



Traffic Forecasting Study

US 290/SH 71 West Corridors

Oak Hill Parkway

City of Austin, Texas

August 27, 2018

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Prepared for:



August 27, 2018

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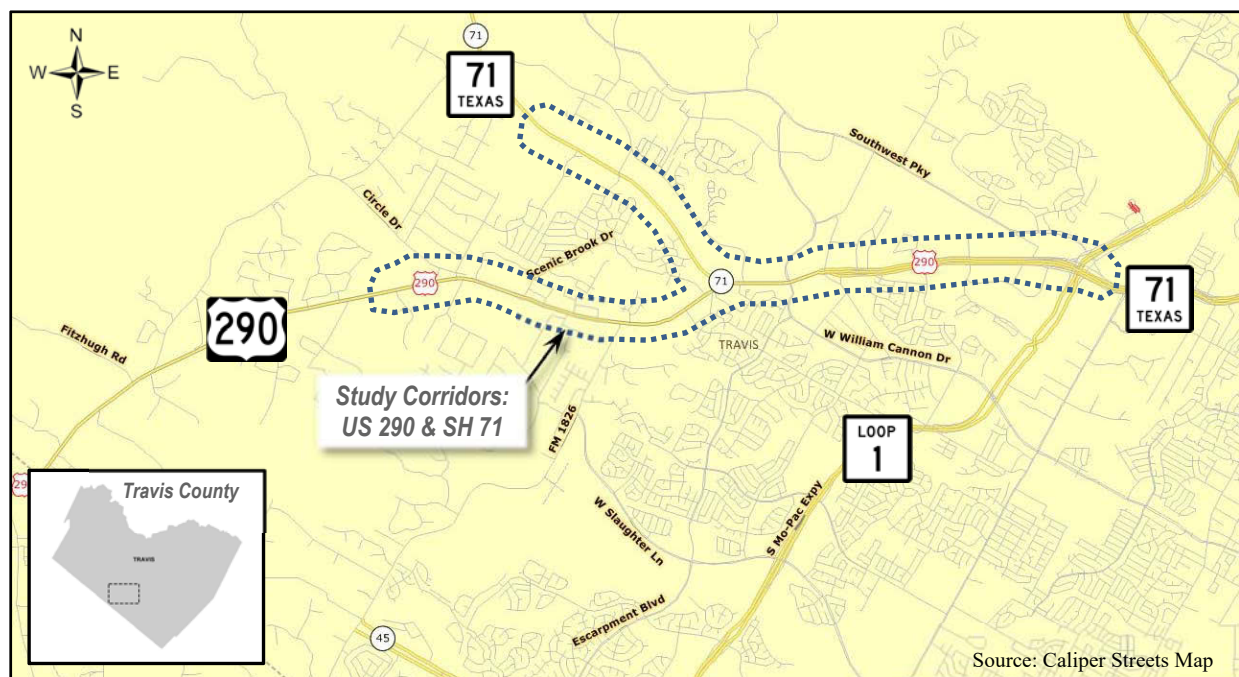
1. INTRODUCTION

This report documents the methodology for forecasting the 2040 “No Build” and “Build” traffic projections of the reconstruction of the United States Highway (US 290) and State Highway 71 (SH 71) West corridors located in the southwest region of Austin, Texas. The projections were developed in support of the environmental analysis of the “Build” alternatives, A and C, as well as the “No Build” alternative. Alternatives A and C each include full freeway and ramp configurations, while the “No Build” alternative includes the existing roadway facilities within the study corridors. The approximate limits of the study corridors are shown in **Figure 1**.

The traffic projections were forecasted by applying the Capital Area Metropolitan Planning Organization (CAMPO) travel demand model. This updated version of the CAMPO travel demand model was approved by the Transportation Planning and Programming (TP&P) division of TxDOT and includes a base year of 2010 and future years of 2020 and 2040. The provided reference guide for the model is called the *CAMPO 2010 Planning Model Guide* (dated March 2015). For the purposes of this study, the model is referred to as the 2040 CAMPO travel demand model. The study was comprised of the following tasks:

- Evaluation of the 2010 Base Model traffic assignments.
- Modification of the 2040 highway network to represent the “No Build” and “Build” alternative geometry and roadway connectivity.
- Application of CAMPO’s 2040 travel demand model and a Multi-modal Multi-class User equilibrium vehicle assignment process to develop peak period and daily traffic assignments for “No Build” and “Build” alternatives.

Figure 1: Location Map



2. 2010 BASE MODEL EVALUATION

2.1. CAMPO TRAVEL DEMAND MODEL

The CAMPO travel demand model is a regional model covering the entire 5-county area (Bastrop, Caldwell, Hays, Travis, and Williamson) and is currently used to develop traffic projections for the years 2010, 2020, and 2040 based on population and employment estimates. Although the context of the model was developed to derive a regional sense of travel demand and movement, this model is the preferred tool used to forecast traffic projections at the corridor and project level for the CAMPO region. The TransCAD software is utilized by CAMPO for travel demand modeling. The model was obtained in late July 2015 for use in this study for the purpose of evaluating the travel demands of the various corridor options. In addition, the updated 2040 model includes a “Time-of-day” (TOD) analysis, which considers various time periods of the day.

2.2. HISTORICAL DATA FOR BASE MODEL EVALUATION

Historical 2010 traffic count data was obtained from TxDOT’s “On System” and “Off System” traffic count efforts, which were accessed through TxDOT’s statewide planning map and CAMPO’s traffic count and regional data website. TxDOT’s “On System” counts are generally collected on major highways and regionally significant arterials, while the “Off System” counts were collected on minor arterials, collectors, and local streets. These data sets provided sufficient information to compare the updated CAMPO model assignments for the 2010 Base Model with observed traffic counts within the study area. The following section discusses this comparison.

2.3. PERFORMANCE OF 2010 BASE MODEL

The initial step in developing traffic forecasts, when utilizing a travel demand model, is to evaluate the performance of the base model in order to validate the model. The percent assignment error test and coefficient of determination tests were used as the validation tests before moving forward with future forecasts. This analysis employs the guidelines suggested by the Federal Highway Administration’s (FHWA) report, *Calibration and Adjustment of System Planning Models*, dated December 1990. A screen line analysis was also completed to evaluate the base models ability to distribute demand across several facilities along the screen line count locations.

2.3.1. Percent Assignment Error Test

Table 1 shows the location number and description of the counts used in this analysis. **Table 2** shows a comparison of 2010 observed daily volumes and the traffic volume assignments from the CAMPO 2010 base model for various roadway segments in the study area. The daily volumes shown in the table are 2-way traffic volumes in vehicles per day (vpd) and their locations are identified in **Figure 2**. Freeway locations include the total main lane and frontage road volumes. Based on the comparison, the model estimates are comparable to the actual traffic volumes observed in the count data. Since the total overall assignment percent error between the two sets of data (for all facility types) fall within the acceptable range of 5%, the CAMPO base model passes this test.

Table 1. List of Study Area Count Locations

Location No.	Location Description
1	Southwest Parkway - East of William Cannon Drive (Screen line)
2	SH 71 - North of US 290 (Screen line)
3	US 290 - West of SH 71 (Screen line)
4	Slaughter Lane - East of RM 1826 (Screen line)
5	SH 45 S - East of RM 1826 (Screen line)
6	RM 1826 - South of Travis County Line (Screen line)
7	Southwest Parkway - West of Mission Oaks Boulevard
8	Loop 1 - South of US 290
9	US 290 - East of William Cannon Drive
10	William Cannon Drive - South of US 290
11	Convict Hill Road - East of US 290
12	RM 1826 - South of US 290
13	US 290 - West of RM 1826
14	Circle Drive - North of US 290
15	US 290 - East of Fitzhugh Road
16	US 290 - at Travis/Hays County Line
17	William Cannon Drive - West of Loop 1
18	Slaughter Lane - East of Loop 1
19	Escarpment Boulevard - South of Slaughter Lane
20	Loop 1 - North of US 290

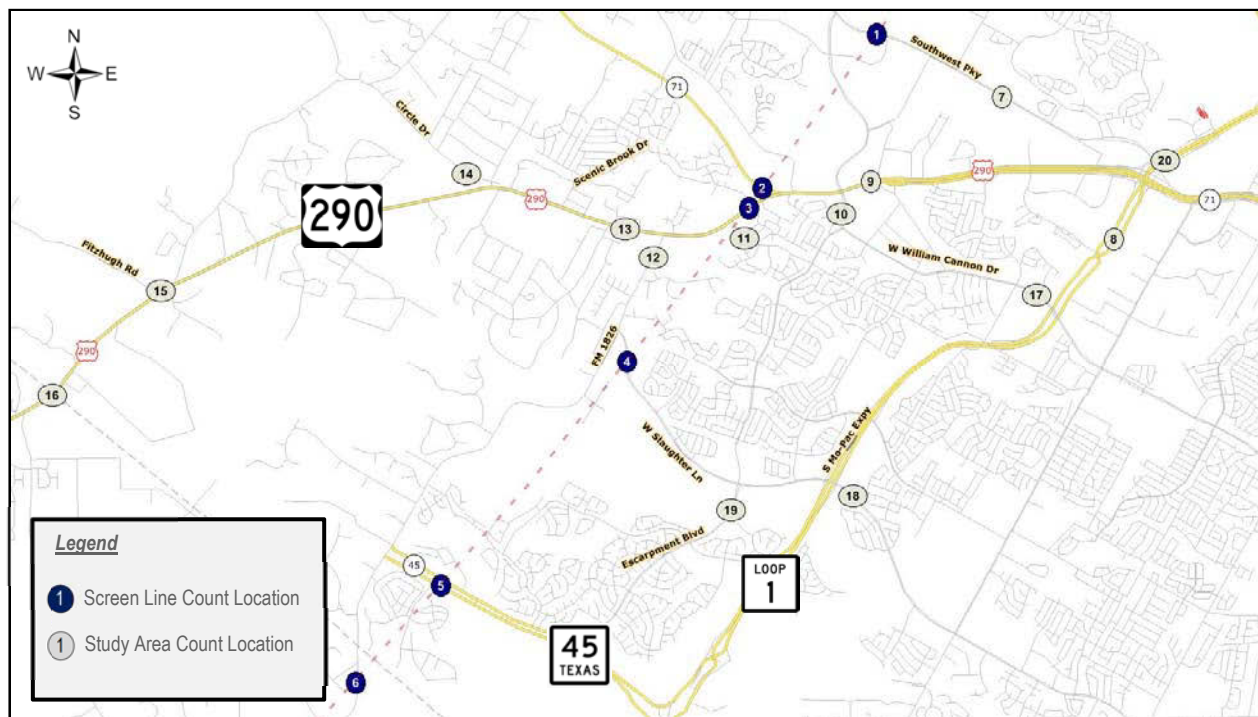
Figure 2: Study Area Count Locations for 2010 Base Model Evaluation

Table 2. Summary of Percent Assignment Error Analysis

Location No.	2010 Assigned Volumes (vpd)	2010 Observed Volumes (vpd)	Percent Assignment Error
1	25,250	24,630	2.5%
2	24,450	26,000	-6.0%
3	33,170	37,000	-10.4%
4	12,920	11,270	14.6%
5	9,800	10,600	-7.5%
6	11,280	9,300	21.3%
7	31,550	29,650	6.4%
8	86,290	82,000	5.2%
9	47,540	54,000	-12.0%
10	30,490	22,350	36.4%
11	10,240	8,300	23.4%
12	12,630	12,800	-1.3%
13	27,210	34,000	-20.0%
14	3,960	3,370	17.5%
15	23,590	27,000	-12.6%
16	20,010	24,000	-16.6%
17	36,940	34,980	5.6%
18	27,110	38,040	-28.7%
19	16,840	16,180	4.1%
20	117,220	110,000	6.6%
Totals	608,490	615,470	-1.1%
Total Assignment Percent Error Suggested Range			+/- 5%

The percent assignment error test was also carried out for the screen line count locations. A screen line analysis provides a check of the total demand crossing an imaginary line through the study area. The screen line alignment was chosen based on the limited count data available along SH 71. **Table 3** below shows the results of the percent assignment error for the screen line count locations. The total screen line volumes are within 1.6% of each other. In addition, the average absolute value of the percent assignment error is 10%, which is an acceptable margin.

Table 3. Summary of Percent Assignment Error Analysis for Screen Line

Location No.	2010 Assigned Volumes (vpd)	2010 Observed Volumes (vpd)	Percent Assignment Error
1	25,250	24,630	2.5%
2	24,450	26,000	-6.0%
3	33,170	37,000	-10.4%
4	12,920	11,270	14.6%
5	9,800	10,600	-7.5%
6	11,280	9,300	21.3%
Totals	116,870	118,800	-1.6%
Total Assignment Percent Error Suggested Range			+/- 5%

2.3.2. Coefficient of Determination Test

The Coefficient of Determination, R^2 , shows how well a regression line represents the data being plotted between two sets of data. An R^2 value of 0.88 or higher is desirable, while a value of 1.0 is perfect. This test was completed for the two sets of data available for the base model validation for the study area counts (**Table 2**) as well as for the screen line counts (**Table 3**). An R^2 value was calculated to be 0.97 for the study area, while the R^2 value for the screen line was calculated to be 0.98. These results indicate that the CAMPO base model passes this test.

2.3.3. Screen Line Analysis

A screen line analysis was also completed to evaluate the base models ability to distribute demand across several facilities along the screen line count locations. The results of the screen line data in **Table 4** shows that the assigned distribution of demand across the facilities are closely matching the observed distribution patterns.

Table 4. Summary of Screen Line Analysis

Location No.	2010 Assigned Volume Distribution	2010 Observed Volume Distribution
1	21.6%	20.7%
2	20.9%	21.9%
3	28.4%	31.1%
4	11.1%	9.5%
5	8.4%	8.9%
6	9.7%	7.8%

Based on the three evaluation tests completed for the 2010 base model, the model estimates are comparable to the actual 2010 traffic volumes with a few minor exceptions. Ultimately, the differences per location did not warrant additional calibration of the adopted CAMPO base model, thus maintaining the integrity of the adopted model.

3. 2040 CAMPO MODEL

This section provides a discussion of the basic assumptions and parameters used in the CAMPO Model for the 2040 traffic assignments.

3.1. PROGRAMMED PROJECTS WITHIN STUDY AREA

A review of CAMPO's 2040 Regional Transportation Plan's (RTP) programmed projects was completed to understand the future committed roadway improvements within the study area. A list of relevant roadway improvements are found in **Table 5**. A cursory check was completed and confirmed that these projects were already coded in the original 2040 highway network provided by CAMPO. An exhibit illustrating CAMPO's road projects programmed for year 2040 is provided in **Appendix A**.

Table 5. Summary of Programmed Projects

Projects	Limits/Location	Let Year	Description
Loop 1	Cesar Chavez - Slaughter	2020	Construct 2 express lanes in each direction
RM 2244	Walsh Tarlton - Redbud Trail	2020	Widen to 4-lane major arterial divided
SH 45 SW	Loop 1 S - FM 1626	2015	Construct 4-lane tolled freeway; shared path
US 290 W	West of RM 1826 - Loop 1	2018	Construct 6-lane tolled freeway
US 290 W	Nutty Brown - RM 1826	2040	Widen to 6-lane major arterial divided
US 290 W	RM 12 - Nutty Brown	2035	Widen to 6-lane major arterial divided
SH 71 W	Silvermine - US 290 W	2018	Construct tolled lanes with frontage road
RM 1826	US 290 W - Slaughter	2022	Widen to 4-lane major arterial divided
RM 1826	Slaughter - SH 45 SW	2040	Widen to 4-lane major arterial divided
RM 1826	SH 45 SW - Nutty Brown	2025	Widen to 4-lane major arterial divided
Fitzhugh Rd	US 290 W - County line	2030	Widen to 2-lane major arterial divided
Fitzhugh Rd	County line - RM 12	2025	Widen to 4-lane major arterial undivided

3.2. 2040 CAMPO MODEL APPLICATION

Traffic projections were developed by applying the key elements provided by the 2040 CAMPO travel demand model. Specifically, the 2040 highway network and trip tables were utilized in conjunction with TransCAD's native Multi-modal Multi-class User equilibrium assignment (MMA) process. The 2040 highway network was modified to develop "No Build" and "Build" scenarios. The key assumptions used in the assignment process are discussed further in subsequent sections.

Although the 2040 highway network was modified in this study, the TOD trip tables provided by the approved CAMPO model were kept unchanged for the purposes of this study. Per discussions with CAMPO staff, the original 2040 TOD trip tables should be kept unchanged for purposes of analyzing a specific project at the corridor level. The trip tables were not modified to maintain the integrity of the regionally adopted model. The traffic assignments in this forecasting study were run with the developed "No Build" and "Build" highway networks and the provided 2040 trip tables.

3.3. TRAFFIC ASSIGNMENT ALGORITHM AND ASSUMPTIONS

Essentially, each link within the entire roadway network of the CAMPO model includes a generalized cost or impedance, which may include a toll cost and/or an operating cost. The generalized costs are reflected in the model in terms of dollars and converted to time based on value of time (VOT) rates depending on peak period and purpose. The MMA routine process allows the application of multiple costs and multiple VOTs for different trip classes. These classes include SOV, HOV2, HOV3, Auto External and Others, and Truck External and Others.

The assignment algorithms were run using a convergence factor of 0.0001 for a maximum number of iterations of 500. In general, the TOD assignments converged to an equilibrium state with less than 80 iterations. The detailed list of turn penalties used in the traffic assignments are provided in **Appendix B**. Furthermore, global passenger car equivalent (PCE) values of 1.0 were used in the assignments for all trip classes except for Truck External and Others. The global PCE value of 2.0 was used for the Truck External and Others trip class.

The specific assignment method used in this analysis is the Bi-conjugate Frank Wolfe (BFW) user equilibrium assignment method. The MMA assignment iterates between assigning volumes and recalculating loaded travel times such that a state of equilibrium is reached. The key behavioral assumption is that in the equilibrium state, no traveler can improve their travel time by changing to another route.

3.3.1. Volume Delay Function

The equilibrium traffic assignment procedure is dependent on the Bureau of Public Roads (BPR) volume-delay function (VDF) to estimate travel speeds under congested conditions. The BPR equation determines the change in travel as congestion is approached by relating link travel times as a function of the volume/capacity ratio. As part of CAMPO's refinement of the updated 2040 model, the BPR function's parameters, alpha and beta, were calibrated to improve the assignment results of various roadway classifications. The updated VDF parameters are provided in **Table 6**.

Table 6. Volume Delay Function Parameters

Functional Class	Alpha (α)	Beta (β)
Interstate/Freeway	1.00	6.00
Principal Arterial	1.30	4.00
Minor Arterial	1.50	4.00
Major Collector	0.50	5.30
Local	0.50	5.30
Frontage Road	0.50	4.00
Ramp	0.15	4.00

3.4. HIGHWAY NETWORK ASSUMPTIONS

The link and highway attributes used in building the generalized cost networks are detailed in a CAMPO's speed-capacity look-up table provided in **Appendix C**. These attributes depend on each link's functional classification and area type and include speed, per lane hourly capacity, alpha coefficient, and beta coefficient values. An update in the 2040 CAMPO model includes an improved representation of speeds on various tolled facilities. New functional classifications (class numbers 21-24) were added to the speed-capacity look-up tables as a result of this update.

3.5. TOLL FACILITY ASSUMPTIONS

This section provides a discussion of the tolling parameters utilized for surrounding tolled facilities as well as any tolled alternatives. During the initial forecasting efforts, the proposed alternatives were set to be tolled facilities since these specific projects were programmed in CAMPO's 2040 RTP (shown in **Table 5**). Therefore, a tolled operations were initially assumed for alternatives A and C and were analyzed under the "Build" scenarios as tolled facilities. However, TxDOT's funding mechanisms changed in 2017, which limited the use of toll roads. This report includes an update for the Preferred Alternative A as a non-tolled facility.

The main toll parameters that have a significant effect of toll diversion behavior in the model are VOT, vehicle operating costs, and toll costs. A distance-based toll was inputted for the study corridors since the location of toll gantries or toll tag readers were not specifically coded along each highway corridor. No changes were made to other programmed or coded tolled facilities for year 2040, which were generally coded at the link-level toll plaza.

Table 7, shown below, provides a summary of the toll parameters used in this study, which also includes the toll costs for the study corridors.

Table 7. Summary of Toll Parameters

Toll Parameters		
	Passenger Car	Truck
Value of Time - Peak Period (per hour)	\$14.70	\$28.16
Value of Time - Off Peak Period (per hour)	\$14.08	\$28.16
Operating Cost (per mile)	\$0.1674	\$0.4185
Toll Cost for US 290 W/SH 71 W (per mile)	\$0.18	\$0.25

After review of the *CAMPO 2010 Planning Model Guide*, it was found that testing and fine tuning of the previous generalized cost assignment process for the CAMPO travel demand model has led to further dampening (discounting) of the toll rates on tolled facilities. The dampening factors help the assignment procedure to avoid the “cliff” effect where at a certain toll rate may cause a drastic change in users of the facility. Varying the dampening factors by corridor and vehicle type is consistent with potential variations in value of time by area of the model. The complete list of dampening factors used in the 2040 CAMPO travel demand model is provided in **Appendix D**.

3.6. TIME OF DAY (TOD) MODEL

An update in the 2040 CAMPO model included the disaggregation of trip tables into four specific time periods as detailed in **Table 8**. The outputs of the four assignments were then aggregated to develop the daily traffic volume projections. This approach to time of day modeling is considered the state of the practice and improves the sensitivity of the model to congestion in the peak periods. As shown in the table, the morning and afternoon peak periods each include a 3-hour time period.

Table 8. Time of Day Periods

Analysis Period	Time	Hours
AM Peak	6:00 - 9:00 AM	3.0
Mid-Day	9:00 AM - 3:30 PM	6.5
PM Peak	3:30 - 6:30 PM	3.0
Night	6:30 PM - 6:00 AM	11.5

4. FUTURE TRAFFIC FORECASTING

4.1. “NO BUILD” SCENARIO

The “No Build” scenario represents the future year 2040 time period without any significant roadway improvement to the US 290 and SH 71 corridors within the study area. This means that the programmed improvements for US 290 and SH 71, which were mentioned earlier in this report, would not occur. This scenario assumes that the existing roadway cross sections and geometry along the study corridors would remain.

For example, the existing US 290 corridor located in the Oak Hill Area and further west would remain a 4-lane highway with two through lanes in each direction. To achieve this scenario, the original 2040 highway network was modified by reducing the planned widening projects and the construction of the tolled freeway facilities back to the existing roadway facilities. Other programmed projects outside the study area were left unchanged and considered “in place” under the 2040 “No Build” scenario.

4.2. “BUILD” SCENARIO

There were two alternatives analyzed under the 2040 “Build” scenario, Alternative A and Alternative C. These alternatives were the final two options that were carried forward in the screening and environmental evaluation of several schematic options for the US 290 and SH 71 corridors. As mentioned previously, the decision to provide a proposed tolled facility was initially determined by CAMPO’s 2040 RTP. This “Build” scenario considers each alternative as “tolled” as an initial assumption to compare two alternatives equally.

4.2.1. Alternative A

The first “Build” scenario was developed by modifying the original 2040 highway network to include the proposed roadway geometry of Alternative A. This alternative includes a tolled freeway section with generally three through lanes and two frontage road lanes in each direction. In addition, the tolled freeway section is extended on SH 71, just north of Scenic Brook Drive. Alternative A includes direct ramp connections to/from the west on SH 71 and the east on US 290. The locations of the proposed access ramps and the details of the at-grade cross street intersections are shown in exhibits found in **Appendix E**.

4.2.2. Alternative C

The second “Build” scenario was developed by also modifying the original 2040 highway network to include the proposed roadway geometry of Alternative C. Similar to Alternative A, this alternative includes a tolled freeway section with generally three through lanes and two frontage road lanes in each direction along the US 290 and SH 71 study corridors. Alternative C includes direct ramp connections to/from the west on SH 71 and the east on US 290. Alternative C’s main lane geometry differs from Alternative A generally between SH 71 and Old Fredericksburg Road. The main lanes for Alternative C are slightly shifted to north in this section and at-grade intersection at William Cannon Drive is configured differently. Exhibits of Alternative C are found in **Appendix F**.

4.3. PROJECTED TRAFFIC VOLUME ADJUSTMENTS

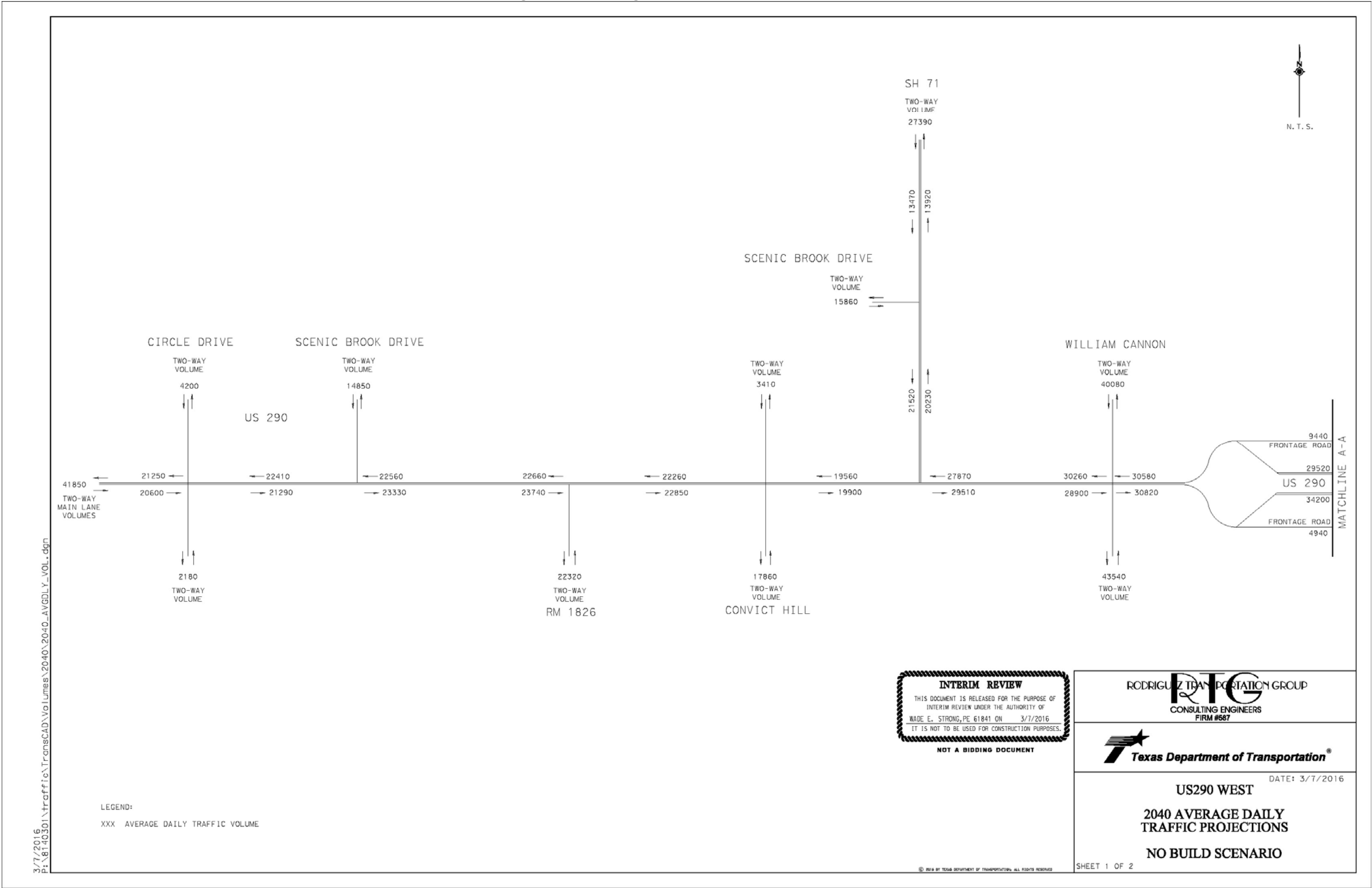
The resulting TOD traffic assignments for the “No Build” and “Build” scenarios were aggregated to forecast the daily traffic volumes. After a review of the model assignments two minor adjustments were made based on engineering judgement. There was a minor adjustment to the assignments that are related to the eastbound braided exit ramp at Monterey Oaks Boulevard under the “No Build” scenario. Under the “No Build” scenario, the existing US 290 freeway section begins near Old Fredericksburg Road. The regional travel demand model assigned traffic (that was destined to use the braided exit ramp) to continue along the eastbound frontage road rather than using the main lanes to by-pass the at-grade signalized intersections. The minor adjustment was made to shift a percentage of traffic from the upstream exit ramp to the eastbound braided exit ramp at Monterey Oaks Boulevard.

Regional models with large traffic analysis zones that can encompass diverse land uses and large geographic areas may have limited local street grids. In this case, the roadway extension of Convict Hill Road, north of US 290 was not included in the regional model. This led to the other minor adjustment to the traffic assignments. This adjustment consisted of taking a small percentage of traffic from the Scenic Brook Drive corridor and assigning the volume to the north leg of Convict Hill Road, which provides access to the Austin Community College Pinnacle Campus.

4.4. 2040 “NO BUILD” AND “BUILD” TRAFFIC FORECASTS

The end results of running the traffic assignments and making the minor adjustments discussed previously include daily and peak hour period traffic volume projections. The 3-hour AM and PM volume assignments were divided by 3 to estimate the hourly volumes for the AM and PM peak hour periods. This assumes that in year 2040 the peak hour periods are spread over a longer time period with less peaking conditions. See **Figures 3 thru 5** for the line diagrams with forecasted 2040 daily volumes under the “No Build”, Alternative A “Build”, and Alternative C “Build” scenarios. The forecasted 2040 AM and PM peak hour volumes are provided in **Appendix G**. The limits of the exhibits reach from Circle Drive on the west side of the study area to Loop 1 on the east side of the study area.

Figure 3: Line Diagram for 2040 “No Build” Scenario



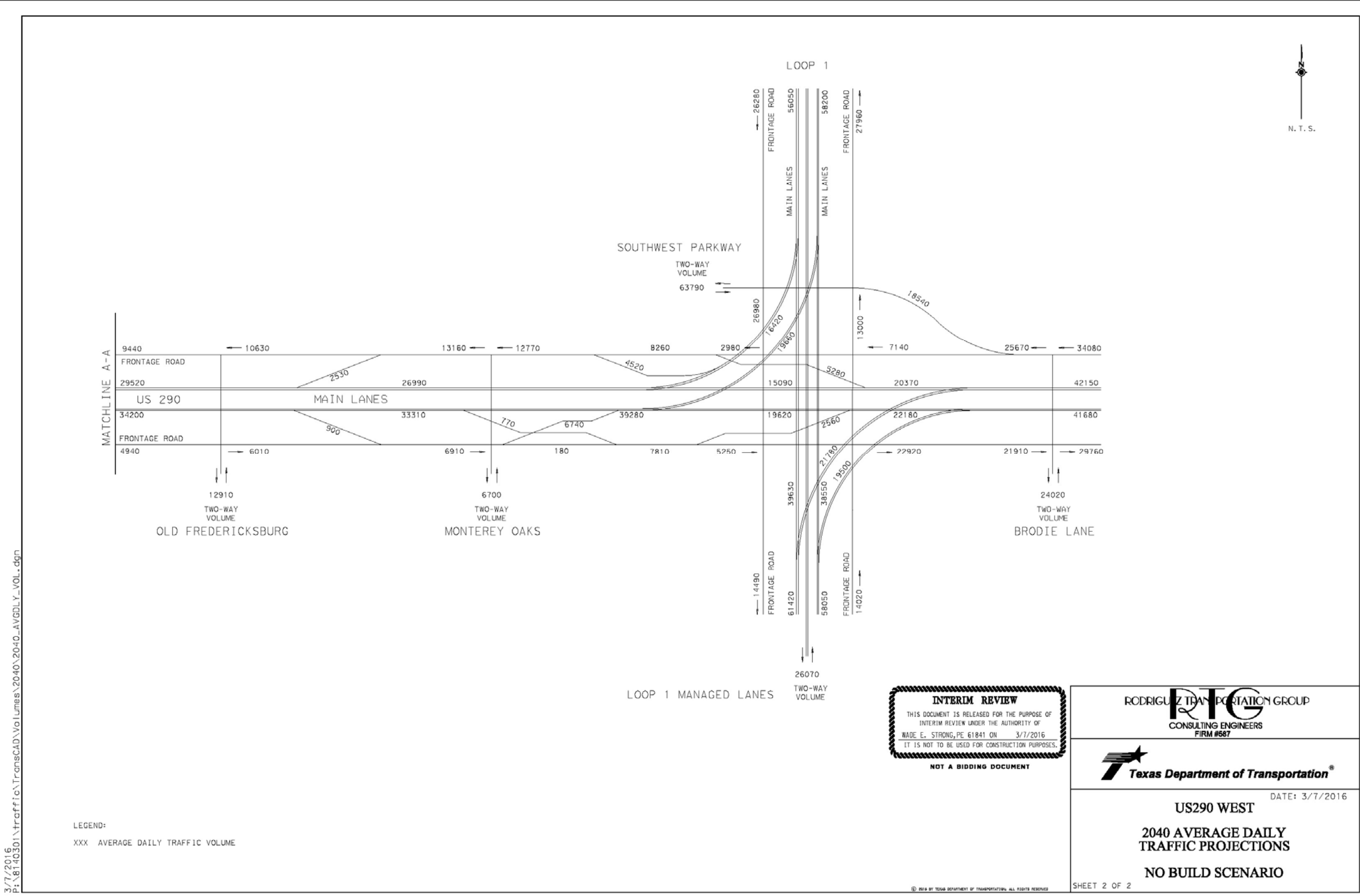
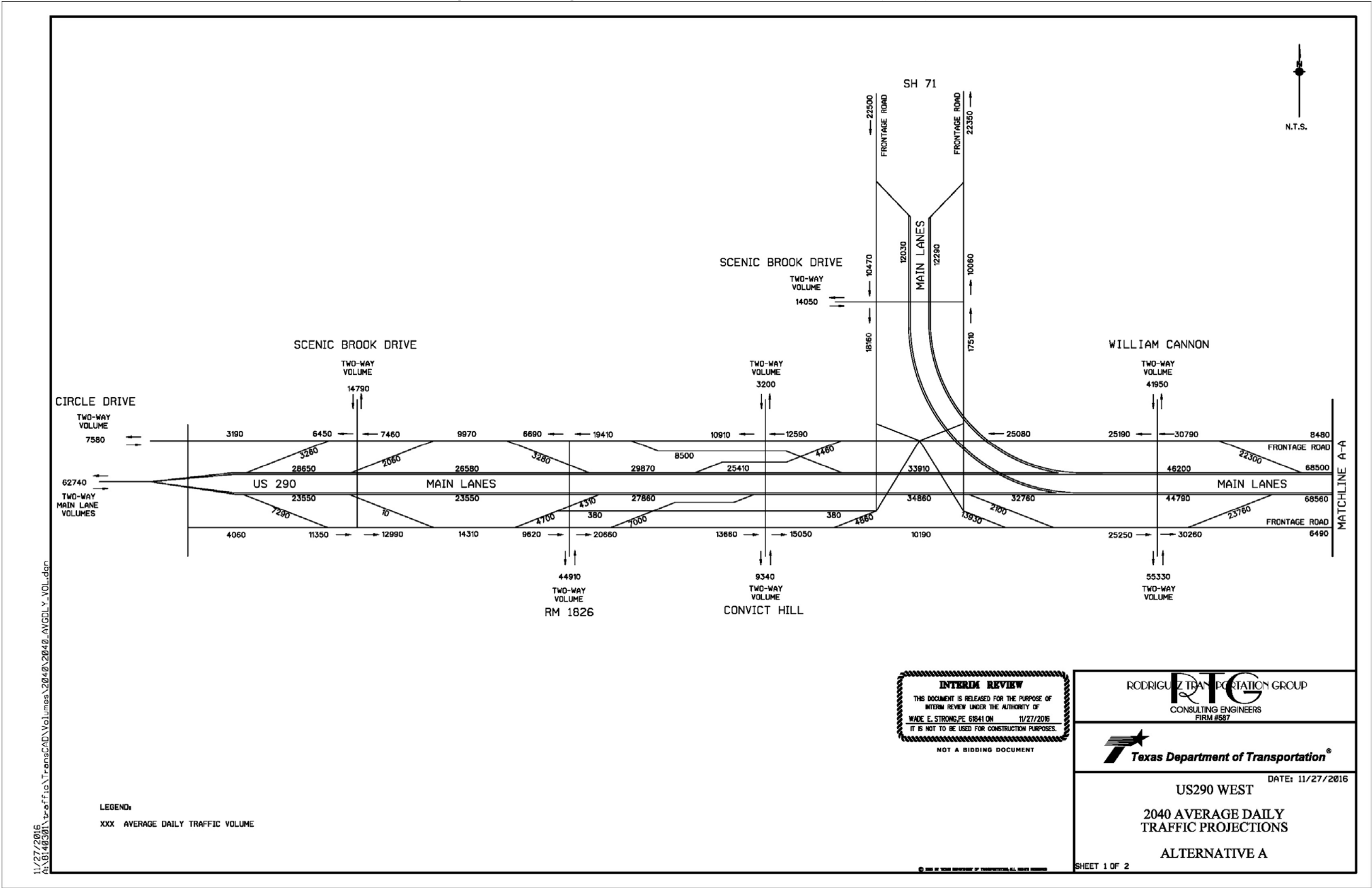


Figure 4: Line Diagram for 2040 “Build” Alternative A Scenario (Tolled)



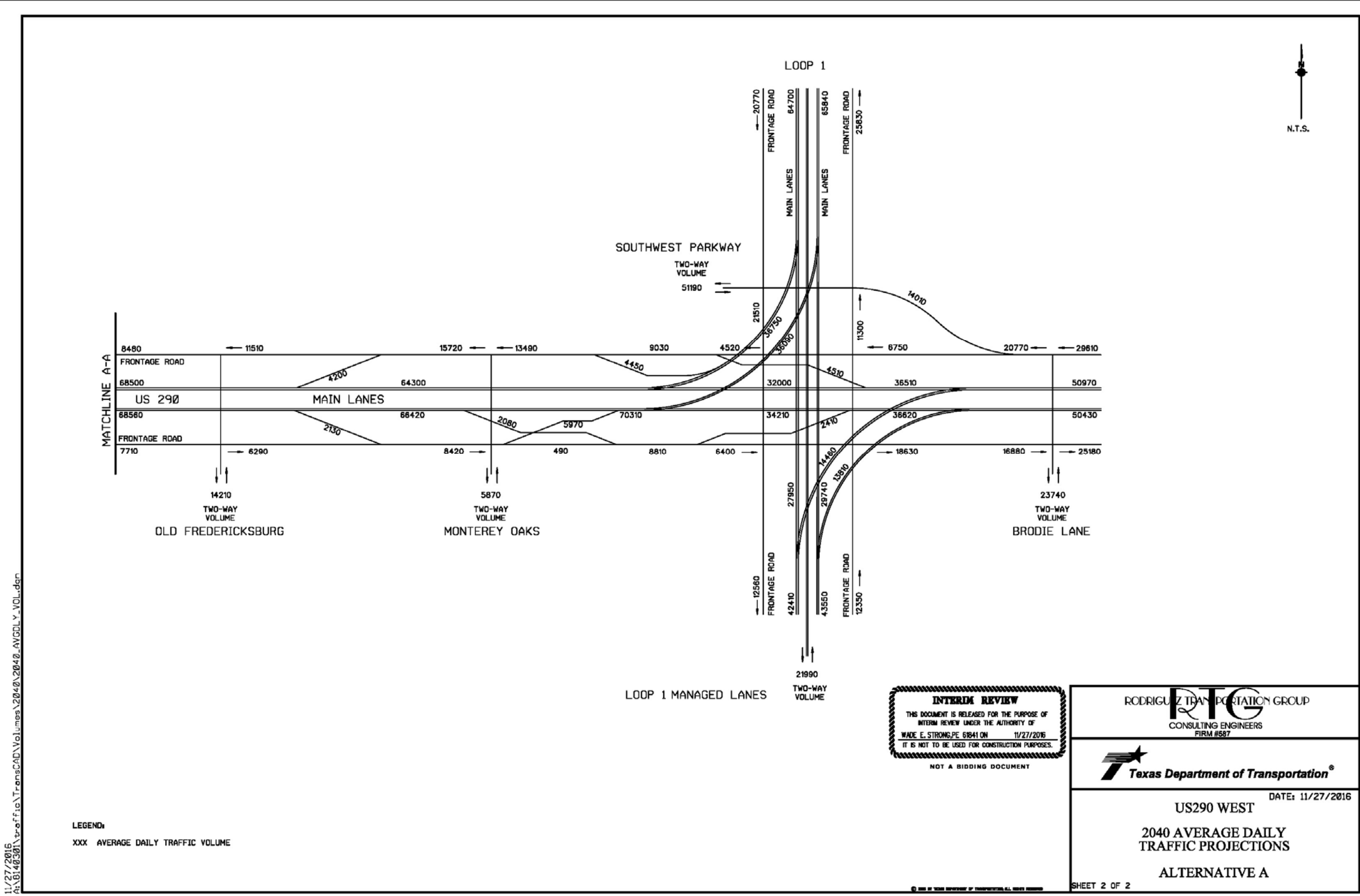
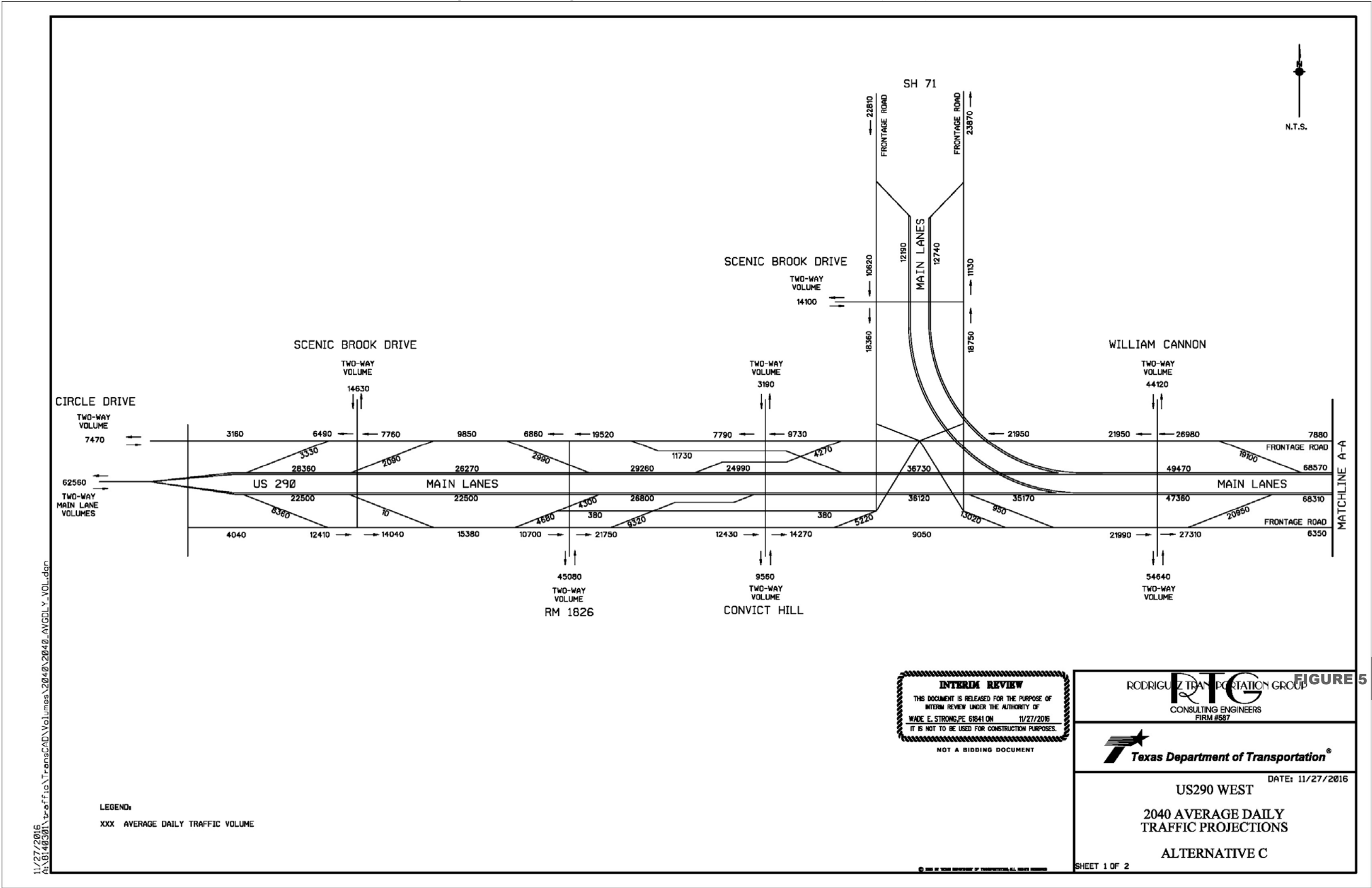
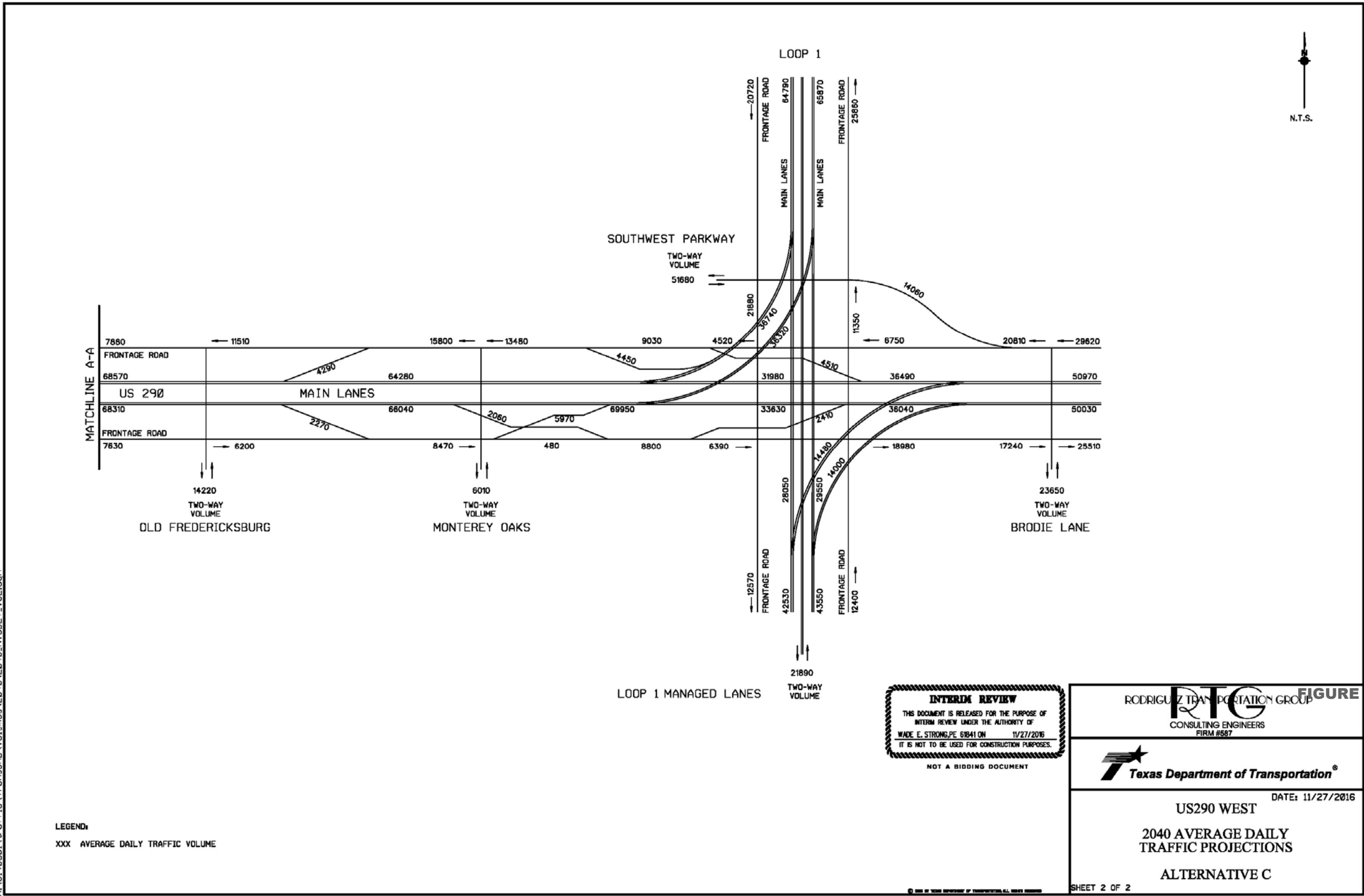


Figure 5: Line Diagram for 2040 “Build” Alternative C Scenario (Tolled)





5. NETWORK RESULTS AND CONCLUSIONS

This report documented the methodology for forecasting the 2040 “No Build” and “Build” traffic projections of the reconstruction of the US 290 and SH 71 corridors located in the southwest region of Austin, Texas. Alternatives A and C were each analyzed under the 2040 “Build” scenario, while the 2040 “No Build” alternative includes the existing roadway facilities within the study corridors. The traffic projections were forecasted by applying the updated 2040 CAMPO travel demand model, which included TOD traffic assignments.

The final step in this forecasting study included summarizing some network results within the surrounding study area. The network results include statistics for vehicle miles of travels (VMT), vehicle hours of travel (VHT), and average speeds. The limits of the network statistics are illustrated in an exhibit provided in **Appendix H**. A summary of the study area network results are provided in **Table 9**.

Table 9. Summary of 2040 Network Results

Network Statistic			
	No Build	Alternative A	Alternative C
Total Daily VMT	4,930,014	5,032,802	5,017,448
VMT Percent Difference to No Build		2.1%	1.8%
Total Daily VHT	175,557	154,506	154,044
VHT Percent Difference to No Build		-12.0%	-12.3%
Average Speed	33.3	35.7	35.7
Average Speed Percent Difference to No Build		7.3%	7.3%

The results indicate that Alternative A and Alternative C provide similar results. There is an approximate 2% increase in VMT due to traffic along the US 290 and SH 71 study corridors utilizing a higher functional classification under Alternative A and C as compared to the “No Build” condition. The increased capacity and more efficient operation of alternatives A and C result in approximately 12% reduction in VHT. The improvements in both alternatives provide a positive increase in overall average speeds of about 7%.

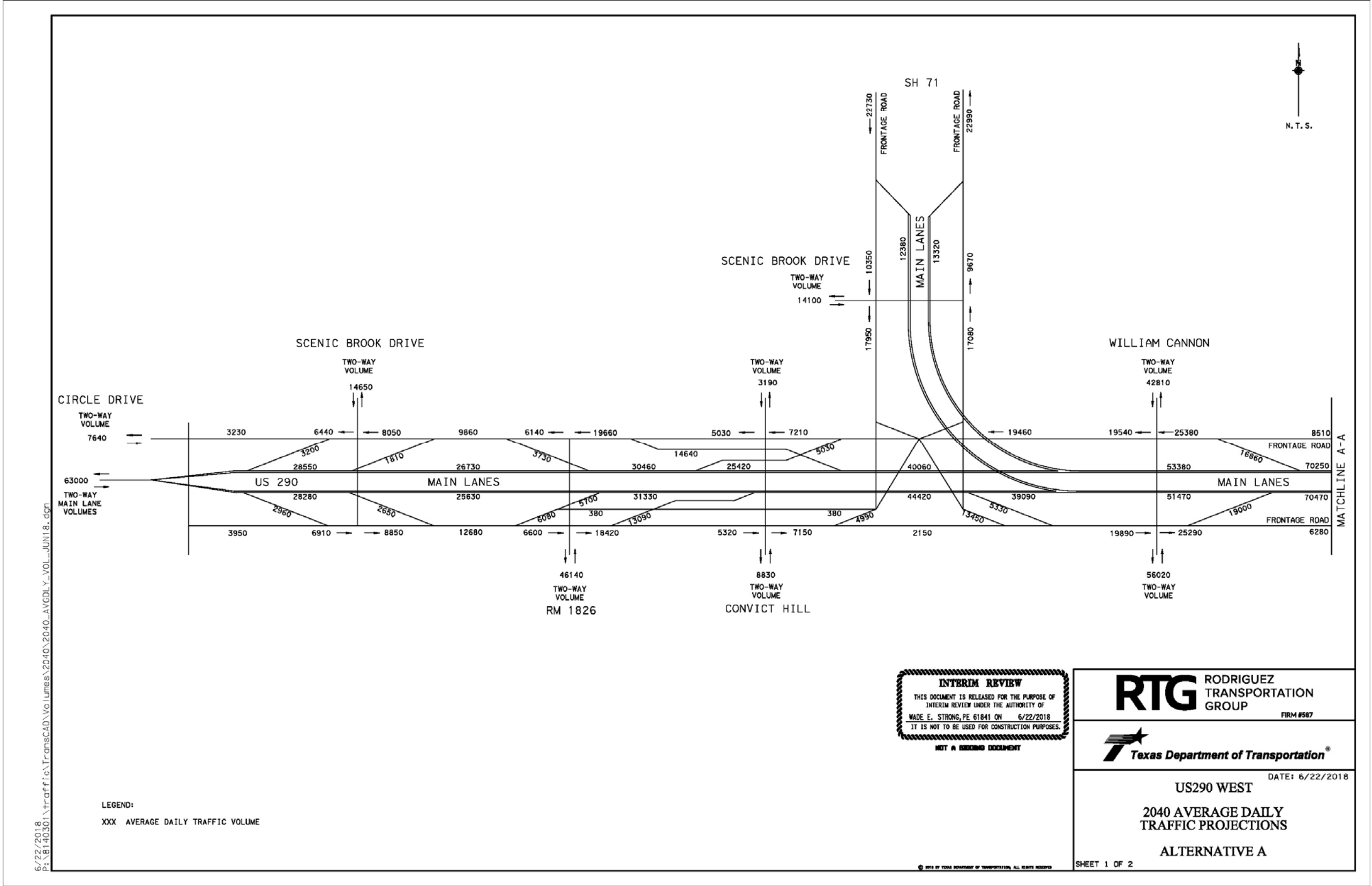
5.1. PREFERRED ALTERNATIVE

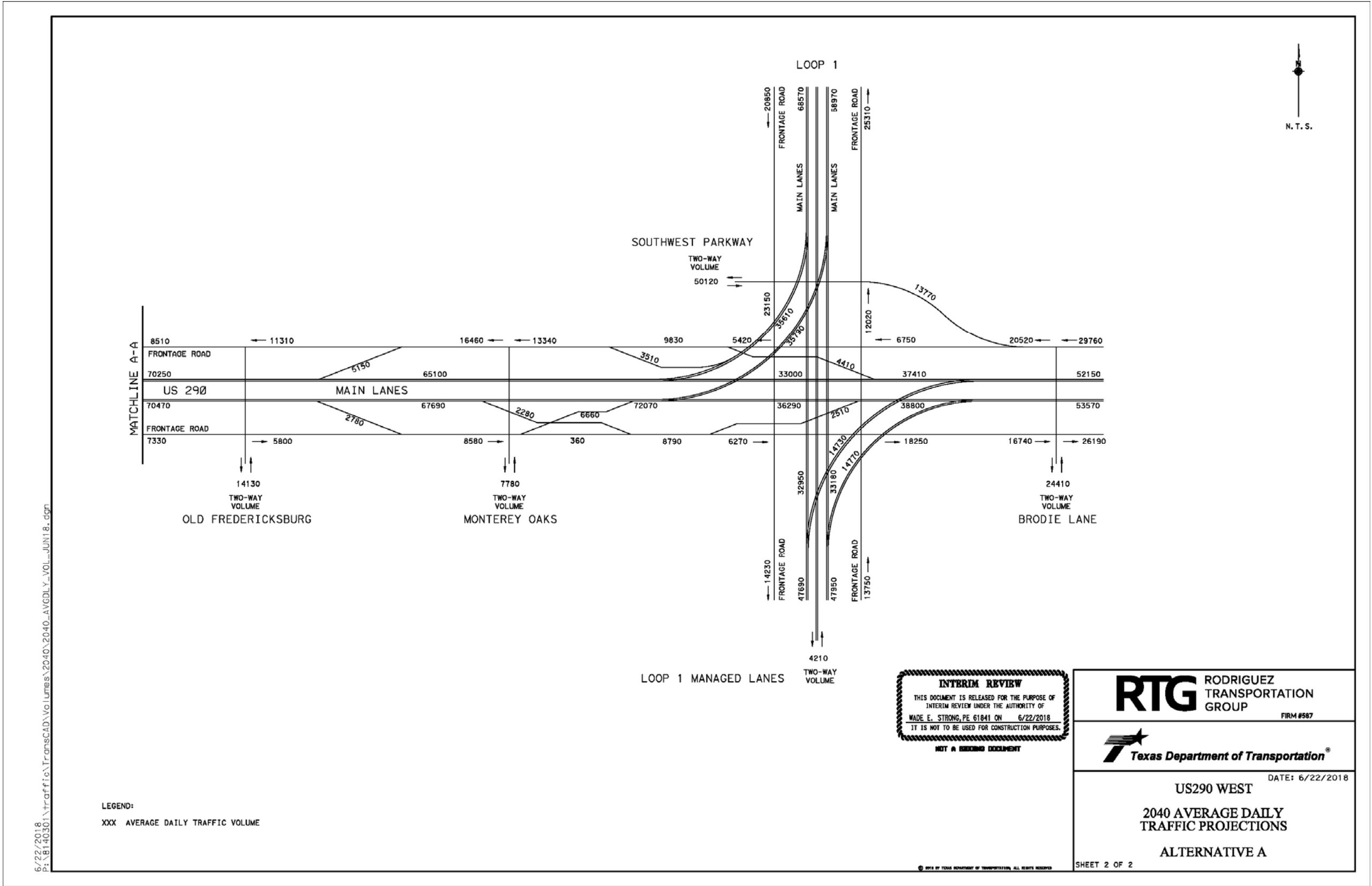
Based on the results found in this traffic forecasting study as well as the overall environmental analysis, Alternative A was chosen as the preferred option. One of the principle reasons Alternative A was chosen was that it provided better access to the traveling public as compared to Alternative C. Due to a change in TxDOT’s funding mechanisms in 2017, the direction to proceed with Alternative A under non-tolled operations was given. Therefore, additional TOD traffic assignments were completed with all toll costs along the US 290 and SH 71 study corridors removed. There were no other changes to the previous Alternative A “Build” scenario except for the toll cost removal.

The updated non-tolled Alternative A forecasts showed an insignificant increase of total traffic along US 290. At William Cannon Drive, the 2040 projected total volume (main lanes and frontage roads) on US 290 increased from approximately 141,400 vpd to 144,300 vpd, which represents an increase of 2%. This indicates that there would be relatively insignificant change in the comparison between the “No Build” and “Build” operations found in the network results under non-tolled conditions. In addition, the change to non-tolled operation shifted a portion of traffic from the frontage roads to the main lanes. At William Cannon Drive, the percentage of traffic that the main lanes are projected to carry would increase from approximately 64% to 73% under the non-tolled operation.

See **Figure 6** for the latest line diagrams with forecasted 2040 daily volumes under the preferred non-tolled Alternative A “Build” scenarios. The forecasted 2040 AM and PM peak hour volumes for the non-tolled Alternative A are provided in **Appendix I**. The recent exhibits for Alternative A with the proposed geometry and details for the environmental study is provided in **Appendix J**.

Figure 6: Line Diagram for 2040 “Build” Alternative A Scenario (Non-Tolled)



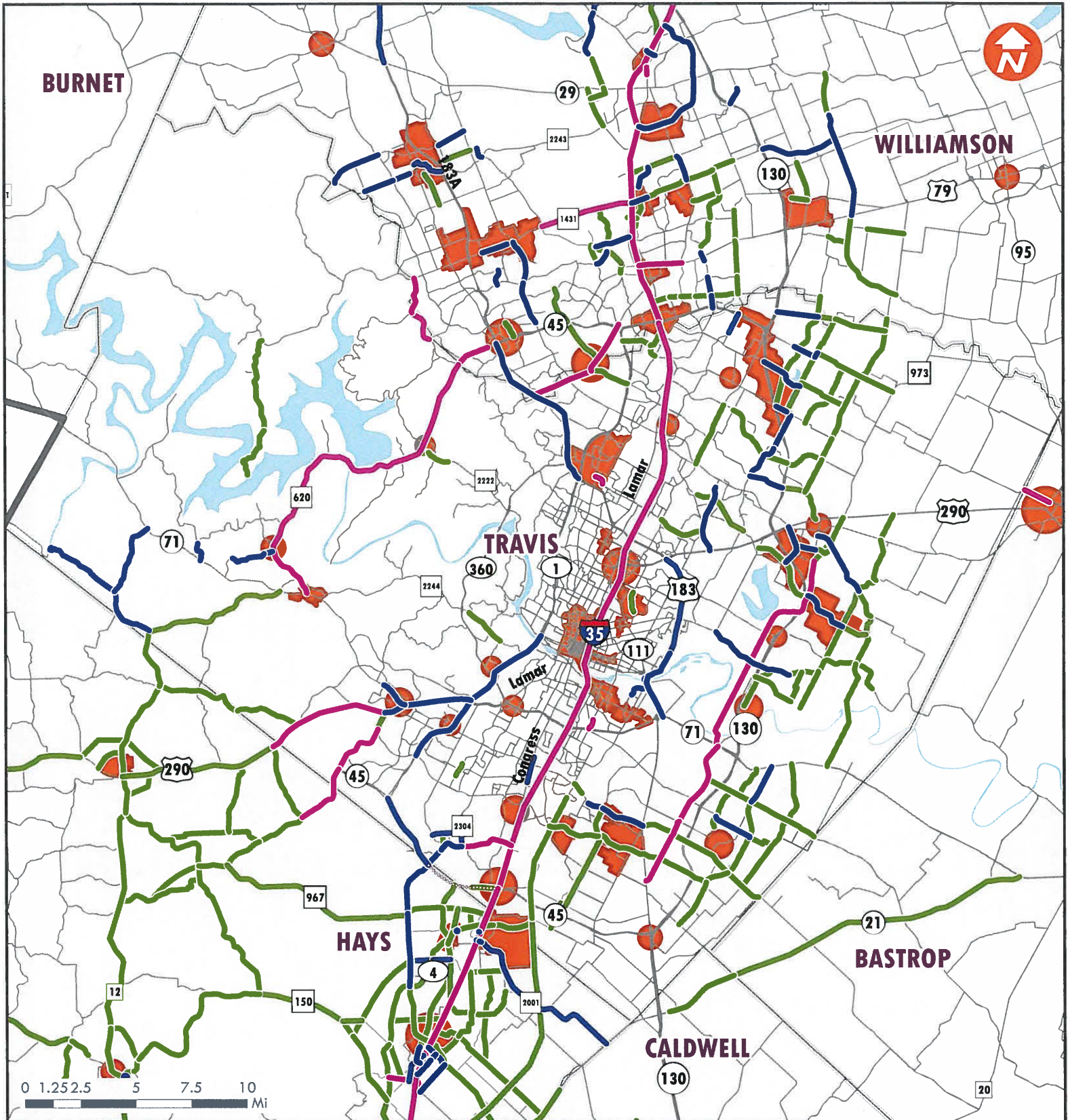


APPENDIX A

CAMPO'S 2040 PROGRAMMED PROJECTS EXHIBIT

Road Projects 2040 with Centers

Travis County
Date: 9/8/2015



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Data Source: CAMPO

Author: GSG
Document Path: H:\Maps\2040 Plan Maps\Revised Plan Maps\CAMPO 2040 Plan Road Projects with Centers.mxd

- Committed
- - - - - Design
- Local
- Preferred
- 2040 Plan Centers



APPENDIX B

TURN PENALTIES

FROM_ID	TO_ID	PENALTY
6045	6046	--
6052	6045	--
21497	21495	--
18240	15262	--
14775	14776	--
14777	14774	--
18213	18192	--
1329	20826	--
20823	20814	--
20831	20834	--
3992	20275	--
20278	20273	--
14768	14765	--
14768	4184	--
4184	14765	--
14766	4184	--
14766	14767	--
12723	12714	--
12750	12749	--
15002	15003	--
12971	12970	--
12971	18371	--
12571	12544	--
15031	15023	--
14116	14117	--
14118	14115	--
14118	14114	--
4073	14095	--
5422	5425	--
5659	5656	--
5671	5675	--
14485	14487	--
5589	14488	--
22409	20752	--
4784	4780	--
4878	20372	--
14469	14471	--
6004	5941	--
5997	5942	--
6143	6133	--
4815	4816	--
3394	3309	--
3394	3395	--
3312	3309	--
3312	3395	--
15185	15186	--
15222	13674	--
15219	15221	--
15439	20922	--
15043	15044	--
7663	7665	--
16959	16957	--
21515	14077	--
6398	6385	--
20951	20952	--
20951	20959	--
20955	20956	--
6376	6375	--
6254	6249	--
4787	17613	--
20545	20544	--
12828	12831	--

FROM_ID	TO_ID	PENALTY
14775	12503	--
14777	14774	--
12503	14774	--
25213	25209	--
25213	25215	--
25220	25219	--
25220	25209	--
2865	25219	--
2865	25215	--

APPENDIX C

SPEED CAPACITY LOOK-UP TABLES

FUNCL	ATYPE	HWY	SPEED	CAP_24HR	CAP_PEAK	ALPHA	BETA	TRN_FACTOR
0	1		15.00	99999	49999	0.15	4.00	1.00
0	2		20.00	99999	49999	0.15	4.00	1.00
0	3		25.00	99999	49999	0.15	4.00	1.00
0	4		30.00	99999	49999	0.15	4.00	1.00
0	5		40.00	99999	49999	0.15	4.00	1.00
1	1		62.00	28200	2170	1.00	6.00	0.80
1	2		65.00	25100	2170	1.00	6.00	0.80
1	3		72.00	22500	2160	1.00	6.00	0.80
1	4		72.00	20200	2150	1.00	6.00	0.80
1	5		76.00	16700	2130	1.00	6.00	0.80
2	1		55.00	28200	2170	1.00	6.00	0.80
2	2		60.00	25100	2170	1.00	6.00	0.80
2	3		63.00	22500	2160	1.00	6.00	0.80
2	4		68.00	20200	2150	1.00	6.00	0.80
2	5		72.00	16700	2130	1.00	6.00	0.80
3	1		40.00	13300	1170	1.00	6.00	0.35
3	2		44.00	11800	1150	1.00	6.00	0.40
3	3		47.00	10400	1130	1.00	6.00	0.40
3	4		54.00	9200	1090	1.00	6.00	0.40
3	5		69.00	7000	980	1.00	6.00	0.40
4	1		28.00	9400	900	1.30	4.00	0.30
4	2		38.00	9000	890	1.30	4.00	0.35
4	3		44.00	8000	870	1.30	4.00	0.35
4	4		55.00	7000	840	1.30	4.00	0.35
4	5		63.00	5300	760	1.30	4.00	0.35
5	1		26.00	9400	900	1.30	4.00	0.30
5	2		35.00	9000	890	1.30	4.00	0.35
5	3		43.00	8000	870	1.30	4.00	0.35
5	4		52.00	7000	840	1.30	4.00	0.35
5	5		59.00	5300	760	1.30	4.00	0.35
6	1		23.00	9100	770	1.30	4.00	0.30
6	2		29.00	8200	760	1.30	4.00	0.35
6	3		38.00	7300	750	1.30	4.00	0.35
6	4		47.00	6300	720	1.30	4.00	0.35
6	5		53.00	4800	660	1.30	4.00	0.35
7	1		25.00	8100	810	1.50	4.00	0.30
7	2		33.00	7700	800	1.50	4.00	0.35
7	3		39.00	6900	780	1.50	4.00	0.35
7	4		46.00	6000	760	1.50	4.00	0.35
7	5		59.00	4600	690	1.50	4.00	0.35
8	1		24.00	8100	810	1.50	4.00	0.30
8	2		31.00	7700	800	1.50	4.00	0.35
8	3		37.00	6900	780	1.50	4.00	0.35
8	4		46.00	6000	760	1.50	4.00	0.35
8	5		56.00	4600	690	1.50	4.00	0.35
9	1		22.00	7800	700	1.50	4.00	0.30
9	2		28.00	7000	690	1.50	4.00	0.35
9	3		33.00	6200	670	1.50	4.00	0.35
9	4		41.00	5500	660	1.50	4.00	0.35
9	5		51.00	4200	610	1.50	4.00	0.35
10	1		23.00	6500	680	0.50	5.30	0.30
10	2		28.00	6000	670	0.50	5.30	0.50
10	3		33.00	5700	650	0.50	5.30	0.50
10	4		43.00	5200	640	0.50	5.30	0.50
10	5		50.00	2500	500	0.50	5.30	0.60
11	1		23.00	6500	680	0.50	5.30	0.30
11	2		28.00	6000	670	0.50	5.30	0.50
11	3		33.00	5700	650	0.50	5.30	0.50
11	4		40.00	5200	640	0.50	5.30	0.50
11	5		47.00	2500	500	0.50	5.30	0.60
12	1		22.00	6500	680	0.50	5.30	0.30

FUNCL	ATYPE	HWY_SPEED	CAP_24HR	CAP_PEAK	ALPHA	BETA	TRN_FACTOR
12	2	27.00	6000	670	0.50	5.30	0.50
12	3	32.00	5700	650	0.50	5.30	0.50
12	4	37.00	5200	640	0.50	5.30	0.50
12	5	44.00	2500	500	0.50	5.30	0.60
13	1	21.00	3800	410	0.50	5.30	0.30
13	2	26.00	3500	400	0.50	5.30	0.50
13	3	31.00	3100	390	0.50	5.30	0.50
13	4	36.00	2800	380	0.50	5.30	0.50
13	5	49.00	2100	350	0.50	5.30	0.60
14	1	21.00	3800	410	0.50	5.30	0.30
14	2	25.00	3500	400	0.50	5.30	0.50
14	3	30.00	3100	390	0.50	5.30	0.50
14	4	35.00	2800	380	0.50	5.30	0.50
14	5	47.00	2100	350	0.50	5.30	0.60
15	1	20.00	3800	410	0.50	5.30	0.30
15	2	24.00	3500	400	0.50	5.30	0.50
15	3	29.00	3100	390	0.50	5.30	0.50
15	4	34.00	2800	380	0.50	5.30	0.50
15	5	45.00	2100	350	0.50	5.30	0.60
16	1	45.00	28150	1971	0.15	4.00	0.80
16	2	50.00	26300	1971	0.15	4.00	0.80
16	3	55.00	24650	1971	0.15	4.00	0.80
16	4	60.00	21600	1945	0.15	4.00	0.80
16	5	65.00	17750	1907	0.15	4.00	0.80
17	1	26.00	22350	1565	0.15	4.00	0.80
17	2	30.00	20850	1565	0.15	4.00	0.80
17	3	35.00	19550	1565	0.15	4.00	0.80
17	4	42.00	17150	1544	0.15	4.00	0.80
17	5	54.00	14100	1514	0.15	4.00	0.80
18	1	37.00	8100	810	0.50	4.00	0.30
18	2	43.00	7700	800	0.50	4.00	0.35
18	3	47.00	6900	780	0.50	4.00	0.35
18	4	53.00	6000	760	0.50	4.00	0.35
18	5	58.00	4600	690	0.50	4.00	0.35
19	1	60.00	28200	2170	1.00	6.00	0.80
19	2	63.00	25100	2170	1.00	6.00	0.80
19	3	65.00	22500	2160	1.00	6.00	0.80
19	4	70.00	20200	2150	1.00	6.00	0.80
19	5	75.00	16700	2130	1.00	6.00	0.80
20	1	60.00	28150	1971	0.15	4.00	0.35
20	2	63.00	26300	1971	0.15	4.00	0.40
20	3	65.00	24650	1971	0.15	4.00	0.40
20	4	70.00	21600	1945	0.15	4.00	0.40
20	5	75.00	17750	1907	0.15	4.00	0.40
21	1	70.00	28200	2170	1.00	6.00	0.80
21	2	73.00	25100	2170	1.00	6.00	0.80
21	3	76.00	22500	2160	1.00	6.00	0.80
21	4	79.00	20200	2150	1.00	6.00	0.80
21	5	82.00	16700	2130	1.00	6.00	0.80
22	1	71.00	28200	2170	1.00	6.00	0.80
22	2	75.00	25100	2170	1.00	6.00	0.80
22	3	79.00	22500	2160	1.00	6.00	0.80
22	4	83.00	20200	2150	1.00	6.00	0.80
22	5	87.00	16700	2130	1.00	6.00	0.80
23	1	26.00	28150	1971	0.15	4.00	0.80
23	2	30.00	26300	1971	0.15	4.00	0.80
23	3	35.00	24650	1971	0.15	4.00	0.80
23	4	35.00	21600	1945	0.15	4.00	0.80
23	5	42.00	17750	1907	0.15	4.00	0.80
24	1	45.00	28150	1971	0.15	4.00	0.80
24	2	50.00	26300	1971	0.15	4.00	0.80

FUNCL	ATYPE	HWY_SPEED	CAP_24HR	CAP_PEAK	ALPHA	BETA	TRN_FACTOR
24	3	55.00	24650	1971	0.15	4.00	0.80
24	4	55.00	21600	1945	0.15	4.00	0.80
24	5	60.00	17750	1907	0.15	4.00	0.80

APPENDIX D

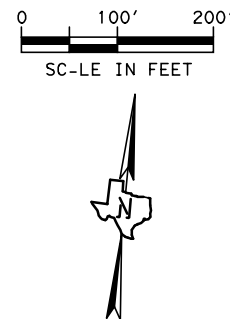
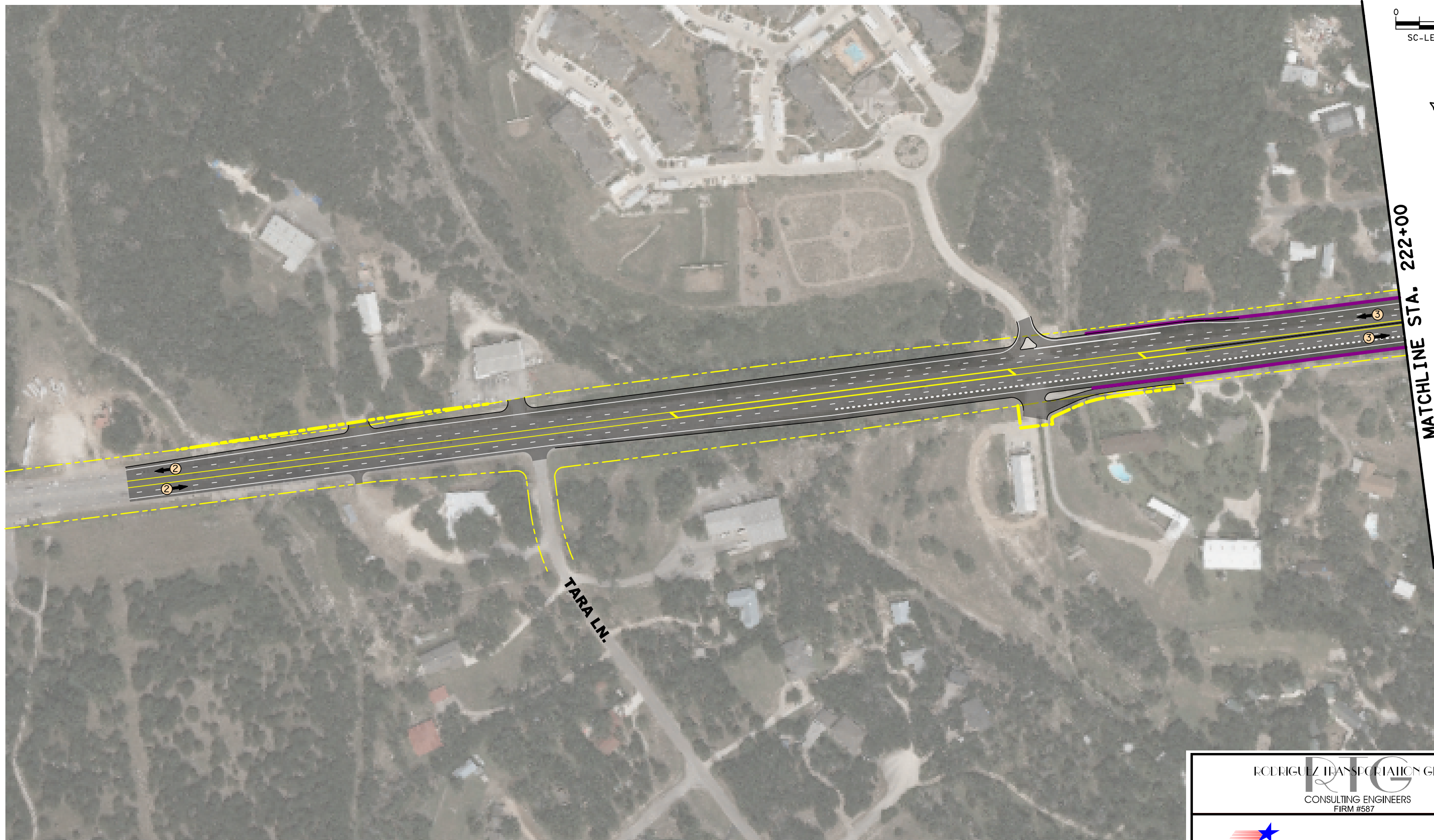
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IH 35 Managed Lane	0.5500	0.5500
IH 35 N Managed Lane	0.5500	0.5500
IH 35 S Managed Lane	0.3000	0.4500
Loop 1 N	0.5500	0.5500
Loop 1 N ML	0.5500	0.5500
Loop 1 S ML	0.5500	0.5500
LW01	0.4500	0.5500
SH 130 Seg 1	0.3000	0.4500
SH 130 Seg 2	0.3000	0.4500
SH 130 Seg 3	0.3000	0.4500
SH 130 Seg 4	0.3000	0.4500
SH 130 Seg 5 & 6	0.3000	0.4500
SH 45 N Seg 1	0.3000	0.5500
SH 45 N Seg 2	0.3000	0.5500
SH 45 N Seg 3	0.3000	0.5500
SH 45 N Seg 4	0.3000	0.5500
SH 45 SE	0.3000	0.4500
SH 45 SW	0.3000	0.4500
SH 71 E	0.4500	0.5500
SH 71 W	0.4500	0.5500
US 183 N ML	0.5500	0.5500
US 183 S	0.4500	0.5500
US 290 E	0.4500	0.5500
US 290 W	0.4500	0.5500

APPENDIX E

ALTERNATIVE A EXHIBITS

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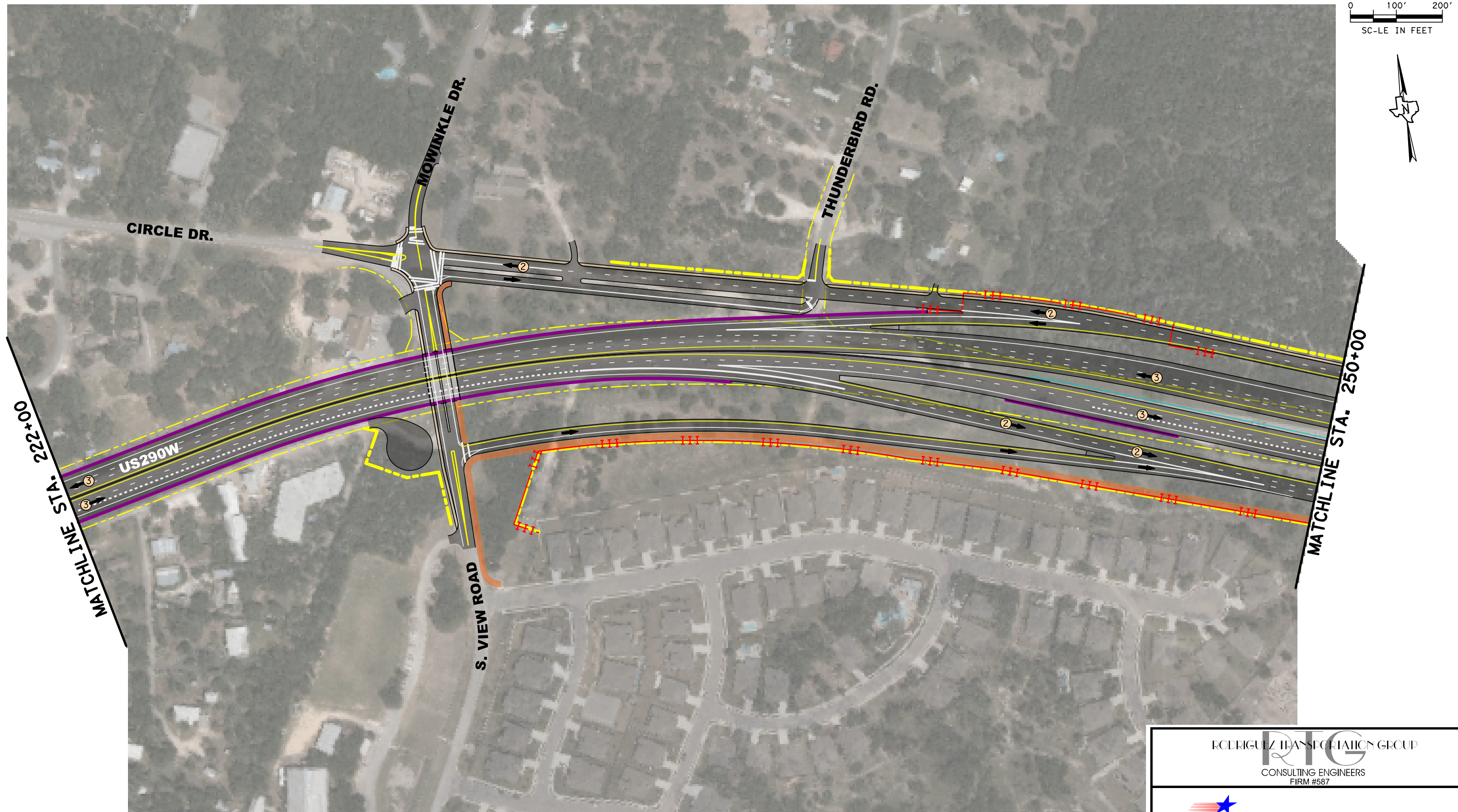


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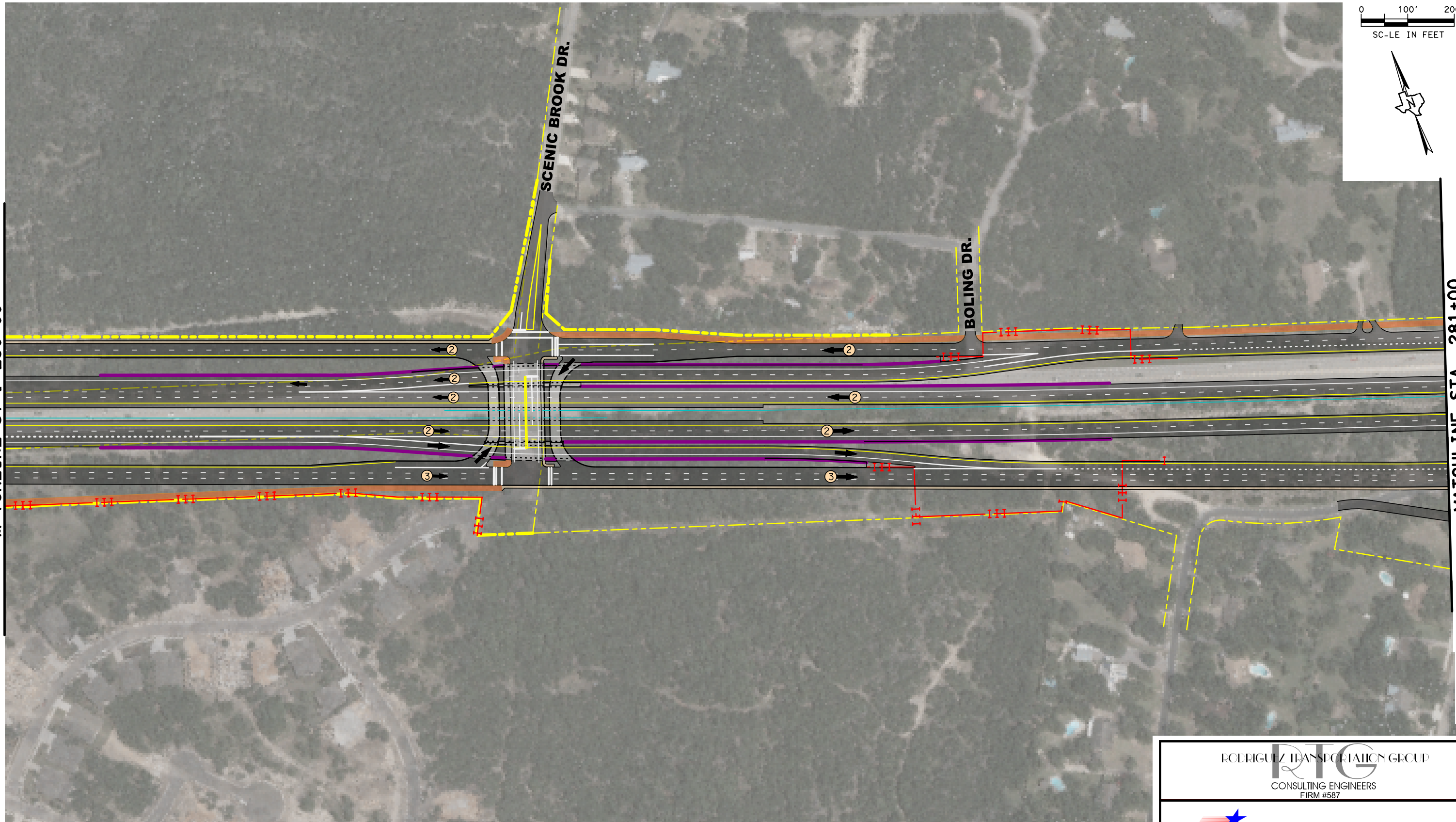
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M-TCHLINE ST-- 250+00



MATCHLINE STA. 281+00

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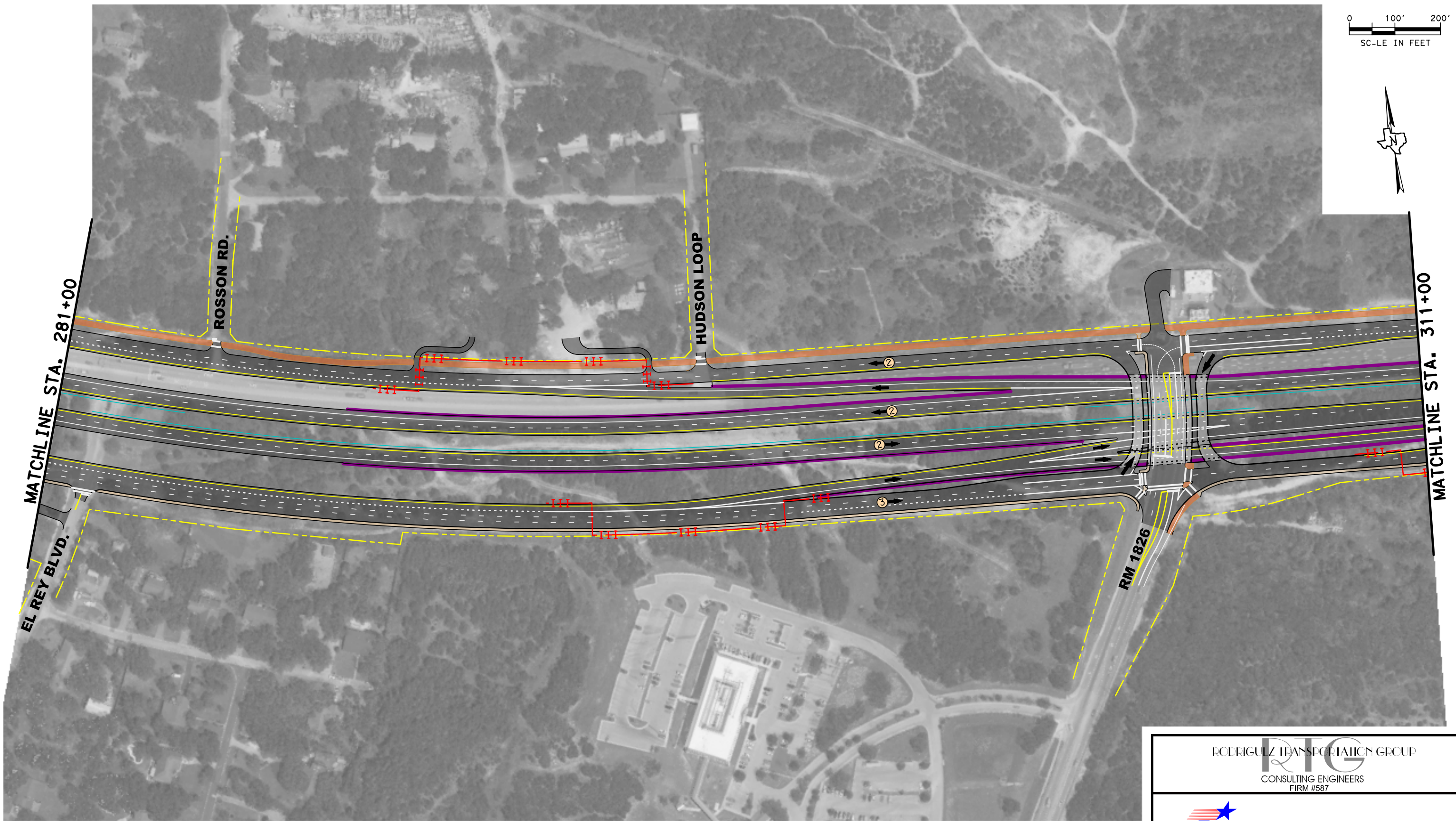
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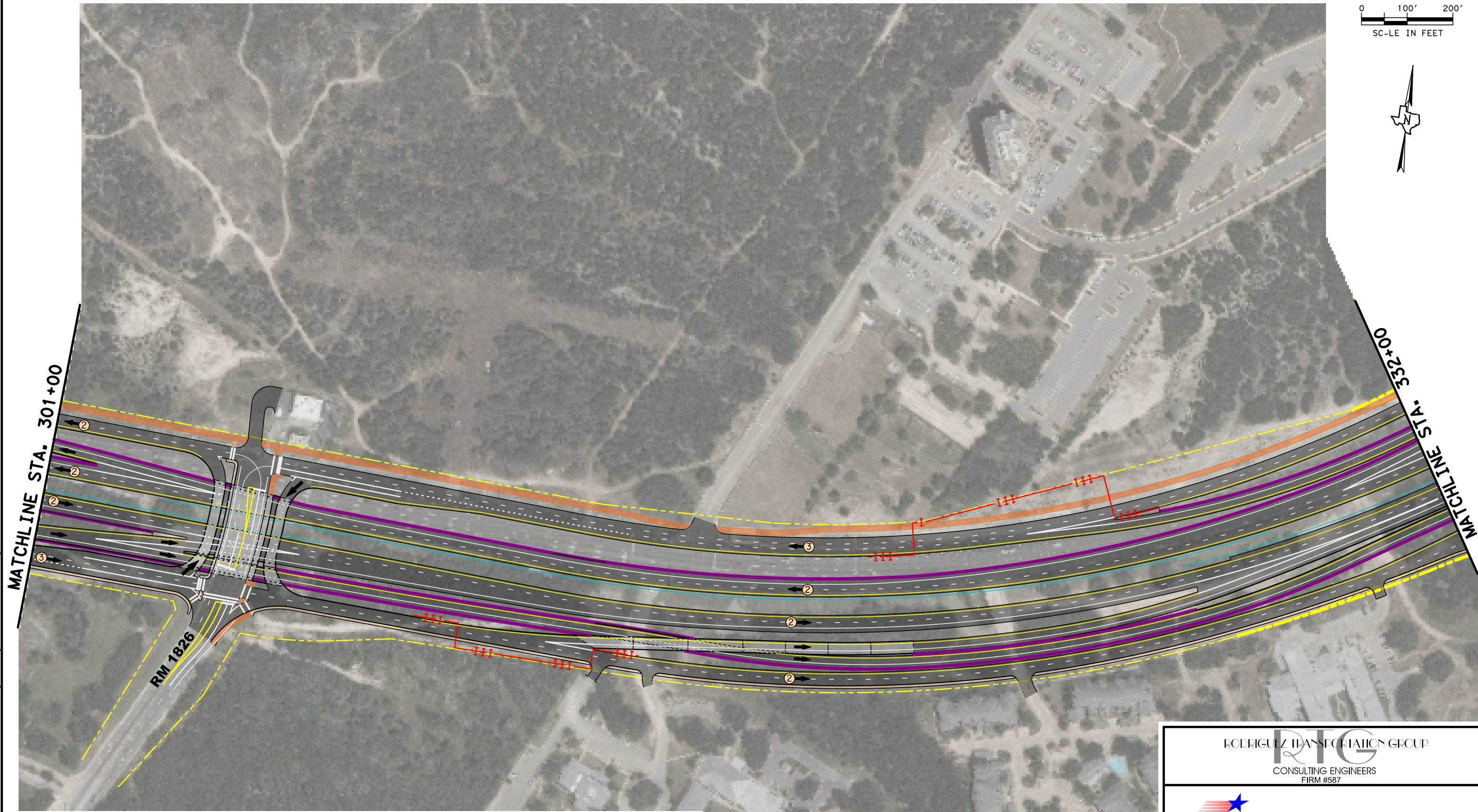


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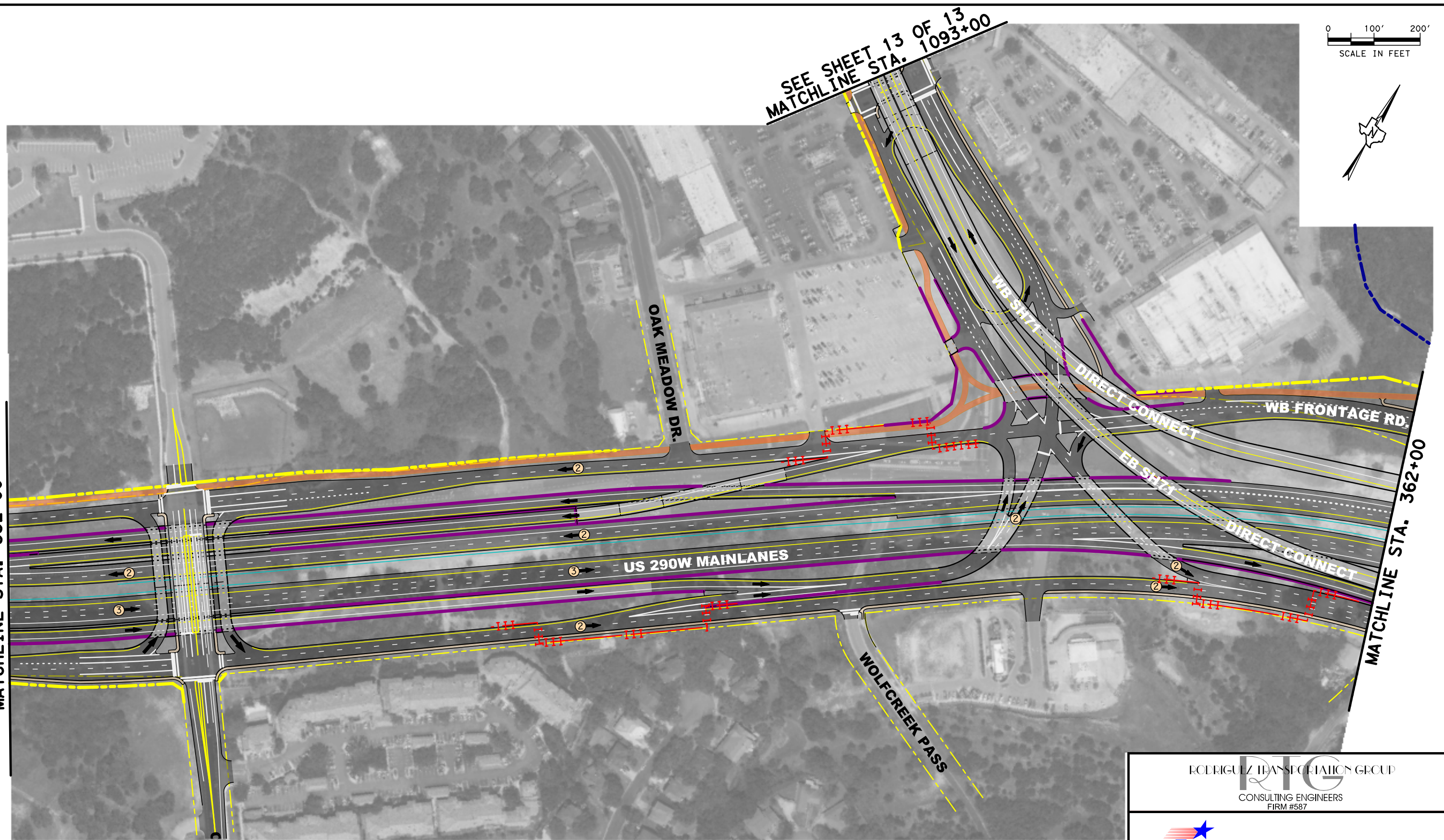


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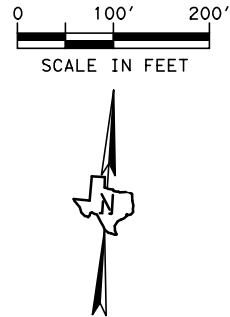
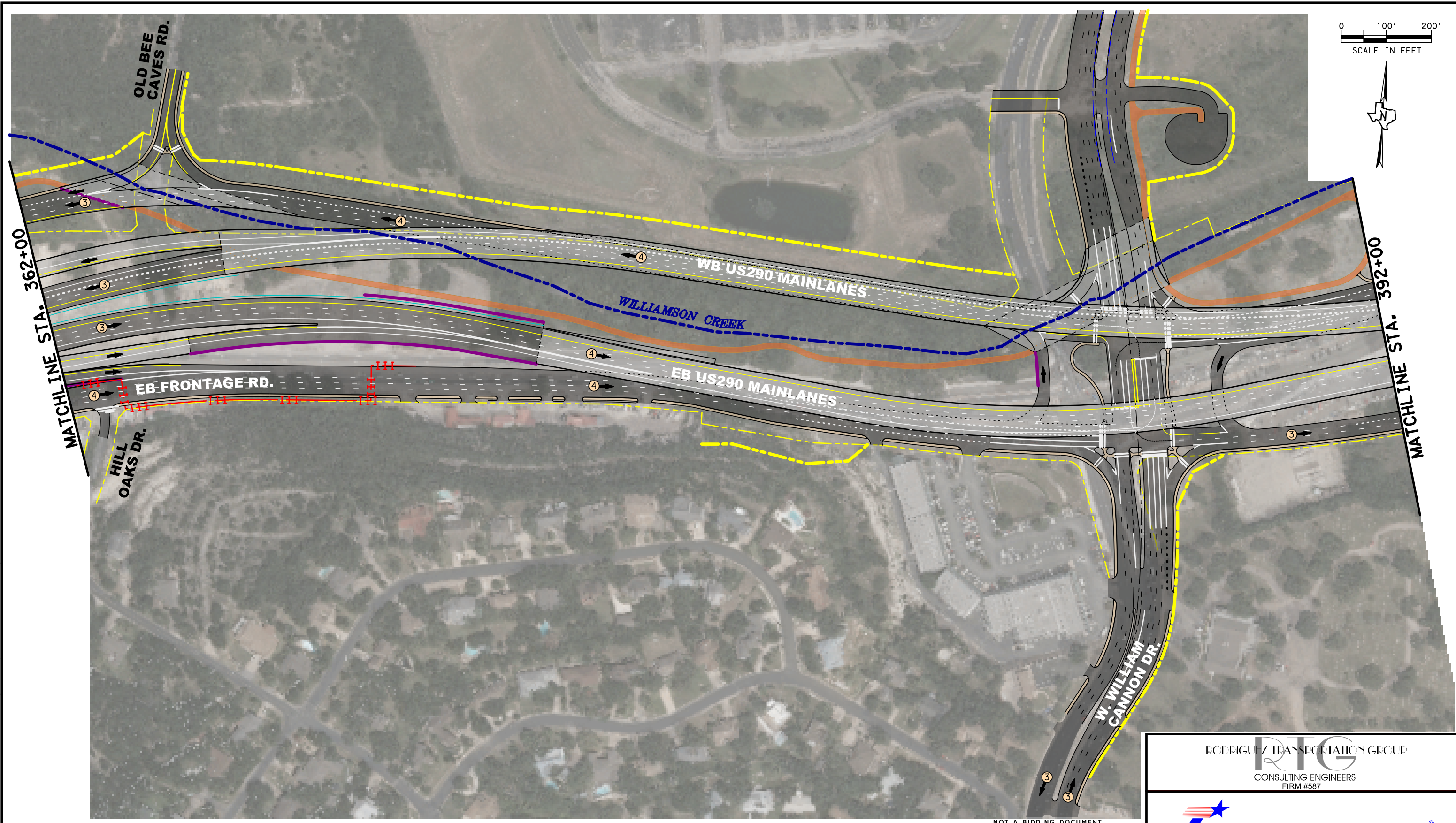


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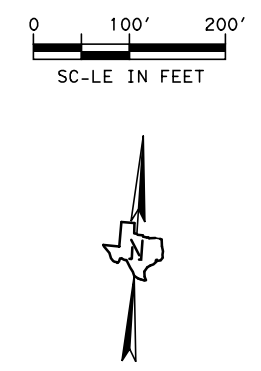
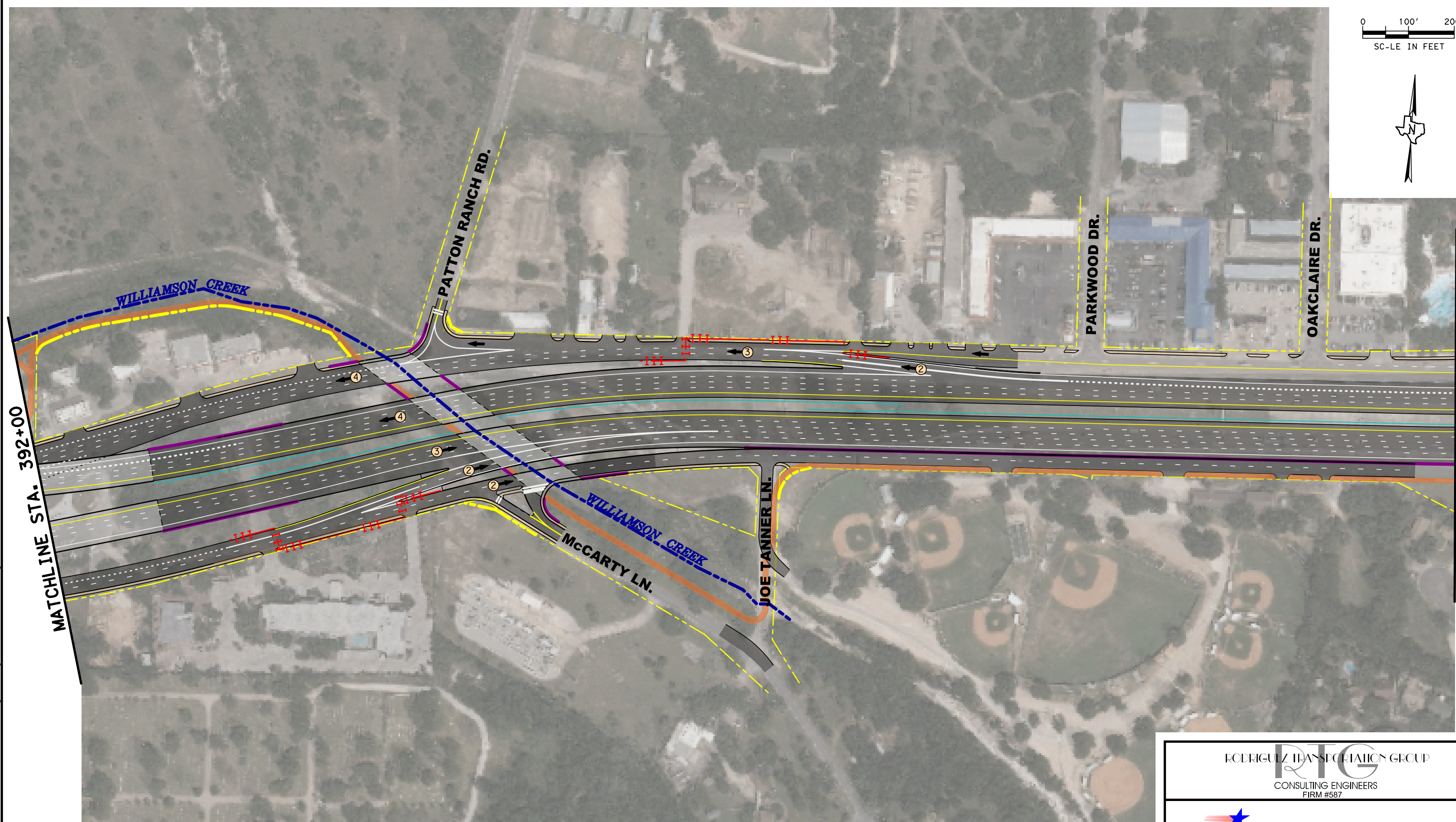
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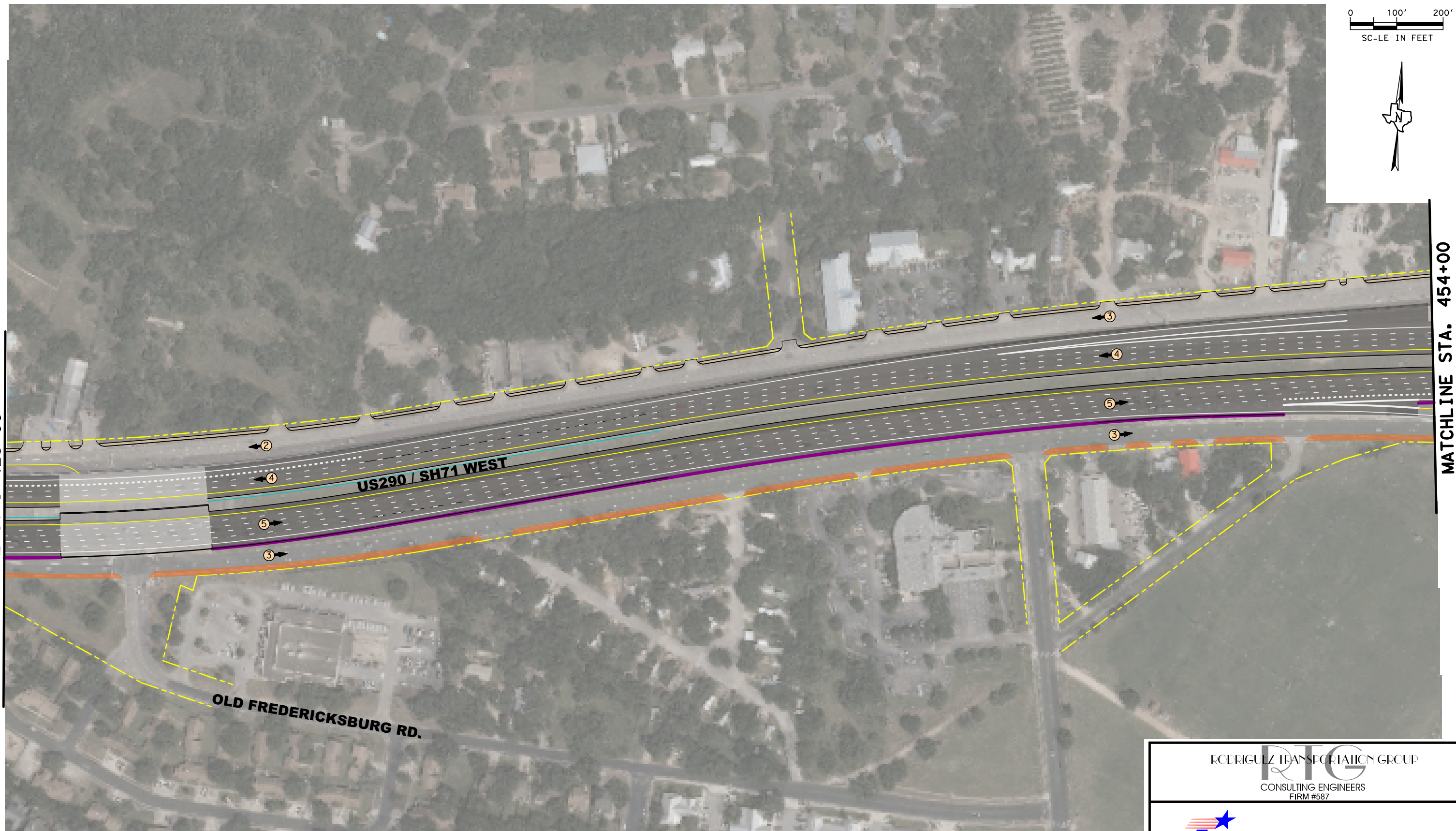


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MATCHLINE ST.-. 423+00



0 100' 200'
SC-LE IN FEET



MATCHLINE STA. 454+00

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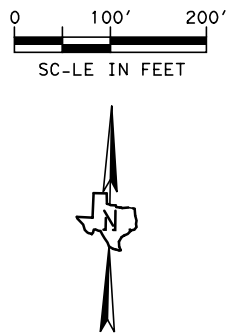
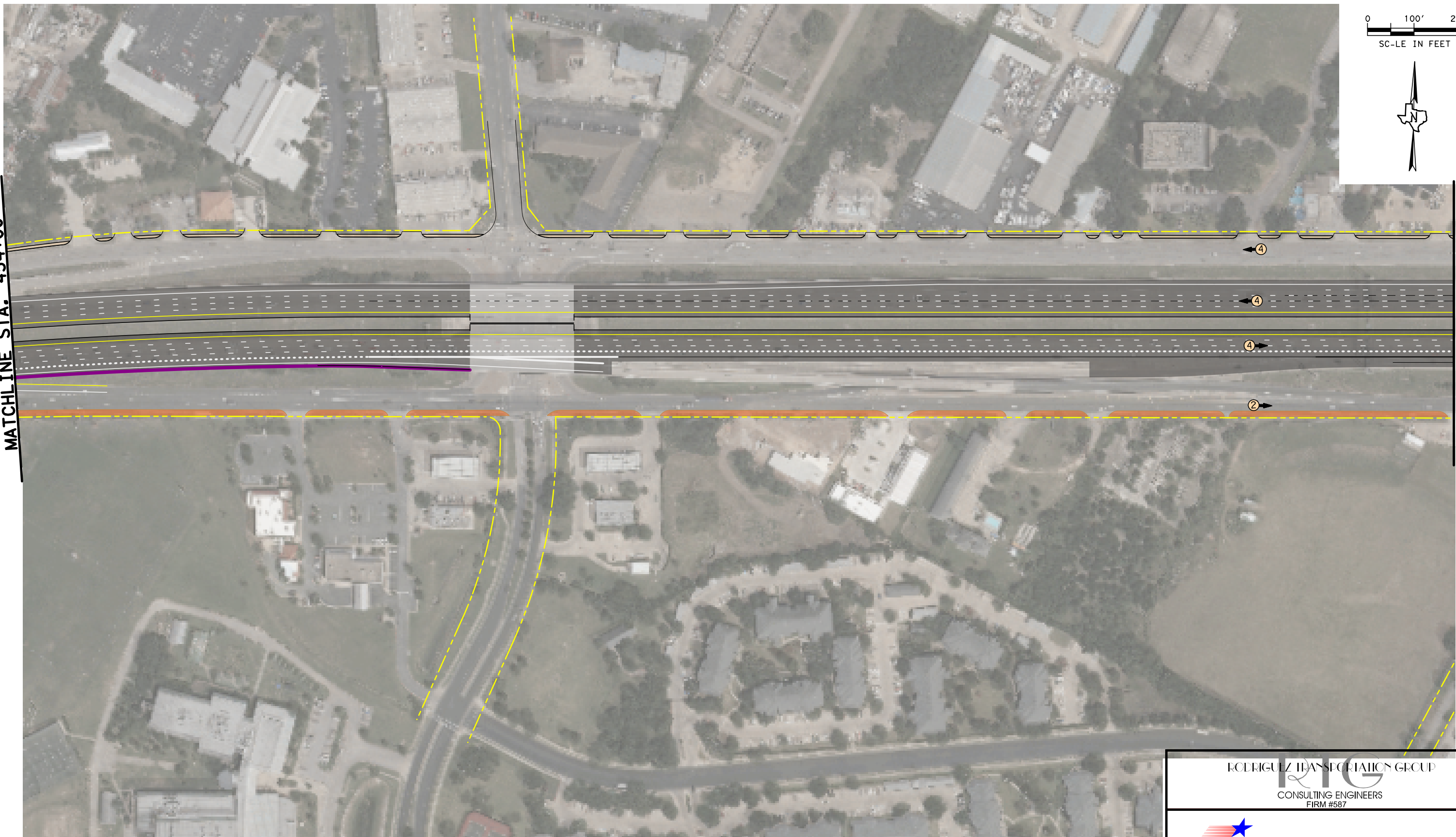
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MATCHLINE STA. 454+00



MATCHLINE ST. 485+00

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US290 WEST
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TRAFFIC FORECASTING STUDY

SHEET 10 OF 13

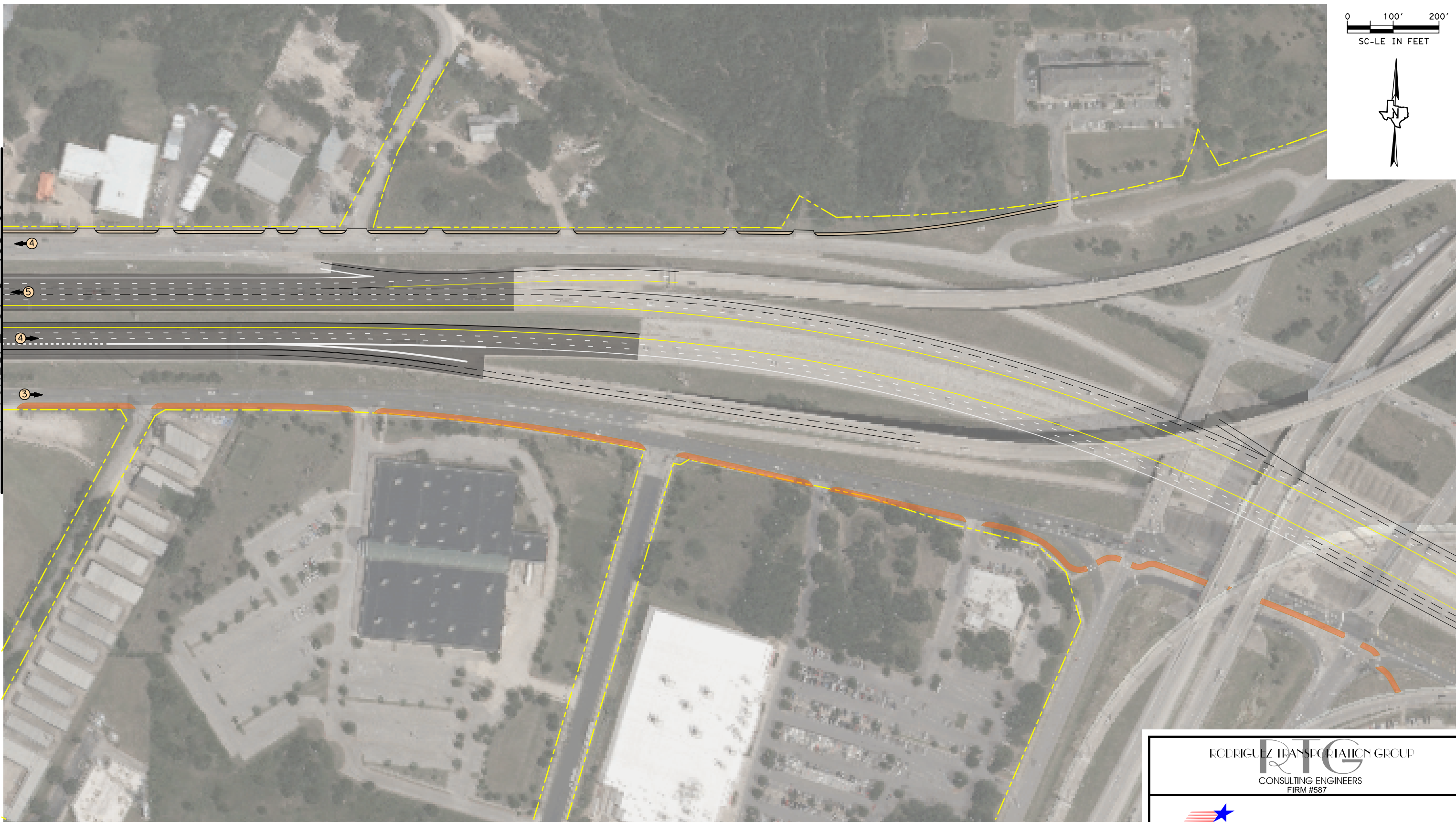
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M-TCHLINE ST - 485+00



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CONSULTING ENGINEERS
FIRM #587



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US290 WEST
PRELIMINARY DESIGN
"ALTERNATIVE A"
TRAFFIC FORECASTING STUDY

SHEET 11 OF 13

3/28/2016
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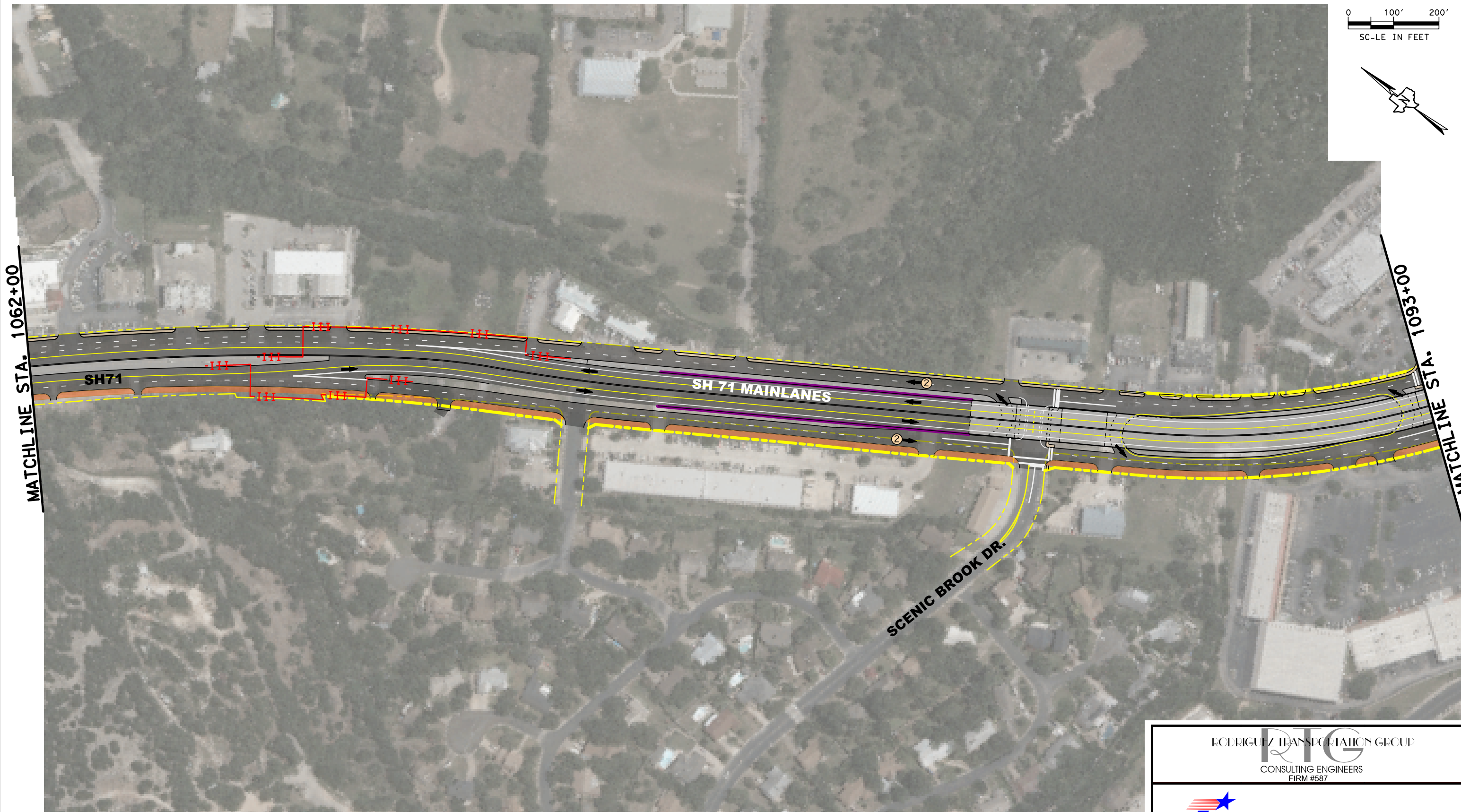


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SH71
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TRAFFIC FORECASTING STUDY

SHEET 12 OF 13

3/28/2016
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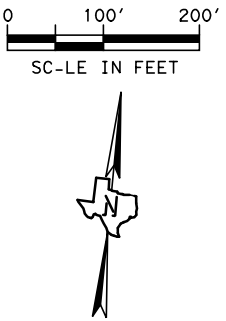
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SH71
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TRAFFIC FORECASTING STUDY

SHEET 13 OF 13

APPENDIX F
ALTERNATIVE C EXHIBITS

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MATCHLINE STA. 222+00

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US290 WEST
PRELIMINARY DESIGN
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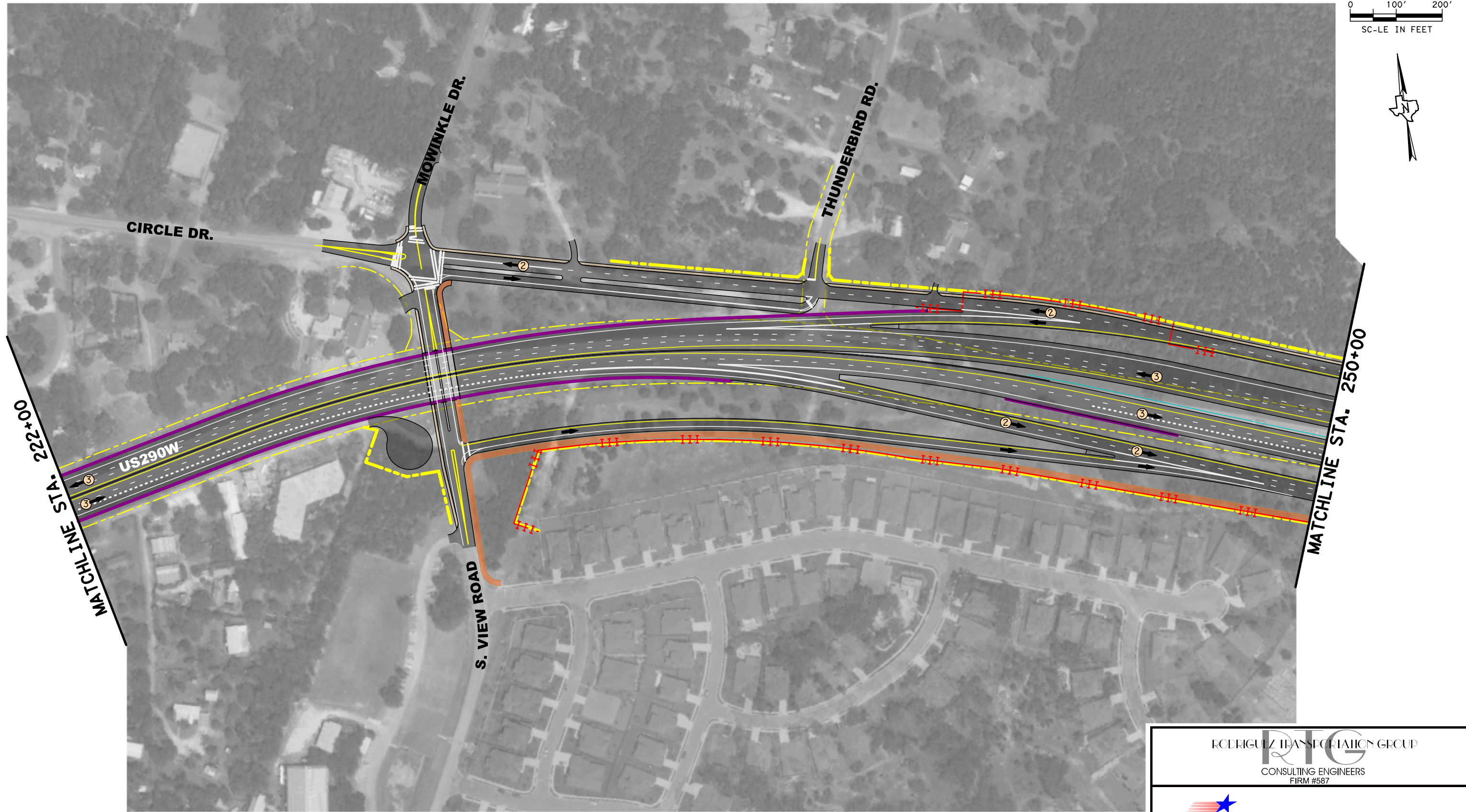
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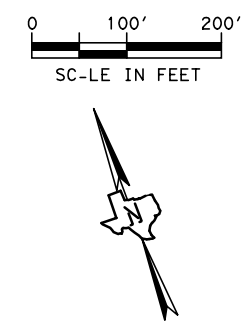
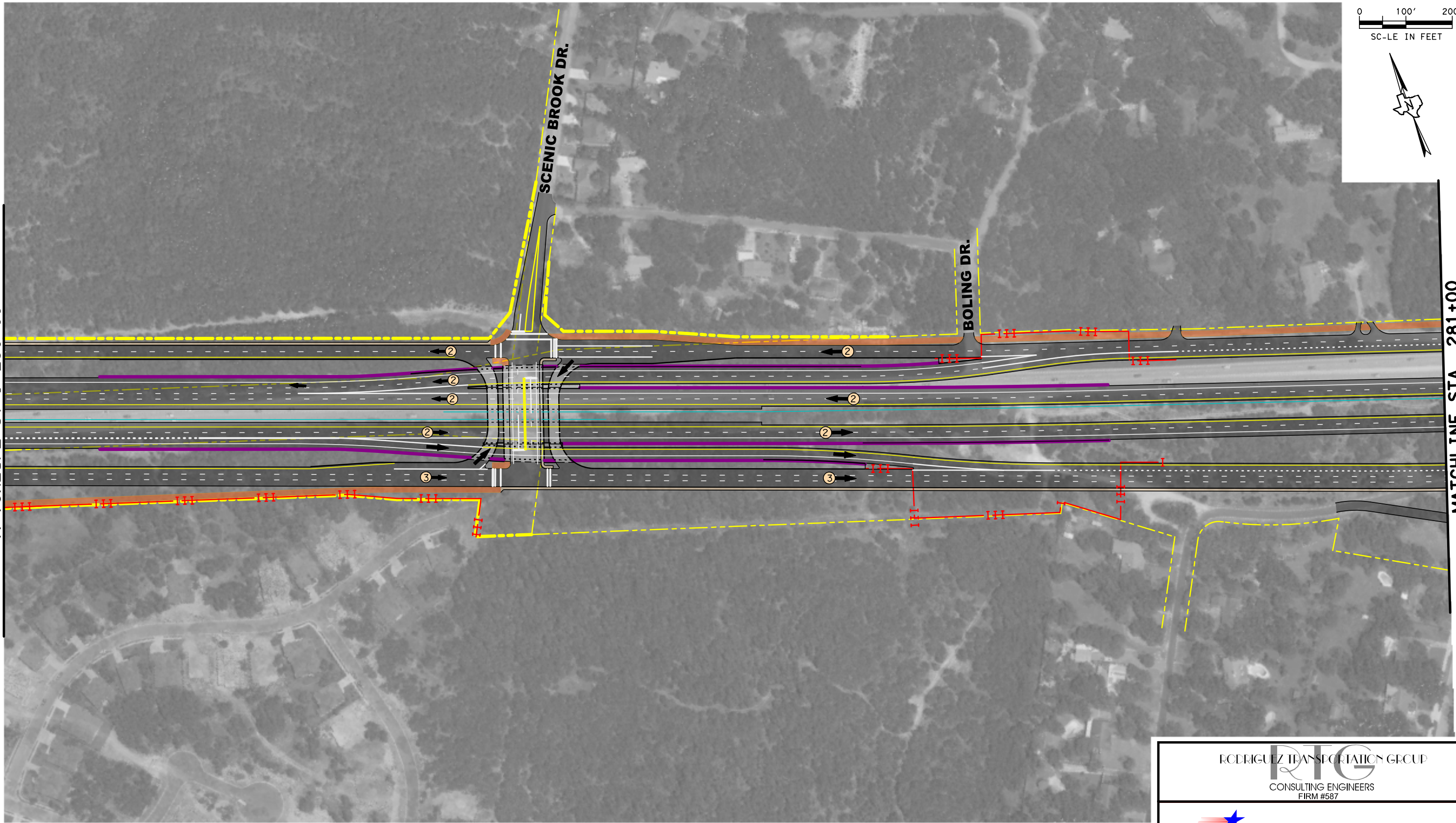
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US290 WEST
PRELIMINARY DESIGN
"ALTERNATIVE C"
TRAFFIC FORECASTING STUDY

SHEET 2 OF 13

3/28/2016
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M-TCHLINE ST-- 250+00



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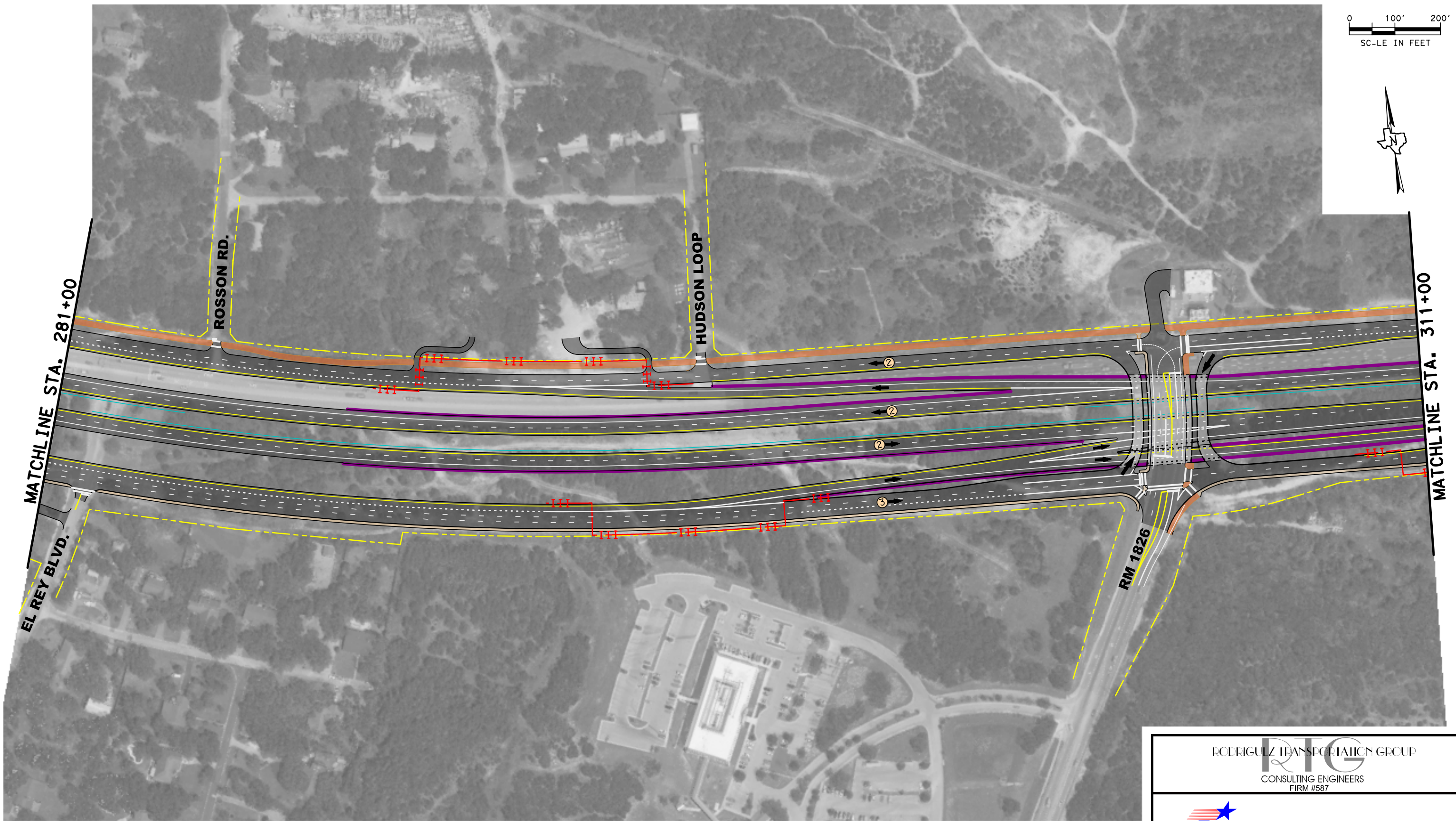


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TRAFFIC FORECASTING STUDY

3/28/2016
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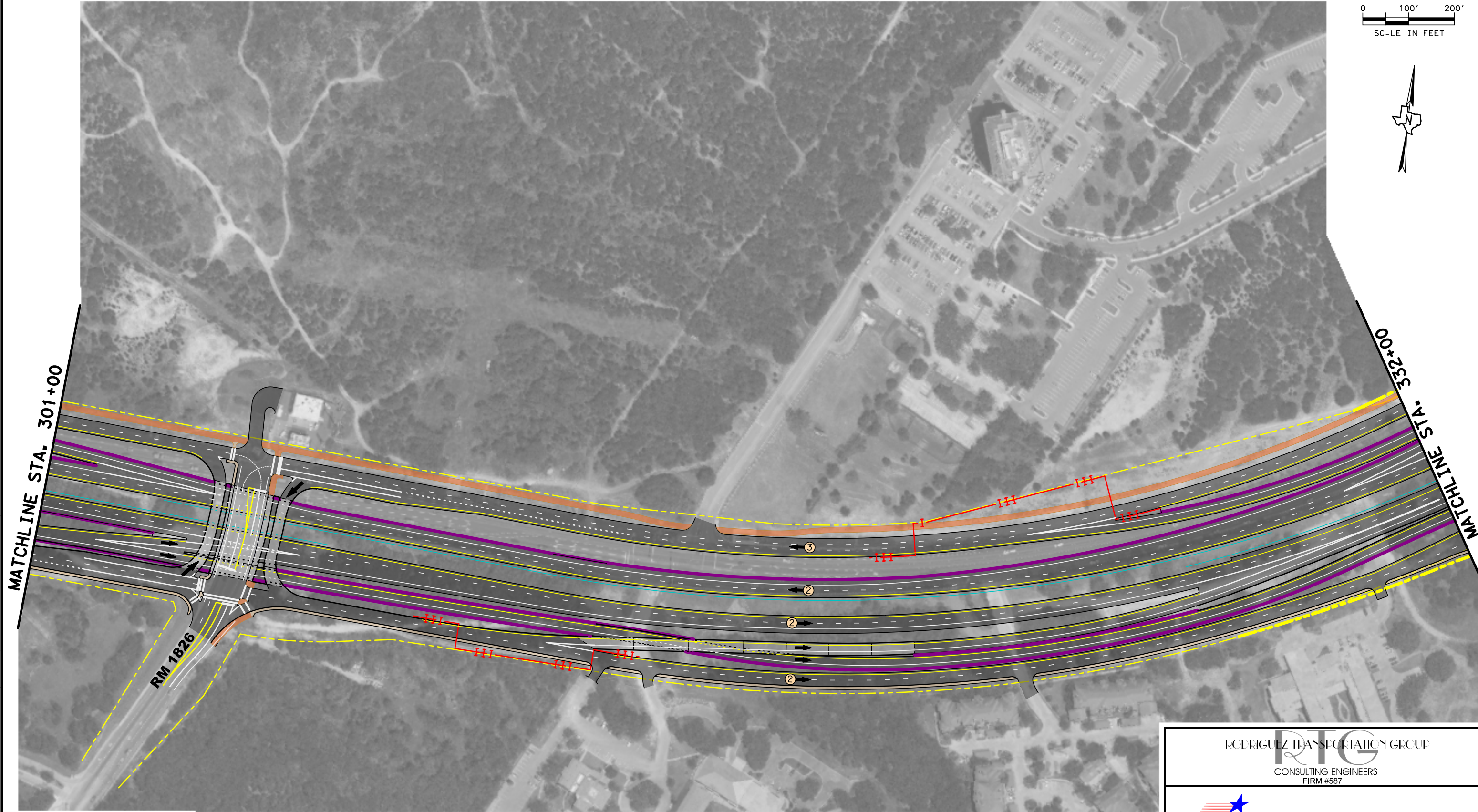
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TRAFFIC FORECASTING STUDY

SHEET 4 OF 13

3/28/2016
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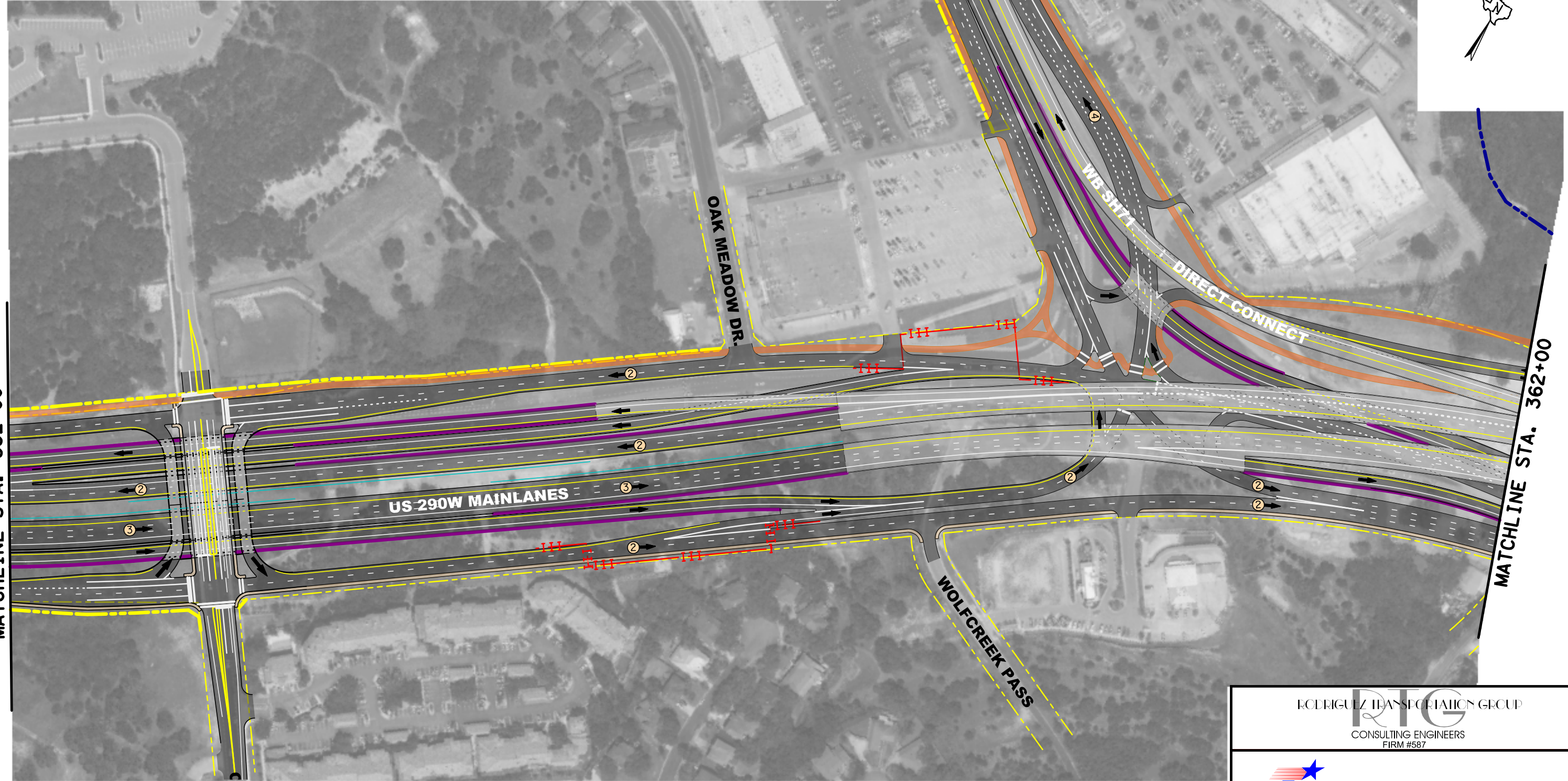
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TRAFFIC FORECASTING STUDY

SHEET 5 OF 13

3/28/2016
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MATCHLINE STA. 332+00



SEE SHEET 13 OF 13
MATCHLINE STA. 1093+00

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SCALE IN FEET



MATCHLINE STA. 362+00

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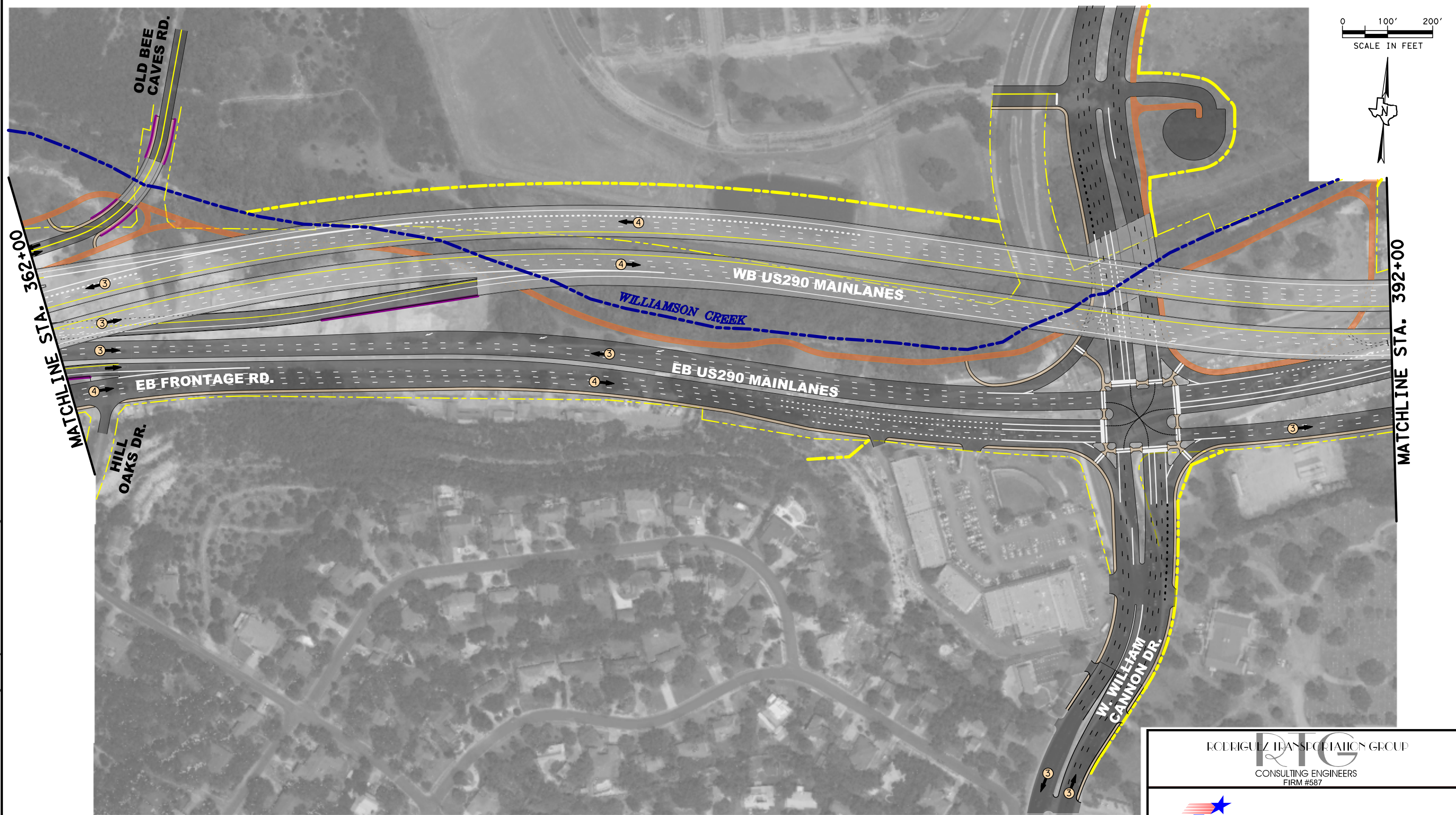
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TRAFFIC FORECASTING STUDY

SHEET 6 OF 13

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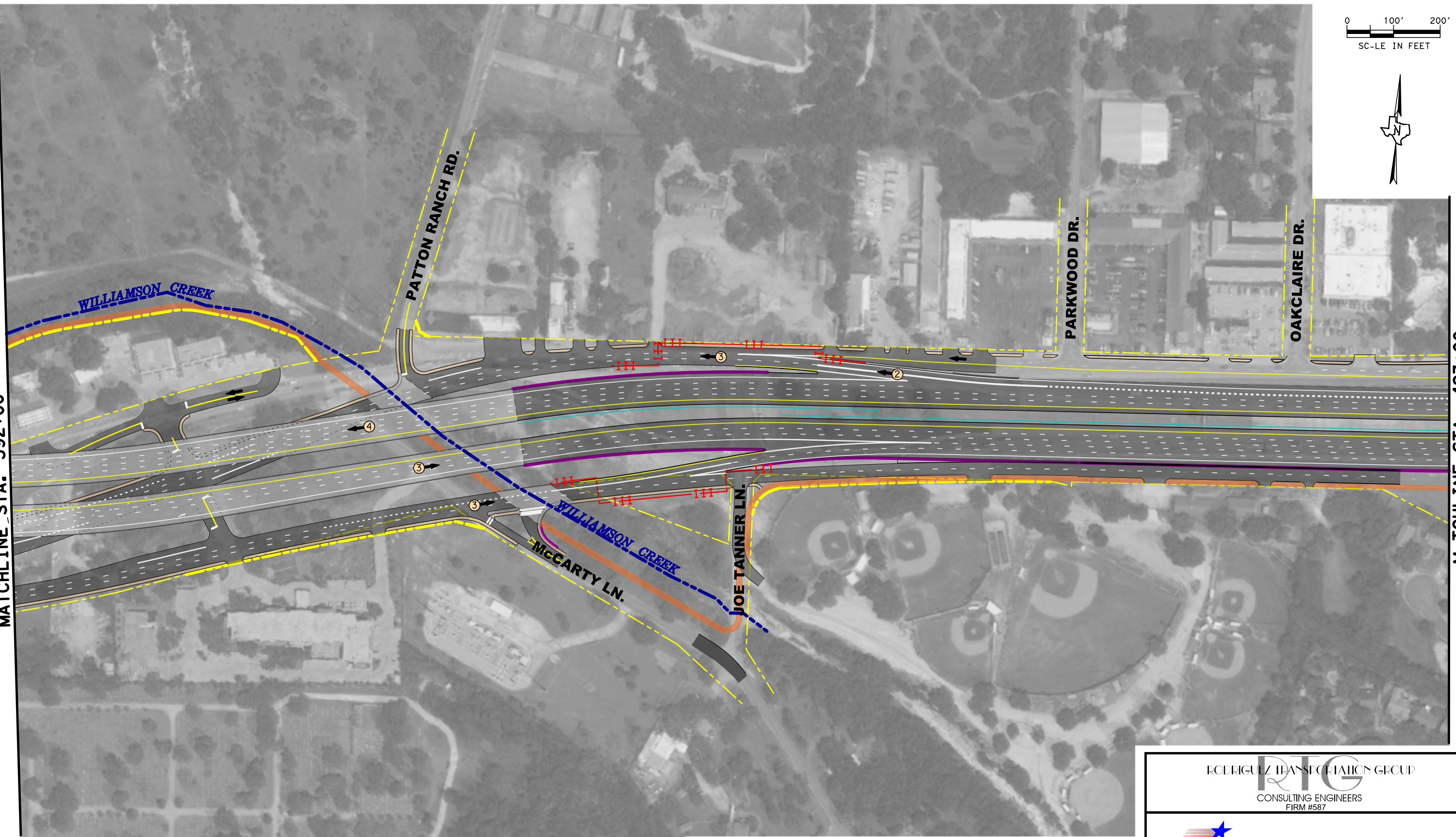


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MATCHLINE STA. 392+00



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M-TCHLINE STA. 423+00

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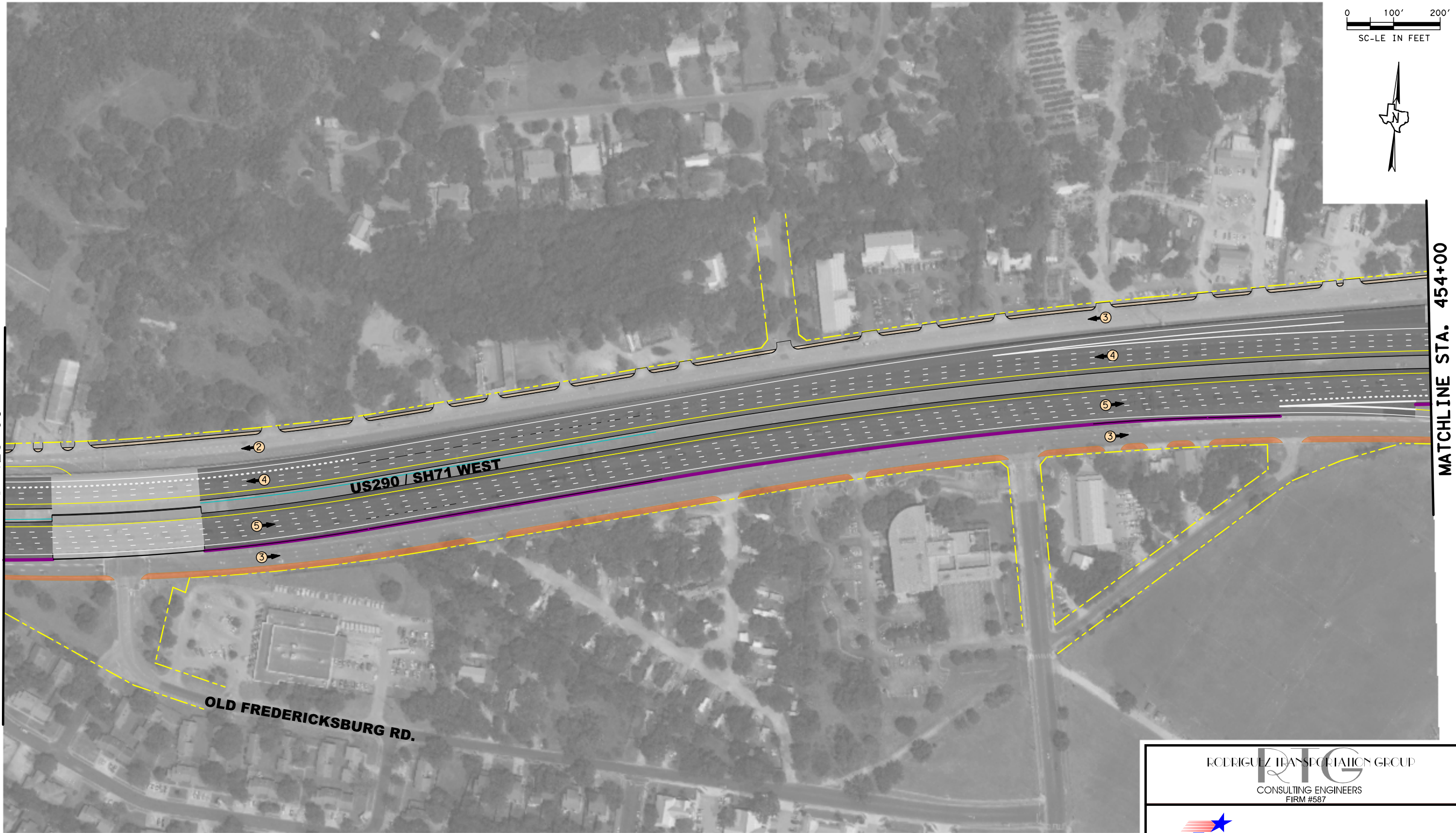
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TRAFFIC FORECASTING STUDY

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3/28/2016
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M-TCHLINE STA. 423+00



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MATCHLINE STA. 454+00

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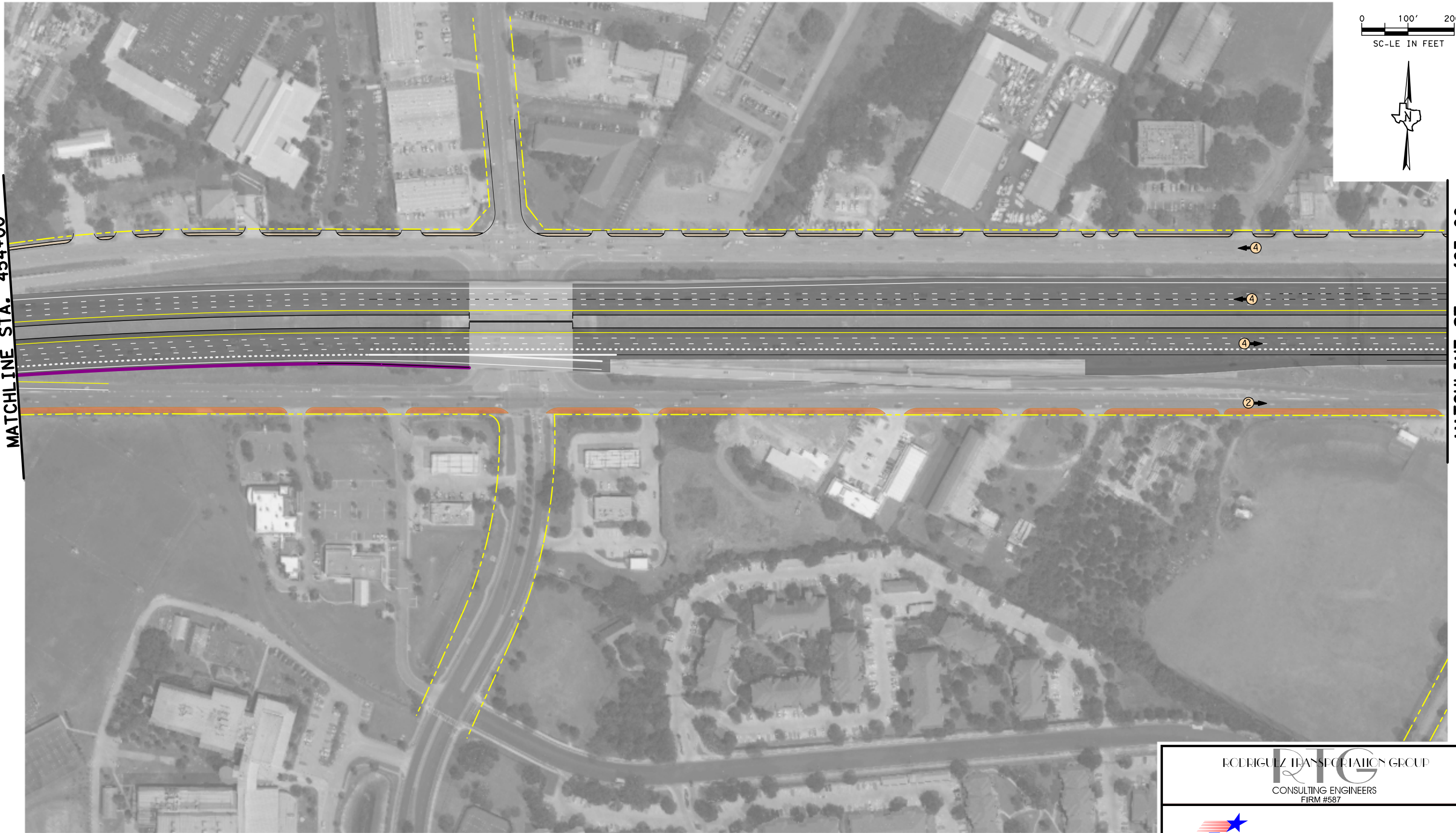
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TRAFFIC FORECASTING STUDY

SHEET 9 OF 13

3/28/2016
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MATCHLINE STA. 454+00



MATCHLINE ST. 485+00

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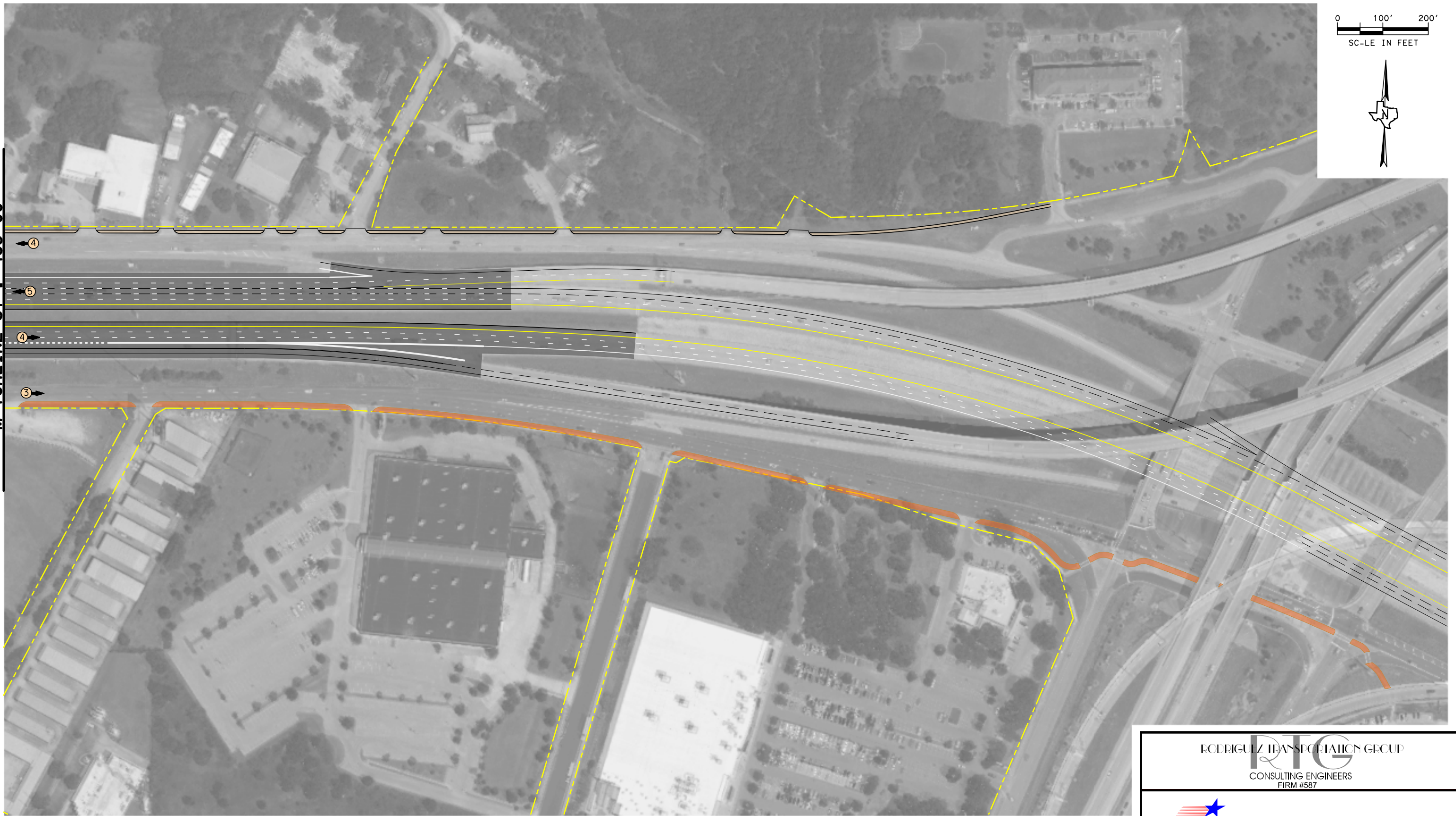
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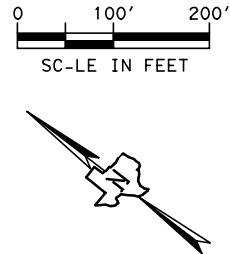
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US290 WEST
PRELIMINARY DESIGN
"ALTERNATIVE C"

TRAFFIC FORECASTING STUDY

SHEET 11 OF 13

3/28/2016
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MATCHLINE STA. 1062+00

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TRAFFIC FORECASTING STUDY

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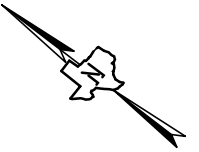
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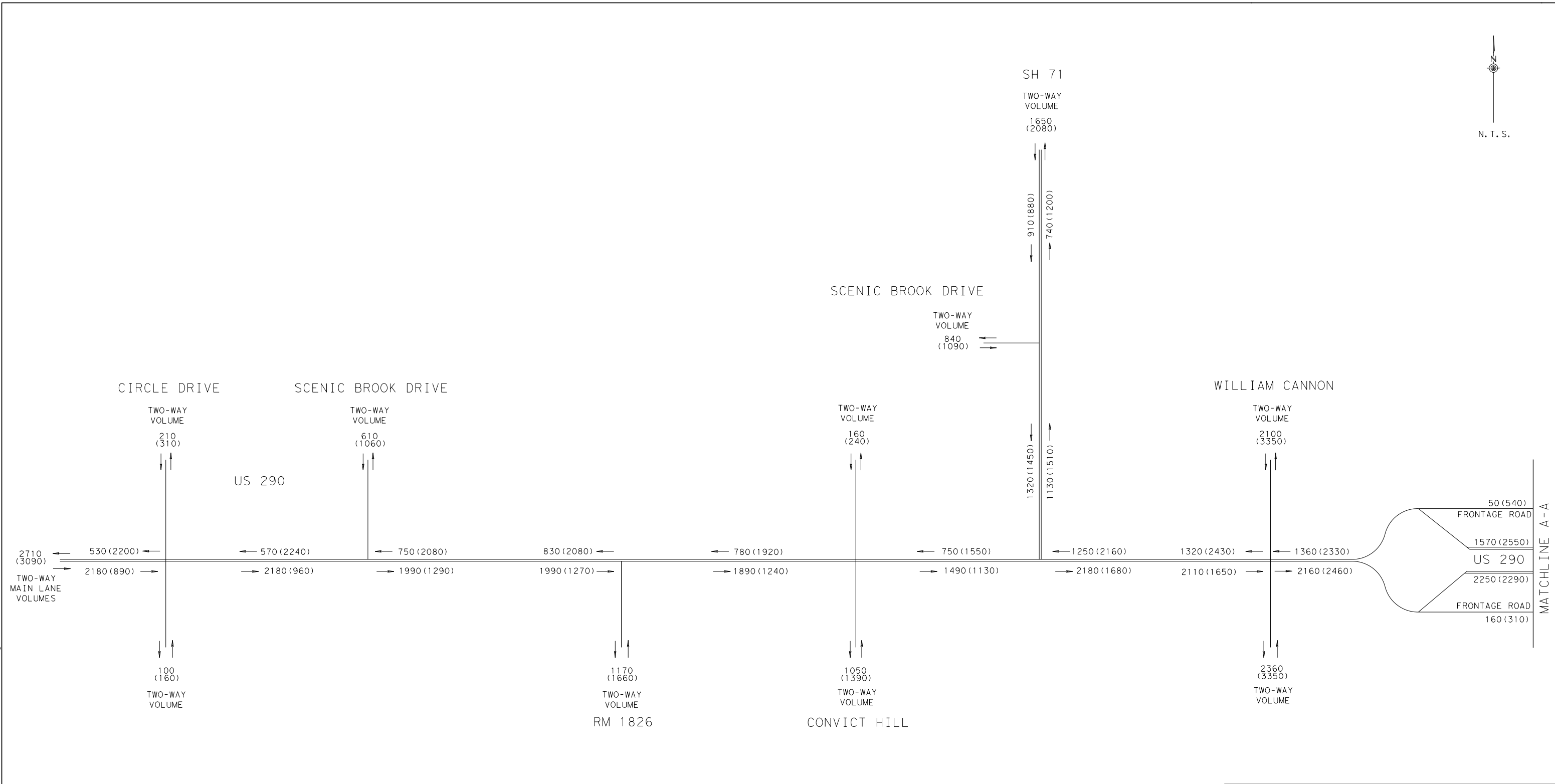
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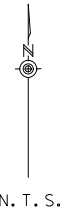
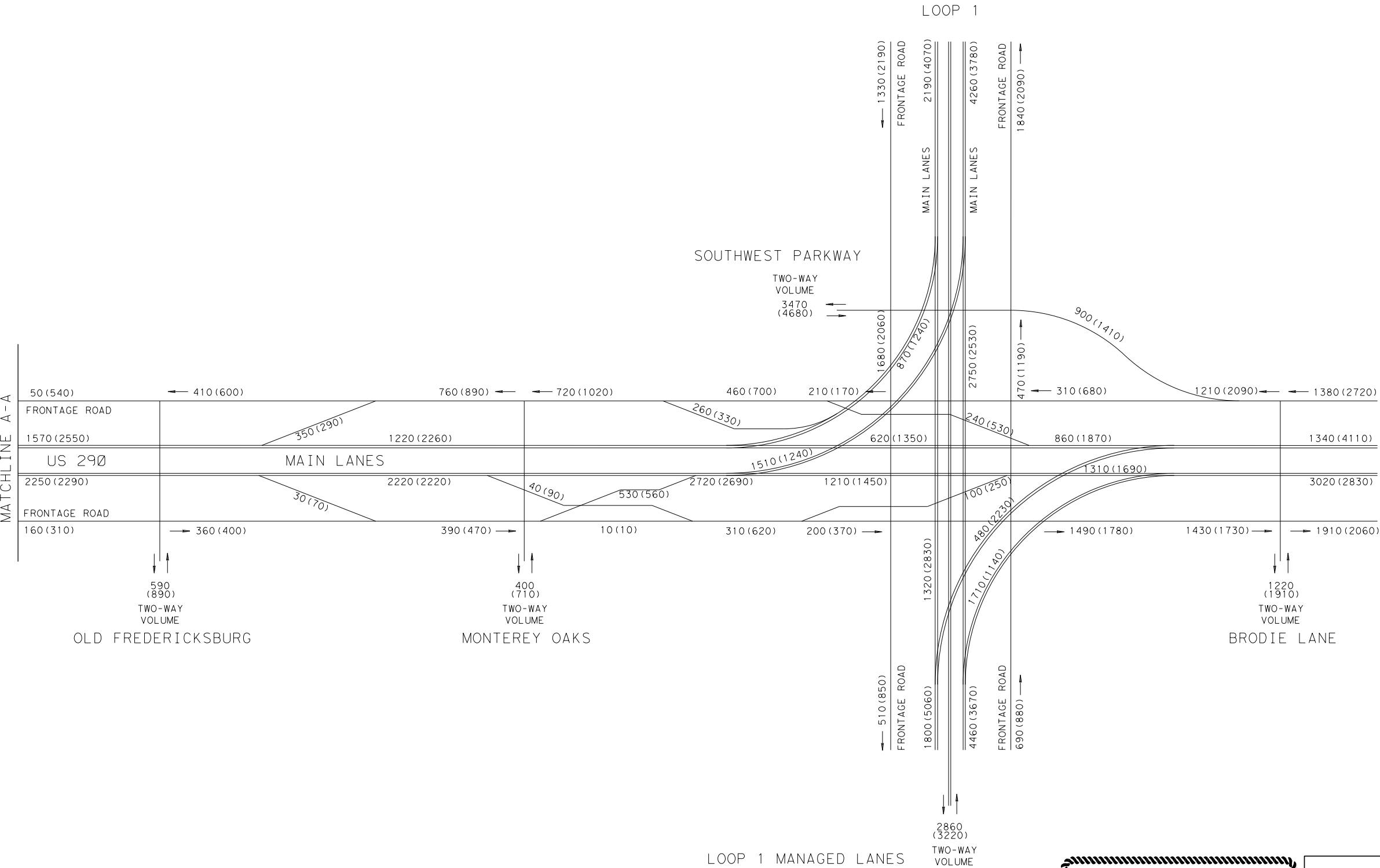
SHEET 13 OF 13

APPENDIX G
2040 PEAK HOUR TRAFFIC PROJECTIONS

3/7/2016
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3/7/2016
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LEGEND:
XXX AVERAGE DAILY TRAFFIC VOLUME

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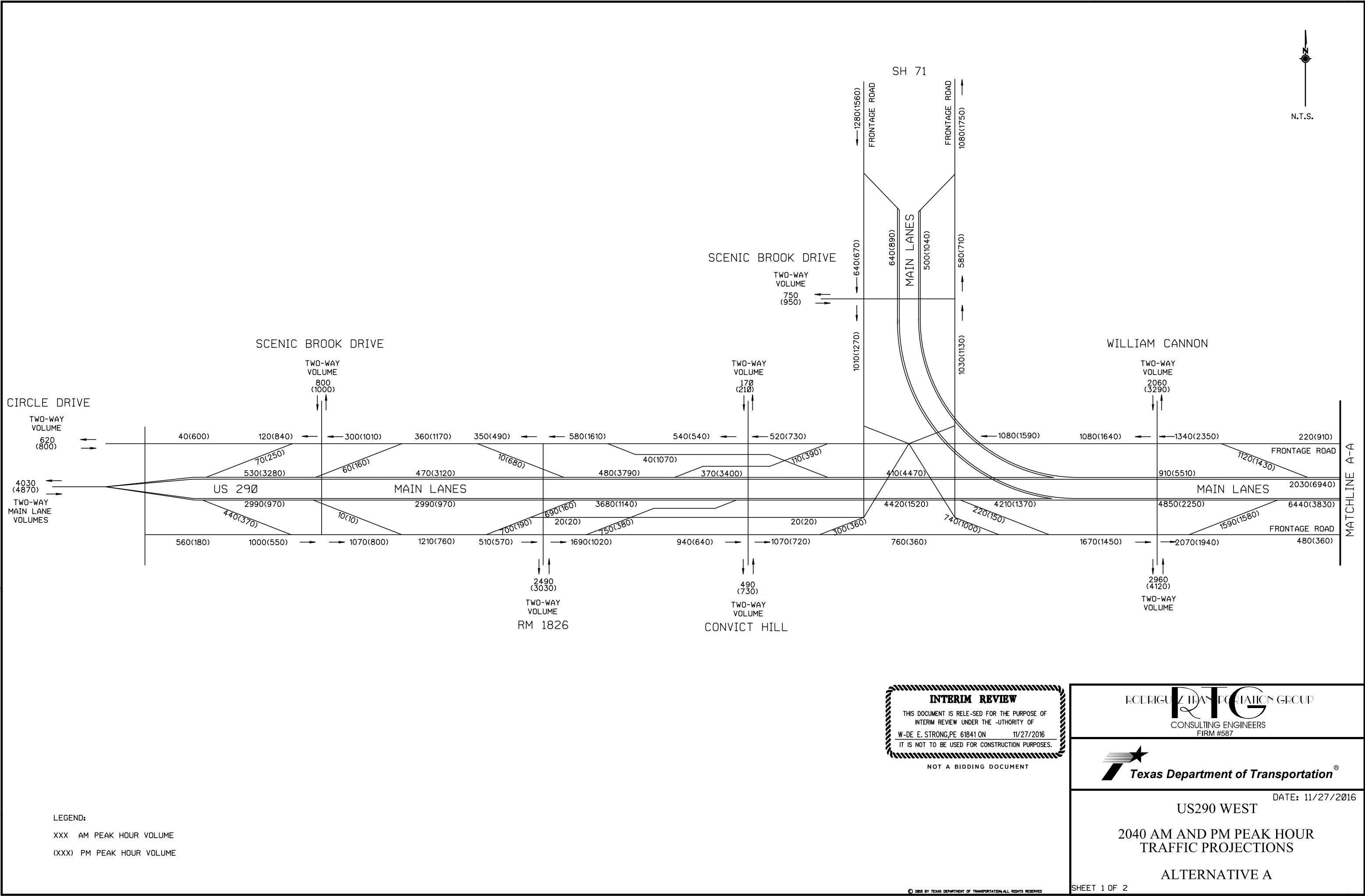
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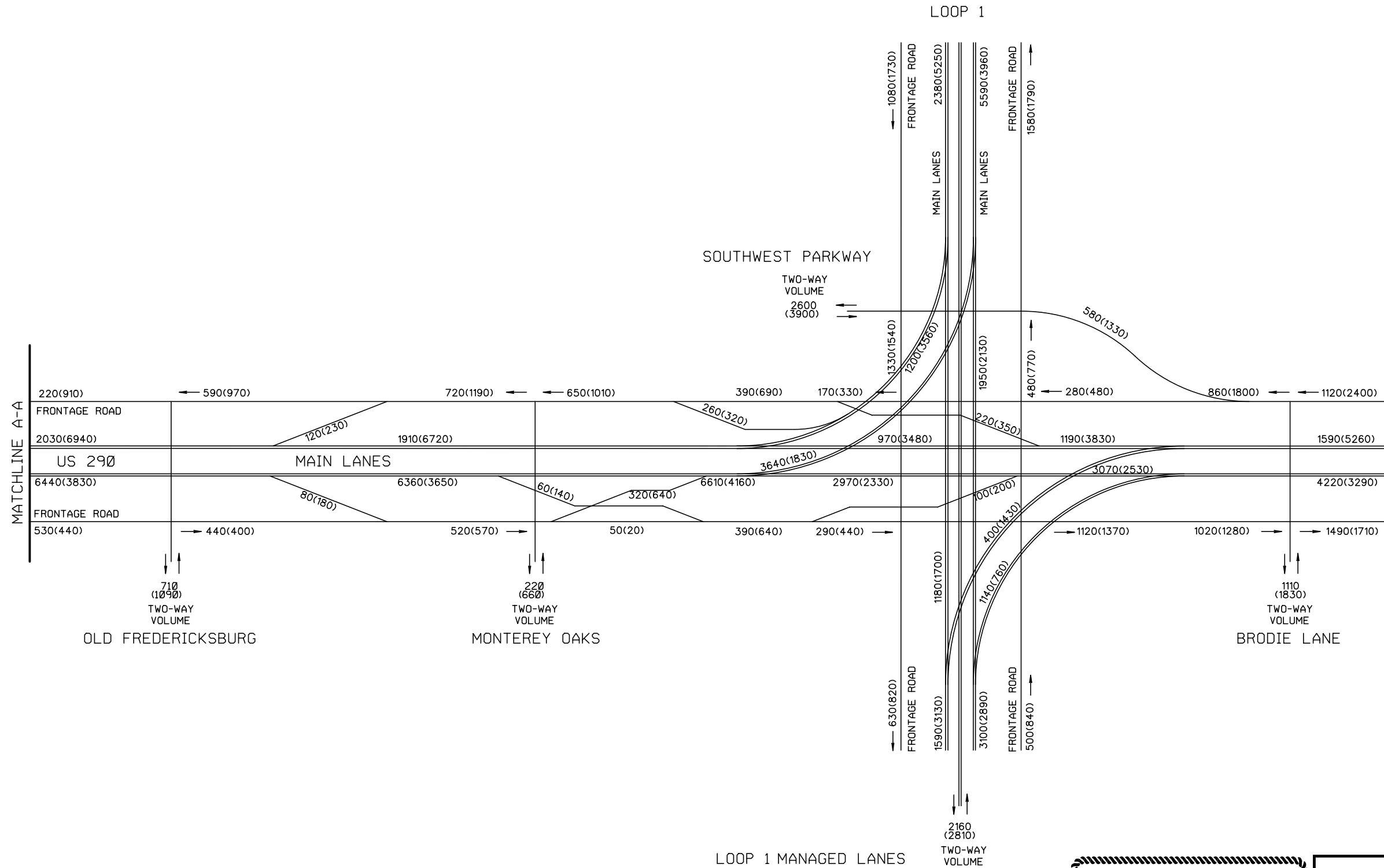
DATE: 3/7/2016
US290 WEST
2040 AM AND PM PEAK HOUR
TRAFFIC PROJECTIONS
NO BUILD SCENARIO

SHEET 2 OF 2

11/27/2016
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11/27/2016
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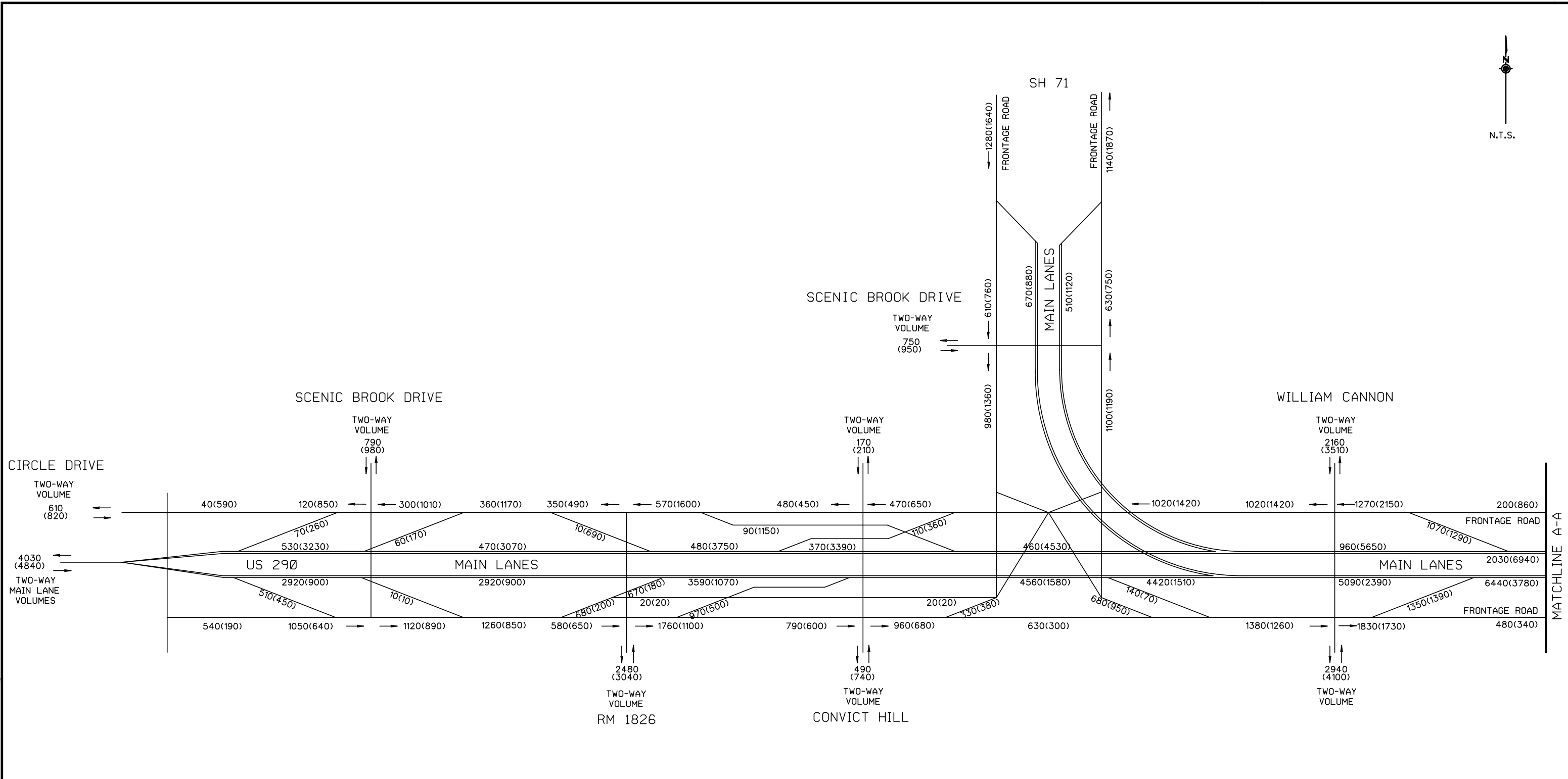
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DATE: 11/27/2016
US290 WEST
2040 AM AND PM PEAK HOUR
TRAFFIC PROJECTIONS
ALTERNATIVE A

11/27/2016
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(XXX) PM PEAK HOUR VOLUME

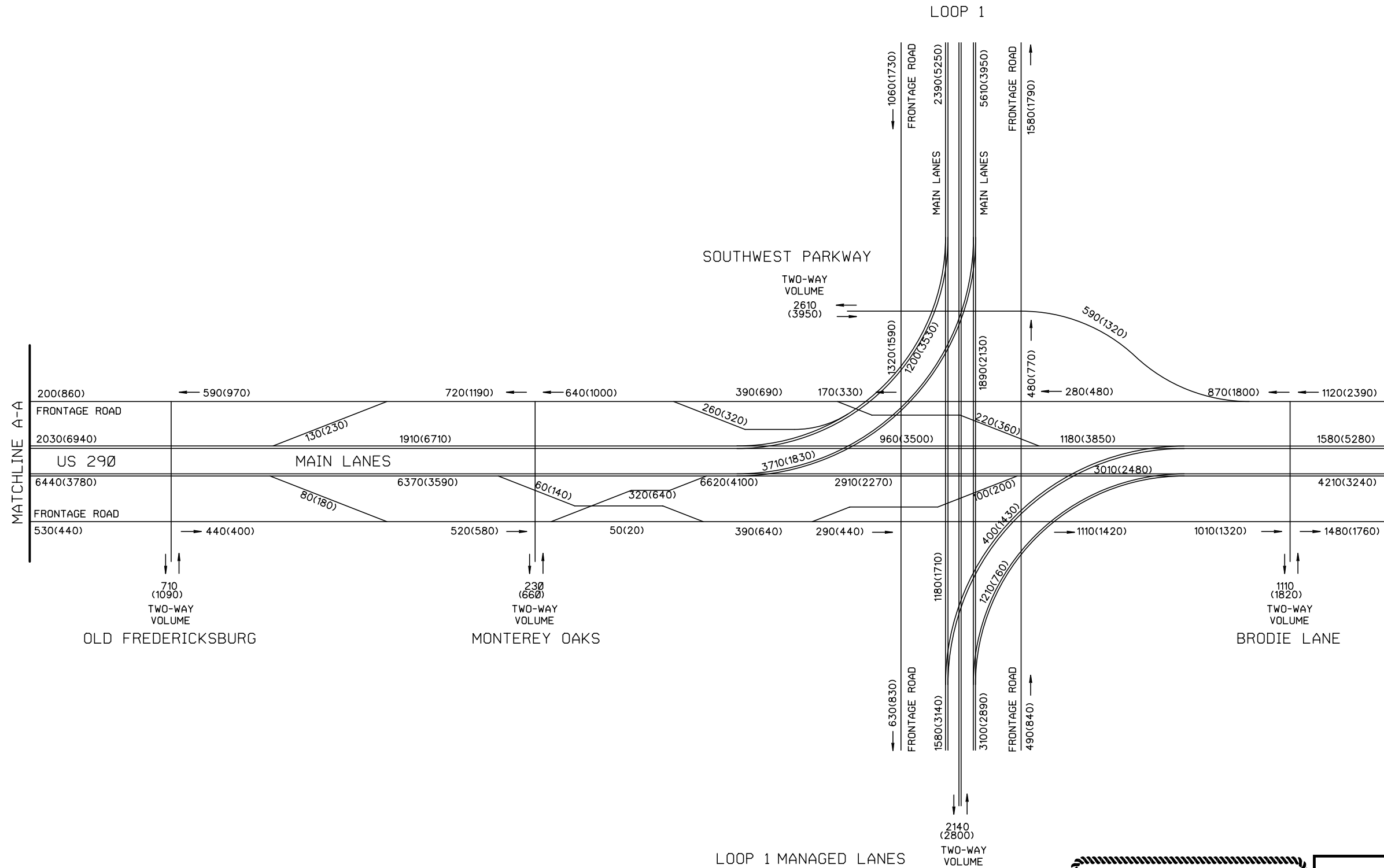
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US290 WEST
2040 AM AND PM PEAK HOUR
TRAFFIC PROJECTIONS
ALTERNATIVE C

11/27/2016
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DATE: 11/27/2016

US290 WEST

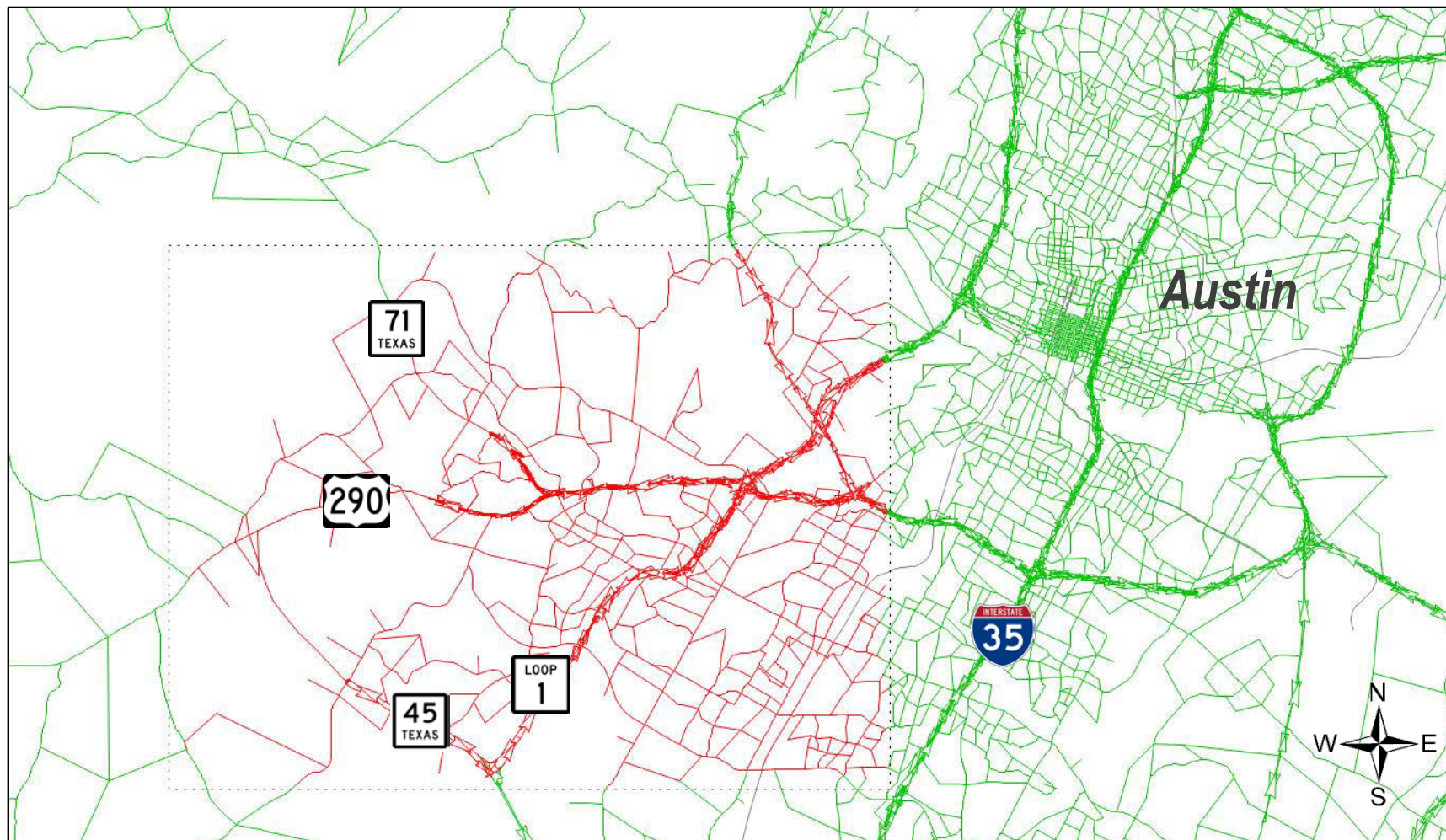
2040 AM AND PM PEAK HOUR TRAFFIC PROJECTIONS

ALTERNATIVE C

APPENDIX H

NETWORK RESULTS STUDY AREA EXHIBIT

Network Results Study Area Exhibit



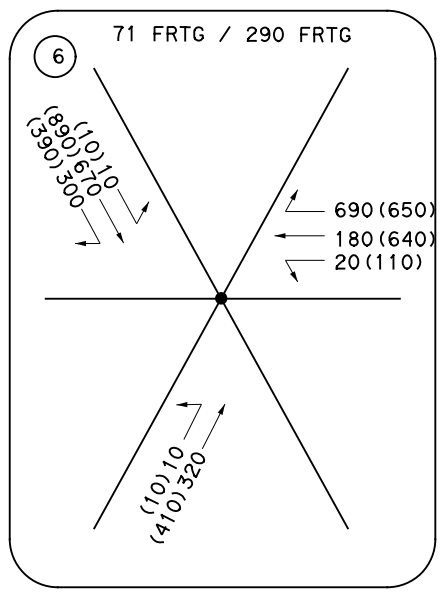
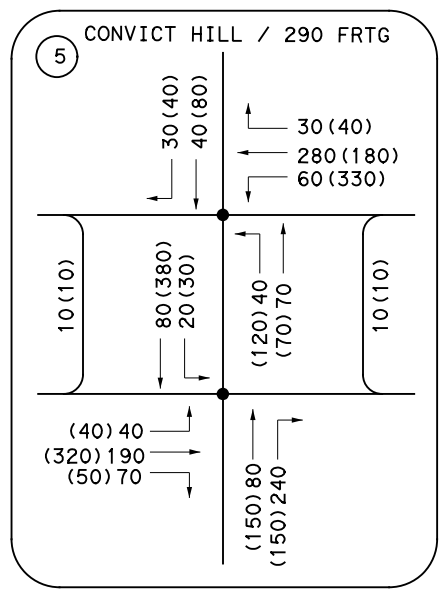
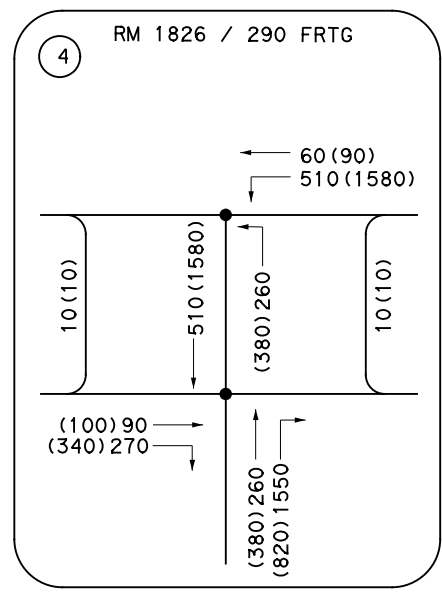
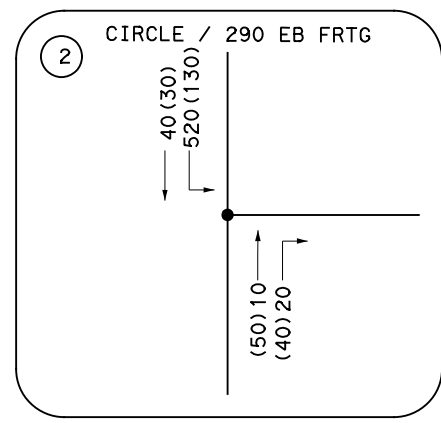
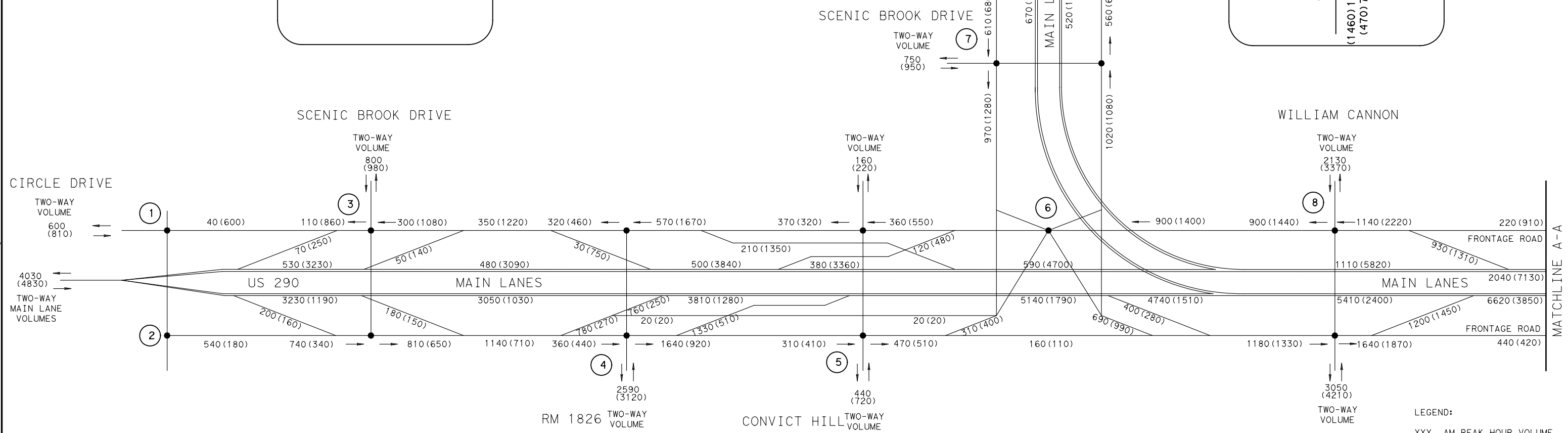
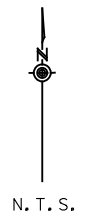
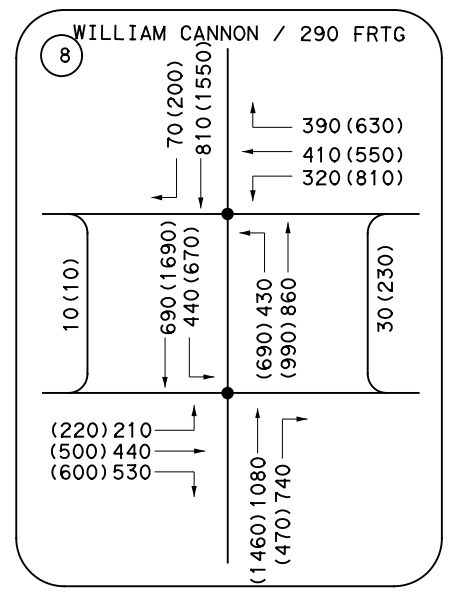
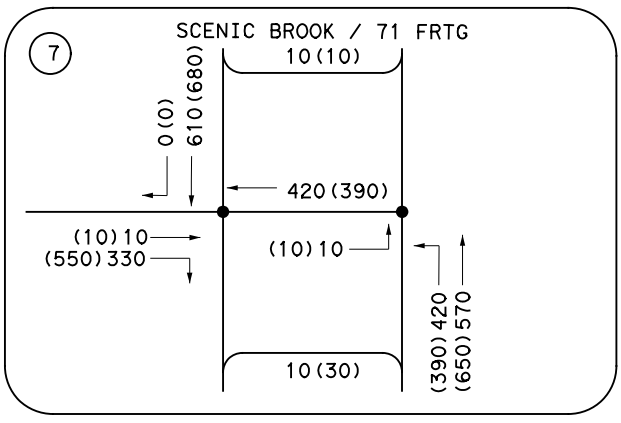
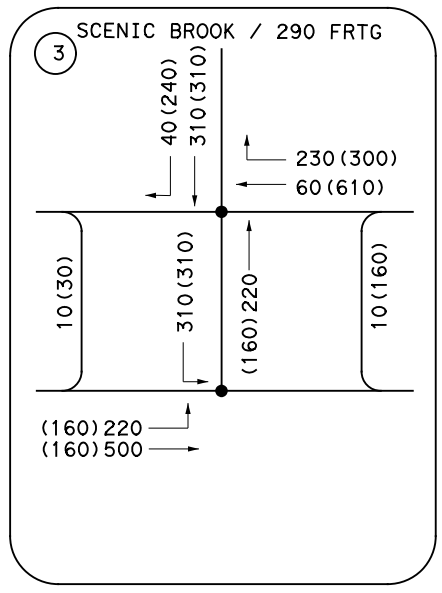
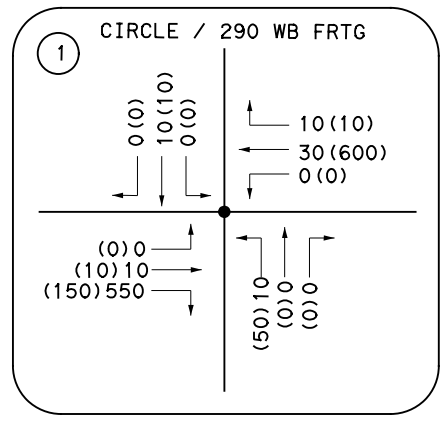
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APPENDIX I

2040 PEAK HOUR TRAFFIC PROJECTIONS

ALTERNATIVE A NON-TOLLED

6/22/2018
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LEGEND:
XXX AM PEAK HOUR VOLUME
(XXX) PM PEAK HOUR VOLUME
(X) INTERSECTION NUMBER

RODRIGUEZ
TRANSPORTATION
GROUP

FIRM #587

Texas Department of Transportation®

DATE: 6/22/2018

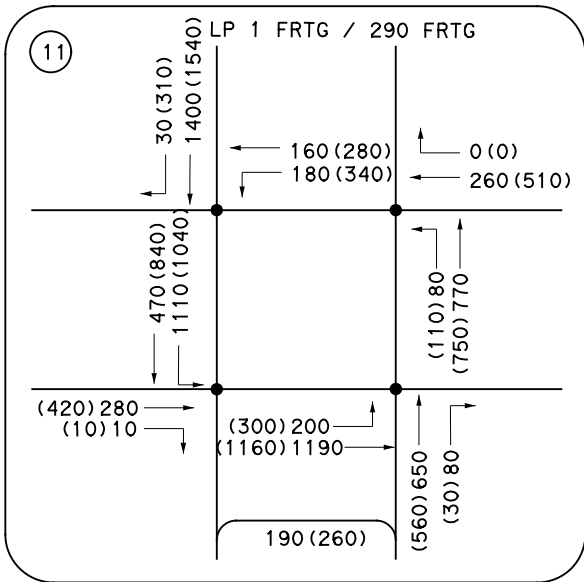
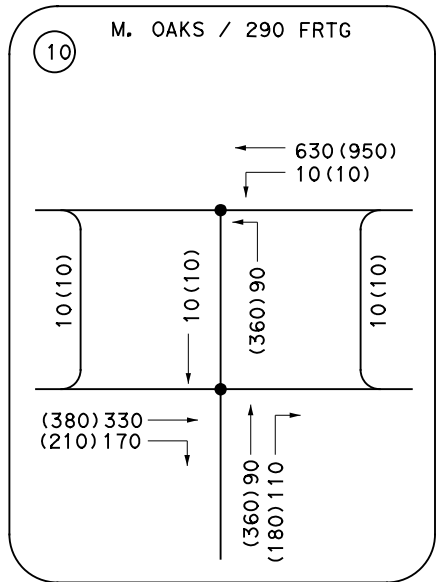
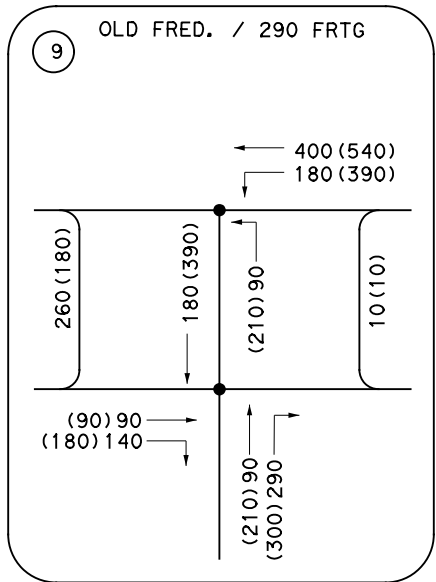
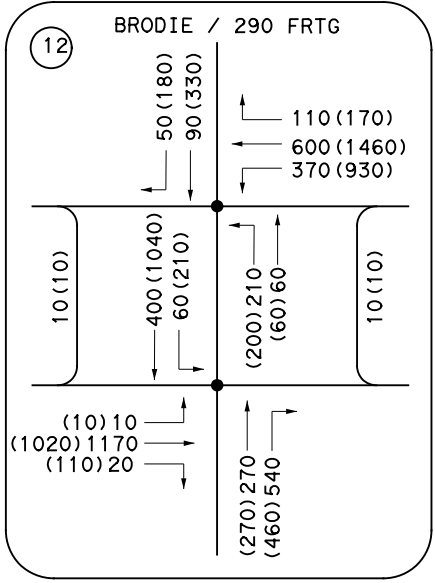
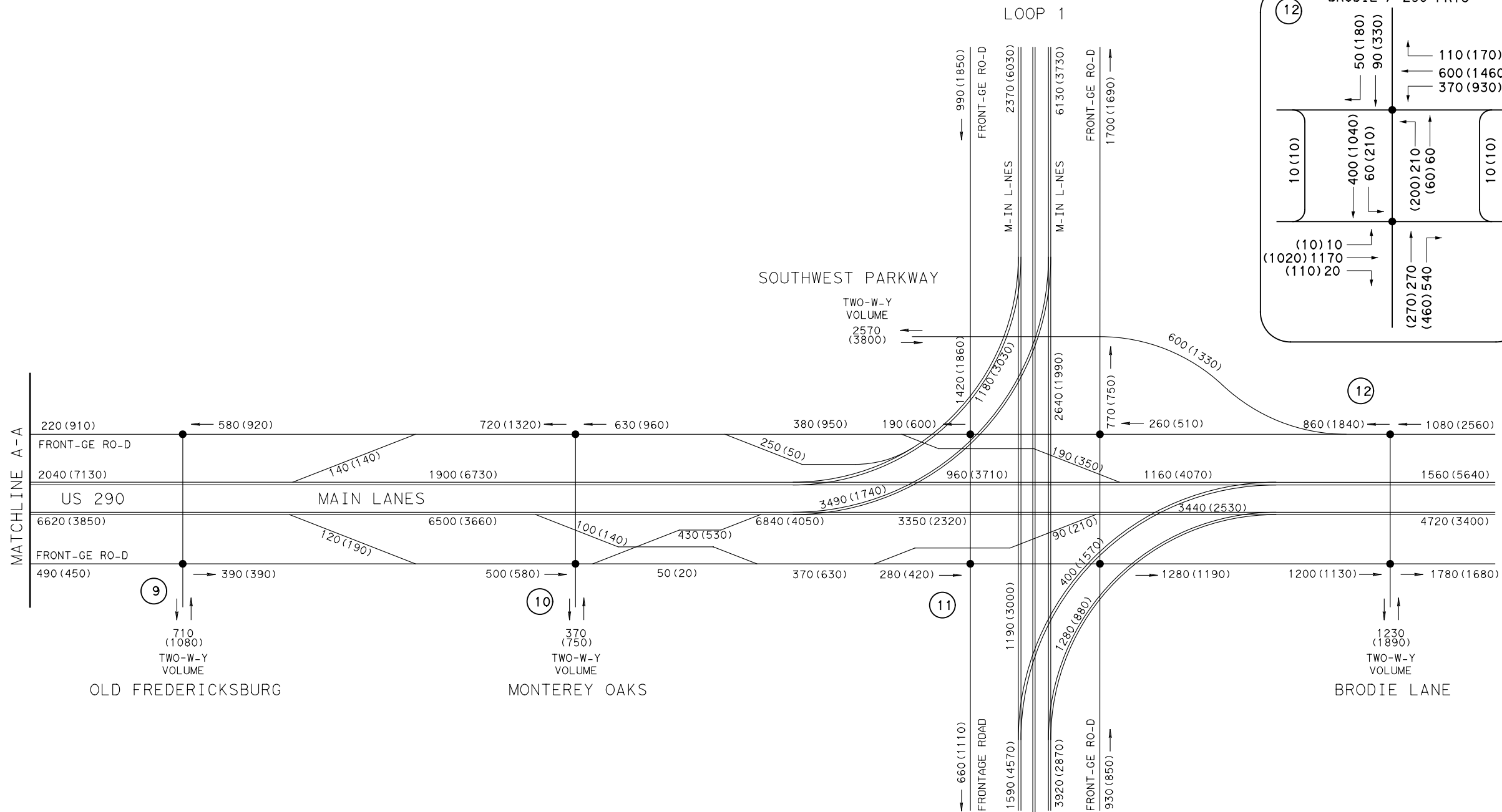
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2040 AM AND PM PEAK HOUR
TRAFFIC PROJECTIONS

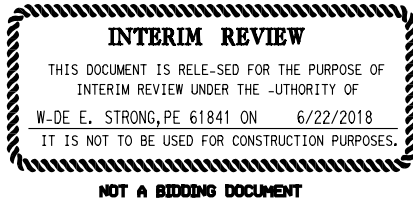
ALTERNATIVE A

SHEET 1 OF 2

6/22/2018
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LOOP 1 MANAGED LANES



LEGEND:

XXX -M PE-K HOUR VOLUME

(XXX) PM PE-K HOUR VOLUME

(X) INTERSECTION NUMBER

RTG RODRIGUEZ
TRANSPORTATION
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US290 WEST
2040 AM AND PM PEAK HOUR
TRAFFIC PROJECTIONS

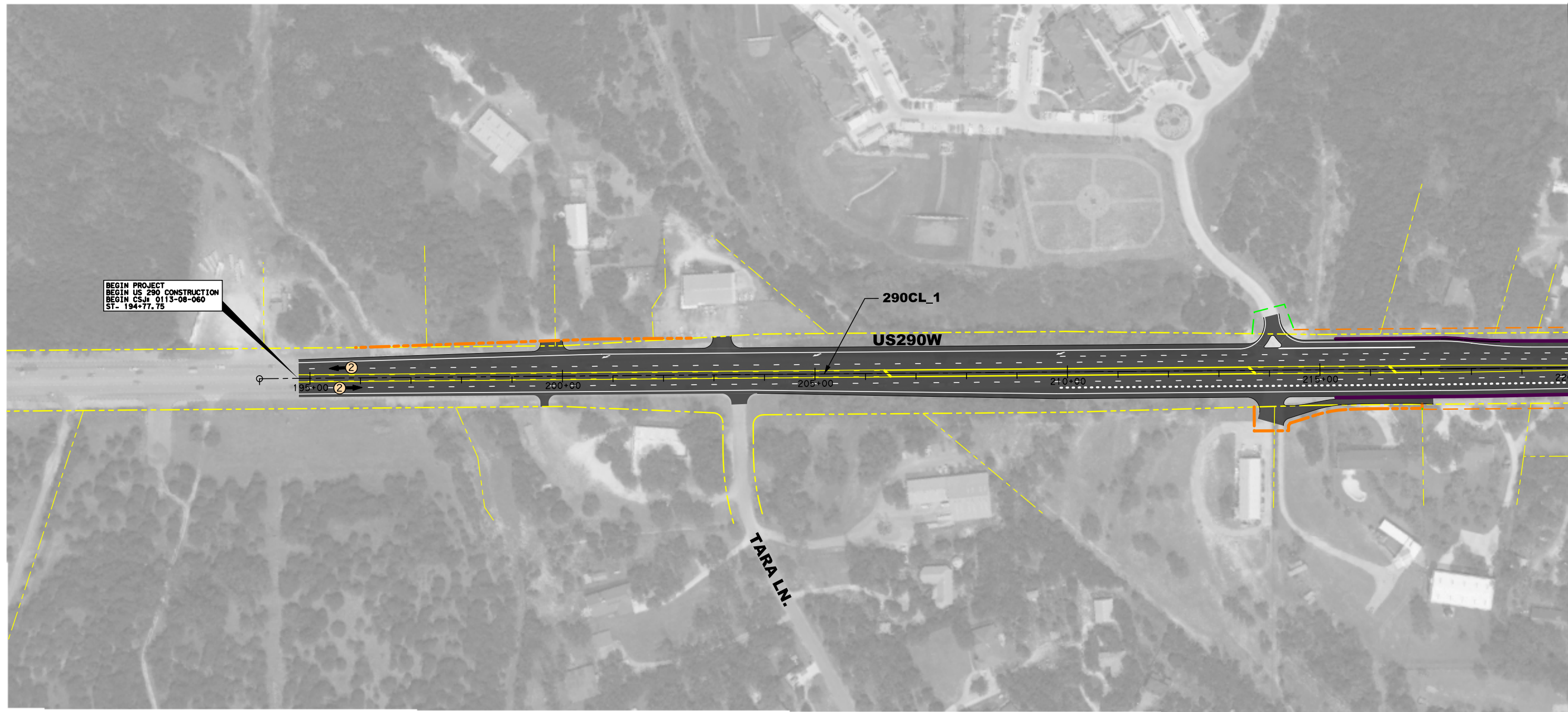
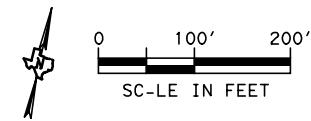
ALTERNATIVE A

SHEET 2 OF 2

APPENDIX J

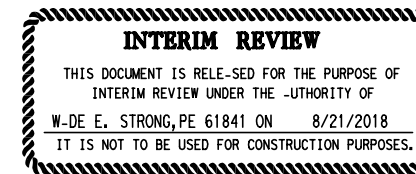
PREFERRED ALTERNATIVE A EXHIBITS

8/21/2018
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LEGEND

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	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK -LIGNMENT		C-BLE B-RRERS
	PROPOSED SH-RED USE P-THS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEW-LKS		PROPOSED DR-IN-GE E-SEMENT		DIRECTION -RRWS / NO. L-NES
	W-TER QU-LITY POND		TEMPOR-RY CONSTRUCTION E-SEMENT		
	RET-INING W-LLS		PROPOSED DRIVEW-Y LICENSE		
	CONTROL OF -CCESS		EXISTING ROW		



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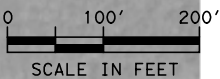
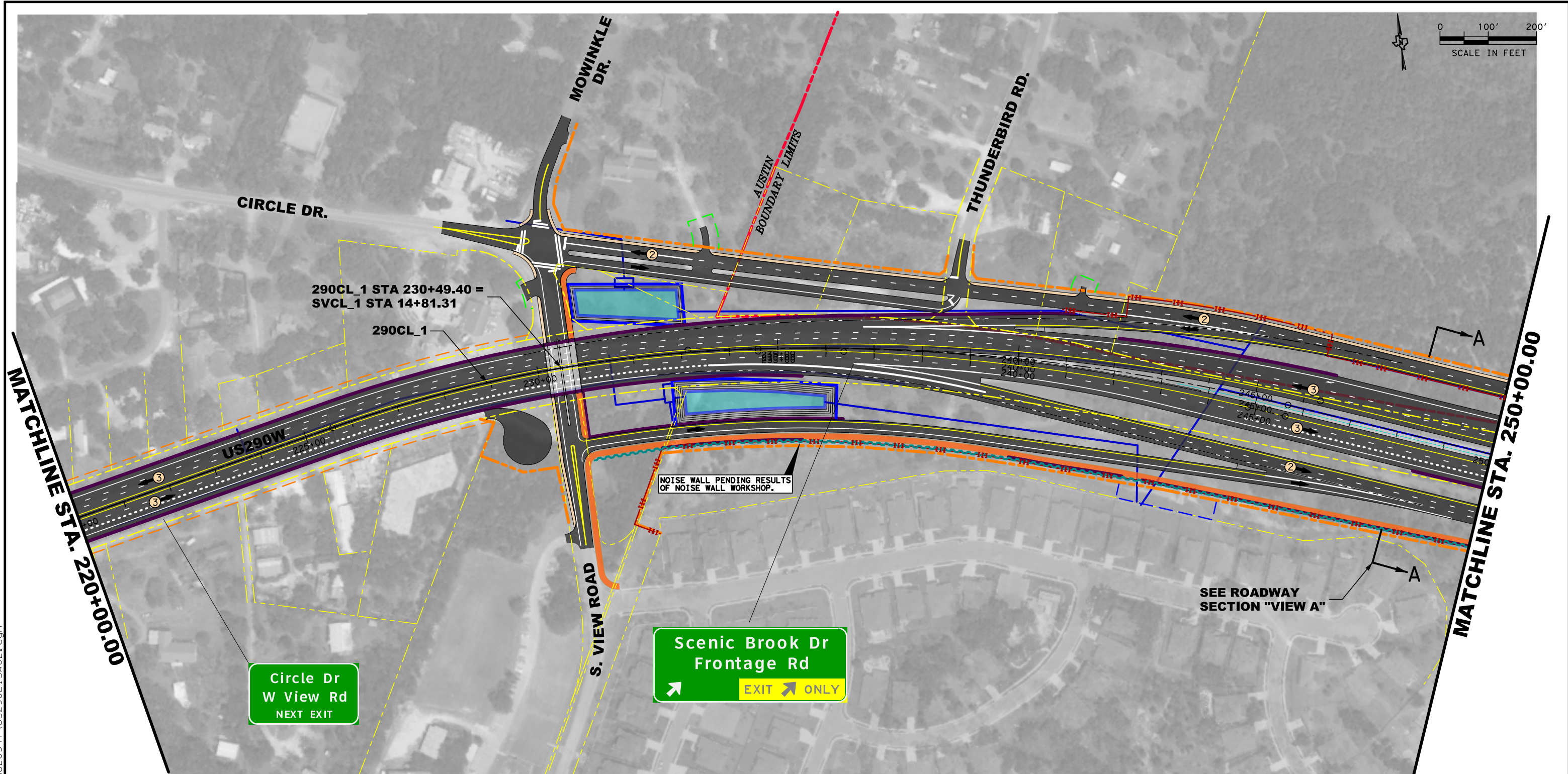
US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

BEGIN TO STA. 220+00.00

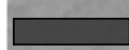


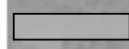




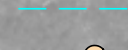
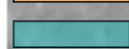


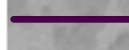
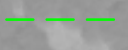
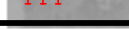



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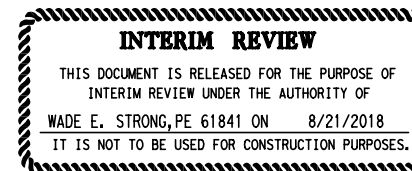
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8/21/2018
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LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		



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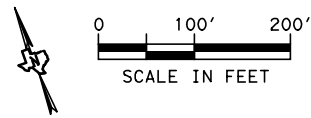
US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

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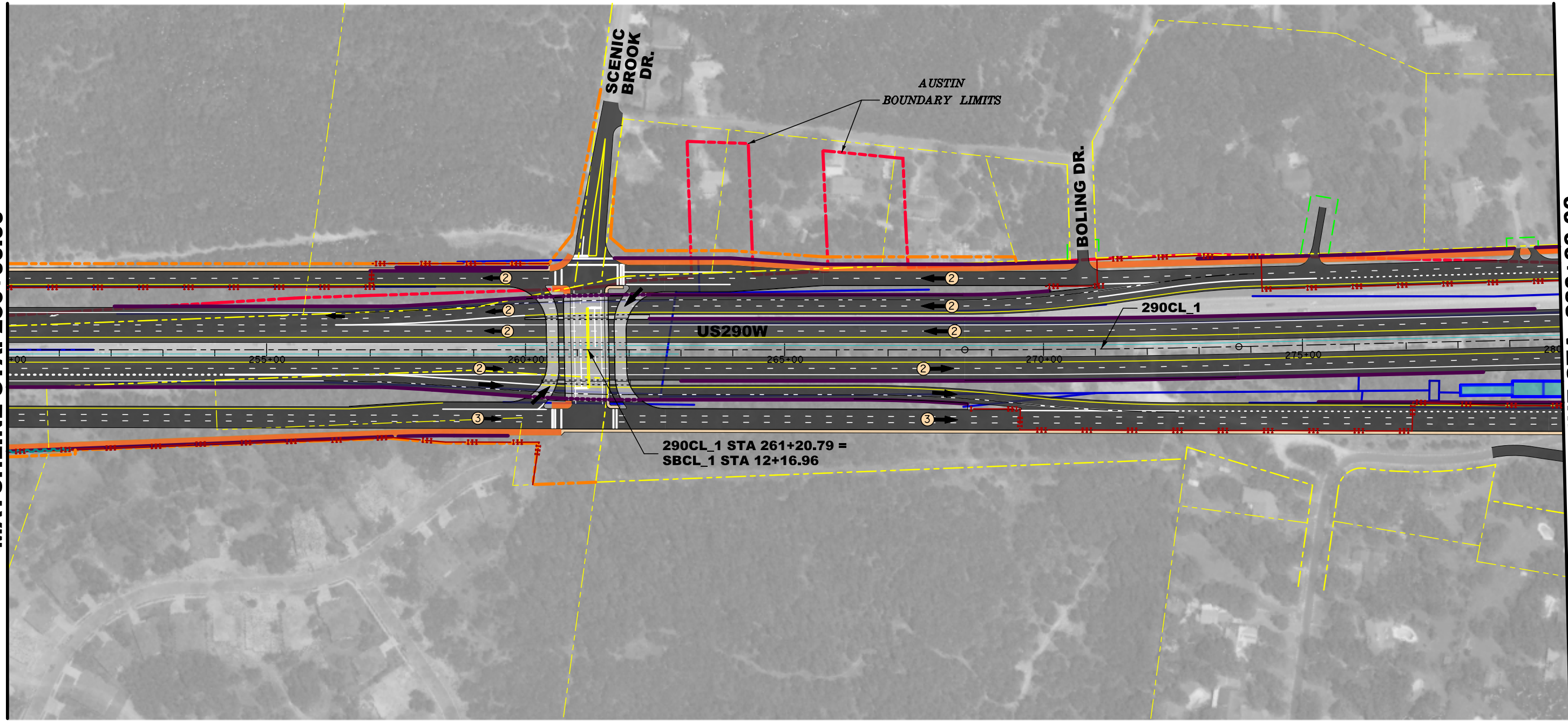
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DATE: 8/21/2018

8/21/2018
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MATCHLINE STA. 250+00.00



MATCHLINE STA. 280+00.00

LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		

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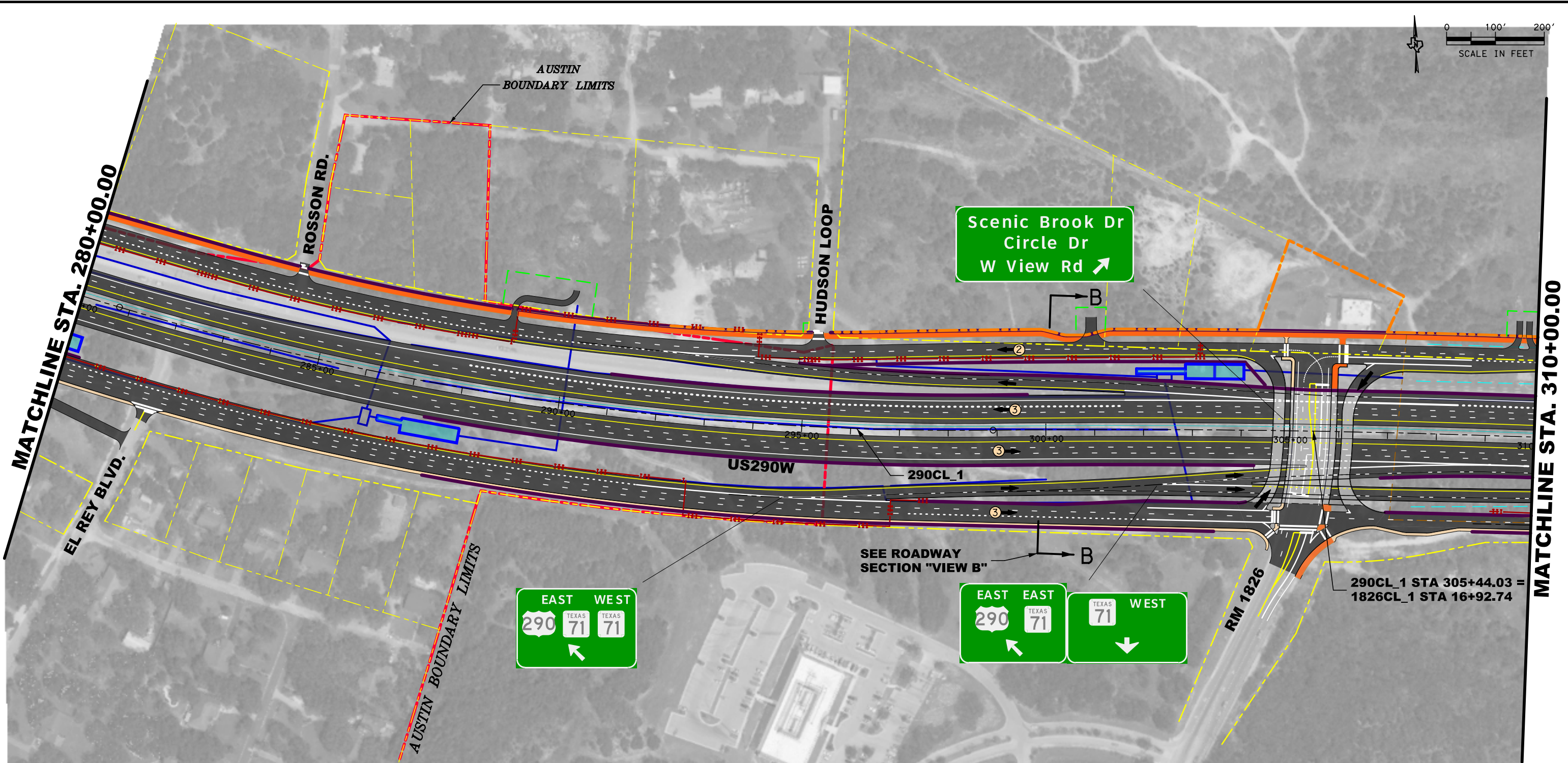
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US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

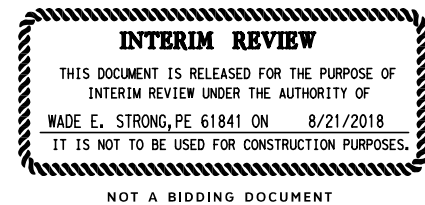
STA. 250+00.00 TO STA. 280+00.00

8/21/2018
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LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		



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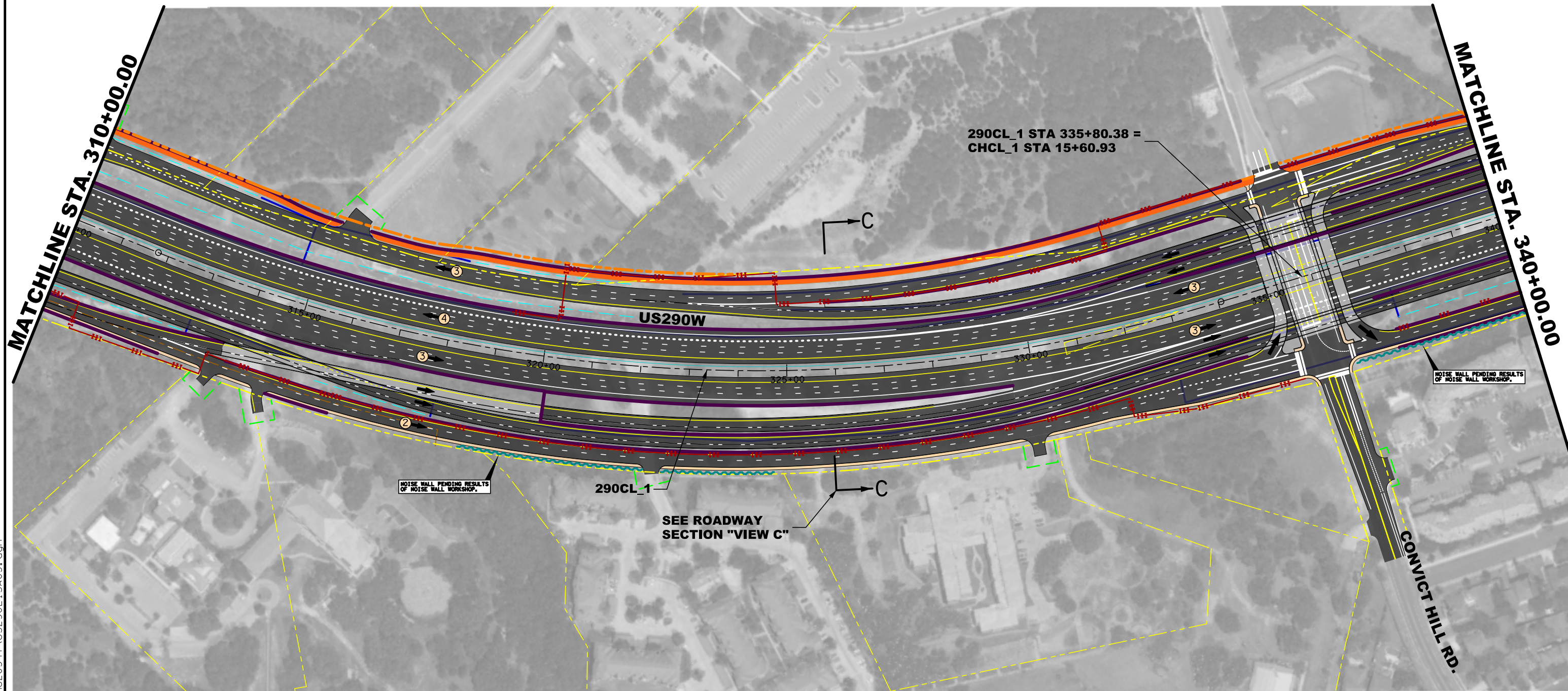
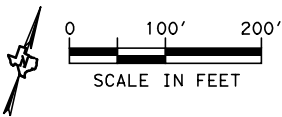


US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

STA. 280+00.00 TO STA. 310+00.00

SHEET 4 OF 15

DATE: 8/21/2018



LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		

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PARKWAY**

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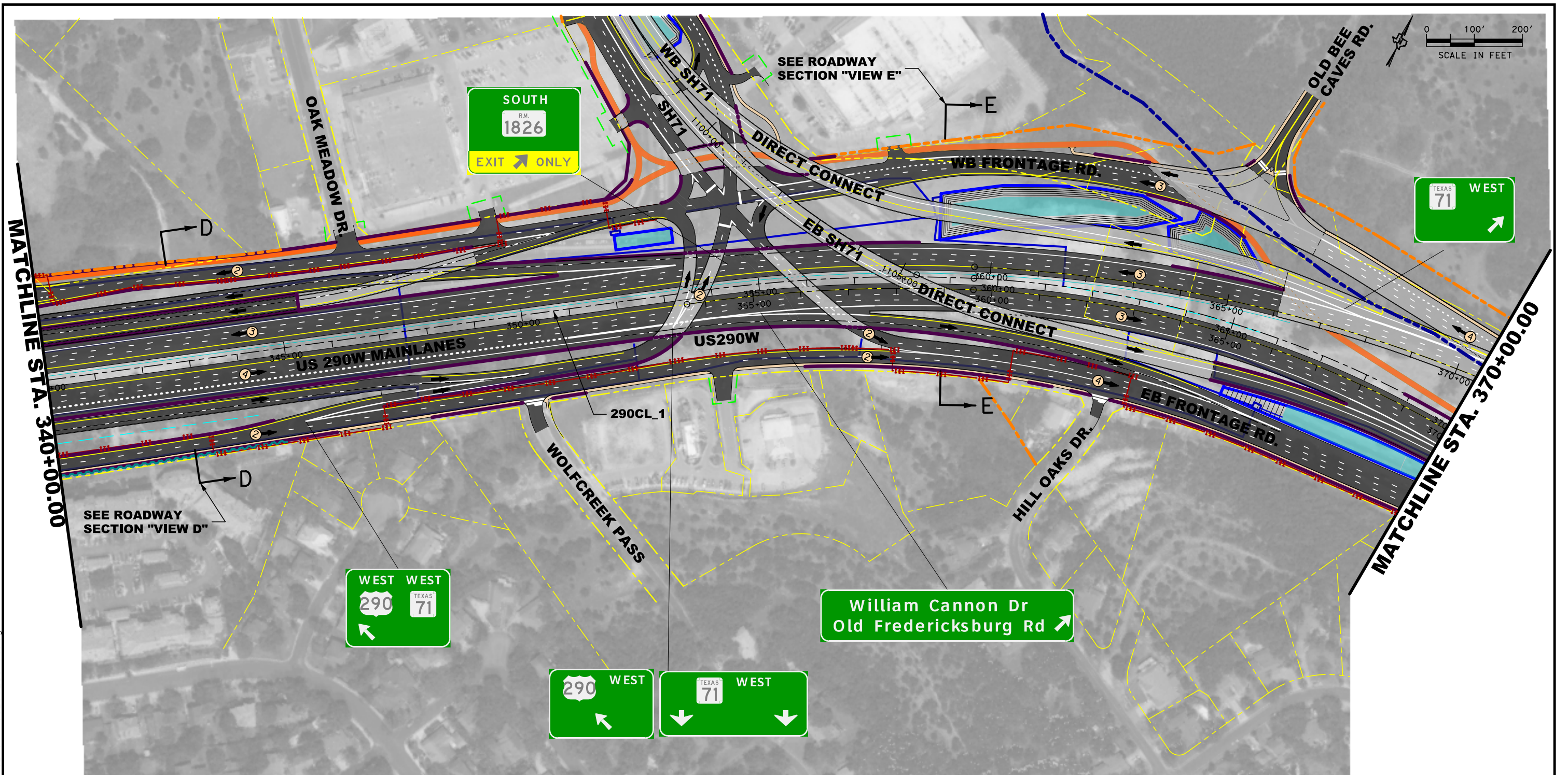
**US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY**

STA. 310+00.00 TO STA. 340+00.00

SHEET 5 OF 15

DATE: 8/21/2018

8/21/2018
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LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		

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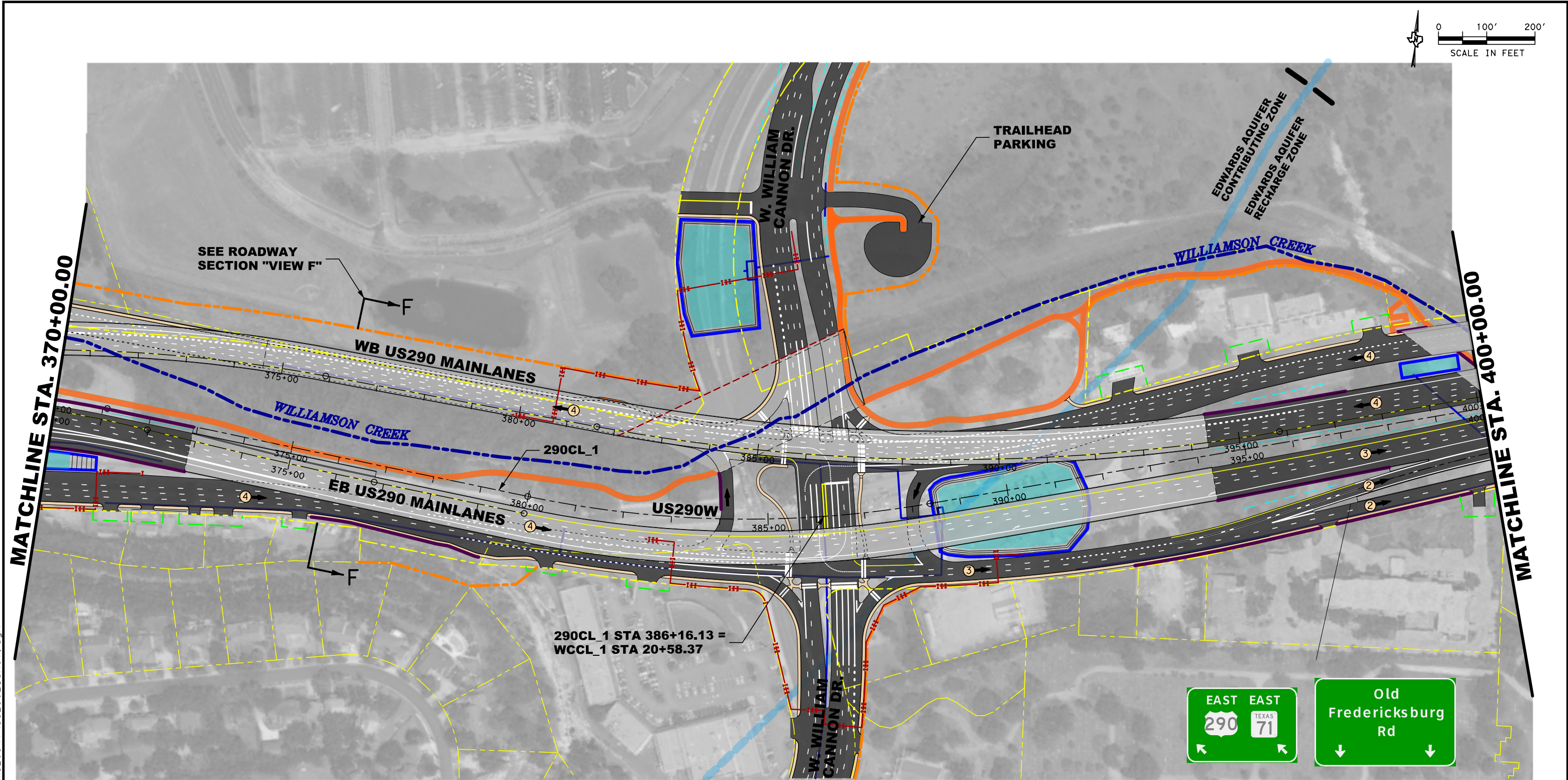
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OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY
STA. 340+00.00 TO STA. 370+00.00

SHEET 6 OF 15
DATE: 8/21/2018

8/21/2018
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LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		

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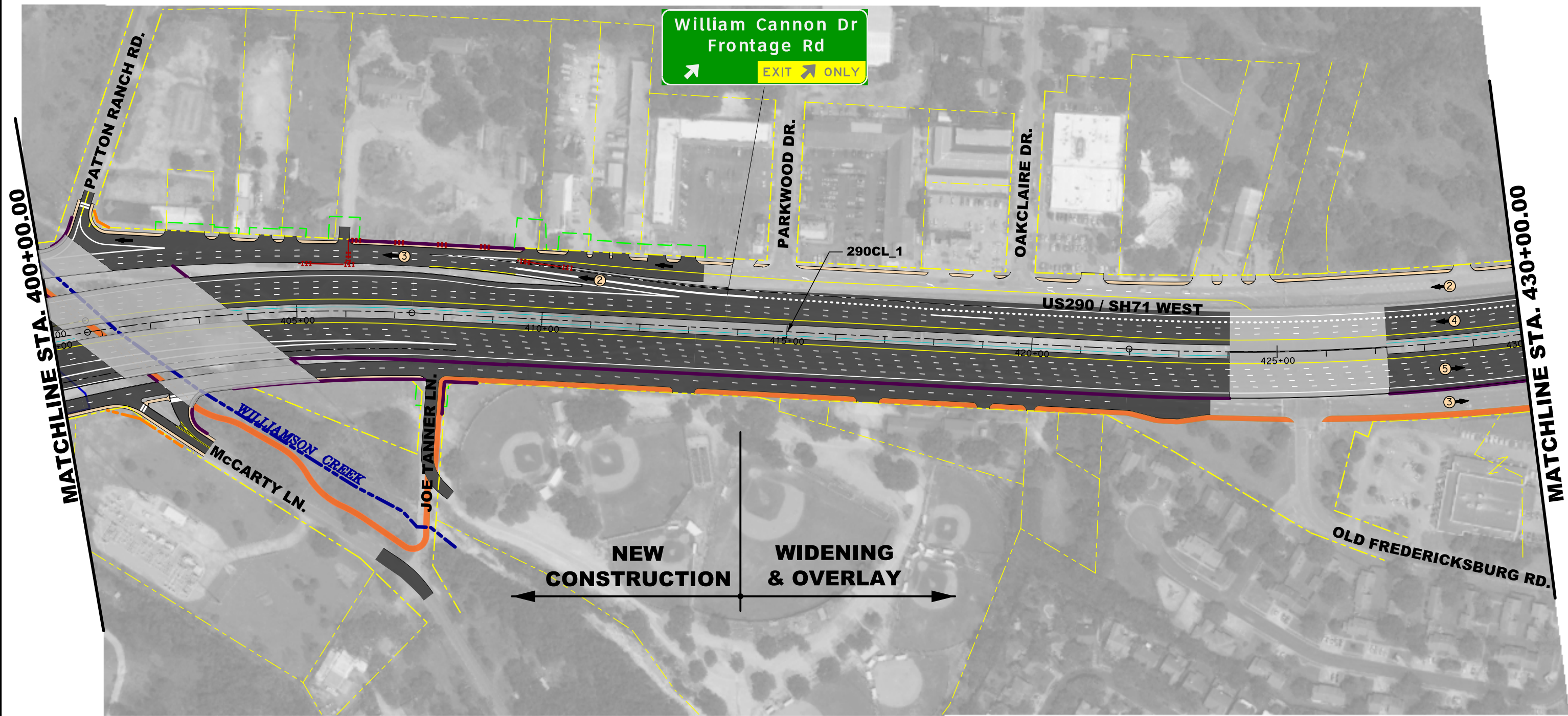


**US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY**

STA. 370+00.00 TO STA. 400+00.00

SHEET 7 OF 15

DATE: 8/21/2018



LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		

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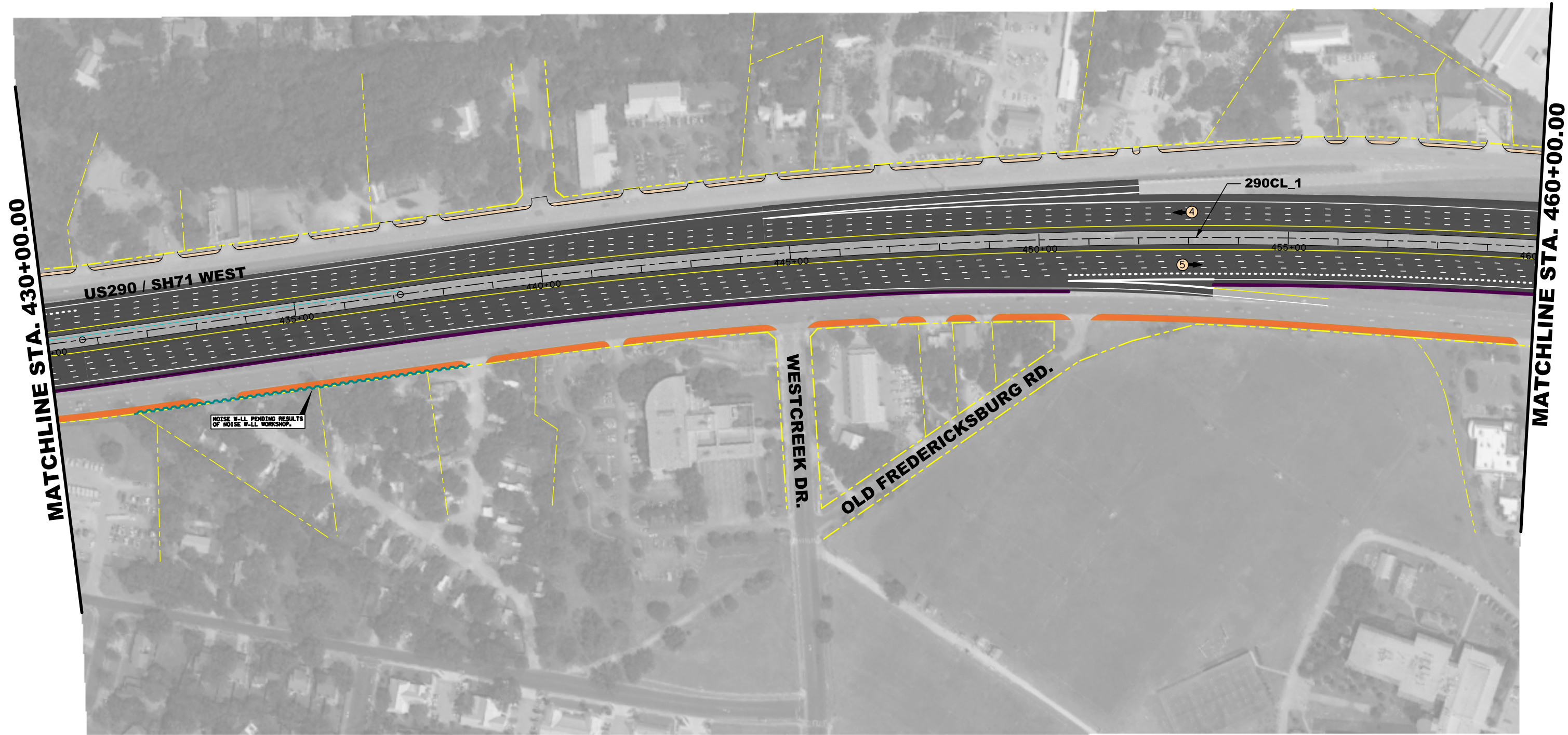
US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

STA. 400+00.00 TO STA. 430+00.00

SHEET 8 OF 15

DATE: 8/21/2018

8/21/2018
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LEGEND

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	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK -LIGNMENT		C-BLE B-RRERS
	PROPOSED SH-RED USE P-THS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEW-LKS		PROPOSED DR-IN-GE E-SEMENT		DIRECTION -RRWS / NO. L-NES
	W-TER QU-LITY POND		TEMPOR-RY CONSTRUCTION E-SEMENT		
	RET-INING W-LLS		PROPOSED DRIVE-WY LICENSE		
	CONTROL OF -CCESS		EXISTING ROW		

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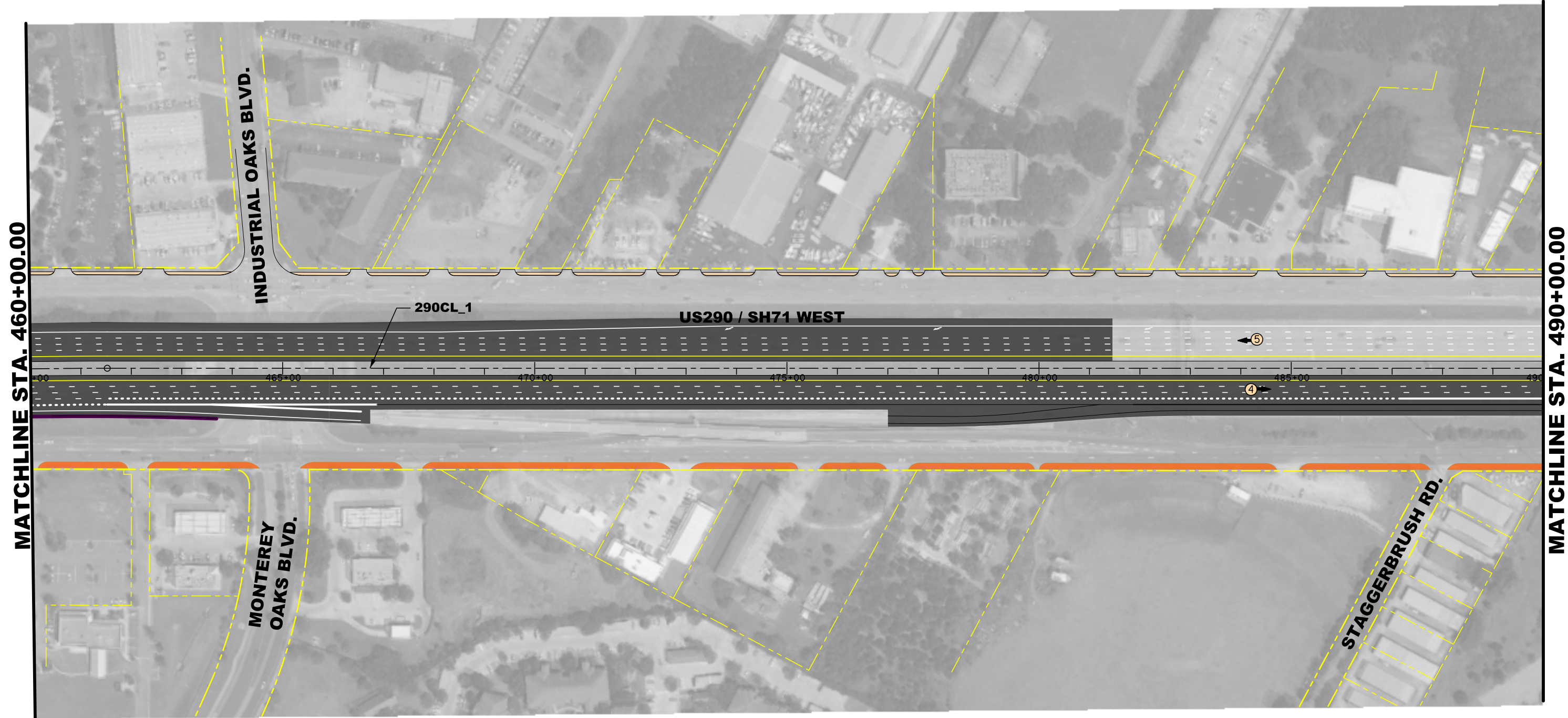
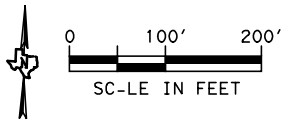
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OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

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SHEET 9 OF 15

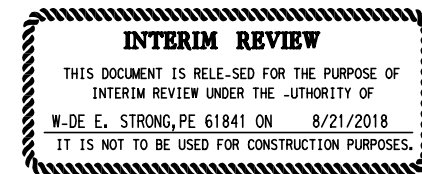
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8/21/2018
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LEGEND

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	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK -LIGNMENT		C-BLE B-RRIRS
	PROPOSED SH-RED USE P-THS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEW-LKS		PROPOSED DR-IN-GE E-SEMENT		DIRECTION -RRWS / NO. L-LNES
	W-TER QU-LITY POND		TEMPOR-RY CONSTRUCTION E-SEMENT		
	RET-INING W-LLS		PROPOSED DRIVE-WY LICENSE		
	CONTROL OF -CCESS		EXISTING ROW		



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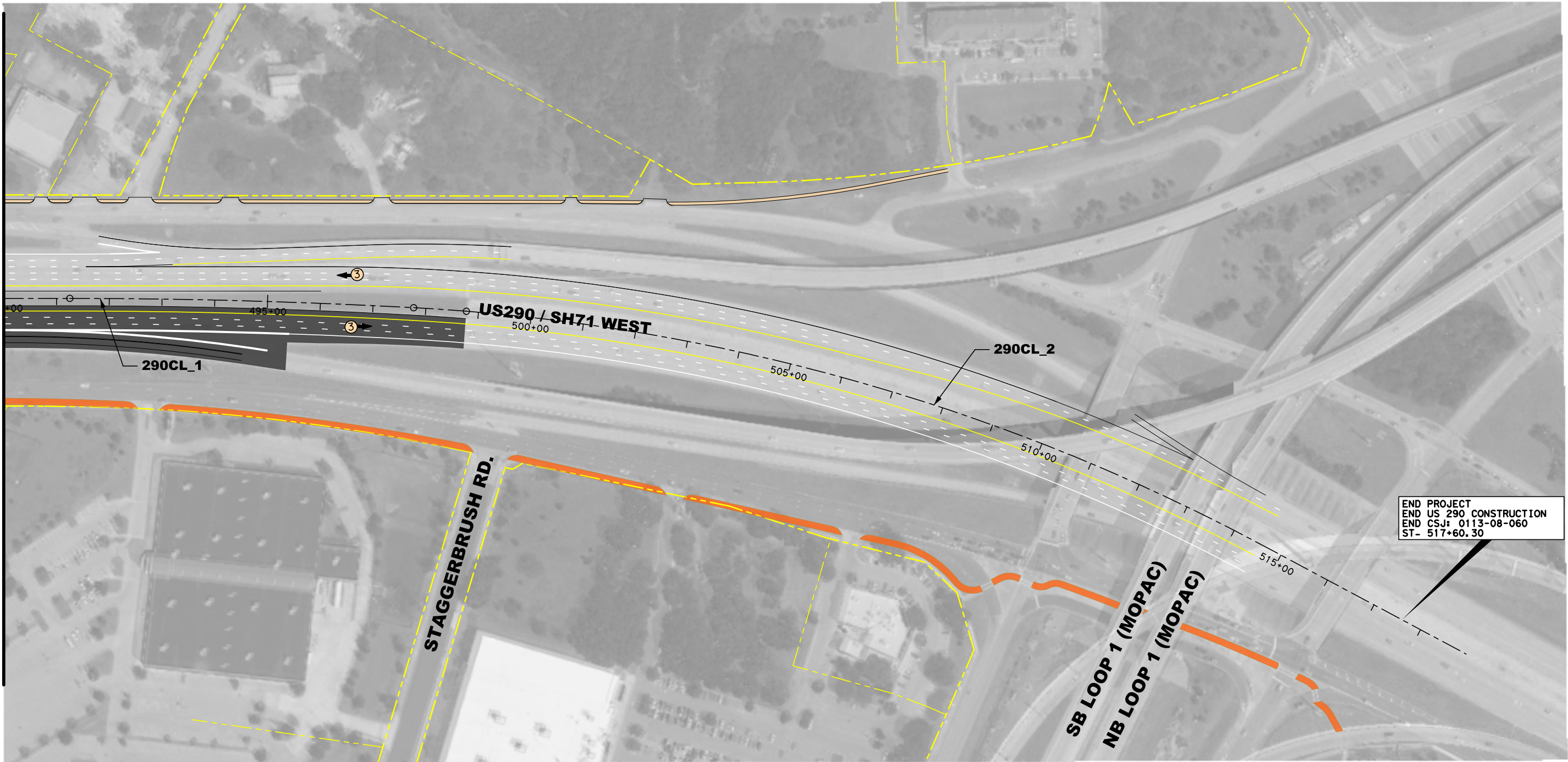
US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

STA. 460+00.00 TO STA. 490+00.00

SHEET 10 OF 15

D-TE: 8/21/2018

MATCHLINE STA. 490+00.00



END PROJECT
END US 290 CONSTRUCTION
END CSJ: 0113-08-060
ST- 517+60.30

LEGEND

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	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK -LIGNMENT		C-BLE B-RRIRS
	PROPOSED SH-RED USE P-THS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEW-LKS		PROPOSED DR-IN-GE E-SEMENT		DIRECTION -RRWS / NO. L-NES
	W-TER QU-LITY POND		TEMPOR-RY CONSTRUCTION E-SEMENT		
	RET-INING W-LLS		PROPOSED DRIVEW-Y LICENSE		
	CONTROL OF -CCESS		EXISTING ROW		

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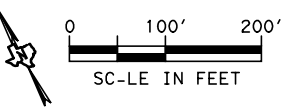
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STA. 490+00.00 TO END

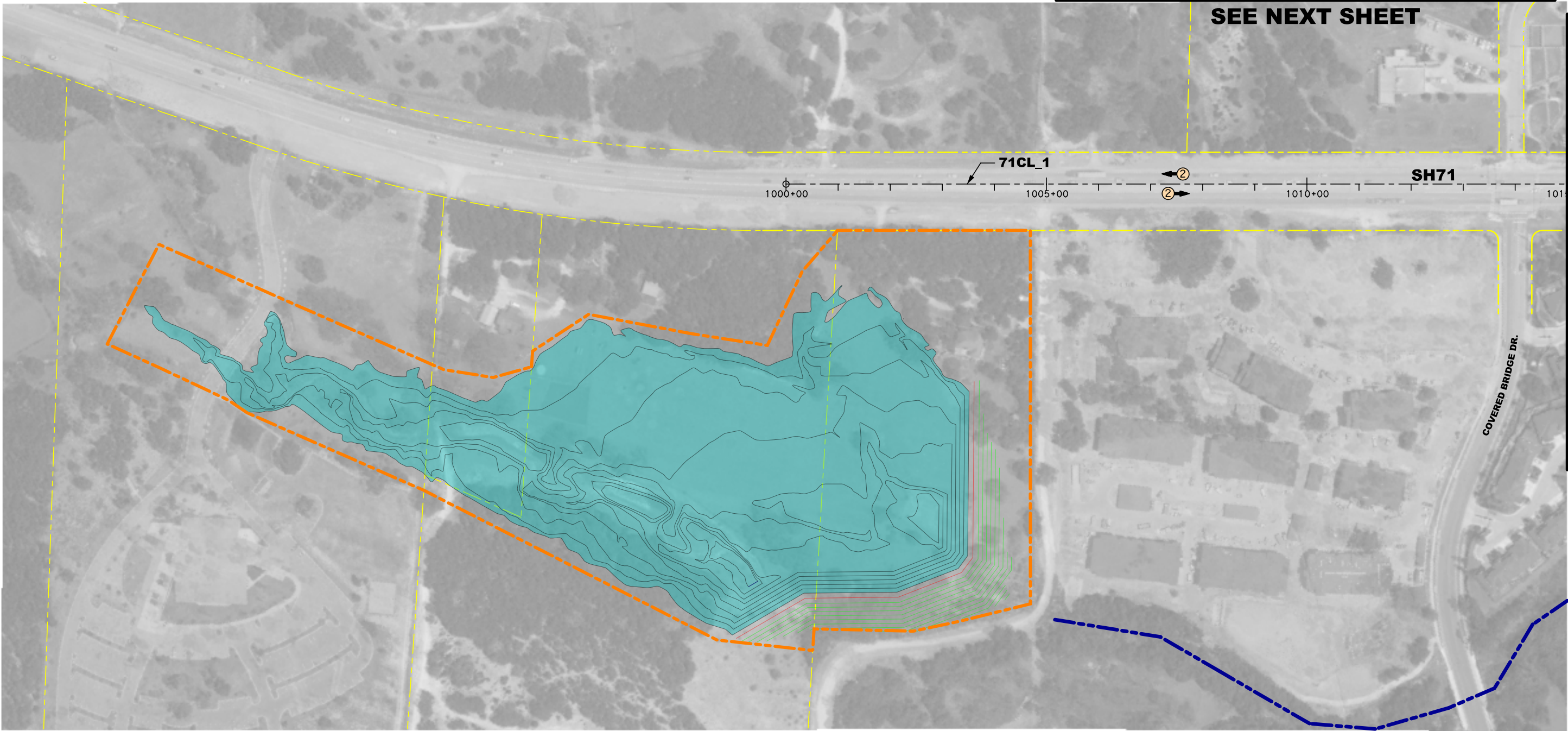
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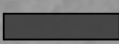


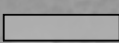
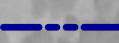



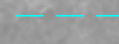



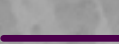

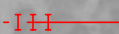



MATCHLINE STA. POND 2

SEE NEXT SHEET

MATCHLINE STA. 1015+00.00



LEGEND

	PROPOSE P-VEMENT/ OVERL-YED EXISTING P-VEMENT		PROPOSED SOUND B-RRIER W-LLS		L-NE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK -LIGNMENT		C-BLE B-RRIRS
	PROPOSED SH-RED USE P-THS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEW-LKS		PROPOSED DR-IN-GE E-SEMENT		DIRECTION -RROWS / NO. L-NES
	W-TER QU-LITY POND		TEMPOR-RY CONSTRUCTION E-SEMENT		
	RET-INING W-LLS		PROPOSED DRIVE-WY LICENSE		
	CONTROL OF -CCESS		EXISTING ROW		

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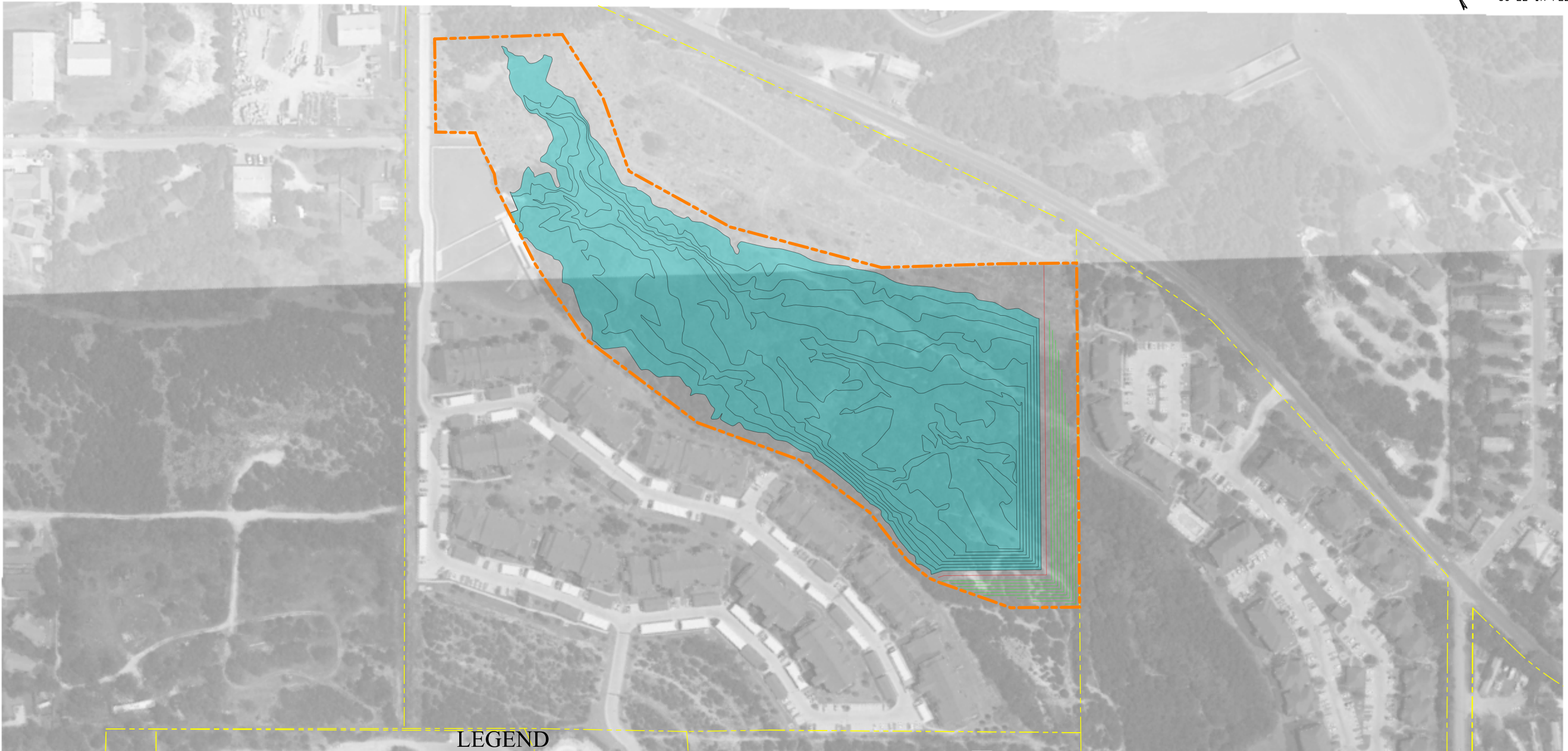


US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

BEGIN TO STA. 1015+00.00

SHEET 12 OF 15

D-TE: 8/22/2018



LEGEND

	PROPOSE P-VEMENT/ OVERL-YED EXISTING P-VEMENT		PROPOSED SOUND B-RRIER W-LLS		L-NE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK -LIGNMENT		C-BLE B-RRIRS
	PROPOSED SH-RED USE P-THS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEW-LKS		PROPOSED DR-IN-GE E-SEMENT		DIRECTION -RRROWS / NO. L-NES
	W-TER QU-LITY POND		TEMPOR-RY CONSTRUCTION E-SEMENT		
	RET-INING W-LLS		PROPOSED DRIVEW-Y LICENSE		
	CONTROL OF -CCESS		EXISTING ROW		

MATCHLINE POND 2

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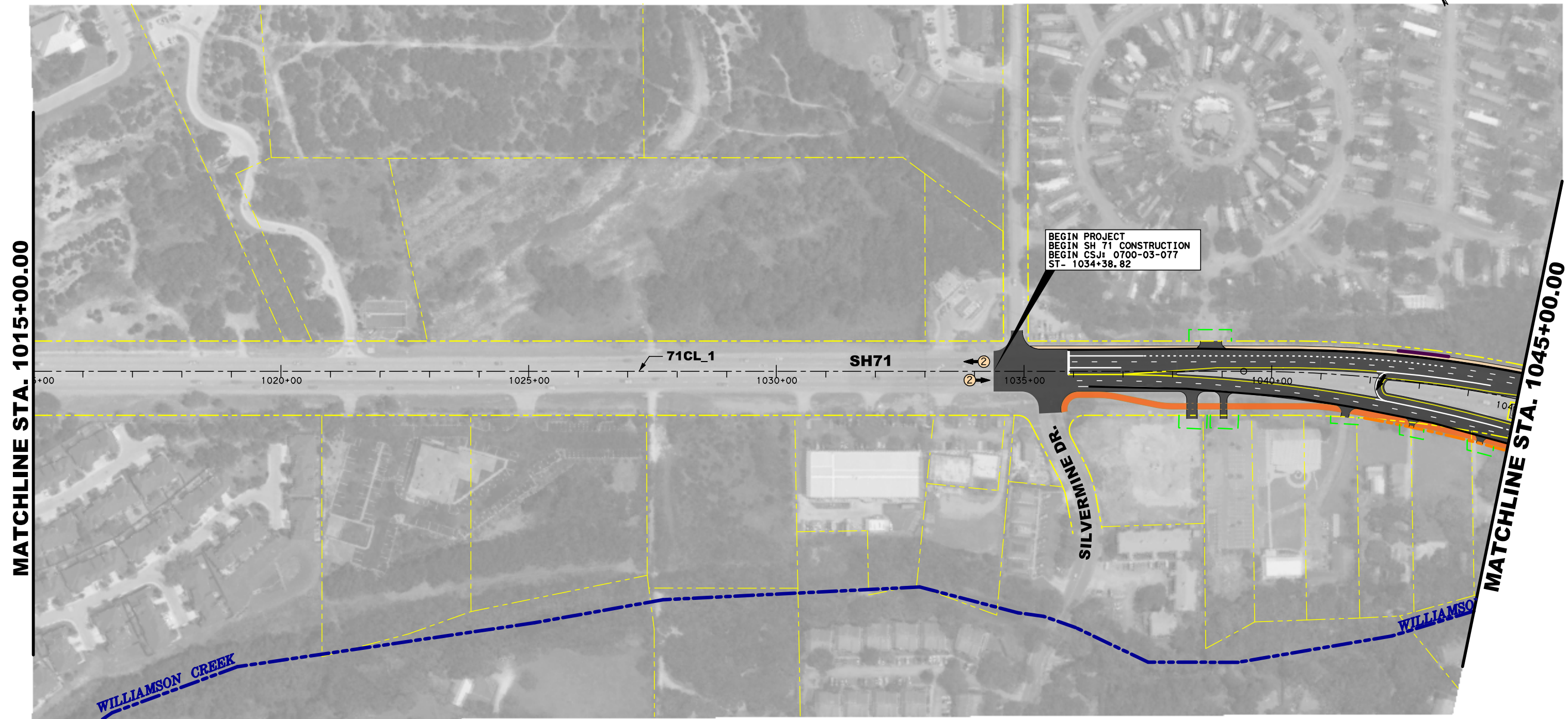
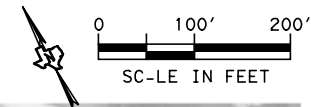


US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

SHEET 12- OF 15

D-TE: 8/23/2018

8/22/2018
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LEGEND

	PROPOSE P-VEMENT/ OVERL-YED EXISTING P-VEMENT		PROPOSED SOUND B-RRIER W-LLS		L-NE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK -LIGNMENT		C-BLE B-RRIRS
	PROPOSED SH-RED USE P-THS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEW-LKS		PROPOSED DR-IN-GE E-SEMENT		DIRECTION -RRWS / NO. L-NES
	W-TER QU-LITY POND		TEMPOR-RY CONSTRUCTION E-SEMENT		
	RET-INING W-LLS		PROPOSED DRIVE-WY LICENSE		
	CONTROL OF -CCESS		EXISTING ROW		

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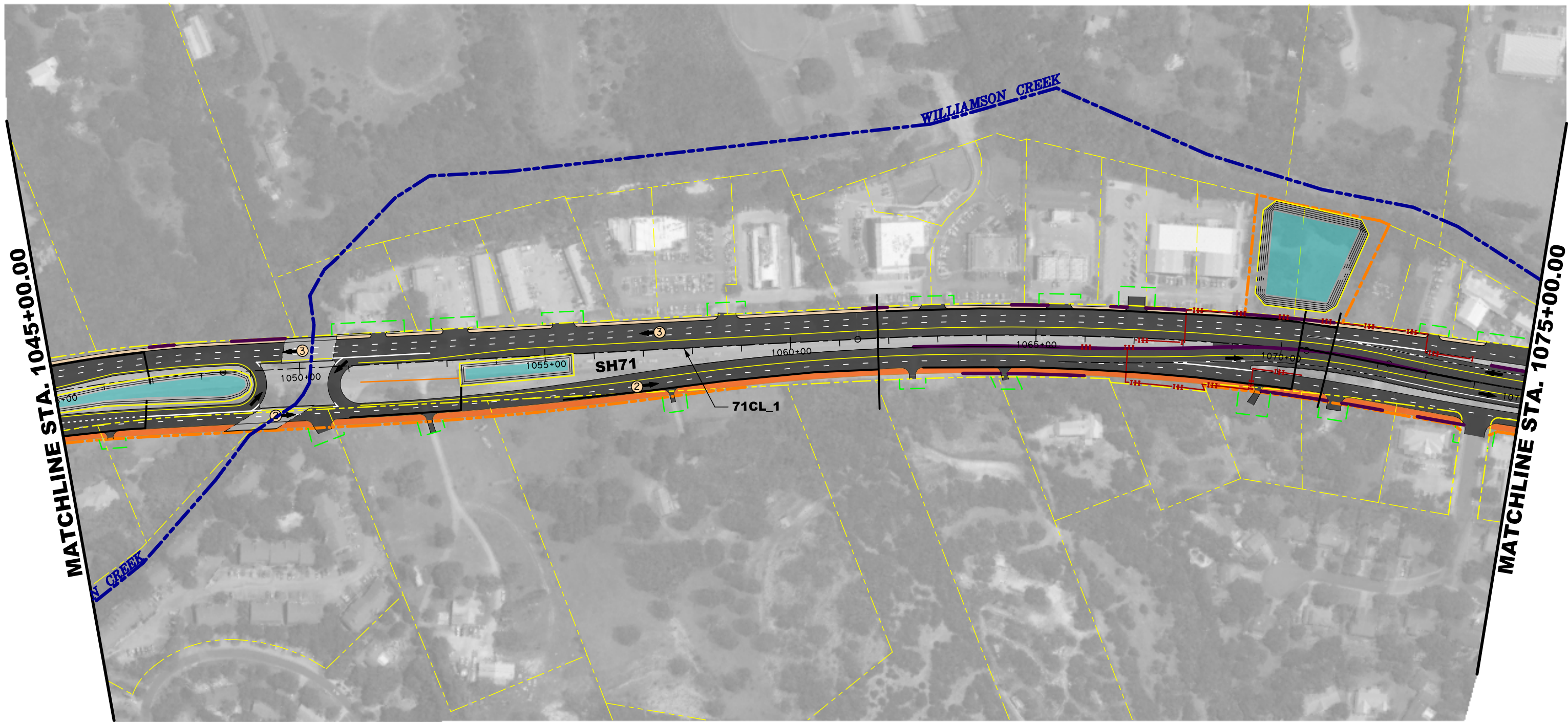
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FIRM #587



US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY

STA. 1015+00.00 TO STA. 1045+00.00

8/23/2018
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LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		

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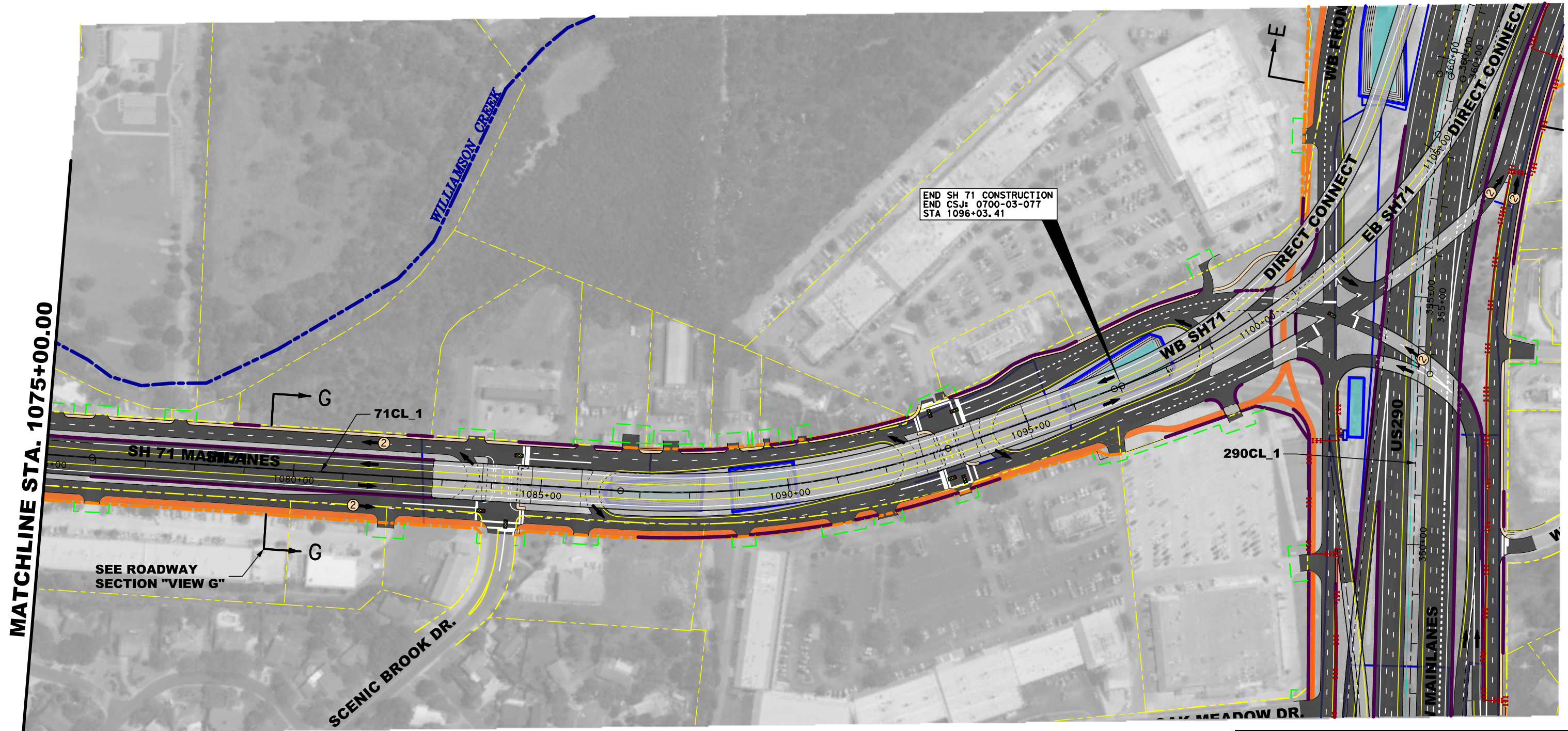
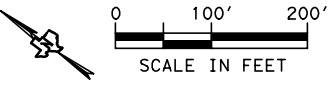
**US290 / SH71
OAK HILL PARKWAY
PREFERRED ALTERNATIVE
ENVIRONMENTAL IMPACT STUDY**

STA. 1045+00.00 TO STA. 1075+00.00

SHEET 14 OF 15

DATE: 8/23/2018

8/21/2018
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LEGEND

	PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT		PROPOSED SOUND BARRIER WALLS		LANE STRIPING
	PROPOSED BRIDGE STRUCTURE		EXISTING CREEK ALIGNMENT		CABLE BARRIERS
	PROPOSED SHARED USE PATHS		PROPOSED ROW		DITCH LINE
	PROPOSED SIDEWALKS		PROPOSED DRAINAGE EASEMENT		DIRECTION ARROWS / NO. LANES
	WATER QUALITY POND		TEMPORARY CONSTRUCTION EASEMENT		
	RETAINING WALLS		PROPOSED DRIVEWAY LICENSE		
	CONTROL OF ACCESS		EXISTING ROW		

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STA. 1075+00.00 TO END

SHEET 15 OF 15

DATE: 8/21/2018