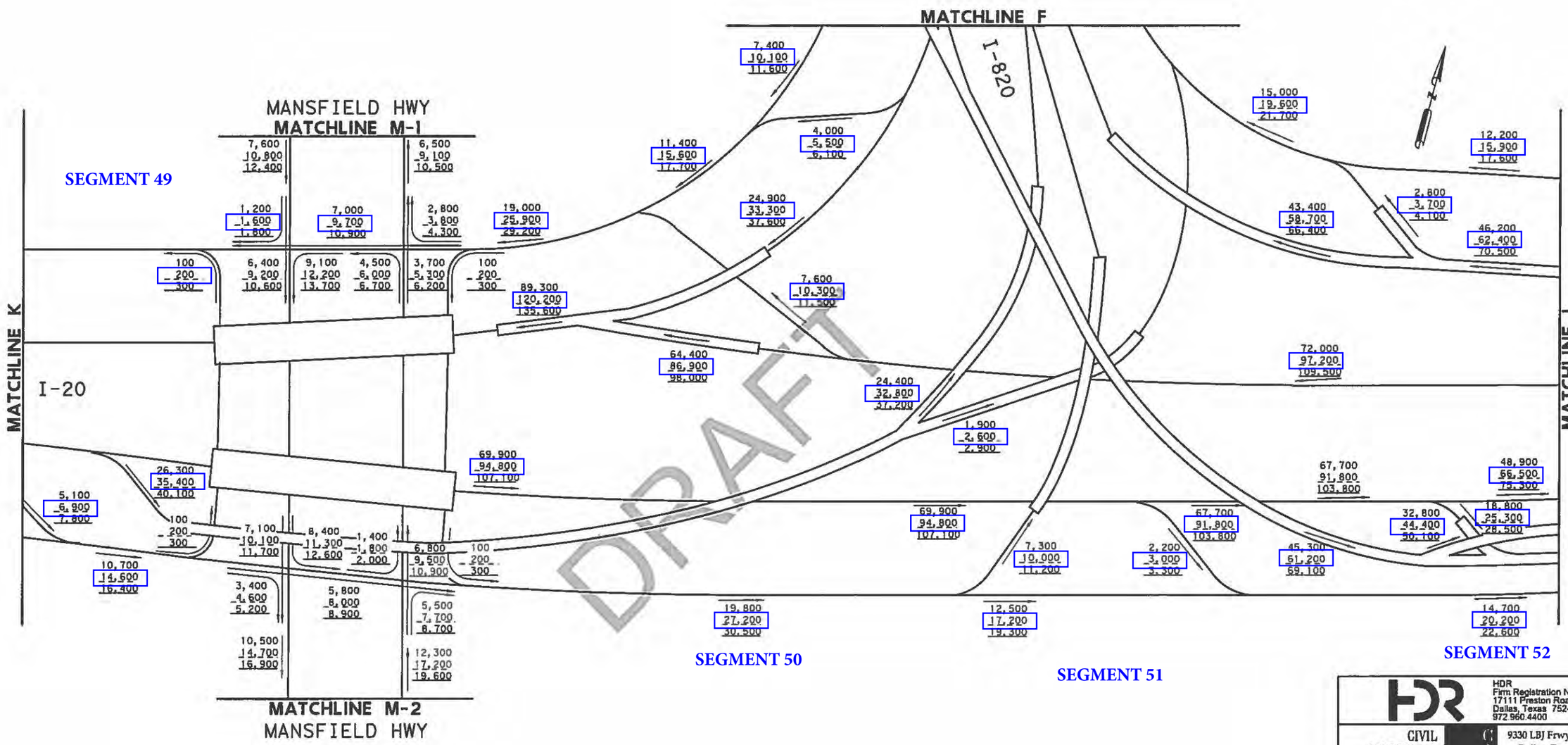
Serial Number 84704



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Serial Number 84704

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

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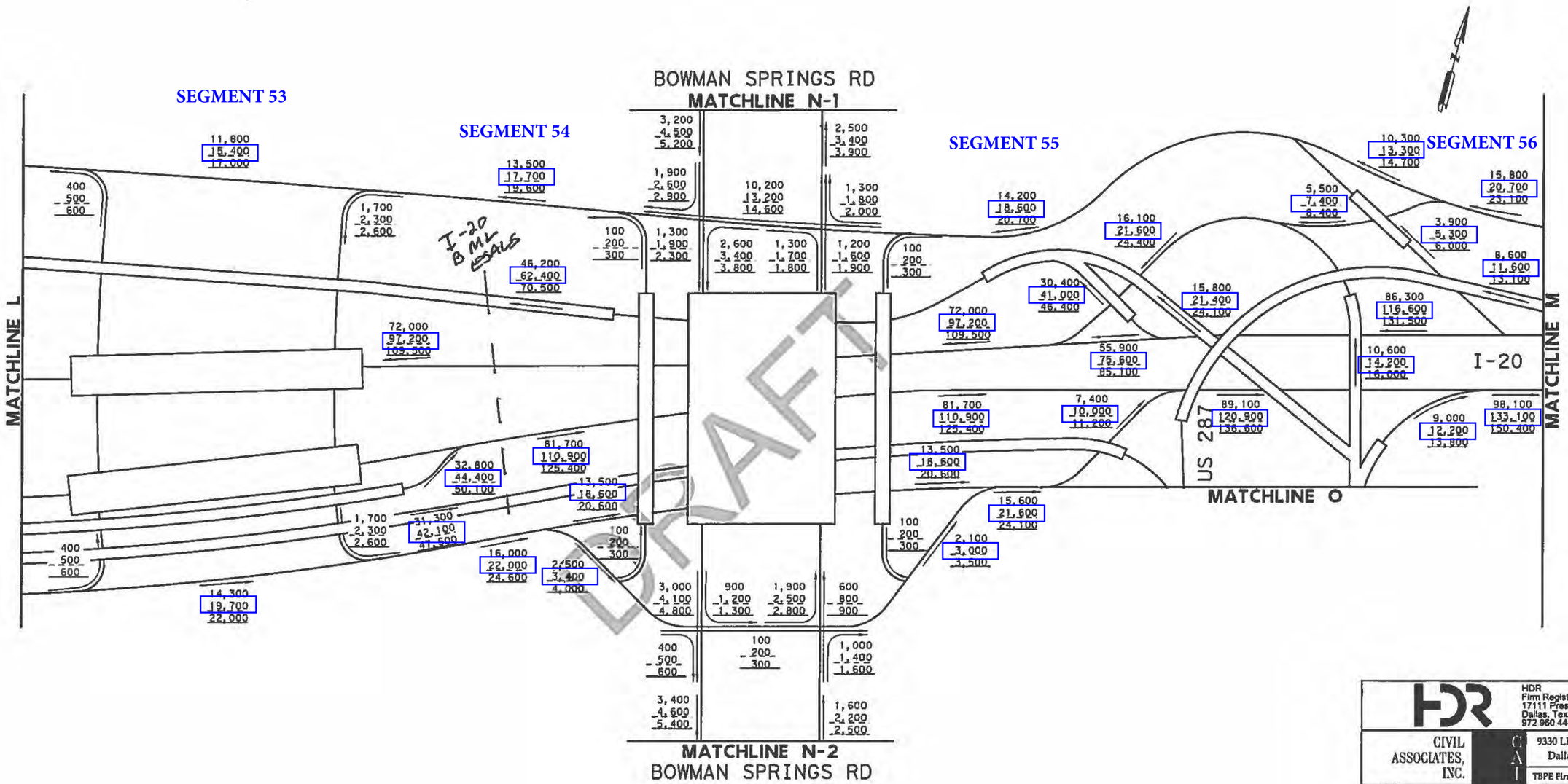
SOUTHEAST CONNECTOR PROJECT
I-20 - MANSFIELD HWY
TO I-820
BUILD VOLUMES

SHEET 08 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 20
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B8
CONTROL	SECTION	JOB	
0008	13	206	



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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Dallas, Texas 75248
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SOUTHEAST CONNECTOR PROJECT
I-20 - I-820 TO
US 287
BUILD VOLUMES

SHEET 09 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 20
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B9
CONTROL	SECTION	JOB	
2374	05	066	

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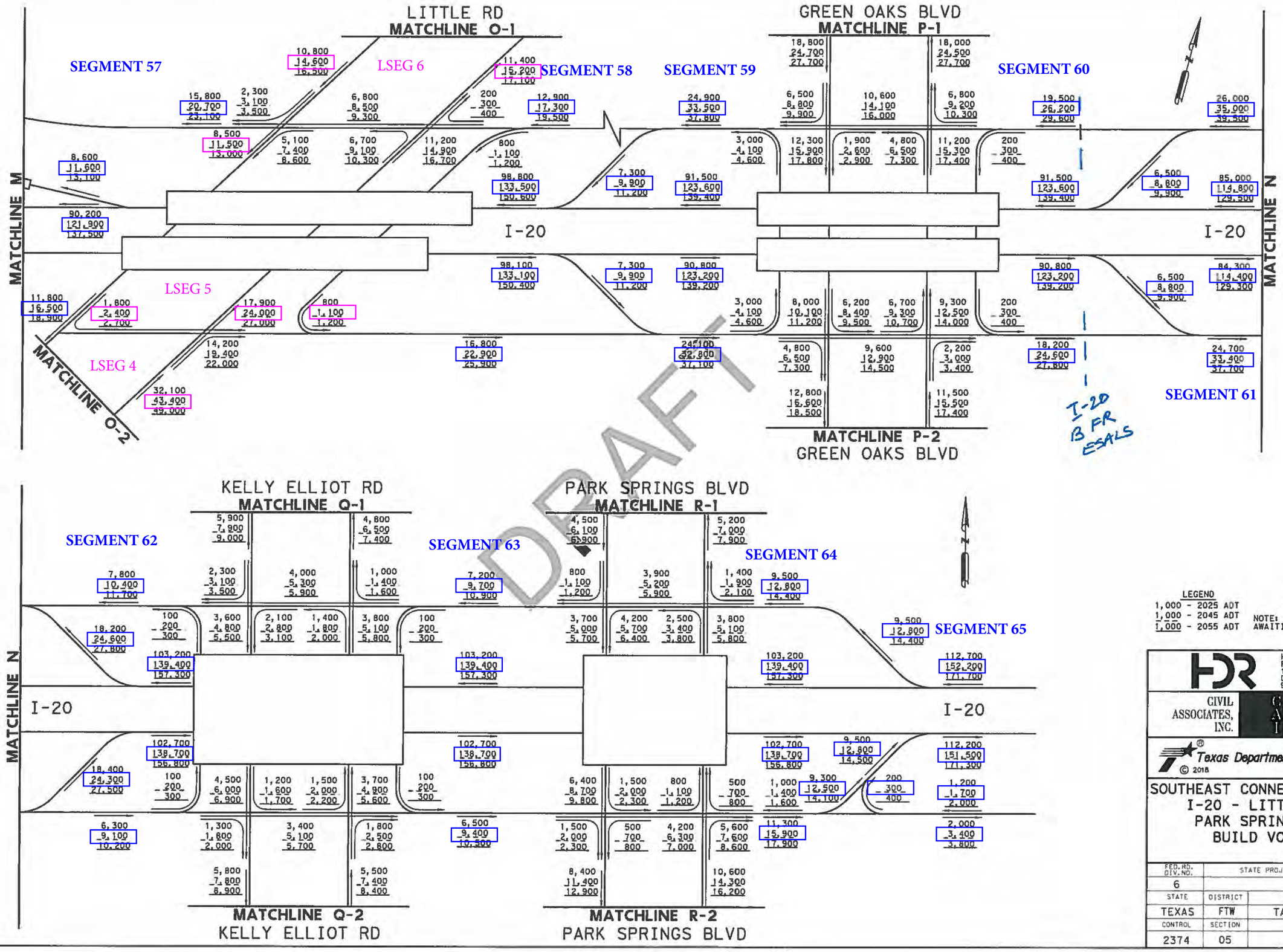
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

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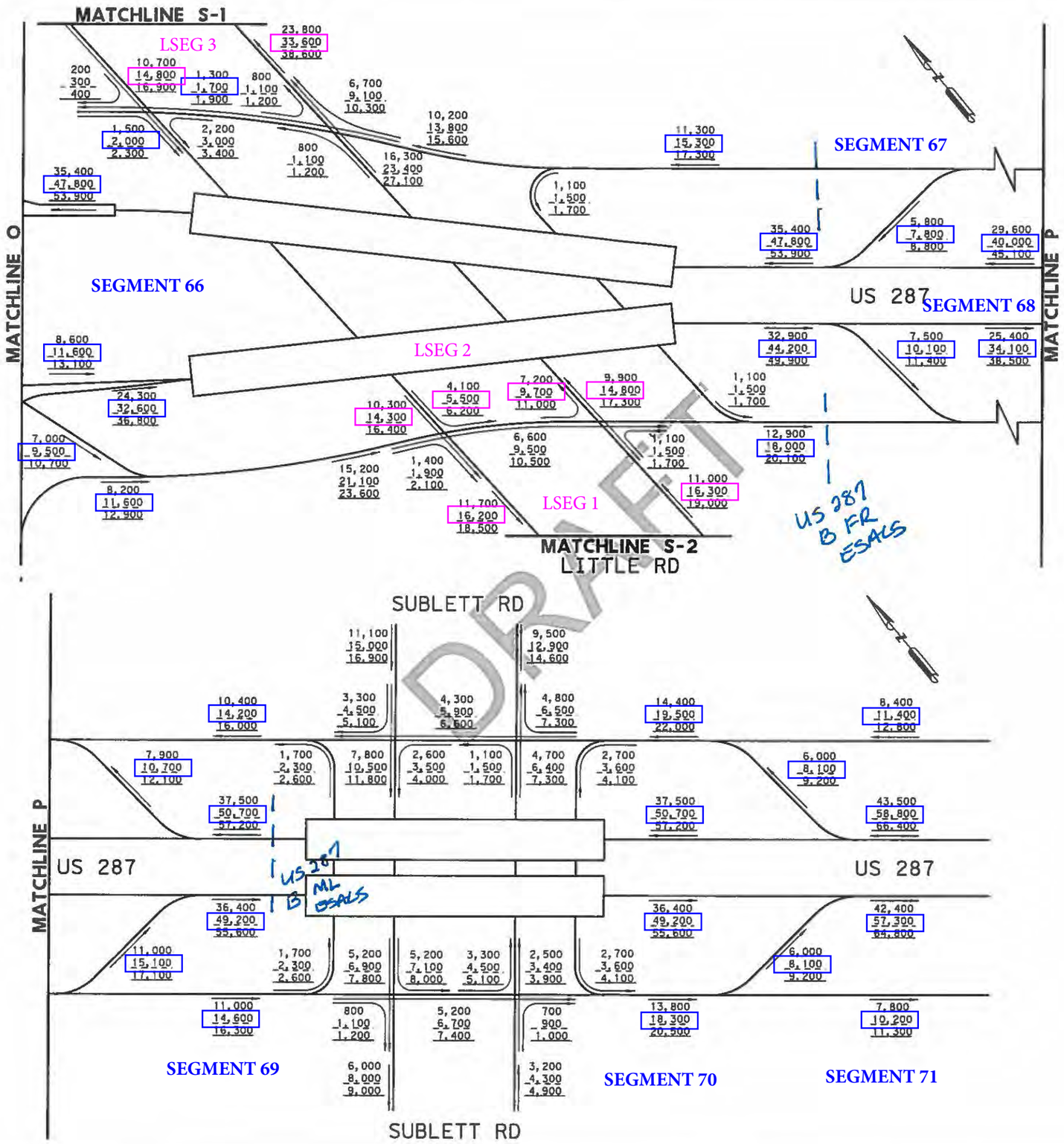
SOUTHEAST CONNECTOR PROJECT
I-20 - LITTLE RD TO
PARK SPRINGS BLVD
BUILD VOLUMES

SHEET 10 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 20
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B10
CONTROL	SECTION	JOB	
2374	05	066	

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
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SOUTHEAST CONNECTOR PROJECT
US 287 - FROM I-20
TO SUBLETT RD
BUILD VOLUMES

SHEET 11 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			US 287
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B11
CONTROL	SECTION	JOB	
0172	09	028	

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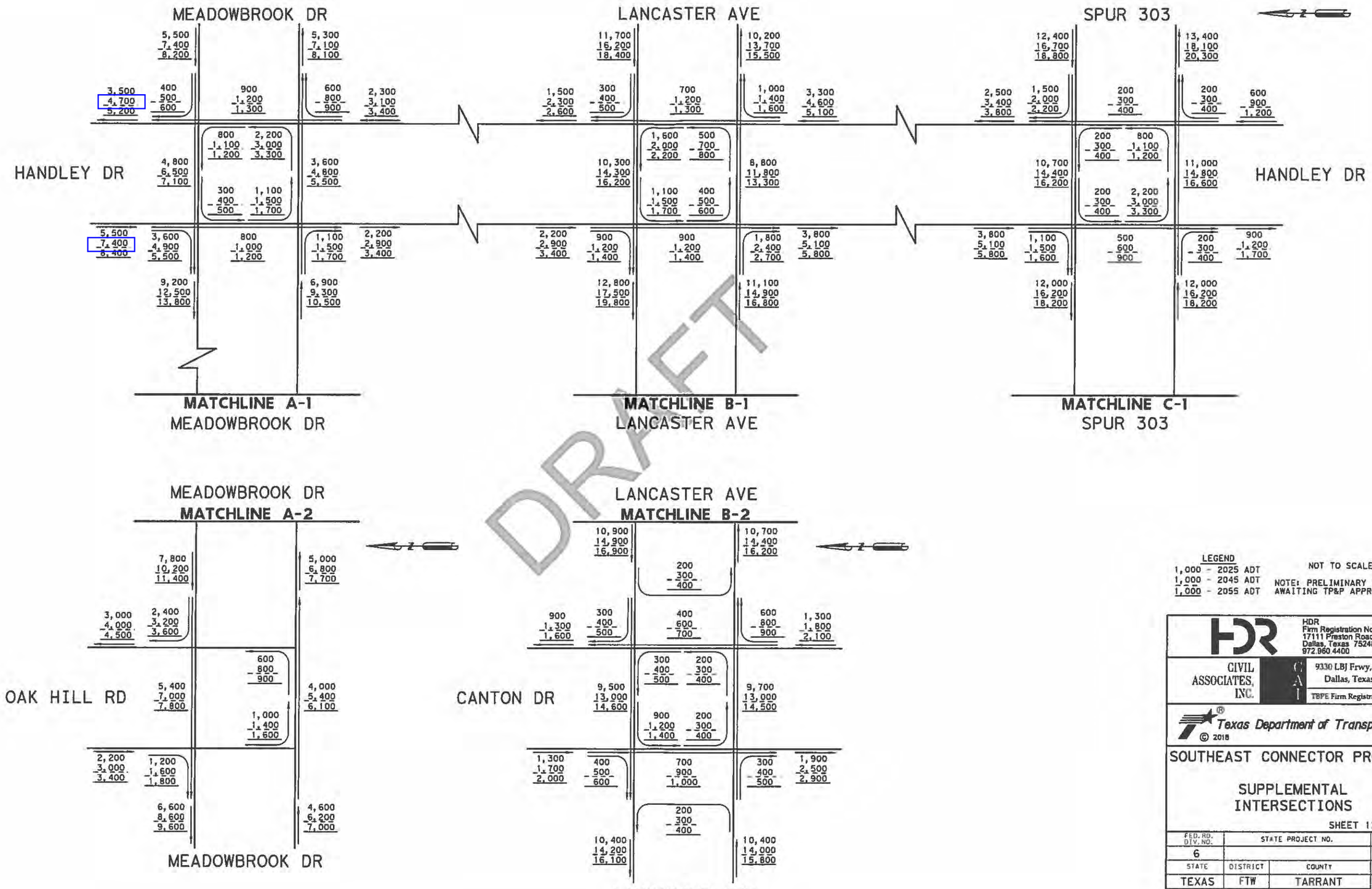
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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Firm Registration No. F-754
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Dallas, Texas 75248
972.960.4400

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SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 12 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B12
CONTROL	SECTION	JOB	
0008	13	125	

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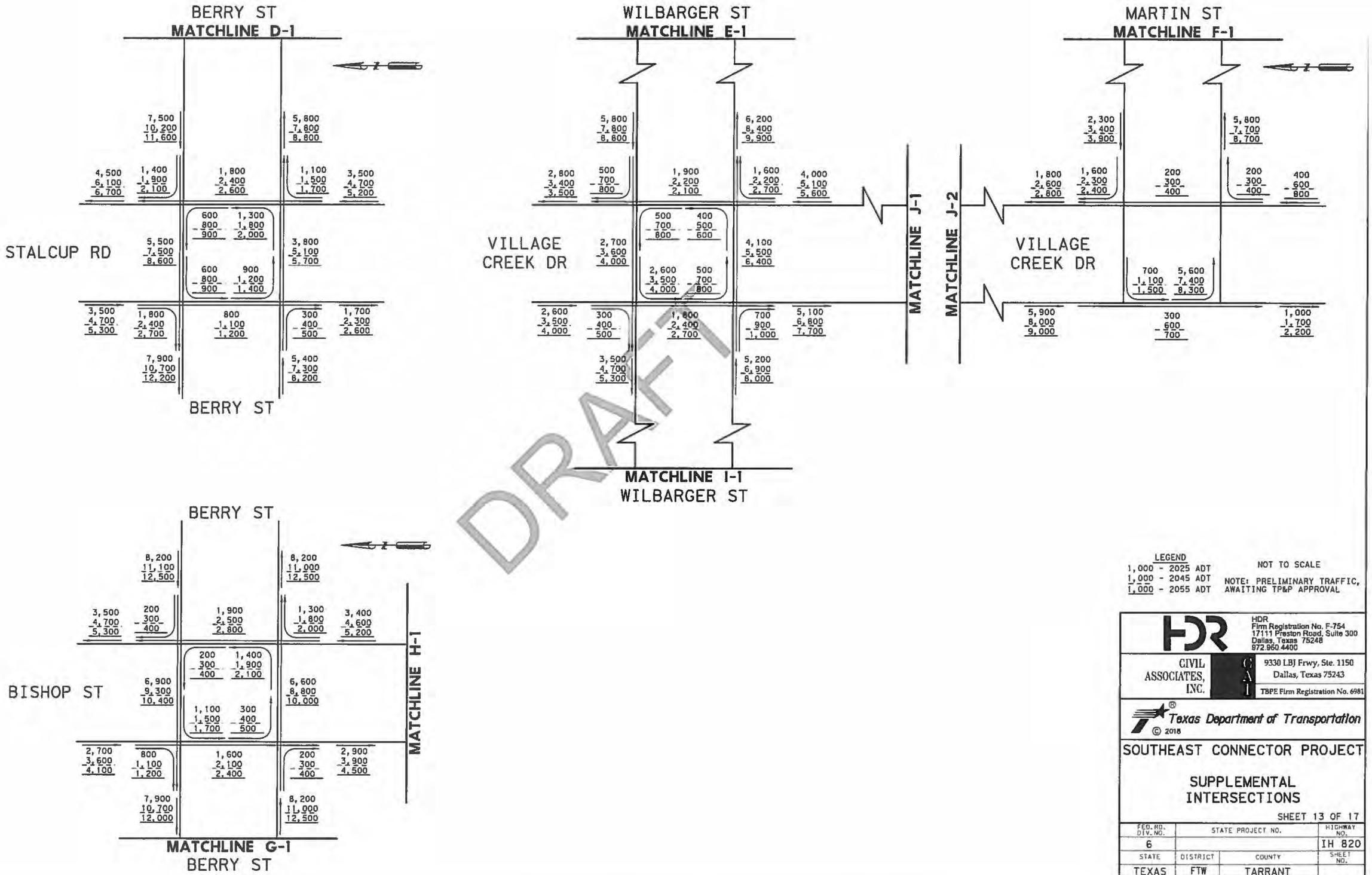
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number 84704



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
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SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 13 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B13
CONTROL	SECTION	JOB	
0008	13	125	

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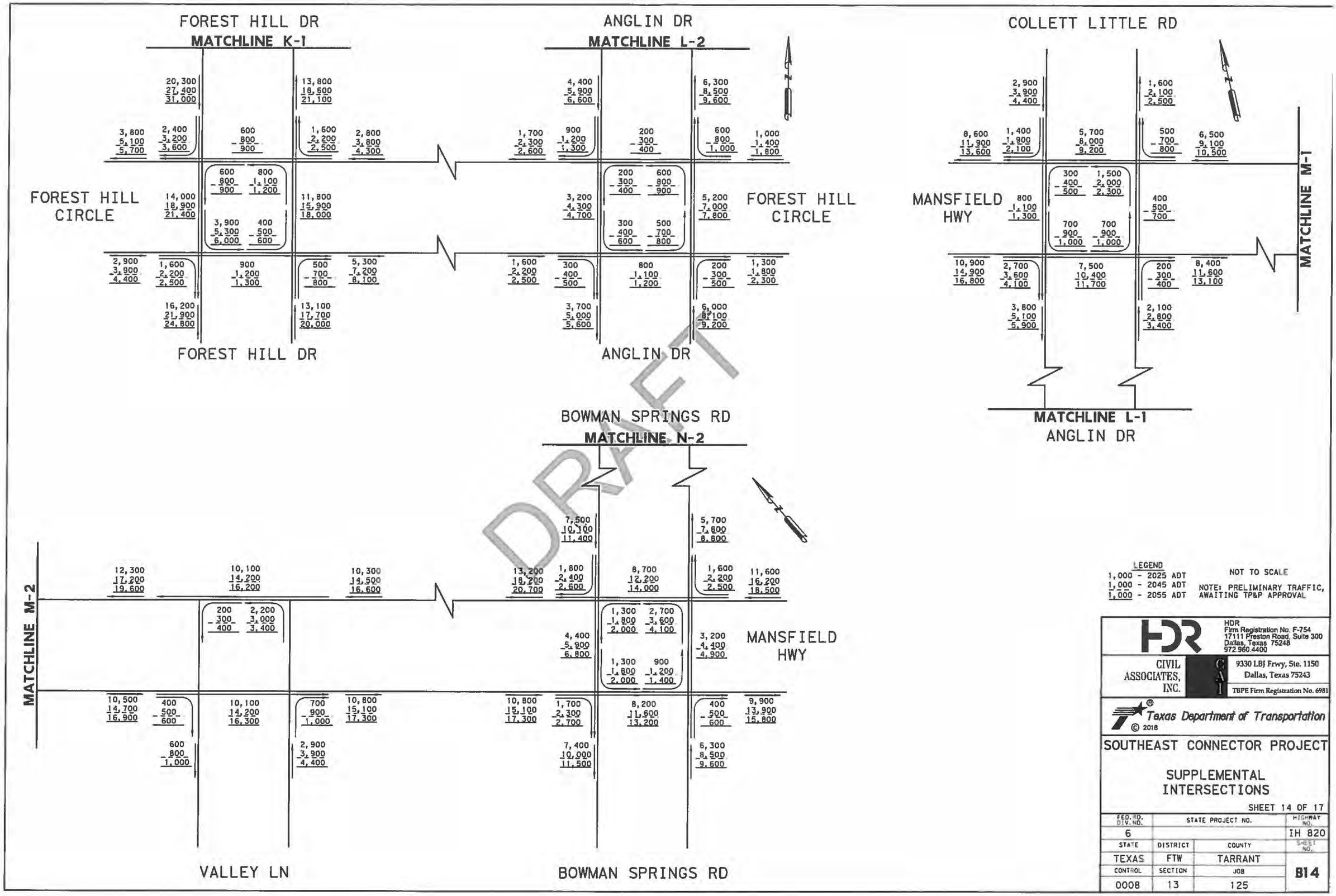
Serial Number 84704



LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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17111 Preston Road, Suite 300
Dallas, Texas 75248
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SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 14 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B14
CONTROL	SECTION	JOB	
0008	13	125	

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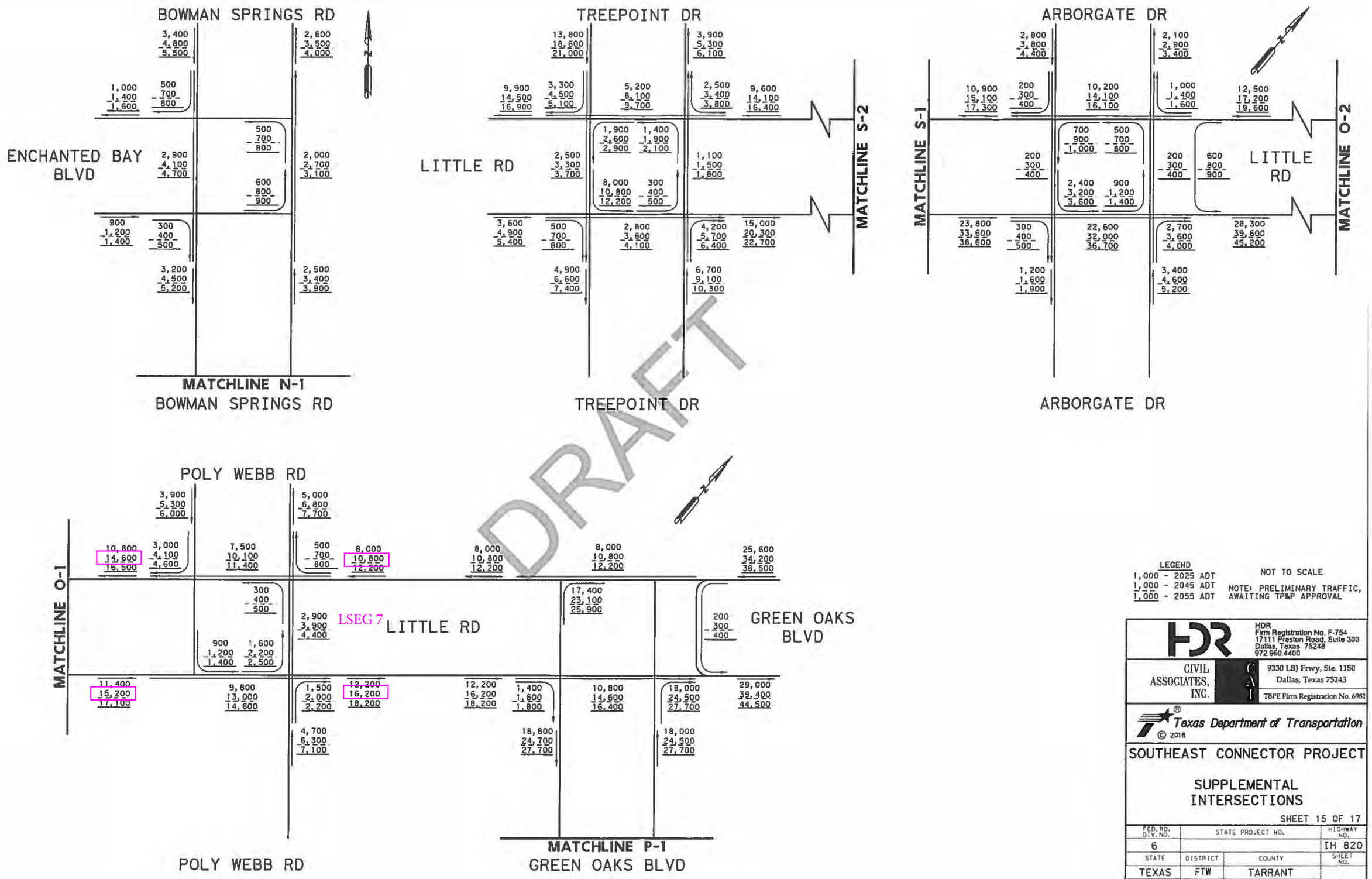
Serial Number 84704



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

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SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 15 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B15
CONTROL	SECTION	JOB	
0008	13	125	

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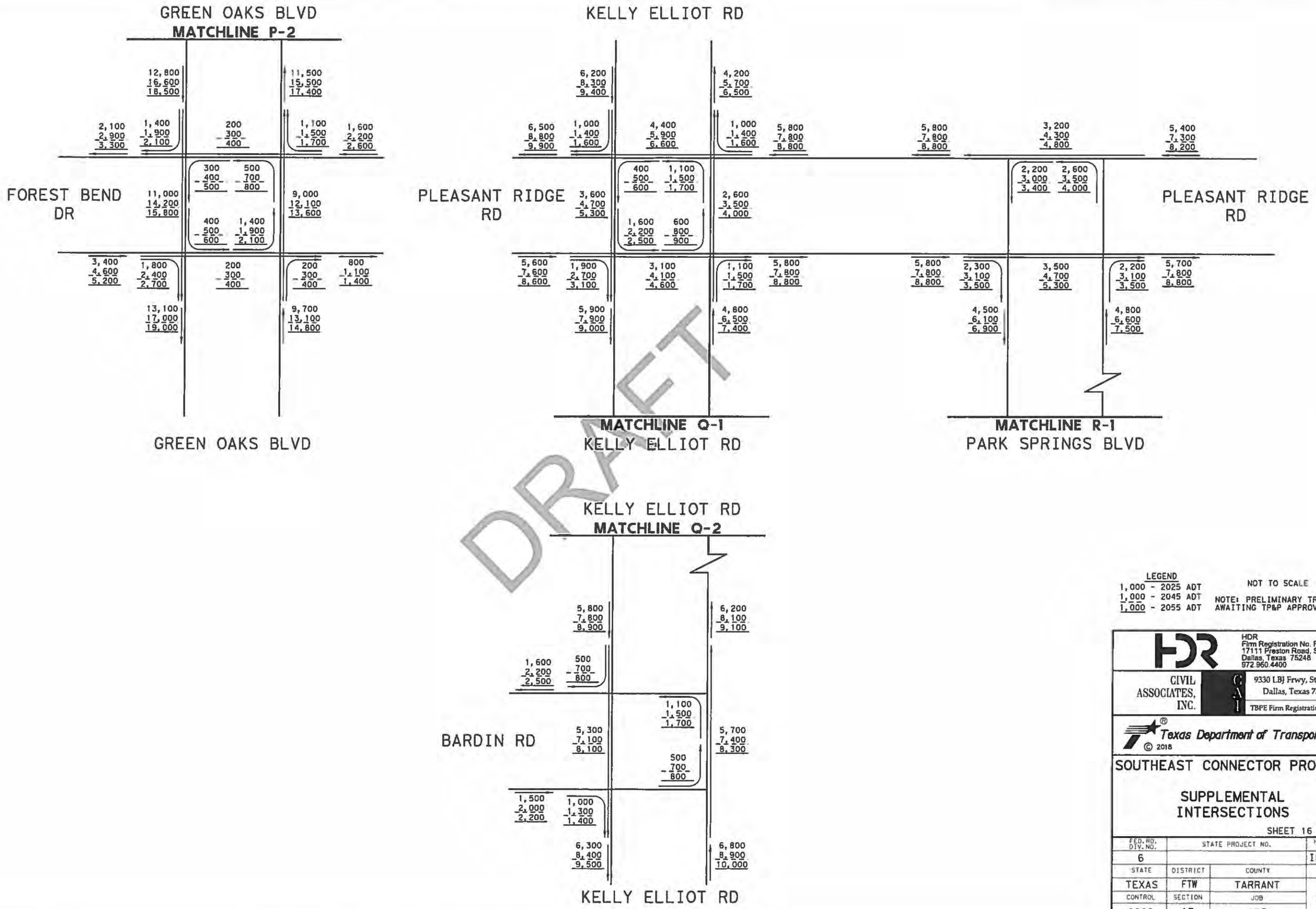
William Erick Knowles, P.E
Serial Number 84704



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

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SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 16 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B16
CONTROL	SECTION	JOB	
0008	13	125	

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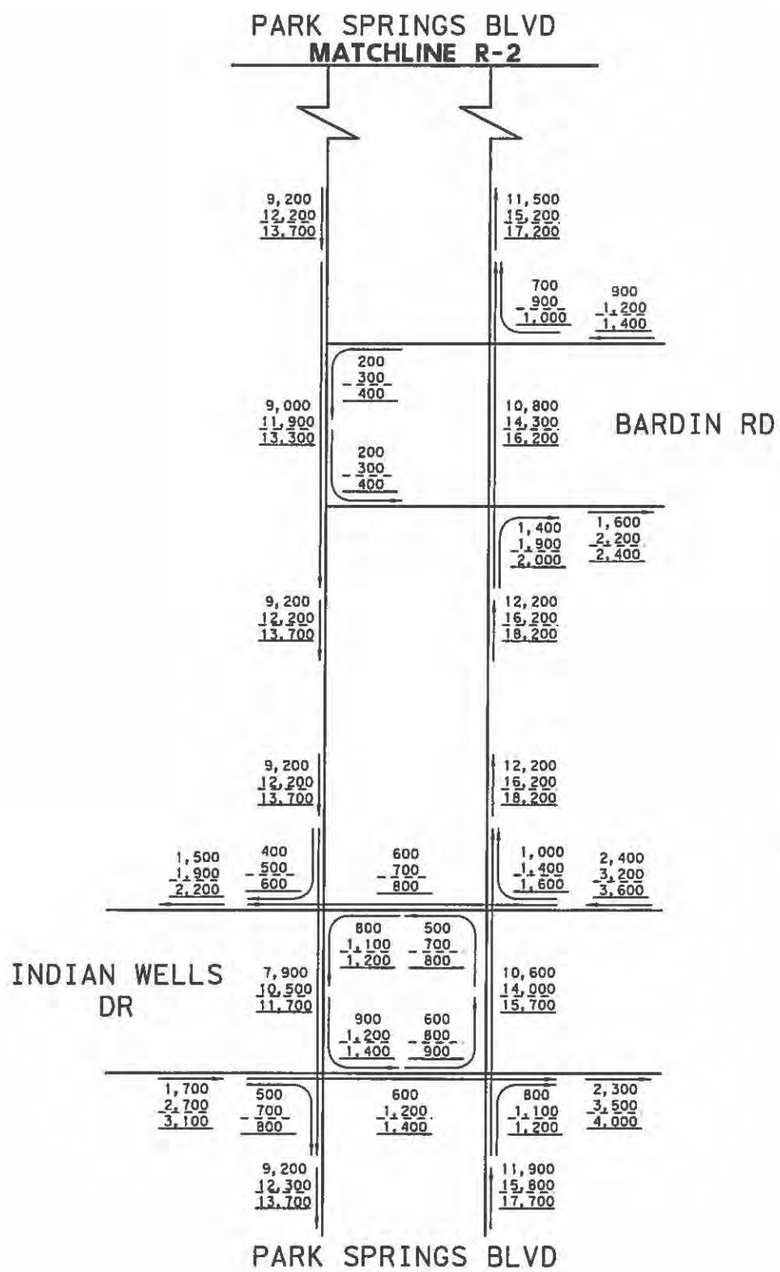
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number 84774



DRAFT

LEGEND
1,000 - 2025 ADT
1,000 - 2045 ADT
1,000 - 2055 ADT

NOT TO SCALE

NOTE: PRELIMINARY TRAFFIC, AWAITING TP&P APPROVAL

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

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SOUTHEAST CONNECTOR PROJECT

SUPPLEMENTAL INTERSECTIONS

SHEET 17 OF 17

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6			IH 820
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	B17
CONTROL	SECTION	JOB	
0008	13	125	

NOT INTENDED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 13, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (No Build-Mainlanes Only) Section 1 From I-20 To US 287 Tarrant County	163,900	221,200	52 - 48	9.9	5.3	2.4	13,100	20	30,563,000	3	39,861,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	94.7	97.6
Medium Duty	2.2	1.0
Heavy Duty	3.1	1.4

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (No Build-Mainlanes Only) Section 1 From I-20 To US 287 Tarrant County	163,900	249,800	52 - 48	9.9	5.3	2.4	13,100	20	49,249,000	3	64,232,000	8"

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BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 13, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (No Build-Mainlanes Only) Section 2 From US 287 To Brentwood Stair Rd. Tarrant County	129,900	175,400	52 - 48	9.9	5.8	2.6	13,000	20	26,482,000	3	34,559,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	94.2	97.4
Medium Duty	2.4	1.1
Heavy Duty	3.4	1.5

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (No Build-Mainlanes Only) Section 2 From US 287 To Brentwood Stair Rd. Tarrant County	129,900	198,000	52 - 48	9.9	5.8	2.6	13,000	20	42,662,000	3	55,675,000	8"

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BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 94764

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 13, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (No Build-Frontage Roads Only) From I-20 To Brentwood Stair Rd. Tarrant County	18,700	25,400	52 - 48	9.9	10.7	8.0	12,000	40	7,717,000	3	10,103,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	89.3	92.0
Medium Duty	3.2	2.4
Heavy Duty	7.5	5.6

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (No Build-Frontage Roads Only) From I-20 To Brentwood Stair Rd. Tarrant County	18,700	28,600	52 - 48	9.9	10.7	8.0	12,000	30	12,416,000	3	16,256,000	8"

OT INTENDED FOR CONSTRUCTIO
DDING OR PERMIT PURPOSES
Villiam Erick Knowles, P.E
Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 14, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Mainlanes Only) Section 1 From I-20/I-820 Interchange To US 287 Tarrant County	246,200	332,500	53 - 47	7.2	7.9	3.6	13,700	20	76,963,000	3	105,102,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	92.1	96.4
Medium Duty	2.3	1.0
Heavy Duty	5.6	2.6

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Mainlanes Only) Section 1 From I-20/I-820 Interchange To US 287 Tarrant County	246,200	375,200	53 - 47	7.2	7.9	3.6	13,700	20	123,966,000	3	169,290,000	8"

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number: 94704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 14, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Mainlanes Only) Section 2 From US 287 To Park Springs Blvd. Tarrant County	218,900	295,700	53 - 47	7.2	8.3	3.7	13,600	20	71,870,000	3	98,168,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	91.7	96.3
Medium Duty	2.4	1.1
Heavy Duty	5.9	2.6

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Mainlanes Only) Section 2 From US 287 To Park Springs Blvd. Tarrant County	218,900	333,800	53 - 47	7.2	8.3	3.7	13,700	20	115,794,000	3	158,164,000	8"

NOT INTENDED FOR CONSTRUCTIO
BIDDING OR PERMIT PURPOSE
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Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 14, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Frontage Roads Only)												
Section 1												
From I-20/I-820 Interchange To US 287	17,400	23,400	53 - 47	7.2	1.2	0.9	10,100	30	504,000	3	523,000	8"
Tarrant County												

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	98.8	99.1
Medium Duty	1.0	0.8
Heavy Duty	0.2	0.1

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Frontage Roads Only)												
Section 1												
From I-20/I-820 Interchange To US 287	17,400	26,100	53 - 47	7.2	1.2	0.9	10,200	30	807,000	3	836,000	8"
Tarrant County												

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TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Frontage Roads Only) Section 2 From US 287 To Park Springs Blvd. Tarrant County	28,400	38,600	53 - 47	7.2	1.1	0.8	10,400	30	766,000	3	791,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	98.9	99.2
Medium Duty	0.9	0.7
Heavy Duty	0.2	0.1

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Frontage Roads Only) Section 2 From US 287 To Park Springs Blvd. Tarrant County	28,400	43,600	53 - 47	7.2	1.1	0.8	10,500	30	1,234,000	3	1,276,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Mainlanes Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	206,500	278,700	53 - 47	7.2	8.6	3.9	13,600	20	70,194,000	3	95,892,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	91.4	96.1
Medium Duty	2.5	1.1
Heavy Duty	6.1	2.8

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Mainlanes Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	206,500	314,400	53 - 47	7.2	8.6	3.9	13,700	20	113,043,000	3	154,429,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Frontage Roads Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	18,400	24,900	53 - 47	7.2	1.2	0.9	10,200	30	535,000	3	555,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	98.8	99.1
Medium Duty	1.0	0.8
Heavy Duty	0.2	0.1

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (No Build-Frontage Roads Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	18,400	27,900	53 - 47	7.2	1.2	0.9	10,200	30	859,000	3	890,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Mainlanes Only) From I-820 To Bishop Street Tarrant County	77,600	104,800	54 - 46	9.7	7.1	4.3	12,700	30	21,187,000	3	28,914,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	92.9	95.7
Medium Duty	2.2	1.3
Heavy Duty	4.9	3.0

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Mainlanes Only) From I-820 To Bishop Street Tarrant County	77,600	118,400	54 - 46	9.7	7.1	4.3	12,800	30	34,150,000	3	46,606,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Frontage Roads Only) From I-820 To Bishop Street Tarrant County	12,200	16,600	54 - 46	9.7	6.6	5.0	11,100	40	2,415,000	3	3,013,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	93.4	95.0
Medium Duty	2.0	1.5
Heavy Duty	4.6	3.5

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Frontage Roads Only) From I-820 To Bishop Street Tarrant County	12,200	18,800	54 - 46	9.7	6.6	5.0	11,200	40	3,900,000	3	4,864,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Mainlanes Only) From I-20 To Sublett Road Tarrant County	73,900	99,900	54 - 46	9.7	10.0	6.0	12,900	40	31,374,000	3	44,291,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	90.0	94.0
Medium Duty	2.3	1.4
Heavy Duty	7.7	4.6

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Mainlanes Only) From I-20 To Sublett Road Tarrant County	73,900	112,800	54 - 46	9.7	10.0	6.0	12,900	40	50,557,000	3	71,371,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Frontage Roads Only) From I-20 To Sublett Road Tarrant County	20,200	27,400	54 - 46	9.7	5.4	4.1	11,400	40	3,671,000	3	4,787,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	94.6	95.9
Medium Duty	1.2	0.9
Heavy Duty	4.2	3.2

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (No Build-Frontage Roads Only) From I-20 To Sublett Road Tarrant County	20,200	30,800	54 - 46	9.7	5.4	4.1	11,500	40	5,900,000	3	7,694,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (Build-Mainlanes Only) Section 1 From I-20 To US 287 Tarrant County	145,300	196,100	52 - 48	9.9	5.5	2.5	13,000	20	28,102,000	3	36,661,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	94.5	97.5
Medium Duty	2.3	1.0
Heavy Duty	3.2	1.5

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (Build-Mainlanes Only) Section 1 From I-20 To US 287 Tarrant County	145,300	221,500	52 - 48	9.9	5.5	2.5	13,000	20	45,289,000	3	59,083,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (Build-Mainlanes Only) Section 2 From US 287 To Brentwood Stair Rd. Tarrant County	110,500	149,200	52 - 48	9.9	6.2	2.8	12,900	30	24,060,000	3	31,412,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	93.8	97.2
Medium Duty	2.5	1.1
Heavy Duty	3.7	1.7

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (Build-Mainlanes Only) Section 2 From US 287 To Brentwood Stair Rd. Tarrant County	110,500	168,400	52 - 48	9.9	6.2	2.8	13,000	20	38,760,000	3	50,604,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (Build-Frontage Roads Only) From I-20 To Brentwood Stair Rd. Tarrant County	31,200	41,600	52 - 48	9.9	10.1	7.6	12,300	30	12,030,000	3	15,747,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	89.9	92.4
Medium Duty	3.0	2.3
Heavy Duty	7.1	5.3

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-820 (Build-Frontage Roads Only) From I-20 To Brentwood Stair Rd. Tarrant County	31,200	46,700	52 - 48	9.9	10.1	7.6	12,300	30	19,308,000	3	25,275,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (Build-Mainlanes Only)												
From I-20/I-820 Interchange To Park Springs Blvd. Tarrant County	231,200	312,600	53 - 47	7.2	8.1	3.6	13,600	20	74,132,000	3	101,247,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	91.9	96.4
Medium Duty	2.4	1.1
Heavy Duty	5.7	2.5

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (Build-Mainlanes Only)												
From I-20/I-820 Interchange To Park Springs Blvd. Tarrant County	231,200	352,900	53 - 47	7.2	8.1	3.6	13,700	20	119,449,000	3	163,138,000	8"

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I-20 (Build-Frontage Roads Only)												
From I-20/I-820 Interchange To Park Springs Blvd. Tarrant County	37,700	50,800	53 - 47	7.2	1.1	0.8	10,700	20	1,011,000	3	1,045,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	98.9	99.2
Medium Duty	0.9	0.7
Heavy Duty	0.2	0.1

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (Build-Frontage Roads Only)												
From I-20/I-820 Interchange To Park Springs Blvd. Tarrant County	37,700	57,400	53 - 47	7.2	1.1	0.8	10,800	20	1,630,000	3	1,685,000	8"

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I-20 (Build-Mainlanes Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	202,100	272,700	53 - 47	7.2	8.7	3.9	13,600	20	69,485,000	3	94,928,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	91.3	96.1
Medium Duty	2.5	1.1
Heavy Duty	6.2	2.8

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (Build-Mainlanes Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	202,100	307,800	53 - 47	7.2	8.7	3.9	13,600	20	111,924,000	3	152,907,000	8"

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I-20 (Build-Frontage Roads Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	20,500	28,300	53 - 47	7.2	1.2	0.9	10,200	30	603,000	3	625,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	98.8	99.1
Medium Duty	1.0	0.8
Heavy Duty	0.2	0.1

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-20 (Build-Frontage Roads Only) From I-20/I-820 Interchange To Forest Hill Drive Tarrant County	20,500	31,900	53 - 47	7.2	1.2	0.9	10,300	30	972,000	3	1,007,000	8"

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US 287 (Build-Mainlanes Only) From I-820 To Bishop Street Tarrant County	74,100	100,100	54 - 46	9.7	7.2	4.3	12,700	30	20,515,000	3	28,000,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	92.8	95.7
Medium Duty	2.2	1.3
Heavy Duty	5.0	3.0

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (Build-Mainlanes Only) From I-820 To Bishop Street Tarrant County	74,100	113,000	54 - 46	9.7	7.2	4.3	12,800	30	33,053,000	3	45,112,000	8"

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Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (Build-Frontage Roads Only) From I-820 To Bishop Street Tarrant County	14,800	19,900	54 - 46	9.7	6.1	4.6	11,200	40	2,693,000	3	3,357,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	93.9	95.4
Medium Duty	1.9	1.4
Heavy Duty	4.2	3.2

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (Build-Frontage Roads Only) From I-820 To Bishop Street Tarrant County	14,800	22,400	54 - 46	9.7	6.1	4.6	11,200	50	4,951,000	3	6,746,000	8"

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 14, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (Build-Mainlanes Only) From I-20 To Sublett Road Tarrant County	73,900	99,900	54 - 46	9.7	10.0	6.0	12,900	40	31,374,000	3	44,291,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	90.0	94.0
Medium Duty	2.3	1.4
Heavy Duty	7.7	4.6

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (Build-Mainlanes Only) From I-20 To Sublett Road Tarrant County	73,900	112,800	54 - 46	9.7	10.0	6.0	12,900	40	50,557,000	3	71,371,000	8"

'OT INTENDED FOR CONSTRUCTIO
'IDDING OR PERMIT PURPOSES
'illiam Erick Knowles, P.E
Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Fort Worth District

August 14, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (Build-Frontage Roads Only) From I-20 To Sublett Road Tarrant County	24,200	33,300	54 - 46	9.7	4.5	3.4	11,400	40	3,707,000	3	4,826,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	95.5	96.6
Medium Duty	1.0	0.8
Heavy Duty	3.5	2.6

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
US 287 (Build-Frontage Roads Only) From I-20 To Sublett Road Tarrant County	24,200	37,400	54 - 46	9.7	4.5	3.4	11,500	40	5,956,000	3	7,756,000	8"

OT INTENDED FOR CONSTRUCTION
'NDING OR PERMIT PURPOSES
'illiam Erick Knowles, P.E
Serial Number 84704

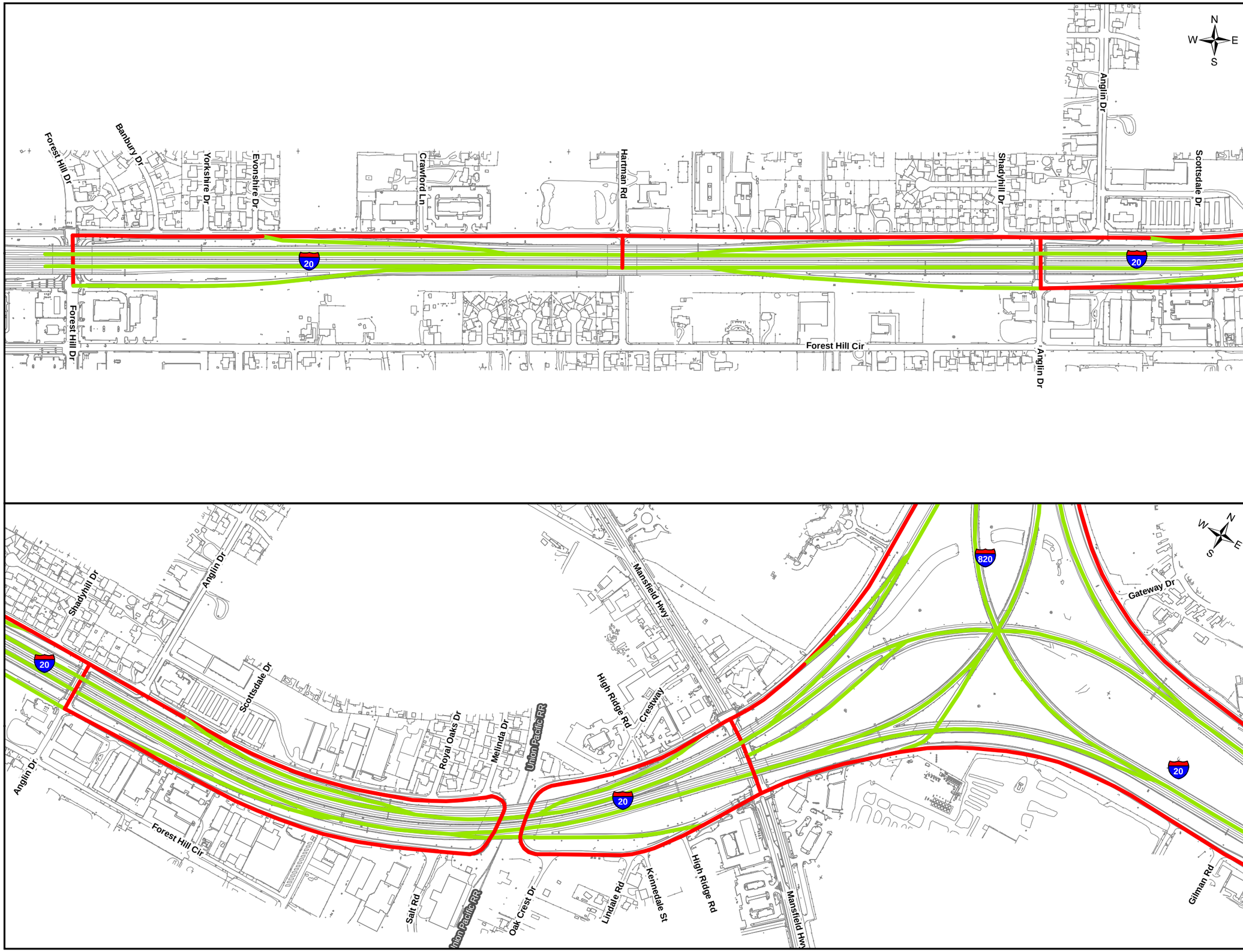
Appendix B:
Affected Transportation Corridor Maps

MSAT 2018 EXISTING AND 2045 NO BUILD ALTERNATIVES AFFECTED TRANSPORTATION CORRIDORS

SOUTHEAST CONNECTOR

I-20/I-820/US 287 Interchanges
I-20 from Forest Hill Drive to
Park Springs Boulevard
I-820 from I-20 to
Brentwood Stair Road
US 287 from Bishop Street
to Sublett Road

CSJ: 0008-13-125, ect.



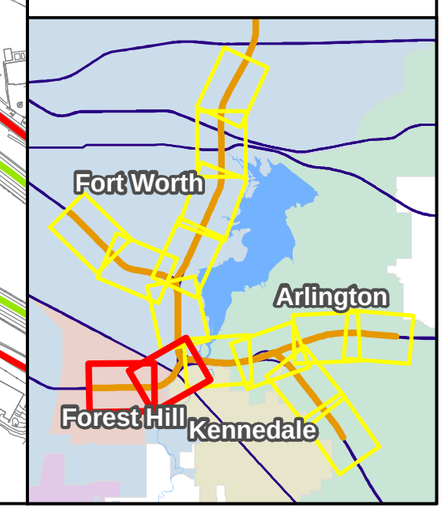
LEGEND

Uncontrolled Access Roadway

Controlled Access Roadway

0 250 500 Feet

Page 1 of 8



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SOUTHEAST CONNECTOR

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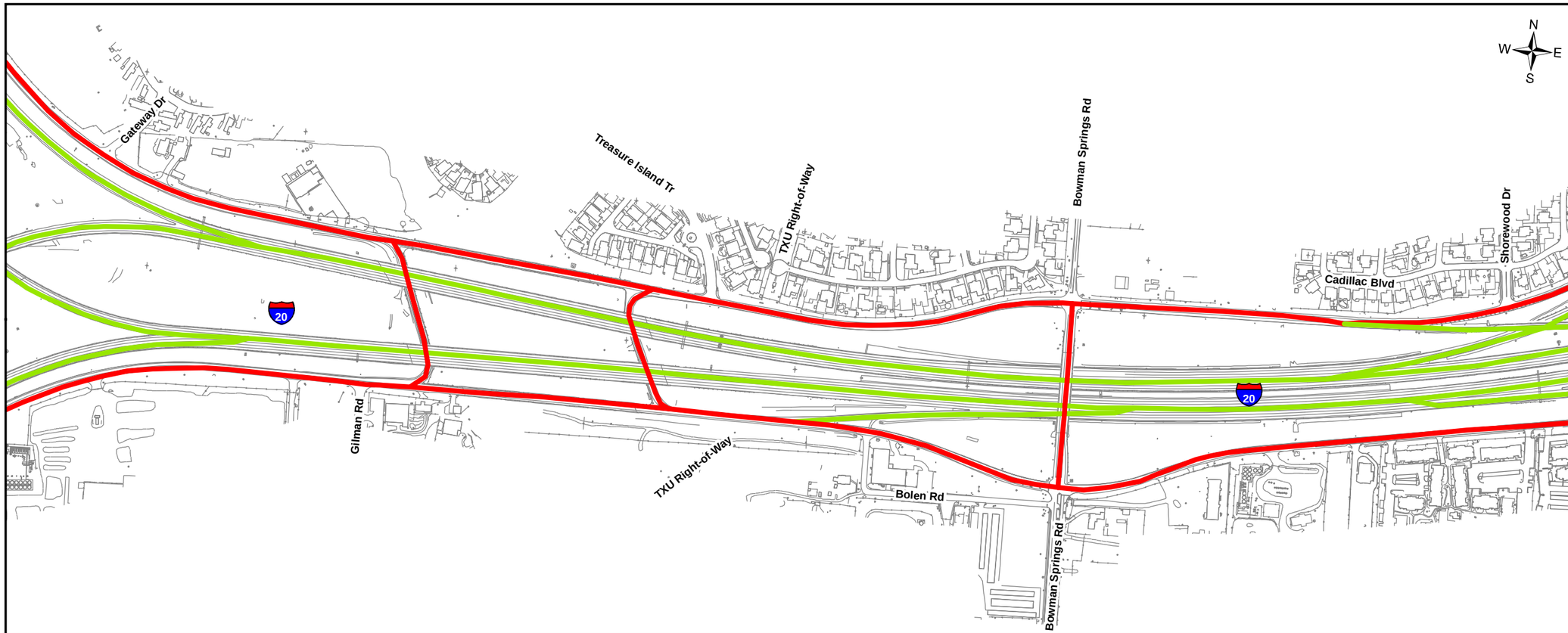
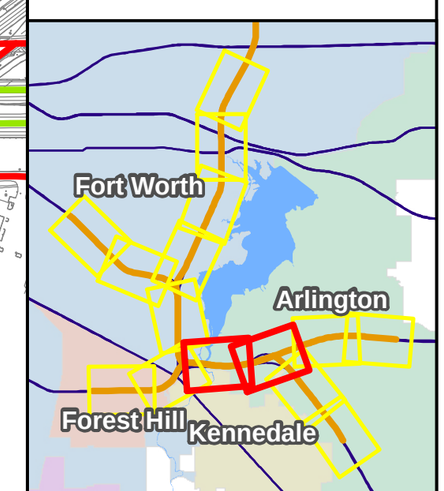
LEGEND

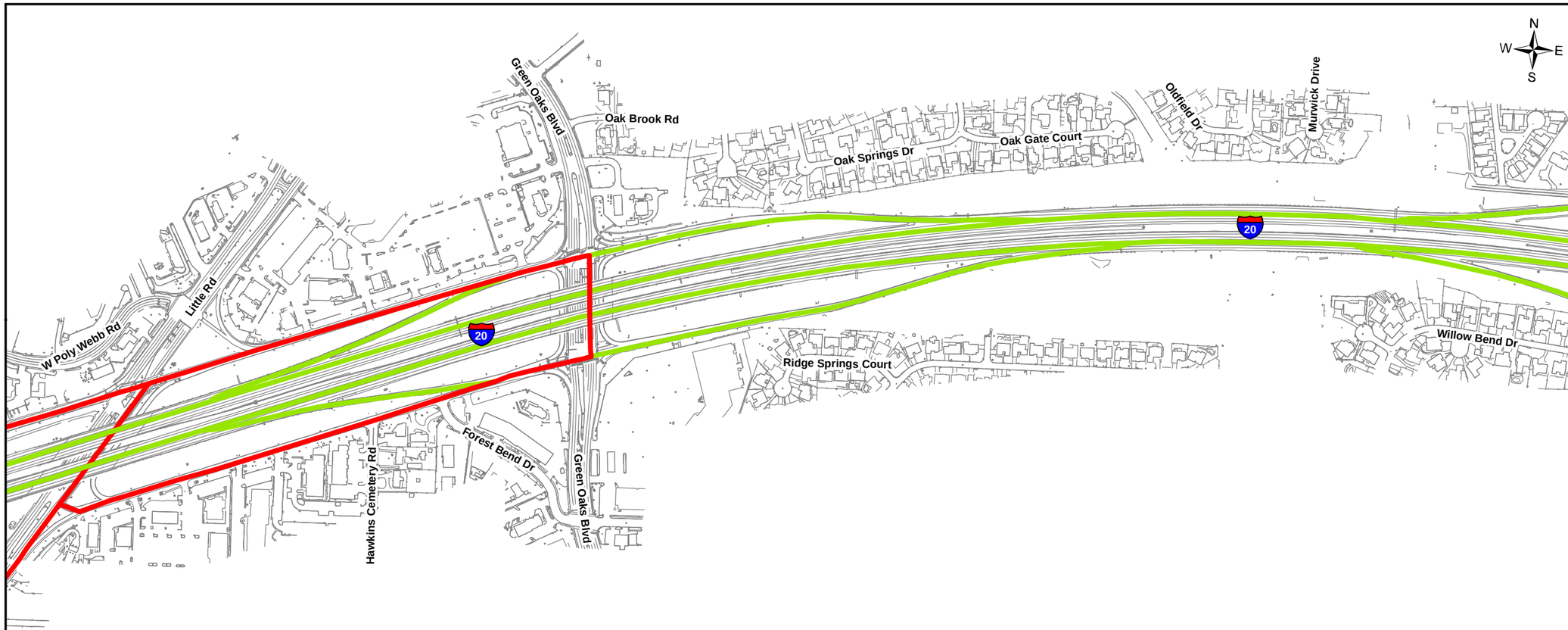
Uncontrolled Access Roadway

Controlled Access Roadway

0 250 500 Feet







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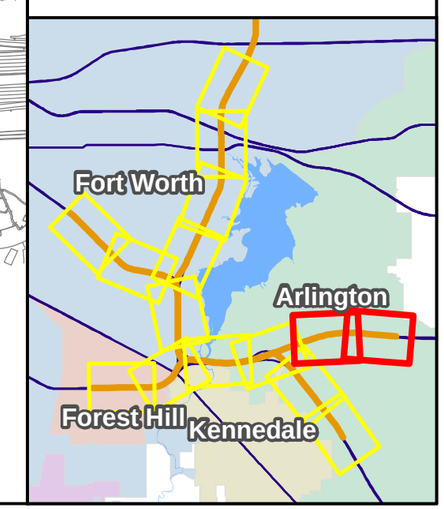

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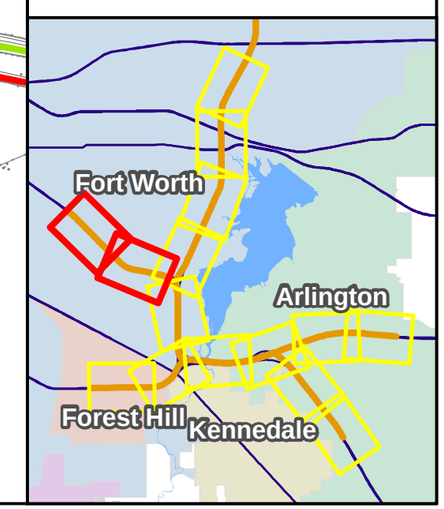

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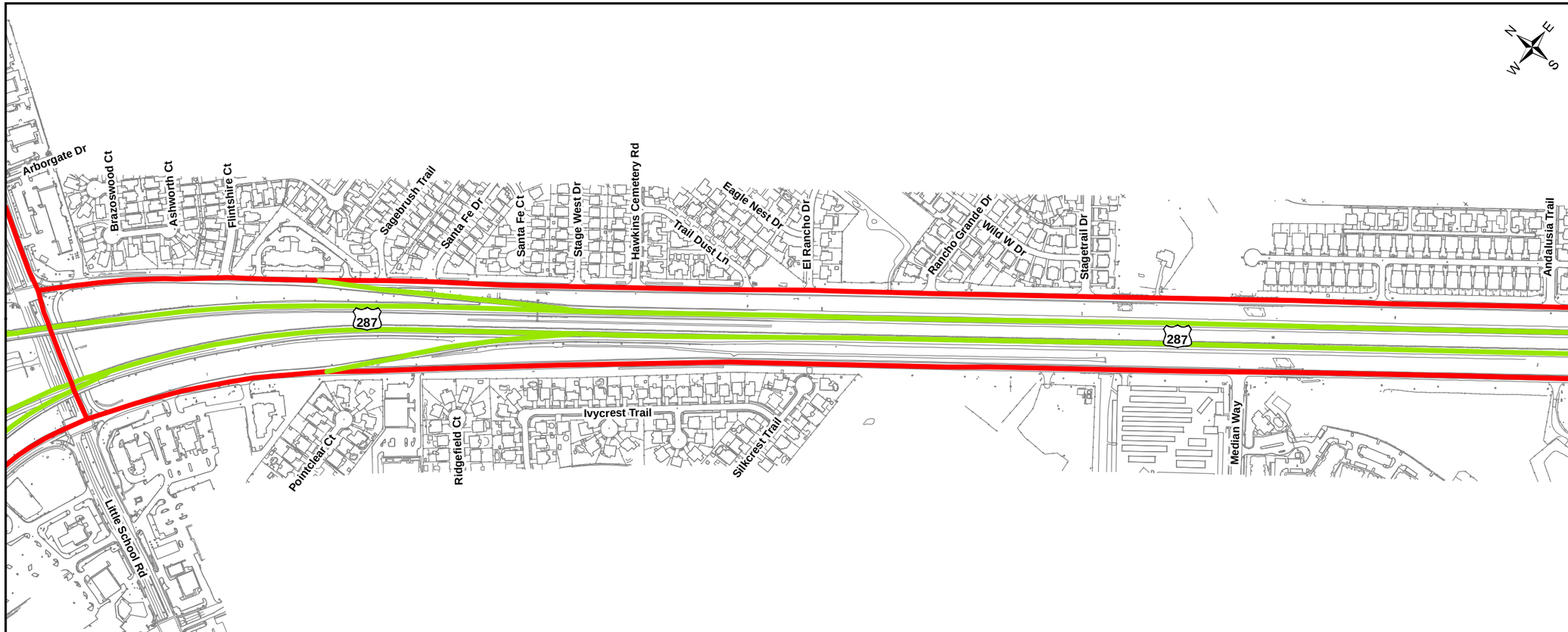

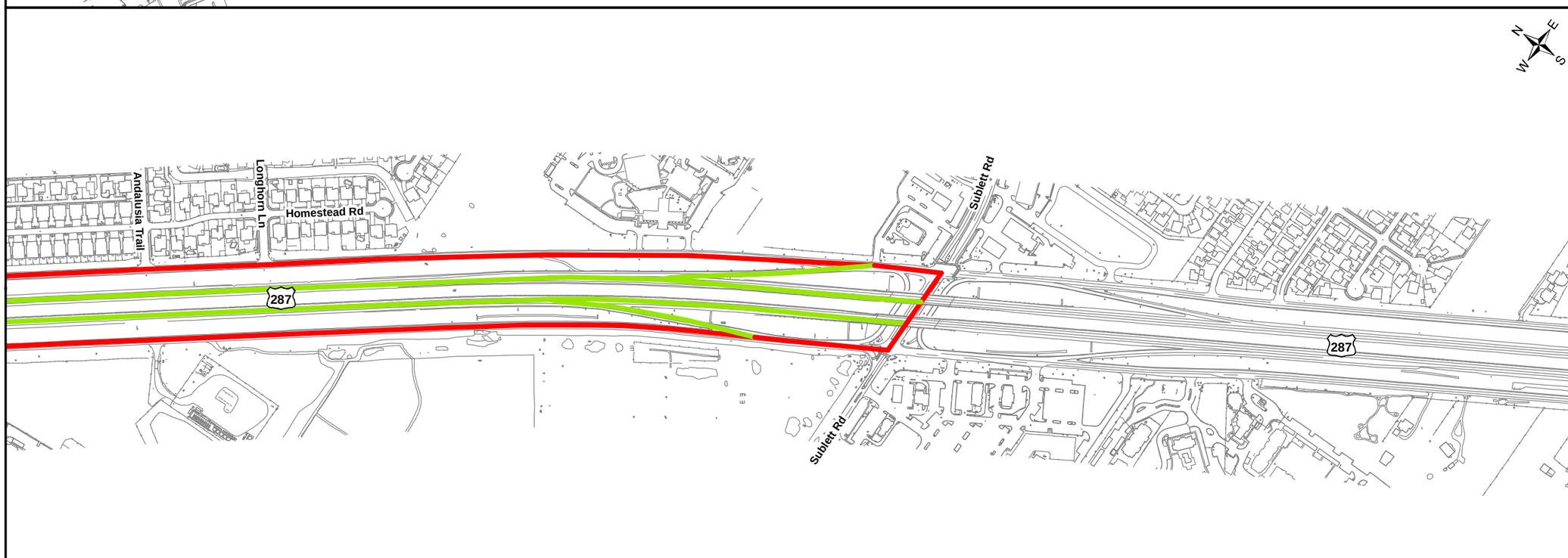

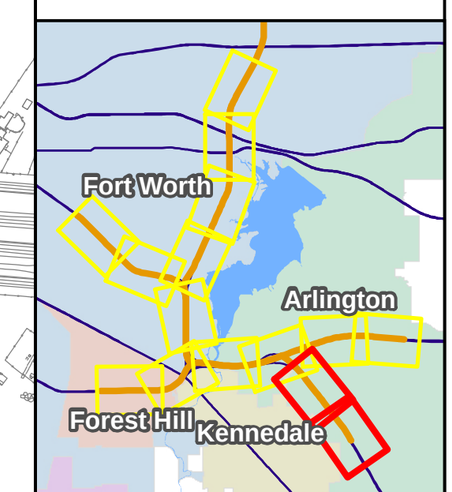

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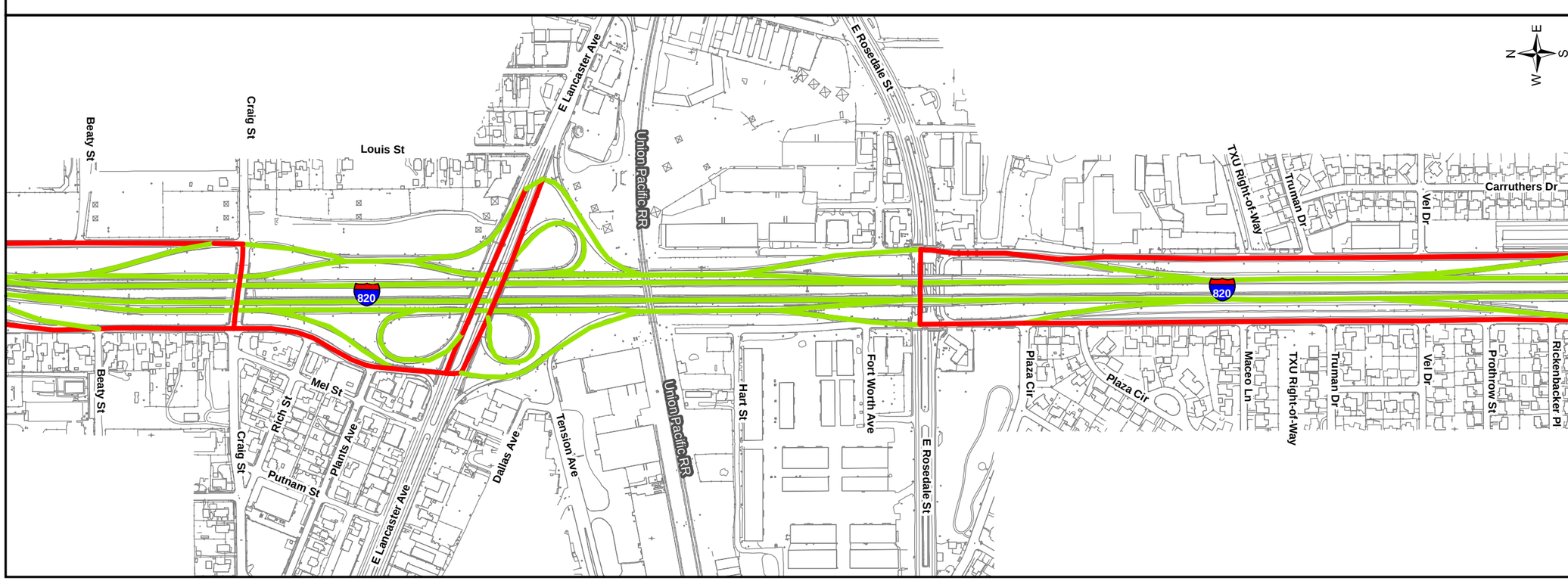

LEGEND

Uncontrolled Access Roadway

Controlled Access Roadway

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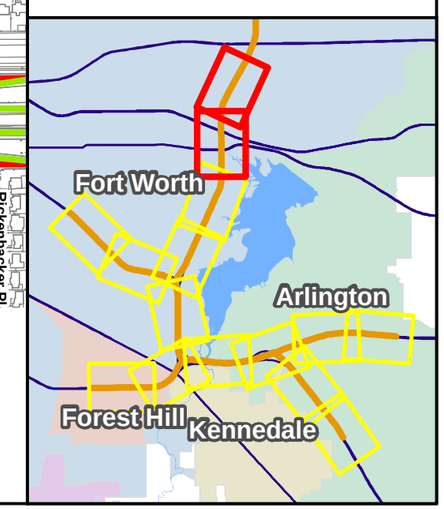

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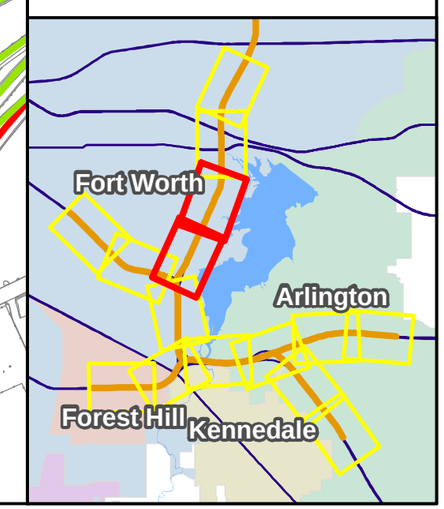

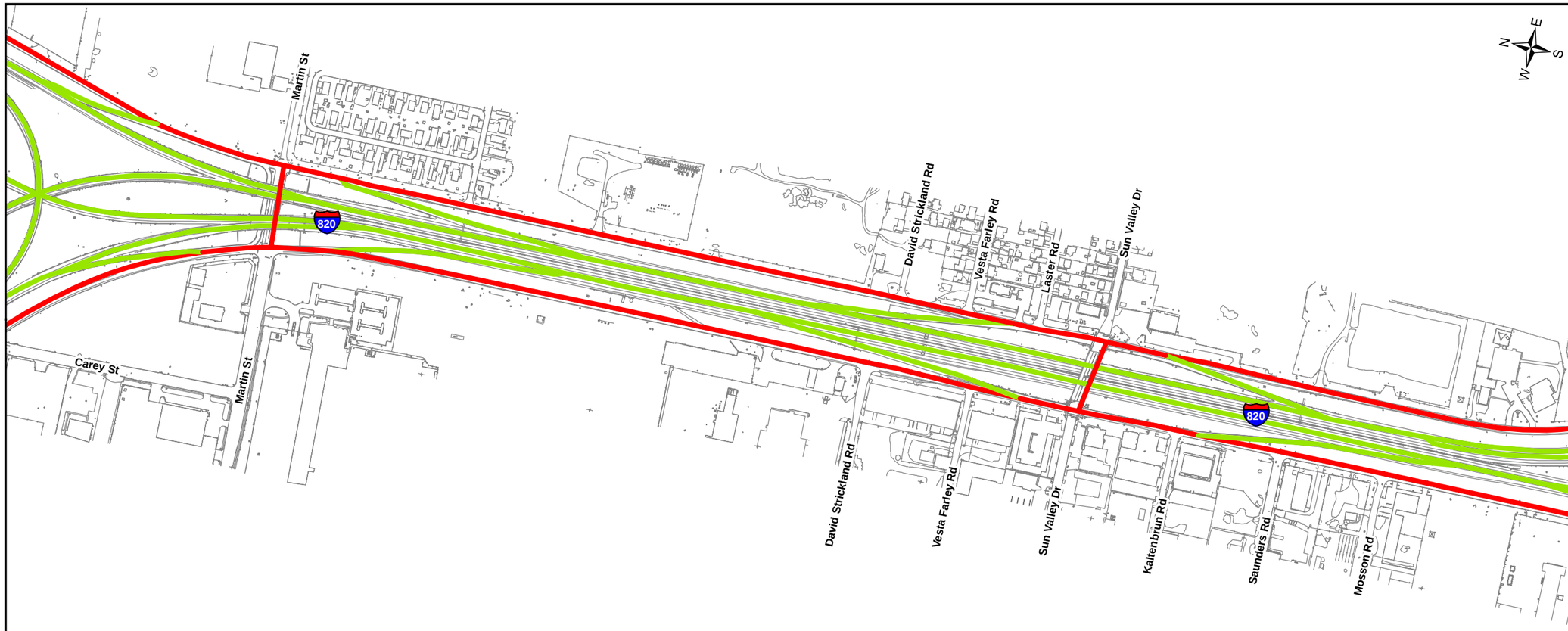

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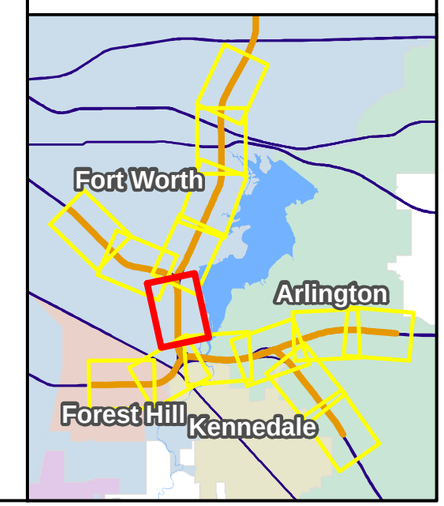

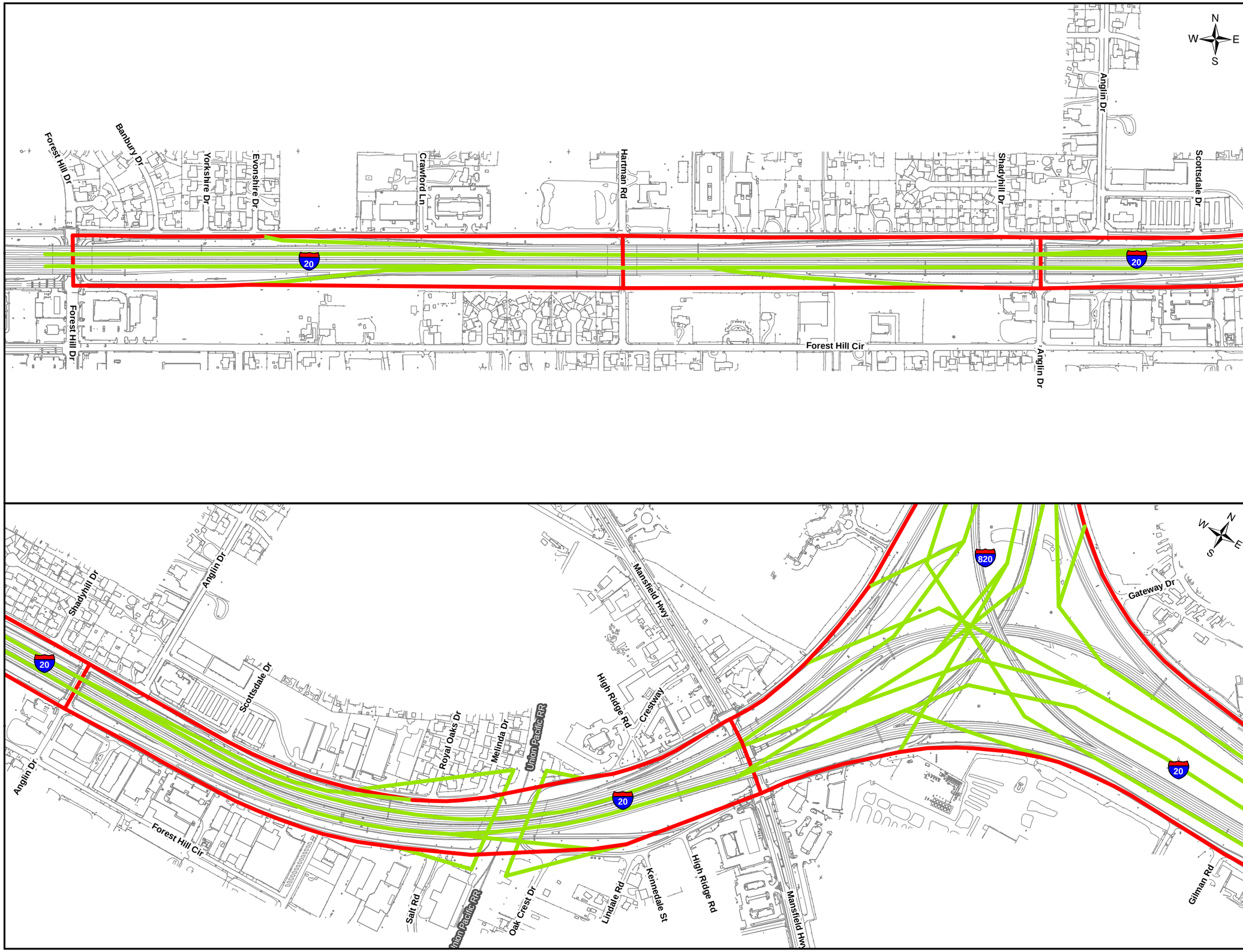

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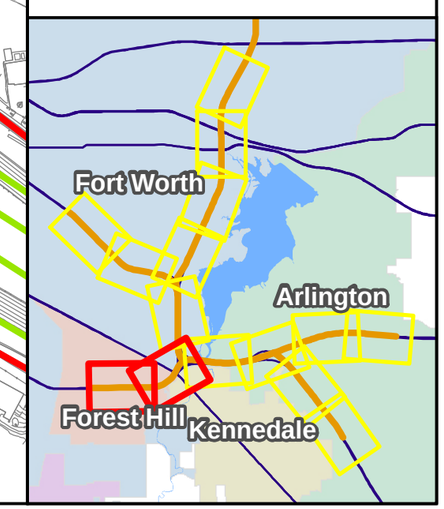

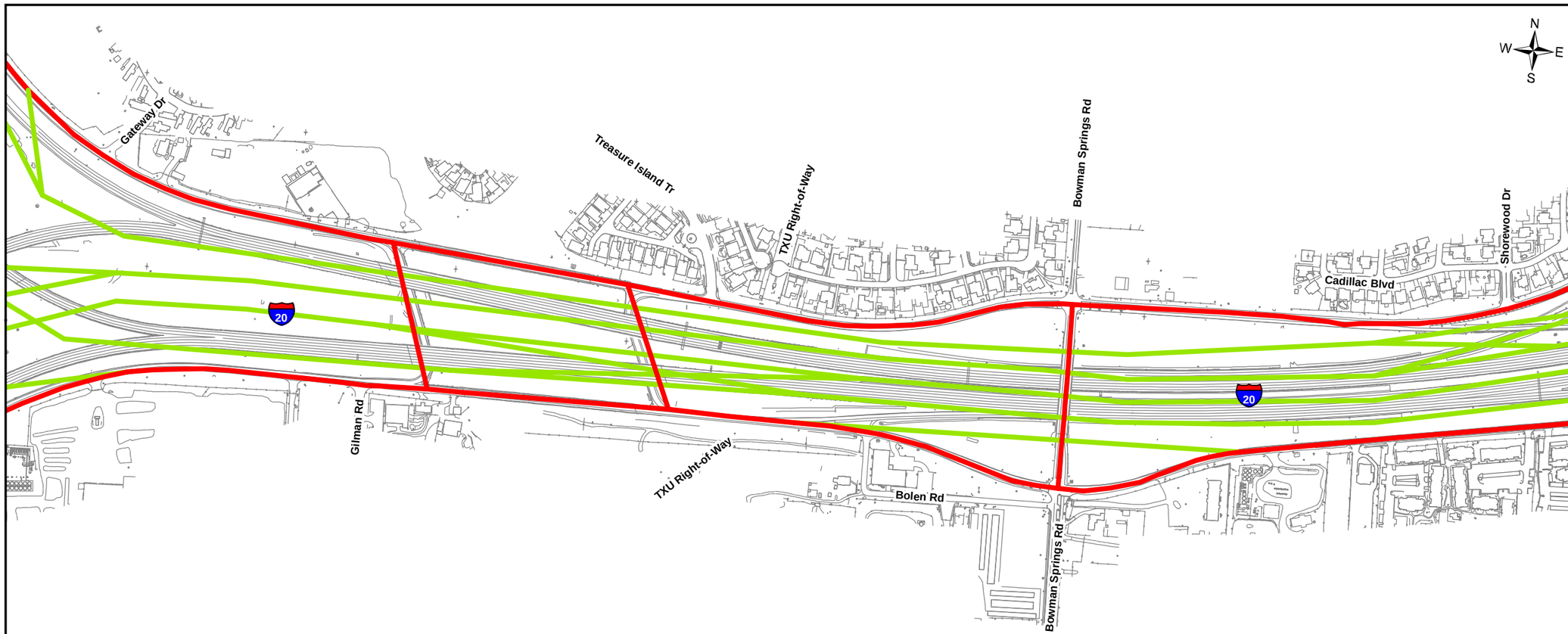

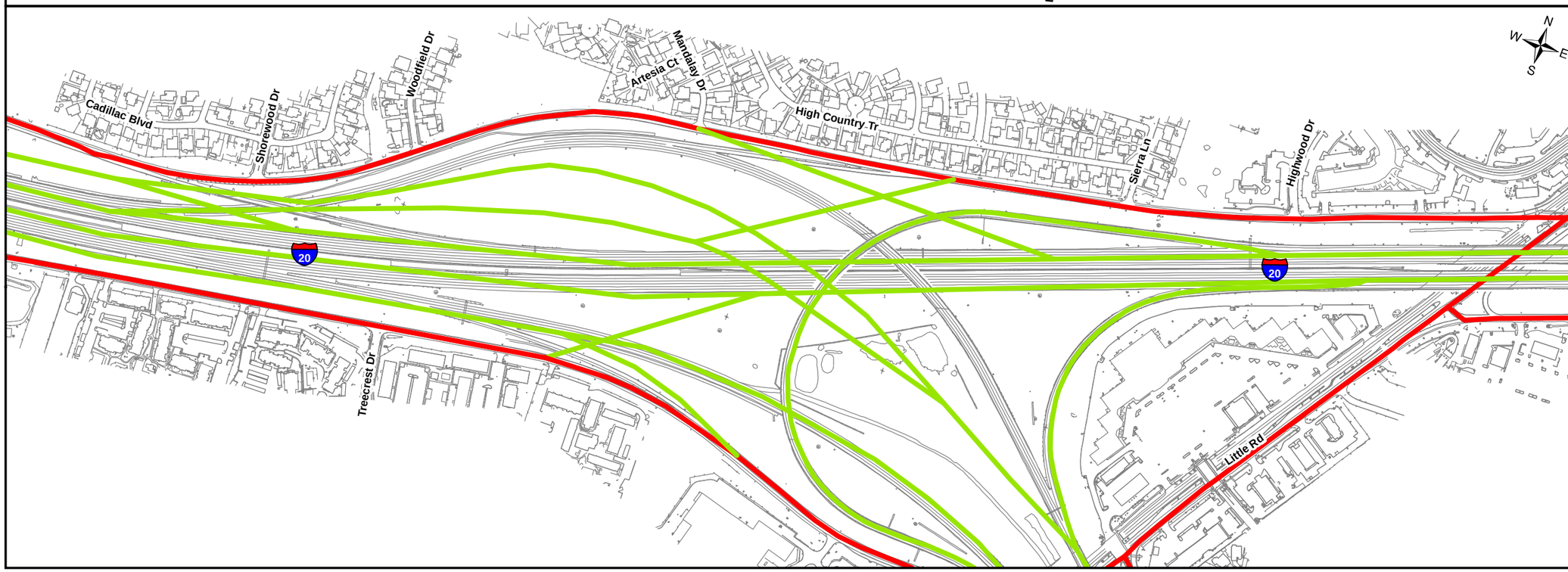

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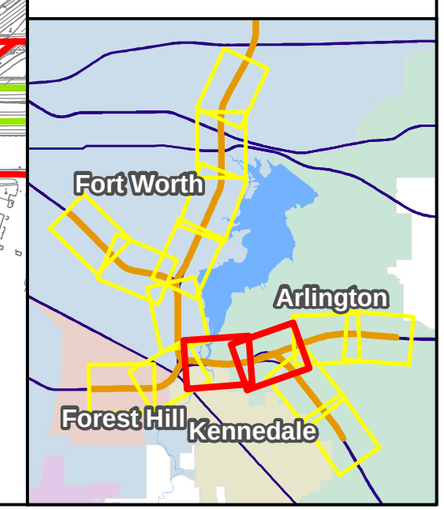

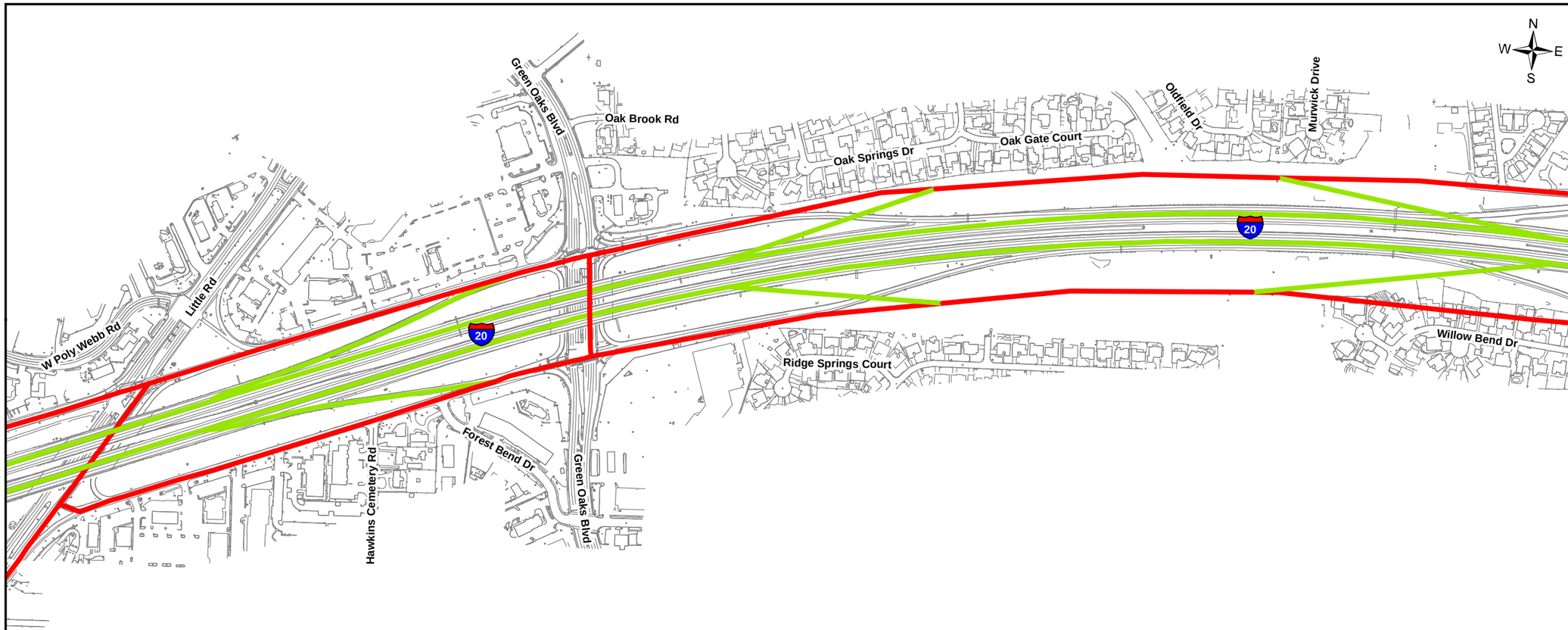

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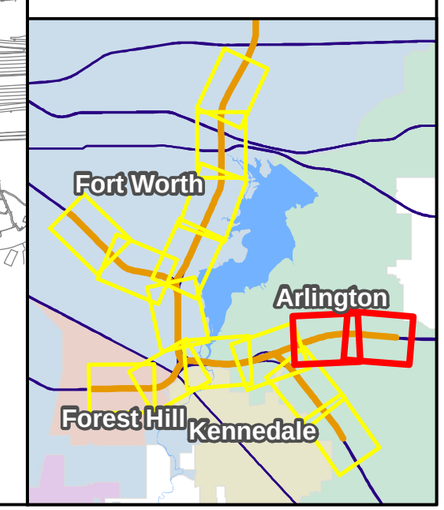

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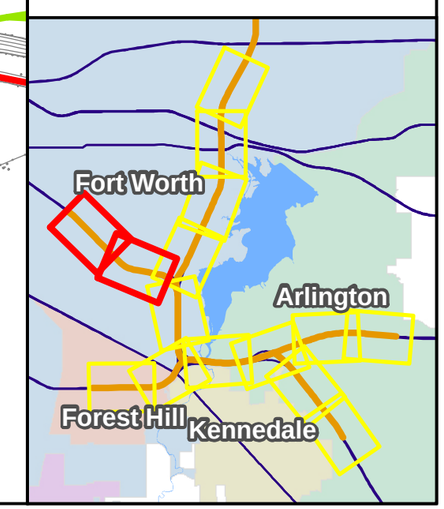

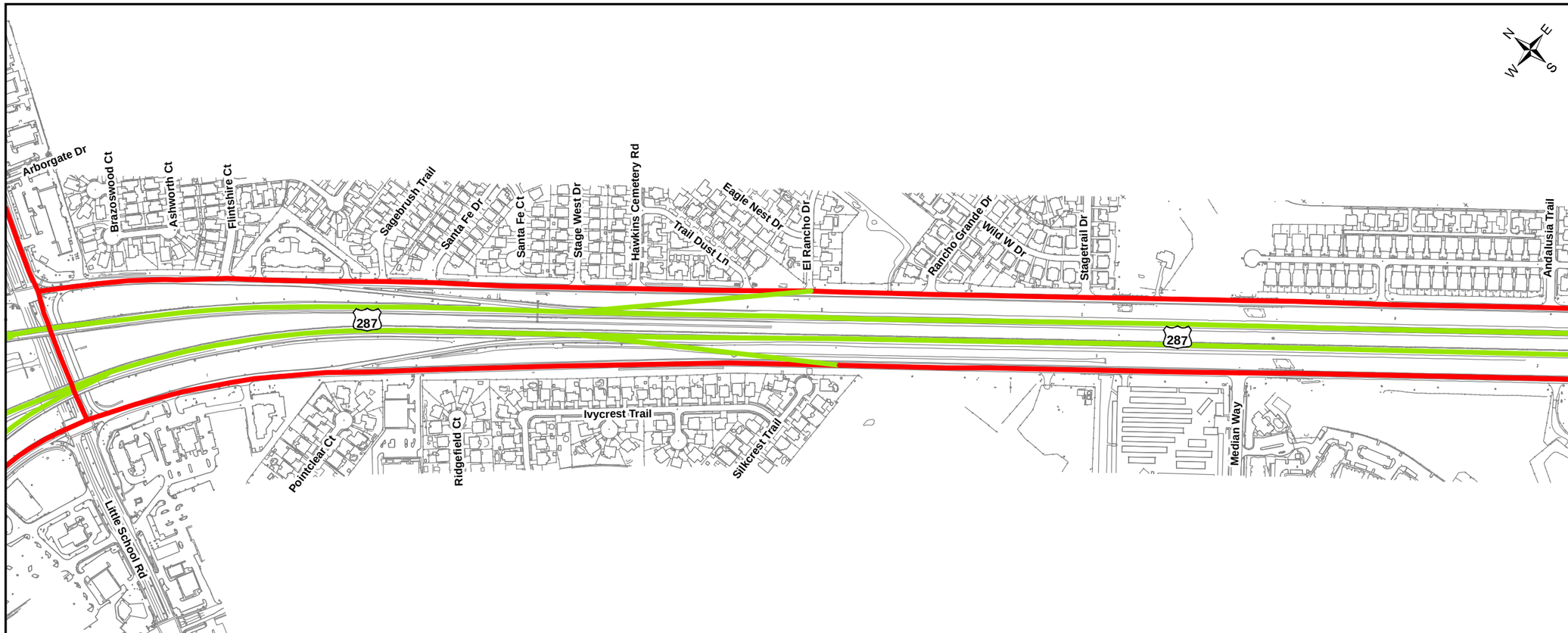

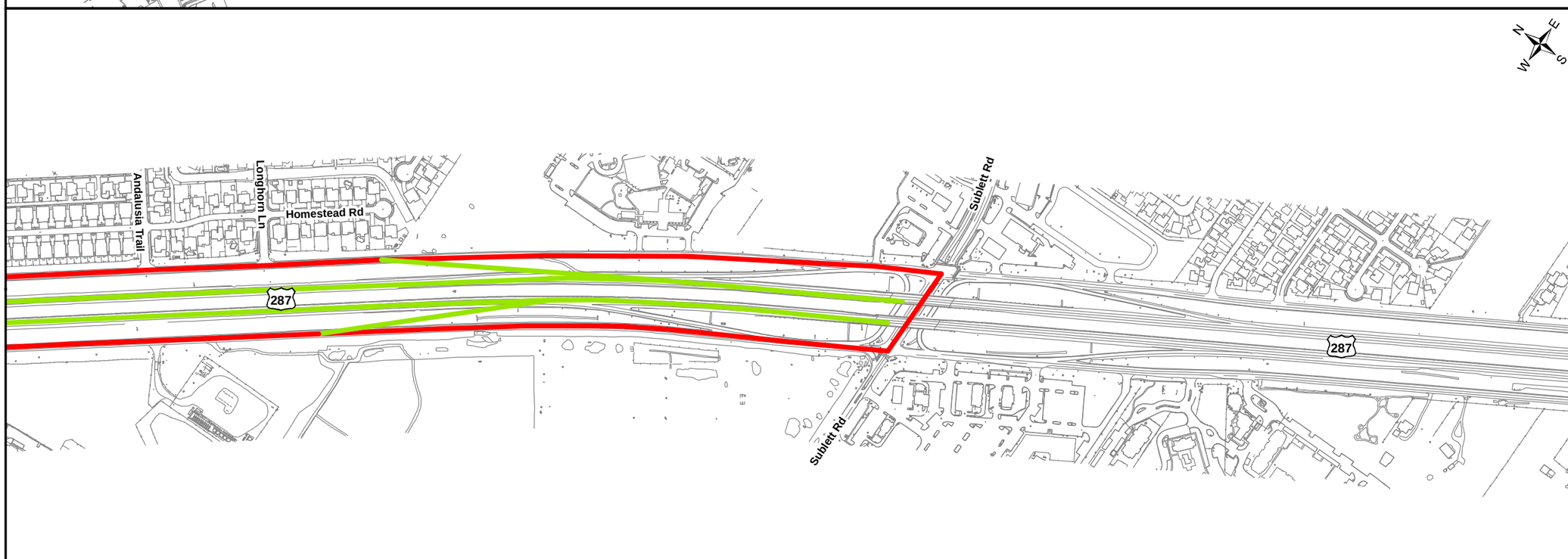

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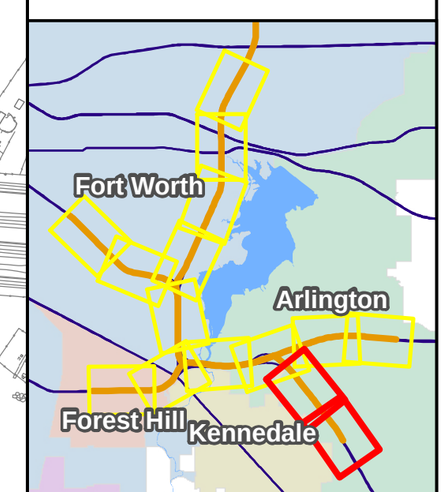

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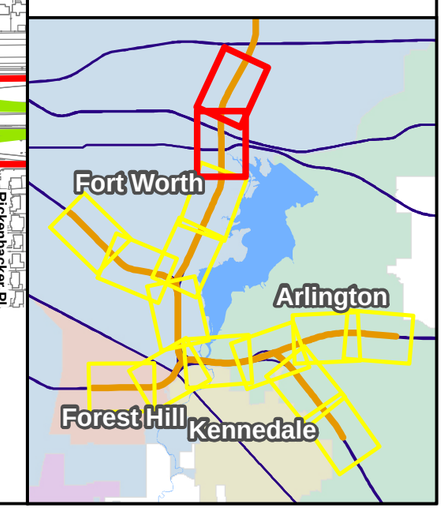

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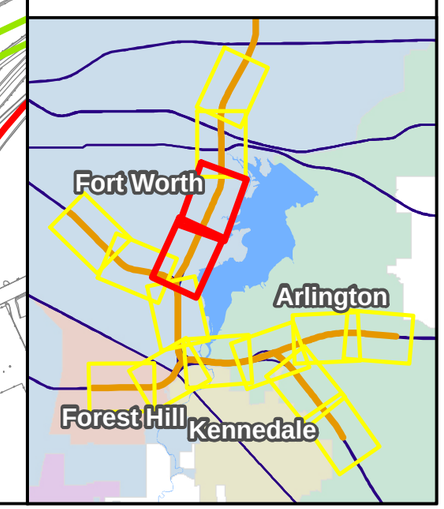
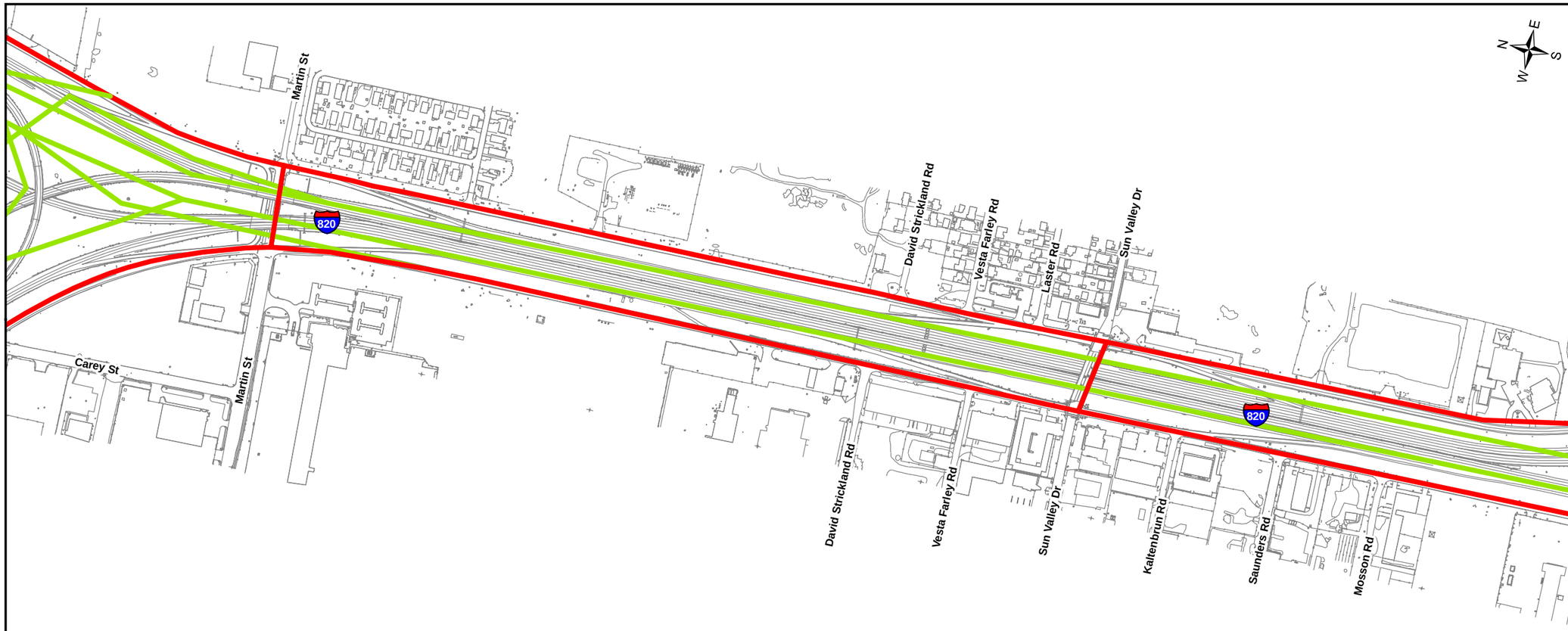


LEGEND

- Uncontrolled Access Roadway
- Controlled Access Roadway



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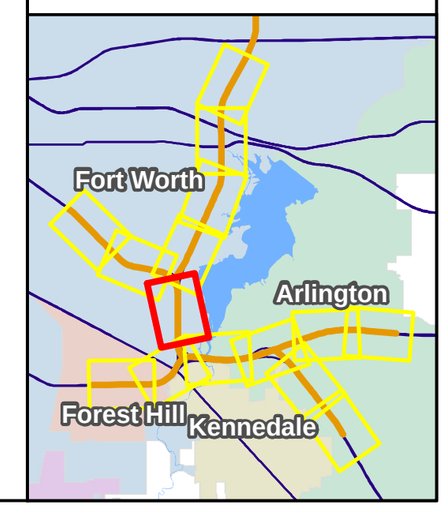
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