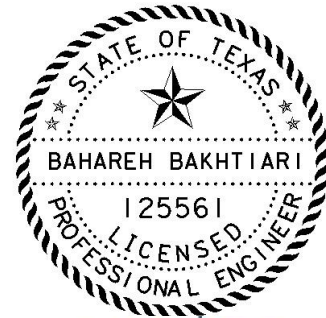


Memorandum

From: Bahareh Bakhtiari, PE, PTOE

Date: January 10, 2024

Re: – Traffic Study Memorandum
LJA Job No. 4059-001



B. Bakhtiari 1-10-2024

This memorandum presents the summary of findings for the Traffic Impact Analysis (TIA) prepared by LJA Engineering, Inc. (LJA) for the proposed Baytown development in Baytown, Texas. The analysis focuses on the proposed development consisting of 32 single-family detached units (ITE 210). The development site is located on the north side of Massey Tompkins Rd and the west side of Crosby Cedar Bayou Rd. The anticipated completion year for this development is in 2024, therefore, the study horizon for this TIA is for the year 2024. **Figure 1** provides a vicinity map along with the surrounding street network within the study area.

Existing Area Conditions

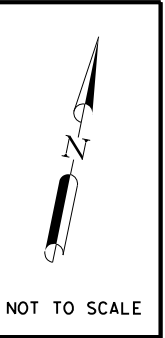
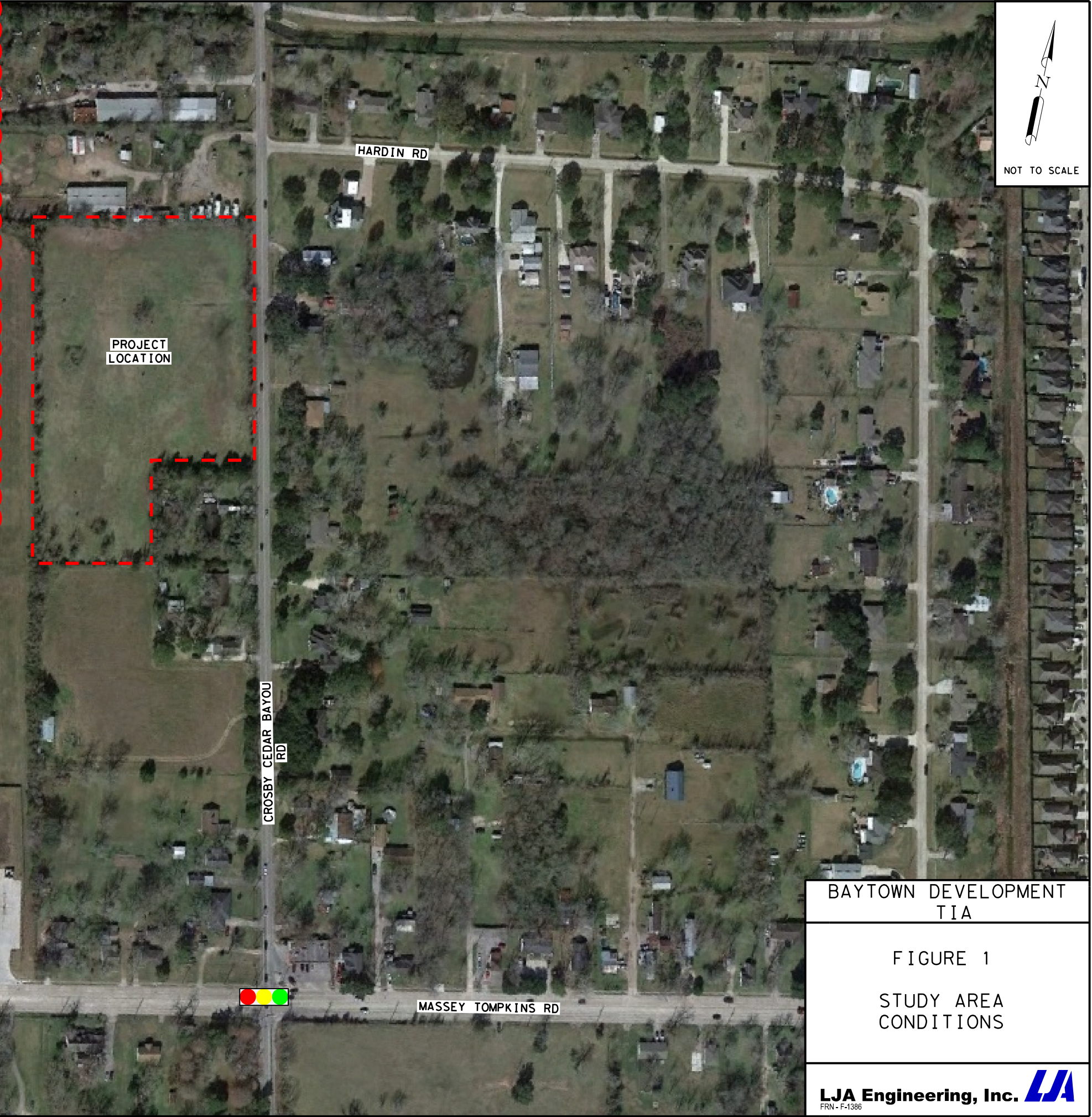
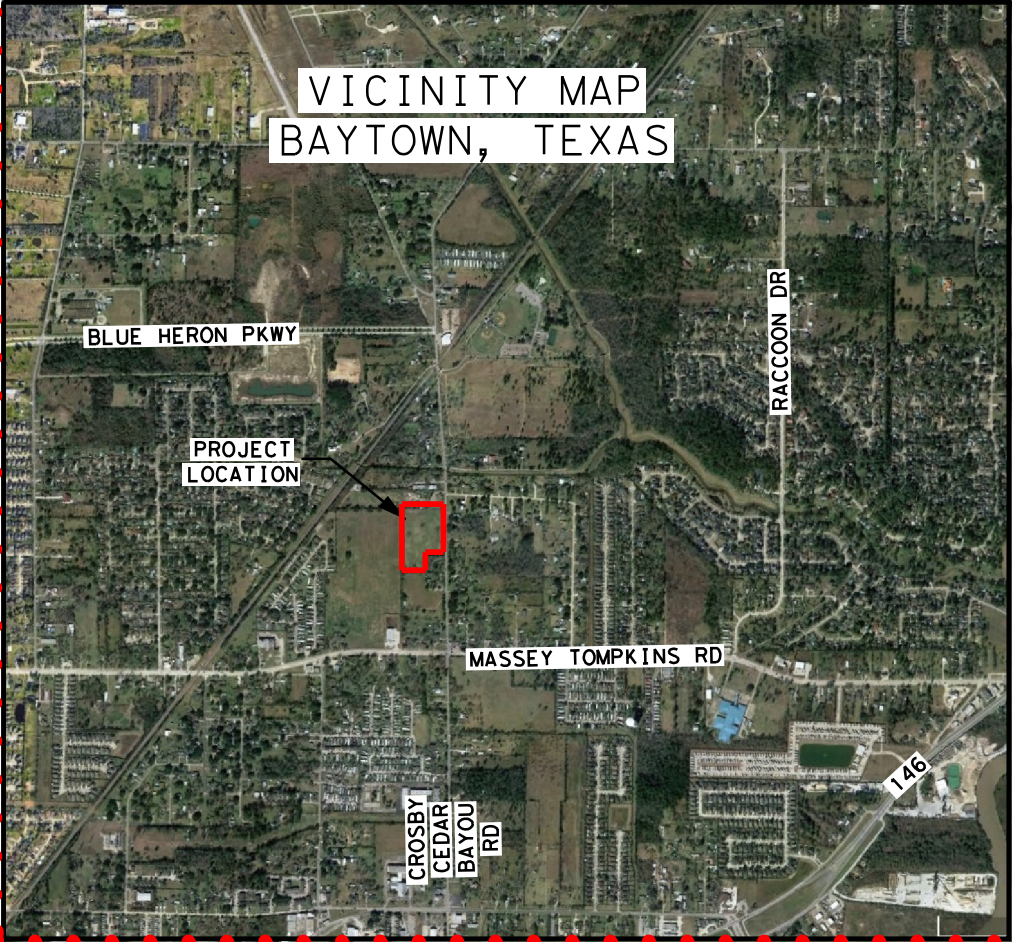
The study area for this analysis includes one existing intersection and proposed driveway intersections:

- Crosby Cedar Bayou Rd and Massey Tompkins Rd (Signalized)

Massey Tompkins Rd is a four-lane roadway, including dual left-turn lanes, that runs in the east-west direction with a posted speed limit of 40 MPH. Crosby Cedar Bayou Rd is a two-lane undivided roadway, which runs in the north-south direction with a posted speed limit of 40 MPH. Existing lane configurations and traffic control features at the intersection is presented in **Figure 2**.

Twenty-four-hour traffic volume data and intersection turning movement counts (TMCs) were collected on November 28, 2023. TMCs were collected for 24 hours and were used to determine the peak periods of traffic. TMCs were collected during the AM and PM Peak periods and were used to determine the Peak hour traffic volumes. **Figure 3** shows the existing traffic volumes. Traffic counts collected for this analysis are provided in **Attachment A**.

9:06:30 AM 1/10/2024 J:\4059\0001\REPORT\2. Exhibits\1. CAD\Figure 1- Existing Area Conditions.dgn



LEGEND

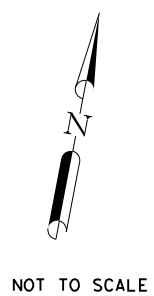
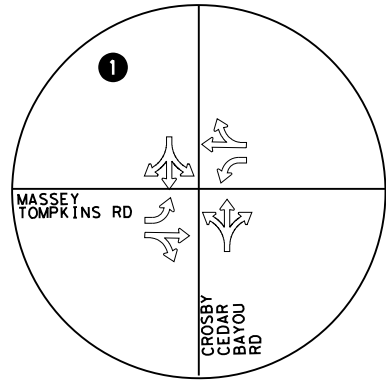
- PROPOSED DEVELOPMENT
- SIGNALIZED INTERSECTION

BAYTOWN DEVELOPMENT
TIA

FIGURE 1
STUDY AREA
CONDITIONS

LJA Engineering, Inc. 
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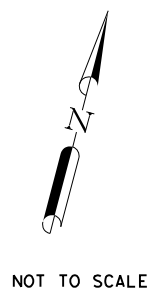
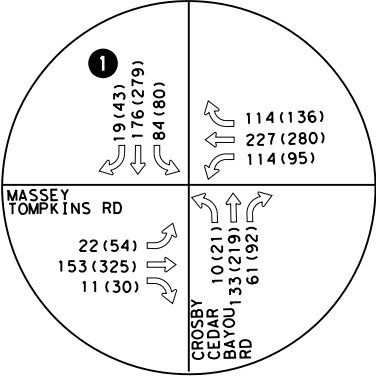
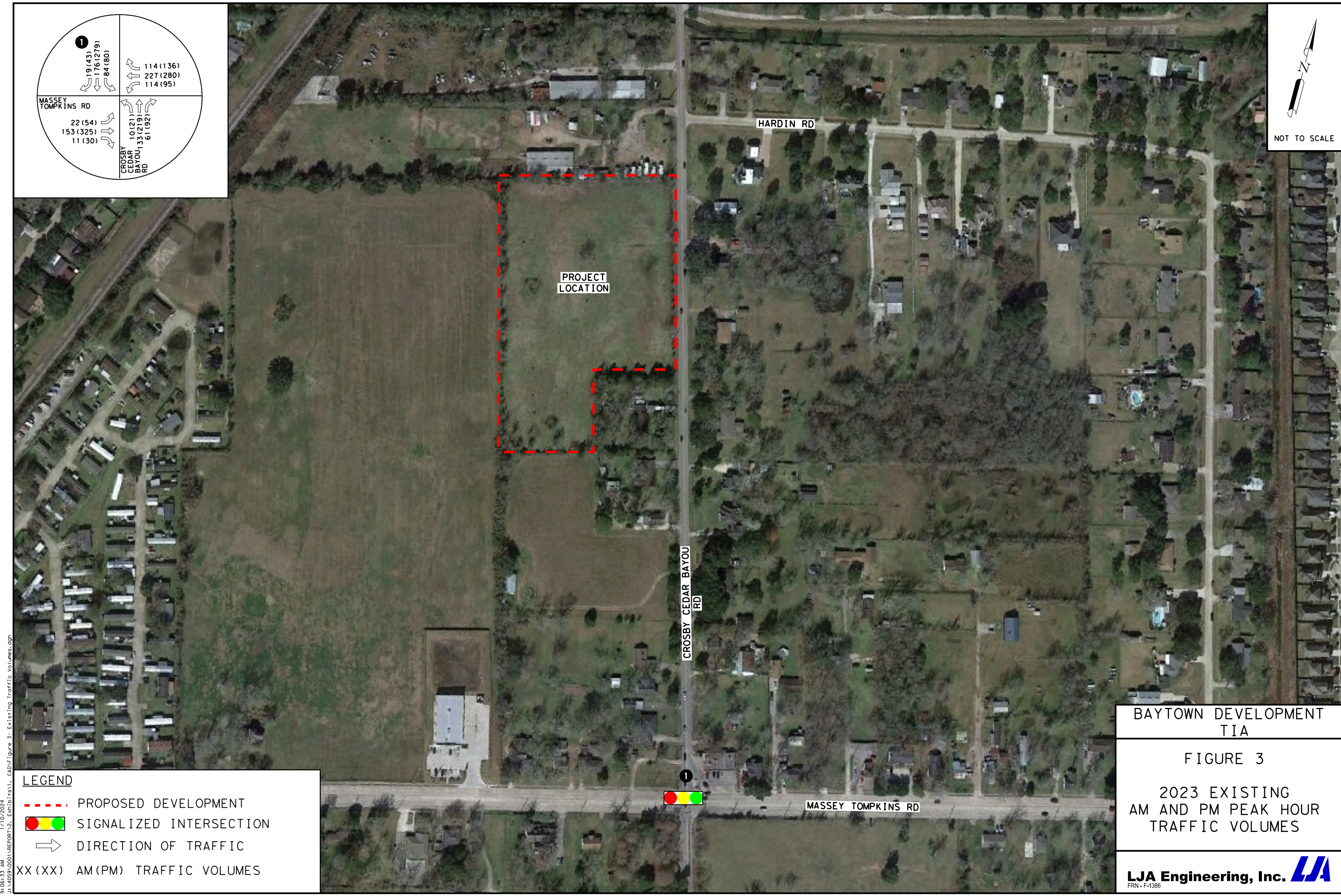
LEGEND

- PROPOSED DEVELOPMENT
- STOP CONTROLLED INTERSECTION
- DIRECTION OF TRAFFIC
- SIGNALIZED INTERSECTION

BAYTOWN DEVELOPMENT
TIA

FIGURE 2
EXISTING LANE
CONFIGURATIONS

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PROJECT
LOCATION

HARDIN RD

CROSBY CEDAR BAYOU
RD

MASSEY TOMPKINS RD

BAYTOWN DEVELOPMENT
TIA


FIGURE 3


2023 EXISTING
AM AND PM PEAK HOUR
TRAFFIC VOLUMES

LJA Engineering, Inc. 
FRN - F-1386

LEGEND

--- PROPOSED DEVELOPMENT

 SIGNALIZED INTERSECTION

 DIRECTION OF TRAFFIC

XX (XX) AM (PM) TRAFFIC VOLUMES

Proposed Area Conditions

The proposed Baytown Development will consist of 32 single-family detached housing units and is located approximately 0.25 miles north of Massey Tompkins Rd, and to the west of Crosby Cedar Bayou Rd. The construction of this development is expected to be completed in 2024. Access to the development will be facilitated through two driveways which will be public roadways along Crosby Cedar Bayou Rd. Driveway 1, located approximately 0.25 miles north of Massey Tompkins Rd, and Driveway 2, situated roughly 0.31 miles north of Massey Tompkins Rd, will both serve as full-access driveways along Crosby Cedar Bayou Rd. A preliminary site plan of the proposed development is provided in **Attachment B**.

Methodology

In order to evaluate the traffic impacts of the proposed development on the surrounding street network, future traffic conditions were analyzed without (No Build Conditions) and with (Build Conditions) the development's generated traffic. After the future Build Conditions were analyzed, mitigation measures were established in order to address any resulting deficiencies in the performance of the surrounding street network. The AM and PM peak hours were analyzed for each of the Existing, No Build, and Build scenarios. A total of six (6) scenarios were analyzed for this study:

- 2023 Existing AM Conditions
- 2023 Existing PM Conditions
- 2024 No Build AM Conditions
- 2024 No Build PM Conditions
- 2024 Build AM Conditions
- 2024 Build PM Conditions

Traffic Growth

An average annualized growth rate of 2 percent was calculated by reviewing the historical growth rate from the TxDOT Traffic Count Database System (TCDS). This growth rate was applied to the 2023 traffic volumes to determine the future traffic volumes without the proposed development generated traffic (2024 No Build Conditions). The traffic that would be generated by the proposed development was then added to the No Build Conditions to establish the future 2024 Build Conditions. **Figure 4** presents the future No Build traffic volumes for the year 2024.

Trip Generation

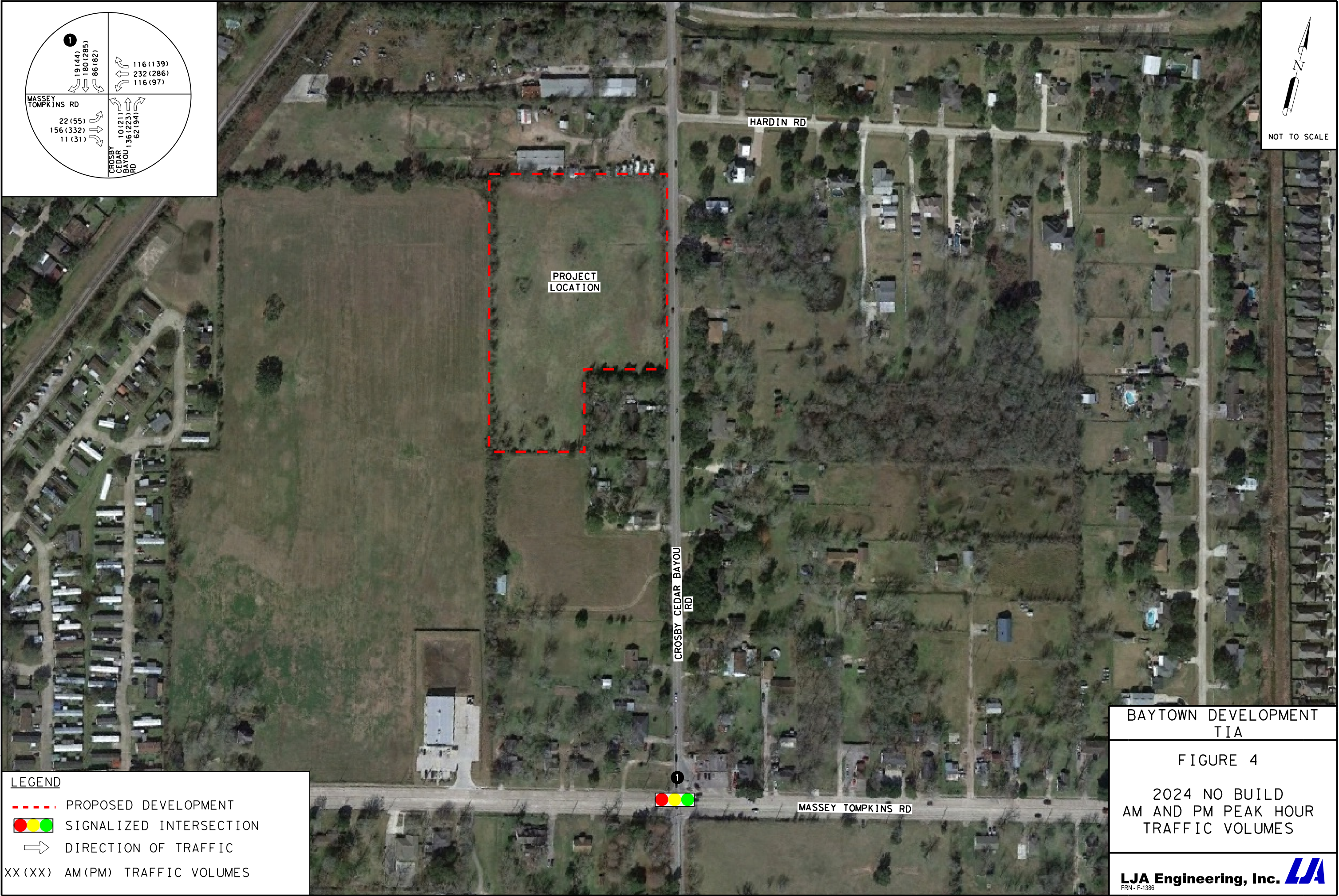
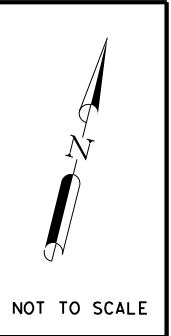
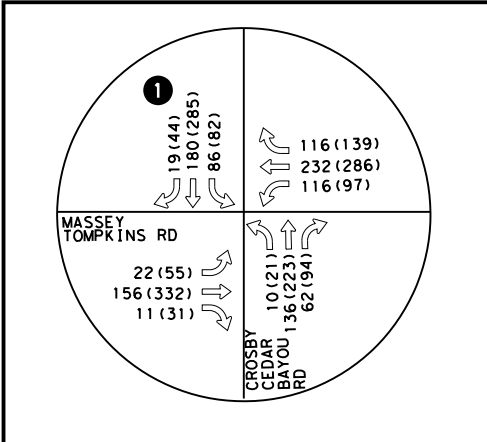
The amount of traffic a proposed development will generate depends on a number of factors including the nature, size, and location of the proposed development. The Trip Generation Manual, 11th Edition which is published by the Institute of Transportation Engineers (ITE) is a compilation of trip generation studies which have been performed at various sites throughout the United States. Standard engineering practice dictates the use of this manual to determine the amount of traffic a proposed development will generate during the peak hours of traffic. **Table 1** provides the amount of traffic which will be generated by this proposed single-family detached housing development. Trip generation calculations are presented in **Attachment C**.

Table 1: Vehicle Trips Generated by the Proposed Development										
Land Use	ITE	Daily Trips (vpd)			AM Peak Trips (vph)			PM Peak Trips (vph)		
	Code	In	Out	Total	In	Out	Total	In	Out	Total
Single-Family Detached Housing	210	151	151	302	6	16	22	19	11	30

The proposed development is expected to generate 302 daily vehicle trips with 22 vehicle trips during the AM peak hour and 30 vehicle trips during the PM peak hour. Peak hour trips generated by the proposed development were assigned to the entrances and exits of the proposed development according to existing travel patterns within the study area. Generated vehicle trips were then distributed to the surrounding street network in accordance with the routes that provide the shortest travel distance to and from the proposed development sites. Refer to the Trip Distribution and Assignment Section of this report for generated vehicle percentages and volumes.

Trip Distribution and Assignment

Peak hour trips generated by the proposed development were distributed to the entrances and exits of the surrounding roadway network based on the expected traffic patterns within the study area. Generated traffic volumes were assigned to the study street network according to the routes that provide the shortest travel distance to their corresponding origins/destinations. Trip distribution and assignment percentages are shown in **Figure 5**. Generated vehicle trips are presented in **Figure 6**. Generated vehicle trips were then added to the No-Build traffic to determine the Build traffic volumes. **Figure 7** shows the total traffic volumes which are projected within the study area following the completion of this development (Build Conditions).



LEGEND

- - - PROPOSED DEVELOPMENT
- ● ● SIGNALIZED INTERSECTION
- ➔ DIRECTION OF TRAFFIC
- XX (XX) AM (PM) TRAFFIC VOLUMES

BAYTOWN DEVELOPMENT
TIA

FIGURE 4

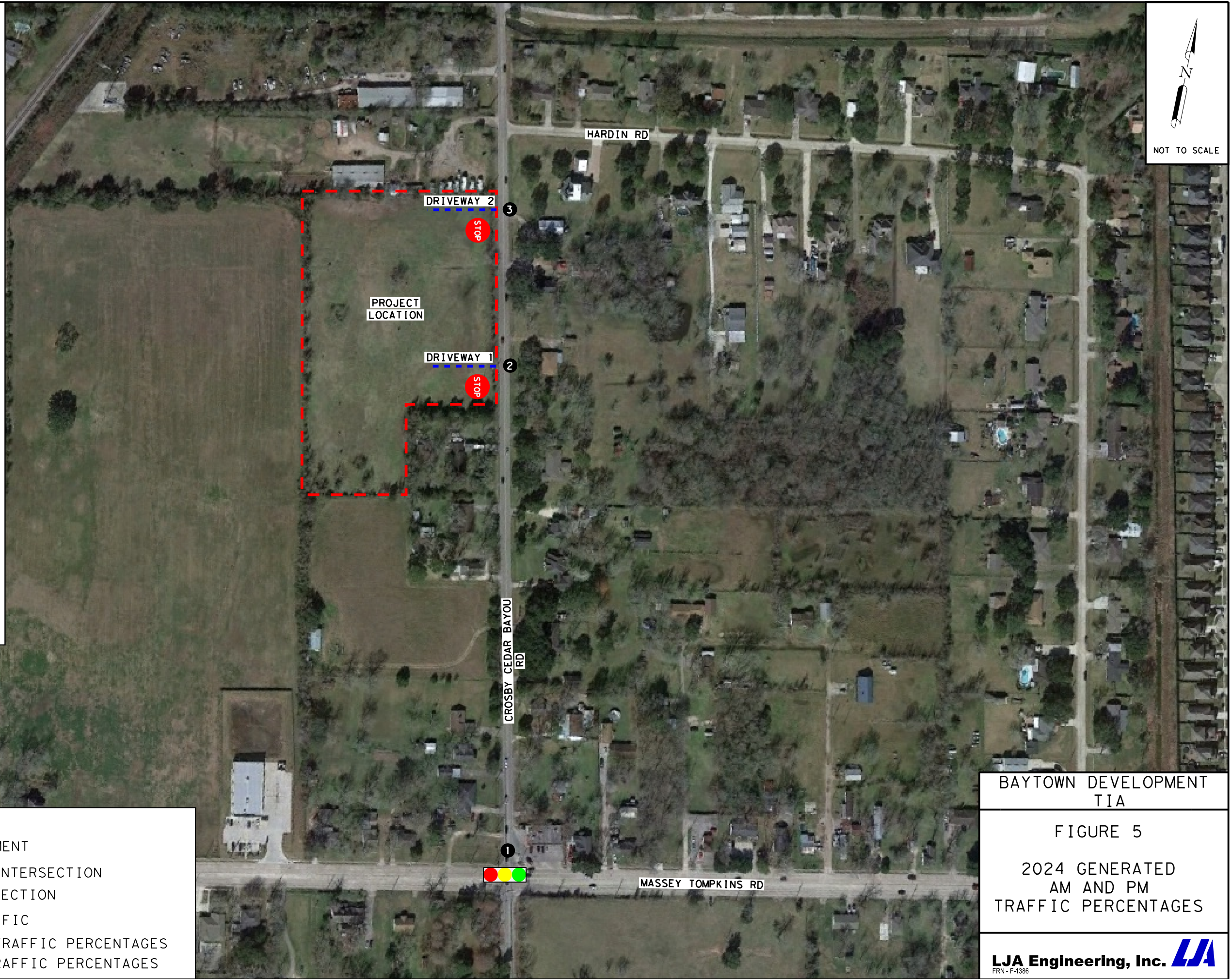
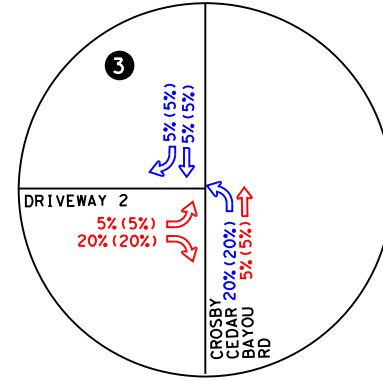
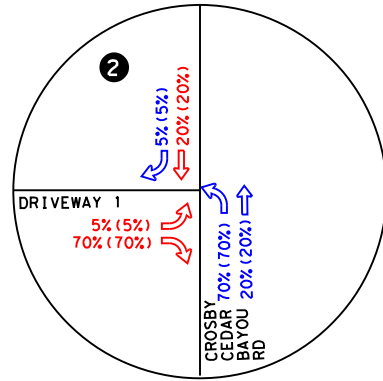
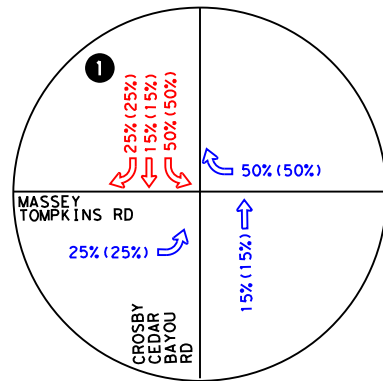
2024 NO BUILD
AM AND PM PEAK HOUR
TRAFFIC VOLUMES

LJA Engineering, Inc. 
FRN - F-1386

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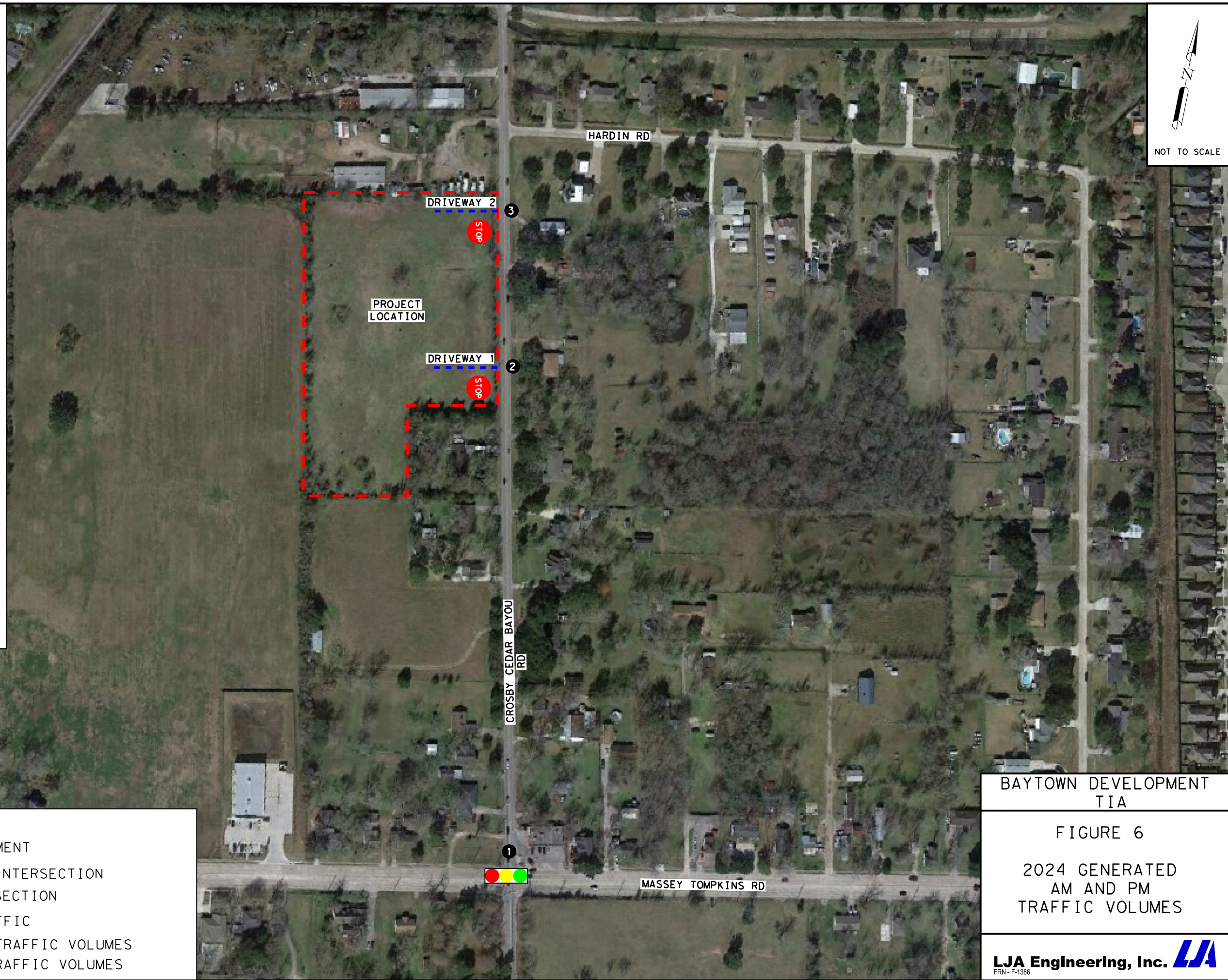
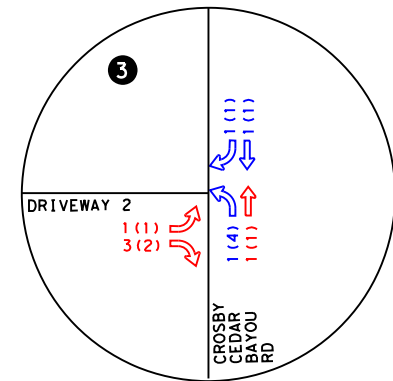
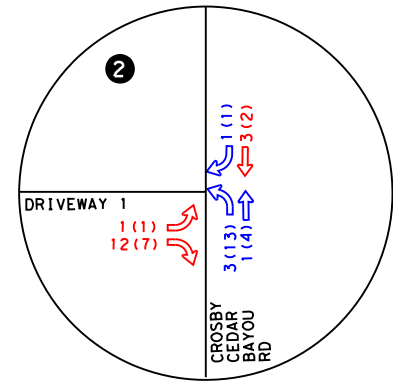
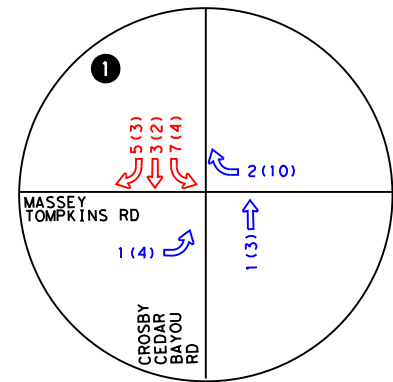
- PROPOSED DEVELOPMENT
- STOP STOP CONTROLLED INTERSECTION
- SIGNALIZED INTERSECTION
- DIRECTION OF TRAFFIC
- AM(PM) ENTERING TRAFFIC PERCENTAGES
- AM(PM) EXITING TRAFFIC PERCENTAGES



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LEGEND

- PROPOSED DEVELOPMENT
- STOP STOP CONTROLLED INTERSECTION
- Signalized Intersection
- Direction of Traffic
- XXX(XXX) AM(PM) ENTERING TRAFFIC VOLUMES
- XXX(XXX) AM(PM) EXITING TRAFFIC VOLUMES



BAYTOWN DEVELOPMENT
TIA

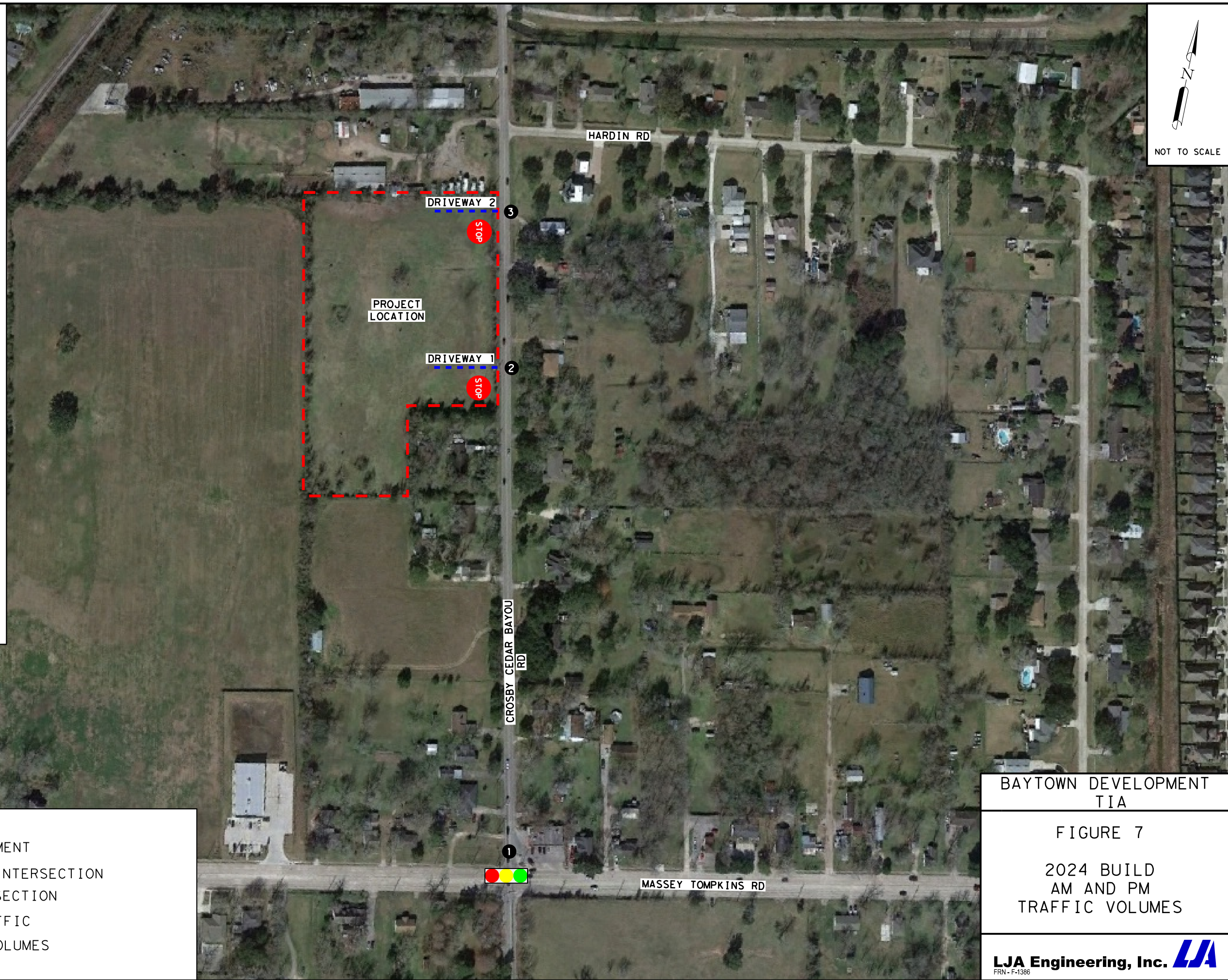
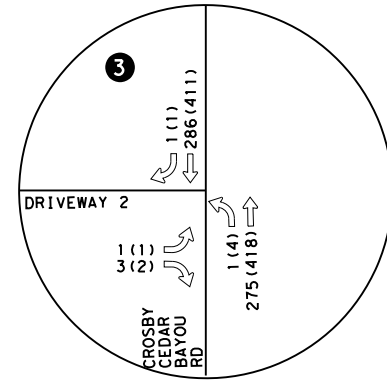
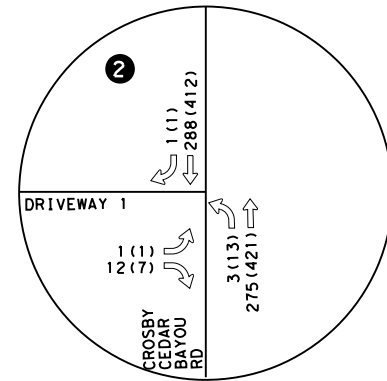
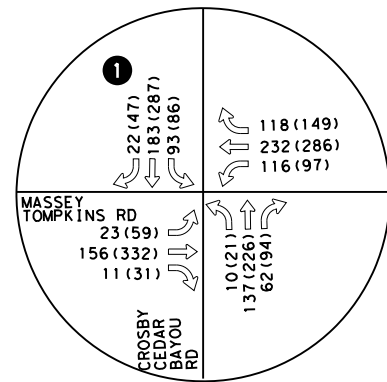
FIGURE 6

2024 GENERATED
AM AND PM
TRAFFIC VOLUMES

LJA Engineering, Inc.
FRN - F-1386

LEGEND

- PROPOSED DEVELOPMENT
- STOP STOP CONTROLLED INTERSECTION
- Signalized Intersection
- DIRECTION OF TRAFFIC
- XX (XX) AM(PM) TRAFFIC VOLUMES



BAYTOWN DEVELOPMENT
TIA

FIGURE 7

2024 BUILD
AM AND PM
TRAFFIC VOLUMES

Intersection Capacity Analysis

The Highway Capacity Manual, 6th Edition (HCM) provides procedures which are used to evaluate the operations of all types of transportation facilities, including both signalized and unsignalized intersections. For intersections that cannot be evaluated with HCM 6th edition methodologies, HCM 2000 was utilized. These procedures require the input of the intersection geometrics, operational characteristics, as well as the traffic volumes in order to determine the maximum capacity the intersection can handle and to calculate the amount of average delay a driver will experience as they travel through the intersection. Following these procedures, a Level of Service (LOS) is given to each of the controlled movements at an intersection which is based on the average amount of control delay drivers experience traveling through the intersection. Control delay is the delay experienced by drivers due to the presence of a traffic control device (such as a stop sign, a yield sign, or a traffic signal) and includes the time associated with drivers slowing down as they approach the intersection, the delay associated in traveling through the intersection in the desired direction, as well as the time it takes drivers to accelerate back to their desired speed. There are six Levels of Service which can be assigned to a controlled movement at an intersection (A through F). Generally, a LOS D or better is considered acceptable. LOS E represents a condition where the demand volume is approaching the maximum capacity for a particular movement or the intersection in general, and a LOS F represents a condition where the demand volume exceeds the capacity.

For signalized intersections and all-way stop controlled intersections, a LOS is calculated for each of the lane groups at the intersection and an overall LOS is also calculated by aggregating the delays at the intersection weighted by the traffic volumes. For one-way and two-way stop-controlled intersections, an overall LOS is not defined, and a LOS is only calculated for the movements which are controlled with a stop sign, a yield sign, or left turning traffic which must yield to the opposing conflicting traffic at the intersection. **Table 2** shows the criteria for each of the levels of service as listed in the HCM for both signalized and unsignalized intersections.

Table 2: Level of Service Criteria for Intersection Lane Groups		
Level of Service	Average Amount of Control Delay (sec/veh)	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	10 – 15	10 – 20
C	15 – 25	20 – 35
D	25 – 35	35 – 55
E	35 – 50	55 – 80
F	> 50	> 80

Synchro 11 software was utilized to complete the analysis. Signalized intersections use optimized signal timings values under the assumption that the intersection is already at its optimized capacity prior to the construction of the proposed development. Capacity Analysis results are presented in the following sub-sections of the report. Complete Capacity Analyses output files are presented in **Attachment D**.

Massey Tompkins Rd and Crosby Cedar Bayou Rd

The intersection of Massey Tompkins Rd and Crosby Cedar Bayou Rd is currently a signalized intersection with permitted/protected left turn lanes along Massey Tompkins Rd. The southbound and northbound approaches consist of one shared right/left/through lane. The westbound approach consists of one left turn lane, one through lane, and one shared through/right lane. The eastbound approach consists of one left turn lane, one through lane and one shared through/right lane. **Table 3** provides the summary of the MOEs at this intersection during the AM and PM peak hours for the weekday.

Table 3: Summary of MOEs at Massey Tompkins Rd and Crosby Cedar Bayou Rd - Delay(sec)/LOS									
Roadway	Massey Tompkins Rd						Crosby Cedar Bayou Rd		Intersection
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	SBL	
2023 Existing AM	41.9/D	59.9/E	60.1/E	17.5/B	17.0/B	17.2/B	48.5/D	45.2/D	36.5/D
2023 Existing PM	38.4/D	57.2/E	57.5/E	31.1/C	31.1/C	31.7/C	54.9/D	51.5/D	46.8/D
2024 No Build AM	41.8/D	59.8/E	60.1/E	17.9/B	17.5/B	17.6/B	48.89/D	45.5/D	36.9/D
2024 No Build PM	38.3/D	57.1/E	57.5/E	31.9/C	32.2/C	32.9/C	55.5/E	52.3/D	47.4/D
2024 Build AM	41.9/D	59.8/E	60.1/E	18.4/B	18.0/B	18.2/B	48.9/D	46.4/D	37.4/D
2024 Build PM	38.4/D	57.1/E	57.5/E	32.4/C	33.3/C	34.2/C	55.9/E	53.0/D	48.0/D

The overall intersection of Massey Tompkins Rd and Crosby Cedar Bayou Rd is expected to operate at an acceptable level with and without the traffic generated by the proposed development. The eastbound through and right movements will operate at unacceptable LOS E during the AM and PM Existing, No Build and Build conditions. The northbound left turn movements will operate at unacceptable levels during the No Build and Build PM conditions.

For the existing conditions the intersection signal timings were optimized. This signal timings carried to the No Build and Build conditions. The signal timings for all conditions are provided in **Attachment D**. The generated trips from the development did not affect the overall intersection to a LOS E or LOS F and the failing movements continue to fail with no significant increase in delay. No mitigation measures were applied at this intersection due to the proposed development.

Driveway 1 and Crosby Cedar Bayou Rd

The intersection of Driveway 1 and Crosby Cedar Bayou Rd will be a one-way stop controlled T-intersection with a stop control sign along Driveway 1. The northbound approach consists of one shared left/through lane. The southbound approach consists of one shared through/right lane. **Table 4** provides the summary of the MOEs at this intersection during the AM and PM peak hours for the weekday.

Table 4: Summary of MOEs at Crosby Cedar Bayou Rd & Driveway 1 - Delay(sec)/LOS		
Roadway	Crosby Cedar Bayou Rd	Driveway 1
Lane Group	NBL	EBL
2024 Build AM	7.9/A	10.3/B
2024 Build PM	8.3/A	11.8/B

All the corresponding intersection movements at the intersection of Crosby Cedar Bayou Rd and Driveway 1 are expected to operate at acceptable levels once this proposed development is completed, therefore mitigation will not be required at this intersection.

Driveway 2 and Crosby Cedar Bayou Rd

The intersection of Driveway 2 and Crosby Cedar Bayou Rd will be a one-way stop controlled T-intersection with a stop control sign along Driveway 2. The northbound approach consists of one shared left/through lane. The southbound approach consists of one shared through/right lane. **Table 5** provides the summary of the MOEs at this intersection during the AM and PM peak hours for the weekday.

Table 5: Summary of MOEs at Crosby Cedar Bayou Rd & Driveway 2 - Delay(sec)/LOS		
Roadway	Crosby Cedar Bayou Rd	Driveway 1
Lane Group	NBL	EBL
2024 Build AM	7.9/A	10.7/B
2024 Build PM	8.2/A	13.0/B

All the corresponding intersection movements at the intersection of Crosby Cedar Bayou Rd and Driveway 2 are expected to operate at acceptable levels once this proposed development is completed, therefore mitigation will not be required at this intersection.

Right and Left Turn Lane Analyses

Right and Left Turn Lane Analyses were completed for the proposed intersections in accordance with the National Cooperative Highway Research Program (NCHRP) 475 requirements for right turn deceleration lanes and for left turn deceleration lanes. **Attachment E** provides the criteria for a right turn lane. **Attachment F** provides the left turn criteria. Based on the analyses conducted, it has been determined that the intersections of Crosby Cedar Bayou Rd at Driveway 1 and Driveway 2 do not warrant right and left turn lanes.

Conclusion and Recommendations

In conclusion, this memorandum presents the summary results for the Baytown development consisting of 32 single family detached homes. Based on the results for the Intersection Capacity Analyses, it is determined that the adjacent roadway network will accommodate the generated trips for the proposed Baytown development successfully. The signal timings used in the Build conditions are the optimized signal timings used in the Existing conditions. Signal timings are provided in **Attachment D**. No improvements are required at any of the intersections analyzed.

Attachment A

Traffic Counts

VOLUME**Crosby Cedar Bayou Rd S/O Hardin Rd**

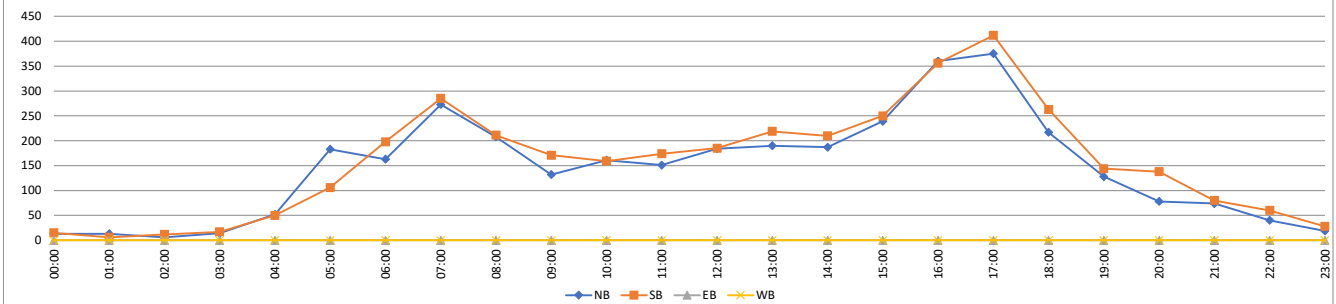
Day: Tuesday

Date: 11/28/2023

City: Baytown

Project #: TX23_450177_001

DAILY TOTALS						NB				SB				EB				WB				Total		DAILY TOTALS					
						3,460		3,749		0		0		7,209															
15-Minutes Interval												Hourly Intervals																	
TIME	NB	SB	EB	WB	TOTAL	TIME	NB	SB	EB	WB	TOTAL	TIME	NB	SB	EB	WB	TOTAL												
00:00	5	5			10	12:00	37	59			96	00:00	01:00	13	15		28												
00:15	3	4			7	12:15	56	35			91	01:00	02:00	13	6		19												
00:30	2	4			6	12:30	39	46			85	02:00	03:00	6	12		18												
00:45	3	2			5	12:45	52	45			97	03:00	04:00	14	17		31												
01:00	8	3			11	13:00	59	62			121	04:00	05:00	52	50		102												
01:15	3	0			3	13:15	40	49			89	05:00	06:00	183	106		289												
01:30	1	1			2	13:30	45	56			101	06:00	07:00	163	198		361												
01:45	1	2			3	13:45	46	52			98	07:00	08:00	273	285		558												
02:00	1	2			3	14:00	40	47			87	08:00	09:00	208	211		419												
02:15	1	3			4	14:15	50	56			106	09:00	10:00	132	171		303												
02:30	2	4			6	14:30	52	56			108	10:00	11:00	161	159		320												
02:45	2	3			5	14:45	45	51			96	11:00	12:00	151	174		325												
03:00	4	3			7	15:00	54	49			103	12:00	13:00	184	185		369												
03:15	3	6			9	15:15	64	61			125	13:00	14:00	190	219		409												
03:30	3	6			9	15:30	62	72			134	14:00	15:00	187	210		397												
03:45	4	2			6	15:45	59	68			127	15:00	16:00	239	250		489												
04:00	3	8			11	16:00	67	79			146	16:00	17:00	360	356		716												
04:15	8	6			14	16:15	78	81			159	17:00	18:00	375	412		787												
04:30	15	14			29	16:30	99	96			195	18:00	19:00	217	263		480												
04:45	26	22			48	16:45	116	100			216	19:00	20:00	128	144		272												
05:00	36	25			61	17:00	101	110			211	20:00	21:00	78	138		216												
05:15	52	22			74	17:15	114	113			227	21:00	22:00	74	80		154												
05:30	47	29			76	17:30	85	80			165	22:00	23:00	40	60		100												
05:45	48	30			78	17:45	75	109			184	23:00	00:00	19	28		47												
06:00	39	47			86	18:00	88	65			153	STATISTICS																	
06:15	44	37			81	18:15	61	72			133		NB	SB	EB	WB	TOTAL												
06:30	38	52			90	18:30	31	77			108	Peak Period	00:00	to	12:00														
06:45	42	62			104	18:45	37	49			86	Volume	1369	1404			2773												
07:00	48	51			99	19:00	33	40			73	Peak Hour	7:15	7:15			7:15												
07:15	82	67			149	19:15	31	31			62	Peak Volume	274	290			564												
07:30	91	71			162	19:30	31	36			67	Peak Hour Factor	0.753	0.755			0.870												
07:45	52	96			148	19:45	33	37			70	Peak Period	12:00	to	00:00														
08:00	49	56			105	20:00	29	47			76	Volume	2091	2345			4436												
08:15	68	58			126	20:15	18	43			61	Peak Hour	16:30	16:30			16:30												
08:30	55	52			107	20:30	14	27			41	Peak Volume	430	419			849												
08:45	36	45			81	20:45	17	21			38	Peak Hour Factor	0.927	0.927			0.935												
09:00	32	35			67	21:00	22	24			46	Peak Period	07:00	to	09:00														
09:15	40	46			86	21:15	23	19			42	Volume	481	496			977												
09:30	31	44			75	21:30	20	21			41	Peak Hour	7:15	7:15			7:15												
09:45	29	46			75	21:45	9	16			25	Peak Volume	274	290			564												
10:00	25	19			44	22:00	10	29			39	Peak Hour Factor	0.753	0.755			0.870												
10:15	33	47			80	22:15	9	15			24	Peak Period	16:00	to	18:00														
10:30	47	43			90	22:30	11	9			20	Volume	735	768			1503												
10:45	56	50			106	22:45	10	7			17	Peak Hour	16:30	16:30			16:30												
11:00	40	45			85	23:00	7	6			13	Peak Volume	430	419			849												
11:15	35	46			81	23:15	4	8			12	Peak Hour Factor	0.927	0.927			0.935												
11:30	30	43			73	23:30	5	7			12																		
11:45	46	40			86	23:45	3	7			10																		
TOTALS	1369	1404	0	0	2773	TOTALS	2091	2345	0	0	4436																		
SPLIT %	49%	51%	0%	0%	38%	SPLIT %	47%	53%	0%	0%	62%																		

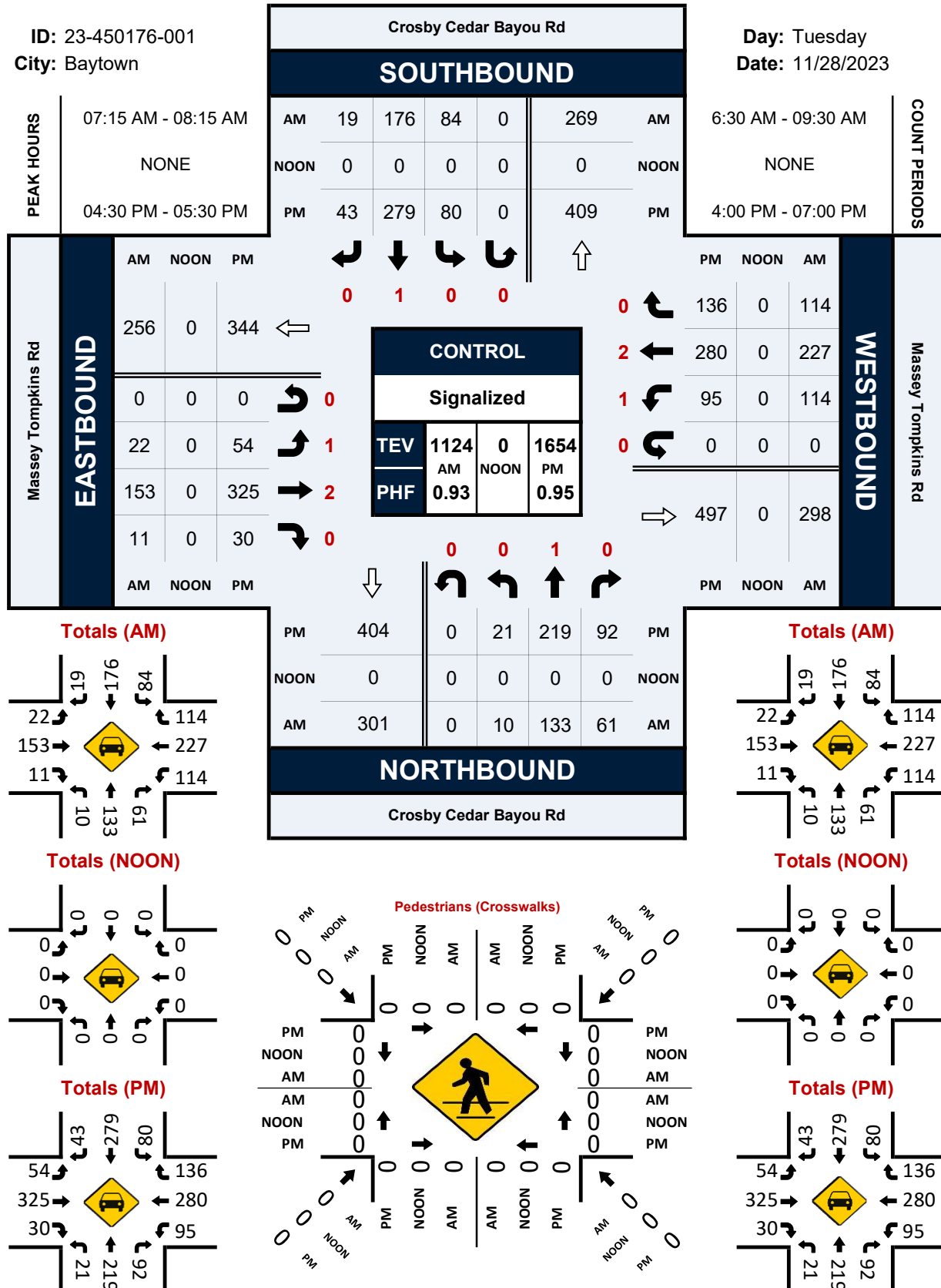


Crosby Cedar Bayou Rd & Massey Tompkins Rd

Peak Hour Turning Movement Count

ID: 23-450176-001
City: Baytown

Day: Tuesday
Date: 11/28/2023



Attachment B

Proposed Site Plan

STATE OF TEXAS
COUNTY OF HARRIS

WE, REDEMPTION ASSOCIATES LLC, A TEXAS LIMITED LIABILITY COMPANY, ACTING BY AND THROUGH LEYLAND SMITH, PRESIDENT, BEING AN OFFICER OF REDEMPTION ASSOCIATES LLC, A TEXAS LIMITED LIABILITY COMPANY, OWNER, HERINAFTER REFERRED TO AS OWNERS OF THE 7.192 ACRE TRACT DESCRIBED IN THE ABOVE AND FOREGOING PLAT OF IZZY CHALETS FINAL PLAT, AND DEDICATE TO PUBLIC USE, AS SUCH, THE STREETS, ALLEYS, PARKS, AND EASEMENTS SHOWN HEREON FOREVER, AND DO HEREBY WAIVE ANY CLAIMS FOR DAMAGES OCCASIONED BY THE SURFACE OF ANY PORTION OF STREETS OR ALLEYS, TO CONFORM TO SUCH GRADES; AND DO HEREBY BIND OURSELVES, OUR HEIRS, SUCCESSORS AND ASSIGNS TO WARRANT AND FOREVER DEFEND THE TITLE TO THE LAND SO DEDICATED.

THIS PLAT OF IZZY CHALETS FINAL PLAT ACCURATELY REPRESENTS THE PROPOSED PLAN AND TYPE OF DEVELOPMENT OF THAT CERTAIN 7.192 ACRE TRACT OF LAND SHOWN HEREON. WE DO FURTHER DEDICATE TO THE PUBLIC ALL EASEMENTS AND PUBLIC UTILITIES THEREIN, AND WE HEREBY COVENANT AND RESTRICT THE LAND SHOWN HEREON THIS PLAT TO THE USES AS SHOWN ON THE PLAT, AND NO USE OF SUCH LAND, DIFFERENT FROM THAT SHOWN ON THE RECORDED PLAT SHALL BE MADE UNLESS AND UNTIL ALL ORDINANCE REQUIREMENTS OF THE CITY OF BAYTOWN AND THE LAWS OF THE STATE OF TEXAS APPLICABLE TO SUCH PROPOSED USES SHALL HAVE FIRST BEEN COMPLIED WITH.

FURTHER, OWNERS HAVE DEDICATED AND BY THESE PRESENTS DO DEDICATE TO THE USE OF THE PUBLIC FOR PUBLIC UTILITY PURPOSES FOREVER UNOBSTRUCTED AERIAL EASEMENTS. THE AERIAL EASEMENTS SHALL EXTEND HORIZONTALLY AN ADDITIONAL ELEVEN FEET, SIX INCHES (11' 6") FOR TEN FEET (10' 0") PERIMETER GROUND EASEMENTS OR SEVEN FEET, SIX INCHES (7' 6") FOR FOURTEEN FEET (14' 0") PERIMETER GROUND EASEMENTS OR FIVE FEET, SIX INCHES (5' 6") FOR SIXTEEN FEET (16' 0") PERIMETER GROUND EASEMENTS, FROM A PLANE SIXTEEN FEET (16' 0") ABOVE GROUND LEVEL UPWARD, LOCATED ADJACENT TO AND ADJOINING SAID PUBLIC UTILITY EASEMENTS THAT ARE DESIGNATED WITH AERIAL EASEMENTS (U.E. AND A.E.) AS INDICATED AND DEPICTED, HEREON, WHEREBY THE AERIAL EASEMENT TOTALS TWENTY ONE FEET, SIX INCHES (21' 6") IN WIDTH.

FURTHER, OWNERS HAVE DEDICATED AND BY THESE PRESENTS DO DEDICATE TO THE USE OF THE PUBLIC FOR PUBLIC UTILITY PURPOSES FOREVER UNOBSTRUCTED AERIAL EASEMENTS. THE AERIAL EASEMENTS SHALL EXTEND HORIZONTALLY AN ADDITIONAL TEN FEET (10' 0") FOR TEN FEET (10' 0") BACK-TO-BACK GROUND EASEMENTS, OR EIGHT FEET (8' 0") FOR FOURTEEN FEET (14' 0") BACK-TO-BACK GROUND EASEMENTS OR SEVEN FEET (7' 0") FOR SIXTEEN FEET (16' 0") BACK-TO-BACK GROUND EASEMENTS, FROM A PLANE SIXTEEN FEET (16' 0") ABOVE GROUND LEVEL UPWARD, LOCATED ADJACENT TO BOTH SIDES AND ADJOINING SOLD PUBLIC UTILITY EASEMENTS THAT ARE DESIGNATED WITH AERIAL EASEMENTS (U.E. AND A.E.) AS INDICATED AND DEPICTED HEREON, WHEREBY THE AERIAL EASEMENT TOTALS THIRTY FEET (30' 0") IN WIDTH.

FURTHER, OWNERS DO HEREBY DECLARE THAT ALL PARCELS OF LAND DESIGNATED AS LOTS ON THIS PLAT ARE ORIGINALLY INTENDED FOR THE CONSTRUCTION OF SINGLE FAMILY RESIDENTIAL DWELLING UNITS THEREON AND SHALL BE RESTRICTED FOR SAME UNDER THE TERMS AND CONDITIONS OF SUCH RESTRICTIONS FILED SEPARATELY.

FURTHER, OWNERS DO HEREBY DEDICATE TO THE PUBLIC A STRIP OF LAND FIFTEEN (15) FEET WIDE ON EACH SIDE OF THE CENTERLINE OF ANY AND ALL BAYOUS, CREEKS, GULLIES, RAVINES, DRAWS, SLOUGHS OR OTHER NATURAL DRAINAGE COURSES LOCATED IN SAID PLAT, AS EASEMENTS FOR DRAINAGE PURPOSES. OWING THE CITY OF BAYTOWN, HARRIS COUNTY, OR ANY OTHER GOVERNMENTAL AGENCY, THE RIGHT TO ENTER UPON SAID EASEMENT AT ANY AND ALL TIMES FOR THE PURPOSE OF CONSTRUCTION AND MAINTENANCE OF DRAINAGE FACILITIES AND STRUCTURES.

FURTHER, OWNERS DO HEREBY COVENANT AND AGREE THAT ALL OF THE PROPERTY WITHIN THE BOUNDARIES OF THIS PLAT AND ADJACENT TO ANY DRAINAGE EASEMENT, DITCH, GULLY, CREEK OR NATURAL DRAINAGE WAY SHALL HEREBY BE RESTRICTED TO KEEP SUCH DRAINAGE WAYS AND EASEMENTS CLEAR OF FENCES, BUILDINGS, PLANTING AND OTHER OBSTRUCTIONS TO THE OPERATIONS AND MAINTENANCE OF THE DRAINAGE FACILITY AND THAT SUCH ABUTTING PROPERTY SHALL NOT BE PERMITTED TO DRAIN DIRECTLY INTO THIS EASEMENT EXCEPT BY MEANS OF AN APPROVED DRAINAGE STRUCTURE.

FURTHER, OWNERS DO HEREBY COVENANT AND AGREE THAT ALL OF THE PROPERTY WITHIN THE BOUNDARIES OF THIS PLAT IS HEREBY RESTRICTED TO PREVENT THE DRAINAGE OF ANY SEPTIC TANKS INTO ANY PUBLIC OR PRIVATE STREET, PERMANENT ACCESS EASEMENT, ROAD OR ALLEY OR ANY DRAINAGE DITCH, EITHER DIRECTLY OR INDIRECTLY.

FURTHER OWNERS DO HEREBY CERTIFY THAT WE ARE THE OWNERS OF ALL PROPERTY IMMEDIATELY ADJACENT TO THE BOUNDARIES OF THE ABOVE AND FOREGOING SUBDIVISION OF IZZY CHALETS FINAL PLAT WHERE BUILDING SETBACK LINES OR PUBLIC UTILITY EASEMENTS ARE TO BE ESTABLISHED OUTSIDE THE BOUNDARIES OF THE ABOVE AND FOREGOING SUBDIVISION AND DO HEREBY MAKE AND ESTABLISH ALL BUILDING SETBACK LINES AND DEDICATE TO THE USE OF THE PUBLIC, ALL PUBLIC UTILITY EASEMENTS SHOWN IN SAID ADJACENT ACREAGE.

IN TESTIMONY WHEREOF, REDEMPTION ASSOCIATES LLC, A TEXAS LIMITED LIABILITY COMPANY, HAS CAUSED THESE PRESENTS TO BE SIGNED BY LEYLAND SMITH, ITS PRESIDENT, THEREUNTO AUTHORIZED, THIS _____ DAY OF _____, 2024.

REDEMPTION ASSOCIATES LLC
A TEXAS LIMITED LIABILITY COMPANY

BY: _____
LEYLAND SMITH, PRESIDENT

STATE OF TEXAS
COUNTY OF HARRIS

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED LEYLAND SMITH, PRESIDENT OF REDEMPTION ASSOCIATES LLC, A TEXAS LIMITED LIABILITY COMPANY, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED

GIVEN UNDER MY HAND AND SEAL OF OFFICE, THIS _____ DAY OF _____, 2024.

NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

I, LUCAS G. DAVIS, AM REGISTERED UNDER THE LAWS OF THE STATE OF TEXAS TO PRACTICE THE PROFESSION OF SURVEYING AND HEREBY CERTIFY THAT THE ABOVE SUBDIVISION IS TRUE AND ACCURATE; WAS PREPARED FROM AN ACTUAL SURVEY OF THE PROPERTY MADE UNDER MY DIRECTION ON THE GROUND; AND THAT, EXCEPT AS SHOWN ALL BOUNDARY CORNERS, ANGLE POINTS, POINTS OF CURVATURE AND OTHER POINTS OF REFERENCE HAVE BEEN MARKED WITH 5/8 INCH IRON RODS WITH PLASTIC CAP STAMPED "GBI PARTNERS".

LUCAS G. DAVIS, R.P.L.S.
REGISTERED PROFESSIONAL LAND SURVEYOR
TEXAS REGISTRATION NO. 6599

THIS IS TO CERTIFY THAT THE PLANNING AND ZONING COMMISSION OF THE CITY OF BAYTOWN, TEXAS, HAS APPROVED THIS MAP AND PLAT OF IZZY CHALETS FINAL PLAT AND THAT THIS PLAT FULFILLS ALL OF THE LAWS OF THE STATE OF TEXAS AND THE ORDINANCES OF THE CITY OF BAYTOWN AS SHOWN HEREON AND AUTHORIZED THE RECORDING OF THIS PLAT

THIS _____ DAY OF _____, 2024.

TRACEY S. WHEELER, PLANNING AND ZONING CHAIRMAN

TIFFANY FOSTER, SECRETARY OF THE COMMISSION

I, TENESHIA HUDSPETH, COUNTY CLERK OF HARRIS COUNTY, DO HEREBY CERTIFY THAT THE WITHIN INSTRUMENT WITH ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR REGISTRATION IN MY OFFICE ON _____, 2024, AT _____ O'CLOCK ____M., AND DULY RECORDED ON _____, 2024, AT _____ O'CLOCK ____M., AND AT FILM CODE NO. _____ OF THE MAP RECORDS OF HARRIS COUNTY FOR SAID COUNTY.

WITNESS MY HAND AND SEAL OF OFFICE, AT HOUSTON, THE DAY AND DATE LAST ABOVE WRITTEN.

TENESHIA HUDSPETH
COUNTY CLERK
OF HARRIS COUNTY, TEXAS

BY: _____
DEPUTY

A TRACT OR PARCEL CONTAINING 7.192 ACRES OR 313,290 SQUARE FEET OF LAND BEING SITUATED IN THE CHRISTIAN SMITH LEAGUE, ABSTRACT NO. 69, HARRIS COUNTY, TEXAS, BEING ALL OF A CALLED 7.19 ACRE TRACT OF LAND DESCRIBED IN DEED TO ALBERTO GARCIA, RECORDED IN H.C.C.F. NO. 20130431380, WITH SAID 7.192 ACRE TRACT BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS, WITH ALL BEARINGS BASED ON THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (NAD 83):

BEGINNING AT A CAPPED 5/8 INCH IRON ROD STAMPED "RPLS 5742" FOUND ON THE SOUTHWEST RIGHT-OF-WAY (R.O.W.) LINE OF CROSBY CEDAR BAYOU ROAD (60' R.O.W.), FOR THE COMMON EAST CONER OF A CALLED 6.02584 ACRE TRACT OF LAND DESCRIBED IN DEED TO G.O.M. GROUP, LLC, RECORDED IN H.C.C.F. NO. RP-2022-576829 AND SAID CALLED 7.19 ACRE TRACT, SAME BEING THE NORTHEAST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE, SOUTH 13 DEG. 56 MIN. 21 SEC. EAST, ALONG THE SOUTHWEST R.O.W. LINE OF SAID CROSBY CEDAR BAYOU ROAD, A DISTANCE OF 542.99 FEET TO A 5/8 INCH IRON ROD FOUND FOR THE COMMON EAST CORNER OF SAID CALLED 7.19 ACRE TRACT AND A TRACT OF LAND DESCRIBED IN DEED TO LISA KAY THAHAN CRONE, RECORDED IN H.C.C.F. NO. RP-2021-507419, SAME BEING THE EAST CORNER OF THE HEREIN DESCRIBED TRACT;

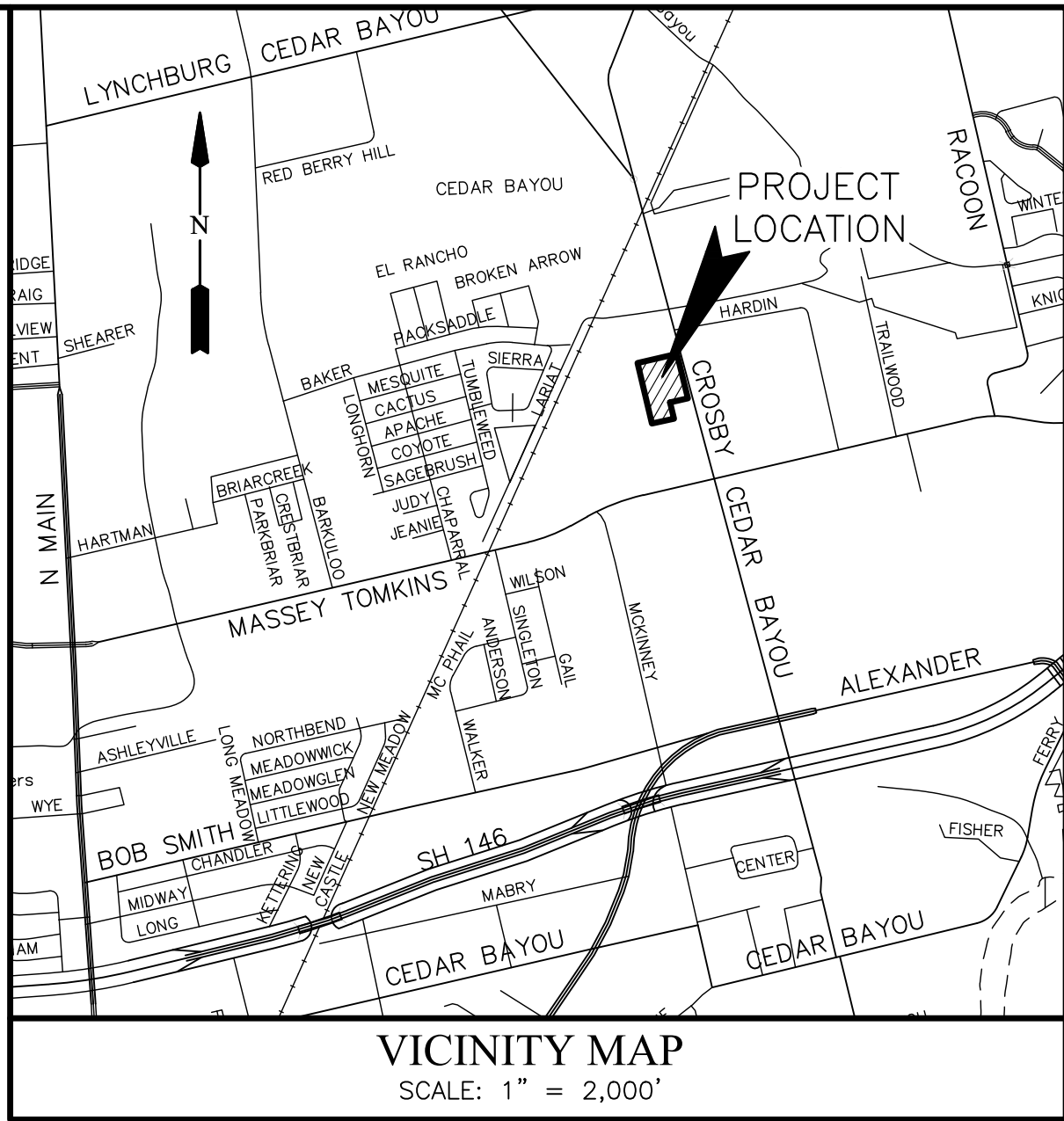
THENCE, SOUTH 77 DEG. 36 MIN. 38 SEC. WEST, ALONG SAID THE COMMON LINE OF SAID CALLED 7.19 ACRE TRACT AND SAID LISA KAY THAHAN CRONE TRACT, A DISTANCE OF 218.03 FEET TO A 1/2 INCH IRON ROD FOUND FOR THE WEST CORNER OF SAID LISA KAY THAHAN CRONE TRACT, AND AN INTERIOR CORNER OF SAID CALLED 7.19 ACRE TRACT AND OF THE HEREIN DESCRIBED TRACT;

THENCE, SOUTH 13 DEG. 41 MIN. 10 SEC. EAST, ALONG SAID COMMON LINE, A DISTANCE OF 200.47 FEET TO A CAPPED 5/8 INCH IRON ROD STAMPED "WINDROSE" SET ON THE NORTH LINE OF A CALLED 5.62 ACRE TRACT OF LAND DESCRIBED IN DEED TO LONNIE EUGENE FRANTA & SUE ELLEN FRANTA, RECORDED IN H.C.C.F. NO. W207560, BEING THE COMMON SOUTH CORNER OF SAID CALLED 7.19 ACRE TRACT AND SAID LISA KAY THAHAN CRONE TRACT, AND THE SOUTHEAST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE, SOUTH 77 DEG. 47 MIN. 43 SEC. WEST, ALONG THE COMMON LINE OF SAID CALLED 5.62 ACRE TRACT AND SAID CALLED 7.19 ACRE TRACT, A DISTANCE OF 267.12 FEET TO A 1 INCH IRON PIPE FOUND ON THE EAST LINE OF A CALLED 29.260 ACRE TRACT OF LAND DESCRIBED IN DEED TO MASSEY TOMPKINS VENTURE, LLC, RECORDED IN H.C.C.F. NO. RP-2022-361970, BEING THE COMMON WEST CORNER OF SAID CALLED 5.62 ACRE TRACT AND SAID CALLED 7.19 ACRE TRACT, AND THE SOUTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE, NORTH 13 DEG. 21 MIN. 13 SEC. WEST, ALONG THE COMMON LINE OF SAID CALLED 7.19 ACRE TRACT AND SAID CALLED 29.260 ACRE TRACT, A DISTANCE OF 737.45 FEET TO A CAPPED 5/8 INCH IRON ROD STAMPED "WINDROSE" SET ON THE SOUTH LINE OF A CALLED 6.0284 ACRE TRACT, BEING THE COMMON NORTH CORNER OF SAID 29.260 ACRE TRACT AND SAID 7.19 ACRE TRACT, AND THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE, NORTH 77 DEG. 00 MIN. 39 SEC. EAST, ALONG THE COMMON LINE OF SAID CALLED 7.19 ACRE TRACT AND SAID CALLED 6.0284 ACRE TRACT, A DISTANCE OF 478.36 FEET TO THE POINT OF BEGINNING AND CONTAINING 7.192 ACRES OR 313,290 SQUARE FEET OF LAND.



VICINITY MAP
SCALE: 1" = 2,000'

KEY MAP NO. 502J

PRELIMINARY PLAT OF IZZY CHALETS

A SUBDIVISION OF 7.192 ACRES OF LAND SITUATED
IN THE CHRISTIAN SMITH LEAGUE, ABSTRACT 69,
CITY OF BAYTOWN, HARRIS COUNTY, TEXAS.

32 LOTS 4 RESERVES (1.253 ACRES) 2 BLOCKS
JANUARY 4, 2024 JOB NO. 1931-7715C

OWNERS:
REDEMPTION ASSOCIATION LLC
A TEXAS LIMITED LIABILITY COMPANY
2416 ELLIS LANE, CONROE, TEXAS 77304
PH: (281) 236-7969

LJA SURVEYING, INC.
3600 W Sam Houston Parkway S
Suite 175
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
TBPELS Firm No. 10194382

LJA Engineering, Inc.
3600 W Sam Houston Parkway S
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

CALLED 6.0284 ACRES
 G.O.M. GROUP, LLC
 F.N. RP-2022-576829
 H.C.O.P.R.R.P.

CALLED 29.260 ACRES
 MASSEY TOMPKINS VENTURES, LLC
 F.N. RP-2022-361970
 H.C.O.P.R.R.P.

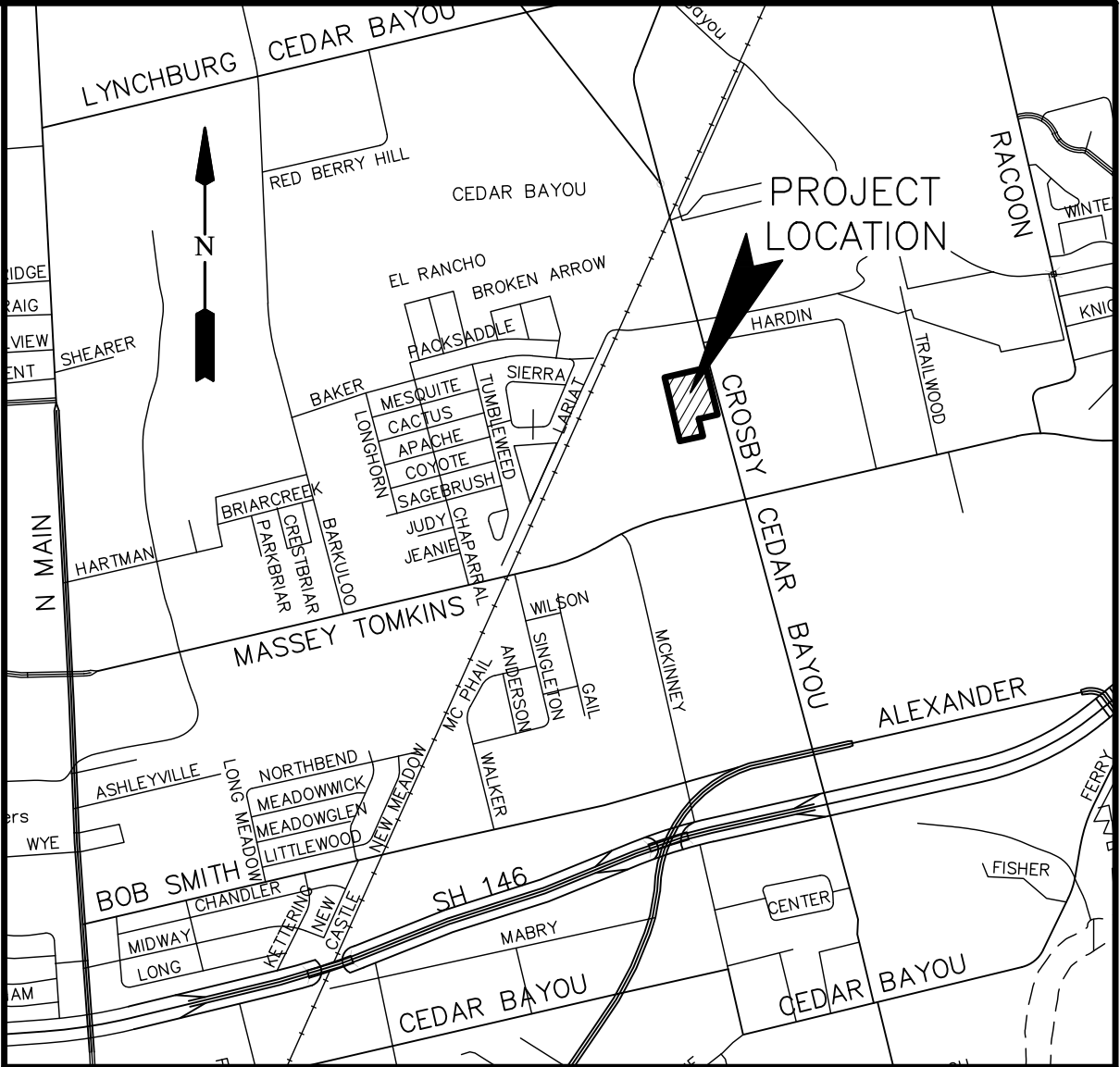
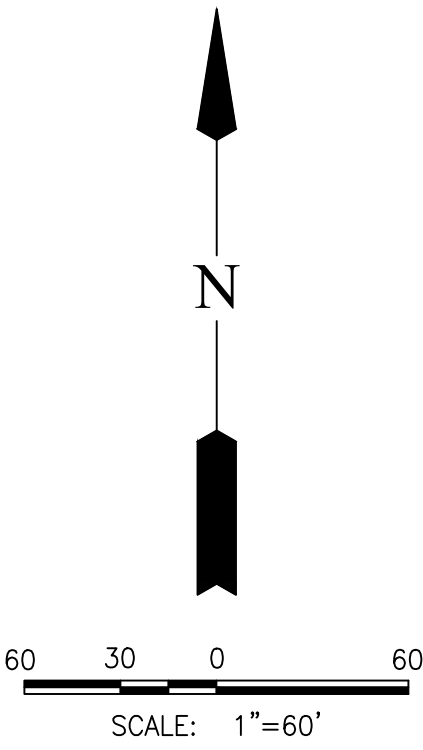
CALLED 5.62 ACRES
 LONNIE EUGENE FRANTA
 & SUE ELLEN FRANTA
 F.N. W207560
 H.C.O.P.R.R.P.

WILLIAM E. CAPPS
 F.N. E075583
 H.C.O.P.R.R.P.

IVETT LEMUSLOYA

LEGEND

- B.L. INDICATES BUILDING LINE
 U.E. INDICATES UTILITY EASEMENT
 A.E. INDICATES AERIAL EASEMENT
 D.E. INDICATES DRAINAGE EASEMENT
 VOL. INDICATES VOLUME
 PG. INDICATES PAGE
 F.N. INDICATES FILE NUMBER
 R.O.W. INDICATES RIGHT-OF-WAY
 FND. INDICATES FOUND
 I.R. INDICATES IRON ROD
 I.P. INDICATES IRON PIPE
 H.C.M.R. INDICATES HARRIS COUNTY MAP RECORDS
 H.C.D.R. INDICATES HARRIS COUNTY DEED RECORDS
 H.C.O.P.R.P. INDICATES HARRIS COUNTY OFFICIAL PUBLIC RECORDS OF REAL PROPERTY



NOTES:

1. BEARINGS REFERENCED HEREON ARE GRID BEARINGS BASED ON THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (NAD83). ALL DISTANCES SHOWN ARE SURFACE DISTANCES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A APPLYING THE FOLLOWING SCALE FACTOR OF 0.999896119.
 2. DRAINAGE FACILITIES AND DRAINAGE EASEMENTS ARE TO BE OWNED, OPERATED, AND MAINTAINED BY THE OWNERS AND NOT THE CITY OF BAYTOWN IN ACCORDANCE WITH AN ENGINEERING REPORT APPROVED BY THE CITY OF BAYTOWN.
 3. THE PROPOSED FACILITY SHALL NOT HINDER THE SURFACE DRAINAGE FROM ADJACENT LAND, NOR CAUSE FLOODING TO ADJACENT PROPERTY.
 4. ANY DRAINAGE EASEMENTS SHALL BE KEPT CLEAR OF FENCES, BUILDING, PLANTING AND OTHER OBSTRUCTIONS TO THE OPERATIONS AND MAINTENANCE OF DRAINAGE FACILITY, AND ABUTTING PROPERTY SHALL NOT BE PERMITTED TO DRAIN INTO THIS EASEMENT EXCEPT BY MEANS OF A DRAINAGE STRUCTURE. (SEC. 126-581B) (DRAINAGE EASEMENTS SHALL BE A MINIMUM OF 16 FEET WIDE)
 5. THIS NOTE SETS REQUIREMENTS FOR DRAINAGE DESIGN AND CONSTRUCTION FOR ALL LOTS WITHIN THIS SUBDIVISION.
 A. DRAINAGE DESIGN FOR ALL LOTS WITHIN THE SUBDIVISION SHALL BE BASED UPON THE ENTIRE SUBDIVISION ACREAGE SHOWN ON THE PLAT, AND
 B. DRAINAGE CONSTRUCTION FOR A LOT WITHIN THE SUBDIVISION SHALL BE BASED UPON THE LOT ACREAGE SHOWN ON THIS PLAT, AND
 C. THE DRAINAGE DESIGN AND CONSTRUCTION SHALL BE APPROVED BY THE CITY OF BAYTOWN PRIOR TO ANY CHANGE IN LAND CONDITION THAT AFFECTS THE AMOUNT OR RATE OF RUNOFF FROM A LOT.
 6. THE DRAINAGE EASEMENT FOR A COLLECTIVE DETENTION BASIN TO SERVE THE DEVELOPMENT SHALL BE SHOWN WITH ADJACENT PLATS.
 7. DEVELOPMENT IN THE FLOODPLAIN MAY BE RESTRICTED OR LIMITED AND A FLOODPLAIN DEVELOPMENT REVIEW AND PERMIT MAY BE REQUIRED. PLEASE CONTACT THE CITY OF BAYTOWN FLOODPLAIN ADMINISTRATOR FOR MORE INFORMATION.
 8. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), FLOOD INSURANCE RATE MAP (FIRM) FOR HARRIS COUNTY, TEXAS, MAP NO. 48201C0765M REVISED/DATED JANUARY 6, 2017, THE SUBJECT TRACT APPEARS TO LIE WITHIN UNSHADED ZONE "X". THIS DETERMINATION WAS DONE BY GRAPHIC PLOTTING AND IS APPROXIMATE ONLY, AND HAS NOT BEEN FIELD VERIFIED. THIS FLOOD STATEMENT DOES NOT IMPLY THAT THE PROPERTY OR STRUCTURES THEREON WILL BE FREE FROM FLOODING OR FLOOD DAMAGE, ON RARE OCCASIONS FLOODS CAN AND WILL OCCUR AND FLOOD HEIGHTS MAY BE INCREASED BY MAN MADE OR NATURAL CAUSES. THIS FLOOD STATEMENT SHALL NOT CREATE LIABILITY ON THE PART OF WINDROSE SURVEYING AND ENGINEERING.
 9. BENCHMARK: BEING A CITY OF BAYTOWN MONUMENT 178 LOCATED AT THE INTERSECTION OF THE WEST LINE OF NORTH MAIN STREET AND THE NORTH LINE OF SCHILLINGS STREET, 13.2 FEET WEST OF A UTILITY POLE. (NAVD88)
 ELEV: 24.05' NAVD88, 2001 ADJUSTMENT

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 77°00'39" E	6.00'

CURVE TABLE					
CURVE	RADIUS	DELTA	ARC	CHORD BEARING	CHORD
C1	25.00'	89°03'00"	38.86'	N 58°27'51" W	35.06'
C2	25.00'	90°00'00"	39.27'	S 32°00'39" W	35.36'
C3	25.00'	90°00'00"	39.27'	S 57°59'21" E	35.36'
C4	25.00'	90°57'00"	39.68'	N 31°32'09" E	35.65'
C5	25.00'	89°02'58"	38.86'	N 58°27'52" W	35.06'
C6	25.00'	90°00'00"	39.27'	S 32°00'39" W	35.36'
C7	25.00'	52°10'09"	22.76'	S 39°04'25" E	21.98'
C8	50.00'	27°1'30'54"	236.94'	S 70°35'57" W	69.77'
C9	25.00'	39°20'45"	17.17'	N 06°41'01" E	16.83'
C10	25.00'	90°00'00"	39.27'	N 57°59'21" W	35.36'

RESERVE TABLE			
RESERVE	ACREAGE	SQ. FT.	TYPE
A	0.043	1,872	RESTRICTED TO LANDSCAPE/OPEN SPACE
B	1.053	45,860	RESTRICTED TO DRAINAGE/DETENTION
C	0.043	1,862	RESTRICTED TO LANDSCAPE/OPEN SPACE
D	0.114	4,980	RESTRICTED TO LANDSCAPE/OPEN SPACE
TOTAL	1.253	54,574	

PRELIMINARY PLAT OF
 IZZY CHALETS

A SUBDIVISION OF 7.192 ACRES OF LAND SITUATED
 IN THE CHRISTIAN SMITH LEAGUE, ABSTRACT 69,
 CITY OF BAYTOWN, HARRIS COUNTY, TEXAS.

32 LOTS 4 RESERVES (1.253 ACRES) 2 BLOCKS
 JANUARY 4, 2024 JOB NO. 4059-7715C

OWNERS:
 REDEMPTION ASSOCIATES LLC
 A TEXAS LIMITED LIABILITY COMPANY
 2416 ELLIS LANE, CONROE, TEXAS 77304
 PH: (281) 236-7969

LJA SURVEYING, INC.
 3600 W Sam Houston Parkway S
 Suite 175
 Houston, Texas 77042
 Phone 713.953.5200
 Fax 713.953.5026
 TBPELS Firm No. 10194382

LJA Engineering, Inc.
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 FRN - F-1386

CALLED 6.0284 ACRES
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 H.C.O.P.R.R.P.

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CALLED 5.62 ACRES
 LONNIE EUGENE FRANTA
 & SUE ELLEN FRANTA
 F.N. W207560
 H.C.O.P.R.R.P.

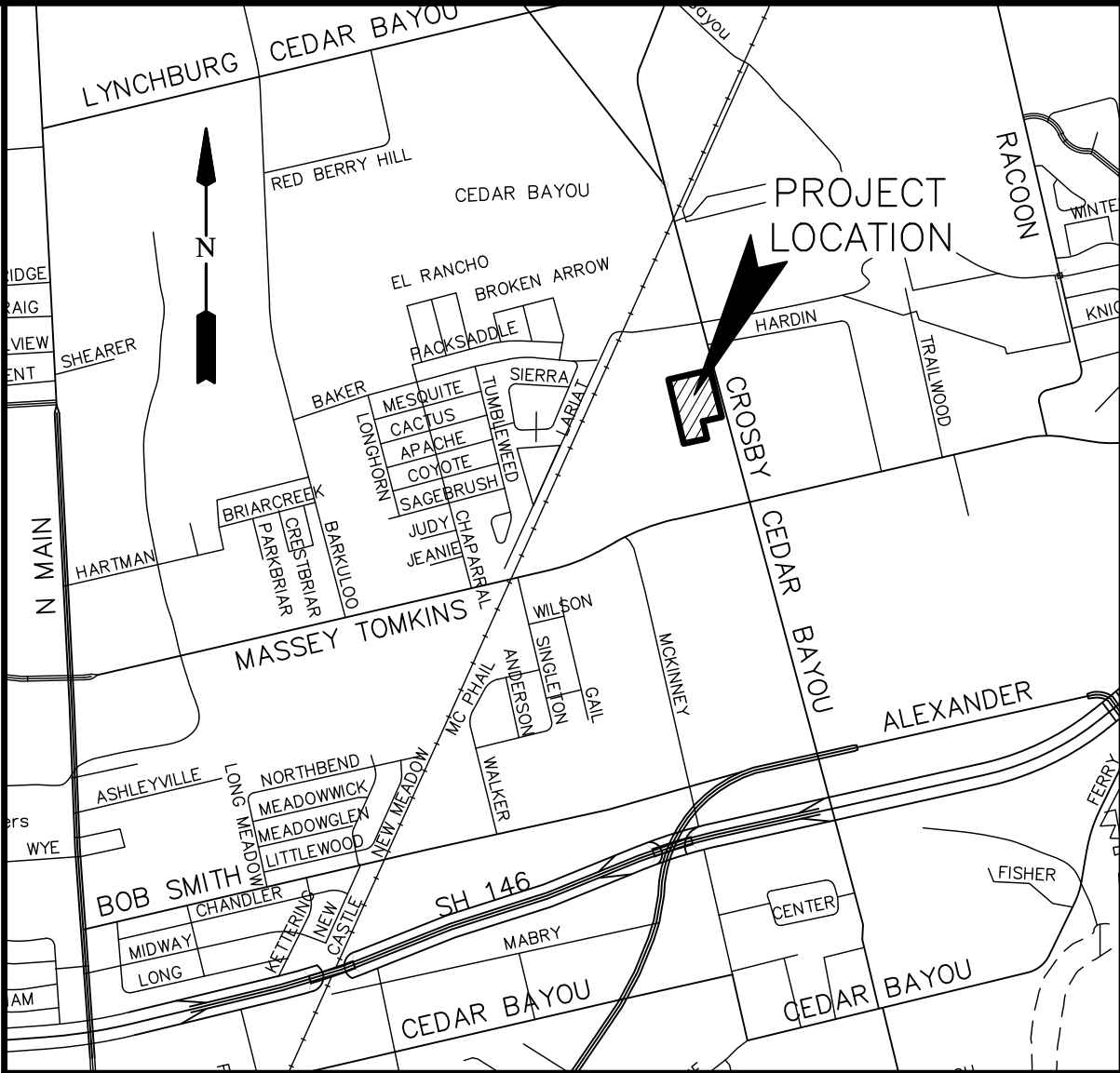
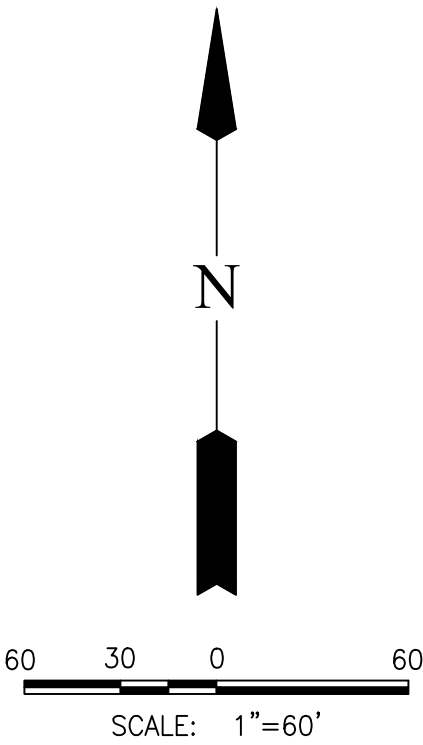
LISA K. CRONE
 F.N. RP-2021-507419
 H.C.O.P.R.R.P.

WILLIAM E. CAPPS
 F.N. E075583
 H.C.O.P.R.R.P.

IVETT LEMUSLOYA

LEGEND

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VICINITY MAP
 SCALE: 1" = 2,000'

KEY MAP NO. 502J

CONCEPTUAL SITE PLAN OF
 IZZY CHALETS

A SUBDIVISION OF 7.192 ACRES OF LAND SITUATED
 IN THE CHRISTIAN SMITH LEAGUE, ABSTRACT 69,
 CITY OF BAYTOWN, HARRIS COUNTY, TEXAS.

32 LOTS 4 RESERVES (1.253 ACRES) 2 BLOCKS
 JANUARY 3, 2024 JOB NO. 4059-7715C

OWNERS:
 REDEMPTION ASSOCIATES LLC
 A TEXAS LIMITED LIABILITY COMPANY
 2416 ELLIS LANE, CONROE, TEXAS 77304
 PH: (281) 236-7969

RESERVE TABLE			
RESERVE	ACREAGE	SQ.FT.	TYPE
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B	1.053	45,860	RESTRICTED TO DRAINAGE/DETENTION
C	0.043	1,862	RESTRICTED TO LANDSCAPE/OPEN SPACE
D	0.114	4,980	RESTRICTED TO LANDSCAPE/OPEN SPACE
TOTAL	1.253	54,574	

LJA SURVEYING, INC.
 3600 W Sam Houston Parkway S
 Suite 175
 Houston, Texas 77042
 Phone 713.953.5200
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LJA Engineering, Inc.
 3600 W Sam Houston Parkway S
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 Houston, Texas 77042
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 FRN - F-1386

Attachment C

Trip Generation

Trip Generation

Project: Baytown Development
 Job Number: 4059-0001
 Phase I
 Land Use: Single-Family Detached Housing
 ITE Code: 210
 Independent Variable: Dwelling Units
 Variable Value: 32

Daily Traffic

Average Rate:	9.43		Type of Equation	1
Linear Equation:	$T =$	$(X) +$	1 Rate	
Exponential Equation:	$\ln(T) =$	$\ln(X) +$	2 Linear	
	%	Volume	3 Exponential	
Total Traffic	100%	302		
In	50%	151		
Out	50%	151		

AM Peak Traffic

Average Rate:	0.7		Type of Equation	1
Linear Equation:	$T =$	$(X) +$	1 Rate	
Exponential Equation:	$\ln(T) =$	$\ln(X) +$	2 Linear	
	%	Volume	3 Exponential	
Total Traffic	100%	22		
In	25%	6		
Out	75%	16		

PM Peak Traffic

Average Rate:	0.94		Type of Equation	1
Linear Equation:	$T =$	$(X) +$	1 Rate	
Exponential Equation:	$\ln(T) =$	$\ln(X) +$	2 Linear	
	%	Volume	3 Exponential	
Total Traffic	100%	30		
In	63%	19		
Out	37%	11		

Attachment D



















Intersection Capacity Analysis Reports

HCM 6th Signalized Intersection Summary

1: Crosby Cedar Bayou Rd & Massey Tompkins Rd

Existing AM Peak 2023

AM Peak



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	153	11	114	227	114	10	133	61	84	176	19
Future Volume (veh/h)	22	153	11	114	227	114	10	133	61	84	176	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	166	12	124	247	124	11	145	66	91	191	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	262	19	755	1000	486	13	173	79	106	223	25
Arrive On Green	0.03	0.08	0.08	0.38	0.43	0.43	0.15	0.15	0.15	0.19	0.19	0.19
Sat Flow, veh/h	1781	3363	241	1781	2318	1127	88	1157	527	547	1147	126
Grp Volume(v), veh/h	24	87	91	124	187	184	222	0	0	303	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1827	1781	1777	1668	1771	0	0	1820	0	0
Q Serve(g_s), s	1.2	4.3	4.3	0.0	6.0	6.3	11.0	0.0	0.0	14.5	0.0	0.0
Cycle Q Clear(g_c), s	1.2	4.3	4.3	0.0	6.0	6.3	11.0	0.0	0.0	14.5	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.68	0.05		0.30	0.30		0.07
Lane Grp Cap(c), veh/h	125	139	142	755	766	719	265	0	0	354	0	0
V/C Ratio(X)	0.19	0.63	0.64	0.16	0.24	0.26	0.84	0.00	0.00	0.86	0.00	0.00
Avail Cap(c_a), veh/h	181	401	412	755	766	719	372	0	0	500	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	41.2	40.2	40.3	17.4	16.3	16.4	37.2	0.0	0.0	35.1	0.0	0.0
Incr Delay (d2), s/veh	0.7	19.7	19.9	0.1	0.8	0.9	11.2	0.0	0.0	10.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.6	2.7	1.5	2.4	2.4	5.4	0.0	0.0	7.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	59.9	60.1	17.5	17.0	17.2	48.5	0.0	0.0	45.2	0.0	0.0
LnGrp LOS	D	E	E	B	B	B	D	A	A	D	A	A
Approach Vol, veh/h		202			495			222			303	
Approach Delay, s/veh		57.9			17.2			48.5			45.2	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.0	38.6	11.5		22.0	6.8	43.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		18.9	8.1	20.3		24.7	5.1	23.3				
Max Q Clear Time (g_c+I1), s		13.0	2.0	6.3		16.5	3.2	8.3				
Green Ext Time (p_c), s		0.5	0.1	0.7		1.0	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay			36.5									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary

1: Crosby Cedar Bayou Rd & Massey Tompkins Rd

Existing PM Peak 2023



















PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	325	30	95	280	136	21	219	92	80	279	43
Future Volume (veh/h)	54	325	30	95	280	136	21	219	92	80	279	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	353	33	103	304	148	23	238	100	87	303	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	156	459	43	399	628	298	25	263	111	95	332	52
Arrive On Green	0.04	0.14	0.14	0.17	0.27	0.27	0.22	0.22	0.22	0.26	0.26	0.26
Sat Flow, veh/h	1781	3287	305	1781	2336	1111	113	1171	492	362	1260	195
Grp Volume(v), veh/h	59	190	196	103	229	223	361	0	0	437	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1815	1781	1777	1670	1776	0	0	1817	0	0
Q Serve(g_s), s	2.7	9.3	9.4	0.0	9.8	10.1	17.8	0.0	0.0	21.0	0.0	0.0
Cycle Q Clear(g_c), s	2.7	9.3	9.4	0.0	9.8	10.1	17.8	0.0	0.0	21.0	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.67	0.06		0.28	0.20		0.11
Lane Grp Cap(c), veh/h	156	248	254	399	477	449	399	0	0	479	0	0
V/C Ratio(X)	0.38	0.77	0.77	0.26	0.48	0.50	0.90	0.00	0.00	0.91	0.00	0.00
Avail Cap(c_a), veh/h	181	369	377	399	477	449	434	0	0	525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.9	37.3	37.3	30.8	27.6	27.8	33.9	0.0	0.0	32.1	0.0	0.0
Incr Delay (d2), s/veh	1.5	19.9	20.2	0.3	3.4	3.9	21.0	0.0	0.0	19.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.2	5.4	1.8	4.4	4.3	9.6	0.0	0.0	11.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	57.2	57.5	31.1	31.1	31.7	54.9	0.0	0.0	51.5	0.0	0.0
LnGrp LOS	D	E	E	C	C	C	D	A	A	D	A	A
Approach Vol, veh/h	445			555			361			437		
Approach Delay, s/veh	54.8			31.3			54.9			51.5		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	24.7		20.0	17.1		28.2		8.4	28.7			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	22.0		5.3	18.7		26.0		5.1	18.9			
Max Q Clear Time (g_c+I1), s	19.8		2.0	11.4		23.0		4.7	12.1			
Green Ext Time (p_c), s	0.4		0.1	1.2		0.7		0.0	1.4			
Intersection Summary												
HCM 6th Ctrl Delay	46.8											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

1: Crosby Cedar Bayou Rd & Massey Tompkins Rd

No Build AM Peak 2024
AM Peak



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	156	11	116	232	116	10	136	62	86	180	19
Future Volume (veh/h)	22	156	11	116	232	116	10	136	62	86	180	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	170	12	126	252	126	11	148	67	93	196	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	267	19	743	987	478	13	176	80	108	228	24
Arrive On Green	0.03	0.08	0.08	0.37	0.43	0.43	0.15	0.15	0.15	0.20	0.20	0.20
Sat Flow, veh/h	1781	3369	236	1781	2321	1124	86	1160	525	546	1151	123
Grp Volume(v), veh/h	24	89	93	126	191	187	226	0	0	310	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1828	1781	1777	1668	1772	0	0	1821	0	0
Q Serve(g_s), s	1.2	4.4	4.4	0.0	6.2	6.5	11.2	0.0	0.0	14.8	0.0	0.0
Cycle Q Clear(g_c), s	1.2	4.4	4.4	0.0	6.2	6.5	11.2	0.0	0.0	14.8	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.67	0.05		0.30	0.30		0.07
Lane Grp Cap(c), veh/h	125	141	145	743	756	709	269	0	0	360	0	0
V/C Ratio(X)	0.19	0.63	0.64	0.17	0.25	0.26	0.84	0.00	0.00	0.86	0.00	0.00
Avail Cap(c_a), veh/h	181	401	412	743	756	709	372	0	0	500	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	41.1	40.2	40.2	17.8	16.7	16.7	37.1	0.0	0.0	34.9	0.0	0.0
Incr Delay (d2), s/veh	0.7	19.7	19.9	0.1	0.8	0.9	11.7	0.0	0.0	10.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.6	2.7	1.6	2.5	2.5	5.5	0.0	0.0	7.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.8	59.8	60.1	17.9	17.5	17.6	48.8	0.0	0.0	45.5	0.0	0.0
LnGrp LOS	D	E	E	B	B	B	D	A	A	D	A	A
Approach Vol, veh/h	206			504				226			310	
Approach Delay, s/veh	57.8			17.6				48.8			45.5	
Approach LOS	E			B				D			D	
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	18.2		37.9	11.6		22.3	6.8	42.8				
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	18.9		8.1	20.3		24.7	5.1	23.3				
Max Q Clear Time (g_c+I1), s	13.2		2.0	6.4		16.8	3.2	8.5				
Green Ext Time (p_c), s	0.5		0.1	0.7		1.0	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay	36.9											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

1: Crosby Cedar Bayou Rd & Massey Tompkins Rd

No Build PM Peak 2024

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	332	31	97	286	139	21	223	94	82	285	44
Future Volume (veh/h)	55	332	31	97	286	139	21	223	94	82	285	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	361	34	105	311	151	23	242	102	89	310	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	467	44	381	610	289	25	267	112	97	338	52
Arrive On Green	0.04	0.14	0.14	0.16	0.26	0.26	0.23	0.23	0.23	0.27	0.27	0.27
Sat Flow, veh/h	1781	3284	308	1781	2338	1110	111	1171	494	362	1260	195
Grp Volume(v), veh/h	60	194	201	105	235	227	367	0	0	447	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1815	1781	1777	1671	1776	0	0	1817	0	0
Q Serve(g_s), s	2.8	9.5	9.6	0.0	10.1	10.5	18.1	0.0	0.0	21.5	0.0	0.0
Cycle Q Clear(g_c), s	2.8	9.5	9.6	0.0	10.1	10.5	18.1	0.0	0.0	21.5	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.66	0.06		0.28	0.20		0.11
Lane Grp Cap(c), veh/h	157	253	258	381	463	436	405	0	0	487	0	0
V/C Ratio(X)	0.38	0.77	0.78	0.28	0.51	0.52	0.91	0.00	0.00	0.92	0.00	0.00
Avail Cap(c_a), veh/h	181	369	377	381	463	436	434	0	0	525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.7	37.2	37.2	31.5	28.3	28.5	33.8	0.0	0.0	32.0	0.0	0.0
Incr Delay (d2), s/veh	1.5	19.9	20.2	0.4	3.9	4.4	21.7	0.0	0.0	20.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.4	5.5	1.9	4.6	4.5	9.8	0.0	0.0	11.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	57.1	57.5	31.9	32.2	32.9	55.5	0.0	0.0	52.3	0.0	0.0
LnGrp LOS	D	E	E	C	C	C	E	A	A	D	A	A
Approach Vol, veh/h	455			567			367			447		
Approach Delay, s/veh	54.8			32.4			55.5			52.3		
Approach LOS	D			C			E			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	25.0		19.1	17.3		28.6		8.4	28.0			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	22.0		5.3	18.7		26.0		5.1	18.9			
Max Q Clear Time (g_c+I1), s	20.1		2.0	11.6		23.5		4.8	12.5			
Green Ext Time (p_c), s	0.4		0.1	1.2		0.7		0.0	1.4			
Intersection Summary												
HCM 6th Ctrl Delay	47.4											
HCM 6th LOS	D											

Timings 1: Crosby Cedar Bayou Rd & Massey Tompkins Rd

Build AM Peak 2024
AM Peak



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	23	156	116	232	137	183
Future Volume (vph)	23	156	116	232	137	183
Turn Type	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases	7	4	3	8	2	6
Permitted Phases	4		8			
Detector Phase	7	4	3	8	2	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	9.6	24.8	12.6	27.8	23.4	29.2
Total Split (%)	10.7%	27.6%	14.0%	30.9%	26.0%	32.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	None	C-Min	None	None
Act Effect Green (s)	28.0	28.0	35.8	35.8	15.6	20.8
Actuated g/C Ratio	0.31	0.31	0.40	0.40	0.17	0.23
v/c Ratio	0.09	0.17	0.24	0.27	0.69	0.77
Control Delay	29.4	26.0	25.6	17.5	42.4	43.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	26.0	25.6	17.5	42.4	43.9
LOS	C	C	C	B	D	D
Approach Delay		26.4		19.5	42.4	43.9
Approach LOS		C		B	D	D

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 65.2 (72%), Referenced to phase 4:EBTL and 8:WBTL, Start of 1st Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 31.0

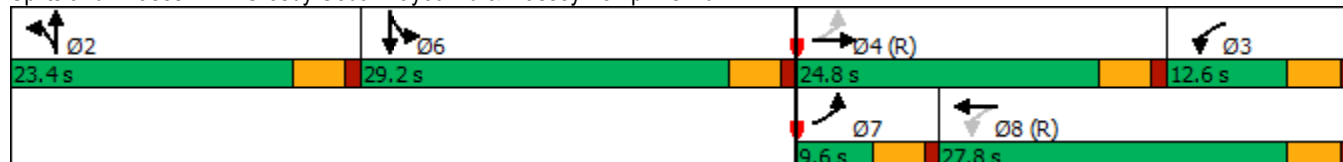
Intersection LOS: C

Intersection Capacity Utilization 57.1%

ICU Level of Service B

Analysis Period (min) 15



















Splits and Phases: 1: Crosby Cedar Bayou Rd & Massey Tompkins Rd






HCM 6th Signalized Intersection Summary

1: Crosby Cedar Bayou Rd & Massey Tompkins Rd




Build AM Peak 2024
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	156	11	116	232	118	10	137	62	93	183	24
Future Volume (veh/h)	23	156	11	116	232	118	10	137	62	93	183	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	170	12	126	252	128	11	149	67	101	199	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	126	267	19	726	958	471	13	177	80	116	229	30
Arrive On Green	0.03	0.08	0.08	0.36	0.42	0.42	0.15	0.15	0.15	0.21	0.21	0.21
Sat Flow, veh/h	1781	3369	236	1781	2307	1135	86	1163	523	563	1109	145
Grp Volume(v), veh/h	25	89	93	126	192	188	227	0	0	326	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1828	1781	1777	1666	1772	0	0	1816	0	0
Q Serve(g_s), s	1.2	4.4	4.4	0.0	6.4	6.7	11.2	0.0	0.0	15.6	0.0	0.0
Cycle Q Clear(g_c), s	1.2	4.4	4.4	0.0	6.4	6.7	11.2	0.0	0.0	15.6	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.68	0.05		0.30	0.31		0.08
Lane Grp Cap(c), veh/h	126	141	145	726	738	692	270	0	0	376	0	0
V/C Ratio(X)	0.20	0.63	0.64	0.17	0.26	0.27	0.84	0.00	0.00	0.87	0.00	0.00
Avail Cap(c_a), veh/h	181	401	412	726	738	692	372	0	0	498	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	41.1	40.2	40.2	18.3	17.3	17.3	37.1	0.0	0.0	34.5	0.0	0.0
Incr Delay (d2), s/veh	0.8	19.7	19.9	0.1	0.9	1.0	11.8	0.0	0.0	12.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.6	2.7	1.6	2.6	2.6	5.5	0.0	0.0	7.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	59.8	60.1	18.4	18.1	18.3	48.9	0.0	0.0	46.5	0.0	0.0
LnGrp LOS	D	E	E	B	B	B	D	A	A	D	A	A
Approach Vol, veh/h	207			506				227			326	
Approach Delay, s/veh	57.8			18.3				48.9			46.5	
Approach LOS	E			B				D			D	
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	18.2		37.1	11.6		23.1		6.8	41.9			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	18.9		8.1	20.3		24.7		5.1	23.3			
Max Q Clear Time (g_c+I1), s	13.2		2.0	6.4		17.6		3.2	8.7			
Green Ext Time (p_c), s	0.5		0.1	0.7		1.0		0.0	1.8			
Intersection Summary												
HCM 6th Ctrl Delay	37.5											
HCM 6th LOS	D											

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	12	3	275	288	1
Future Vol, veh/h	1	12	3	275	288	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	13	3	299	313	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	619	314	314	0	-	0
Stage 1	314	-	-	-	-	-
Stage 2	305	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	452	726	1246	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	451	726	1246	-	-	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.3	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1246	-	693	-	-	
HCM Lane V/C Ratio	0.003	-	0.02	-	-	
HCM Control Delay (s)	7.9	0	10.3	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC
3: Crosby Cedar Bayou Rd & Driveway 2

Build AM Peak 2024
AM Peak

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	1	275	286	1
Future Vol, veh/h	1	3	1	275	286	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	3	1	299	311	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	613	312	312	0	-	0
Stage 1	312	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	456	728	1248	-	-	-
Stage 1	742	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	456	728	1248	-	-	-
Mov Cap-2 Maneuver	456	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1248	-	634	-	-	
HCM Lane V/C Ratio	0.001	-	0.007	-	-	
HCM Control Delay (s)	7.9	0	10.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Timings

1: Crosby Cedar Bayou Rd & Massey Tompkins Rd

Build PM Peak 2024

PM Peak



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	59	332	97	286	226	287
Future Volume (vph)	59	332	97	286	226	287
Turn Type	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases	7	4	3	8	2	6
Permitted Phases	4		8			
Detector Phase	7	4	3	8	2	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	9.6	23.2	9.8	23.4	26.5	30.5
Total Split (%)	10.7%	25.8%	10.9%	26.0%	29.4%	33.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	None	C-Min	None	None
Act Effect Green (s)	22.2	22.2	22.5	22.4	21.0	25.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.23	0.28
v/c Ratio	0.34	0.45	0.36	0.52	0.86	0.89
Control Delay	35.5	32.0	36.2	27.2	51.6	52.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	32.0	36.2	27.2	51.6	52.1
LOS	D	C	D	C	D	D
Approach Delay		32.5		28.8	51.6	52.1
Approach LOS		C		C	D	D

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 67.2 (75%), Referenced to phase 4:EBTL and 8:WBTL, Start of 1st Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 40.0

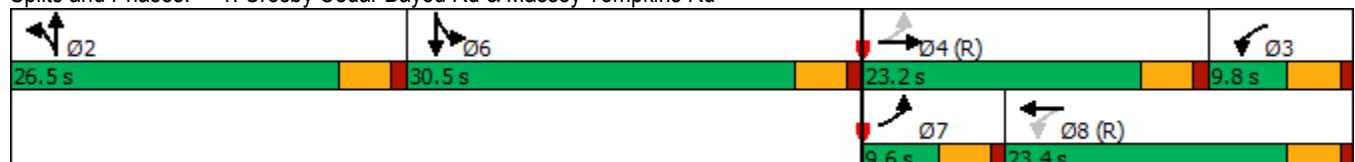
Intersection LOS: D

Intersection Capacity Utilization 73.3%

ICU Level of Service D

Analysis Period (min) 15



















Splits and Phases: 1: Crosby Cedar Bayou Rd & Massey Tompkins Rd



HCM 6th Signalized Intersection Summary




1: Crosby Cedar Bayou Rd & Massey Tompkins Rd




Build PM Peak 2024
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	332	31	97	286	149	21	226	94	86	287	47
Future Volume (veh/h)	59	332	31	97	286	149	21	226	94	86	287	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	361	34	105	311	162	23	246	102	93	312	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	467	44	371	578	294	25	271	112	101	338	55
Arrive On Green	0.04	0.14	0.14	0.16	0.25	0.25	0.23	0.23	0.23	0.27	0.27	0.27
Sat Flow, veh/h	1781	3284	308	1781	2279	1160	110	1178	489	370	1242	203
Grp Volume(v), veh/h	64	194	201	105	241	232	371	0	0	456	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1815	1781	1777	1662	1777	0	0	1815	0	0
Q Serve(g_s), s	3.0	9.5	9.6	0.0	10.5	10.9	18.3	0.0	0.0	22.0	0.0	0.0
Cycle Q Clear(g_c), s	3.0	9.5	9.6	0.0	10.5	10.9	18.3	0.0	0.0	22.0	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.70	0.06		0.27	0.20		0.11
Lane Grp Cap(c), veh/h	159	253	258	371	451	421	408	0	0	495	0	0
V/C Ratio(X)	0.40	0.77	0.78	0.28	0.53	0.55	0.91	0.00	0.00	0.92	0.00	0.00
Avail Cap(c_a), veh/h	181	369	377	371	451	421	434	0	0	524	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.8	37.2	37.2	32.0	29.0	29.1	33.8	0.0	0.0	31.8	0.0	0.0
Incr Delay (d2), s/veh	1.6	19.9	20.2	0.4	4.5	5.1	22.1	0.0	0.0	21.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	5.4	5.5	1.9	4.8	4.7	10.0	0.0	0.0	12.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	57.1	57.5	32.4	33.5	34.2	55.9	0.0	0.0	53.1	0.0	0.0
LnGrp LOS	D	E	E	C	C	C	E	A	A	D	A	A
Approach Vol, veh/h	459			578			371			456		
Approach Delay, s/veh	54.7			33.6			55.9			53.1		
Approach LOS	D			C			E			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	25.2		18.5	17.3		29.0		8.5	27.3			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	22.0		5.3	18.7		26.0		5.1	18.9			
Max Q Clear Time (g_c+I1), s	20.3		2.0	11.6		24.0		5.0	12.9			
Green Ext Time (p_c), s	0.4		0.1	1.2		0.6		0.0	1.4			
Intersection Summary												
HCM 6th Ctrl Delay	48.0											
HCM 6th LOS	D											

HCM 6th TWSC
2: Crosby Cedar Bayou Rd & Driveway 1

Build PM Peak 2024
PM Peak

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	7	13	421	412	1
Future Vol, veh/h	1	7	13	421	412	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	8	14	458	448	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	935	449	449	0	-	0
Stage 1	449	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	295	610	1111	-	-	-
Stage 1	643	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	290	610	1111	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.8	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1111	-	536	-	-	
HCM Lane V/C Ratio	0.013	-	0.016	-	-	
HCM Control Delay (s)	8.3	0	11.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	4	418	411	1
Future Vol, veh/h	1	2	4	418	411	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	4	454	447	1

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	910	448	448	0	0
Stage 1	448	-	-	-	-
Stage 2	462	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	305	611	1112	-	-
Stage 1	644	-	-	-	-
Stage 2	634	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	303	611	1112	-	-
Mov Cap-2 Maneuver	303	-	-	-	-
Stage 1	641	-	-	-	-
Stage 2	634	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	456	-	-
HCM Lane V/C Ratio	0.004	-	0.007	-	-
HCM Control Delay (s)	8.2	0	13	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

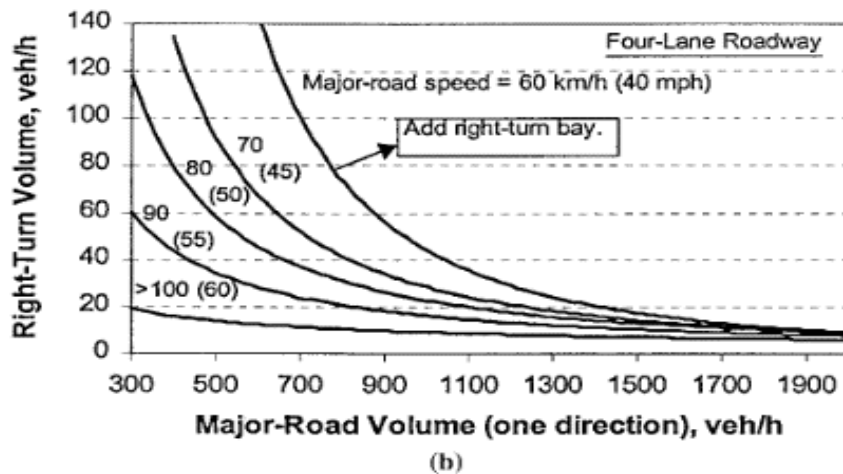
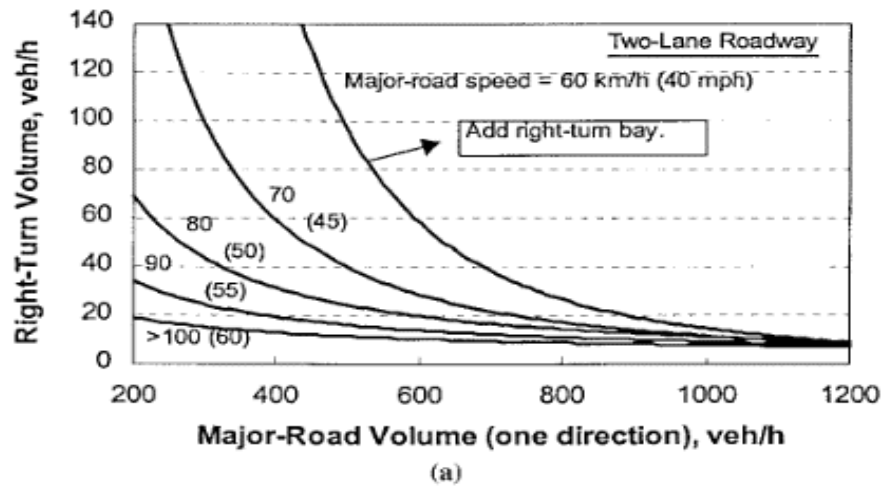
Attachment E

Right Turn Criteria

NCHRP 457 RT Turn Warrant Analysis					
Intersection	Year 2026				
	Advancing Volume	Opposing Volume	Right Turn Volume	AM	PM
Crosby Cedar Bayou Rd and Driveway 1	289(413)	277(434)	1(1)	No	No
Crosby Cedar Bayou Rd and Driveway 2	287(412)	275(419)	1(1)	No	No

LEGEND:

AM Volume (PM Volume)



Attachment F

Left Turn Criteria

NCHRP 457 Left Turn Warrant Analysis						
Intersection	Year 2026					
	Advancing Volume	Opposing Volume	Left Turn Volume	% Left of Advancing	AM	PM
Crosby Cedar Bayou Rd and Driveway 1	277(434)	289(413)	3(13)	1%(3%)	No	No
Crosby Cedar Bayou Rd and Driveway 2	275(419)	287(412)	1(4)	0.4%(1%)	No	No

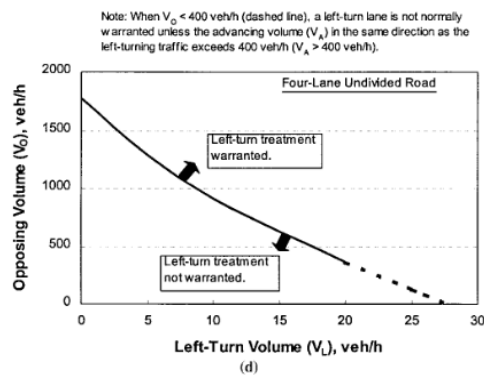
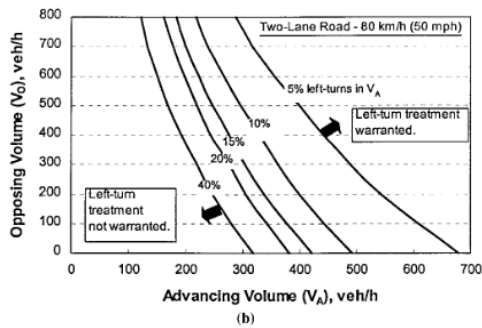
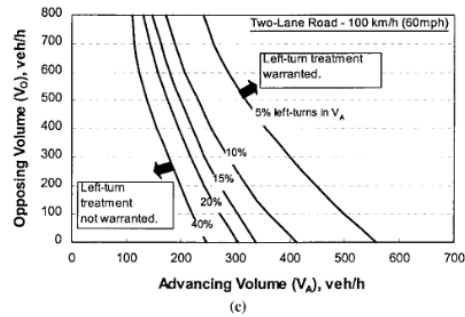
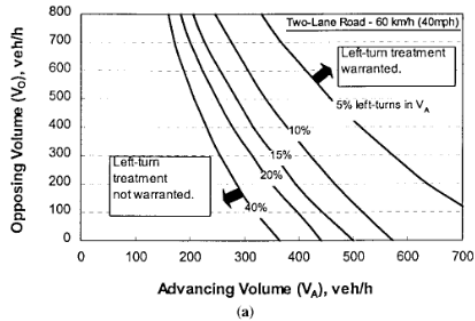


Figure 2-5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.