



City of Hutto

Agenda

Planning and Zoning Commission

Tuesday, April 9, 2024 at 7:00 PM

Council Chambers

In accordance with the Texas Open Meetings Act this meeting agenda is posted for public information, continuously, for at least 72 hours prior to the scheduled time of the meeting on the bulletin board located on the exterior wall of the City Hall building at 500 West Live Oak, Hutto, Texas. This meeting agenda is also accessible via the Internet at huttotx.gov

1. CALL SESSION TO ORDER

2. ROLL CALL

3. PUBLIC COMMENT

Any citizen wishing to speak during public comment may do so after completing the required registration form. The purpose of this item is to allow the residents of Hutto and other interested persons an opportunity to address the City Council on agenda issues and on non-agenda issues that are a matter of the jurisdiction of the City Council (i.e., City policy or legislative issues). Non-agenda issues regarding daily operational or administrative matters should be first dealt with at the administrative level by calling City Hall at (512) 759-4839 during business hours. Each person providing public comment will be limited to 3 minutes. Any citizen wishing to speak during public comment may do so after completing the required registration form. Written comments for this meeting may also be sent to comments@huttotx.gov PRIOR to 4:00 pm on April 9, 2024. The email must include name, address, phone # and email to be recognized properly. Written comments will be provided to Council.

4. CONSENT AGENDA

- 4.1. Consideration and possible action on the meeting minutes from the regular scheduled Planning and Zoning Commission meeting held on March 5, 2024.
- 4.2. Consideration and possible action on the proposed Cottonwood Creek Phase 5 Final Plat, 60.785 acres, more or less, of land, 146 residential lots, located south of CR 132 and North of FM 1660 South.
- 4.3. Consideration and possible action on the proposed Alta Ed Schmidt Final Plat, 77.881 acres, more or less, of land, 4 multi-family lots, located on CR 119.

5. AGENDA ITEMS

- 5.1. Conduct a public hearing and consider possible action on the proposed Hutto Gateway Preliminary Plat, 46.777 acres, more or less, of land, located on the east side of County Road 119 and north of Limmer Loop.
- 5.2. Presentation and discussion on the 2025 Capital Improvement Plan.

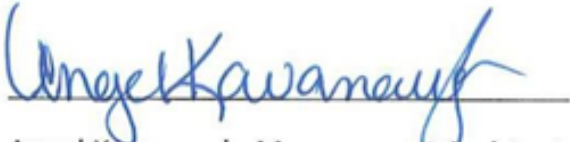
6. DEVELOPMENT SERVICES DIRECTOR REPORT

7. ADJOURNMENT

8. CERTIFICATION

I certify that this notice of the April 9, 2024 Hutto Planning and Zoning Commission meeting was posted on the City of Hutto website and the City Hall bulletin board of the City of Hutto on April 5, 2024 before 5:00 P.M.




Angel Kavanaugh, Management Assistant

The City of Hutto is committed to comply with the Americans Disability Act. The Hutto City Council Chamber is wheelchair accessible. Request for reasonable special accommodations must be made 48 hours prior to the meeting. Please email the City Secretary's office at City.Secretary@huttox.gov or call (512) 759-4033 for assistance.

AGENDA ITEM REPORT

4.1.



To: Planning and Zoning Commission
Subject: Consideration and possible action on the meeting minutes from the regular scheduled Planning and Zoning Commission meeting held on March 5, 2024.
Meeting: Tuesday, April 9, 2024
Department: Development Services
Staff Contact:

BACKGROUND INFORMATION:

SUMMARY OF REQUEST:

STAFF REVIEW:

FISCAL NOTES:

POLICY IMPLICATIONS:

ATTACHMENTS:

1. Planning and Zoning Meeting Minutes 3.5.2024



City of Hutto

Minutes

Planning and Zoning Commission

Tuesday, March 5, 2024 at 7:00 PM

City Council Chambers

1. CALL SESSION TO ORDER

The Planning and Zoning Commission meeting was called to order at 7:00 PM.

2. ROLL CALL

Planning and Zoning Commission members in attendance were: Jim Morris, Tony Wertz, Rick Hudson, Cheryl Stewart and Susanna Boyer.

Jerica Lawyer and Bryan Lee were not in attendance.

3. PUBLIC COMMENT

Any citizen wishing to speak during public comment may do so after completing the required registration form. The purpose of this item is to allow the residents of Hutto and other interested persons an opportunity to address the City Council on agenda issues and on non-agenda issues that are a matter of the jurisdiction of the City Council (i.e., City policy or legislative issues). Non-agenda issues regarding daily operational or administrative matters should be first dealt with at the administrative level by calling City Hall at (512) 759-4839 during business hours. Each person providing public comment will be limited to 3 minutes. Any citizen wishing to speak during public comment may do so after completing the required registration form. Written comments for this meeting may also be sent to comments@huttotx.gov PRIOR to 4:00 pm on March 5, 2024. The email must include name, address, phone # and email to be recognized properly. Written comments will be provided to Council.

No public comment

4. AGENDA ITEMS

- 4.1. Consideration and possible action on the meeting minutes from the regular scheduled Planning and Zoning Commission meeting held on February 6, 2024.

Vice Chair Rick Hudson made a motion to approve the meeting minutes from the regular scheduled Planning and Zoning Commission meeting held on February 6, 2024, with correction to who made the motion on 5.2, seconded by Commissioner Jim Morris. Motion passed 5 Ayes to 0 Nays

- 4.2. Conduct a public hearing and consider possible action on the proposed Hippo Partner - LI Hutto Megasite Preliminary Plat, 52.57 acres, more or less, of land, located located south of US79 and approximately 0.30 miles west of CR3349.

John Byrum presented agenda 4.2 public hearing was closed at 7:08 PM. Vice Chair Rick Hudson made a motion to approve 4.2 as presented, seconded by Commissioner Cheryl Stewart. Motion passed 5 Ayes to 0 Nays

- 4.3. Consideration and possible action on the proposed Hippo Partner - LI Hutto Megasite Final Plat, 52.57 acres, more or less, of land, located located south of US79 and approximately 0.30 miles west of CR3349.

A motion was made by Vice Chair Rick Hudson to approve agenda item 4.3 as presented, seconded by Commissioner Tony Wertz. Motion passed 5 Ayes to 0 Nays

5. DEVELOPMENT SERVICES DIRECTOR REPORT

- * Open House pushed to 20th
- * Council Strategic planning session on the 23rd.

6. ADJOURNMENT

The meeting was adjourned at 7:35 PM

7. CERTIFICATION

I certify that this notice of the March 5, 2024 Hutto Planning and Zoning Commission meeting was posted on the City of Hutto website and the City Hall bulletin board of the City of Hutto on March 1, 2024 before 5:00 P.M.

Planning and zoning Commission Chair

AGENDA ITEM REPORT

4.2.



To: Planning and Zoning Commission
Subject: Consideration and possible action on the proposed Cottonwood Creek Phase 5 Final Plat, 60.785 acres, more or less, of land, 146 residential lots, located south of CR 132 and North of FM 1660 South.
Meeting: Tuesday, April 9, 2024
Department: Development Services
Staff Contact: Ashley Bailey

BACKGROUND INFORMATION:

The Cottonwood Creek Preliminary Plat includes 987 single-family lots, 2 amenity lots and 22 open space lots on 370.33 acres of land. The site is north of FM 1660 S, south of CR 199 and east of Cottonwood Creek and the Cross Creek Subdivision (Meritage) and Glenwood Subdivision.

WEST: PUD Cottonwood Creek
NORTH: ETJ, Vacant and Residential
EAST: ETJ, Vacant Pastureland
SOUTH: PUD Cottonwood Creek

SUMMARY OF REQUEST:

This property is part of the Cottonwood Creek PUD approved in April 2018. Phases 1-4 have been approved. Phase 5 contains 142 single family lots, one amenity lot and three open space lots. Phases 6-8 remain to be final platted.

STAFF REVIEW:

This plat is subject to the 'shot clock' bill (HB3167). The options available as approval, approval with conditions, and denial. Staff recommends approval of the Final Plat with the following conditions:

1. Comment #4 remains. CN values does not match Table 2-3 of RRDCM. No category is called Row Crops. The existing land can not be classified as Row crop. Additionally, a curve number of 85 appears too high. Clarify how existing CN is 85 and a residential lot is only 86.5. Additionally, on pre-developed existing OV-2 table there is a category called "impervious cover" this is not shown table 2-3 of the RRDCM. Provide information supporting the use of each hydrologic soil group.
2. UDC 10.802.3.1 Storm water runoff peak flow rates for the 2,10,25, and 100-year frequency storms stall demonstrate that, as result of the proposed development, there will not be any adverse impact to downstream properties adjacent to the drainage resulting from a 100-year event. Exhibits have been provided that compare pre-developed and post-developed peak flow. Considering no detention has been provided and clearly curve numbers are showing an increase from existing to proposed scenario.

AGENDA ITEM REPORT

4.2.



FISCAL NOTES:

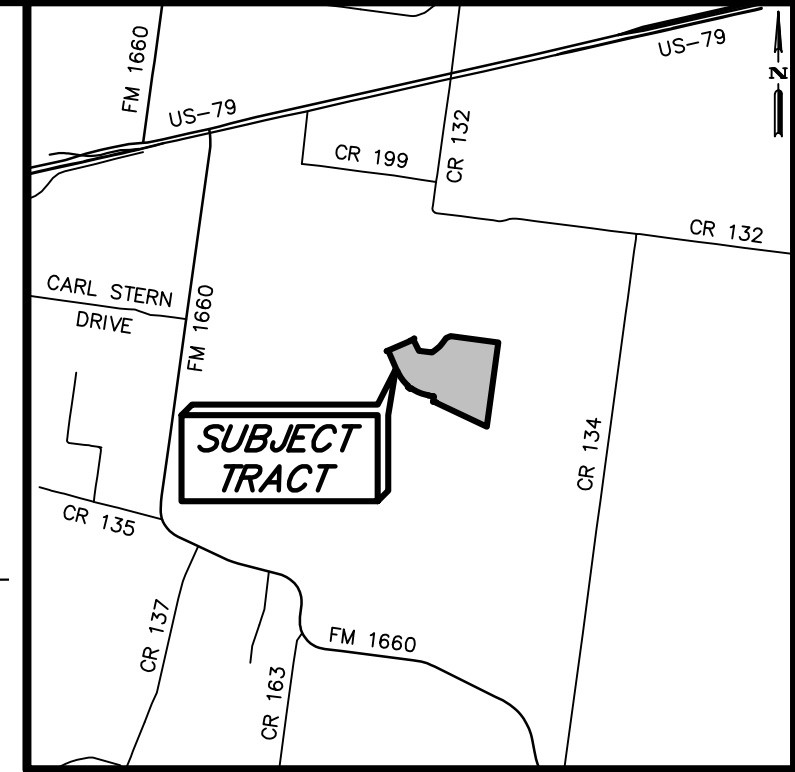
POLICY IMPLICATIONS:

ATTACHMENTS:

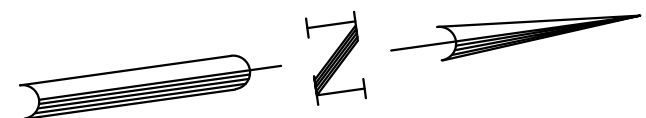
1. CottonwoodPh5FP-U1-Plat(4-1-24)

HUTTO 372, LTD.
REMAINDER OF A
CALLED 367.15 ACRES
(EXHIBIT "A")
DOC. NOS. 2003097296,
2003097297
& 2003097298
O.P.R.W.C.

LESCHBER INVESTMENT, LP
CALLED 50 ACRES
(THIRD TRACT)
DOC. NO. 2010007504 O.P.R.W.C.



VICINITY MAP
NOT TO SCALE



BEARING BASIS NOTE:
BEARING ORIENTATION IS BASED ON THE TEXAS
STATE PLANE COORDINATE SYSTEM, CENTRAL
ZONE 4203, NAD83. DISTANCES SHOWN
HEREON ARE IN SURFACE
COMBINED SCALE FACTOR = 0.99989025

LESCHBER INVESTMENT, LP
CALLED 43.34 ACRES
(FOURTH TRACT)
DOC. NO. 2010007504 O.P.R.W.C.

LARRY W. LESCHBER
REMAINDER OF A
CALLED 87.71 ACRES
VOL. 2430, PG. 332
O.P.R.W.C.

P.O.B.

BASELINE, INC.

LAND USE SCHEDULE

DESCRIPTION	NO.	ACREAGE
RESIDENTIAL	142	24.590 AC.
AMENITY CENTER	1	2.447 AC.
OPEN SPACE/DRAINAGE LOT	2	20.168 AC.
RIGHT-OF-WAY	-	10.750 AC.
RIGHT-OF-WAY DEDICATION	-	2.830 AC.
TOTAL	145	60.785 AC.

FINAL PLAT

COTTONWOOD PHASE 5

A SUBDIVISION OF 60.785 ACRES OF LAND
LOCATED IN THE WILLIAM GATLIN SURVEY,
ABSTRACT NO. 271 AND THE JAMES HICKMAN
SURVEY, ABSTRACT NO. 291
WILLIAMSON COUNTY, TEXAS

LEGEND

DOC.
D.R.W.C.
ELEC.
ESMT.
NO.
NOS.
O.S.
O.P.R.W.C.
O.R.W.C.
PG.
P.O.B.
R.O.W.
VOL.

DOCUMENT
DEED RECORDS OF WILLIAMSON COUNTY
ELECTRIC
EASEMENT
NUMBER
NUMBERS
OPEN SPACE
OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY
OFFICIAL RECORDS OF WILLIAMSON COUNTY
POINT OF BEGINNING
RIGHT-OF-WAY
VOLUME
FOUND 1/2" IRON ROD
SET 1/2" IRON ROD W/CAP STAMPED "BGE INC"
CALCULATED POINT

SCALE BREAK SYMBOL

STREET NAMES

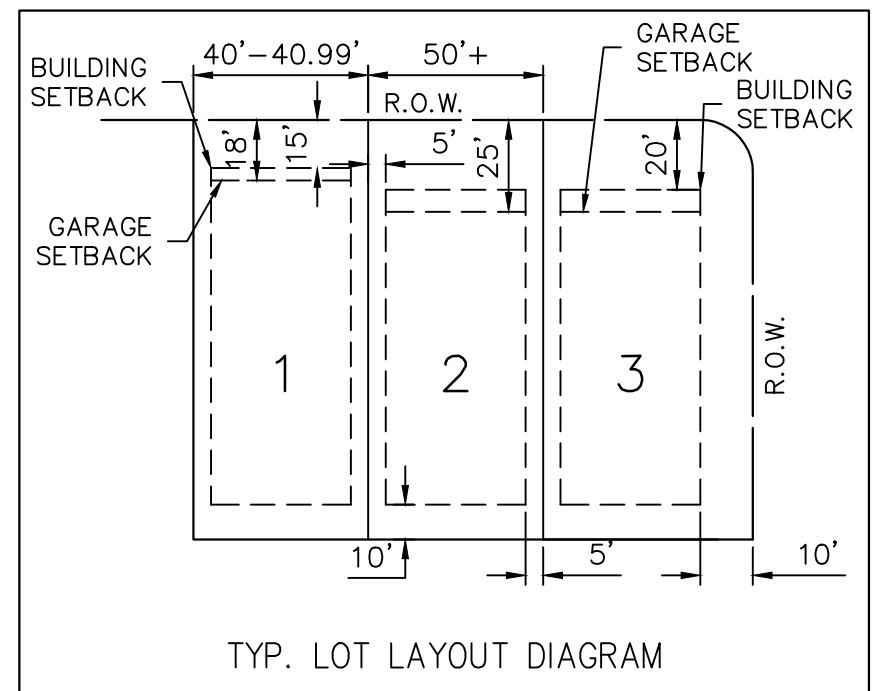
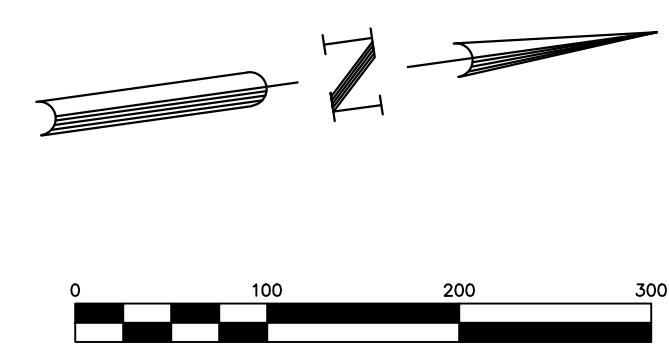
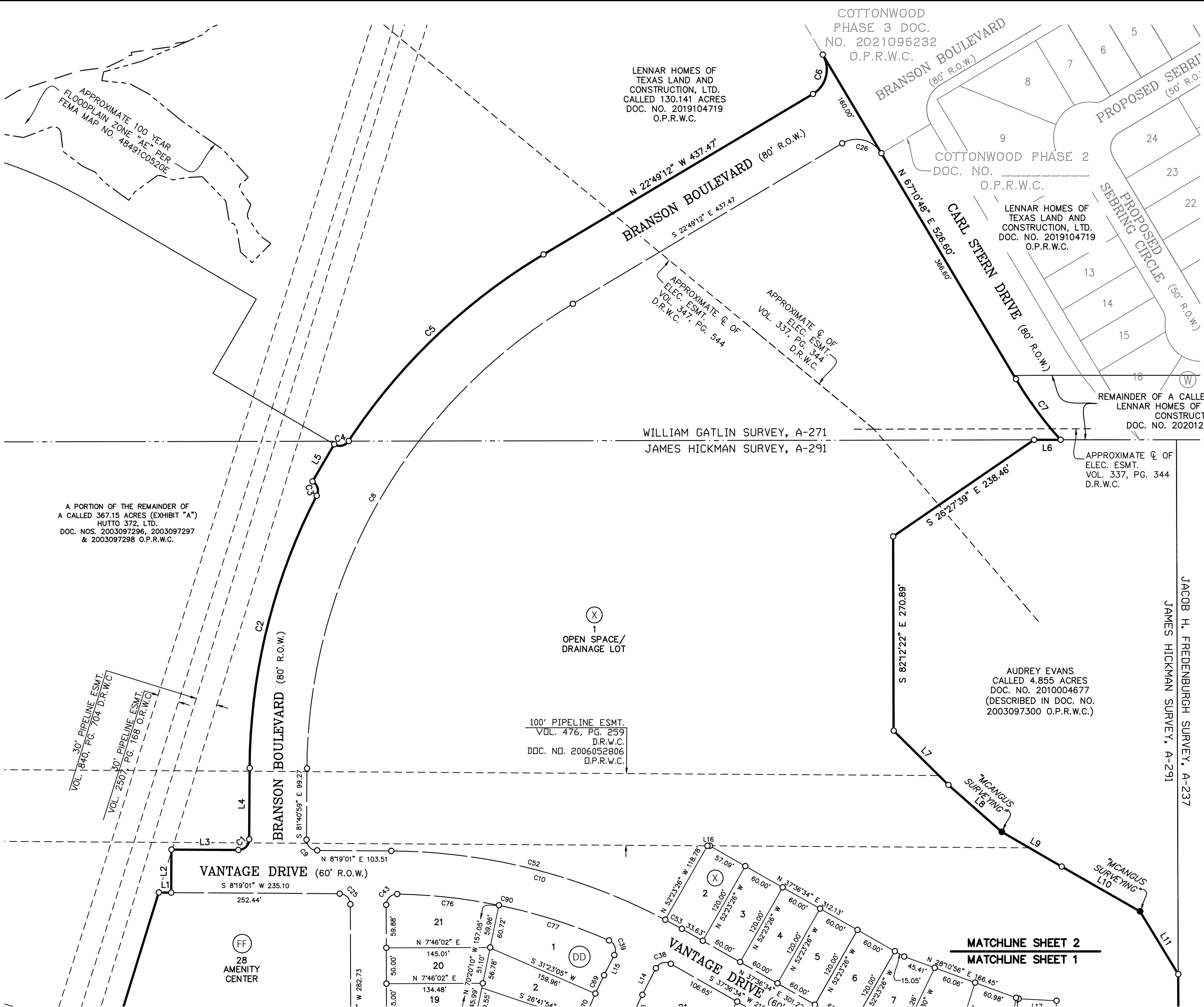
STREET	R.O.W. WIDTH	CENTERLINE LENGTH
BRANSON BOULEVARD	80 FT.	1,444 FT.
CAMARGUE DRIVE	VARIES	1,520 FT.
DONNINGTON DRIVE	60 FT.	1,005 FT.
HERALD DRIVE	50 FT.	895 FT.
IMOLA STREET	50 FT.	836 FT.
MIGLIA STEET	50 FT.	684 FT.
VANTAGE DRIVE	60 FT.	1,844 FT.
TOTAL LINEAR FEET		8,228 FT.



BGE, Inc.

7330 San Pedro Ave., Suite 202
San Antonio, TX 78216
Tel: 210-581-3600 • www.bgeinc.com
TBPELS Registration No. F-1046
TBPELS Licensed Surveying Firm No. 10194490

G:\TXC\Projects\Lennar\9257-00-Cottonwood_PHS_PLAT.dwg, 3/21/2024 3:28 PM, shorger, 1:0



FINAL PLAT COTTONWOOD PHASE 5

A SUBDIVISION OF 60.785 ACRES OF LAND
LOCATED IN THE WILLIAM GATLIN SURVEY,
ABSTRACT NO. 271 AND THE JAMES HICKMAN
SURVEY, ABSTRACT NO. 291
WILLIAMSON COUNTY, TEXAS



BGE, Inc.
7330 San Pedro Ave., Suite 202
San Antonio, TX 78216
Tel: 210-581-3600 • www.bgeinc.com
TBPELS Registration No. F-1046
TBPELS Licensed Surveying Firm No. 10194490

G:\TXC\Projects\Lemarr\9257-00-Cottonwood_PHS\SV 04_Finals\Drawings\Plan\9257-00-Cottonwood_PHS_PLAT.dwg, 3/21/2024 3:28 PM, dgarner, 1:0

R -- RESIDENTIAL O.S. -- OPEN SPACE O.S.D. -- OPEN SPACE/DRAINAGE A.C. -- AMENITY CENTER

LOT AREA TABLE			
LOT	BLOCK	SQ. FT.	TYPE
1	AA	10,135	O.S.
2	AA	8,700	R
3	AA	8,700	R
4	AA	8,700	R
5	AA	8,700	R
6	AA	8,700	R
7	AA	8,700	R
8	AA	8,700	R
9	AA	8,700	R
10	AA	8,700	R
11	AA	8,700	R
12	AA	8,700	R
13	AA	10,117	R

LOT AREA TABLE			
LOT	BLOCK	SQ. FT.	TYPE
1	BB	14,729	R
2	BB	8,100	R
3	BB	8,100	R
4	BB	8,100	R
5	BB	8,100	R
6	BB	8,100	R
7	BB	8,100	R
8	BB	9,441	R
9	BB	9,415	R
10	BB	8,100	R
11	BB	8,100	R
12	BB	8,100	R
13	BB	8,100	R
14	BB	8,100	R
15	BB	8,100	R
16	BB	8,100	R
17	BB	13,380	R

LOT AREA TABLE			
LOT	BLOCK	SQ. FT.	TYPE
1	CC	11,774	R
2	CC	10,994	R
3	CC	7,909	R
4	CC	7,500	R
5	CC	7,500	R
6	CC	7,500	R
7	CC	7,500	R
8	CC	7,500	R
9	CC	7,500	R
10	CC	8,735	R
11	CC	8,362	R
12	CC	7,200	R
13	CC	7,200	R
14	CC	7,200	R
15	CC	9,253	R
16	CC	8,267	R
17	CC	7,200	R
18	CC	7,943	R
19	CC	8,115	R
20	CC	7,971	R
21	CC	10,832	R

LOT AREA TABLE			
LOT	BLOCK	SQ. FT.	TYPE
1	DD	11,899	R
2	DD	7,686	R
3	DD	7,252	R
4	DD	6,638	R
5	DD	6,112	R
6	DD	5,861	R
7	DD	5,400	R
8	DD	5,400	R
9	DD	5,400	R
10	DD	6,584	R
11	DD	6,753	R
12	DD	5,625	R
13	DD	5,625	R
14	DD	5,625	R
15	DD	5,625	R
16	DD	5,625	R
17	DD	5,625	R
18	DD	5,625	R
19	DD	5,838	R
20	DD	6,987	R
21	DD	10,539	R

LOT AREA TABLE			
LOT	BLOCK	SQ. FT.	TYPE
1	EE	7,090	R
2	EE	5,808	R
3	EE	5,811	R
4	EE	5,479	R
5	EE	9,528	R
6	EE	13,423	R
7	EE	7,295	R
8	EE	6,248	R
9	EE	6,300	R
10	EE	6,300	R
11	EE	6,300	R
12	EE	7,666	R
13	EE	6,586	R
14	EE	5,400	R
15	EE	5,400	R
16	EE	5,400	R
17	EE	5,400	R
18	EE	5,400	R
19	EE	5,400	R
20	EE	5,400	R
21	EE	6,515	R
22	EE	8,647	R
23	EE	5,400	R
24	EE	5,400	R
25	EE	5,400	R
26	EE	5,400	R
27	EE	5,400	R
28	EE	5,400	R
29	EE	5,400	R
30	EE	5,400	R
31	EE	6,484	R

LOT AREA TABLE			
LOT	BLOCK	SQ. FT.	TYPE
1	FF	7,942	O.S.
2	FF	6,525	R
3	FF	6,525	R
4	FF	6,525	R
5	FF	6,525	R
6	FF	6,525	R
7	FF	6,525	R
8	FF	6,525	R
9	FF	6,525	R
10	FF	6,525	R
11	FF	6,525	R
12	FF	6,525	R
13	FF	6,525	R
14	FF	6,220	R
15	FF	7,612	R
16	FF	16,444	R
17	FF	12,498	R
18	FF	9,079	R
19	FF	12,647	R
20	FF	12,201	R
21	FF	7,954	R
22	FF	7,323	R
23	FF	6,693	R
24	FF	6,062	R
25	FF	5,432	R
26	FF	4,801	R
27	FF	106,604	A.C.

LOT AREA TABLE			
LOT	BLOCK	SQ. FT.	TYPE
1	X	867,582	R
2	X	7,201	R
3	X	7,200	R
4	X	7,200	R
5	X	7,200	R
6	X	7,200	R
7	X	7,918	R
8	X	8,764	R
9	X	8,625	R
10	X	7,158	R
11	X	6,600	R
12	X	6,600	R
13	X	6,600	R
14	X	6,600	R

CURVE DATA					
NUMBER	RADIUS	DELTA ANGLE	ARC DISTANCE	CHORD BEARING	CHORD DISTANCE
C1	15.00'	90°00'00"	23.56'	N 36°40'59" W	21.21'
C2	840.00'	26°56'17"	394.93'	S 68°12'51" E	391.30'
C3	15.00'	86°58'59"	22.77'	S 81°45'48" W	20.65'
C4	15.00'	86°58'59"	22.77'	N 51°31'11" W	20.65'
C5	840.00'	25°53'28"	379.59'	S 35°45'56" E	376.36'
C6	40.00'	90°00'00"	62.83'	N 67°49'12" W	56.57'
C7	540.00'	111°1'09"	105.42'	N 61°35'09" E	105.26'
C8	760.00'	58°51'47"	780.79'	S 52°15'06" E	746.90'
C9	15.00'	90°00'00"	23.56'	N 53°19'01" E	21.21'
C10	830.00'	29°17'34"	424.34'	S 22°57'48" W	419.74'
C11	570.00'	18°51'36"	187.63'	N 28°10'46" E	186.78'
C12	15.00'	41°48'48"	10.95'	N 2°09'25" W	10.71'
C13	50.00'	160°32'45"	140.10'	S 57°12'34" W	98.56'
C14	15.00'	39°42'54"	10.40'	S 62°22'31" E	10.19'
C15	15.00'	89°55'01"	23.54'	N 52°48'31" E	21.20'
C16	15.00'	90°04'59"	23.58'	S 37°11'29" E	21.23'
C17	15.00'	89°55'01"	23.54'	S 52°48'31" W	21.20'
C18	14.77'	52°32'40"	13.55'	S 16°34'38" E	13.08'
C19	50.00'	283°06'46"	247.06'	S 83°08'16" E	62.17'
C20	15.00'	140°34'06"	36.80'	N 11°51'56" W	28.24'
C21	15.00'	39°42'54"	10.40'	S 77°59'34" W	10.19'
C22	15.00'	169°20'50"	147.78'	S 37°11'29" E	99.57'
C23	15.00'	39°42'54"	10.40'	N 27°37'29" E	10.19'
C24	15.00'	90°00'00"	23.56'	N 37°13'58" W	21.21'
C25	15.00'	89°27'01"	23.42'	S 53°02'31" W	21.11'
C26	40.00'	90°00'00"	62.83'	S 22°10'48" W	56.57'
C27	25.00'	79°57'45"	34.89'	S 57°47'09" W	32.13'
C28	15.00'	90°04'59"	23.58'	N 37°11'29" W	21.23'
C29	15.00'	89°55'01"	23.54'	N 52°48'31" E	21.20'
C30	175.00'	29°50'33"	91.15'	S 67°18'42" E	90.12'
C31	15.00'	89°27'13"	23.42'	S 7°39'49" E	21.11'
C32	620.00'	19°15'31"	208.40'	N 27°26'02" E	207.42'
C33	15.00'	90°00'00"	23.56'	S 82°36'34" W	21.21'
C34	225.00'	29°50'33"	117.19'	S 67°18'42" E	115.87'
C35	15.00'	90°04'59"	23.58'	N 37°11'29" W	21.23'
C36	15.00'	89°55'01"	23.54'	N 52°48'31" E	21.20'
C37	470.00'	27°12'39"	223.21'	S 68°37'39" E	221.12'
C38	15.00'	92°37'54"	24.25'	S 8°42'22" E	21.69'
C39	15.00'	93°21'39"	24.44'	S 78°17'51" W	21.83'
C40	530.00'	27°12'39"	251.71'	S 68°37'39" E	249.35'
C41	15.00'	90°04'59"	23.58'	N 37°11'29" W	21.23'
C42	25.00'	89°55'01"	39.23'	N 52°48'31" E	35.33'
C43	15.00'	91°10'42"	23.87'	S 36°38'37" E	21.43'
C44	15.00'	90°00'00"	23.56'	S 52°46'02" W	21.21'
C45	15.00'	39°42'54"	10.40'	N 62°22'31" W	10.19'
C46	50.00'	169°20'50"	147.78'	N 52°48'31" E	99.57'
C47	15.00'	39°42'54"	10.40'	S 12°00'26" E	10.19'
C48	15.00'	89°55'01"	23.54'	S 52°48'31" W	21.20'
C49	15.00'	90°04'59"	23.58'	N 37°11'29" W	21.23'
C50	15.00'	90°00'00"	23.56'	N 52°51'01" E	21.21'

CURVE DATA					
NUMBER	RADIUS	DELTA ANGLE	ARC DISTANCE	CHORD BEARING	CHORD DISTANCE
C51	25.00'	89°55'01"	39.23'	S 37°11'29" E	35.33'
C52	830.00'	27°28'20"	397.97'	S 22°03'11" W	394.17'
C53	830.00'	1°49'14"	26.37'	S 36°41'57" W	26.37'
C54	570.00'	41°0'04"	41.46'	N 35°31'33" E	41.45'
C55	570.00'	7°46'16"	77.31'	N 29°33'23" E	77.25'
C56	570.00'	6°55'16"	68.85'	N 22°12'36" E	68.81'
C57	15.00'	35°17'57"	9.24'	N 1°06'00" E	9.10'
C58	15.00'	6°30'51"	1.71'	N 19°48'25" W	1.70'
C59	50.00'	91°34'00"	79.91'	S 22°43'11" W	71.67'
C60	50.00'	68°58'45"	60.20'	N 77°00'26" W	56.63'
C61	620.00'	10°34'07"	114.36'	N 31°46'44" E	114.20'
C62	620.00'	8°41'24"	94.03'	N 22°08'59" E	93.94'
C63	470.00'	3°55'57"	32.26'	S 80°16'00" E	32.25'
C64	470.00'	9°11'21"	75.38'	S 73°42'21" E	75.30'
C65	470.00'	9°10'35"	75.27'	S 64°31'23" E	75.19'
C66	470.00'	4°54'47"	40.30'	S 57°28'43" E	40.29'
C67	225.00'	11°48'36"	46.38'	S 58°17'43" E	46.30'
C68	225.00'	18°01'57"	70.81'	S 73°13'00" E	70.52'
C69	530.00'	3°03'10"	28.24'	S 56°32'54" E	28.24'
C70	530.00'	4°41'10"	43.35'	S 60°25'05" E	43.34'
C71	530.00'	4°41'10"	43.35'	S 65°06'15" E	43.34'
C72	530.00'	4°41'36"	43.41'	S 69°47'38" E	43.40'
C73	530.00'	4°41'10"	43.35'	S 74°29'01" E	43.34'
C74	530.00'	4°40'44"	43.28'	S 79°09'58" E	43.27'
C75	530.00'	0°43'38"	6.73'	S 81°52'09" E	6.73'
C76	770.00'	10°39'18"	143.19'	S 14°16'22" W	142.99'
C77	770.00'	12°01'00"	161.49'	S 25°36'32" W	161.20'
C78	50.00'	36°48'42"	32.12'	S 60°55'25" E	31.57'
C79	50.00'	39°30'15"	34.47'	N 80°55'07" E	33.80'
C80	50.00'	37°03'54"	32.35'	N 42°38'02" E	31.78'
C81	50.00'	46°19'07"	40.42'	N 0°56'31" E	39.33'
C82	50.00'	9°38'51"	8.42'	N 27°02'28" W	8.41'
C83	50.00'	59°09'29"	51.63'	S 28°50'22" W	49.36'
C84	50.00'	37°34'48"	32.79'	S 19°31'46" E	32.21'
C85	50.00'	37°33'04"	32.77'	S 57°05'43" E	32.19'
C86	50.00'	37°26'00"	32.67'	N 85°24'45" E	32.09'
C87	50.00'	37°27'42"	32.69'	N 47°57'54" E	32.11'
C88	50.00'	44°53'43"	39.18'	N 6°47'12" E	38.18'
C89	50.00'	29°01'59"	25.34'	N 30°10'39" W	25.07'
C90	770.00'	22°40'18"	304.69'	S 20°16'52" W	302.70'

LINE DATA		
NUMBER	BEARING	DISTANCE
L1	N81°9'01"E	17.33'
L2	N81°40'59"W	60.00'
L3	N81°9'01"E	93.32'
L4	N81°40'59"W	99.27'
L5	N51°43'42"W	60.00'
L6	S75°7'27"W	37.03'
L7	N52°43'18"E	107.54'
L8	N49°15'10"E	99.03'
L9	N38°02'42"E	96.62'
L10	N37°41'23"E	125.99'
L11	N66°38'01"E	102.61'
L12	S52°23'26"E	21.06'
L13	N52°23'26"W	21.04'
L14	S55°01'19"E	41.58'
L15	N55°01'19"W	31.58'
L16	S81°9'10"E	3.34'
L17	S110°43'55"W	53.01'
L18	N63°19'35"W	72.08'
L19	N52°23'26"W	36.04'
L20	S85°32'38"W	42.62'

G:\TXC\Projects\Lennar\9257-00-Cottonwood_PHS\SV\04_Finals\Drawings\Plat\9257-00-Cottonwood_PHS_PLAT.dwg, 3/21/2024 3:28 PM, sbrger, 1:0

LEGAL DESCRIPTION

FIELD NOTES FOR A 60.785 ACRE TRACT OF LAND IN THE WILLIAM GATLIN SURVEY, ABSTRACT NO. 271 AND THE JAMES HICKMAN SURVEY, ABSTRACT NO. 291, WILLIAMSON COUNTY, TEXAS; BEING OUT OF THE REMAINING PORTION OF A CALLED 367.15 ACRE TRACT OF LAND (EXHIBIT "A") AND THE REMAINING PORTION OF A 5.57 ACRE TRACT OF LAND (EXHIBIT 'B') AS CONVEYED UNTO HUTTO 372, LTD IN DOCUMENT NUMBERS 2003097296, 2003097297 AND 2003097298 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS, AND A PORTION OF A CALLED 9.487 ACRE TRACT OF LAND AS CONVEYED UNTO LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD IN DOCUMENT NUMBER 2020120045 AND A PORTION OF A CALLED 130.141 ACRE TRACT OF LAND AS CONVEYED UNTO LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD. IN DOCUMENT NUMBER 2019104719 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; SAID 60.785 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at a 1/2-inch iron rod with cap stamped "BASELINE INC" found on the south line of a called 87.71 acre tract of land as conveyed unto Larry W. Leschber in Volume 2430, Page 332 of the Official Public Records of Williamson County, Texas, at the northwest corner of a called 143.5 acre tract of land as conveyed unto LPL Investments, LP in Document Number 2010007498 of the Official Public Records of Williamson County, Texas, at an easterly corner of the remainder of said 367.15 acre tract for the northeast corner and POINT OF BEGINNING of the herein described tract;

THENCE, S 07°51'01" W, coincident with the common line of said 143.5 acre tract and the remainder of the 367.15 acre tract, a distance of 1,771.87 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for the southeast corner of the herein described tract, from which a 1/2-inch iron rod with cap stamped "BASELINE INC" found at the common corner of the remainder of the 367.15 acre tract and a called 45.77 acre tract of land (Tract 2) as conveyed unto Swindoll Investments, LP in Document Number 2008093458, of the Official Public Records of Williamson County, Texas, bears S 07°51'01" W, a distance of 1,598.53 feet;

Thence departing said common line, over an across the remainder of the 367.15 acre tract the following nine (9) courses;

- 1)N 64° 51' 23" W, a distance of 1,170.57 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a south corner of the herein described tract;
- 2) N 08° 19' 01" E, a distance of 17.33 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a re-entrant corner of the herein described tract;
- 3) N 81° 40' 59" W, a distance of 60.00 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a south corner of the herein described tract;
- 4) N 08° 19' 01" E, a distance of 93.32 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of curvature of the herein described tract;
- 5) Curving to the left, with a radius of 15.00 feet, an arc length of 23.56 feet, a central angle of 90° 00' 00", a chord bearing of N 36° 40' 59" W, and a chord distance of 21.21 feet a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of tangency of the herein described tract;
- 6) N 81° 40' 59" W, a distance of 99.27 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of curvature of the herein described tract;
- 7) Curving to the right, with a radius of 840.00 feet, an arc length of 394.93 feet, a central angle of 26° 56' 17", a chord bearing of N 68° 12' 51" W, and a chord distance of 391.30 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of reverse curvature of the herein described tract;
- 8) Curving to the left, with a radius of 15.00 feet, an arc length of 22.77 feet, a central angle of 86° 58' 59", a chord bearing of S 81° 45' 48" W, and a chord distance of 20.65 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set at the end of this curve for a southerly corner of the herein described tract;
- 9) N 51° 43' 42" W, a distance of 60.00 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set on the common line of the remainder of the 367.15 acre tract and a called 130.141 acre tract of land as conveyed unto Lennar Homes of Texas Land and Construction, LTD in Document Number 2019104719 of the Official Public Records of Williamson County, Texas, at the beginning of a non-tangent curve for a southerly corner of the herein described tract;

THENCE, coincident with the common line of the remainder of the 367.15 acre tract and said 130.141 acre tract the following five (5) courses:

- 1)Curving to the left, with a radius of 15.00 feet, an arc length of 22.77 feet, a central angle of 86° 58' 59", a chord bearing of N 05° 13' 11" W, and a chord distance of 20.65 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of reverse curvature of the herein described tract;

- 2) Curving to the right, with a radius of 840.00 feet, an arc length of 379.59 feet, a central angle of 25° 53' 28", a chord bearing of N 35° 45' 56" W, and a chord distance of 376.36 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of tangency of the herein described tract;

- 3) N 22° 49' 12" W, a distance of 437.47 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of curvature of the herein described tract;

- 4) Curving to the left, with a radius of 40.00 feet, an arc length of 62.83 feet, a central angle of 90° 00' 00", a chord bearing of N 67° 49' 12" W, and a chord distance of 56.57 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set at the end of this curve for an the most westerly corner of the herein described tract;

- 5) N 67° 10' 48" E, passing at a distance of 520.85 feet the common line of the 130.141 acre tract and the remainder of the aforementioned 9.487 acre tract and continuing over and across said remainder of the 9.487 acre tract a total distance of 526.60 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for a point of curvature of the herein described tract;

THENCE, continuing over and across the remainder of the 9.487 acre tract, curving to the left, with a radius of 540.00 feet, an arc length of 105.42 feet, a central angle of 11° 11' 09", a chord bearing of N 61° 35' 09" E, and a chord distance of 105.26 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set on the common line of the remainder of the 9.487 acre tract and a called 4.855 acre tract of land as conveyed unto Audrey Evans in Document Number 2003097300 of the Official Public Records of Williamson County, Texas, at the end of this curve for a northerly corner of the herein described tract;

THENCE, coincident with the common line of the remainder of the 9.487 acre tract and said 4.855 acre tract, the following four (4) courses:

- 1)S 07° 57' 27" W, a distance of 37.03 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for an angle point of the herein described tract;
- 2) S 26° 27' 39" E, a distance of 238.46 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for an angle point of the herein described tract;
- 3) S 82° 12' 22" E, a distance of 270.89 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for an angle point of the herein described tract;
- 4) N 52° 43' 18" E, passing at a distance of 84.62 feet a 1/2-inch iron rod with a cap stamped "BASELINE INC" found on the common line of the remainder of the aforementioned 5.57 acre tract and the 4.855 acre tract and continuing coincident with the common line of the remainder of said 5.57 acre tract and the 4.855 acre tract a total distance of 107.54 feet to a 1/2-inch iron rod with a cap stamped "BASELINE INC" found for an angle point of the herein described tract;

THENCE, continuing coincident with the common line of the remainder of the 5.57 acre tract and the 4.855 acre tract the following four (4) courses:

- 1)N 49° 15' 10" E, a distance of 99.03 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set for an angle point of the herein described tract;
- 2) N 38° 02' 42" E, a distance of 96.62 feet to a 1/2-inch iron rod with a cap stamped "MCANGUS SURVEYING" found for an angle point of the herein described tract;
- 3) N 37° 41' 23" E, a distance of 125.99 feet to a 1/2-inch iron rod with a cap stamped "MCANGUS SURVEYING" for an angle point of the herein described tract;
- 4) N 66° 38' 01" E, a distance of 102.61 feet to a 1/2-inch iron rod with a cap stamped "BGE INC" set on the south line of a called 50 acre tract of land (Third Tract) as conveyed unto Leschber Investments, LP in Document Number 2010007504 of the Official Public Records of Williamson County, Texas at a common corner of the remainder of the 5.57 acre tract, the 4.855 acre tract and the aforementioned remainder of the 367.15 acre tract for a north corner of the herein described tract;

THENCE, S 82° 13' 58" E, coincident with the common line of the remainder of said 367.15 acre tract, said 50 acre tract, a called 43.34 acre tract of land (Fourth Tract) as conveyed unto Leschber Investments, LP in said Document Number 2010007504, and the aforementioned 87.71 acre tract, a distance of 1,001.06 feet to the POINT OF BEGINNING and containing 60.785 acres of land, more or less.



BGE, Inc.
7330 San Pedro Ave., Suite 202
San Antonio, TX 78216
Tel: 210-581-3600 • www.bgeinc.com
TBPELS Registration No. F-1046
TBPELS Licensed Surveying Firm No. 10194490

FINAL PLAT
COTTONWOOD PHASE 5

A SUBDIVISION OF 60.785 ACRES OF LAND
LOCATED IN THE WILLIAM GATLIN SURVEY,
ABSTRACT NO. 271 AND THE JAMES HICKMAN
SURVEY, ABSTRACT NO. 291
WILLIAMSON COUNTY, TEXAS

STATE OF TEXAS §
COUNTY OF TRAVIS §

KNOW ALL MEN BY THESE PRESENTS:

THAT LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD., A TEXAS LIMITED PARTNERSHIP, ACTING HEREIN BY AND THROUGH KEVIN PAPE, VICE PRESIDENT, BEING THE OWNER OF A CALLED 9.487 ACRES OF LAND AND A PORTION OF A CALLED 130.141 ACRES OF LAND OUT OF THE WILLIAM GATLIN SURVEY A-271, WILLIAMSON COUNTY AND THE JAMES HICKMAN SURVEY, A-291, TEXAS AS CONVEYED TO IT BY INSTRUMENT RECORDED IN DOCUMENT NUMBERS 2019116498 AND 2019104719 RESPECTIVE, BOTH OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS, AND HUTTO 372, LTD, A TEXAS LIMITED PARTNERSHIP, ACTING HEREIN BY AND THROUGH _____ BEING THE OWNER OF THE REMAINING PORTION OF A CALLED 367.15 ACRE TRACT OF LAND (EXHIBIT "A") AND THE REMAINING PORTION OF A 5.57 ACRE TRACT OF LAND (EXHIBIT "B") AS CONVEYED UNTO HUTTO 372, LTD IN DOCUMENT NUMBERS 2003097296, 2003097297 AND 2003097298 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, DO HEREBY SUBDIVIDE SAID 60.785 ACRES OF LAND IN ACCORDANCE WITH THE PLAT SHOWN HEREON, TO BE KNOWN AS:

COTTONWOOD PHASE 5

AND DOES HEREBY DEDICATE TO THE PUBLIC THE USE OF THE STREETS AND EASEMENTS SHOWN HEREON, SUBJECT TO ANY EASEMENTS AND/OR RESTRICTIONS HERETOFORE GRANTED AND NOT RELEASED.

WITNESS MY HAND, THIS THE _____ DAY OF _____, 20____, A.D.

KEVIN PAPE, VICE PRESIDENT
LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.
13620 NORTH F.M. 620
BUILDING 1, SUITE 150
AUSTIN, TEXAS 78717

STATE OF TEXAS §
COUNTY OF TRAVIS §

BEFORE ME, THE UNDERSIGNED AUTHORITY, PERSONALLY APPEARED KEVIN PAPE, 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 CONSIDERATION THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED.

NOTARY PUBLIC, STATE OF TEXAS

PRINT NOTARY'S NAME
MY COMMISSION EXPIRES _____

I, STACY MULHOLLAND, AM AUTHORIZED UNDER THE LAWS OF THE STATE OF TEXAS, TO PRACTICE THE PROFESSION OF ENGINEERING, AND DO HEREBY CERTIFY THAT THIS PLAT IS FEASIBLE FROM AN ENGINEERING STANDPOINT, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

**PRELIMINARY, THIS DOCUMENT SHALL NOT
BE RECORDED FOR ANY PURPOSE AND
SHALL NOT BE USED OR VIEWED OR RELIED
UPON AS A FINAL SURVEY DOCUMENT**

STACY MULHOLLAND, P.E.
LICENSED PROFESSIONAL ENGINEER NO. 146417
BGE, INC.
1701 DIRECTORS BOULEVARD, SUITE 1000
AUSTIN, TX 78744

DATE

I, DION P. ALBERTSON, AM AUTHORIZED UNDER THE LAWS OF THE STATE OF TEXAS, TO PRACTICE THE PROFESSION OF LAND SURVEYING, AND DO HEREBY CERTIFY THAT THIS PLAT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND WAS PREPARED FROM AN ACTUAL ON THE GROUND SURVEY OF THE PROPERTY UNDER MY SUPERVISION.

**PRELIMINARY, THIS DOCUMENT SHALL NOT
BE RECORDED FOR ANY PURPOSE AND
SHALL NOT BE USED OR VIEWED OR RELIED
UPON AS A FINAL SURVEY DOCUMENT**

DION P. ALBERTSON, R.P.L.S.
REGISTERED PROFESSIONAL LAND SURVEYOR NO. 4963
BGE, INC.
7330 SAN PEDRO AVE, SUITE 202
SAN ANTONIO, TEXAS 78216

DATE

GENERAL NOTES:

1. BEARING ORIENTATION IS BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE 4203, NAD83. COMBINED SCALE FACTOR = 0.99989025
2. NO BUILDING, FENCING, LANDSCAPING OR STRUCTURES ARE ALLOWED WITHIN ANY DRAINAGE OR WASTEWATER EASEMENT UNLESS EXPRESSLY PERMITTED BY THE CITY OF HUTTO.
3. BUILDING SETBACKS SHALL CONFORM TO UDC REQUIREMENTS, AS AMENDED.
4. A TEN (10) FOOT PUBLIC UTILITY EASEMENT (PUE) IS HEREBY DEDICATED ALONG AND ADJACENT TO ALL STREET SIDE PROPERTY LINES.
5. A FIVE (5) FOOT PUBLIC UTILITY EASEMENT (PUE) IS HEREBY DEDICATED ON EACH SIDE OF ALL REAR LOT LINES.
6. IF PARKING IS DESIRED ON BOTH SIDES OF THE STREET THEN THE STREETS MUST BE A MINIMUM OF 33 FEET WIDE. IF THE STREETS ARE LESS THAN 33 FEET IN WIDTH FIRE LANE SIGNAGE IS REQUIRED. (2018 IFC APPENDIX D SEC. 103.6 – D103.6.2)
7. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTION IS MADE TO PUBLIC WATER AND WASTEWATER UTILITIES.
8. SIDEWALKS AND TREES SHALL BE PROVIDED ON BOTH SIDES OF ALL STREETS WITHIN THIS SUBDIVISION.
9. SIDEWALKS AND TREES SHALL BE PROVIDED ALONG ALL STREETS BOUNDING THIS SUBDIVISION.
10. AN ARTERIAL FENCE SHALL BE CONSTRUCTED ALONG F.M. 1660 PER UDC REQUIREMENTS, AS AMENDED.
11. ALL FENCING THAT IS NOT ON A PRIVATE LOT TO BE MAINTAINED BY THE HOA.
12. STREET LIGHTING SHALL BE PROVIDED BY THE DEVELOPER IN CONFORMANCE WITH THE UDC REQUIREMENTS, AS AMENDED.
13. THIS TRACT IS WITHIN WATER CCN SERVICE AREA 10321. WATER AND WASTEWATER WILL BE AVAILABLE THROUGH THE CITY OF HUTTO AFTER THE APPROPRIATE WATER AND WASTEWATER SYSTEMS ARE INSTALLED TO THIS SITE. THE CITY OF HUTTO ASSUMES NO OBLIGATIONS FOR INSTALLING ANY WATER AND WASTEWATER IMPROVEMENTS REQUIRED TO SERVE THIS SITE.
14. NO PORTION OF THIS TRACT IS ENCROACHED BY THE ULTIMATE 1% ANNUAL CHANCE FLOODPLAIN.
15. NO PORTION OF THIS TRACT IS ENCROACHED BY ANY SPECIAL FLOOD HAZARD AREAS INUNDATED BY THE 1% ANNUAL CHANCE FLOODPLAIN AS IDENTIFIED BY THE U.S. FEDERAL EMERGENCY MANAGEMENT AGENCY BOUNDARY MAP (FLOOD INSURANCE RATE MAP) COMMUNITY PANEL NUMBER 48491C0520F, EFFECTIVE DATE DECEMBER 12, 2019, FOR WILLIAMSON COUNTY, TEXAS.
16. IN ORDER TO PROMOTE DRAINAGE AWAY FROM A STRUCTURE, THE SLAB ELEVATIONS SHALL BE BUILT AT LEAST ONE (1) FOOT ABOVE THE SURROUNDING GROUND AND SHOULD BE GRADED AWAY FROM THE STRUCTURE AT A SLOPE OF ½" PER FOOT FOR A DISTANCE OF AT LEAST TEN (10) FEET.
17. ALL SUBDIVISION CONSTRUCTION SHALL CONFORM TO THE CITY OF HUTTO UNIFIED DEVELOPMENT CODE AS AMENDED, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
18. ON-SITE STORMWATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST-DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 2, 10, 25 AND 100-YEAR STORM EVENTS.
19. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
20. ALL DRAINAGE LOTS, OPEN SPACE LOTS, AND AMENITY LOTS SHALL BE OWNED AND MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.
21. THIS SUBDIVISION IS ZONED PUD 06-024-00.
22. OPEN SPACE AND DRAINAGE LOTS WILL BE OWNED AND MAINTAINED BY THE HOA.

PLANNING AND ZONING COMMISSION CHAIR:

THIS PLAT WAS APPROVED FOR RECORDING BY THE PLANNING AND ZONING COMMISSION CHAIR ON THE _____ DAY OF _____, 20____.

RICHARD HUDSON
DATE

CITY DEVELOPMENT SERVICES:

THIS SUBDIVISION IS LOCATED WITHIN THE CITY LIMITS OF HUTTO, THIS THE _____ DAY OF _____, 20____.

ASHLEY BAILEY, DEVELOPMENT SERVICES EXECUTIVE DIRECTOR
DATE

STATE OF TEXAS §
COUNTY OF WILLIAMSON §

KNOW ALL MEN BY THESE PRESENTS:

THAT I, NANCY RISTER, CLERK OF THE COUNTY COURT OF SAID COUNTY, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT IN WRITING, WITH ITS CERTIFICATION OF AUTHENTICATION, WAS FILED FOR RECORD IN MY OFFICE ON THE ____DAY OF _____, 20____ A.D., AT _____ O'CLOCK ____M. AND DULY RECORDED ON THE ____DAY OF _____, 20____ A.D., AT _____ O'CLOCK ____M. IN THE PLAT RECORDS OF SAID COUNTY, IN DOCUMENT NO. _____

WITNESS MY HAND AND SEAL OF THE COUNTY COURT OF SAID COUNTY, AT MY OFFICE IN GEORGETOWN, TEXAS, THE DATE LAST ABOVE WRITTEN.

NANCY RISTER, CLERK, COUNTY COURT
WILLIAMSON COUNTY, TEXAS

BY: _____
DEPUTY



BGE, Inc.
7330 San Pedro Ave., Suite 202
San Antonio, TX 78216
Tel: 210-581-3600 • www.bgeinc.com
TBPELS Registration No. F-1046
TBPELS Licensed Surveying Firm No. 10194490

AGENDA ITEM REPORT

4.3.



To: Planning and Zoning Commission
Subject: Consideration and possible action on the proposed Alta Ed Schmidt Final Plat, 77.881 acres, more or less, of land, 4 multi-family lots, located on CR 119.
Meeting: Tuesday, April 9, 2024
Department: Development Services
Staff Contact: John Byrum

BACKGROUND INFORMATION:

The tract is approximately 77.881 acres on the west side of Ed Schmidt Blvd. at the Emory Crossing Blvd. intersection. The plat proposes four multi-family lots and extends Emory Crossing Blvd. to the west as shown within the Mobility Master Plan. The property was annexed and zoned multi-family in April 2023.

WEST: ETJ, (AG) Agriculture
NORTH: ETJ
EAST: ETJ, RSI Planned Unit Development
SOUTH: (SF-1) Single Family

SUMMARY OF REQUEST:

Both the preliminary plat and final plat are in review with outstanding comments. The applicant waived the shot clock bill for the preliminary plat but did not waive the right for the final plat, which requires the final plat to move forward with recommendation of denial due to outstanding comments.

STAFF REVIEW:

This plat is subject to the shot clock bill and is recommended for denial per state law.

FISCAL NOTES:

Not applicable to this item.

POLICY IMPLICATIONS:

None at this time.

ATTACHMENTS:

1. AltaEdSchmidt-FP-Init-ComlIssued(4-5-24)

AGENDA ITEM REPORT

4.3.





April 5, 2024

Kimley-Horn and Associates Inc
Andy Graham
5301 Southwest Pkwy #100 Bldg 2
Austin, TX 78735
andy.graham@kimley-horn.com - *communication provided via email*

RE: Alta Ed Schmidt Final Plat, Hutto, TX 78634
Final Plat Review – Alta Ed Schmidt Final Plat - Comment Report to Initial Submittal (received 3-14-24)
Project No.: 2156-PLAT

Mr. Graham,

Upon review of the above referenced final plat initial application submitted on March 14, 2024, the following comments are required to be resolved.

Please provide **Update #1** addressing all comments. With your updated plat, please provide a comment response letter detailing how each comment was addressed in **both** digital and paper formats (all paper plan set sizes are required for an update submittal). If the plat contains more than one sheet, please combine all sheets into one document file. Send digital update files to: planning@huttotx.gov, reference project number, project name and update number.

Planning Review – Sofia Sierra, Planner (512) 759-4038 – sofia.sierra@huttotx.gov

1. Please see markups.
2. Provide payment of the final plat application fee in the amount of \$1,219.92. Payment can be made by credit card through the MGO Connect permit system or deliver check made payable to the City of Hutto. Reference permit number and project name for proper credit.

Engineering Review – Matt Rector, PE, City Engineer (512) 759-4025 – matt.rector@huttotx.gov

3. Please see markups.

Fire Prevention Review – Eric Woods, Fire Marshal. WCESD #3 - (512) 759-2616 – ewoods@huttofirerescue.org

4. Please add the following notes to the plat notes,
 - “A second point of access, meeting all criteria of the most recently adopted Fire Code, as amended, shall be required on all plats of residential subdivisions containing greater than 29 dwelling units.” (2021 IFC Appendix D)
 - “Fire lane striping/signs shall be posted on one side of fire apparatus access roads more than 26 feet wide and less than 32 feet wide” (2021 IFC Appendix D)
5. Please pay the required fee of \$150.00. Online payment can be made at Huttofirerescue.org, click on the Fire Marshal payment portal.

This review is based only on the information provided. Please note that plats remain subject to additional staff comments throughout the duration of the review period. This review in no way alleviates the responsibility of the developer to comply with all ordinances adopted by the City of Hutto, or state and federal laws and codes. No code violations are approved by this department.

If you have specific questions regarding any of the comments in this report, please contact the department reviewer noted at the top of the corresponding section.

Sincerely,
Development Services Department

Alta Ed Schmidt Final Plat - Initial

4/5/2024

Attendees

Sydnee (sydnee.best@huttotx.gov)
Ashley Bailey (ashley.bailey@huttotx.gov)
Sofia Sierra (sofia.sierra@huttotx.gov)
Matt Rector (matt.rector@huttotx.gov)

Documents

AltaEdSchmidt-FP-Init-TIA(3-14-24).pdf
AltaEdSchmidt-FP-Init-Parkland(3-14-24).pdf
AltaEdSchmidt-FP-Init-Plat(3-14-24).pdf
AltaEdSchmidt-FP-Init-Eng-DrainStdy(3-14-24).pdf
AltaEdSchmidt-FP-Init-SubmitLtr(3-14-24).pdf
AltaEdSchmidt-FP-Init-Esmts(3-14-24).pdf

Traffic Impact Analysis

Alta Ed Schmidt TIA

City of Hutto, Texas

Prepared for:
WP West Acquisitions, L.L.C.



Benjamin Plett

8/8/2023

Prepared by:

Kimley»Horn

10814 Jollyville Road, Building IV, Suite 200
Austin, Texas 78759
(512) 418-1771

KH Project No. 067780346

Submittal:
August 8, 2023

ENGINEERING REVIEW

Review is for general compliance only. Sole responsibility for correctness remains with the Engineer of Record.

- ☒ No Exceptions Taken
- ☐ Revise as Noted
- ☐ Denied. Revise and Resubmit.

Alta Ed Schmidt TIA



AUGUST 8, 2023

Prepared By:

Kimley»Horn

EXECUTIVE SUMMARY

The proposed Alta Ed Schmidt Development is a site located southwest of Ed Schmidt Boulevard at the intersection of Ed Schmidt Boulevard and Emory Crossing Boulevard in the City of Hutto, Williamson County, Texas. The project is assumed to be completed in one phase. The development is projected to be complete in 2026. This study determines traffic generation characteristics, analyzes potential traffic related impacts on the adjacent road network, and identifies mitigation measures. The site is anticipated to contain the following land uses:

- 1,392 units of Multifamily Housing (Low-Rise)

The site will have access to the surrounding roadway network via two driveways and Emory Crossing Boulevard. The two site driveways and Emory Crossing Boulevard will connect to Ed Schmidt Boulevard. Along with the driveways, existing intersections to be analyzed were determined after discussions with review agency staff and are listed below.

1. US 130 SB Frontage Road at Limmer Loop
2. US 130 NB Frontage Road at Limmer Loop
3. Ed Schmidt Boulevard at Limmer Loop
4. Ed Schmidt Boulevard at Emory Crossing Boulevard

Turning movement counts were obtained at the above existing intersections during weekday AM and PM peak demand periods on Thursday, February 23rd, 2023. Traffic operations were analyzed at the study intersections for 2023 Existing conditions, 2026 No Build, 2026 Site Build-Out. Background traffic was projected to 2026 by applying a 6.0% annual growth factor that was determined in the scope. More detailed discussion of the turning movement counts methodology can be found in the Existing Traffic Volumes section.

Site traffic is distributed into and out of the site driveways and onto the street system based on the area street system characteristics, existing traffic patterns, and the location of driveway access to/from the site.

For the proposed land uses, projected site traffic is calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual* 11th Edition. The full development is anticipated to generate approximately 456 new trips during the AM peak-hour and 620 new trips during PM peak-hour. Analysis of the 2026 Build-Out scenario showed some study intersections operate below acceptable LOS D or worse than the No Build LOS.

To restore operating conditions to acceptable LOS or at least to the 2026 No Build operating conditions, the following mitigations are recommended:

- US 130 SB Frontage Road & Limmer Loop
 - a. Install traffic signal
- US 130 NB Frontage Road & Limmer Loop
 - a. Install eastbound left-turn deceleration lane
- Ed Schmidt Boulevard & Limmer Loop
 - a. Install 5 section head to facilitate southbound right-turn overlap
- Ed Schmidt Boulevard & Emory Crossing Boulevard
 - a. Install northbound left-turn deceleration lane
 - b. Install all-way stop-controlled intersection
- Ed Schmidt Boulevard & Driveway 2
 - a. Install northbound left-turn deceleration lane

For the above mitigations, the developer pro-rata cost share is expected to be approximately \$70,540.

The developer is also responsible for constructing the required northbound left-turn deceleration lane improvements at the intersections of Ed Schmidt Boulevard & Emory Crossing Boulevard and Ed Schmidt Boulevard & Driveway 2.

Table of Contents

EXECUTIVE SUMMARY	1
INTRODUCTION AND BACKGROUND.....	6
Purpose	6
General Study Information.....	6
EXISTING OPERATING CONDITIONS	9
Surrounding Transportation System	9
Existing Traffic Volumes.....	10
NO BUILD (FORECASTED) OPERATING CONDITIONS.....	12
Background Projects.....	12
No Build (Forecasted) Volumes.....	12
TRIP GENERATION AND DISTRIBUTION.....	15
Trip Generation.....	15
Trip Distribution and Assignment.....	16
BUILD (SITE + FORECASTED) OPERATING CONDITIONS.....	19
BUILD WITH MITIGATIONS OPERATING CONDITIONS	21
INTERSECTION CAPACITY ANALYSIS	22
Analysis Methodology	22
Analysis Results & Mitigations.....	23
TURN LANE ANALYSIS	26
RECOMMENDATIONS, MITIGATIONS, AND CONCLUSIONS.....	27
CERTIFICATION STATEMENT	29

Figures

Figure 1: Site Vicinity Map and Study Intersections.....	7
Figure 2: Proposed Site Plan	8
Figure 3: 2023 Existing Traffic Volumes.....	11
Figure 4: 2026 Background Project Traffic Volumes.....	13
Figure 5: 2026 No Build Traffic Volumes.....	14
Figure 6: 2026 Site Trip Distribution	17
Figure 7: 2026 Site Traffic Volumes	18
Figure 8: 2026 Build-Out (Site + Background) Traffic Volumes	20

Tables

Table 1 – Proposed Land-Uses.....	6
Table 2 – Background Projects	12
Table 3 – 2026 Site Trip Generation	15
Table 4 - Site Trip Distribution.....	16
Table 5 – Level of Service.....	22
Table 6 – Existing (2023) Intersection Analysis.....	24
Table 7 – 2026 Intersection Analysis.....	25
Table 8 – Turn Lane Analysis.....	26
Table 9 – Mitigation Cost Estimate.....	28

Appendices

Appendix A: TIA Determination Worksheet	A
Appendix B: TIA Scoping Document	B
Appendix C: Traffic Counts	C
Appendix D: Trip Generation Calculations.....	D
Appendix E: Traffic Volume Calculations.....	E
Appendix F: Synchro Outputs	F
Appendix G: Background Projects.....	G

INTRODUCTION AND BACKGROUND

PURPOSE

Kimley-Horn and Associates, Inc. was retained to conduct a Traffic Impact Analysis (TIA) of future traffic conditions associated with the Alta Ed Schmidt Development. The proposed development is located southwest of Ed Schmidt Boulevard at the intersection of Ed Schmidt Boulevard and Emory Crossing Boulevard in the City of Hutto, Texas. A site vicinity map is provided in **Figure 1**.

This study addresses potential traffic impacts of the proposed development on the surrounding roadway network and intersections. This traffic impact study was prepared based on criteria set forth by the review agency. The specific objectives of this study are to determine the future operational levels-of-service (LOS) at the various study intersections and to identify capacity related improvements.

GENERAL STUDY INFORMATION

This development will consist of 1392 multifamily (low-rise) dwelling units. A TIA determination worksheet was completed and is provided in **Appendix A**; additionally, the scope of analysis for this study was prepared in consultation with City of Hutto and is provided in **Appendix B**. The following scenarios were analyzed:

- 2023 Existing Conditions
- 2026 No Build
- 2026 Site Build-Out

The following intersections were studied in the scenarios listed above for both AM and PM peak hour periods:

1. US 130 SB Frontage Road at Limmer Loop
2. US 130 NB Frontage Road at Limmer Loop
3. Ed Schmidt Boulevard at Limmer Loop
4. Ed Schmidt Boulevard at Emory Crossing Boulevard
5. Ed Schmidt Boulevard at Driveway 1
6. Ed Schmidt Boulevard at Driveway 2

Figure 1 shows the study intersections. All Driveways are proposed to be full access. **Figure 2** shows the proposed site plan. Land uses for the development are summarized in **Table 1**.

Table 1 – Proposed Land-Uses

Land Uses	Size	ITE Code
Multifamily (Low-Rise) Housing	1392 DU	220



SITE DATA		MULTI-FAMILY PROJECT DATA			
PHASE 1 AREA:	15.59 ACRES (ESTIMATED)	PHASE 1:	438 UNITS @ 919 AVE	657 SPACES @ 1.5 RATIO	LEASING / CLUB @ 5,000 SF
PHASE 2 AREA:	13.53 ACRES (ESTIMATED)	PHASE 2:	306 UNITS @ 922 AVE	459 SPACES @ 1.5 RATIO	LEASING / CLUB @ 5,000 SF
PHASE 3 AREA:	15.07 ACRES (ESTIMATED)	PHASE 3:	342 UNITS @ 920 AVE	513 SPACES @ 1.5 RATIO	LEASING / CLUB @ 5,000 SF
PHASE 4 AREA:	12.65 ACRES (ESTIMATED)	PHASE 4:	306 UNITS @ 922 AVE	459 SPACES @ 1.5 RATIO	LEASING / CLUB @ 5,000 SF
R.O.W AREA:	03.47 ACRES (ESTIMATED)				
COMMERCIAL AREA:	28.52 ACRES (ESTIMATED)	TOTAL:	1,392 UNITS @ 921 AVE	2,088 SPACES @ 1.5 RATIO	LEASING / CLUB @ 20,000 SF
DRAINAGE AREA:	16.77 ACRES (ESTIMATED)				
TOTAL SITE AREA:	105.60 ACRES (ESTIMATED)				



ALTA ED SCHMIDT CONCEPTUAL SITE PLAN

EXISTING OPERATING CONDITIONS

SURROUNDING TRANSPORTATION SYSTEM

The major study area roadways are described below.

US 130 SB Frontage Road – is currently a two (2) lane roadway, with one lane in each direction of travel south of Limmer Loop and both lanes traveling in the north direction north of Limmer Loop. It is classified by TxDOT as a major collector. It runs generally in the north-south direction. There is no posted speed limit in the project vicinity. There are no bicycle or pedestrian facilities in the project vicinity.

US 130 NB Frontage Road – is currently a two (2) lane roadway, with both lanes in the north direction of travel. It is classified by TxDOT as a major collector. It runs generally in the north-south direction. There is no posted speed limit in the project vicinity. There are no bicycle or pedestrian facilities in the project vicinity.

Limmer Loop – is a two-lane undivided roadway that generally runs in the east-west direction in the project vicinity. It is classified by the City of Hutto as a minor arterial. Limmer Loop has a 45-mph speed limit west of US 130 and a 50-mph speed limit east of US 130. There are no bicycle or pedestrian facilities in the project vicinity.

Ed Schmidt Boulevard – is currently a two (2) lane roadway, with one lane in each direction of travel. It is classified by the City of Hutto as a minor arterial. It runs generally in the north-south direction. There is a posted speed limit of 55 mph in the project vicinity. There are no bicycle or pedestrian facilities in the project vicinity. The Hutto Thoroughfare Plan proposes an extension of Ed Schmidt Boulevard from CR 119 to CR 100.

Emory Crossing Boulevard – is currently a four (4) lane divided roadway, with two lanes in each direction of travel at Ed Schmidt Boulevard. The road merges into a two-lane undivided roadway further from the intersection. It runs generally in the east-west direction. There is no posted speed limit in the project vicinity. There are sidewalks provided on each side of the roadway and no bicycle facilities in the project vicinity.

EXISTING TRAFFIC VOLUMES

Weekday AM and PM peak period turning movement counts were collected at the following study intersections on Thursday, February 23rd, 2023:

1. US 130 SB Frontage Road at Limmer Loop
 - AM Peak Hour: 7:00 AM – 8:00 AM
 - PM Peak Hour: 4:30 PM – 5:30 PM
2. US 130 NB Frontage Road at Limmer Loop
 - AM Peak Hour: 7:00 AM – 8:00 AM
 - PM Peak Hour: 4:30 PM – 5:30 PM
3. Ed Schmidt Boulevard at Limmer Loop
 - AM Peak Hour: 7:15 AM – 8:15 AM
 - PM Peak Hour: 4:30 PM – 5:30 PM
4. Ed Schmidt Boulevard at Emory Crossing Boulevard
 - AM Peak Hour: 7:15 AM – 8:15 AM
 - PM Peak Hour: 4:30 PM – 5:30 PM

Figure 3 shows the existing traffic volumes. The raw count sheets are provided in **Appendix C**.



NO BUILD (FORECASTED) OPERATING CONDITIONS

To obtain 2026 background traffic projections, a 6% annual growth rate was applied to existing traffic volumes per direction from city staff. This growth factor is shown in the scope in **Appendix B**.

BACKGROUND PROJECTS

Background development projects identified in the scope were reviewed, and relevant background traffic was added to the network's existing traffic counts.

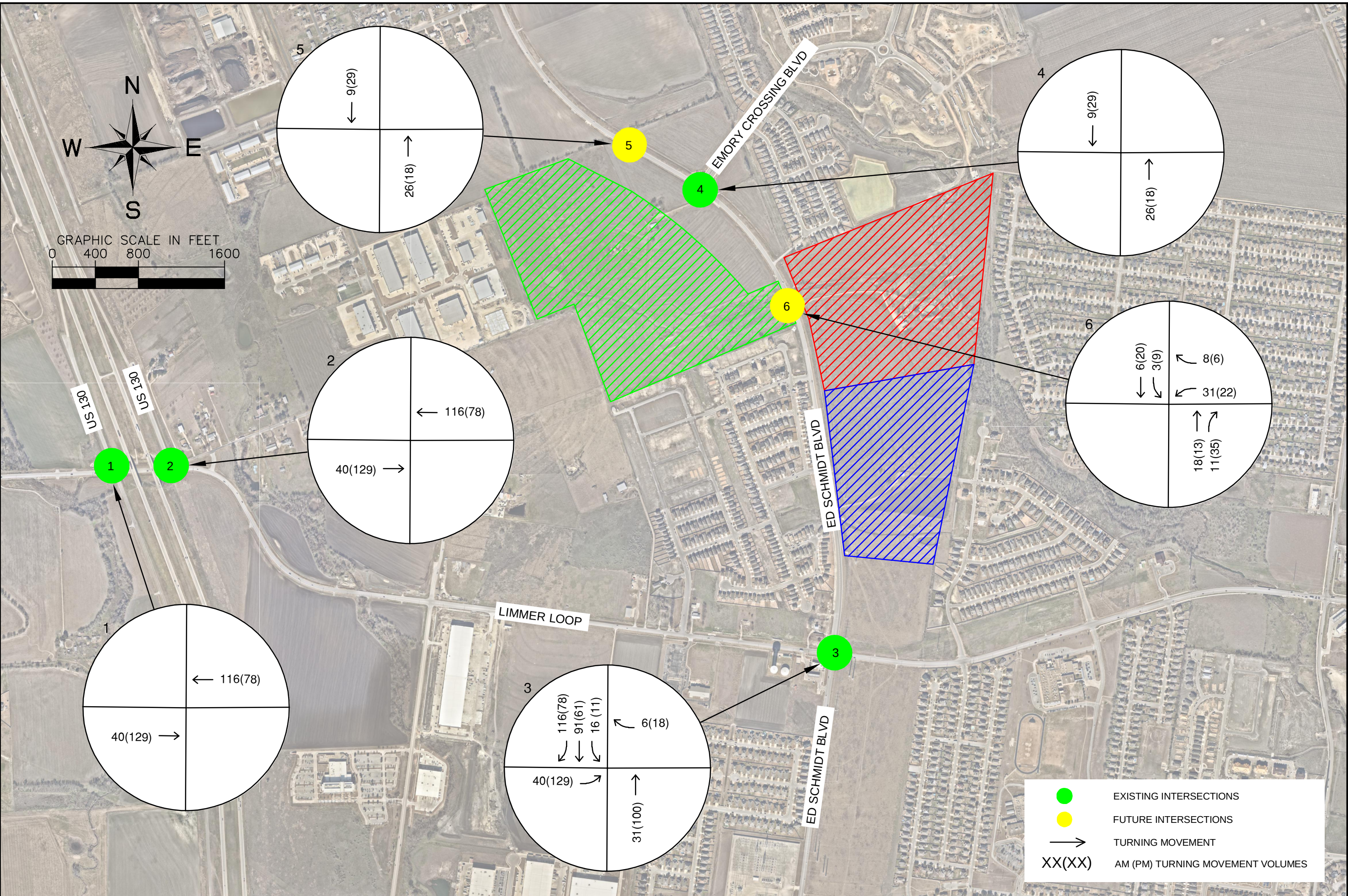
Two (2) developments were identified to be included in the analysis. Details of the approved development are summarized in **Table 2**. The nearby background project's location in relation to the proposed site and their resulting trips are shown in **Figure 4**. Scoping documents from background TIAs are included in **Appendix G**.

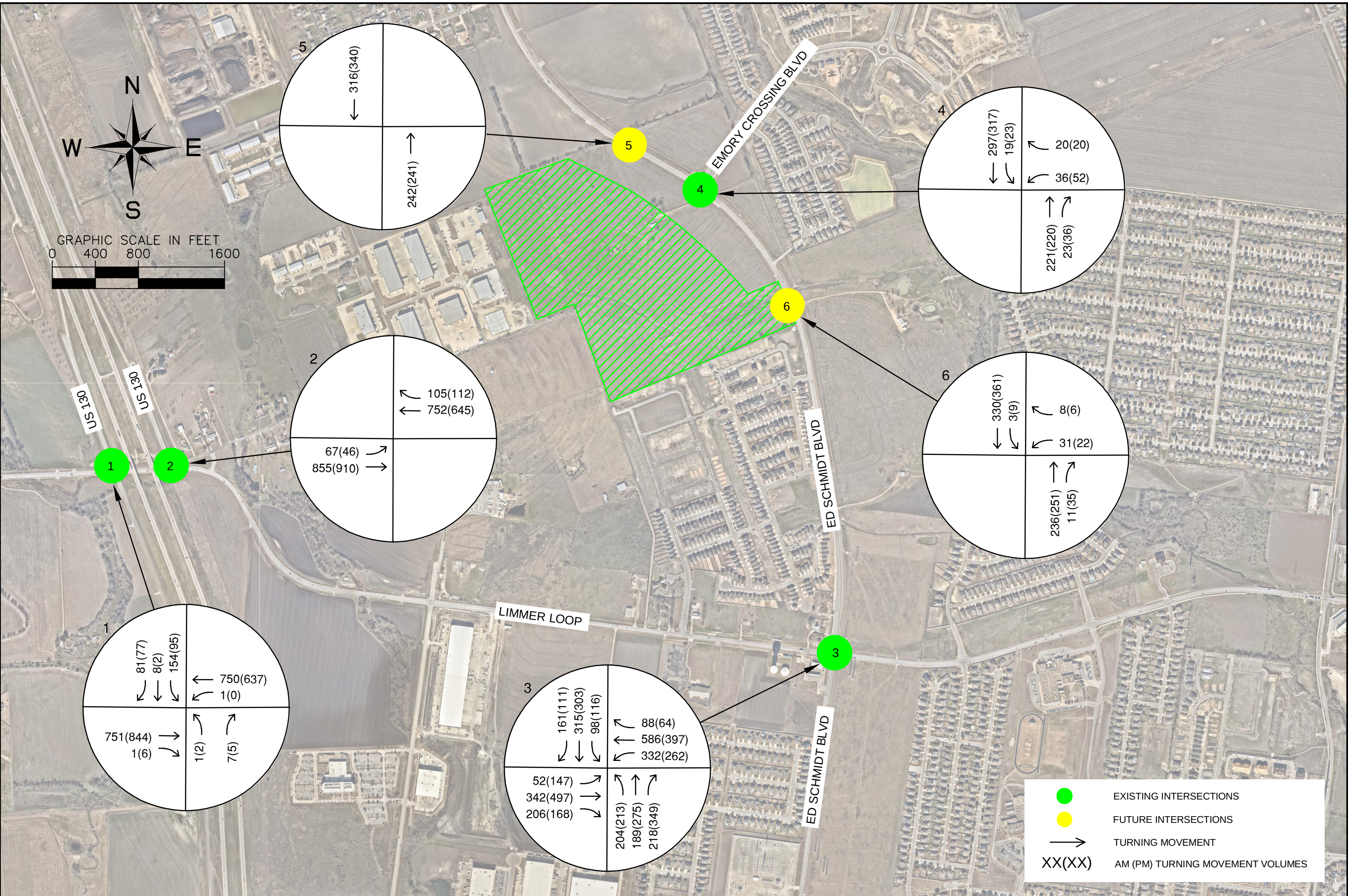
Table 2 – Background Projects

Project Name	Land Use(s)	Size	% Build-Out (2026)
Emory Crossing	• Single-Family Detached Housing • Single-Family Attached Housing	252 DU 78 DU	100%
Ed Schmidt Multifamily South	• Multifamily Housing (Low-Rise)	360 DU	100%

NO BUILD (FORECASTED) VOLUMES

The resulting 2026 No Build weekday AM and PM peak hour traffic volumes are shown on **Figure 5**. These volumes include the background traffic projections (per the growth rate) and traffic associated with the background projects, Emory Crossing and Ed Schmidt Multifamily South.





TRIP GENERATION AND DISTRIBUTION

TRIP GENERATION

Site-generated traffic estimates are determined through a process known as trip generation. The acknowledged source for trip generation rates is the 11th edition of *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are one-way trips or trip ends, where one vehicle entering and exiting the site is counted as two trips (one inbound trip and one outbound trip).

Internal capture is the tendency for customers or residents to visit several parts of a mixed-use development in one trip but be counted twice in the trip generation since the formula assumes the land uses are isolated. For this development, internal capture was not applied to either land use.

Pass-by trips are existing vehicles on the adjacent roadways that choose to visit the new site, and then return to their original path. Pass-by trips do not reduce the driveway volumes projected for the site but are deducted from the through traffic volume and routed as right-in / right-out or left-in / left-out movements at driveways on the area roadways. The ITE 11th Edition *Trip Generation Manual* report is the acknowledged source to calculate pass-by trips for different land uses. There were no pass-by trips associated with this development.

Table 3 summarizes the resulting Daily and Weekday AM and PM peak hour trip generation for 2026. Details of the site trip generation are provided in **Appendix D**.

Table 3 – 2026 Site Trip Generation

Land Uses	Quantity	ITE Code	Daily Trips	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Multifamily (Low-Rise) ¹	1392 DU	220	9,000	109	347	456	391	229	620
TOTAL TRIPS			9,000	109	347	456	391	229	620

Notes:

- Single-Family Detached
 - Daily: $T = 6.41(X) + 75.31$
 - AM: $T = 0.31(X) + 22.85$; 24% IN, 76% OUT
 - PM: $T = 0.43(X) + 20.55$; 63% IN, 37% OUT
 - Where T = Trips and X = Number of Dwelling Units

TRIP DISTRIBUTION AND ASSIGNMENT

Due to the proposed land use, it is not expected for traffic from this development to travel to/from the north and south on US 130. Traffic is expected to utilize Limmer Loop to travel to developments west of US 130. Traffic is also expected to travel south on Ed Schmidt Boulevard and east on Limmer Loop to reach US 79. Traffic traveling north on Ed Schmidt Boulevard can reach US 130 by Chandler Road.

Table 4 displays the general directional distribution percentages assumed for the proposed development that was agreed upon during TIA scoping as shown in **Appendix B. Figure 6** shows the site trip assignment at all study intersections for the development. **Figure 7** shows the total site traffic calculated using the percentages for each trip assignment group in **Figure 6**.

Table 4 - Site Trip Distribution

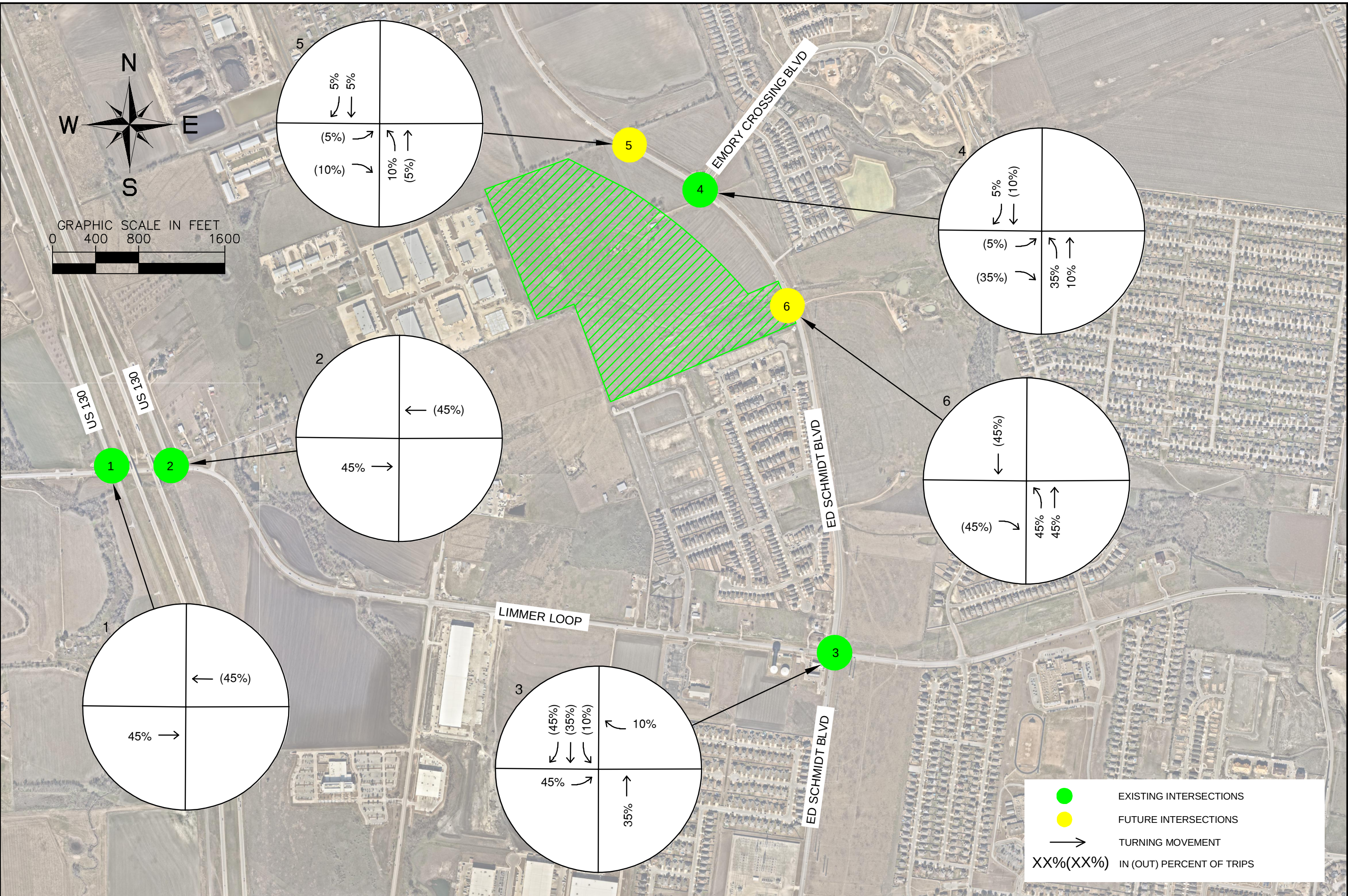
Direction	Roadway	Percent to Development
North	Ed Schmidt Boulevard	10%
South	Ed Schmidt Boulevard	35%
West	Limmer Loop	45%
East	Limmer Loop	10%

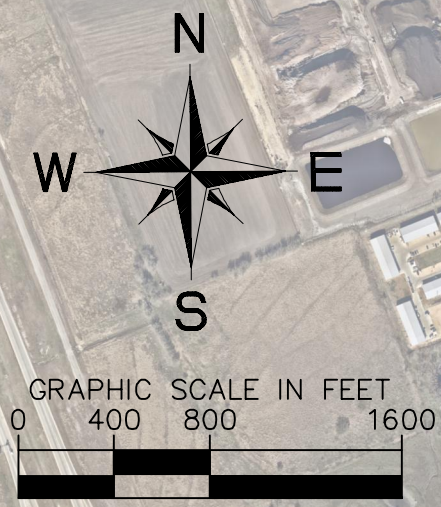
After considering the overall distribution of the site traffic, assumptions can be made for a development about how vehicles will choose the most appropriate exit point. Some factors that are included in distributing site traffic between the proposed driveways include the following:

- The accessibility of the driveway to the primary travel directions,
- The preference of drivers to use the first available driveway when entering and exiting the site
- The preference of drivers to make right-turns versus left-turns, and
- The choice of a route to provide the most opportunity to make preferred maneuvers.

ASSUMPTIONS

- Traffic volume calculations can be found in **Appendix E**.
- The traffic generated by the site was assigned to the future roadway network using the appropriate trip distribution percentages for the AM and PM peak hours.
- Site trips are added to the forecasted year 2026 background trips to determine the total 2026 traffic volumes.
- Peak Hour Factors (PHF) and HV% from existing counts were used for every existing intersection.
- *Synchro 11™* default PHF (0.92) and HV% (2%) values were used for proposed intersections.





BUILD (SITE + FORECASTED) OPERATING CONDITIONS

Site traffic was added to the No Build volumes to represent estimated total buildout (growth plus site-generated) traffic conditions in 2026 after the completion of the proposed development. The resulting 2026 total weekday AM, and PM peak hour traffic volumes are shown in **Figure 8**.



BUILD WITH MITIGATIONS OPERATING CONDITIONS

A mitigation plan must be developed for every development phase considered in a Traffic Impact Analysis. Mitigation plans are designed to show the recommended improvements to bring intersection operations back to Level of Service (LOS) D or to at least the operating conditions of the No Build scenario.

To accommodate traffic from the proposed development, the following mitigations are proposed:

- US 130 SB Frontage Road & Limmer Loop
 - a. Install traffic signal
- US 130 NB Frontage Road & Limmer Loop
 - a. Install eastbound left-turn deceleration lane
- Ed Schmidt Boulevard & Limmer Loop
 - a. Install 5 section head to facilitate southbound right-turn overlap
- Ed Schmidt Boulevard & Emory Crossing Boulevard
 - a. Install northbound left-turn deceleration lane
 - b. Install all-way stop-controlled intersection
- Ed Schmidt Boulevard & Driveway 2
 - a. Install northbound left-turn deceleration lane

Intersection operations were improved to a LOS D by proposing additional mitigations beyond what the developer is responsible for. Site driveways were not mitigated. It is not expected that these driveways will meet signal warrants or be good locations for signals.

This scenario is provided for informational purposes only. No pro rata cost share is proposed for these mitigations.

- Ed Schmidt Boulevard & Limmer Loop
 - a. Increase storage length of the eastbound left-turn lane
 - b. Install an eastbound right-turn lane
 - c. Install a northbound right-turn lane
 - d. Install a westbound right-turn lane
 - e. Optimize signal timings

INTERSECTION CAPACITY ANALYSIS

Kimley-Horn conducted a traffic operations analysis to determine potential capacity deficiencies in 2026 at the study intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual*.

ANALYSIS METHODOLOGY

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from “A” (very little delay) to “F” (long delays and congestion). **Table 5** shows the definition of level of service for signalized and unsignalized intersections. LOS D is the threshold for acceptable operations for signalized intersections.

Table 5 – Level of Service

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2010.

Study area intersections were analyzed based on average total delay for signalized intersections. For the unsignalized analysis, the level of service (LOS) is defined for each controlled approach.

Where possible, HCM 6th analysis is used. For intersections not possible to analyze using HCM 6th, HCM 2000 is used. *Synchro 11* output reports for the level of service at the study intersections are provided in **Appendix F**.

ANALYSIS RESULTS & MITIGATIONS

2023 EXISTING TRAFFIC OPERATIONS

Existing conditions measures of effectiveness (MOEs) are summarized in **Table 6**.

2026 NO BUILD TRAFFIC OPERATIONS

The 2026 No Build condition represents traffic operations if this project is never built. The 2026 No Build conditions also assume traffic growth using the previously discussed growth factor and background projects have been completed.

2026 No Build conditions MOEs are summarized in **Table 7**.

2026 BUILD-OUT TRAFFIC OPERATIONS

Site trips from the proposed project are added to the No Build scenario for the Build-Out scenario.

2026 Build-Out conditions MOEs are summarized in **Table 7**.

As shown in **Table 7**, the intersection of Ed Schmidt Boulevard & Driveway 2/Emory Crossing Driveway operates as a LOS F in the PM peak hour. The delay for the intersection is from the eastbound approach, which is the site driveway approach. The intersection of Ed Schmidt Boulevard & Driveway 2/Emory Crossing Boulevard would not be an appropriate location for a traffic signal as the driveway is in close proximity to the intersection of Ed Schmidt Boulevard & Emory Crossing Boulevard where there is a traffic signal recommended as a mitigation.

2026 BUILD-OUT WITH MITIGATIONS TRAFFIC OPERATIONS

Intersection operations were improved to the acceptable LOS by adding the mitigations identified in the previous section.

2026 Build-Out with Mitigations conditions MOEs are summarized in **Table 7**.

2026 BUILD-OUT WITH MITIGATIONS FOR LOS D TRAFFIC OPERATIONS

Intersection operations were improved to a LOS D by proposing additional mitigations beyond what the developer is responsible for. Site driveways were not mitigated. It is not expected that these driveways will meet signal warrants or be good locations for signals.

This scenario is provided for informational purposes only. No pro rata cost share is proposed for these mitigations.

2026 Build-Out with Mitigations for LOS D conditions MOEs are summarized in **Table 7**.

Table 6 – Existing (2023) Intersection Analysis

Intersection	2023 Existing			
	AM Peak Hour		PM Peak Hour	
	Delay ¹	LOS	Delay ¹	LOS
US 130 SB Frontage Road & Limmer Loop ⁴	271.9	F	52.5	F
US 130 NB Frontage Road & Limmer Loop ⁵	-	-	-	-
Ed Schmidt Boulevard & Limmer Loop ^{2,3}	30.2	C	49.8	D
Ed Schmidt Boulevard & Emory Crossing Boulevard ⁴	11.9	B	12.3	B

¹ Delay is reported as HCM delay in seconds per vehicle.

² Delay is reported for the overall intersection.

³ Delay shown includes traffic signal.

⁴ Delay is reported for the stop control approach experiencing the highest delay.

⁵ There is no stop-controlled approach at this intersection, therefore HCM analysis is not allowed.

Table 7 – 2026 Intersection Analysis

Intersection	2026 No Build				2026 Build-Out				2026 Build-Out with Mitigations				2026 Build-Out with Mitigations for LOS D			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS
US 130 SB Frontage Road & Limmer Loop ⁴	1046.6	F	296.4	F	1799.6	F	641.0	F	13.1	B	10.3	B	13.1	B	10.3	B
US 130 NB Frontage Road & Limmer Loop ⁵	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ed Schmidt Boulevard & Limmer Loop ^{2,3}	65.7	E	106.3	F	102.4	F	152.8	F	79.4	E	125.0	F	42.4	D	41.9	D
Ed Schmidt Boulevard & Emory Crossing Boulevard ⁴	13.4	B	14.3	B	22.0	C	42.9	E	23.4	C	17.9	C	23.4	C	17.9	C
Ed Schmidt Boulevard & Driveway 1 ⁴	-	-	-	-	12.0	B	12.6	B	12.0	B	12.6	B	12.0	B	12.6	B
Ed Schmidt Boulevard & Driveway 2/Emory Crossing Driveway ⁴	13.0	B	13.7	B	38	E	76.6	F	37.7	E	70.4	F	37.7	E	70.4	F

¹ Delay is reported as HCM delay in seconds per vehicle.

² Delay is reported for the overall intersection.

³ Delay shown includes traffic signal.

⁴ Delay is reported for the stop control approach experiencing the highest delay.

⁵ There is no stop-controlled approach at this intersection, therefore HCM analysis is not allowed.

TURN LANE ANALYSIS

TxDOT's access management standards state that for roads where the posted speed limit is greater than 45 miles per hour, a deceleration lane is required at the approach to a driveway with 50 or more vehicles turning right into the driveway during the peak hour. The guidelines for left turn lanes consist of an analysis of advancing traffic volume, the percentage of this volume that is turning left, and the opposing volume. The detailed TxDOT analysis for each driveway is provided in **Table 8**.

Table 8 – Turn Lane Analysis

Location	AM Peak		PM Peak		Right-Turn Lane required?	Left-Turn Lane required?
	Right-Turn	Left-Turn	Right-Turn	Left-Turn		
US 130 NB Frontage Road & Limmer Loop	-	67	-	47	No	Yes
Ed Schmidt & Emory Crossing Blvd / Site Driveway	5	38	20	137	No	Yes
Ed Schmidt & Driveway 1	5	11	20	39	No	No
Ed Schmidt & Driveway 2	0	49	0	176	No	Yes

Results of the analysis for both the AM and PM peak periods are summarized below:

- US 130 NB Frontage Road & Limmer Loop
 - **Left-turn lane – warranted**
 - Right-turn lane – not warranted
- Ed Schmidt Boulevard & Emory Crossing Boulevard
 - **Left-turn lane – warranted**
 - Right-turn lane – not warranted
- Ed Schmidt Boulevard & Driveway 1
 - Left-turn lane – not warranted
 - Right-turn lane – not warranted
- Ed Schmidt Boulevard & Driveway 2
 - **Left-turn lane – warranted**
 - Right-turn lane – not warranted

RECOMMENDATIONS, MITIGATIONS, AND CONCLUSIONS

This study analyzes traffic impacts of the proposed Alta Ed Schmidt development located in the City of Hutto, Williamson County, Texas. The scenarios studied include – Existing conditions, 2026 No Build, and 2026 Build-Out. Analysis of the 2026 Build-Out scenario showed some study intersections operate below acceptable LOS D. To restore operating conditions to acceptable LOS, the following mitigations are recommended:

- US 130 SB Frontage Road & Limmer Loop
 - a. Install traffic signal
- US 130 NB Frontage Road & Limmer Loop
 - a. Install eastbound left-turn deceleration lane
- Ed Schmidt Boulevard & Limmer Loop
 - a. Install 5 section head to facilitate southbound right-turn overlap
- Ed Schmidt Boulevard & Emory Crossing Boulevard
 - a. Install northbound left-turn deceleration lane
 - b. Install all-way stop-controlled intersection
- Ed Schmidt Boulevard & Driveway 2
 - a. Install northbound left-turn deceleration lane

For the above mitigation measures, the total contribution by the developer is broken down in **Table 9**.

To restore operating conditions to LOS D, the following additional mitigations are recommended:

- Ed Schmidt Boulevard & Limmer Loop
 - a. Increase storage length of the eastbound left-turn lane
 - b. Install an eastbound right-turn lane
 - c. Install a northbound right-turn lane
 - d. Install a westbound right-turn lane
 - e. Optimize signal timings

There is no pro-rata cost share for these additional recommendations as these mitigations are not required to restore operating conditions to the 2026 No Build operating conditions.

Table 9 – Mitigation Cost Estimate

Intersection	Approach	Mitigation Measure	Unit Cost	Total Estimated Cost	% Site Traffic at Location	Pro-Rata Cost Share
US 130 SB Frontage Road & Limmer Loop	All	Install Traffic Signal	\$350,000 per signal	\$350,000	14%	\$ 50,079
US 130 NB Frontage Road & Limmer Loop	EB	Install left-turn deceleration lane	\$350 per linear foot	\$119,000	14%	\$ 16,651
Ed Schmidt Boulevard & Limmer Loop	SB	Install SB right-turn 5-section head to facilitate right-turn overlap	\$2,500 per signal head	\$2,500	26%	\$ 647
Ed Schmidt Boulevard & Emory Crossing Boulevard	All	Install All-Way Stop	\$5,000 per sign	\$10,000	32%	\$ 3,162
	NB	Install left-turn deceleration lane	To be constructed by the developer			
Ed Schmidt Boulevard & Driveway 2	NB	Install left-turn deceleration lane	To be constructed by the developer			
TOTAL				\$ 481,500	-	\$ 70,540

CERTIFICATION STATEMENT

I hereby certify that this report complies with the City Guidelines and with applicable technical requirements of the City of Hutto and is complete to the best of my knowledge.

KIMLEY-HORN AND ASSOCIATES

A handwritten signature in blue ink, reading "Benjamin Plett". The signature is written in a cursive style with a large, stylized "P" and "A" at the end.

Benjamin Plett, P.E.
Project Manager

APPENDIX

Appendix A: TIA Determination Worksheet



CITY OF HUTTO
TRAFFIC IMPACT ANALYSIS (TIA) DETERMINATION WORKSHEET
 APPLICANT MUST FILL IN WORKSHEET PRIOR TO SUBMITTING FOR TIA DETERMINATION

PROJECT NAME: Alta Ed Schmidt
 LOCATION: See Attached
 APPLICANT'S AGENT: FIRM NAME Kimley-Horn (ENGINEER NAME) Benjamin Plett, P.E.
 TELEPHONE NO.: 512-418-4523 APPLICANT'S EMAIL ADDRESS Ben.Plett@Kimely-Horn.com
 APPLICATION STATUS: DEVELOPMENT ASSESSMENT; ZONING SITE PLAN: OTHER:

EXISTING:

PARCEL NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS
N/A	N/A	N/A			

PROPOSED:

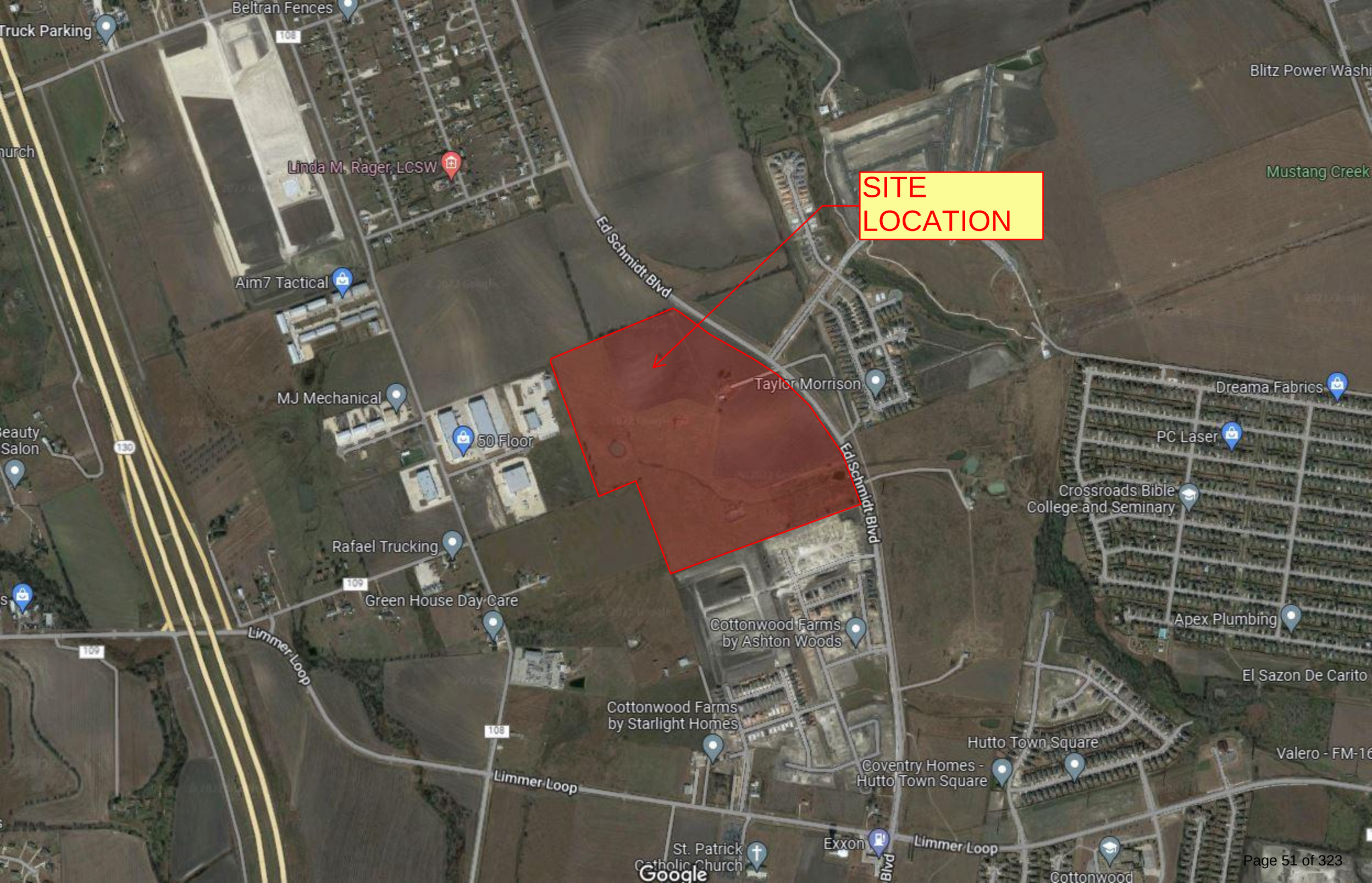
TRACT NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS	AM / PM TRIP RATE/EQ	AM TRIPS	PM TRIPS
1 (Phase)	1,392 DU	Multifamily	220	$T = 6.41(X) + 75.31$	9000	$T = 0.31(X) + 22.85$ $T = 0.43(X) + 20.55$	456	620
	400 KSF	Retail	820	37.01	14804	0.84 / 3.40	336	1360
	70 KSF	Restaurant	932	107.2	7504	9.57 / 9.05	670	634
	25 KSF	Fast Food	934	467.48	11688	44.61 / 33.03	1115	826
2 (Phase)								
				Total	42996	-	2577	3440

ABUTTING ROADWAYS

STREET NAME	PROPOSED ACCESS?	PAVEMENT WIDTH	CLASSIFICATION*
Ed Schmidt Blvd	Yes	42'	Minor Arterial
Emory Crossing Blvd	Yes	60'	Not classified

*Classification reflects Mobility Master Plan, 2018

NOTE: A TIA determination must be made prior to submittal of any zoning or site plan application. Therefore, this completed and reviewed form MUST ACCOMPANY any subsequent application for the IDENTICAL project. CHANGES to the proposed project will REQUIRE a new TIA determination to be made.



**SITE
LOCATION**

Appendix B: TIA Scoping Document



TRAFFIC IMPACT ANALYSIS SCOPE AND STUDY AREA

Project Name: Alta Ed Schmidt Multi-Family
Location: Ed Schmidt north of Limmer Loop
Owner's Agent: Benjamin Plett, P.E.
Kimley-Horn

Date: February 2, 2023
Phone: (512) 418-4523

Scope must be approved and signed by staff prior to submittal of a Traffic Impact Analysis (TIA).

I. Data Collection

1. Background Information:

- a. A Study Area Map that specifies study intersections and points of access to the site for the TIA is shown as Attachment A.
2. Intersections Capacity Analysis: Calculations for a.m. and p.m. peak hours must be performed for the following intersections, showing (a) existing traffic conditions and (b) projected traffic conditions, identifying site, non-site, and total traffic. Capacity analysis will be done with the 6th edition of the HCM (latest edition) wherever possible. Due to limitations of *Synchro* modeling software, some signalized intersections may be analyzed with HCM 2000. Capacity analysis should include the following elements, and will be presented for the overall intersection unless otherwise specified:
 - a. Intersection LOS
 - b. V/C (for intersection if signal, critical movements if unsignalized)
 - c. Delay (for intersection if signal, critical movements if unsignalized)
 - d. Queueing analysis with 95% queue length (for left and right turn lanes existing or proposed)

Existing Intersections

- A. Limmer Loop & Ed Schmidt
- B. Limmer Loop & US 130 NB Frontage Road
- C. Limmer Loop & US 130 FB Frontage Road
- D. Ed Schmidt Boulevard & Emory Crossing Boulevard

Future Intersections:

1. SITE DRIVEWAYS AND FUTURE INTERSECTIONS CREATED BY DEVELOPMENT ACCESS

Alta Ed Schmidt Multi-Family – TIA scope

Mitigation shall be shown to achieve LOS D or better at all study intersections and with a $V/C < 1$. When physical constraints or inadequate right-of-way prevent construction of additional capacity, justification for the constraints shall be provided with approximate right-of-way based on parcel data from Williamson Central Appraisal District (WCAD) in an exhibit. If an intersection is below LOS D in the mitigated scenario due to these constraints, the delay and V/C shall be less than the no-build condition.

Segment Capacity Analysis:

- Capacity analysis shall be shown for all scenarios and phases of development for the following study area roadways. Turning movement counts in each phase may be used and grown to 24 hour counts with a k-factor of 0.1:
 1. N/A
- All internal site roadways shall be sized appropriately based on ADT range of different street classifications as shown in the UDC for Alley, Residential Local, or Residential Collector

Note: the TIA may be required to review and discuss the consequences of the following future build conditions:

Redistribution of existing traffic and background growth traffic should be shown as a result of the above future alignments in all phases of development.

Site Boundary and Internal Roadways:

- For adjacent roadways not yet built to the cross section in UDC 10.511.12 for the functional classification defined in the 2018 Mobility Plan, roadway capacities for the 2018 Mobility Plan ultimate section will be compared with site traffic volumes on the same roadway segment to determine a pro-rata share of improving the roadway to the 2018 Mobility Plan ultimate section. Pro-rata will be capped at 50% for roadway segments where the site borders the roadway on one side, and at 100% when the site borders both sides of a roadway alignment. Internal roadways shall be sized to accommodate site build out traffic based on ADT thresholds defined in the UDC 10.511.
- The following shall be used as the planning level cost of different street classifications on a per-mile basis to build the ultimate section from the 2018 Mobility Plan and UDC:
 - Residential Collector or Major Collector - \$5 million per mile
 - Minor Arterial - \$8 million per mile
 - Major Arterial - \$12 million per mile

II. Study Assumptions

1. **Data Assumptions:** The following assumptions must be included in the analysis. Any change in these assumptions must be approved prior to submittal of the TIA. The assumptions are based on data provided by ITE.
 - a. Growth of Existing Traffic — Average annual growth rate to be 6%, compounded annually
 - b. Trip Generation – ITE 11th Edition, attach trip generation to this scope with use of either average trip rate or equation for each land use and associated period (peak hour of generator, weekday AM, e.g.)
 - c. Background TIAs
 - i. Ed Schmidt Hutto SF North
 - ii. Ed Schmidt Hutto MF South
2. The following reduction factors are approved for the proposed land uses:
 - a. Internal trip capture rates: Internal Capture shall be calculated utilizing the methods prescribed by the ITE Trip Generation Handbook.
 - b. Pass-by Trips: Pass-by Trips shall be calculated utilizing the methods prescribed by the ITE Trip Generation Handbook.
 - c. Traffic Distribution Trip distribution for trips generated by the site should follow Section 3 of this scope.
 - d. Transit Trips: None.
3. **Trip Distribution:** The distribution of trips to/from the proposed development will be based upon the existing roadway network and traffic patterns. Where new roadways (and connections) are integral to the site, present these elements as part of the “build out” condition. Trip Distribution to be submitted for interim review and approval before capacity analysis is performed after collection of existing counts and comparison with existing distribution trends.

Direction	Roadway	Phase 1: 2026 Site Traffic To/From
North	Ed Schmidt	10
South	Ed Schmidt	35
West	Limmer Loop	45
East	Limmer Loop	10

4. **Other Considerations:**
Build-Out year for Phase 1 of Development: 2026
Build-Out year for Phase 2 of Development: N/A

Demonstration of adequate sight distance, turn lane warrants, appropriate spacing, and queueing analysis shall be provided for all proposed site access points.

5. Mitigations: Proposed mitigations shall show a pro-rata percentage for the share of the improvement attributable to the site development.
- For signal timing adjustments and deceleration left- or right-turn lanes into the site, pro-rata shall be 100%.
 - For new signals or full intersection control changes, pro-rata percentage shall be calculated as the site traffic entering the intersection divided by the total traffic entering the intersection for a given phase build-out.
 - For new turn lanes, pro-rata percentage shall be calculated for the approach for which the improvement is being made as the site traffic for the approach divided by the total traffic using the approach. Turn lanes cannot be achieved by restriping unless 12' lanes are maintained with a 4' shoulder on both sides of the roadway, when curb and gutter is not present. Mitigations shall be tied to each phase of development and pro-rata calculated for the phase in which the mitigation is required. Mitigations may be carried into subsequent phases of development as background improvements.
 - Pro-rata for site boundary and internal roadways shall follow method outlined in Section 2 with segment capacity analysis.

Costs for mitigations shall be \$350 per linear foot for each lane of roadway or turn lane, \$350,000 for new signals, and \$5,000 for signal timing adjustments at each intersection. If a new turn lane or roadway requires relocation of sidewalks, overhead utilities, bridge expansions, retaining walls, or other street elements, additional cost shall be estimated for relocation or construction of these facilities based on the latest TxDOT 3 month Statewide average low bid unit prices with supporting documentation of calculations. Costs for other mitigations shall be coordinated with and approved by City of Hutto.

Submittal Requirements

- e. Submit electronic copies to City of Hutto, and coordinate with TxDOT regarding their requirements. Submit CD's or .zip files containing the following: PDF of the TIA, Synchro network for all conditions analyzed, Excel spreadsheets for all calculations, and a CAD file for the site plan, if available.

Submittal Distribution is to be as follows:

City of Hutto: Electronic, Attention Sam Ray
TxDOT: Electronic, Attention Scott Cunningham

- f. Traffic signal modeling requirements (Synchro files must be in real world coordinates):
- TxDOT timing sheets to be included in the appendix of the TIA
 - All intersections must be modeled in one Synchro file (including unsignalized intersections).
 - Synchro signal timing sheets to be included in the following format for each phase of development:
 - Existing conditions (am + pm),
 - Eight (8) future conditions:
 - (am background, am background + site, am background + site + mitigation)
 - (pm background, pm background + site, pm background + site + mitigation)
 - Eight (8) site + 10 year (horizon year) conditions:
 - (am background, am background + site, am background + site + mitigation)
 - (pm background, pm background + site, pm background + site + mitigation)

Alta Ed Schmidt Multi-Family – TIA scope

This scope and study is based upon the assumed development uses and intensities in the TIA Determination sheet in Attachment B. Any change in these assumptions may require a change in the scope. Preparation of the TIA shall follow City of Hutto Unified Development Code Chapter 10.515.4 requirements unless otherwise specified in this document.

Approved by (City of Hutto): _____ Phone: _____

Alta Ed Schmidt Multi-Family – TIA scope

Attachment A

SEE EXHIBIT ATTACHED

Existing Intersections

A. ALL STUDY INTERSECTIONS

Future Intersections:

1. PROPOSED SITE DRIVEWAYS AND NEW INTERSECTIONS CREATED BY SITE ACCESS



CITY OF HUTTO

TRAFFIC IMPACT ANALYSIS (TIA) DETERMINATION WORKSHEET

APPLICANT MUST FILL IN WORKSHEET PRIOR TO SUBMITTING FOR TIA DETERMINATION

PROJECT NAME: **Alta Ed Schmidt MF**

LOCATION: See Attached

APPLICANT'S AGENT: FIRM NAME **Kimley-Horn** (ENGINEER NAME) **Benjamin Plett, P.E.**TELEPHONE NO.: **512-418-4523** APPLICANT'S EMAIL ADDRESS: **Ben.Plett@Kimley-Horn.com**

APPLICATION STATUS: DEVELOPMENT ASSESSMENT: _____ ZONING _____ SITE PLAN: _____

EXISTING:

PARCEL NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS
N/A	N/A	N/A			

PROPOSED

TRACT NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS	AM / PM TRIP RATE/EQ	AM TRIPS	PM TRIPS
1 (Phase)	1, 392 DU	Multi-Family	220	T=6.41(X) +75.31	9000	T=0.31(X) +22.85 T=0.43(X) +20.55	456	620
2 (Phase)								
				Total				

ABUTTING ROADWAYS

STREET NAME	PROPOSED ACCESS?	PAVEMENT WIDTH	CLASSIFICATION*
Ed Schmidt Blvd	Yes	42'	Minor Arterial

*Classification reflects Mobility Master Plan, 2018

NOTE: A TIA determination must be made prior to submittal of any zoning or site plan application. Therefore, this completed and reviewed form MUST ACCOMPANY any subsequent application for the IDENTICAL project. CHANGES to the proposed project will REQUIRE a new TIA determination to be made.



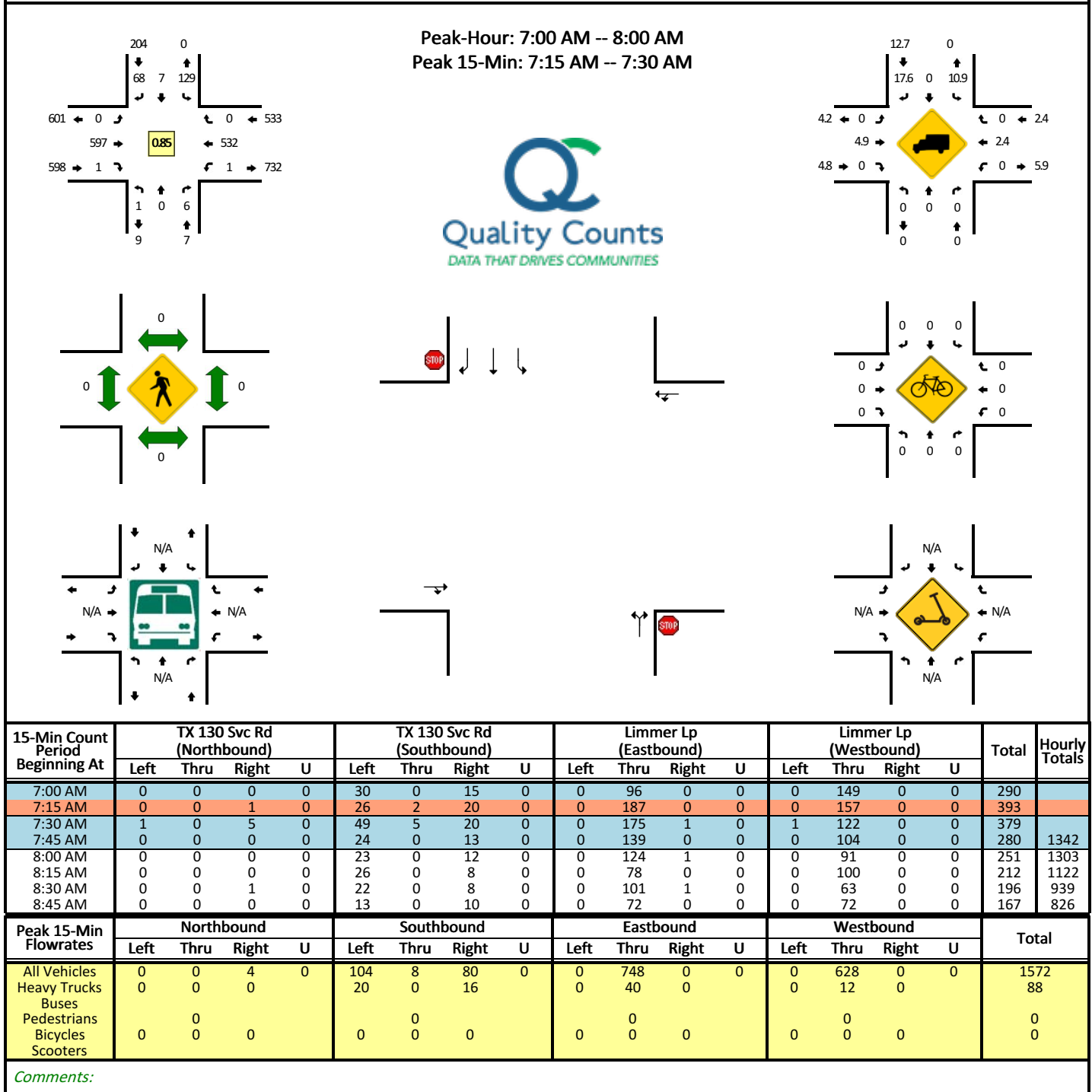
Appendix C: Traffic Counts

LOCATION: TX 130 Svc Rd -- Limmer Lp

CITY/STATE: Hutto, TX

QC JOB #: 16104401

DATE: Thu, Feb 23 2023

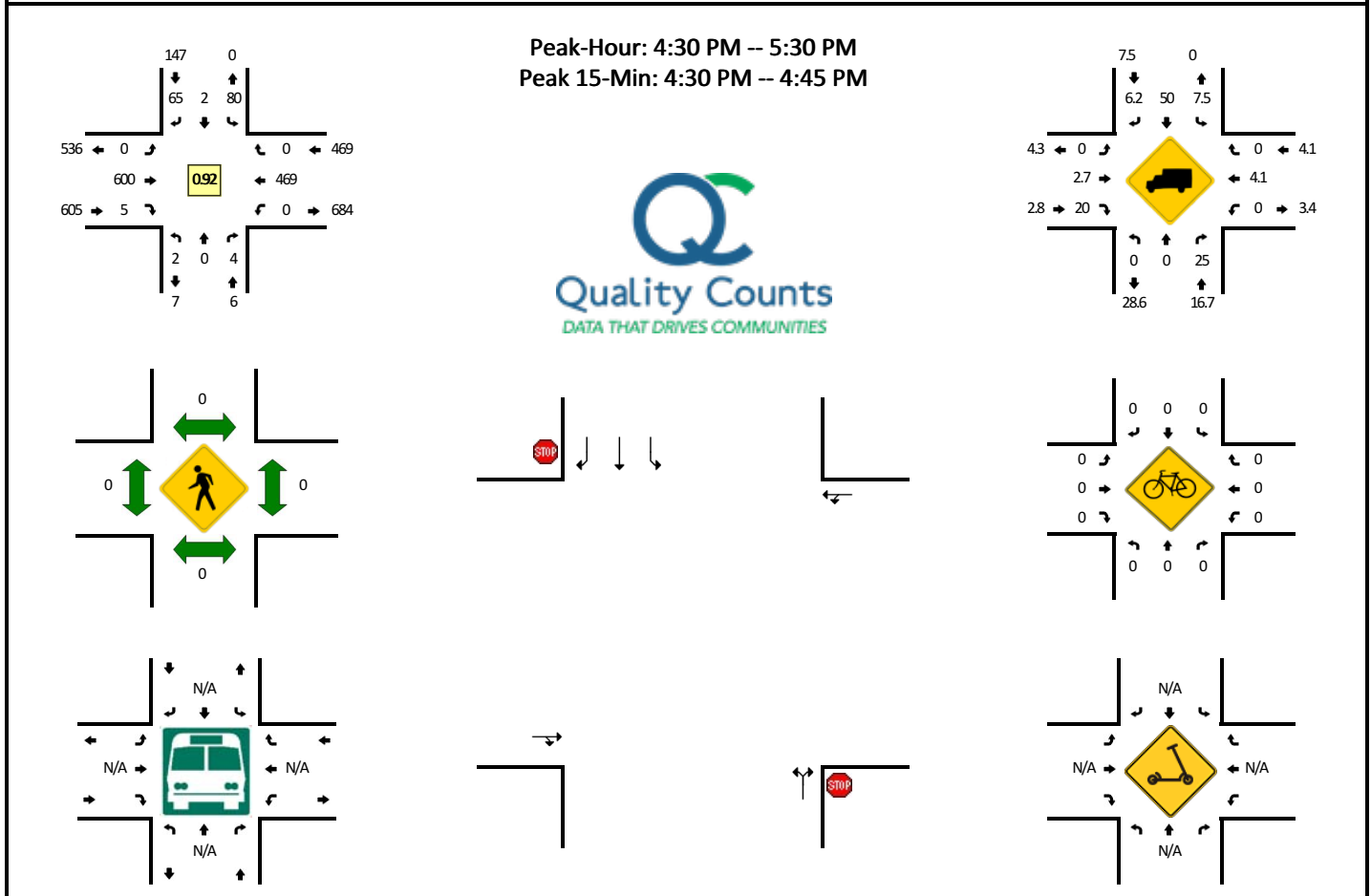


LOCATION: TX 130 Svc Rd -- Limmer Lp

QC JOB #: 16104402

CITY/STATE: Hutto, TX

DATE: Thu, Feb 23 2023



15-Min Count Period Beginning At	TX 130 Svc Rd (Northbound)				TX 130 Svc Rd (Southbound)				Limmer Lp (Eastbound)				Limmer Lp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	22	0	9	0	0	113	0	0	0	104	0	0	248	
4:15 PM	0	0	0	0	20	0	12	0	0	143	0	0	0	83	0	0	258	
4:30 PM	0	0	1	0	30	0	26	0	0	158	1	0	0	116	0	0	332	
4:45 PM	0	0	0	0	19	1	13	0	0	143	1	0	0	115	0	0	292	1130
5:00 PM	0	0	3	0	17	0	13	0	0	130	2	0	0	125	0	0	290	1172
5:15 PM	2	0	0	0	14	1	13	0	0	169	1	0	0	113	0	0	313	1227
5:30 PM	0	0	0	0	17	0	19	0	0	112	1	0	0	112	0	0	261	1156
5:45 PM	0	0	1	0	11	0	14	0	0	164	0	0	0	99	0	0	290	1154
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	4	0	120	0	104	0	0	632	4	0	0	464	0	0	1328	
Heavy Trucks	0	0	0	0	12	0	8	0	0	24	0	0	0	20	0	0	64	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

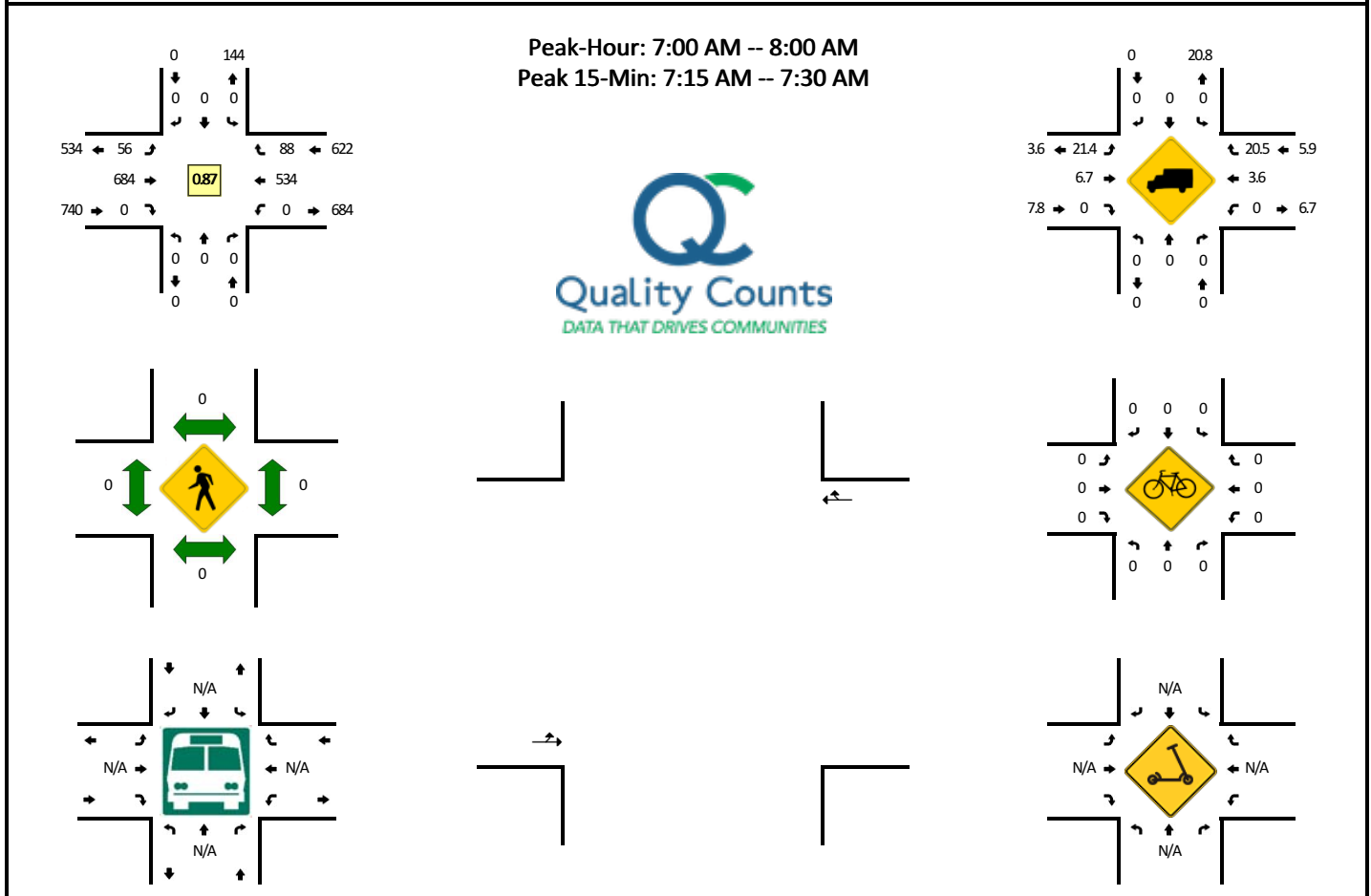
Comments:

Report generated on 3/2/2023 12:03 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

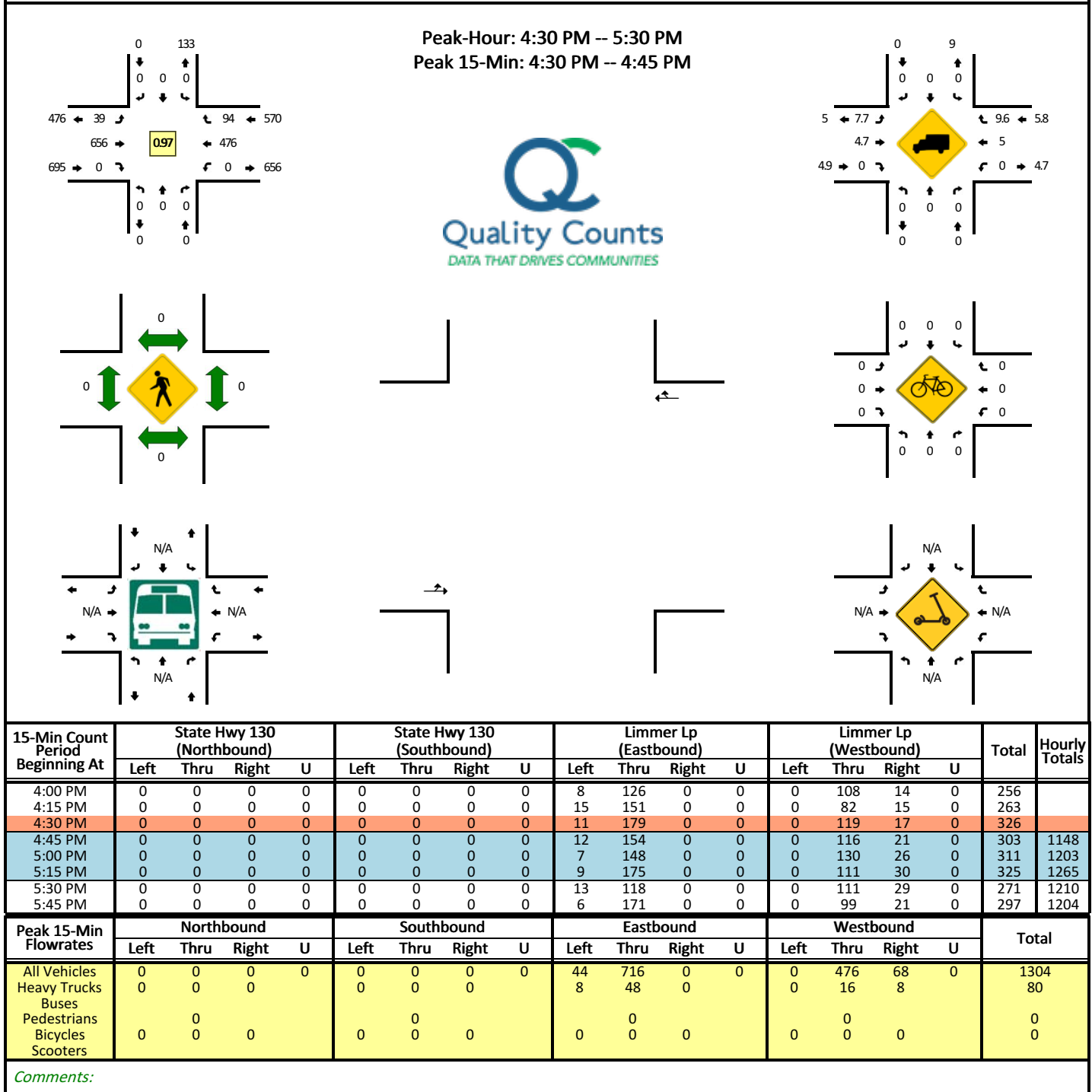
LOCATION: State Hwy 130 -- Limmer Lp
CITY/STATE: Hutto, TX

QC JOB #: 16104403
DATE: Thu, Feb 23 2023



15-Min Count Period Beginning At	State Hwy 130 (Northbound)				State Hwy 130 (Southbound)				Limmer Lp (Eastbound)				Limmer Lp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	11	116	0	0	0	153	13	0	293	
7:15 AM	0	0	0	0	0	0	0	0	16	196	0	0	0	157	24	0	393	
7:30 AM	0	0	0	0	0	0	0	0	19	217	0	0	0	121	26	0	383	
7:45 AM	0	0	0	0	0	0	0	0	10	155	0	0	0	103	25	0	293	1362
8:00 AM	0	0	0	0	0	0	0	0	11	136	0	0	0	95	22	0	264	1333
8:15 AM	0	0	0	0	0	0	0	0	7	100	0	0	0	100	15	0	222	1162
8:30 AM	0	0	0	0	0	0	0	0	14	119	0	0	0	65	8	0	206	985
8:45 AM	0	0	0	0	0	0	0	0	11	74	0	0	0	72	9	0	166	858
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	0	0	64	784	0	0	0	628	96	0	1572	
Heavy Trucks	0	0	0	0	0	0	0	0	12	56	0	0	0	28	32	0	128	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																		

Comments:

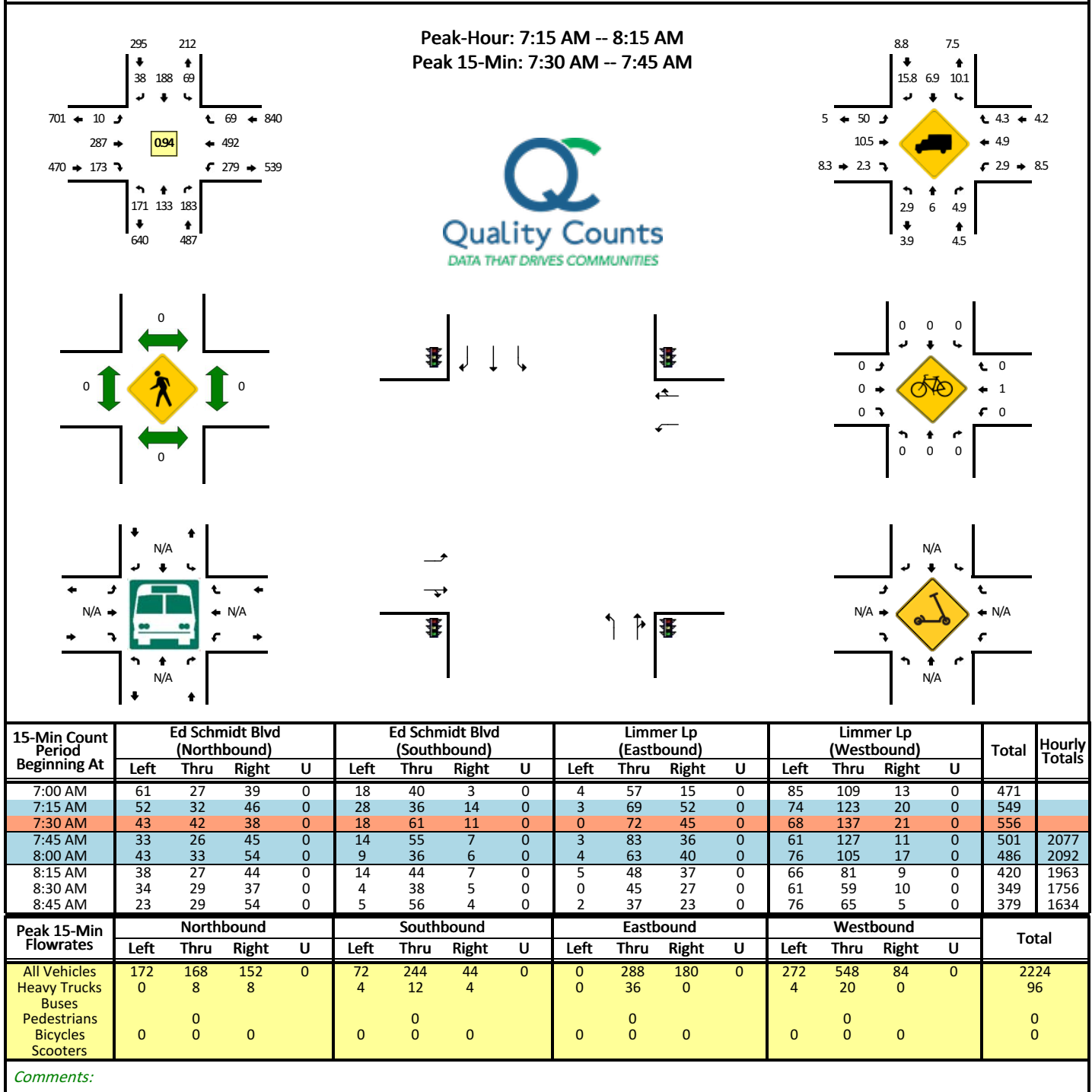
LOCATION: State Hwy 130 -- Limmer Lp**QC JOB #:** 16104404**CITY/STATE:** Hutto, TX**DATE:** Thu, Feb 23 2023

Report generated on 3/2/2023 12:03 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

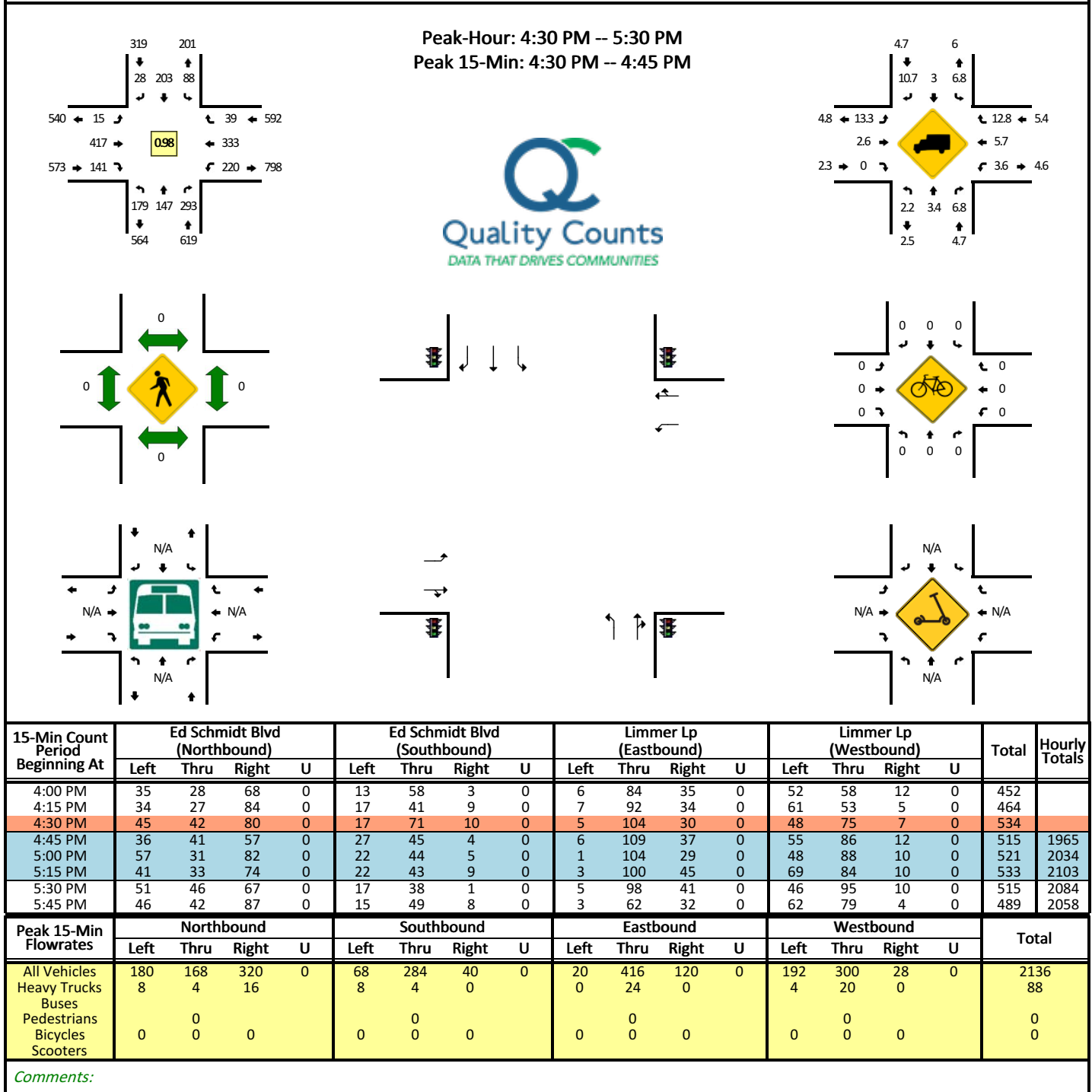
LOCATION: Ed Schmidt Blvd -- Limmer Lp
CITY/STATE: Hutto, TX

QC JOB #: 16104405
DATE: Thu, Feb 23 2023



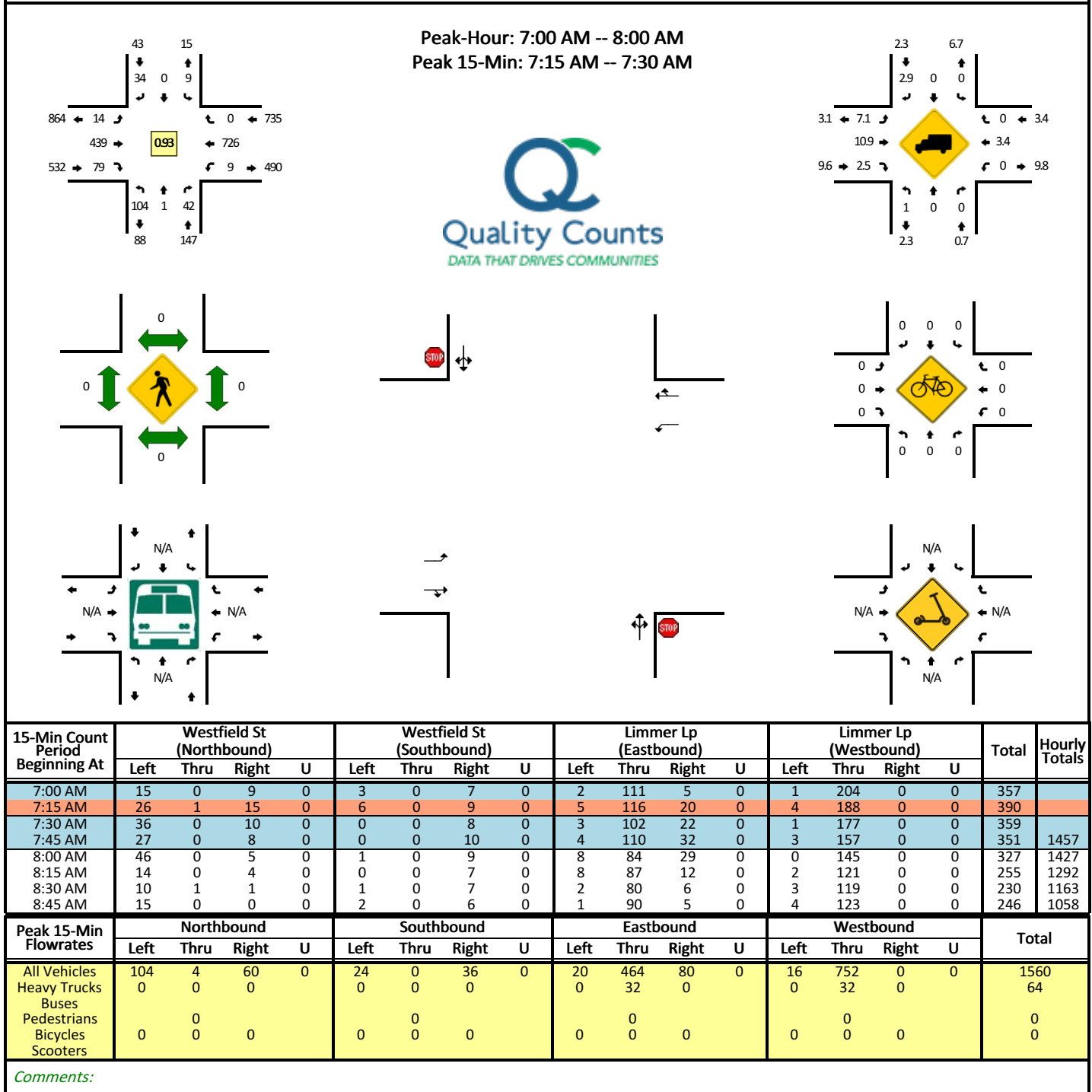
LOCATION: Ed Schmidt Blvd -- Limmer Lp
CITY/STATE: Hutto, TX

QC JOB #: 16104406
DATE: Thu, Feb 23 2023



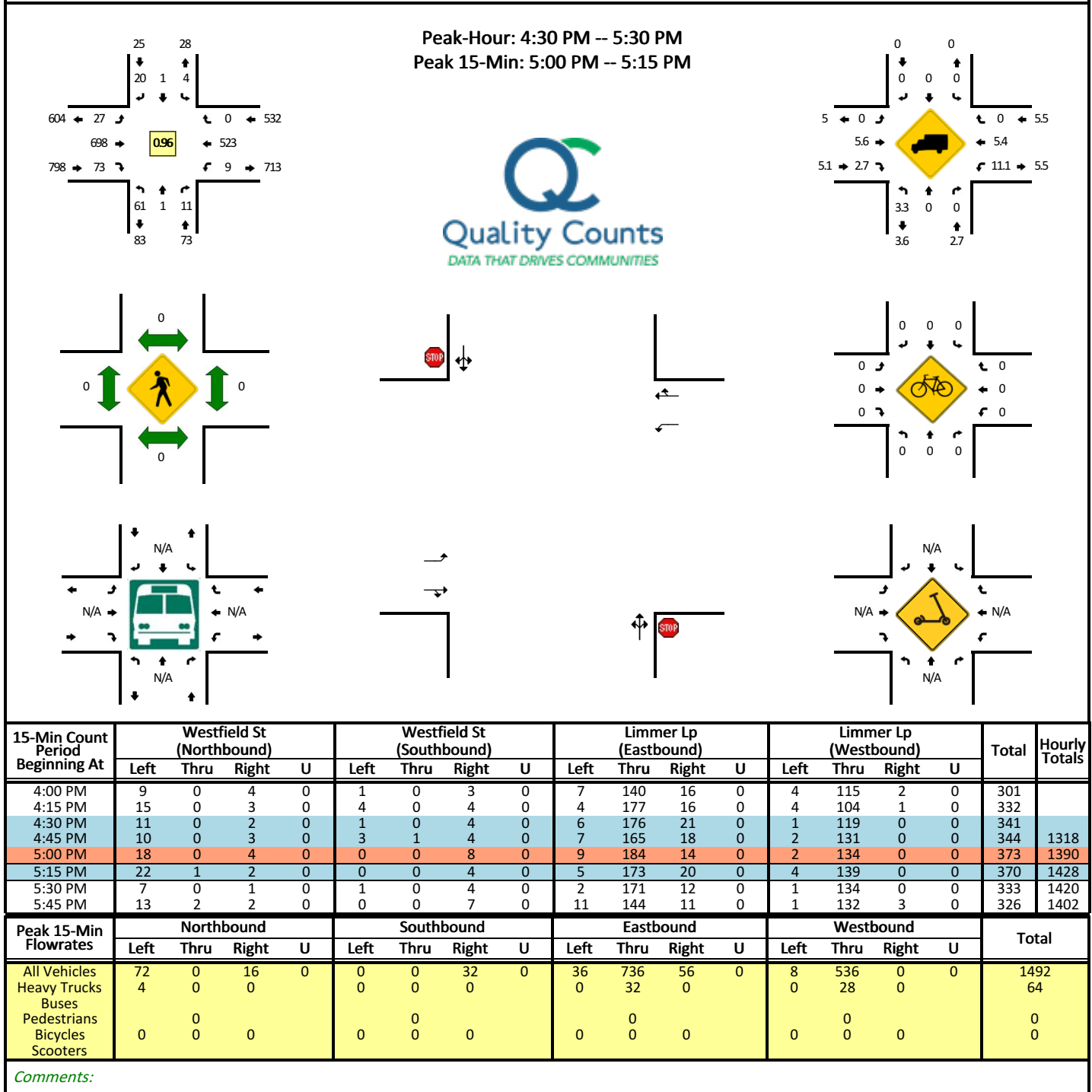
LOCATION: Westfield St -- Limmer Lp
CITY/STATE: Hutto, TX

QC JOB #: 16104407
DATE: Thu, Feb 23 2023



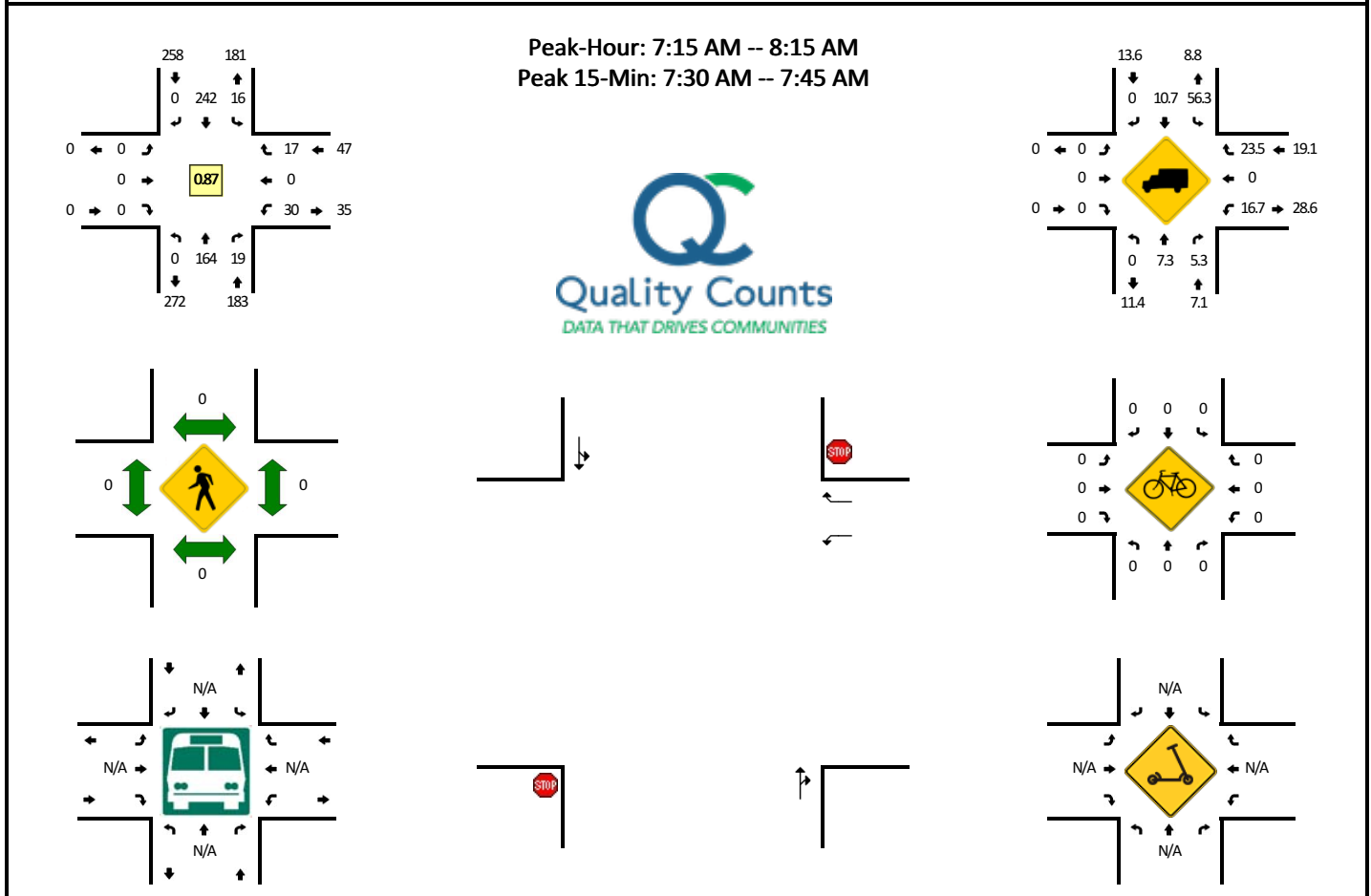
LOCATION: Westfield St -- Limmer Lp
CITY/STATE: Hutto, TX

QC JOB #: 16104408
DATE: Thu, Feb 23 2023



LOCATION: Ed Schmidt Blvd -- Emory Xing Blvd
CITY/STATE: Hutto, TX

QC JOB #: 16104409
DATE: Thu, Feb 23 2023



15-Min Count Period Beginning At	Ed Schmidt Blvd (Northbound)				Ed Schmidt Blvd (Southbound)				Emory Xing Blvd (Eastbound)				Emory Xing Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	36	4	0	2	39	0	0	0	0	0	0	12	0	4	0	97	
7:15 AM	0	45	3	0	10	58	0	0	0	0	0	0	6	0	5	0	127	
7:30 AM	0	42	4	0	3	79	0	0	0	0	0	0	10	0	3	0	141	
7:45 AM	0	33	6	0	0	63	0	0	0	0	0	0	6	0	5	0	113	478
8:00 AM	0	44	6	0	3	42	0	0	0	0	0	0	8	0	4	0	107	488
8:15 AM	0	32	2	0	2	43	0	0	0	0	0	0	8	0	6	0	93	454
8:30 AM	0	32	2	0	1	39	0	0	0	0	0	0	8	0	3	0	85	398
8:45 AM	0	30	4	0	4	45	0	0	0	0	0	0	3	0	1	0	87	372
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	168	16	0	12	316	0	0	0	0	0	0	40	0	12	0	564	
Heavy Trucks	0	4	4	0	8	24	0	0	0	0	0	0	12	0	4	0	56	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

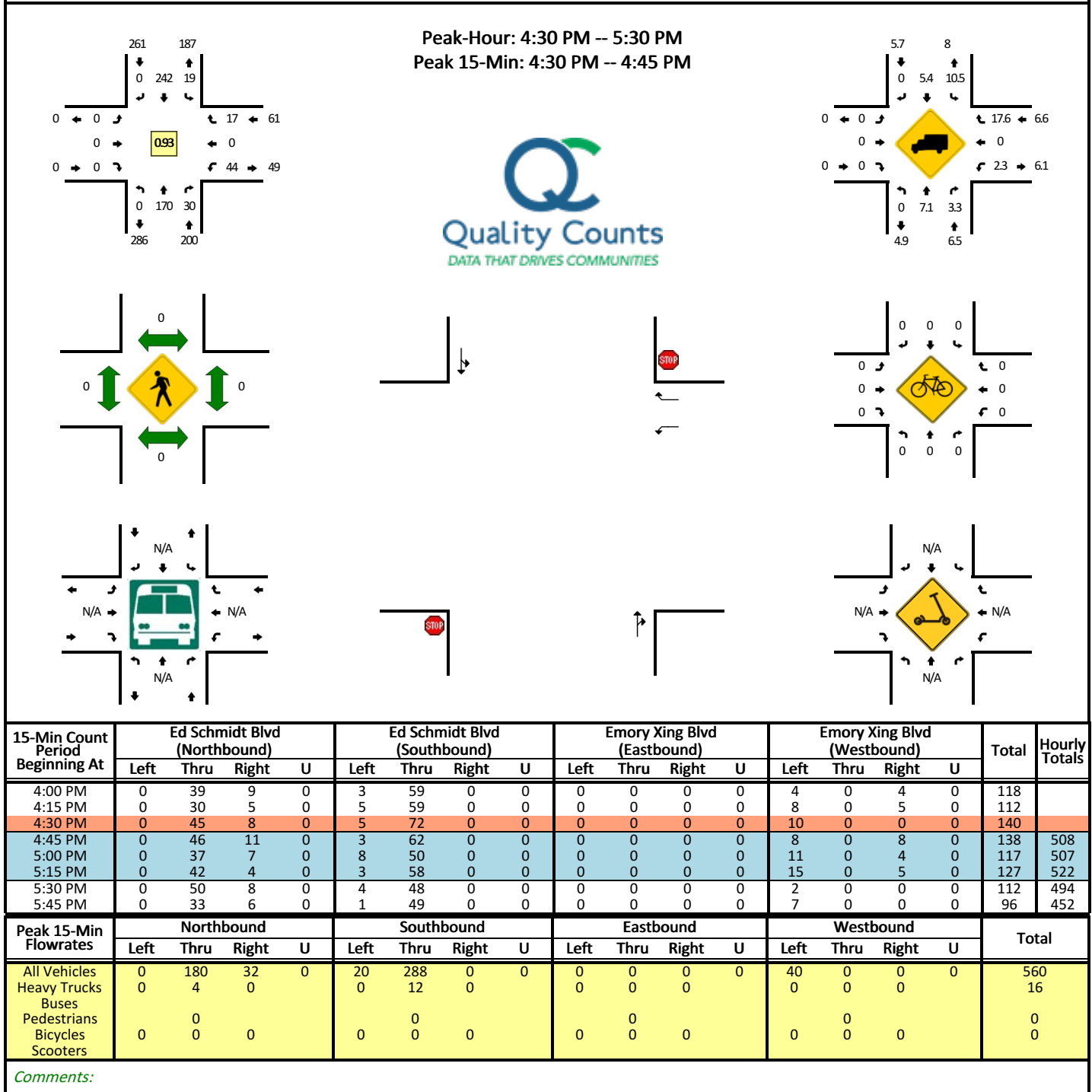
Comments:

Report generated on 3/2/2023 12:03 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

LOCATION: Ed Schmidt Blvd -- Emory Xing Blvd
CITY/STATE: Hutto, TX

QC JOB #: 16104410
DATE: Thu, Feb 23 2023



Appendix D: Trip Generation Calculations

PM PEAK-PERIOD																																			
Phase	ITE Code	Land-Use Description	Land-Use	# UNITS	UNIT	Phase Percentage	Total Trips			Internally Captured Trips (Internal Trips)			Net Trips After Internal Capture (External Trips)			Pass By Trips (Existing External)			Net Trips After IC + PB (Net New External)			TDM	TDM Trips			Existing Trips			Net Trips After All Reductions			Phase	Net Trips After All Reductions By Phase		
							Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out		PM	Total	In	Out	Total	In	Out	Total	In		Out	Total	In
1	220	Select Use	Multifamily Housing (Low-Rise) Not Close to Rail Transit	1392	Dwelling Unit(s)	100%	620	391	229	0	0	0	620	391	229	0	0	0	620	391	229		0	0	0	0	0	0	620	391	229	1	620	391	229
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0				
		Select Use					0	0	0	0	0	0																							

Appendix E: Traffic Volume Calculations

	Intersection (North/South and East/West)	Direction	Movement SYNCHRO	AutoCAD Index	Existing Counts (2023)		Existing PHF	Existing HV		Emory Crossing	Ed Schmidt Multifamily		Total Present Background	2025 % Trip Assignment		2025 Growth	2025 No Build Volumes		2025 PHF	2025 Site Trips		2025 Build Out		2025 HV		2025 Movement Pro Rata		2025 Approach Pro Rata		2025 Intersection Pro Rata					
					AM	PM		AM	PM		AM	PM		AM	PM		IN	OUT		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
					AM	PM		AM	PM		AM	PM		AM	PM		AM	PM		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	US 130 FB Frontage Road at Limmer Loop	SB (US 130 FB Frontage Road)	SBL	SBL	129	80	0.69	0.66	10.9	7.5			0	0	0	0	154	96	0.69	0.66	0	0	154	96	10.9	7.5	0%	0%	0%	0%					
			SBT	SBT	7	2	0.69	0.66	0.0	50.0			0	0	0	0	8	2	0.69	0.66	0	0	9	3	0.0	50.0	0%	0%	0%	0%					
		WB (Limmer Loop)	SBR	SBR	68	65	0.69	0.66	17.6	6.2			0	0	0	0	81	77	0.69	0.66	0	0	81	78	17.6	6.2	0%	0%	0%	0%					
			WBL	WBL	1	0	0.85	0.84	0.0	0.0			0	0	0	0	1	0	0.85	0.84	0	0	2	0	0.0	0.0	0%	0%	0%	0%					
		NB (US 130 FB Frontage Road)	WBT	WBT	532	469	0.85	0.84	2.4	4.1	70	49	46	29	116	78	0	45	634	559	0.85	0.84	156	103	906	740	2.4	4.1	17%	14%	17%	14%			
			WBR	WBR	0	0	0.85	0.84	0.0	0.0			0	0	0	0	0	0	0.85	0.84	0	0	0	0	0.0	0.0	0%	0%	0%	0%	10%	14%			
		EB (Limmer Loop)	NBL	NBL	1	2	0.29	0.50	0.0	0.0			0	0	0	0	1	2	0.29	0.50	0	0	2	3	0.0	0.0	0%	0%	0%	0%					
			NBT	NBT	0	0	0.29	0.50	0.0	0.0			0	0	0	0	0	0	0.29	0.50	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%			
		EBR	NBR	NBR	6	4	0.29	0.50	0.0	25.0			0	0	0	0	7	5	0.29	0.50	0	0	8	5	0.0	25.0	0%	0%	0%	0%					
			EBL	EBL	0	0	0.80	0.89	0.0	0.0			0	0	0	0	0	0	0.80	0.89	0	0	0	0	0.0	0.0	0%	0%	0%	0%					
2	US 130 NB Frontage Road at Limmer Loop	SB (US 130 NB Frontage Road)	SBL	SBL	597	600	0.80	0.89	4.9	2.7	25	79	15	50	40	129	46	0	0	0.80	0.89	49	176	801	1,020	4.9	2.7	6%	17%	6%	17%				
			SBT	SBT	1	5	0.80	0.89	0.0	20.0			0	0	0	0	1	6	1	6	0.80	0.89	0	0	2	6	0.0	20.0	0%	0%	0%	0%			
		WB (Limmer Loop)	SBR	SBR	0	0	0.92	0.92	0.0	0.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%			
			WBL	WBL	0	0	0.92	0.92	0.0	0.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%			
		NB (US 130 NB Frontage Road)	WBT	WBT	534	476	0.86	0.91	3.6	5.0	70	49	46	29	116	78	0	45	636	567	0.86	0.91	156	103	908	748	3.6	5.0	17%	14%	15%	12%			
			WBR	WBR	88	94	0.86	0.91	20.5	9.6			0	0	0	0	105	112	0.86	0.91	0	0	105	112	20.5	9.6	0%	0%	0%	0%	10%	14%			
		EB (Limmer Loop)	NBL	NBL	0	0	0.92	0.92	0.0	0.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%			
			NBT	NBT	0	0	0.92	0.92	0.0	0.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%			
		EBR	NBR	NBR	0	0	0.92	0.92	0.0	0.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%			
			EBL	EBL	56	39	0.78	0.91	21.4	7.7	25	79	15	50	40	129	46	0	0	0.78	0.91	0	0	67	47	21.4	7.7	0%	0%	5%	16%				
3	Ed Schmidt Boulevard at Limmer Loop	SB (Ed Schmidt Boulevard)	SBL	SBL	69	88	0.82	0.81	10.1	6.8	16	11	36	23	91	61	0	35	224	242	0.82	0.81	121	80	436	383	6.9	3.0	28%	21%	35%	28%			
			SBT	SBT	188	203	0.82	0.81	6.9	3.0	55	38	36	23	91	61	0	35	224	242	0.82	0.81	121	80	436	383	6.9	3.0	28%	21%	35%	28%			
		WB (Limmer Loop)	SBR	SBR	38	28	0.82	0.81	15.8	10.7	70	49	46	29	116	78	0	45	45	33	0.82	0.81	156	103	318	215	15.8	10.7	49%	49%					
			WBL	WBL	279	220	0.93	0.91	2.9	3.6			0	0	0	0	0	0	332	262	0.93	0.91	0	0	333	263	2.9	3.6	0%	0%	1%	5%			
		NB (Ed Schmidt Boulevard)	WBT	WBT	492	333	0.93	0.91	4.9	5.7			0	0	0	0	0	0	586	397	0.93	0.91	0	0	586	397	4.9	5.7	0%	0%	0%	0%			
			WBR	WBR	69	39	0.93	0.91	4.3	12.8	6	18	10	7	26	18	10	0	82	46	0.93	0.91	11	39	100	104	4.3	12.8	11%	38%					
		EB (Limmer Loop)	NBL	NBL	171	179	0.94	0.91	2.3	2.2			0	0	0	0	0	204	213	0.94	0.91	0	0	204	214	2.3	2.2	0%	0%	0%	0%	13%	16%		
			NBT	NBT	133	147	0.94	0.91	6.0	3.4	19	61	12	39	31	100	35	0	158	175	0.94	0.91	38	137	228	413	6.0	3.4	17%	33%	6%	14%			
		EBR	NBR	NBR	183	293	0.94	0.91	4.9	6.8			0	0	0	0	0	218	349	0.94	0.91	0	0	218	349	4.9	6.8	0%	0%	8%	18%				
			EBL	EBL	10	15	0.95	0.94	50.0	13.3	25	79	15	50	40	129	46	0	12	18	0.95	0.94	49	176	101	323	50.0	2.0	49%	55%					
4	Ed Schmidt Boulevard at Emory Crossing Boulevard	SB (Ed Schmidt Boulevard)	SBL	SBL	16	19	0.79	0.85	56.3	10.5	6	18	3	11	0	0	0	0	19	23	0.79	0.85	0	0	20	22	56.3	10.5	0%	0%	11%	11%			
			SBT	SBT	242	242	0.79	0.85	10.7	5.4			9	29	0	10	388	288	0.79	0.85	35	23	333	341	10.7	5.4	10%	7%							
		WB (Emory Crossing Boulevard)	SBR	SBR	0	0	0.79	0.85	0.0	0.0			0	0	0	0	0	0	0.79	0.85	5	20	5	20	2.0	2.0	100%	100%							
			WBL	WBL	30	44	0.90	0.76	16.7	2.3			0	0	0	0	36	52	0.90	0.76	0	0	36	53	16.7	2.3	0%	0%	0%	0%	0%	0%			
		NB (Ed Schmidt Boulevard)	WBT	WBT	0	0	0.90	0.76	0.0	0.0			0	0	0	0	0	0	0.90	0.76	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%			
			WBR	WBR	17	17	0.90	0.76	23.5	17.6			0	0	0	0	20	20	0.90	0.76	0	0	21	21	23.5	17.6	0%	0%	0%	0%	0%	0%			
		EB (Emory Crossing Boulevard)	NBL	NBL	0	0	0.92	0.88	0.0	0.0			0	0	0	0	0	0	0.92	0.88	18	137	38	137	2.0	2.0	100%	100%	27%	32%					
			NBT	NBT	164	170	0.92	0.88	7.3	7.1	16	11	10	7	26	18	10	0	195	202	0.92	0.88	11	39	233	260	7.3	7.1	5%	15%	17%	41%			
		EBR	NBR	NBR	19	30	0.92	0.88	5.3	3.3			0	0	0	0	23	36	0.92	0.88	0	0	23	36	5.3	3.3	0%	0%	0%	0%	100%	100%			
			EBL	EBL	0	0	0.92	0.92	0.0	0.0			0	0	0	0	0	0	0.92	0.92	17	11	17	11	2.0	2.0	100%	100%			100%	100%			
5	Ed Schmidt Boulevard at Driveway 1	SB (Ed Schmidt Boulevard)	SBL	SBL	0	0	0.92	0.92	0.0	0.0			0	0	0	0	0	0.92	0.92	0	0	0	0	0.0	0.0	0%	0%	0%	0%	0%	0%				
			SBT	SBT	258	261	0.92	0.92	2.0	2.0	6	18	3	11	0	0	0	29	5	0.92	0.92	5	20	322	369	2.0	2.0	2%	5%	3%	10%				
		WB (Driveway 1)	SBR	SBR	0	0	0.92	0.92	2.0	2.0			0	0	0	0	0	0	0.92	0.92	5	20	5	20	2.0	2.0	100%	100%			0%	0%			
			WBL	WBL	0	0	0.92	0.92	2.0	2.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	2.0	2.0	0%	0%	0%	0%	0%	0%			
		NB (Ed Schmidt Boulevard)	WBT	WBT	0	0	0.92	0.92	2.0	2.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	2.0	2.0	0%	0%	0%	0%	0%	0%			
			WBR	WBR	0	0	0.92	0.92	2.0	2.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	2.0	2.0	0%	0%	0%	0%	0%	0%			
		EB (Driveway 1)	NBL	NBL	0	0	0.92	0.92	2.0	2.0			0	0	0	0	0	0	0.92	0.92	11	39	11	39	2.0	2.0	100%	100%			14%	18%			
			NBT	NBT	181	187	0.92	0.92	2.0	2.0	16	11	10	7	0	0	0	0	182	223	0.92	0.92	17	11	269	252	2.0	2.0	10%	17%					
		EBR	NBR	NBR	0	0	0.92	0.92	2.0	2.0			0	0	0	0	0	0	0.92	0.92	0	0	0	0	2.0	2.0	0%	0%	0%	0%	0%	0%			
			EBL	EBL	0	0	0.92	0.92	2.0	2.0			0	0	0	0	0	0	0.92	0.92	17	11	17	11	2.0	2.0	100%	100%			100%	100%			
6	Ed Schmidt Boulevard at Driveway 2	SB (Ed Schmidt Boulevard)	SBL	SBL	0	0	0.92	0.92	2.0	2.0	3	9	0	0	0	0	3	9	0.92	0.92	0	0	3	9	2.0	2.0	0%	0%	0%	0%					
			SBT	SBT	272	286	0.92	0.92	2.0	2.0	3	9	3	11	0	0	0	20	45	0.92															

Appendix F: Synchro Outputs

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	597	1	1	532	0	1	0	6	129	7	68
Future Volume (vph)	0	597	1	1	532	0	1	0	6	129	7	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.882								0.864			
Flt Protected	0.994								0.950			
Satd. Flow (prot)	0	1827	0	0	1863	0	0	1666	0	1641	1422	0
Flt Permitted	0.994								0.950			
Satd. Flow (perm)	0	1827	0	0	1863	0	0	1666	0	1641	1422	0
Link Speed (mph)	45				45				30		30	
Link Distance (ft)	768				512				309		804	
Travel Time (s)	11.6				7.8				7.0		18.3	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	10%	0%	17%
Adj. Flow (vph)	0	746	1	1	626	0	3	0	21	187	10	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	747	0	0	627	0	0	24	0	187	109	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0		12	
Link Offset(ft)	0				0				0		0	
Crosswalk Width(ft)	16				16				16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free				Free				Stop		Stop	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 52.0%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	597	1	1	532	0	1	0	6	129	7	68
Future Volume (Veh/h)	0	597	1	1	532	0	1	0	6	129	7	68
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Hourly flow rate (vph)	0	746	1	1	626	0	3	0	21	187	10	99
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	626			747			1380	1374	746	1396	1375	626
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	626			747			1380	1374	746	1396	1375	626
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	100			100			97	100	95	0	93	78
cM capacity (veh/h)	965			870			91	147	416	108	147	458
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	747	627	24	187	109							
Volume Left	0	1	3	187	0							
Volume Right	1	0	21	0	99							
cSH	1700	870	288	108	383							
Volume to Capacity	0.44	0.00	0.08	1.73	0.28							
Queue Length 95th (ft)	0	0	7	366	29							
Control Delay (s)	0.0	0.0	18.6	432.3	18.1							
Lane LOS		A	C	F	C							
Approach Delay (s)	0.0	0.0	18.6	279.8								
Approach LOS			C	F								
Intersection Summary												
Average Delay			49.2									
Intersection Capacity Utilization			52.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Intersection

Int Delay, s/veh 47.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↰			↰		↱	↰	
Traffic Vol, veh/h	0	597	1	1	532	0	1	0	6	129	7	68
Future Vol, veh/h	0	597	1	1	532	0	1	0	6	129	7	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	85	85	85	29	29	29	69	69	69
Heavy Vehicles, %	0	4	0	0	2	0	0	0	0	10	0	17
Mvmt Flow	0	746	1	1	626	0	3	0	21	187	10	99

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	747	0	0	1380	1375	747	1385	1375	626
Stage 1	-	-	-	-	-	-	747	747	-	628	628	-
Stage 2	-	-	-	-	-	-	633	628	-	757	747	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.2	7.2	6.5	6.37
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.3	3.59	4	3.453
Pot Cap-1 Maneuver	0	-	-	870	-	0	123	147	416	~ 116	147	458
Stage 1	0	-	-	-	-	0	408	423	-	458	479	-
Stage 2	0	-	-	-	-	0	471	479	-	388	423	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	870	-	-	91	147	416	~ 110	147	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	147	-	~ 110	147	-
Stage 1	-	-	-	-	-	-	408	423	-	458	478	-
Stage 2	-	-	-	-	-	-	361	478	-	369	423	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			19.3			271.9		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	275	-	-	870	-	110	345
HCM Lane V/C Ratio	0.088	-	-	0.001	-	1.7	0.315
HCM Control Delay (s)	19.3	-	-	9.1	0	418.3	20.2
HCM Lane LOS	C	-	-	A	A	F	C
HCM 95th %tile Q(veh)	0.3	-	-	0	-	14.5	1.3

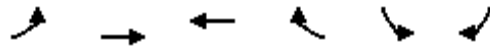
Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	684	534	88	0	0
Future Volume (vph)	56	684	534	88	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.981			
Flt Protected		0.996				
Satd. Flow (prot)	0	1766	1768	0	0	0
Flt Permitted		0.996				
Satd. Flow (perm)	0	1766	1768	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.78	0.78	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	21%	6%	3%	20%	0%	0%
Adj. Flow (vph)	72	877	621	102	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	949	723	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type: Other						
Control Type: Unsignalized						
Intersection Capacity Utilization 79.2% ICU Level of Service D						
Analysis Period (min) 15						

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	287	173	279	492	69	171	133	183	69	188	38
Future Volume (vph)	10	287	173	279	492	69	171	133	183	69	188	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.944			0.982			0.913				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1203	1676	0	1770	1794	0	1770	1655	0	1641	1792	1404
Flt Permitted	0.245			0.216			0.434			0.280		
Satd. Flow (perm)	310	1676	0	402	1794	0	808	1655	0	484	1792	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			10			83				205
Link Speed (mph)		50			50			50				55
Link Distance (ft)		3016			735			1325			3130	
Travel Time (s)		41.1			10.0			18.1			38.8	
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Adj. Flow (vph)	11	302	182	300	529	74	182	141	195	84	229	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	484	0	300	603	0	182	336	0	84	229	46
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

2023 Existing AM Alta Ed Schmidt TIA 5:31 pm 04/18/2023 2023 Existing AM
Kimley-Horn

Synchro 11 Report
Page 6

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	9.5	29.0		17.0	36.5		11.1	24.4		9.6	22.9	22.9
Total Split (%)	11.9%	36.3%		21.3%	45.6%		13.9%	30.5%		12.0%	28.6%	28.6%
Maximum Green (s)	5.0	24.5		12.5	32.0		6.6	19.9		5.1	18.4	18.4
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effect Green (s)	38.2	22.8		34.4	37.2		21.3	18.6		22.5	14.7	14.7
Actuated g/C Ratio	0.52	0.31		0.46	0.50		0.29	0.25		0.30	0.20	0.20
v/c Ratio	0.05	0.89		0.75	0.66		0.57	0.70		0.37	0.65	0.10
Control Delay	9.9	44.7		26.0	20.1		26.6	29.5		22.3	36.9	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	9.9	44.7		26.0	20.1		26.6	29.5		22.3	36.9	0.5
LOS	A	D		C	C		C	C		C	D	A
Approach Delay		44.0			22.0			28.5			28.8	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 74

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 29.3

Intersection LOS: C

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

 Ø1	 Ø2	 Ø3	 Ø4
9.6 s	24.4 s	17 s	29 s
 Ø5	 Ø6	 Ø7	 Ø8
11.1 s	22.9 s	9.5 s	36.5 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	484	300	603	182	336	84	229	46
v/c Ratio	0.05	0.89	0.75	0.66	0.57	0.70	0.37	0.65	0.10
Control Delay	9.9	44.7	26.0	20.1	26.6	29.5	22.3	36.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	44.7	26.0	20.1	26.6	29.5	22.3	36.9	0.5
Queue Length 50th (ft)	2	204	76	188	63	115	27	101	0
Queue Length 95th (ft)	10	#394	#189	#448	111	#216	52	153	0
Internal Link Dist (ft)		2936		655		1245		3050	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	220	587	426	916	319	511	227	451	506
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.82	0.70	0.66	0.57	0.66	0.37	0.51	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	287	173	279	492	69	171	133	183	69	188	38
Future Volume (vph)	10	287	173	279	492	69	171	133	183	69	188	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1203	1676		1770	1793		1770	1655		1641	1792	1404
Flt Permitted	0.24	1.00		0.22	1.00		0.43	1.00		0.28	1.00	1.00
Satd. Flow (perm)	310	1676		402	1793		809	1655		484	1792	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	11	302	182	300	529	74	182	141	195	84	229	46
RTOR Reduction (vph)	0	26	0	0	5	0	0	63	0	0	0	37
Lane Group Flow (vph)	11	458	0	300	598	0	182	273	0	84	229	9
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	38.1	26.4		38.1	37.2		22.5	18.6		22.5	15.8	15.8
Effective Green, g (s)	38.1	26.4		38.1	37.2		22.5	18.6		22.5	15.8	15.8
Actuated g/C Ratio	0.48	0.34		0.48	0.47		0.29	0.24		0.29	0.20	0.20
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	160	562		398	848		313	391		195	360	282
v/s Ratio Prot	0.00	c0.27		c0.11	0.33		c0.05	c0.16		0.02	0.13	
v/s Ratio Perm	0.03			0.25			0.12			0.10		0.01
v/c Ratio	0.07	0.82		0.75	0.70		0.58	0.70		0.43	0.64	0.03
Uniform Delay, d1	12.3	23.9		14.6	16.4		22.5	27.4		21.7	28.8	25.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	8.9		7.9	2.7		2.7	5.3		1.5	3.7	0.0
Delay (s)	12.4	32.7		22.5	19.0		25.2	32.8		23.2	32.4	25.3
Level of Service	B	C		C	B		C	C		C	C	C
Approach Delay (s)		32.3			20.2			30.1			29.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			78.6			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			78.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	287	173	279	492	69	171	133	183	69	188	38
Future Volume (veh/h)	10	287	173	279	492	69	171	133	183	69	188	38
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	1159	1752	1870	1870	1841	1841	1870	1811	1841	1752	1811	1678
Adj Flow Rate, veh/h	11	302	182	300	529	74	182	141	195	84	229	46
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Percent Heavy Veh, %	50	10	2	2	4	4	2	6	4	10	6	15
Cap, veh/h	200	328	198	382	705	99	354	161	222	230	360	282
Arrive On Green	0.01	0.32	0.32	0.14	0.45	0.45	0.09	0.23	0.23	0.06	0.20	0.20
Sat Flow, veh/h	1104	1024	617	1781	1580	221	1781	688	952	1668	1811	1422
Grp Volume(v), veh/h	11	0	484	300	0	603	182	0	336	84	229	46
Grp Sat Flow(s),veh/h/ln	1104	0	1641	1781	0	1801	1781	0	1640	1668	1811	1422
Q Serve(g_s), s	0.4	0.0	20.5	7.9	0.0	20.1	5.8	0.0	14.2	2.7	8.4	1.9
Cycle Q Clear(g_c), s	0.4	0.0	20.5	7.9	0.0	20.1	5.8	0.0	14.2	2.7	8.4	1.9
Prop In Lane	1.00		0.38	1.00		0.12	1.00		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	200	0	525	382	0	804	354	0	383	230	360	282
V/C Ratio(X)	0.06	0.00	0.92	0.79	0.00	0.75	0.51	0.00	0.88	0.37	0.64	0.16
Avail Cap(c_a), veh/h	261	0	558	441	0	804	354	0	453	253	462	363
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	0.0	23.6	16.2	0.0	16.6	20.8	0.0	26.6	20.7	26.5	23.9
Incr Delay (d2), s/veh	0.1	0.0	20.3	8.0	0.0	3.9	1.3	0.0	15.5	1.0	1.9	0.3
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	0.1	0.0	9.7	3.4	0.0	7.5	2.2	0.0	6.5	1.0	3.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	0.0	43.9	24.2	0.0	20.6	22.1	0.0	42.1	21.6	28.4	24.2
LnGrp LOS	B	A	D	C	A	C	C	A	D	C	C	C
Approach Vol, veh/h	495			903			518			359		
Approach Delay, s/veh	43.2			21.8			35.1			26.3		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	21.4	14.6	27.6	11.1	18.8	5.5	36.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	19.9	12.5	24.5	6.6	18.4	5.0	32.0				
Max Q Clear Time (g_c+I1), s	4.7	16.2	9.9	22.5	7.8	10.4	2.4	22.1				
Green Ext Time (p_c), s	0.0	0.6	0.2	0.6	0.0	0.7	0.0	2.5				
Intersection Summary												
HCM 6th Ctrl Delay	30.2											
HCM 6th LOS	C											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	17	164	19	16	242
Future Volume (vph)	30	17	164	19	16	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.986			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1556	1313	1754	0	0	1679
Flt Permitted	0.950					0.997
Satd. Flow (perm)	1556	1313	1754	0	0	1679
Link Speed (mph)	30		55			55
Link Distance (ft)	992		413			1010
Travel Time (s)	22.5		5.1			12.5
Peak Hour Factor	0.90	0.90	0.92	0.92	0.79	0.79
Heavy Vehicles (%)	16%	23%	7%	5%	56%	10%
Adj. Flow (vph)	33	19	178	21	20	306
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	19	199	0	0	326
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	17	164	19	16	242
Future Volume (Veh/h)	30	17	164	19	16	242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.92	0.92	0.79	0.79
Hourly flow rate (vph)	33	19	178	21	20	306
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	534	188			199	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	534	188			199	
tC, single (s)	6.6	6.4			4.7	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.7	
p0 queue free %	93	98			98	
cM capacity (veh/h)	474	802			1108	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total	33	19	199	326		
Volume Left	33	0	0	20		
Volume Right	0	19	21	0		
cSH	474	802	1700	1108		
Volume to Capacity	0.07	0.02	0.12	0.02		
Queue Length 95th (ft)	6	2	0	1		
Control Delay (s)	13.2	9.6	0.0	0.7		
Lane LOS	B	A		A		
Approach Delay (s)	11.9		0.0	0.7		
Approach LOS	B					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	17	164	19	16	242
Future Vol, veh/h	30	17	164	19	16	242
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	92	92	79	79
Heavy Vehicles, %	16	23	7	5	56	10
Mvmt Flow	33	19	178	21	20	306

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	535	189	0
Stage 1	189	-	-
Stage 2	346	-	-
Critical Hdwy	6.56	6.43	-
Critical Hdwy Stg 1	5.56	-	-
Critical Hdwy Stg 2	5.56	-	-
Follow-up Hdwy	3.644	3.507	-
Pot Cap-1 Maneuver	483	802	-
Stage 1	811	-	-
Stage 2	686	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	472	802	-
Mov Cap-2 Maneuver	472	-	-
Stage 1	811	-	-
Stage 2	671	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	-	472	802
HCM Lane V/C Ratio	-	-	0.071	0.024
HCM Control Delay (s)	-	-	13.2	9.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	600	5	0	469	0	2	0	4	80	2	65
Future Volume (vph)	0	600	5	0	469	0	2	0	4	80	2	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999						0.910				0.854	
Flt Protected							0.984				0.950	
Satd. Flow (prot)	0	1858	0	0	1827	0	0	1458	0	1687	1512	0
Flt Permitted							0.984				0.950	
Satd. Flow (perm)	0	1858	0	0	1827	0	0	1458	0	1687	1512	0
Link Speed (mph)	45				45		30				30	
Link Distance (ft)	768				512		309				804	
Travel Time (s)	11.6				7.8		7.0				18.3	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Heavy Vehicles (%)	0%	2%	20%	0%	4%	0%	0%	0%	25%	7%	50%	6%
Adj. Flow (vph)	0	674	6	0	499	0	4	0	8	121	3	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	680	0	0	499	0	0	12	0	121	101	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0		0				12	
Link Offset(ft)	0				0		0				0	
Crosswalk Width(ft)	16				16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free				Free		Stop				Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	49.6%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	600	5	0	469	0	2	0	4	80	2	65
Future Volume (Veh/h)	0	600	5	0	469	0	2	0	4	80	2	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Hourly flow rate (vph)	0	674	6	0	499	0	4	0	8	121	3	98
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	499			680			1178	1176	677	1184	1179	499
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	499			680			1178	1176	677	1184	1179	499
tC, single (s)	4.1			4.1			7.1	6.5	6.5	7.2	7.0	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.6	4.5	3.4
p0 queue free %	100			100			97	100	98	24	98	83
cM capacity (veh/h)	1075			922			138	193	415	159	155	564
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	680	499	12	121	101							
Volume Left	0	0	4	121	0							
Volume Right	6	0	8	0	98							
cSH	1700	922	249	159	523							
Volume to Capacity	0.40	0.00	0.05	0.76	0.19							
Queue Length 95th (ft)	0	0	4	119	18							
Control Delay (s)	0.0	0.0	20.2	76.9	13.5							
Lane LOS			C	F	B							
Approach Delay (s)	0.0	0.0	20.2	48.1								
Approach LOS			C	E								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			49.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Intersection

Int Delay, s/veh 8.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱		↱	↱	
Traffic Vol, veh/h	0	600	5	0	469	0	2	0	4	80	2	65
Future Vol, veh/h	0	600	5	0	469	0	2	0	4	80	2	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	50	50	50	66	66	66
Heavy Vehicles, %	0	2	20	0	4	0	0	0	25	7	50	6
Mvmt Flow	0	674	6	0	499	0	4	0	8	121	3	98

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	680	0	0	1178	1176	677	1180	1179	499
Stage 1	-	-	-	-	-	-	677	677	-	499	499	-
Stage 2	-	-	-	-	-	-	501	499	-	681	680	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.45	7.17	7	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.17	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.17	6	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.525	3.563	4.45	3.354
Pot Cap-1 Maneuver	0	-	-	922	-	0	169	193	415	163	155	564
Stage 1	0	-	-	-	-	0	446	455	-	544	472	-
Stage 2	0	-	-	-	-	0	556	547	-	432	385	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	922	-	-	137	193	415	160	155	564
Mov Cap-2 Maneuver	-	-	-	-	-	-	137	193	-	160	155	-
Stage 1	-	-	-	-	-	-	446	455	-	544	472	-
Stage 2	-	-	-	-	-	-	456	547	-	424	385	-

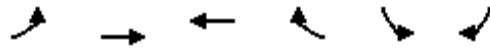
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			20.3			52.5		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	248	-	-	922	-	160	287
HCM Lane V/C Ratio	0.048	-	-	-	-	0.758	0.354
HCM Control Delay (s)	20.3	-	-	0	-	76.1	24.3
HCM Lane LOS	C	-	-	A	-	F	C
HCM 95th %tile Q(veh)	0.2	-	-	0	-	4.7	1.5

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	656	476	94	0	0
Future Volume (vph)	39	656	476	94	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.978			
Flt Protected		0.997				
Satd. Flow (prot)	0	1818	1759	0	0	0
Flt Permitted		0.997				
Satd. Flow (perm)	0	1818	1759	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Heavy Vehicles (%)	7%	4%	5%	9%	0%	0%
Adj. Flow (vph)	43	721	523	103	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	764	626	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	69.8%			ICU Level of Service C		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	417	141	220	333	39	179	147	293	88	203	28
Future Volume (vph)	15	417	141	220	333	39	179	147	293	88	203	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.984			0.900				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	1801	0	1752	1768	0	1770	1629	0	1703	1845	1468
Flt Permitted	0.404			0.133			0.415			0.186		
Satd. Flow (perm)	679	1801	0	245	1768	0	773	1629	0	333	1845	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			9			123				143
Link Speed (mph)		50			50			50				55
Link Distance (ft)		3016			735			1325				3130
Travel Time (s)		41.1			10.0			18.1				38.8
Peak Hour Factor	0.94	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Heavy Vehicles (%)	13%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Adj. Flow (vph)	16	444	150	242	366	43	197	162	322	109	251	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	594	0	242	409	0	197	484	0	109	251	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

2023 Existing PM Alta Ed Schmidt TIA 5:31 pm 04/18/2023 2023 Existing PM
Kimley-Horn

Synchro 11 Report
Page 6

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	9.5	31.0		13.3	34.8		11.4	26.1		9.6	24.3	24.3
Total Split (%)	11.9%	38.8%		16.6%	43.5%		14.3%	32.6%		12.0%	30.4%	30.4%
Maximum Green (s)	5.0	26.5		8.8	30.3		6.9	21.6		5.1	19.8	19.8
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effect Green (s)	38.8	26.3		35.1	37.8		24.5	21.6		25.5	17.6	17.6
Actuated g/C Ratio	0.50	0.34		0.45	0.49		0.32	0.28		0.33	0.23	0.23
v/c Ratio	0.04	0.95		0.86	0.47		0.59	0.90		0.55	0.60	0.08
Control Delay	10.6	53.1		47.7	16.9		26.1	42.8		27.8	33.4	0.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.6	53.1		47.7	16.9		26.1	42.8		27.8	33.4	0.4
LOS	B	D		D	B		C	D		C	C	A
Approach Delay		52.0			28.3			38.0			29.0	
Approach LOS		D			C			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 77.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 37.4

Intersection LOS: D

Intersection Capacity Utilization 88.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

 Ø1	 Ø2	 Ø3	 Ø4
9.6 s	26.1 s	13.3 s	31 s
 Ø5	 Ø6	 Ø7	 Ø8
11.4 s	24.3 s	9.5 s	34.8 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	16	594	242	409	197	484	109	251	35
v/c Ratio	0.04	0.95	0.86	0.47	0.59	0.90	0.55	0.60	0.08
Control Delay	10.6	53.1	47.7	16.9	26.1	42.8	27.8	33.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	53.1	47.7	16.9	26.1	42.8	27.8	33.4	0.4
Queue Length 50th (ft)	4	280	74	123	66	180	35	109	0
Queue Length 95th (ft)	13	#494	#207	250	115	#365	60	160	0
Internal Link Dist (ft)		2936		655		1245		3050	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	398	631	281	865	332	543	199	472	481
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.94	0.86	0.47	0.59	0.89	0.55	0.53	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	417	141	220	333	39	179	147	293	88	203	28
Future Volume (vph)	15	417	141	220	333	39	179	147	293	88	203	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1597	1801		1752	1769		1770	1629		1703	1845	1468
Flt Permitted	0.40	1.00		0.13	1.00		0.41	1.00		0.19	1.00	1.00
Satd. Flow (perm)	679	1801		246	1769		772	1629		333	1845	1468
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Adj. Flow (vph)	16	444	150	242	366	43	197	162	322	109	251	35
RTOR Reduction (vph)	0	15	0	0	5	0	0	91	0	0	0	27
Lane Group Flow (vph)	16	579	0	242	404	0	197	393	0	109	251	8
Heavy Vehicles (%)	13%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	38.8	30.0		38.8	37.8		25.5	21.5		25.5	18.6	18.6
Effective Green, g (s)	38.8	30.0		38.8	37.8		25.5	21.5		25.5	18.6	18.6
Actuated g/C Ratio	0.47	0.36		0.47	0.46		0.31	0.26		0.31	0.23	0.23
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	331	656		277	812		322	425		169	416	331
v/s Ratio Prot	0.00	c0.32		c0.09	0.23		c0.05	c0.24		0.03	0.14	
v/s Ratio Perm	0.02			0.32			0.14			0.17		0.01
v/c Ratio	0.05	0.88		0.87	0.50		0.61	0.93		0.64	0.60	0.02
Uniform Delay, d1	12.1	24.5		17.2	15.6		22.5	29.6		22.9	28.5	24.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	13.4		24.8	0.5		3.4	25.8		8.2	2.5	0.0
Delay (s)	12.1	37.9		42.0	16.1		25.9	55.4		31.1	31.0	24.8
Level of Service	B	D		D	B		C	E		C	C	C
Approach Delay (s)		37.2			25.7			46.9			30.5	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			35.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			82.3			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			88.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	417	141	220	333	39	179	147	293	88	203	28
Future Volume (veh/h)	15	417	141	220	333	39	179	147	293	88	203	28
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	1707	1870	1900	1856	1826	1722	1870	1856	1811	1811	1856	1752
Adj Flow Rate, veh/h	16	444	150	242	366	43	197	162	322	109	251	35
Peak Hour Factor	0.94	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Percent Heavy Veh, %	13	2	0	3	5	12	2	3	6	6	3	10
Cap, veh/h	345	443	150	284	678	80	386	150	298	200	459	367
Arrive On Green	0.02	0.33	0.33	0.11	0.42	0.42	0.09	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	1626	1337	452	1767	1604	188	1781	555	1102	1725	1856	1485
Grp Volume(v), veh/h	16	0	594	242	0	409	197	0	484	109	251	35
Grp Sat Flow(s),veh/h/ln	1626	0	1789	1767	0	1792	1781	0	1657	1725	1856	1485
Q Serve(g_s), s	0.4	0.0	26.5	7.1	0.0	13.7	6.6	0.0	21.6	3.6	9.4	1.5
Cycle Q Clear(g_c), s	0.4	0.0	26.5	7.1	0.0	13.7	6.6	0.0	21.6	3.6	9.4	1.5
Prop In Lane	1.00		0.25	1.00		0.11	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	345	0	593	284	0	757	386	0	447	200	459	367
V/C Ratio(X)	0.05	0.00	1.00	0.85	0.00	0.54	0.51	0.00	1.08	0.55	0.55	0.10
Avail Cap(c_a), veh/h	416	0	593	284	0	757	386	0	447	200	459	367
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	0.0	26.7	18.9	0.0	17.3	20.6	0.0	29.2	21.9	26.2	23.2
Incr Delay (d2), s/veh	0.1	0.0	37.5	21.1	0.0	0.8	1.1	0.0	66.3	3.0	1.4	0.1
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	0.1	0.0	16.0	4.1	0.0	5.0	2.6	0.0	15.9	1.4	3.9	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	0.0	64.3	39.9	0.0	18.1	21.8	0.0	95.5	24.9	27.6	23.3
LnGrp LOS	B	A	F	D	A	B	C	A	F	C	C	C
Approach Vol, veh/h	610			651			681			395		
Approach Delay, s/veh	63.0			26.2			74.2			26.4		
Approach LOS	E			C			E			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	26.1	13.3	31.0	11.4	24.3	6.0	38.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	21.6	8.8	26.5	6.9	19.8	5.0	30.3				
Max Q Clear Time (g_c+I1), s	5.6	23.6	9.1	28.5	8.6	11.4	2.4	15.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.8	0.0	1.9				
Intersection Summary												
HCM 6th Ctrl Delay	49.8											
HCM 6th LOS	D											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	44	17	170	30	19	242
Future Volume (vph)	44	17	170	30	19	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.980			
Flt Protected	0.950					0.996
Satd. Flow (prot)	1770	1380	1750	0	0	1796
Flt Permitted	0.950					0.996
Satd. Flow (perm)	1770	1380	1750	0	0	1796
Link Speed (mph)	30		55			55
Link Distance (ft)	992		413			1010
Travel Time (s)	22.5		5.1			12.5
Peak Hour Factor	0.76	0.76	0.88	0.88	0.85	0.85
Heavy Vehicles (%)	2%	17%	7%	3%	10%	5%
Adj. Flow (vph)	58	22	193	34	22	285
Shared Lane Traffic (%)						
Lane Group Flow (vph)	58	22	227	0	0	307
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	44	17	170	30	19	242
Future Volume (Veh/h)	44	17	170	30	19	242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.88	0.88	0.85	0.85
Hourly flow rate (vph)	58	22	193	34	22	285
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	539	210			227	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	539	210			227	
tC, single (s)	6.4	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.3	
p0 queue free %	88	97			98	
cM capacity (veh/h)	495	794			1295	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total	58	22	227	307		
Volume Left	58	0	0	22		
Volume Right	0	22	34	0		
cSH	495	794	1700	1295		
Volume to Capacity	0.12	0.03	0.13	0.02		
Queue Length 95th (ft)	10	2	0	1		
Control Delay (s)	13.2	9.7	0.0	0.7		
Lane LOS	B	A		A		
Approach Delay (s)	12.3		0.0	0.7		
Approach LOS	B					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			37.9%		ICU Level of Service	A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	17	170	30	19	242
Future Vol, veh/h	44	17	170	30	19	242
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	88	88	85	85
Heavy Vehicles, %	2	17	7	3	10	5
Mvmt Flow	58	22	193	34	22	285
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	539	210	0	0	227	0
Stage 1	210	-	-	-	-	-
Stage 2	329	-	-	-	-	-
Critical Hdwy	6.42	6.37	-	-	4.2	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.453	-	-	2.29	-
Pot Cap-1 Maneuver	503	794	-	-	1295	-
Stage 1	825	-	-	-	-	-
Stage 2	729	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	493	794	-	-	1295	-
Mov Cap-2 Maneuver	493	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.3	0	0.6			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 493 794 1295	-	-		
HCM Lane V/C Ratio	-	- 0.117 0.028 0.017	-	-		
HCM Control Delay (s)	-	- 13.3 9.7 7.8	0			
HCM Lane LOS	-	- B A A	A			
HCM 95th %tile Q(veh)	-	- 0.4 0.1 0.1	-			

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	751	1	1	749	0	1	0	7	153	8	80
Future Volume (vph)	0	751	1	1	749	0	1	0	7	153	8	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.880	0.864			
Flt Protected								0.994	0.950			
Satd. Flow (prot)	0	1827	0	0	1863	0	0	1662	0	1641	1422	0
Flt Permitted								0.994	0.950			
Satd. Flow (perm)	0	1827	0	0	1863	0	0	1662	0	1641	1422	0
Link Speed (mph)	45				45				30		30	
Link Distance (ft)	768				512				309		804	
Travel Time (s)	11.6				7.8				7.0		18.3	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	10%	0%	17%
Adj. Flow (vph)	0	939	1	1	881	0	3	0	24	222	12	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	940	0	0	882	0	0	27	0	222	128	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0		12	
Link Offset(ft)	0				0				0		0	
Crosswalk Width(ft)	16				16				16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free				Free				Stop		Stop	
Intersection Summary												
Area Type: Other												
Control Type: Unsignalized												
Intersection Capacity Utilization 62.0%												
ICU Level of Service B												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	751	1	1	749	0	1	0	7	153	8	80
Future Volume (Veh/h)	0	751	1	1	749	0	1	0	7	153	8	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Hourly flow rate (vph)	0	939	1	1	881	0	3	0	24	222	12	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	881			940			1828	1822	940	1846	1823	881
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	881			940			1828	1822	940	1846	1823	881
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	100			100			91	100	93	0	85	64
cM capacity (veh/h)	776			737			34	78	323	51	78	325
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	940	882	27	222	128							
Volume Left	0	1	3	222	0							
Volume Right	1	0	24	0	116							
cSH	1700	737	166	51	251							
Volume to Capacity	0.55	0.00	0.16	4.39	0.51							
Queue Length 95th (ft)	0	0	14	Err	67							
Control Delay (s)	0.0	0.0	30.9	Err	33.5							
Lane LOS		A	D	F	D							
Approach Delay (s)	0.0	0.0	30.9	6354.5								
Approach LOS			D	F								
Intersection Summary												
Average Delay			1011.8									
Intersection Capacity Utilization			62.0%		ICU Level of Service			B				
Analysis Period (min)			15									

Intersection

Int Delay, s/veh 166.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱		↱	↱	
Traffic Vol, veh/h	0	751	1	1	749	0	1	0	7	153	8	80
Future Vol, veh/h	0	751	1	1	749	0	1	0	7	153	8	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	85	85	85	29	29	29	69	69	69
Heavy Vehicles, %	0	4	0	0	2	0	0	0	0	10	0	17
Mvmt Flow	0	939	1	1	881	0	3	0	24	222	12	116

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	940	0	0	1829	1823	940	1835	1823	881
Stage 1	-	-	-	-	-	-	940	940	-	883	883	-
Stage 2	-	-	-	-	-	-	889	883	-	952	940	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.2	7.2	6.5	6.37
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.3	3.59	4	3.453
Pot Cap-1 Maneuver	0	-	-	737	-	0	60	78	322	~ 56	78	325
Stage 1	0	-	-	-	-	0	319	345	-	330	367	-
Stage 2	0	-	-	-	-	0	341	367	-	301	345	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	737	-	-	34	78	322	~ 52	78	325
Mov Cap-2 Maneuver	-	-	-	-	-	-	34	78	-	~ 52	78	-
Stage 1	-	-	-	-	-	-	319	345	-	330	366	-
Stage 2	-	-	-	-	-	-	212	366	-	278	345	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	33	\$ 1046.6
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	156	-	-	737	-	52	245
HCM Lane V/C Ratio	0.177	-	-	0.002	-	4.264	0.521
HCM Control Delay (s)	33	-	-	9.9	\$ 1628.6	34.6	
HCM Lane LOS	D	-	-	A	A	F	D
HCM 95th %tile Q(veh)	0.6	-	-	0	-	24.6	2.7

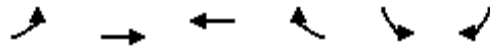
Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱			
Traffic Volume (vph)	66	854	752	104	0	0
Future Volume (vph)	66	854	752	104	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.984			
Flt Protected		0.996				
Satd. Flow (prot)	0	1767	1779	0	0	0
Flt Permitted		0.996				
Satd. Flow (perm)	0	1767	1779	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.78	0.78	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	21%	6%	3%	20%	0%	0%
Adj. Flow (vph)	85	1095	874	121	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1180	995	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	101.2%			ICU Level of Service G		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	341	206	332	585	88	203	189	217	98	314	161
Future Volume (vph)	51	341	206	332	585	88	203	189	217	98	314	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.943			0.980			0.920				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1203	1675	0	1770	1790	0	1770	1666	0	1641	1792	1404
Flt Permitted	0.112			0.152			0.208			0.184		
Satd. Flow (perm)	142	1675	0	283	1790	0	387	1666	0	318	1792	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			11			69				205
Link Speed (mph)		50			50			50				55
Link Distance (ft)		3016			735			1325				3249
Travel Time (s)		41.1			10.0			18.1				40.3
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Adj. Flow (vph)	54	359	217	357	629	95	216	201	231	120	383	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	576	0	357	724	0	216	432	0	120	383	196
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

2023 No Build AM Alta Ed Schmidt TIA 5:31 pm 04/18/2023 2023 No Build AM
Kimley-Horn

Synchro 11 Report
Page 6

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	9.5	29.0		17.0	36.5		11.1	24.4		9.6	22.9	22.9
Total Split (%)	11.9%	36.3%		21.3%	45.6%		13.9%	30.5%		12.0%	28.6%	28.6%
Maximum Green (s)	5.0	24.5		12.5	32.0		6.6	19.9		5.1	18.4	18.4
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effect Green (s)	38.8	24.5		37.0	35.8		24.9	21.7		25.8	18.3	18.3
Actuated g/C Ratio	0.49	0.31		0.46	0.45		0.31	0.27		0.32	0.23	0.23
v/c Ratio	0.40	1.07		0.98	0.90		0.92	0.86		0.64	0.93	0.41
Control Delay	19.1	85.3		66.1	38.4		65.6	43.4		36.4	63.0	6.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	19.1	85.3		66.1	38.4		65.6	43.4		36.4	63.0	6.5
LOS	B	F		E	D		E	D		D	E	A
Approach Delay		79.6			47.6			50.8			42.6	
Approach LOS		E			D			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 79.9

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 53.7

Intersection LOS: D

Intersection Capacity Utilization 92.6%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

			
Ø1	Ø2	Ø3	Ø4
9.6 s	24.4 s	17 s	29 s
			
Ø5	Ø6	Ø7	Ø8
11.1 s	22.9 s	9.5 s	36.5 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	54	576	357	724	216	432	120	383	196
v/c Ratio	0.40	1.07	0.98	0.90	0.92	0.86	0.64	0.93	0.41
Control Delay	19.1	85.3	66.1	38.4	65.6	43.4	36.4	63.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	85.3	66.1	38.4	65.6	43.4	36.4	63.0	6.5
Queue Length 50th (ft)	13	~309	131	~350	76	180	40	188	0
Queue Length 95th (ft)	31	#505	#302	#591	#184	#357	#78	#301	34
Internal Link Dist (ft)		2936		655		1245		3169	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	134	540	363	807	235	503	187	412	480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.07	0.98	0.90	0.92	0.86	0.64	0.93	0.41

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	341	206	332	585	88	203	189	217	98	314	161
Future Volume (vph)	51	341	206	332	585	88	203	189	217	98	314	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1203	1676		1770	1791		1770	1665		1641	1792	1404
Flt Permitted	0.11	1.00		0.15	1.00		0.21	1.00		0.18	1.00	1.00
Satd. Flow (perm)	142	1676		283	1791		388	1665		318	1792	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	54	359	217	357	629	95	216	201	231	120	383	196
RTOR Reduction (vph)	0	27	0	0	6	0	0	51	0	0	0	150
Lane Group Flow (vph)	54	549	0	357	718	0	216	381	0	120	383	46
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	38.8	26.3		38.8	35.8		25.8	21.7		25.8	19.2	19.2
Effective Green, g (s)	38.8	26.3		38.8	35.8		25.8	21.7		25.8	19.2	19.2
Actuated g/C Ratio	0.47	0.32		0.47	0.43		0.31	0.26		0.31	0.23	0.23
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	105	533		357	776		231	437		164	416	326
v/s Ratio Prot	0.02	c0.33		c0.15	0.40		c0.07	c0.23		0.04	0.21	
v/s Ratio Perm	0.22			0.32			0.22			0.19		0.03
v/c Ratio	0.51	1.03		1.00	0.92		0.94	0.87		0.73	0.92	0.14
Uniform Delay, d1	17.0	28.1		21.8	22.1		25.3	29.1		23.6	31.0	25.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.2	47.1		47.6	16.7		41.3	17.1		15.4	25.5	0.2
Delay (s)	21.2	75.3		69.5	38.8		66.5	46.3		39.0	56.5	25.3
Level of Service	C	E		E	D		E	D		D	E	C
Approach Delay (s)		70.6			48.9			53.0			44.8	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			53.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			82.6			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			92.6%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	341	206	332	585	88	203	189	217	98	314	161
Future Volume (veh/h)	51	341	206	332	585	88	203	189	217	98	314	161
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	1159	1752	1870	1870	1841	1841	1870	1811	1841	1752	1811	1678
Adj Flow Rate, veh/h	54	359	217	357	629	95	216	201	231	120	383	196
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Percent Heavy Veh, %	50	10	2	2	4	4	2	6	4	10	6	15
Cap, veh/h	150	313	189	368	654	99	257	191	220	196	417	327
Arrive On Green	0.04	0.31	0.31	0.16	0.42	0.42	0.08	0.25	0.25	0.06	0.23	0.23
Sat Flow, veh/h	1104	1022	618	1781	1562	236	1781	769	883	1668	1811	1422
Grp Volume(v), veh/h	54	0	576	357	0	724	216	0	432	120	383	196
Grp Sat Flow(s),veh/h/ln	1104	0	1641	1781	0	1798	1781	0	1652	1668	1811	1422
Q Serve(g_s), s	2.2	0.0	24.5	11.9	0.0	31.3	6.6	0.0	19.9	4.3	16.5	9.8
Cycle Q Clear(g_c), s	2.2	0.0	24.5	11.9	0.0	31.3	6.6	0.0	19.9	4.3	16.5	9.8
Prop In Lane	1.00		0.38	1.00		0.13	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	150	0	502	368	0	753	257	0	411	196	417	327
V/C Ratio(X)	0.36	0.00	1.15	0.97	0.00	0.96	0.84	0.00	1.05	0.61	0.92	0.60
Avail Cap(c_a), veh/h	171	0	502	368	0	753	257	0	411	196	417	327
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	0.0	27.8	21.1	0.0	22.6	25.2	0.0	30.1	22.8	30.1	27.5
Incr Delay (d2), s/veh	1.4	0.0	87.1	38.7	0.0	23.6	21.6	0.0	58.5	5.5	25.4	3.0
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	0.0	20.6	8.1	0.0	16.0	4.4	0.0	13.7	1.8	9.3	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	114.9	59.8	0.0	46.3	46.7	0.0	88.5	28.3	55.4	30.5
LnGrp LOS	C	A	F	E	A	D	D	A	F	C	E	C
Approach Vol, veh/h	630			1081			648			699		
Approach Delay, s/veh	106.8			50.7			74.6			43.8		
Approach LOS	F			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	24.4	17.0	29.0	11.1	22.9	8.0	38.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	19.9	12.5	24.5	6.6	18.4	5.0	32.0				
Max Q Clear Time (g_c+I1), s	6.3	21.9	13.9	26.5	8.6	18.5	4.2	33.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	65.7											
HCM 6th LOS	E											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	35	20	221	22	19	297
Future Volume (vph)	35	20	221	22	19	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.988			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1556	1313	1757	0	0	1680
Flt Permitted	0.950					0.997
Satd. Flow (perm)	1556	1313	1757	0	0	1680
Link Speed (mph)	30		55			55
Link Distance (ft)	992		413			1010
Travel Time (s)	22.5		5.1			12.5
Peak Hour Factor	0.90	0.90	0.92	0.92	0.79	0.79
Heavy Vehicles (%)	16%	23%	7%	5%	56%	10%
Adj. Flow (vph)	39	22	240	24	24	376
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	22	264	0	0	400
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	20	221	22	19	297
Future Volume (Veh/h)	35	20	221	22	19	297
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.92	0.92	0.79	0.79
Hourly flow rate (vph)	39	22	240	24	24	376
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	676	252			264	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	676	252			264	
tC, single (s)	6.6	6.4			4.7	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.7	
p0 queue free %	90	97			98	
cM capacity (veh/h)	389	738			1043	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total	39	22	264	400		
Volume Left	39	0	0	24		
Volume Right	0	22	24	0		
cSH	389	738	1700	1043		
Volume to Capacity	0.10	0.03	0.16	0.02		
Queue Length 95th (ft)	8	2	0	2		
Control Delay (s)	15.3	10.0	0.0	0.7		
Lane LOS	C	B		A		
Approach Delay (s)	13.4		0.0	0.7		
Approach LOS	B					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			41.2%		ICU Level of Service	A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	20	221	22	19	297
Future Vol, veh/h	35	20	221	22	19	297
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	92	92	79	79
Heavy Vehicles, %	16	23	7	5	56	10
Mvmt Flow	39	22	240	24	24	376
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	676	252	0	0	264	0
Stage 1	252	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Critical Hdwy	6.56	6.43	-	-	4.66	-
Critical Hdwy Stg 1	5.56	-	-	-	-	-
Critical Hdwy Stg 2	5.56	-	-	-	-	-
Follow-up Hdwy	3.644	3.507	-	-	2.704	-
Pot Cap-1 Maneuver	398	738	-	-	1043	-
Stage 1	758	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	386	738	-	-	1043	-
Mov Cap-2 Maneuver	386	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13.4	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 386 738 1043			-	
HCM Lane V/C Ratio	-	- 0.101 0.03 0.023			-	
HCM Control Delay (s)	-	- 15.4 10 8.5			0	
HCM Lane LOS	-	- C B A			A	
HCM 95th %tile Q(veh)	-	- 0.3 0.1 0.1			-	

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Emory Crossing Driveway

08/08/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	31	8	235	11	3	329
Future Volume (vph)	31	8	235	11	3	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.972		0.994			
Flt Protected	0.962					
Satd. Flow (prot)	1742	0	1852	0	0	1863
Flt Permitted	0.962					
Satd. Flow (perm)	1742	0	1852	0	0	1863
Link Speed (mph)	30		55			55
Link Distance (ft)	834		3249			1031
Travel Time (s)	19.0		40.3			12.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	34	9	255	12	3	358
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	267	0	0	361
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	29.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 6: Ed Schmidt Blvd & Emory Crossing Driveway

08/08/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	8	235	11	3	329
Future Volume (Veh/h)	31	8	235	11	3	329
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	9	255	12	3	358
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	625	261			267	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	625	261			267	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	448	778			1297	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	43	267	361			
Volume Left	34	0	3			
Volume Right	9	12	0			
cSH	491	1700	1297			
Volume to Capacity	0.09	0.16	0.00			
Queue Length 95th (ft)	7	0	0			
Control Delay (s)	13.0	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	13.0	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		29.7%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	31	8	235	11	3	329
Future Vol, veh/h	31	8	235	11	3	329
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	34	9	255	12	3	358

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	625	261	0
Stage 1	261	-	-
Stage 2	364	-	-
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	449	778	1297
Stage 1	783	-	-
Stage 2	703	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	448	778	1297
Mov Cap-2 Maneuver	448	-	-
Stage 1	783	-	-
Stage 2	701	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	491	1297
HCM Lane V/C Ratio	-	-	0.086	0.003
HCM Control Delay (s)	-	-	13	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	843	5	0	636	0	2	0	4	95	2	77
Future Volume (vph)	0	843	5	0	636	0	2	0	4	95	2	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999						0.910				0.854	
Flt Protected							0.984				0.950	
Satd. Flow (prot)	0	1859	0	0	1827	0	0	1458	0	1687	1515	0
Flt Permitted							0.984				0.950	
Satd. Flow (perm)	0	1859	0	0	1827	0	0	1458	0	1687	1515	0
Link Speed (mph)	45				45				30		30	
Link Distance (ft)	768				512				309		804	
Travel Time (s)	11.6				7.8				7.0		18.3	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Heavy Vehicles (%)	0%	2%	20%	0%	4%	0%	0%	0%	25%	7%	50%	6%
Adj. Flow (vph)	0	947	6	0	677	0	4	0	8	144	3	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	953	0	0	677	0	0	12	0	144	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0		12	
Link Offset(ft)	0				0				0		0	
Crosswalk Width(ft)	16				16				16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free				Free				Stop		Stop	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 63.3%												
ICU Level of Service B												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	843	5	0	636	0	2	0	4	95	2	77
Future Volume (Veh/h)	0	843	5	0	636	0	2	0	4	95	2	77
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Hourly flow rate (vph)	0	947	6	0	677	0	4	0	8	144	3	117
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	677			953			1628	1627	950	1635	1630	677
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	677			953			1628	1627	950	1635	1630	677
tC, single (s)	4.1			4.1			7.1	6.5	6.5	7.2	7.0	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.6	4.5	3.4
p0 queue free %	100			100			93	100	97	0	96	74
cM capacity (veh/h)	924			729			59	103	286	76	79	446
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	953	677	12	144	120							
Volume Left	0	0	4	144	0							
Volume Right	6	0	8	0	117							
cSH	1700	729	125	76	400							
Volume to Capacity	0.56	0.00	0.10	1.89	0.30							
Queue Length 95th (ft)	0	0	8	318	31							
Control Delay (s)	0.0	0.0	36.7	533.7	17.8							
Lane LOS			E	F	C							
Approach Delay (s)	0.0	0.0	36.7	299.2								
Approach LOS			E	F								
Intersection Summary												
Average Delay			41.7									
Intersection Capacity Utilization			63.3%			ICU Level of Service				B		
Analysis Period (min)			15									

Intersection

Int Delay, s/veh 41.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	843	5	0	636	0	2	0	4	95	2	77
Future Vol, veh/h	0	843	5	0	636	0	2	0	4	95	2	77
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	50	50	50	66	66	66
Heavy Vehicles, %	0	2	20	0	4	0	0	0	25	7	50	6
Mvmt Flow	0	947	6	0	677	0	4	0	8	144	3	117

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	953	0	0	1629	1627	950	1631	1630	677
Stage 1	-	-	-	-	-	-	950	950	-	677	677	-
Stage 2	-	-	-	-	-	-	679	677	-	954	953	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.45	7.17	7	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.17	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.17	6	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.525	3.563	4.45	3.354
Pot Cap-1 Maneuver	0	-	-	729	-	0	82	103	286	~ 79	79	446
Stage 1	0	-	-	-	-	0	315	341	-	434	386	-
Stage 2	0	-	-	-	-	0	445	455	-	304	281	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	729	-	-	59	103	286	~ 77	79	446
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	103	-	~ 77	79	-
Stage 1	-	-	-	-	-	-	315	341	-	434	386	-
Stage 2	-	-	-	-	-	-	326	455	-	295	281	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			36.8			296.4		
HCM LOS							E			F		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	125	-	-	729	-	77	352
HCM Lane V/C Ratio	0.096	-	-	-	-	1.869	0.34
HCM Control Delay (s)	36.8	-	-	0	-	525.9	20.4
HCM Lane LOS	E	-	-	A	-	F	C
HCM 95th %tile Q(veh)	0.3	-	-	0	-	12.6	1.5

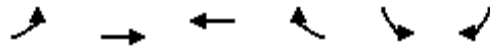
Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱			
Traffic Volume (vph)	46	910	644	111	0	0
Future Volume (vph)	46	910	644	111	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.980			
Flt Protected		0.998				
Satd. Flow (prot)	0	1821	1763	0	0	0
Flt Permitted		0.998				
Satd. Flow (perm)	0	1821	1763	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Heavy Vehicles (%)	7%	4%	5%	9%	0%	0%
Adj. Flow (vph)	51	1000	708	122	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1051	830	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	88.7%			ICU Level of Service E		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	496	167	262	396	64	213	275	348	115	302	111
Future Volume (vph)	146	496	167	262	396	64	213	275	348	115	302	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.979			0.916				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1801	0	1752	1755	0	1770	1663	0	1703	1845	1468
Flt Permitted	0.243			0.151			0.233			0.185		
Satd. Flow (perm)	453	1801	0	279	1755	0	434	1663	0	332	1845	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			12			78				143
Link Speed (mph)		50			50			50				55
Link Distance (ft)		3016			735			1325				3249
Travel Time (s)		41.1			10.0			18.1				40.3
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Adj. Flow (vph)	159	528	178	288	435	70	234	302	382	142	373	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	706	0	288	505	0	234	684	0	142	373	137
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

2023 No Build PM Alta Ed Schmidt TIA 5:31 pm 04/18/2023 2023 No Build PM
Kimley-Horn

Synchro 11 Report
Page 6

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	9.5	31.0		13.3	34.8		11.4	26.1		9.6	24.3	24.3
Total Split (%)	11.9%	38.8%		16.6%	43.5%		14.3%	32.6%		12.0%	30.4%	30.4%
Maximum Green (s)	5.0	26.5		8.8	30.3		6.9	21.6		5.1	19.8	19.8
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effect Green (s)	35.3	26.5		35.3	30.3		26.7	21.6		26.7	19.8	19.8
Actuated g/C Ratio	0.44	0.33		0.44	0.38		0.33	0.27		0.33	0.25	0.25
v/c Ratio	0.56	1.16		1.01	0.75		0.90	1.35		0.72	0.82	0.29
Control Delay	20.5	114.5		77.8	29.6		58.2	197.4		40.3	45.0	6.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	20.5	114.5		77.8	29.6		58.2	197.4		40.3	45.0	6.1
LOS	C	F		E	C		E	F		D	D	A
Approach Delay		97.2			47.1			161.9			35.8	
Approach LOS		F			D			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.35

Intersection Signal Delay: 90.9

Intersection LOS: F

Intersection Capacity Utilization 107.9%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

			
Ø1	Ø2	Ø3	Ø4
9.6 s	26.1 s	13.3 s	31 s
			
Ø5	Ø6	Ø7	Ø8
11.4 s	24.3 s	9.5 s	34.8 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	159	706	288	505	234	684	142	373	137
v/c Ratio	0.56	1.16	1.01	0.75	0.90	1.35	0.72	0.82	0.29
Control Delay	20.5	114.5	77.8	29.6	58.2	197.4	40.3	45.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	114.5	77.8	29.6	58.2	197.4	40.3	45.0	6.1
Queue Length 50th (ft)	41	~417	~97	210	80	~429	46	176	0
Queue Length 95th (ft)	75	#626	#254	#334	#185	#637	#79	#261	29
Internal Link Dist (ft)		2936		655		1245		3169	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	282	611	285	672	260	505	198	456	470
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.16	1.01	0.75	0.90	1.35	0.72	0.82	0.29

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	496	167	262	396	64	213	275	348	115	302	111
Future Volume (vph)	146	496	167	262	396	64	213	275	348	115	302	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1801		1752	1756		1770	1663		1703	1845	1468
Flt Permitted	0.24	1.00		0.15	1.00		0.23	1.00		0.19	1.00	1.00
Satd. Flow (perm)	453	1801		278	1756		435	1663		332	1845	1468
Peak-hour factor, PHF	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Adj. Flow (vph)	159	528	178	288	435	70	234	302	382	142	373	137
RTOR Reduction (vph)	0	15	0	0	7	0	0	57	0	0	0	103
Lane Group Flow (vph)	159	691	0	288	498	0	234	627	0	142	373	34
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	35.3	26.5		35.3	30.3		26.7	21.6		26.7	19.8	19.8
Effective Green, g (s)	35.3	26.5		35.3	30.3		26.7	21.6		26.7	19.8	19.8
Actuated g/C Ratio	0.44	0.33		0.44	0.38		0.33	0.27		0.33	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	282	596		284	665		260	449		198	456	363
v/s Ratio Prot	0.04	c0.38		c0.11	c0.28		c0.08	c0.38		0.05	0.20	
v/s Ratio Perm	0.21			0.33			0.22			0.19		0.02
v/c Ratio	0.56	1.16		1.01	0.75		0.90	1.40		0.72	0.82	0.09
Uniform Delay, d1	15.4	26.8		19.0	21.5		23.0	29.2		21.5	28.4	23.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	89.1		57.0	4.6		31.0	191.6		11.7	10.9	0.1
Delay (s)	18.0	115.9		76.0	26.1		54.0	220.8		33.2	39.3	23.3
Level of Service	B	F		E	C		D	F		C	D	C
Approach Delay (s)		97.9			44.3			178.3			34.6	
Approach LOS		F			D			F			C	
Intersection Summary												
HCM 2000 Control Delay			94.8			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.21									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			107.9%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	496	167	262	396	64	213	275	348	115	302	111
Future Volume (veh/h)	146	496	167	262	396	64	213	275	348	115	302	111
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	1900	1856	1826	1722	1870	1856	1811	1811	1856	1752
Adj Flow Rate, veh/h	159	528	178	288	435	70	234	302	382	142	373	137
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	0	3	5	12	2	3	6	6	3	10
Cap, veh/h	320	443	149	284	581	94	295	201	254	200	459	367
Arrive On Green	0.06	0.33	0.33	0.11	0.38	0.38	0.09	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	1781	1338	451	1767	1535	247	1781	744	942	1725	1856	1485
Grp Volume(v), veh/h	159	0	706	288	0	505	234	0	684	142	373	137
Grp Sat Flow(s),veh/h/ln	1781	0	1789	1767	0	1781	1781	0	1686	1725	1856	1485
Q Serve(g_s), s	4.4	0.0	26.5	8.8	0.0	19.7	6.9	0.0	21.6	4.8	15.1	6.1
Cycle Q Clear(g_c), s	4.4	0.0	26.5	8.8	0.0	19.7	6.9	0.0	21.6	4.8	15.1	6.1
Prop In Lane	1.00		0.25	1.00		0.14	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	320	0	593	284	0	675	295	0	455	200	459	367
V/C Ratio(X)	0.50	0.00	1.19	1.01	0.00	0.75	0.79	0.00	1.50	0.71	0.81	0.37
Avail Cap(c_a), veh/h	320	0	593	284	0	675	295	0	455	200	459	367
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	26.8	20.1	0.0	21.5	24.2	0.0	29.2	22.3	28.3	25.0
Incr Delay (d2), s/veh	1.2	0.0	102.0	56.6	0.0	4.6	13.7	0.0	237.4	11.1	10.6	0.6
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	1.6	0.0	26.6	7.5	0.0	7.9	4.1	0.0	37.8	2.3	7.3	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	0.0	128.8	76.7	0.0	26.2	37.9	0.0	266.6	33.4	39.0	25.6
LnGrp LOS	B	A	F	F	A	C	D	A	F	C	D	C
Approach Vol, veh/h	865			793			918			652		
Approach Delay, s/veh	108.4			44.5			208.3			34.9		
Approach LOS	F			D			F			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	26.1	13.3	31.0	11.4	24.3	9.5	34.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	21.6	8.8	26.5	6.9	19.8	5.0	30.3				
Max Q Clear Time (g_c+I1), s	6.8	23.6	10.8	28.5	8.9	17.1	6.4	21.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.7	0.0	1.9				
Intersection Summary												
HCM 6th Ctrl Delay	106.3											
HCM 6th LOS	F											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	52	20	220	35	22	317
Future Volume (vph)	52	20	220	35	22	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.981			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1770	1380	1751	0	0	1799
Flt Permitted	0.950					0.997
Satd. Flow (perm)	1770	1380	1751	0	0	1799
Link Speed (mph)	30		55			55
Link Distance (ft)	992		413			1010
Travel Time (s)	22.5		5.1			12.5
Peak Hour Factor	0.76	0.76	0.88	0.88	0.85	0.85
Heavy Vehicles (%)	2%	17%	7%	3%	10%	5%
Adj. Flow (vph)	68	26	250	40	26	373
Shared Lane Traffic (%)						
Lane Group Flow (vph)	68	26	290	0	0	399
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	44.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	20	220	35	22	317
Future Volume (Veh/h)	52	20	220	35	22	317
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.88	0.88	0.85	0.85
Hourly flow rate (vph)	68	26	250	40	26	373
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	695	270			290	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	695	270			290	
tC, single (s)	6.4	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.3	
p0 queue free %	83	96			98	
cM capacity (veh/h)	400	734			1227	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total	68	26	290	399		
Volume Left	68	0	0	26		
Volume Right	0	26	40	0		
cSH	400	734	1700	1227		
Volume to Capacity	0.17	0.04	0.17	0.02		
Queue Length 95th (ft)	15	3	0	2		
Control Delay (s)	15.8	10.1	0.0	0.7		
Lane LOS	C	B		A		
Approach Delay (s)	14.3		0.0	0.7		
Approach LOS	B					
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			44.8%		ICU Level of Service	A
Analysis Period (min)			15			

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	20	220	35	22	317
Future Vol, veh/h	52	20	220	35	22	317
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	88	88	85	85
Heavy Vehicles, %	2	17	7	3	10	5
Mvmt Flow	68	26	250	40	26	373

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	695	270	0	0	290
Stage 1	270	-	-	-	-
Stage 2	425	-	-	-	-
Critical Hdwy	6.42	6.37	-	-	4.2
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.453	-	-	2.29
Pot Cap-1 Maneuver	408	734	-	-	1227
Stage 1	775	-	-	-	-
Stage 2	659	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	397	734	-	-	1227
Mov Cap-2 Maneuver	397	-	-	-	-
Stage 1	775	-	-	-	-
Stage 2	641	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.3	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 397 734 1227	-	-
HCM Lane V/C Ratio	-	- 0.172 0.036 0.021	-	-
HCM Control Delay (s)	-	- 15.9 10.1 8	0	0
HCM Lane LOS	-	- C B A	A	A
HCM 95th %tile Q(veh)	-	- 0.6 0.1 0.1	-	-

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Emory Crossing Driveway

08/08/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	22	6	251	35	9	360
Future Volume (vph)	22	6	251	35	9	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.970		0.984			
Flt Protected	0.963					0.999
Satd. Flow (prot)	1740	0	1833	0	0	1861
Flt Permitted	0.963					0.999
Satd. Flow (perm)	1740	0	1833	0	0	1861
Link Speed (mph)	30		55			55
Link Distance (ft)	834		3249			1031
Travel Time (s)	19.0		40.3			12.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	24	7	273	38	10	391
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	0	311	0	0	401
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60		60	60	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 6: Ed Schmidt Blvd & Emory Crossing Driveway

08/08/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	6	251	35	9	360
Future Volume (Veh/h)	22	6	251	35	9	360
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	7	273	38	10	391
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	703	292			311	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	703	292			311	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			99	
cM capacity (veh/h)	401	747			1249	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	31	311	401			
Volume Left	24	0	10			
Volume Right	7	38	0			
cSH	447	1700	1249			
Volume to Capacity	0.07	0.18	0.01			
Queue Length 95th (ft)	6	0	1			
Control Delay (s)	13.6	0.0	0.3			
Lane LOS	B		A			
Approach Delay (s)	13.6	0.0	0.3			
Approach LOS	B					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		36.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM 6th TWSC
6: Ed Schmidt Blvd & Emory Crossing Driveway

08/08/2023

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	6	251	35	9	360
Future Vol, veh/h	22	6	251	35	9	360
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	24	7	273	38	10	391
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	703	292	0	0	311	0
Stage 1	292	-	-	-	-	-
Stage 2	411	-	-	-	-	-
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	404	747	-	-	1249	-
Stage 1	758	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	400	747	-	-	1249	-
Mov Cap-2 Maneuver	400	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13.7	0	0.2			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	444	1249	-	
HCM Lane V/C Ratio	-	-	0.069	0.008	-	
HCM Control Delay (s)	-	-	13.7	7.9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.892	0.865			
Flt Protected								0.990	0.950			
Satd. Flow (prot)	0	1827	0	0	1863	0	0	1678	0	1641	1426	0
Flt Permitted								0.990	0.950			
Satd. Flow (perm)	0	1827	0	0	1863	0	0	1678	0	1641	1426	0
Link Speed (mph)	45				45		30				30	
Link Distance (ft)	768				512		309				804	
Travel Time (s)	11.6				7.8		7.0				18.3	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	10%	0%	17%
Adj. Flow (vph)	0	1001	3	2	1065	0	7	0	28	222	13	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1004	0	0	1067	0	0	35	0	222	129	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0		0				12	
Link Offset(ft)	0				0		0				0	
Crosswalk Width(ft)	16				16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free				Free		Stop				Stop	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 71.0%												
ICU Level of Service C												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

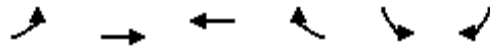
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (Veh/h)	0	801	2	2	905	0	2	0	8	153	9	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Hourly flow rate (vph)	0	1001	2	2	1065	0	7	0	28	222	13	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1065			1003			2078	2071	1002	2099	2072	1065
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1065			1003			2078	2071	1002	2099	2072	1065
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	100			100			60	100	91	0	76	54
cM capacity (veh/h)	662			698			18	55	297	33	54	253
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	1003	1067	35	222	129							
Volume Left	0	2	7	222	0							
Volume Right	2	0	28	0	116							
cSH	1700	698	71	33	185							
Volume to Capacity	0.59	0.00	0.49	6.83	0.70							
Queue Length 95th (ft)	0	0	50	Err	107							
Control Delay (s)	0.0	0.1	97.5	Err	60.0							
Lane LOS		A	F	F	F							
Approach Delay (s)	0.0	0.1	97.5	6346.2								
Approach LOS			F	F								
Intersection Summary												
Average Delay			908.4									
Intersection Capacity Utilization			71.0%		ICU Level of Service				C			
Analysis Period (min)			15									

Intersection												
Int Delay, s/veh	258.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱		↱	↱	
Traffic Vol, veh/h	0	801	2	2	905	0	2	0	8	153	9	80
Future Vol, veh/h	0	801	2	2	905	0	2	0	8	153	9	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	85	85	85	29	29	29	69	69	69
Heavy Vehicles, %	0	4	0	0	2	0	0	0	0	10	0	17
Mvmt Flow	0	1001	3	2	1065	0	7	0	28	222	13	116
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1004	0	0	2079	2072	1003	2086	2073	1065
Stage 1	-	-	-	-	-	-	1003	1003	-	1069	1069	-
Stage 2	-	-	-	-	-	-	1076	1069	-	1017	1004	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.2	7.2	6.5	6.37
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.3	3.59	4	3.453
Pot Cap-1 Maneuver	0	-	-	698	-	0	40	55	297	~ 37	55	253
Stage 1	0	-	-	-	-	0	294	322	-	259	300	-
Stage 2	0	-	-	-	-	0	268	300	-	277	322	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	698	-	-	18	55	297	~ 33	55	253
Mov Cap-2 Maneuver	-	-	-	-	-	-	18	55	-	~ 33	55	-
Stage 1	-	-	-	-	-	-	294	322	-	259	298	-
Stage 2	-	-	-	-	-	-	138	298	-	251	322	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			94.4			\$ 1799.6		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2					
Capacity (veh/h)	72	-	-	698	-	33	182					
HCM Lane V/C Ratio	0.479	-	-	0.003	-	6.719	0.709					
HCM Control Delay (s)	94.4	-	-	10.2	\$	2810.2	62.2					
HCM Lane LOS	F	-	-	B	A	F	F					
HCM 95th %tile Q(veh)	1.9	-	-	0	-	26.7	4.4					
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	903	908	104	0	0
Future Volume (vph)	66	903	908	104	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986			
Flt Protected		0.997				
Satd. Flow (prot)	0	1770	1788	0	0	0
Flt Permitted		0.997				
Satd. Flow (perm)	0	1770	1788	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.78	0.78	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	21%	6%	3%	20%	0%	0%
Adj. Flow (vph)	85	1158	1056	121	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1243	1177	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	105.2%			ICU Level of Service G		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.943			0.978			0.927				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1203	1675	0	1770	1787	0	1770	1677	0	1641	1792	1404
Flt Permitted	0.125			0.163			0.217			0.201		
Satd. Flow (perm)	158	1675	0	304	1787	0	404	1677	0	347	1792	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			13			57				263
Link Speed (mph)		50			50			50				55
Link Distance (ft)		3016			735			1325				3271
Travel Time (s)		41.1			10.0			18.1				40.5
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Adj. Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	577	0	358	737	0	216	472	0	163	532	388
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	9.5	29.0		17.0	36.5		11.1	24.4		9.6	22.9	22.9
Total Split (%)	11.9%	36.3%		21.3%	45.6%		13.9%	30.5%		12.0%	28.6%	28.6%
Maximum Green (s)	5.0	24.5		12.5	32.0		6.6	19.9		5.1	18.4	18.4
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effect Green (s)	37.0	24.5		37.0	32.0		25.0	19.9		25.0	18.4	18.4
Actuated g/C Ratio	0.46	0.31		0.46	0.40		0.31	0.25		0.31	0.23	0.23
v/c Ratio	0.76	1.07		0.97	1.02		0.91	1.03		0.86	1.29	0.74
Control Delay	48.4	86.2		62.1	64.7		62.8	78.3		60.8	177.6	19.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.4	86.2		62.1	64.7		62.8	78.3		60.8	177.6	19.5
LOS	D	F		E	E		E	E		E	F	B
Approach Delay		80.4			63.8			73.4			103.4	
Approach LOS		F			E			E			F	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.29

Intersection Signal Delay: 80.9

Intersection LOS: F

Intersection Capacity Utilization 98.2%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

 Ø1	 Ø2	 Ø3	 Ø4
9.6 s	24.4 s	17 s	29 s
 Ø5	 Ø6	 Ø7	 Ø8
11.1 s	22.9 s	9.5 s	36.5 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	105	577	358	737	216	472	163	532	388
v/c Ratio	0.76	1.07	0.97	1.02	0.91	1.03	0.86	1.29	0.74
Control Delay	48.4	86.2	62.1	64.7	62.8	78.3	60.8	177.6	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	86.2	62.1	64.7	62.8	78.3	60.8	177.6	19.5
Queue Length 50th (ft)	26	~310	127	~372	76	~223	56	~344	53
Queue Length 95th (ft)	#100	#506	#296	#605	#180	#415	#114	#464	123
Internal Link Dist (ft)		2936		655		1245		3191	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	138	540	369	722	238	459	190	412	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.07	0.97	1.02	0.91	1.03	0.86	1.29	0.74

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1203	1675		1770	1787		1770	1676		1641	1792	1404
Flt Permitted	0.12	1.00		0.16	1.00		0.22	1.00		0.20	1.00	1.00
Satd. Flow (perm)	158	1675		304	1787		405	1676		347	1792	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
RTOR Reduction (vph)	0	27	0	0	8	0	0	43	0	0	0	203
Lane Group Flow (vph)	105	550	0	358	729	0	216	429	0	163	532	185
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	37.0	24.5		37.0	32.0		25.0	19.9		25.0	18.4	18.4
Effective Green, g (s)	37.0	24.5		37.0	32.0		25.0	19.9		25.0	18.4	18.4
Actuated g/C Ratio	0.46	0.31		0.46	0.40		0.31	0.25		0.31	0.23	0.23
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	138	512		369	714		239	416		190	412	322
v/s Ratio Prot	0.05	0.33		c0.15	c0.41		c0.07	0.26		0.05	c0.30	
v/s Ratio Perm	0.30			0.30			0.21			0.21		0.13
v/c Ratio	0.76	1.07		0.97	1.02		0.90	1.03		0.86	1.29	0.58
Uniform Delay, d1	18.0	27.8		20.2	24.0		24.5	30.1		24.7	30.8	27.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.6	61.1		38.8	39.2		33.5	52.5		29.7	148.2	2.5
Delay (s)	39.6	88.9		59.0	63.2		58.0	82.6		54.3	179.0	29.8
Level of Service	D	F		E	E		E	F		D	F	C
Approach Delay (s)		81.3			61.8			74.9			106.8	
Approach LOS		F			E			E			F	
Intersection Summary												
HCM 2000 Control Delay			81.8			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.12									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			98.2%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (veh/h)	100	341	207	333	585	100	203	227	217	134	436	318
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	1159	1752	1870	1870	1841	1841	1870	1811	1841	1752	1811	1678
Adj Flow Rate, veh/h	105	359	218	358	629	108	216	241	231	163	532	388
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Percent Heavy Veh, %	50	10	2	2	4	4	2	6	4	10	6	15
Cap, veh/h	159	313	190	368	612	105	237	211	203	196	417	327
Arrive On Green	0.06	0.31	0.31	0.16	0.40	0.40	0.08	0.25	0.25	0.06	0.23	0.23
Sat Flow, veh/h	1104	1021	620	1781	1531	263	1781	850	815	1668	1811	1422
Grp Volume(v), veh/h	105	0	577	358	0	737	216	0	472	163	532	388
Grp Sat Flow(s),veh/h/ln	1104	0	1640	1781	0	1793	1781	0	1664	1668	1811	1422
Q Serve(g_s), s	4.5	0.0	24.5	11.9	0.0	32.0	6.6	0.0	19.9	5.1	18.4	18.4
Cycle Q Clear(g_c), s	4.5	0.0	24.5	11.9	0.0	32.0	6.6	0.0	19.9	5.1	18.4	18.4
Prop In Lane	1.00		0.38	1.00		0.15	1.00		0.49	1.00		1.00
Lane Grp Cap(c), veh/h	159	0	502	368	0	717	237	0	414	196	417	327
V/C Ratio(X)	0.66	0.00	1.15	0.97	0.00	1.03	0.91	0.00	1.14	0.83	1.28	1.19
Avail Cap(c_a), veh/h	159	0	502	368	0	717	237	0	414	196	417	327
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	27.8	21.2	0.0	24.0	25.2	0.0	30.1	25.4	30.8	30.8
Incr Delay (d2), s/veh	9.7	0.0	88.0	39.3	0.0	40.8	35.6	0.0	88.3	24.8	142.2	110.5
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	1.4	0.0	20.7	8.2	0.0	19.5	5.2	0.0	17.3	3.4	23.5	15.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	0.0	115.7	60.5	0.0	64.8	60.8	0.0	118.3	50.2	173.0	141.3
LnGrp LOS	C	A	F	E	A	F	E	A	F	D	F	F
Approach Vol, veh/h	682			1095			688			1083		
Approach Delay, s/veh	102.3			63.4			100.3			143.2		
Approach LOS	F			E			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	24.4	17.0	29.0	11.1	22.9	9.5	36.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	19.9	12.5	24.5	6.6	18.4	5.0	32.0				
Max Q Clear Time (g_c+I1), s	7.1	21.9	13.9	26.5	8.6	20.4	6.5	34.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	102.4											
HCM 6th LOS	F											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Future Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.881				0.850		0.990			0.999	
Flt Protected		0.994		0.950	0.950			0.994			0.997	
Satd. Flow (prot)	0	1631	0	1556	0	1313	0	1760	0	0	1683	0
Flt Permitted		0.994		0.950	0.950			0.994			0.997	
Satd. Flow (perm)	0	1631	0	1556	0	1313	0	1760	0	0	1683	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		667			992			468			872	
Travel Time (s)		15.2			22.5			5.8			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92
Heavy Vehicles (%)	2%	0%	2%	16%	0%	23%	2%	7%	5%	56%	10%	2%
Adj. Flow (vph)	18	0	132	39	0	23	41	253	24	25	422	5
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	150	0	35	4	23	0	318	0	0	452	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	48.4%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	0	121	35	0	21	38	233	22	20	333	5
Future Volume (Veh/h)	17	0	121	35	0	21	38	233	22	20	333	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92
Hourly flow rate (vph)	18	0	132	39	0	23	41	253	24	25	422	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	844	834	424	954	824	265	427			277		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844	834	424	954	824	265	427			277		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.4	4.1			4.7		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.5	2.2			2.7		
p0 queue free %	93	100	79	77	100	97	96			98		
cM capacity (veh/h)	261	288	630	170	292	726	1132			1030		
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	150	26	36	318	452							
Volume Left	18	26	13	41	25							
Volume Right	132	0	23	24	5							
cSH	539	170	333	1132	1030							
Volume to Capacity	0.28	0.15	0.11	0.04	0.02							
Queue Length 95th (ft)	28	13	9	3	2							
Control Delay (s)	14.2	30.0	17.1	1.4	0.7							
Lane LOS	B	D	C	A	A							
Approach Delay (s)	14.2	22.5		1.4	0.7							
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			48.4%			ICU Level of Service			A			
Analysis Period (min)			15									

Intersection

Int Delay, s/veh 4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕		↕		↕			↕	
Traffic Vol, veh/h	17	0	121	35	0	21	38	233	22	20	333	5
Future Vol, veh/h	17	0	121	35	0	21	38	233	22	20	333	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	90	90	90	92	92	92	79	79	92
Heavy Vehicles, %	2	0	2	16	0	23	2	7	5	56	10	2
Mvmt Flow	18	0	132	39	0	23	41	253	24	25	422	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	834	834	425	888	-	265	427	0	0	277	0	0
Stage 1	475	475	-	347	-	-	-	-	-	-	-	-
Stage 2	359	359	-	541	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.5	6.22	7.26	-	6.43	4.12	-	-	4.66	-	-
Critical Hdwy Stg 1	6.12	5.5	-	6.26	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.5	-	6.26	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.318	3.644	-	3.507	2.218	-	-	2.704	-	-
Pot Cap-1 Maneuver	288	306	629	250	0	726	1132	-	-	1030	-	-
Stage 1	570	561	-	641	0	-	-	-	-	-	-	-
Stage 2	659	631	-	501	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	263	283	629	187	-	726	1132	-	-	1030	-	-
Mov Cap-2 Maneuver	263	283	-	187	-	-	-	-	-	-	-	-
Stage 1	545	543	-	613	-	-	-	-	-	-	-	-
Stage 2	610	604	-	384	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.3		22		1.1		0.5	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1132	-	-	537 187 726	1030	-	-
HCM Lane V/C Ratio	0.036	-	-	0.279 0.208 0.032	0.025	-	-
HCM Control Delay (s)	8.3	0	-	14.3 29.2 10.1	8.6	0	-
HCM Lane LOS	A	A	-	B D B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1 0.8 0.1	0.1	-	-

Lanes, Volumes, Timings
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	34	10	258	321	5
Future Volume (vph)	17	34	10	258	321	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.909				0.998	
Flt Protected	0.984			0.998		
Satd. Flow (prot)	1666	0	0	1859	1859	0
Flt Permitted	0.984			0.998		
Satd. Flow (perm)	1666	0	0	1859	1859	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	655			872	798	
Travel Time (s)	14.9			10.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	18	37	11	280	349	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	0	0	291	354	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ed Schmidt Blvd & Driveway 1

08/08/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	17	34	10	258	321	5
Future Volume (Veh/h)	17	34	10	258	321	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	37	11	280	349	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	654	352	354			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	654	352	354			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	99			
cM capacity (veh/h)	428	692	1205			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	55	291	354			
Volume Left	18	11	0			
Volume Right	37	0	5			
cSH	576	1205	1700			
Volume to Capacity	0.10	0.01	0.21			
Queue Length 95th (ft)	8	1	0			
Control Delay (s)	11.9	0.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.9	0.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			31.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM 6th TWSC
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	34	10	258	321	5
Future Vol, veh/h	17	34	10	258	321	5
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	18	37	11	280	349	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	654	352	354	0	-	0
Stage 1	352	-	-	-	-	-
Stage 2	302	-	-	-	-	-
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	431	692	1205	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	426	692	1205	-	-	-
Mov Cap-2 Maneuver	426	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1205	-	573	-	-	
HCM Lane V/C Ratio	0.009	-	0.097	-	-	
HCM Control Delay (s)	8	0	12	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	156	39	0	8	49	285	11	3	487	0
Future Volume (vph)	0	0	156	39	0	8	49	285	11	3	487	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.976			0.996				
Flt Protected					0.960			0.993				
Satd. Flow (prot)	0	1611	0	0	1745	0	0	1842	0	0	1863	0
Flt Permitted					0.960			0.993				
Satd. Flow (perm)	0	1611	0	0	1745	0	0	1842	0	0	1863	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		669			577			3271			968	
Travel Time (s)		15.2			13.1			40.5			12.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	170	42	0	9	53	310	12	3	529	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	170	0	0	51	0	0	375	0	0	532	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	70.5%											
Analysis Period (min)	15											
	ICU Level of Service C											

HCM Unsignalized Intersection Capacity Analysis

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	156	39	0	8	49	285	11	3	487	0
Future Volume (Veh/h)	0	0	156	39	0	8	49	285	11	3	487	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	170	42	0	9	53	310	12	3	529	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	966	963	529	1127	957	316	529			322		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	966	963	529	1127	957	316	529			322		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	69	65	100	99	95			100		
cM capacity (veh/h)	222	242	550	120	244	724	1038			1238		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	170	51	375	532								
Volume Left	0	42	53	3								
Volume Right	170	9	12	0								
cSH	550	141	1038	1238								
Volume to Capacity	0.31	0.36	0.05	0.00								
Queue Length 95th (ft)	33	37	4	0								
Control Delay (s)	14.5	44.3	1.7	0.1								
Lane LOS	B	E	A	A								
Approach Delay (s)	14.5	44.3	1.7	0.1								
Approach LOS	B	E										
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			70.5%	ICU Level of Service					C			
Analysis Period (min)			15									

Intersection

Int Delay, s/veh 4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	156	39	0	8	49	285	11	3	487	0
Future Vol, veh/h	0	0	156	39	0	8	49	285	11	3	487	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	170	42	0	9	53	310	12	3	529	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	962	963	529	1042	957	316	529	0	0	322	0	0
Stage 1	535	535	-	422	422	-	-	-	-	-	-	-
Stage 2	427	428	-	620	535	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	235	256	550	208	258	724	1038	-	-	1238	-	-
Stage 1	529	524	-	609	588	-	-	-	-	-	-	-
Stage 2	606	585	-	476	524	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	221	239	550	137	241	724	1038	-	-	1238	-	-
Mov Cap-2 Maneuver	221	239	-	137	241	-	-	-	-	-	-	-
Stage 1	496	522	-	571	552	-	-	-	-	-	-	-
Stage 2	562	549	-	328	522	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.4		38		1.2		0	
HCM LOS	B		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1038	-	-	550	159	1238	-
HCM Lane V/C Ratio	0.051	-	-	0.308	0.321	0.003	-
HCM Control Delay (s)	8.7	0	-	14.4	38	7.9	0
HCM Lane LOS	A	A	-	B	E	A	A
HCM 95th %tile Q(veh)	0.2	-	-	1.3	1.3	0	-

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999						0.923			0.856	
Flt Protected								0.979		0.950		
Satd. Flow (prot)	0	1859	0	0	1827	0	0	1502	0	1687	1509	0
Flt Permitted								0.979		0.950		
Satd. Flow (perm)	0	1859	0	0	1827	0	0	1502	0	1687	1509	0
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		768			512			309			804	
Travel Time (s)		11.6			7.8			7.0			18.3	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Heavy Vehicles (%)	0%	2%	20%	0%	4%	0%	0%	0%	25%	7%	50%	6%
Adj. Flow (vph)	0	1145	6	0	786	0	6	0	8	145	5	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1151	0	0	786	0	0	14	0	145	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	71.3%											
Analysis Period (min)	15											
	ICU Level of Service C											

HCM Unsignalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

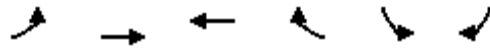
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (Veh/h)	0	1019	5	0	739	0	3	0	4	96	3	78
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Hourly flow rate (vph)	0	1145	6	0	786	0	6	0	8	145	5	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	786			1151			1936	1934	1148	1942	1937	786
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	786			1151			1936	1934	1148	1942	1937	786
tC, single (s)	4.1			4.1			7.1	6.5	6.5	7.2	7.0	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.6	4.5	3.4
p0 queue free %	100			100			81	100	96	0	90	69
cM capacity (veh/h)	842			614			32	67	217	46	49	386
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	1151	786	14	145	123							
Volume Left	0	0	6	145	0							
Volume Right	6	0	8	0	118							
cSH	1700	614	63	46	302							
Volume to Capacity	0.68	0.00	0.22	3.17	0.41							
Queue Length 95th (ft)	0	0	19	Err	47							
Control Delay (s)	0.0	0.0	78.4	Err	24.9							
Lane LOS			F	F	C							
Approach Delay (s)	0.0	0.0	78.4	5421.3								
Approach LOS			F	F								
Intersection Summary												
Average Delay			655.3									
Intersection Capacity Utilization			71.3%		ICU Level of Service				C			
Analysis Period (min)			15									

Intersection												
Int Delay, s/veh	78											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↕		↱		↱
Traffic Vol, veh/h	0	1019	5	0	739	0	3	0	4	96	3	78
Future Vol, veh/h	0	1019	5	0	739	0	3	0	4	96	3	78
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	50	50	50	66	66	66
Heavy Vehicles, %	0	2	20	0	4	0	0	0	25	7	50	6
Mvmt Flow	0	1145	6	0	786	0	6	0	8	145	5	118
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1151	0	0	1937	1934	1148	1938	1937	786
Stage 1	-	-	-	-	-	-	1148	1148	-	786	786	-
Stage 2	-	-	-	-	-	-	789	786	-	1152	1151	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.45	7.17	7	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.17	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.17	6	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.525	3.563	4.45	3.354
Pot Cap-1 Maneuver	0	-	-	614	-	0	50	67	217	~ 48	49	386
Stage 1	0	-	-	-	-	0	244	276	-	378	341	-
Stage 2	0	-	-	-	-	0	387	406	-	235	223	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	614	-	-	32	67	217	~ 46	49	386
Mov Cap-2 Maneuver	-	-	-	-	-	-	32	67	-	~ 46	49	-
Stage 1	-	-	-	-	-	-	244	276	-	378	341	-
Stage 2	-	-	-	-	-	-	265	406	-	226	223	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			79.2			\$ 641		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2					
Capacity (veh/h)	62	-	-	614	-	46	289					
HCM Lane V/C Ratio	0.226	-	-	-	-	3.162	0.425					
HCM Control Delay (s)	79.2	-	-	0		\$ 1159.6	26.3					
HCM Lane LOS	F	-	-	A	-	F	D					
HCM 95th %tile Q(veh)	0.8	-	-	0	-	15.9	2					
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱			
Traffic Volume (vph)	47	1087	747	111	0	0
Future Volume (vph)	47	1087	747	111	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.983			
Flt Protected		0.998				
Satd. Flow (prot)	0	1821	1770	0	0	0
Flt Permitted		0.998				
Satd. Flow (perm)	0	1821	1770	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Heavy Vehicles (%)	7%	4%	5%	9%	0%	0%
Adj. Flow (vph)	52	1195	821	122	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1247	943	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	98.7%			ICU Level of Service F		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.969			0.931				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1801	0	1752	1730	0	1770	1695	0	1703	1845	1468
Flt Permitted	0.198			0.151			0.202			0.185		
Satd. Flow (perm)	369	1801	0	279	1730	0	376	1695	0	332	1845	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			19			52				265
Link Speed (mph)		50			50			50				55
Link Distance (ft)		3016			735			1325				3271
Travel Time (s)		41.1			10.0			18.1				40.5
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Adj. Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265
Shared Lane Traffic (%)												
Lane Group Flow (vph)	350	706	0	289	548	0	235	836	0	170	472	265
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

2023 Build-Out PM Alta Ed Schmidt TIA 5:31 pm 04/18/2023 2023 Build-Out PM
Kimley-Horn

Synchro 11 Report
Page 6

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	9.5	31.0		13.3	34.8		11.4	26.1		9.6	24.3	24.3
Total Split (%)	11.9%	38.8%		16.6%	43.5%		14.3%	32.6%		12.0%	30.4%	30.4%
Maximum Green (s)	5.0	26.5		8.8	30.3		6.9	21.6		5.1	19.8	19.8
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effect Green (s)	35.3	26.5		35.3	30.3		26.7	21.6		26.7	19.8	19.8
Actuated g/C Ratio	0.44	0.33		0.44	0.38		0.33	0.27		0.33	0.25	0.25
v/c Ratio	1.40	1.16		1.01	0.82		0.96	1.69		0.86	1.04	0.47
Control Delay	223.2	114.5		78.7	34.0		71.9	342.3		58.5	83.8	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	223.2	114.5		78.7	34.0		71.9	342.3		58.5	83.8	6.6
LOS	F	F		E	C		E	F		E	F	A
Approach Delay		150.5			49.4			283.0			56.5	
Approach LOS		F			D			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.69

Intersection Signal Delay: 143.3

Intersection LOS: F

Intersection Capacity Utilization 116.5%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

 Ø1	 Ø2	 Ø3	 Ø4
9.6 s	26.1 s	13.3 s	31 s
 Ø5	 Ø6	 Ø7	 Ø8
11.4 s	24.3 s	9.5 s	34.8 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	350	706	289	548	235	836	170	472	265
v/c Ratio	1.40	1.16	1.01	0.82	0.96	1.69	0.86	1.04	0.47
Control Delay	223.2	114.5	78.7	34.0	71.9	342.3	58.5	83.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	223.2	114.5	78.7	34.0	71.9	342.3	58.5	83.8	6.6
Queue Length 50th (ft)	~163	~417	~98	234	81	~610	56	~257	0
Queue Length 95th (ft)	#330	#626	#255	#409	#201	#831	#113	#368	38
Internal Link Dist (ft)		2936		655		1245		3191	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	250	611	285	667	245	495	198	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	1.16	1.01	0.82	0.96	1.69	0.86	1.04	0.47

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1801		1752	1730		1770	1696		1703	1845	1468
Flt Permitted	0.20	1.00		0.15	1.00		0.20	1.00		0.19	1.00	1.00
Satd. Flow (perm)	368	1801		278	1730		376	1696		332	1845	1468
Peak-hour factor, PHF	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Adj. Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265
RTOR Reduction (vph)	0	15	0	0	12	0	0	38	0	0	0	199
Lane Group Flow (vph)	350	691	0	289	536	0	235	798	0	170	472	66
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	35.3	26.5		35.3	30.3		26.7	21.6		26.7	19.8	19.8
Effective Green, g (s)	35.3	26.5		35.3	30.3		26.7	21.6		26.7	19.8	19.8
Actuated g/C Ratio	0.44	0.33		0.44	0.38		0.33	0.27		0.33	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	250	596		284	655		245	457		198	456	363
v/s Ratio Prot	0.09	0.38		0.11	0.31		0.08	0.47		0.05	0.26	
v/s Ratio Perm	0.53			0.34			0.24			0.23		0.04
v/c Ratio	1.40	1.16		1.02	0.82		0.96	1.75		0.86	1.04	0.18
Uniform Delay, d1	21.8	26.8		19.0	22.4		24.1	29.2		23.6	30.1	23.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	202.4	89.1		58.0	7.9		45.6	344.8		28.9	51.5	0.2
Delay (s)	224.3	115.9		77.0	30.2		69.7	374.0		52.5	81.6	24.0
Level of Service	F	F		E	C		E	F		D	F	C
Approach Delay (s)		151.8			46.4			307.2			59.3	
Approach LOS		F			D			F			E	
Intersection Summary												
HCM 2000 Control Delay		150.3										F
HCM 2000 Volume to Capacity ratio		1.51										
Actuated Cycle Length (s)		80.0										18.0
Intersection Capacity Utilization		116.5%										H
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (veh/h)	322	496	167	263	396	103	214	413	348	138	382	215
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	1900	1856	1826	1722	1870	1856	1811	1811	1856	1752
Adj Flow Rate, veh/h	350	528	178	289	435	113	235	454	382	170	472	265
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	0	3	5	12	2	3	6	6	3	10
Cap, veh/h	286	443	149	284	529	137	244	251	212	200	459	367
Arrive On Green	0.06	0.33	0.33	0.11	0.38	0.38	0.09	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	1781	1338	451	1767	1398	363	1781	931	783	1725	1856	1485
Grp Volume(v), veh/h	350	0	706	289	0	548	235	0	836	170	472	265
Grp Sat Flow(s),veh/h/ln	1781	0	1789	1767	0	1761	1781	0	1715	1725	1856	1485
Q Serve(g_s), s	5.0	0.0	26.5	8.8	0.0	22.5	6.9	0.0	21.6	5.1	19.8	13.1
Cycle Q Clear(g_c), s	5.0	0.0	26.5	8.8	0.0	22.5	6.9	0.0	21.6	5.1	19.8	13.1
Prop In Lane	1.00		0.25	1.00		0.21	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	286	0	593	284	0	667	244	0	463	200	459	367
V/C Ratio(X)	1.23	0.00	1.19	1.02	0.00	0.82	0.96	0.00	1.81	0.85	1.03	0.72
Avail Cap(c_a), veh/h	286	0	593	284	0	667	244	0	463	200	459	367
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	26.8	20.1	0.0	22.4	24.8	0.0	29.2	24.4	30.1	27.6
Incr Delay (d2), s/veh	128.7	0.0	102.0	57.6	0.0	8.1	47.6	0.0	371.2	27.7	49.3	6.8
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	13.0	0.0	26.6	7.6	0.0	9.5	6.2	0.0	55.6	3.6	14.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	154.7	0.0	128.8	77.6	0.0	30.6	72.4	0.0	400.4	52.1	79.4	34.3
LnGrp LOS	F	A	F	F	A	C	E	A	F	D	F	C
Approach Vol, veh/h	1056			837			1071			907		
Approach Delay, s/veh	137.4			46.8			328.4			61.1		
Approach LOS	F			D			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	26.1	13.3	31.0	11.4	24.3	9.5	34.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	21.6	8.8	26.5	6.9	19.8	5.0	30.3				
Max Q Clear Time (g_c+I1), s	7.1	23.6	10.8	28.5	8.9	21.8	7.0	24.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6				
Intersection Summary												
HCM 6th Ctrl Delay	152.8											
HCM 6th LOS	F											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Future Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.881				0.850		0.989			0.994	
Flt Protected		0.994		0.950	0.950			0.985			0.997	
Satd. Flow (prot)	0	1631	0	1770	0	1380	0	1761	0	0	1791	0
Flt Permitted		0.994		0.950	0.950			0.985			0.997	
Satd. Flow (perm)	0	1631	0	1770	0	1380	0	1761	0	0	1791	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		667			992			468			872	
Travel Time (s)		15.2			22.5			5.8			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92
Heavy Vehicles (%)	2%	0%	2%	2%	0%	17%	2%	7%	3%	10%	5%	2%
Adj. Flow (vph)	12	0	87	70	0	28	148	294	40	26	401	21
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	99	0	63	7	28	0	482	0	0	448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	15		9	60		9	15		60
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	65.8%						ICU Level of Service C					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	80	53	0	21	136	259	35	22	341	19
Future Volume (Veh/h)	11	0	80	53	0	21	136	259	35	22	341	19
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92
Hourly flow rate (vph)	12	0	87	70	0	28	148	294	40	26	401	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1102	1094	412	1160	1084	314	422				334	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1102	1094	412	1160	1084	314	422				334	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1				4.2	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2				2.3	
p0 queue free %	93	100	86	47	100	96	87				98	
cM capacity (veh/h)	161	184	640	132	186	693	1137				1182	
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	99	47	51	482	448							
Volume Left	12	47	23	148	26							
Volume Right	87	0	28	40	21							
cSH	470	132	236	1137	1182							
Volume to Capacity	0.21	0.35	0.22	0.13	0.02							
Queue Length 95th (ft)	20	36	20	11	2							
Control Delay (s)	14.7	46.5	24.4	3.6	0.7							
Lane LOS	B	E	C	A	A							
Approach Delay (s)	14.7	35.0		3.6	0.7							
Approach LOS	B	D										
Intersection Summary												
Average Delay	6.2											
Intersection Capacity Utilization	65.8%			ICU Level of Service				C				
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	80	53	0	21	136	259	35	22	341	19
Future Vol, veh/h	11	0	80	53	0	21	136	259	35	22	341	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	76	76	76	92	88	88	85	85	92
Heavy Vehicles, %	2	0	2	2	0	17	2	7	3	10	5	2
Mvmt Flow	12	0	87	70	0	28	148	294	40	26	401	21
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1088	1094	412	1117	-	314	422	0	0	334	0	0
Stage 1	464	464	-	610	-	-	-	-	-	-	-	-
Stage 2	624	630	-	507	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.5	6.22	7.12	-	6.37	4.12	-	-	4.2	-	-
Critical Hdwy Stg 1	6.12	5.5	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.5	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.318	3.518	-	3.453	2.218	-	-	2.29	-	-
Pot Cap-1 Maneuver	193	216	640	185	0	693	1137	-	-	1182	-	-
Stage 1	578	567	-	482	0	-	-	-	-	-	-	-
Stage 2	473	478	-	548	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	159	176	640	137	-	693	1137	-	-	1182	-	-
Mov Cap-2 Maneuver	159	176	-	137	-	-	-	-	-	-	-	-
Stage 1	485	551	-	404	-	-	-	-	-	-	-	-
Stage 2	381	401	-	460	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.7		42.9		2.6		0.5					
HCM LOS	B		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1137	-	-	469	137	693	1182	-	-			
HCM Lane V/C Ratio	0.13	-	-	0.211	0.509	0.04	0.022	-	-			
HCM Control Delay (s)	8.6	0	-	14.7	55.8	10.4	8.1	0	-			
HCM Lane LOS	A	A	-	B	F	B	A	A	-			
HCM 95th %tile O(veh)	0.4	-	-	0.8	2.4	0.1	0.1	-	-			

Lanes, Volumes, Timings
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	22	39	252	359	19
Future Volume (vph)	11	22	39	252	359	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910				0.993	
Flt Protected	0.984			0.993		
Satd. Flow (prot)	1668	0	0	1850	1850	0
Flt Permitted	0.984			0.993		
Satd. Flow (perm)	1668	0	0	1850	1850	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	655			872	798	
Travel Time (s)	14.9			19.8	18.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	12	24	42	274	390	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	0	0	316	411	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60	60			60
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	22	39	252	359	19
Future Volume (Veh/h)	11	22	39	252	359	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	24	42	274	390	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	758	400	411			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758	400	411			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	96	96			
cM capacity (veh/h)	361	650	1148			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	316	411			
Volume Left	12	42	0			
Volume Right	24	0	21			
cSH	513	1148	1700			
Volume to Capacity	0.07	0.04	0.24			
Queue Length 95th (ft)	6	3	0			
Control Delay (s)	12.5	1.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.5	1.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		48.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM 6th TWSC
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	22	39	252	359	19
Future Vol, veh/h	11	22	39	252	359	19
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	12	24	42	274	390	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	759	401	411	0	-	0
Stage 1	401	-	-	-	-	-
Stage 2	358	-	-	-	-	-
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	374	649	1148	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	358	649	1148	-	-	-
Mov Cap-2 Maneuver	358	-	-	-	-	-
Stage 1	647	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.6	1.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1148	-	511	-	-	
HCM Lane V/C Ratio	0.037	-	0.07	-	-	
HCM Control Delay (s)	8.3	0	12.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	103	27	0	6	175	427	35	9	465	0
Future Volume (vph)	0	0	103	27	0	6	175	427	35	9	465	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.974			0.993				
Flt Protected					0.961			0.986			0.999	
Satd. Flow (prot)	0	1611	0	0	1744	0	0	1824	0	0	1861	0
Flt Permitted					0.961			0.986			0.999	
Satd. Flow (perm)	0	1611	0	0	1744	0	0	1824	0	0	1861	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		669			577			3271			968	
Travel Time (s)		15.2			13.1			40.5			12.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	112	29	0	7	190	464	38	10	505	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	112	0	0	36	0	0	692	0	0	515	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	77.8%											
Analysis Period (min)	15											
	ICU Level of Service D											

HCM Unsignalized Intersection Capacity Analysis

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	103	27	0	6	175	427	35	9	465	0
Future Volume (Veh/h)	0	0	103	27	0	6	175	427	35	9	465	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	112	29	0	7	190	464	38	10	505	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1395	1407	505	1500	1388	483	505	502				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1395	1407	505	1500	1388	483	505	502				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	100	100	80	58	100	99	82	99				
cM capacity (veh/h)	100	113	567	69	116	584	1060	1062				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	112	36	692	515								
Volume Left	0	29	190	10								
Volume Right	112	7	38	0								
cSH	567	83	1060	1062								
Volume to Capacity	0.20	0.43	0.18	0.01								
Queue Length 95th (ft)	18	44	16	1								
Control Delay (s)	12.9	77.8	4.2	0.3								
Lane LOS	B	F	A	A								
Approach Delay (s)	12.9	77.8	4.2	0.3								
Approach LOS	B	F										
Intersection Summary												
Average Delay	5.4											
Intersection Capacity Utilization	77.8%			ICU Level of Service					D			
Analysis Period (min)	15											

Intersection

Int Delay, s/veh 4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	103	27	0	6	175	427	35	9	465	0
Future Vol, veh/h	0	0	103	27	0	6	175	427	35	9	465	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	112	29	0	7	190	464	38	10	505	0

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1392	1407	505	1444	1388	483	505	0	0	502	0	0
Stage 1	525	525	-	863	863	-	-	-	-	-	-	-
Stage 2	867	882	-	581	525	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	119	139	567	110	143	584	1060	-	-	1062	-	-
Stage 1	536	529	-	349	372	-	-	-	-	-	-	-
Stage 2	348	364	-	499	529	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	94	103	567	71	106	584	1060	-	-	1062	-	-
Mov Cap-2 Maneuver	94	103	-	71	106	-	-	-	-	-	-	-
Stage 1	402	522	-	262	279	-	-	-	-	-	-	-
Stage 2	258	273	-	395	522	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.9		76.6		2.5		0.2	
HCM LOS	B		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	567	84	1062	-
HCM Lane V/C Ratio	0.179	-	-	0.197	0.427	0.009	-
HCM Control Delay (s)	9.1	0	-	12.9	76.6	8.4	0
HCM Lane LOS	A	A	-	B	F	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.7	1.7	0	-

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frts								0.892			0.865	
Flt Protected								0.990		0.950		
Satd. Flow (prot)	0	1827	0	0	1863	0	0	1678	0	1641	1426	0
Flt Permitted					0.999			0.948		0.734		
Satd. Flow (perm)	0	1827	0	0	1861	0	0	1607	0	1268	1426	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								28			116	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		768			512			309			804	
Travel Time (s)		11.6			7.8			7.0			18.3	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	10%	0%	17%
Adj. Flow (vph)	0	1001	3	2	1065	0	7	0	28	222	13	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1004	0	0	1067	0	0	35	0	222	129	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Detector 1 Position(ft)		0		0	0		0	0		0	0	
Detector 1 Size(ft)		6		20	6		20	6		20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Detector Phase		2		6	6		4	4		8	8	
Switch Phase												

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)		22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)		53.0		53.0	53.0		22.0	22.0		22.0	22.0	
Total Split (%)		70.7%		70.7%	70.7%		29.3%	29.3%		29.3%	29.3%	
Maximum Green (s)		48.5		48.5	48.5		17.5	17.5		17.5	17.5	
Yellow Time (s)		3.5		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	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5			4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode		Min		Min	Min		Min	Min		Min	Min	
Act Effect Green (s)		42.3		42.3	42.3		15.3	15.3		15.3	15.3	
Actuated g/C Ratio		0.63		0.63	0.63		0.23	0.23		0.23	0.23	
v/c Ratio		0.87		0.91	0.91		0.09	0.09		0.77	0.31	
Control Delay		20.6		24.1	24.1		11.8	11.8		45.7	8.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		20.6		24.1	24.1		11.8	11.8		45.7	8.9	
LOS		C		C	C		B	B		D	A	
Approach Delay		20.6		24.1	24.1		11.8	11.8			32.2	
Approach LOS		C		C	C		B	B			C	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 66.9

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 23.7

Intersection LOS: C

Intersection Capacity Utilization 71.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Limmer Loop & US 130 FB Frontage



Queues

1: Limmer Loop & US 130 FB Frontage

08/08/2023



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1004	1067	35	222	129
v/c Ratio	0.87	0.91	0.09	0.77	0.31
Control Delay	20.6	24.1	11.8	45.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	24.1	11.8	45.7	8.9
Queue Length 50th (ft)	318	357	3	96	5
Queue Length 95th (ft)	386	#534	1	123	23
Internal Link Dist (ft)	688	432	229		724
Turn Bay Length (ft)					
Base Capacity (vph)	1351	1376	457	344	471
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.78	0.08	0.65	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶			↷			↶		↷	↶	↷
Traffic Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frt		1.00			1.00			0.89		1.00	0.87	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1826			1863			1678		1641	1426	
Flt Permitted		1.00			1.00			0.95		0.73	1.00	
Satd. Flow (perm)		1826			1861			1606		1268	1426	
Peak-hour factor, PHF	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Adj. Flow (vph)	0	1001	2	2	1065	0	7	0	28	222	13	116
RTOR Reduction (vph)	0	0	0	0	0	0	0	22	0	0	89	0
Lane Group Flow (vph)	0	1004	0	0	1067	0	0	13	0	222	40	0
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	10%	0%	17%
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		42.2			42.2			15.3		15.3	15.3	
Effective Green, g (s)		42.2			42.2			15.3		15.3	15.3	
Actuated g/C Ratio		0.63			0.63			0.23		0.23	0.23	
Clearance Time (s)		4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1158			1180			369		291	328	
v/s Ratio Prot		0.55									0.03	
v/s Ratio Perm					c0.57			0.01		c0.18		
v/c Ratio		0.87			0.90			0.04		0.76	0.12	
Uniform Delay, d1		9.9			10.4			19.9		23.9	20.3	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		7.0			9.8			0.0		11.2	0.2	
Delay (s)		16.9			20.3			19.9		35.1	20.4	
Level of Service		B			C			B		D	C	
Approach Delay (s)		16.9			20.3			19.9			29.7	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			66.5			Sum of lost time (s)			9.0			
Intersection Capacity Utilization			71.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

1: Limmer Loop & US 130 FB Frontage

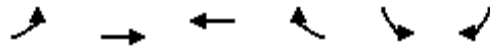
08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (veh/h)	0	801	2	2	905	0	2	0	8	153	9	80
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	0	1841	1900	1900	1870	0	1900	1900	1900	1752	1900	1648
Adj Flow Rate, veh/h	0	1001	2	2	1065	0	7	0	28	222	13	0
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Percent Heavy Veh, %	0	4	0	0	2	0	0	0	0	10	0	17
Cap, veh/h	0	1184	2	62	1205	0	106	33	259	390	381	
Arrive On Green	0.00	0.64	0.64	0.64	0.64	0.00	0.20	0.00	0.20	0.20	0.20	0.00
Sat Flow, veh/h	0	1836	4	1	1869	0	157	166	1292	1295	1900	0
Grp Volume(v), veh/h	0	0	1003	1067	0	0	35	0	0	222	13	0
Grp Sat Flow(s),veh/h/ln	0	0	1840	1869	0	0	1615	0	0	1295	1900	0
Q Serve(g_s), s	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	24.8	27.5	0.0	0.0	1.0	0.0	0.0	9.3	0.3	0.0
Prop In Lane	0.00		0.00	0.00		0.00	0.20		0.80	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	1187	1267	0	0	398	0	0	390	381	
V/C Ratio(X)	0.00	0.00	0.85	0.84	0.00	0.00	0.09	0.00	0.00	0.57	0.03	
Avail Cap(c_a), veh/h	0	0	1532	1617	0	0	555	0	0	519	571	
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)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	8.1	8.6	0.0	0.0	19.0	0.0	0.0	22.2	18.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.6	3.4	0.0	0.0	0.1	0.0	0.0	1.3	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	0.0	0.0	6.0	6.6	0.0	0.0	0.4	0.0	0.0	2.8	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	11.7	11.9	0.0	0.0	19.1	0.0	0.0	23.5	18.8	0.0
LnGrp LOS	A	A	B	B	A	A	B	A	A	C	B	
Approach Vol, veh/h	1003		1067			35			235			
Approach Delay, s/veh	11.7		11.9			19.1			23.3			
Approach LOS	B		B			B			C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	42.1		16.2		42.1		16.2					
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5					
Max Green Setting (Gmax), s	48.5		17.5		48.5		17.5					
Max Q Clear Time (g_c+I1), s	26.8		3.0		29.5		11.3					
Green Ext Time (p_c), s	7.8		0.1		8.1		0.4					
Intersection Summary												
HCM 6th Ctrl Delay			13.1									
HCM 6th LOS			B									
Notes												

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	903	908	104	0	0
Future Volume (vph)	66	903	908	104	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	340			0	0	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.986			
Flt Protected	0.950					
Satd. Flow (prot)	1417	1701	1788	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1417	1701	1788	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.78	0.78	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	21%	6%	3%	20%	0%	0%
Adj. Flow (vph)	85	1158	1056	121	0	0
Shared Lane Traffic (%)	10%					
Lane Group Flow (vph)	76	1167	1177	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	57.4%			ICU Level of Service B		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.943			0.978			0.927				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1203	1675	0	1770	1787	0	1770	1677	0	1641	1792	1404
Flt Permitted	0.092			0.116			0.127			0.143		
Satd. Flow (perm)	117	1675	0	216	1787	0	237	1677	0	247	1792	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			9			45				127
Link Speed (mph)		50			50			50				55
Link Distance (ft)		3016			735			1325				3271
Travel Time (s)		41.1			10.0			18.1				40.5
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Adj. Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	577	0	358	737	0	216	472	0	163	532	388
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	13.0	39.0		22.0	48.0		13.0	37.0		12.0	36.0	13.0
Total Split (%)	11.8%	35.5%		20.0%	43.6%		11.8%	33.6%		10.9%	32.7%	11.8%
Maximum Green (s)	8.5	34.5		17.5	43.5		8.5	32.5		7.5	31.5	8.5
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	None
Act Effect Green (s)	52.0	34.5		52.0	43.6		40.0	32.5		40.0	31.5	44.4
Actuated g/C Ratio	0.47	0.31		0.47	0.40		0.36	0.30		0.36	0.29	0.40
v/c Ratio	0.76	1.06		1.03	1.03		1.06	0.90		0.89	1.04	0.60
Control Delay	55.0	90.6		86.5	75.7		106.7	54.9		68.6	88.9	21.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	55.0	90.6		86.5	75.7		106.7	54.9		68.6	88.9	21.5
LOS	D	F		F	E		F	D		E	F	C
Approach Delay		85.2			79.2			71.2			61.7	
Approach LOS		F			E			E			E	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 73.5

Intersection LOS: E

Intersection Capacity Utilization 98.2%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

 Ø1	 Ø2	 Ø3	 Ø4
12 s	37 s	22 s	39 s
 Ø5	 Ø6	 Ø7	 Ø8
13 s	36 s	13 s	48 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	105	577	358	737	216	472	163	532	388
v/c Ratio	0.76	1.06	1.03	1.03	1.06	0.90	0.89	1.04	0.60
Control Delay	55.0	90.6	86.5	75.7	106.7	54.9	68.6	88.9	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	90.6	86.5	75.7	106.7	54.9	68.6	88.9	21.5
Queue Length 50th (ft)	38	~434	~219	~558	~115	293	75	~406	142
Queue Length 95th (ft)	#130	#653	#405	#792	#271	#485	#149	#526	205
Internal Link Dist (ft)		2936		655		1245		3191	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	139	545	349	714	204	527	184	513	643
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.06	1.03	1.03	1.06	0.90	0.89	1.04	0.60

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1203	1675		1770	1787		1770	1676		1641	1792	1404
Flt Permitted	0.09	1.00		0.12	1.00		0.13	1.00		0.14	1.00	1.00
Satd. Flow (perm)	116	1675		216	1787		237	1676		248	1792	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
RTOR Reduction (vph)	0	20	0	0	5	0	0	32	0	0	0	81
Lane Group Flow (vph)	105	557	0	358	732	0	216	440	0	163	532	307
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	52.0	34.5		52.0	43.6		40.0	32.5		40.0	31.5	39.9
Effective Green, g (s)	52.0	34.5		52.0	43.6		40.0	32.5		40.0	31.5	39.9
Actuated g/C Ratio	0.47	0.31		0.47	0.40		0.36	0.30		0.36	0.29	0.36
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	137	525		349	708		204	495		185	513	566
v/s Ratio Prot	0.06	0.33		c0.16	c0.41		c0.08	0.26		0.06	0.30	0.04
v/s Ratio Perm	0.30			0.32			c0.30			0.26		0.18
v/c Ratio	0.77	1.06		1.03	1.03		1.06	0.89		0.88	1.04	0.54
Uniform Delay, d1	24.5	37.8		32.9	33.2		30.4	37.0		28.2	39.2	27.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	22.2	56.5		54.9	42.7		79.4	17.5		35.2	49.6	1.1
Delay (s)	46.7	94.2		87.8	75.9		109.8	54.5		63.4	88.9	28.9
Level of Service	D	F		F	E		F	D		E	F	C
Approach Delay (s)		86.9			79.8			71.9			63.6	
Approach LOS		F			E			E			E	
Intersection Summary												
HCM 2000 Control Delay			74.7			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			98.2%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (veh/h)	100	341	207	333	585	100	203	227	217	134	436	318
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	1159	1752	1870	1870	1841	1841	1870	1811	1841	1752	1811	1678
Adj Flow Rate, veh/h	105	359	218	358	629	108	216	241	231	163	532	388
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Percent Heavy Veh, %	50	10	2	2	4	4	2	6	4	10	6	15
Cap, veh/h	144	320	194	349	615	106	203	251	241	194	519	508
Arrive On Green	0.07	0.31	0.31	0.16	0.40	0.40	0.08	0.30	0.30	0.07	0.29	0.29
Sat Flow, veh/h	1104	1021	620	1781	1531	263	1781	850	815	1668	1811	1422
Grp Volume(v), veh/h	105	0	577	358	0	737	216	0	472	163	532	388
Grp Sat Flow(s),veh/h/ln	1104	0	1640	1781	0	1793	1781	0	1664	1668	1811	1422
Q Serve(g_s), s	6.1	0.0	34.5	17.5	0.0	44.2	8.5	0.0	30.7	7.5	31.5	26.5
Cycle Q Clear(g_c), s	6.1	0.0	34.5	17.5	0.0	44.2	8.5	0.0	30.7	7.5	31.5	26.5
Prop In Lane	1.00		0.38	1.00		0.15	1.00		0.49	1.00		1.00
Lane Grp Cap(c), veh/h	144	0	514	349	0	721	203	0	492	194	519	508
V/C Ratio(X)	0.73	0.00	1.12	1.03	0.00	1.02	1.06	0.00	0.96	0.84	1.03	0.76
Avail Cap(c_a), veh/h	151	0	514	349	0	721	203	0	492	194	519	508
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	37.8	33.7	0.0	32.9	30.8	0.0	38.1	29.6	39.2	31.3
Incr Delay (d2), s/veh	15.8	0.0	77.5	55.1	0.0	39.3	81.0	0.0	30.5	27.1	46.2	6.8
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	2.1	0.0	23.9	10.7	0.0	25.3	8.2	0.0	15.8	4.2	19.6	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.6	0.0	115.3	88.8	0.0	72.1	111.7	0.0	68.6	56.7	85.5	38.1
LnGrp LOS	D	A	F	F	A	F	F	A	E	E	F	D
Approach Vol, veh/h	682			1095			688			1083		
Approach Delay, s/veh	103.9			77.6			82.1			64.2		
Approach LOS	F			E			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	37.0	22.0	39.0	13.0	36.0	12.3	48.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	32.5	17.5	34.5	8.5	31.5	8.5	43.5				
Max Q Clear Time (g_c+I1), s	9.5	32.7	19.5	36.5	10.5	33.5	8.1	46.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	79.4											
HCM 6th LOS	E											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Future Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.881				0.850		0.987			0.999	
Flt Protected		0.994			0.950		0.950				0.997	
Satd. Flow (prot)	0	1631	0	0	1556	1313	1770	1755	0	0	1683	0
Flt Permitted		0.994			0.950		0.950				0.997	
Satd. Flow (perm)	0	1631	0	0	1556	1313	1770	1755	0	0	1683	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		667			992			468			872	
Travel Time (s)		15.2			22.5			5.8			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92
Heavy Vehicles (%)	2%	0%	2%	16%	0%	23%	2%	7%	5%	56%	10%	2%
Adj. Flow (vph)	18	0	132	39	0	23	41	253	24	25	422	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	39	23	41	277	0	0	452	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	56.0%											
Analysis Period (min)	15											
	ICU Level of Service B											

08/08/2023

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Sign Control	Stop			Stop			Stop			Stop								
Traffic Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5						
Future Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5						
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92						
Hourly flow rate (vph)	18	0	132	39	0	23	41	253	24	25	422	5						
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1												
Volume Total (vph)	150	39	23	41	277	452												
Volume Left (vph)	18	39	0	41	0	25												
Volume Right (vph)	132	0	23	0	24	5												
Hadj (s)	-0.47	0.77	-0.31	0.53	0.06	0.22												
Departure Headway (s)	6.3	7.8	6.7	6.4	5.9	5.9												
Degree Utilization, x	0.26	0.08	0.04	0.07	0.45	0.74												
Capacity (veh/h)	503	412	473	543	588	598												
Control Delay (s)	11.6	10.3	8.8	8.7	12.4	24.0												
Approach Delay (s)	11.6	9.8		11.9		24.0												
Approach LOS	B	A		B		C												
Intersection Summary																		
Delay	17.3																	
Level of Service	C																	
Intersection Capacity Utilization	56.0%			ICU Level of Service			B											
Analysis Period (min)	15																	

HCM 6th AWSC
4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

Intersection												
Intersection Delay, s/veh	23.4											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕			↕	
Traffic Vol, veh/h	17	0	121	35	0	21	38	233	22	20	333	5
Future Vol, veh/h	17	0	121	35	0	21	38	233	22	20	333	5
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92
Heavy Vehicles, %	2	0	2	16	0	23	2	7	5	56	10	2
Mvmt Flow	18	0	132	39	0	23	41	253	24	25	422	5
Number of Lanes	0	1	0	0	1	1	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	2			1			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			1			2		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			2			1		
HCM Control Delay	12			10.8			13.2			36		
HCM LOS	B			B			B			E		
Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1						
Vol Left, %	100%	0%	12%	100%	0%	6%						
Vol Thru, %	0%	91%	0%	0%	0%	93%						
Vol Right, %	0%	9%	88%	0%	100%	1%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	38	255	138	35	21	358						
LT Vol	38	0	17	35	0	20						
Through Vol	0	233	0	0	0	333						
RT Vol	0	22	121	0	21	5						
Lane Flow Rate	41	277	150	39	23	452						
Geometry Grp	7	7	6	7	7	6						
Degree of Util (X)	0.074	0.46	0.272	0.086	0.042	0.842						
Departure Headway (Hd)	6.455	5.973	6.531	7.997	6.489	6.699						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	554	601	548	446	549	543						
Service Time	4.203	3.72	4.6	5.776	4.267	4.74						
HCM Lane V/C Ratio	0.074	0.461	0.274	0.087	0.042	0.832						
HCM Control Delay	9.7	13.7	12	11.5	9.6	36						
HCM Lane LOS	A	B	B	B	A	E						
HCM 95th-tile Q	0.2	2.4	1.1	0.3	0.1	8.7						

Lanes, Volumes, Timings
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	34	10	258	321	5
Future Volume (vph)	17	34	10	258	321	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.909				0.998	
Flt Protected	0.984			0.998		
Satd. Flow (prot)	1666	0	0	1859	1859	0
Flt Permitted	0.984			0.998		
Satd. Flow (perm)	1666	0	0	1859	1859	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	655			872	798	
Travel Time (s)	14.9			10.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	18	37	11	280	349	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	0	0	291	354	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	34	10	258	321	5
Future Volume (Veh/h)	17	34	10	258	321	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	37	11	280	349	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	654	352	354			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	654	352	354			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	99			
cM capacity (veh/h)	428	692	1205			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	55	291	354			
Volume Left	18	11	0			
Volume Right	37	0	5			
cSH	576	1205	1700			
Volume to Capacity	0.10	0.01	0.21			
Queue Length 95th (ft)	8	1	0			
Control Delay (s)	11.9	0.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.9	0.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.1				
Intersection Capacity Utilization		31.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM 6th TWSC
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	34	10	258	321	5
Future Vol, veh/h	17	34	10	258	321	5
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	18	37	11	280	349	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	654	352	354	0	-	0
Stage 1	352	-	-	-	-	-
Stage 2	302	-	-	-	-	-
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	431	692	1205	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	426	692	1205	-	-	-
Mov Cap-2 Maneuver	426	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1205	-	573	-	-	
HCM Lane V/C Ratio	0.009	-	0.097	-	-	
HCM Control Delay (s)	8	0	12	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	156	39	0	8	49	285	11	3	487	0
Future Volume (vph)	0	0	156	39	0	8	49	285	11	3	487	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.976			0.994				
Flt Protected					0.960		0.950					
Satd. Flow (prot)	0	1611	0	0	1745	0	1770	1852	0	0	1863	0
Flt Permitted					0.960		0.950					
Satd. Flow (perm)	0	1611	0	0	1745	0	1770	1852	0	0	1863	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		669			577			3271			968	
Travel Time (s)		15.2			13.1			40.5			12.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	170	42	0	9	53	310	12	3	529	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	170	0	0	51	0	53	322	0	0	532	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	60.3%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	156	39	0	8	49	285	11	3	487	0
Future Volume (Veh/h)	0	0	156	39	0	8	49	285	11	3	487	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	170	42	0	9	53	310	12	3	529	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	960	963	529	1127	957	316	529			322		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	960	963	529	1127	957	316	529			322		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	69	65	100	99	95			100		
cM capacity (veh/h)	224	242	550	120	244	724	1038			1238		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	170	51	53	322	532							
Volume Left	0	42	53	0	3							
Volume Right	170	9	0	12	0							
cSH	550	141	1038	1700	1238							
Volume to Capacity	0.31	0.36	0.05	0.19	0.00							
Queue Length 95th (ft)	33	37	4	0	0							
Control Delay (s)	14.5	44.3	8.7	0.0	0.1							
Lane LOS	B	E	A		A							
Approach Delay (s)	14.5	44.3	1.2		0.1							
Approach LOS	B	E										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			60.3%			ICU Level of Service			B			
Analysis Period (min)			15									

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵			↕	
Traffic Vol, veh/h	0	0	156	39	0	8	49	285	11	3	487	0
Future Vol, veh/h	0	0	156	39	0	8	49	285	11	3	487	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	170	42	0	9	53	310	12	3	529	0
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	962	963	529	1042	957	316	529	0	0	322	0	0
Stage 1	535	535	-	422	422	-	-	-	-	-	-	-
Stage 2	427	428	-	620	535	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	235	256	550	208	258	724	1038	-	-	1238	-	-
Stage 1	529	524	-	609	588	-	-	-	-	-	-	-
Stage 2	606	585	-	476	524	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	223	242	550	138	244	724	1038	-	-	1238	-	-
Mov Cap-2 Maneuver	223	242	-	138	244	-	-	-	-	-	-	-
Stage 1	502	522	-	578	558	-	-	-	-	-	-	-
Stage 2	568	555	-	328	522	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	14.4		37.7			1.2			0			
HCM LOS	B		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1038	-	-	550	160	1238	-	-				
HCM Lane V/C Ratio	0.051	-	-	0.308	0.319	0.003	-	-				
HCM Control Delay (s)	8.7	-	-	14.4	37.7	7.9	0	-				
HCM Lane LOS	A	-	-	B	E	A	A	-				
HCM 95th %tile Q(veh)	0.2	-	-	1.3	1.3	0	-	-				

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frnt		0.999						0.923			0.856	
Flt Protected								0.979		0.950		
Satd. Flow (prot)	0	1859	0	0	1827	0	0	1502	0	1687	1509	0
Flt Permitted								0.869		0.748		
Satd. Flow (perm)	0	1859	0	0	1827	0	0	1333	0	1328	1509	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1						25			118	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		768			512			309			804	
Travel Time (s)		11.6			7.8			7.0			18.3	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Heavy Vehicles (%)	0%	2%	20%	0%	4%	0%	0%	0%	25%	7%	50%	6%
Adj. Flow (vph)	0	1145	6	0	786	0	6	0	8	145	5	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1151	0	0	786	0	0	14	0	145	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Detector 1 Position(ft)		0		0	0		0	0		0	0	
Detector 1 Size(ft)		6		20	6		20	6		20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Detector Phase		2		6	6		4	4		8	8	
Switch Phase												

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)		22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)		51.0		51.0	51.0		14.0	14.0		14.0	14.0	
Total Split (%)		78.5%		78.5%	78.5%		21.5%	21.5%		21.5%	21.5%	
Maximum Green (s)		46.5		46.5	46.5		9.5	9.5		9.5	9.5	
Yellow Time (s)		3.5		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	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5			4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode		Min		Min	Min		Min	Min		Min	Min	
Act Effect Green (s)		39.9			39.9			9.2		9.2	9.2	
Actuated g/C Ratio		0.68			0.68			0.16		0.16	0.16	
v/c Ratio		0.91			0.63			0.06		0.69	0.36	
Control Delay		19.8			7.6			8.0		46.8	10.0	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		19.8			7.6			8.0		46.8	10.0	
LOS		B			A			A		D	B	
Approach Delay		19.8			7.6			8.0			29.9	
Approach LOS		B			A			A			C	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 58.4

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 16.6

Intersection LOS: B

Intersection Capacity Utilization 72.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Limmer Loop & US 130 FB Frontage

 Ø2	 Ø4
51 s	14 s
 Ø6	 Ø8
51 s	14 s

Queues

1: Limmer Loop & US 130 FB Frontage

08/08/2023



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1151	786	14	145	123
v/c Ratio	0.91	0.63	0.06	0.69	0.36
Control Delay	19.8	7.6	8.0	46.8	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	7.6	8.0	46.8	10.0
Queue Length 50th (ft)	262	120	0	56	2
Queue Length 95th (ft)	#620	199	2	78	19
Internal Link Dist (ft)	688	432	229		724
Turn Bay Length (ft)					
Base Capacity (vph)	1484	1458	244	222	351
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.78	0.54	0.06	0.65	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻			↻		↻	↻	
Traffic Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frt		1.00			1.00			0.92		1.00	0.86	
Flt Protected		1.00			1.00			0.98		0.95	1.00	
Satd. Flow (prot)		1860			1827			1502		1687	1509	
Flt Permitted		1.00			1.00			0.87		0.75	1.00	
Satd. Flow (perm)		1860			1827			1334		1329	1509	
Peak-hour factor, PHF	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Adj. Flow (vph)	0	1145	6	0	786	0	6	0	8	145	5	118
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	99	0
Lane Group Flow (vph)	0	1151	0	0	786	0	0	2	0	145	24	0
Heavy Vehicles (%)	0%	2%	20%	0%	4%	0%	0%	0%	25%	7%	50%	6%
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		39.9			39.9			9.2		9.2	9.2	
Effective Green, g (s)		39.9			39.9			9.2		9.2	9.2	
Actuated g/C Ratio		0.69			0.69			0.16		0.16	0.16	
Clearance Time (s)		4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1277			1254			211		210	238	
v/s Ratio Prot		c0.62			0.43						0.02	
v/s Ratio Perm								0.00		c0.11		
v/c Ratio		0.90			0.63			0.01		0.69	0.10	
Uniform Delay, d1		7.5			5.0			20.6		23.1	20.9	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		9.0			1.0			0.0		9.4	0.2	
Delay (s)		16.5			6.0			20.6		32.5	21.1	
Level of Service		B			A			C		C	C	
Approach Delay (s)		16.5			6.0			20.6			27.3	
Approach LOS		B			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			14.1									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			58.1									Sum of lost time (s) 9.0
Intersection Capacity Utilization			72.2%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

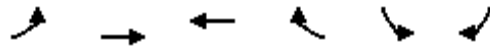
1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (veh/h)	0	1019	5	0	739	0	3	0	4	96	3	78
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	0	1870	1604	1900	1841	0	1900	1900	1530	1796	1159	1811
Adj Flow Rate, veh/h	0	1145	6	0	786	0	6	0	8	145	5	0
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Percent Heavy Veh, %	0	2	20	0	4	0	0	0	25	7	50	6
Cap, veh/h	0	1289	7	0	1276	0	158	32	127	325	162	
Arrive On Green	0.00	0.69	0.69	0.00	0.69	0.00	0.14	0.00	0.14	0.14	0.14	0.00
Sat Flow, veh/h	0	1859	10	0	1841	0	452	229	908	1352	1159	0
Grp Volume(v), veh/h	0	0	1151	0	786	0	14	0	0	145	5	0
Grp Sat Flow(s),veh/h/ln	0	0	1869	0	1841	0	1590	0	0	1352	1159	0
Q Serve(g_s), s	0.0	0.0	26.5	0.0	12.3	0.0	0.0	0.0	0.0	5.1	0.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	26.5	0.0	12.3	0.0	0.4	0.0	0.0	5.5	0.2	0.0
Prop In Lane	0.00		0.01	0.00		0.00	0.43		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	1296	0	1276	0	317	0	0	325	162	
V/C Ratio(X)	0.00	0.00	0.89	0.00	0.62	0.00	0.04	0.00	0.00	0.45	0.03	
Avail Cap(c_a), veh/h	0	0	1611	0	1586	0	373	0	0	374	204	
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)	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	6.6	0.0	4.4	0.0	20.1	0.0	0.0	22.3	20.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	5.5	0.0	0.5	0.0	0.1	0.0	0.0	1.0	0.1	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	0.0	0.0	5.1	0.0	1.6	0.0	0.1	0.0	0.0	1.7	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	12.1	0.0	4.9	0.0	20.2	0.0	0.0	23.2	20.1	0.0
LnGrp LOS	A	A	B	A	A	A	C	A	A	C	C	
Approach Vol, veh/h	1151		786			14			150			
Approach Delay, s/veh	12.1		4.9			20.2			23.1			
Approach LOS	B		A			C			C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	41.9		12.0		41.9		12.0					
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5					
Max Green Setting (Gmax), s	46.5		9.5		46.5		9.5					
Max Q Clear Time (g_c+I1), s	28.5		2.4		14.3		7.5					
Green Ext Time (p_c), s	8.9		0.0		5.8		0.1					
Intersection Summary												
HCM 6th Ctrl Delay	10.3											
HCM 6th LOS	B											
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings
2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	1087	747	111	0	0
Future Volume (vph)	47	1087	747	111	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	340			0	0	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.983			
Flt Protected	0.950					
Satd. Flow (prot)	1603	1735	1770	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1603	1735	1770	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Heavy Vehicles (%)	7%	4%	5%	9%	0%	0%
Adj. Flow (vph)	52	1195	821	122	0	0
Shared Lane Traffic (%)	10%					
Lane Group Flow (vph)	47	1200	943	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	51.0%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	200		200	100		0	500		500
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.969			0.931				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1801	0	1752	1730	0	1770	1695	0	1703	1845	1468
Flt Permitted	0.113			0.096			0.244			0.078		
Satd. Flow (perm)	210	1801	0	177	1730	0	455	1695	0	140	1845	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			10			39				140
Link Speed (mph)		50			50			50			55	
Link Distance (ft)		3016			735			1325			3271	
Travel Time (s)		41.1			10.0			18.1			40.5	
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Adj. Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265
Shared Lane Traffic (%)												
Lane Group Flow (vph)	350	706	0	289	548	0	235	836	0	170	472	265
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	9.5		9.5	9.5		9.5	9.5		9.5	9.5	9.5
Total Split (s)	23.0	46.0		17.0	40.0		14.0	56.0		11.0	53.0	23.0
Total Split (%)	17.7%	35.4%		13.1%	30.8%		10.8%	43.1%		8.5%	40.8%	17.7%
Maximum Green (s)	18.5	41.5		12.5	35.5		9.5	51.5		6.5	48.5	18.5
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	None
Act Effect Green (s)	54.0	41.5		54.0	35.5		58.0	51.5		58.0	48.5	71.5
Actuated g/C Ratio	0.42	0.32		0.42	0.27		0.45	0.40		0.45	0.37	0.55
v/c Ratio	1.13	1.21		1.29	1.14		0.79	1.20		1.21	0.69	0.30
Control Delay	127.3	147.4		190.5	128.9		42.4	138.7		171.2	40.5	8.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	127.3	147.4		190.5	128.9		42.4	138.7		171.2	40.5	8.0
LOS	F	F		F	F		D	F		F	D	A
Approach Delay		140.7			150.2			117.5			55.5	
Approach LOS		F			F			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.29

Intersection Signal Delay: 116.4

Intersection LOS: F

Intersection Capacity Utilization 116.5%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

			
Ø1	Ø2	Ø3	Ø4
11 s	56 s	17 s	46 s
			
Ø5	Ø6	Ø7	Ø8
14 s	53 s	23 s	40 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	350	706	289	548	235	836	170	472	265
v/c Ratio	1.13	1.21	1.29	1.14	0.79	1.20	1.21	0.69	0.30
Control Delay	127.3	147.4	190.5	128.9	42.4	138.7	171.2	40.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.3	147.4	190.5	128.9	42.4	138.7	171.2	40.5	8.0
Queue Length 50th (ft)	~291	~719	~260	~535	116	~838	~125	333	50
Queue Length 95th (ft)	#489	#961	#443	#762	#206	#1089	#230	395	82
Internal Link Dist (ft)		2936		655		1245		3191	
Turn Bay Length (ft)	50		200		100		500		500
Base Capacity (vph)	309	584	224	479	299	695	140	688	870
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	1.21	1.29	1.14	0.79	1.20	1.21	0.69	0.30

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1801		1752	1730		1770	1696		1703	1845	1468
Flt Permitted	0.11	1.00		0.10	1.00		0.24	1.00		0.08	1.00	1.00
Satd. Flow (perm)	210	1801		178	1730		455	1696		139	1845	1468
Peak-hour factor, PHF	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Adj. Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265
RTOR Reduction (vph)	0	10	0	0	7	0	0	24	0	0	0	68
Lane Group Flow (vph)	350	696	0	289	541	0	235	812	0	170	472	197
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Actuated Green, G (s)	54.0	41.5		54.0	35.5		58.0	51.5		58.0	48.5	67.0
Effective Green, g (s)	54.0	41.5		54.0	35.5		58.0	51.5		58.0	48.5	67.0
Actuated g/C Ratio	0.42	0.32		0.42	0.27		0.45	0.40		0.45	0.37	0.52
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	309	574		225	472		299	671		140	688	807
v/s Ratio Prot	c0.16	0.39		0.12	0.31		0.06	0.48		c0.06	0.26	0.03
v/s Ratio Perm	0.31			c0.41			0.29			c0.48		0.10
v/c Ratio	1.13	1.21		1.28	1.15		0.79	1.21		1.21	0.69	0.24
Uniform Delay, d1	39.6	44.2		37.5	47.2		28.7	39.2		31.3	34.3	17.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	92.0	111.4		157.4	87.9		12.7	108.4		144.9	2.8	0.2
Delay (s)	131.5	155.6		194.9	135.1		41.4	147.6		176.2	37.2	17.6
Level of Service	F	F		F	F		D	F		F	D	B
Approach Delay (s)		147.7			155.8			124.3			57.5	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM 2000 Control Delay		121.8					HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio		1.25										
Actuated Cycle Length (s)		130.0					Sum of lost time (s)			18.0		
Intersection Capacity Utilization		116.5%					ICU Level of Service			H		
Analysis Period (min)		15										
c Critical Lane Group												

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (veh/h)	322	496	167	263	396	103	214	413	348	138	382	215
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	1900	1856	1826	1722	1870	1856	1811	1811	1856	1752
Adj Flow Rate, veh/h	350	528	178	289	435	113	235	454	382	170	472	265
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	0	3	5	12	2	3	6	6	3	10
Cap, veh/h	309	427	144	225	382	99	300	369	310	142	692	765
Arrive On Green	0.14	0.32	0.32	0.10	0.27	0.27	0.07	0.40	0.40	0.05	0.37	0.37
Sat Flow, veh/h	1781	1338	451	1767	1398	363	1781	931	783	1725	1856	1485
Grp Volume(v), veh/h	350	0	706	289	0	548	235	0	836	170	472	265
Grp Sat Flow(s),veh/h/ln	1781	0	1789	1767	0	1761	1781	0	1715	1725	1856	1485
Q Serve(g_s), s	18.5	0.0	41.5	12.5	0.0	35.5	9.5	0.0	51.5	6.5	27.8	13.7
Cycle Q Clear(g_c), s	18.5	0.0	41.5	12.5	0.0	35.5	9.5	0.0	51.5	6.5	27.8	13.7
Prop In Lane	1.00		0.25	1.00		0.21	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	309	0	571	225	0	481	300	0	679	142	692	765
V/C Ratio(X)	1.13	0.00	1.24	1.28	0.00	1.14	0.78	0.00	1.23	1.20	0.68	0.35
Avail Cap(c_a), veh/h	309	0	571	225	0	481	300	0	679	142	692	765
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	0.0	44.3	38.5	0.0	47.3	30.5	0.0	39.3	32.3	34.3	18.6
Incr Delay (d2), s/veh	92.2	0.0	120.8	156.7	0.0	85.4	12.6	0.0	116.5	139.4	2.7	0.3
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	14.4	0.0	36.6	14.3	0.0	26.2	5.4	0.0	42.2	7.9	12.3	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	132.6	0.0	165.0	195.2	0.0	132.7	43.1	0.0	155.7	171.7	37.0	18.9
LnGrp LOS	F	A	F	F	A	F	D	A	F	F	D	B
Approach Vol, veh/h		1056			837			1071			907	
Approach Delay, s/veh		154.3			154.3			131.0			56.9	
Approach LOS		F			F			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	56.0	17.0	46.0	14.0	53.0	23.0	40.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	51.5	12.5	41.5	9.5	48.5	18.5	35.5				
Max Q Clear Time (g_c+I1), s	8.5	53.5	14.5	43.5	11.5	29.8	20.5	37.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			125.0									
HCM 6th LOS			F									

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Future Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.881				0.850		0.982			0.994	
Flt Protected		0.994			0.950		0.950				0.997	
Satd. Flow (prot)	0	1631	0	0	1770	1380	1770	1752	0	0	1791	0
Flt Permitted		0.994			0.950		0.950				0.997	
Satd. Flow (perm)	0	1631	0	0	1770	1380	1770	1752	0	0	1791	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		667			992			468			872	
Travel Time (s)		15.2			22.5			5.8			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92
Heavy Vehicles (%)	2%	0%	2%	2%	0%	17%	2%	7%	3%	10%	5%	2%
Adj. Flow (vph)	12	0	87	70	0	28	148	294	40	26	401	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	99	0	0	70	28	148	334	0	0	448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	15		9	60		9	15		60
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.3%											
Analysis Period (min)	15											
	ICU Level of Service B											

08/08/2023

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Sign Control	Stop			Stop			Stop			Stop								
Traffic Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19						
Future Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19						
Peak Hour Factor	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92						
Hourly flow rate (vph)	12	0	87	70	0	28	148	294	40	26	401	21						
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1												
Volume Total (vph)	99	70	28	148	334	448												
Volume Left (vph)	12	70	0	148	0	26												
Volume Right (vph)	87	0	28	0	40	21												
Hadj (s)	-0.47	0.53	-0.41	0.53	0.03	0.07												
Departure Headway (s)	6.7	7.7	6.8	6.3	5.8	5.9												
Degree Utilization, x	0.18	0.15	0.05	0.26	0.54	0.74												
Capacity (veh/h)	465	425	478	552	603	598												
Control Delay (s)	11.2	10.9	8.9	10.4	14.2	23.6												
Approach Delay (s)	11.2	10.3		13.1		23.6												
Approach LOS	B	B		B		C												
Intersection Summary																		
Delay				16.9														
Level of Service				C														
Intersection Capacity Utilization				58.3%			ICU Level of Service			B								
Analysis Period (min)				15														

HCM 6th AWSC
4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

Intersection												
Intersection Delay, s/veh	17.9											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕			↕	
Traffic Vol, veh/h	11	0	80	53	0	21	136	259	35	22	341	19
Future Vol, veh/h	11	0	80	53	0	21	136	259	35	22	341	19
Peak Hour Factor	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92
Heavy Vehicles, %	2	0	2	2	0	17	2	7	3	10	5	2
Mvmt Flow	12	0	87	70	0	28	148	294	40	26	401	21
Number of Lanes	0	1	0	0	1	1	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	2			1			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			1			2		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			2			1		
HCM Control Delay	11.4			11.2			14.1			24.8		
HCM LOS	B			B			B			C		
Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1						
Vol Left, %	100%	0%	12%	100%	0%	6%						
Vol Thru, %	0%	88%	0%	0%	0%	89%						
Vol Right, %	0%	12%	88%	0%	100%	5%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	136	294	91	53	21	382						
LT Vol	136	0	11	53	0	22						
Through Vol	0	259	0	0	0	341						
RT Vol	0	35	80	0	21	19						
Lane Flow Rate	148	334	99	70	28	448						
Geometry Grp	7	7	6	7	7	6						
Degree of Util (X)	0.26	0.541	0.186	0.15	0.05	0.747						
Departure Headway (Hd)	6.331	5.826	6.753	7.749	6.485	6.01						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	566	618	529	462	550	600						
Service Time	4.078	3.572	4.822	5.518	4.254	4.054						
HCM Lane V/C Ratio	0.261	0.54	0.187	0.152	0.051	0.747						
HCM Control Delay	11.3	15.3	11.4	11.9	9.6	24.8						
HCM Lane LOS	B	C	B	B	A	C						
HCM 95th-tile Q	1	3.2	0.7	0.5	0.2	6.6						

Lanes, Volumes, Timings
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	22	39	252	359	19
Future Volume (vph)	11	22	39	252	359	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910				0.993	
Flt Protected	0.984			0.993		
Satd. Flow (prot)	1668	0	0	1850	1850	0
Flt Permitted	0.984			0.993		
Satd. Flow (perm)	1668	0	0	1850	1850	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	655			872	798	
Travel Time (s)	14.9			19.8	18.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	12	24	42	274	390	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	0	0	316	411	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60	60			60
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	22	39	252	359	19
Future Volume (Veh/h)	11	22	39	252	359	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	24	42	274	390	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	758	400	411			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758	400	411			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	96	96			
cM capacity (veh/h)	361	650	1148			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	316	411			
Volume Left	12	42	0			
Volume Right	24	0	21			
cSH	513	1148	1700			
Volume to Capacity	0.07	0.04	0.24			
Queue Length 95th (ft)	6	3	0			
Control Delay (s)	12.5	1.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.5	1.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		48.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM 6th TWSC
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	22	39	252	359	19
Future Vol, veh/h	11	22	39	252	359	19
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	12	24	42	274	390	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	759	401	411	0	-	0
Stage 1	401	-	-	-	-	-
Stage 2	358	-	-	-	-	-
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	374	649	1148	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	358	649	1148	-	-	-
Mov Cap-2 Maneuver	358	-	-	-	-	-
Stage 1	647	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.6	1.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1148	-	511	-	-	
HCM Lane V/C Ratio	0.037	-	0.07	-	-	
HCM Control Delay (s)	8.3	0	12.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	103	27	0	6	175	427	35	9	465	0
Future Volume (vph)	0	0	103	27	0	6	175	427	35	9	465	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.974			0.989				
Flt Protected					0.961		0.950				0.999	
Satd. Flow (prot)	0	1611	0	0	1744	0	1770	1842	0	0	1861	0
Flt Permitted					0.961		0.950				0.999	
Satd. Flow (perm)	0	1611	0	0	1744	0	1770	1842	0	0	1861	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		669			577			3271			968	
Travel Time (s)		15.2			13.1			40.5			12.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	112	29	0	7	190	464	38	10	505	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	112	0	0	36	0	190	502	0	0	515	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	68.1%											
Analysis Period (min)	15											
ICU Level of Service C												

HCM Unsignalized Intersection Capacity Analysis

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	103	27	0	6	175	427	35	9	465	0
Future Volume (Veh/h)	0	0	103	27	0	6	175	427	35	9	465	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	112	29	0	7	190	464	38	10	505	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1376	1407	505	1500	1388	483	505			502		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1376	1407	505	1500	1388	483	505			502		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	80	58	100	99	82			99		
cM capacity (veh/h)	104	113	567	69	116	584	1060			1062		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	112	36	190	502	515							
Volume Left	0	29	190	0	10							
Volume Right	112	7	0	38	0							
cSH	567	83	1060	1700	1062							
Volume to Capacity	0.20	0.43	0.18	0.30	0.01							
Queue Length 95th (ft)	18	44	16	0	1							
Control Delay (s)	12.9	77.8	9.1	0.0	0.3							
Lane LOS	B	F	A		A							
Approach Delay (s)	12.9	77.8	2.5		0.3							
Approach LOS	B	F										
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			68.1%			ICU Level of Service			C			
Analysis Period (min)			15									

Intersection

Int Delay, s/veh 4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	0	0	103	27	0	6	175	427	35	9	465	0
Future Vol, veh/h	0	0	103	27	0	6	175	427	35	9	465	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	112	29	0	7	190	464	38	10	505	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1392	1407	505	1444	1388	483	505	0	0	502	0	0
Stage 1	525	525	-	863	863	-	-	-	-	-	-	-
Stage 2	867	882	-	581	525	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	119	139	567	110	143	584	1060	-	-	1062	-	-
Stage 1	536	529	-	349	372	-	-	-	-	-	-	-
Stage 2	348	364	-	499	529	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	100	113	567	75	116	584	1060	-	-	1062	-	-
Mov Cap-2 Maneuver	100	113	-	75	116	-	-	-	-	-	-	-
Stage 1	440	522	-	287	305	-	-	-	-	-	-	-
Stage 2	282	299	-	395	522	-	-	-	-	-	-	-

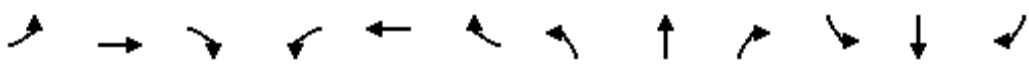
Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.9		70.4		2.5		0.2	
HCM LOS	B		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	567	89	1062	-
HCM Lane V/C Ratio	0.179	-	-	0.197	0.403	0.009	-
HCM Control Delay (s)	9.1	-	-	12.9	70.4	8.4	0
HCM Lane LOS	A	-	-	B	F	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.7	1.6	0	-

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frts								0.892			0.865	
Flt Protected								0.990		0.950		
Satd. Flow (prot)	0	1827	0	0	1863	0	0	1678	0	1641	1426	0
Flt Permitted					0.999			0.948		0.734		
Satd. Flow (perm)	0	1827	0	0	1861	0	0	1607	0	1268	1426	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								28			116	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		768			512			309			804	
Travel Time (s)		11.6			7.8			7.0			18.3	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	10%	0%	17%
Adj. Flow (vph)	0	1001	3	2	1065	0	7	0	28	222	13	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1004	0	0	1067	0	0	35	0	222	129	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Detector 1 Position(ft)		0		0	0		0	0		0	0	
Detector 1 Size(ft)		6		20	6		20	6		20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Detector Phase		2		6	6		4	4		8	8	
Switch Phase												

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)		22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)		53.0		53.0	53.0		22.0	22.0		22.0	22.0	
Total Split (%)		70.7%		70.7%	70.7%		29.3%	29.3%		29.3%	29.3%	
Maximum Green (s)		48.5		48.5	48.5		17.5	17.5		17.5	17.5	
Yellow Time (s)		3.5		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	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5			4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode		Min		Min	Min		Min	Min		Min	Min	
Act Effect Green (s)		42.3		42.3	42.3		15.3	15.3		15.3	15.3	
Actuated g/C Ratio		0.63		0.63	0.63		0.23	0.23		0.23	0.23	
v/c Ratio		0.87		0.91	0.91		0.09	0.09		0.77	0.31	
Control Delay		20.6		24.1	24.1		11.8	11.8		45.7	8.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		20.6		24.1	24.1		11.8	11.8		45.7	8.9	
LOS		C		C	C		B	B		D	A	
Approach Delay		20.6		24.1	24.1		11.8	11.8			32.2	
Approach LOS		C		C	C		B	B			C	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 66.9

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 23.7

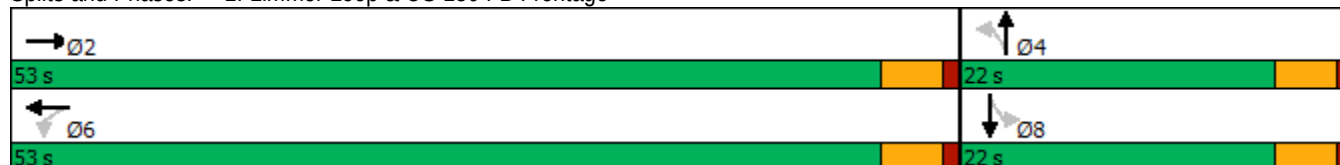
Intersection LOS: C

Intersection Capacity Utilization 71.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Limmer Loop & US 130 FB Frontage



Queues

1: Limmer Loop & US 130 FB Frontage

08/08/2023



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1004	1067	35	222	129
v/c Ratio	0.87	0.91	0.09	0.77	0.31
Control Delay	20.6	24.1	11.8	45.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	24.1	11.8	45.7	8.9
Queue Length 50th (ft)	318	357	3	96	5
Queue Length 95th (ft)	386	#534	1	123	23
Internal Link Dist (ft)	688	432	229		724
Turn Bay Length (ft)					
Base Capacity (vph)	1351	1376	457	344	471
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.78	0.08	0.65	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶			↷			↶↷		↶	↷	
Traffic Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (vph)	0	801	2	2	905	0	2	0	8	153	9	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frt		1.00			1.00			0.89		1.00	0.87	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1826			1863			1678		1641	1426	
Flt Permitted		1.00			1.00			0.95		0.73	1.00	
Satd. Flow (perm)		1826			1861			1606		1268	1426	
Peak-hour factor, PHF	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Adj. Flow (vph)	0	1001	2	2	1065	0	7	0	28	222	13	116
RTOR Reduction (vph)	0	0	0	0	0	0	0	22	0	0	89	0
Lane Group Flow (vph)	0	1004	0	0	1067	0	0	13	0	222	40	0
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	10%	0%	17%
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		42.2			42.2			15.3		15.3	15.3	
Effective Green, g (s)		42.2			42.2			15.3		15.3	15.3	
Actuated g/C Ratio		0.63			0.63			0.23		0.23	0.23	
Clearance Time (s)		4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1158			1180			369		291	328	
v/s Ratio Prot		0.55									0.03	
v/s Ratio Perm					c0.57			0.01		c0.18		
v/c Ratio		0.87			0.90			0.04		0.76	0.12	
Uniform Delay, d1		9.9			10.4			19.9		23.9	20.3	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		7.0			9.8			0.0		11.2	0.2	
Delay (s)		16.9			20.3			19.9		35.1	20.4	
Level of Service		B			C			B		D	C	
Approach Delay (s)		16.9			20.3			19.9			29.7	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.2									
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			66.5							9.0		
Intersection Capacity Utilization			71.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

1: Limmer Loop & US 130 FB Frontage

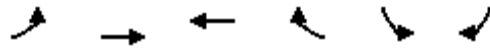
08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	801	2	2	905	0	2	0	8	153	9	80
Future Volume (veh/h)	0	801	2	2	905	0	2	0	8	153	9	80
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	0	1841	1900	1900	1870	0	1900	1900	1900	1752	1900	1648
Adj Flow Rate, veh/h	0	1001	2	2	1065	0	7	0	28	222	13	0
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.29	0.29	0.29	0.69	0.69	0.69
Percent Heavy Veh, %	0	4	0	0	2	0	0	0	0	10	0	17
Cap, veh/h	0	1184	2	62	1205	0	106	33	259	390	381	
Arrive On Green	0.00	0.64	0.64	0.64	0.64	0.00	0.20	0.00	0.20	0.20	0.20	0.00
Sat Flow, veh/h	0	1836	4	1	1869	0	157	166	1292	1295	1900	0
Grp Volume(v), veh/h	0	0	1003	1067	0	0	35	0	0	222	13	0
Grp Sat Flow(s),veh/h/ln	0	0	1840	1869	0	0	1615	0	0	1295	1900	0
Q Serve(g_s), s	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	24.8	27.5	0.0	0.0	1.0	0.0	0.0	9.3	0.3	0.0
Prop In Lane	0.00		0.00	0.00		0.00	0.20		0.80	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	1187	1267	0	0	398	0	0	390	381	
V/C Ratio(X)	0.00	0.00	0.85	0.84	0.00	0.00	0.09	0.00	0.00	0.57	0.03	
Avail Cap(c_a), veh/h	0	0	1532	1617	0	0	555	0	0	519	571	
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)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	8.1	8.6	0.0	0.0	19.0	0.0	0.0	22.2	18.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.6	3.4	0.0	0.0	0.1	0.0	0.0	1.3	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	0.0	0.0	6.0	6.6	0.0	0.0	0.4	0.0	0.0	2.8	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	11.7	11.9	0.0	0.0	19.1	0.0	0.0	23.5	18.8	0.0
LnGrp LOS	A	A	B	B	A	A	B	A	A	C	B	
Approach Vol, veh/h	1003		1067			35			235			
Approach Delay, s/veh	11.7		11.9			19.1			23.3			
Approach LOS	B		B			B			C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	42.1		16.2		42.1		16.2					
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5					
Max Green Setting (Gmax), s	48.5		17.5		48.5		17.5					
Max Q Clear Time (g_c+I1), s	26.8		3.0		29.5		11.3					
Green Ext Time (p_c), s	7.8		0.1		8.1		0.4					
Intersection Summary												
HCM 6th Ctrl Delay			13.1									
HCM 6th LOS			B									
Notes												

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	903	908	104	0	0
Future Volume (vph)	66	903	908	104	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	340			0	0	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.986			
Flt Protected	0.950					
Satd. Flow (prot)	1417	1701	1788	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1417	1701	1788	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.78	0.78	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	21%	6%	3%	20%	0%	0%
Adj. Flow (vph)	85	1158	1056	121	0	0
Shared Lane Traffic (%)	10%					
Lane Group Flow (vph)	76	1167	1177	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	57.4%			ICU Level of Service B		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		50	100		100	500		500
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1203	1727	1583	1770	1827	1553	1770	1792	1553	1641	1792	1404
Flt Permitted	0.127			0.299			0.145			0.482		
Satd. Flow (perm)	161	1727	1583	557	1827	1553	270	1792	1553	833	1792	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			218			127			231			127
Link Speed (mph)		50			50			50			55	
Link Distance (ft)		3016			735			1325			3271	
Travel Time (s)		41.1			10.0			18.1			40.5	
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Adj. Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		4	4		8	6		2	2		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	10.0	30.0	30.0	16.0	36.0	36.0	12.0	30.0	30.0	14.0	32.0	10.0
Total Split (%)	11.1%	33.3%	33.3%	17.8%	40.0%	40.0%	13.3%	33.3%	33.3%	15.6%	35.6%	11.1%
Maximum Green (s)	5.5	25.5	25.5	11.5	31.5	31.5	7.5	25.5	25.5	9.5	27.5	5.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	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	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	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	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None
Act Effect Green (s)	37.0	25.5	25.5	37.0	31.5	31.5	35.0	25.9	25.9	35.0	27.5	37.5
Actuated g/C Ratio	0.41	0.28	0.28	0.41	0.35	0.35	0.39	0.29	0.29	0.39	0.31	0.42
v/c Ratio	0.81	0.73	0.36	0.93	0.98	0.17	0.94	0.47	0.38	0.40	0.97	0.59
Control Delay	62.1	39.6	5.5	53.5	62.8	3.6	67.7	30.2	5.5	19.2	65.0	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	39.6	5.5	53.5	62.8	3.6	67.7	30.2	5.5	19.2	65.0	17.5
LOS	E	D	A	D	E	A	E	C	A	B	E	B
Approach Delay		32.2			53.9			33.7			41.1	
Approach LOS		C			D			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 41.9

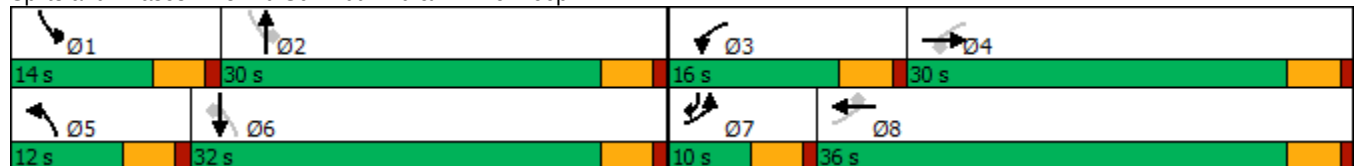
Intersection LOS: D

Intersection Capacity Utilization 85.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop



Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
v/c Ratio	0.81	0.73	0.36	0.93	0.98	0.17	0.94	0.47	0.38	0.40	0.97	0.59
Control Delay	62.1	39.6	5.5	53.5	62.8	3.6	67.7	30.2	5.5	19.2	65.0	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	39.6	5.5	53.5	62.8	3.6	67.7	30.2	5.5	19.2	65.0	17.5
Queue Length 50th (ft)	34	184	0	133	350	0	76	113	0	56	297	109
Queue Length 95th (ft)	#117	#295	51	#268	#575	26	#211	185	52	88	#429	170
Internal Link Dist (ft)	2936		655		1245		3191					
Turn Bay Length (ft)	150		150	200		50	100		100	500		500
Base Capacity (vph)	129	489	604	383	639	626	230	516	611	413	547	659
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.73	0.36	0.93	0.98	0.17	0.94	0.47	0.38	0.39	0.97	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (vph)	100	341	207	333	585	100	203	227	217	134	436	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1203	1727	1583	1770	1827	1553	1770	1792	1553	1641	1792	1404
Flt Permitted	0.13	1.00	1.00	0.30	1.00	1.00	0.15	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	161	1727	1583	556	1827	1553	271	1792	1553	832	1792	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	105	359	218	358	629	108	216	241	231	163	532	388
RTOR Reduction (vph)	0	0	156	0	0	70	0	0	165	0	0	80
Lane Group Flow (vph)	105	359	62	358	629	38	216	241	66	163	532	308
Heavy Vehicles (%)	50%	10%	2%	2%	4%	4%	2%	6%	4%	10%	6%	15%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8		4	4		8	6		2	2		6
Actuated Green, G (s)	37.0	25.5	25.5	37.0	31.5	31.5	35.0	25.9	25.9	35.0	27.5	33.0
Effective Green, g (s)	37.0	25.5	25.5	37.0	31.5	31.5	35.0	25.9	25.9	35.0	27.5	33.0
Actuated g/C Ratio	0.41	0.28	0.28	0.41	0.35	0.35	0.39	0.29	0.29	0.39	0.31	0.37
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	129	489	448	383	639	543	230	515	446	405	547	585
v/s Ratio Prot	0.05	0.21		c0.12	c0.34		c0.08	0.13		0.04	c0.30	0.03
v/s Ratio Perm	0.28		0.04	0.26		0.02	0.29		0.04	0.12		0.19
v/c Ratio	0.81	0.73	0.14	0.93	0.98	0.07	0.94	0.47	0.15	0.40	0.97	0.53
Uniform Delay, d1	21.5	29.2	24.1	22.3	29.0	19.5	22.6	26.4	23.8	18.9	30.9	22.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	31.0	5.6	0.1	29.7	31.4	0.1	42.2	0.7	0.2	0.7	31.4	0.9
Delay (s)	52.6	34.8	24.2	52.0	60.4	19.5	64.8	27.1	24.0	19.5	62.2	23.2
Level of Service	D	C	C	D	E	B	E	C	C	B	E	C
Approach Delay (s)		34.2			53.6			37.9			41.8	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			43.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			85.6%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: Ed Schmidt Blvd & Limmer Loop

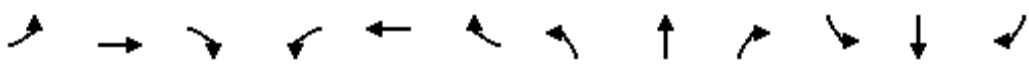
08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	341	207	333	585	100	203	227	217	134	436	318
Future Volume (veh/h)	100	341	207	333	585	100	203	227	217	134	436	318
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	1159	1752	1870	1870	1841	1841	1870	1811	1841	1752	1811	1678
Adj Flow Rate, veh/h	105	359	218	358	629	108	216	241	231	163	532	388
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.94	0.94	0.94	0.82	0.82	0.82
Percent Heavy Veh, %	50	10	2	2	4	4	2	6	4	10	6	15
Cap, veh/h	153	496	449	390	644	546	239	546	470	394	553	521
Arrive On Green	0.06	0.28	0.28	0.13	0.35	0.35	0.08	0.30	0.30	0.09	0.31	0.31
Sat Flow, veh/h	1104	1752	1585	1781	1841	1560	1781	1811	1560	1668	1811	1422
Grp Volume(v), veh/h	105	359	218	358	629	108	216	241	231	163	532	388
Grp Sat Flow(s),veh/h/ln	1104	1752	1585	1781	1841	1560	1781	1811	1560	1668	1811	1422
Q Serve(g_s), s	5.5	16.6	10.3	11.5	30.4	4.4	7.5	9.7	10.9	6.0	26.0	21.4
Cycle Q Clear(g_c), s	5.5	16.6	10.3	11.5	30.4	4.4	7.5	9.7	10.9	6.0	26.0	21.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	496	449	390	644	546	239	546	470	394	553	521
V/C Ratio(X)	0.69	0.72	0.49	0.92	0.98	0.20	0.91	0.44	0.49	0.41	0.96	0.74
Avail Cap(c_a), veh/h	153	496	449	390	644	546	239	546	470	424	553	521
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	29.1	26.8	24.1	28.9	20.4	23.5	25.3	25.8	19.3	30.7	24.8
Incr Delay (d2), s/veh	12.0	5.2	0.8	26.2	29.5	0.2	34.1	0.6	0.8	0.7	28.7	5.7
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	1.8	7.1	3.7	7.7	17.2	1.5	5.1	3.9	3.8	2.1	14.5	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	34.2	27.6	50.4	58.3	20.6	57.6	25.9	26.6	20.0	59.4	30.6
LnGrp LOS	C	C	C	D	E	C	E	C	C	B	E	C
Approach Vol, veh/h	682			1095			688			1083		
Approach Delay, s/veh	32.2			52.0			36.1			43.1		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.4	31.6	16.0	30.0	12.0	32.0	10.0	36.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	9.5	25.5	11.5	25.5	7.5	27.5	5.5	31.5				
Max Q Clear Time (g_c+l1), s	8.0	12.9	13.5	18.6	9.5	28.0	7.5	32.4				
Green Ext Time (p_c), s	0.1	1.6	0.0	1.5	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	42.4											
HCM 6th LOS	D											

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕			↕	
Traffic Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Future Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.881				0.850		0.987			0.999	
Flt Protected		0.994			0.950		0.950				0.997	
Satd. Flow (prot)	0	1631	0	0	1556	1313	1770	1755	0	0	1683	0
Flt Permitted		0.951			0.923		0.565				0.976	
Satd. Flow (perm)	0	1561	0	0	1512	1313	1052	1755	0	0	1647	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		132				33		12			1	
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		667			992			468			872	
Travel Time (s)		15.2			22.5			5.8			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92
Heavy Vehicles (%)	2%	0%	2%	16%	0%	23%	2%	7%	5%	56%	10%	2%
Adj. Flow (vph)	18	0	132	39	0	23	41	253	24	25	422	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	39	23	41	277	0	0	452	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	27.0	27.0		27.0	27.0	
Total Split (%)	46.0%	46.0%		46.0%	46.0%	46.0%	54.0%	54.0%		54.0%	54.0%	
Maximum Green (s)	18.5	18.5		18.5	18.5	18.5	22.5	22.5		22.5	22.5	
Yellow Time (s)	3.5	3.5		3.5	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	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-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)		6.9			6.9	6.9	19.6	19.6			19.6	
Actuated g/C Ratio		0.21			0.21	0.21	0.61	0.61			0.61	
v/c Ratio		0.34			0.12	0.07	0.06	0.26			0.45	
Control Delay		6.3			11.7	5.1	4.8	5.3			7.2	
Queue Delay		0.0			0.0	0.0	0.0	0.0			0.0	
Total Delay		6.3			11.7	5.1	4.8	5.3			7.2	
LOS		A			B	A	A	A			A	
Approach Delay		6.3			9.3			5.2			7.2	
Approach LOS		A			A			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 32.2

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 6.5

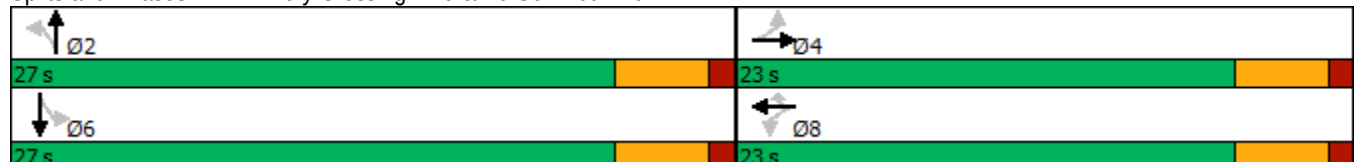
Intersection LOS: A

Intersection Capacity Utilization 56.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Emory Crossing Blvd & Ed Schmidt Blvd



Queues

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023



Lane Group	EBT	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	150	39	23	41	277	452
v/c Ratio	0.34	0.12	0.07	0.06	0.26	0.45
Control Delay	6.3	11.7	5.1	4.8	5.3	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	11.7	5.1	4.8	5.3	7.2
Queue Length 50th (ft)	2	4	0	3	20	41
Queue Length 95th (ft)	33	22	10	13	56	86
Internal Link Dist (ft)	587	912			388	792
Turn Bay Length (ft)				150		
Base Capacity (vph)	973	890	786	753	1259	1179
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.03	0.05	0.22	0.38
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔			↔	
Traffic Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Future Volume (vph)	17	0	121	35	0	21	38	233	22	20	333	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Frt		0.88			1.00	0.85	1.00	0.99			1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1632			1556	1313	1770	1755			1682	
Flt Permitted		0.95			0.92	1.00	0.56	1.00			0.98	
Satd. Flow (perm)		1560			1512	1313	1052	1755			1647	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92
Adj. Flow (vph)	18	0	132	39	0	23	41	253	24	25	422	5
RTOR Reduction (vph)	0	110	0	0	0	19	0	5	0	0	0	0
Lane Group Flow (vph)	0	40	0	0	39	4	41	272	0	0	452	0
Heavy Vehicles (%)	2%	0%	2%	16%	0%	23%	2%	7%	5%	56%	10%	2%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		5.6			5.6	5.6	18.5	18.5			18.5	
Effective Green, g (s)		5.6			5.6	5.6	18.5	18.5			18.5	
Actuated g/C Ratio		0.17			0.17	0.17	0.56	0.56			0.56	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5			4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		263			255	222	587	980			920	
v/s Ratio Prot								0.15				
v/s Ratio Perm		c0.03			0.03	0.00	0.04				c0.27	
v/c Ratio		0.15			0.15	0.02	0.07	0.28			0.49	
Uniform Delay, d1		11.7			11.7	11.5	3.4	3.8			4.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2		0.3			0.3	0.0	0.1	0.2			0.4	
Delay (s)		12.0			12.0	11.5	3.4	4.0			4.9	
Level of Service		B			B	B	A	A			A	
Approach Delay (s)		12.0			11.8			3.9			4.9	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.1									
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			33.1									
Intersection Capacity Utilization			56.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	0	121	35	0	21	38	233	22	20	333	5
Future Volume (veh/h)	17	0	121	35	0	21	38	233	22	20	333	5
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	1900	1870	1663	1900	1559	1870	1796	1826	1070	1752	1870
Adj Flow Rate, veh/h	18	0	132	39	0	23	41	253	24	25	422	5
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.79	0.79	0.92
Percent Heavy Veh, %	2	0	2	16	0	23	2	7	5	56	10	2
Cap, veh/h	215	8	237	602	0	223	852	654	62	198	670	8
Arrive On Green	0.17	0.00	0.17	0.17	0.00	0.17	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	143	49	1406	1547	0	1321	961	1615	153	43	1657	19
Grp Volume(v), veh/h	150	0	0	39	0	23	41	0	277	452	0	0
Grp Sat Flow(s),veh/h/ln	1597	0	0	1547	0	1321	961	0	1769	1718	0	0
Q Serve(g_s), s	0.9	0.0	0.0	0.0	0.0	0.3	0.0	0.0	2.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.4	0.0	0.3	0.3	0.0	2.3	4.4	0.0	0.0
Prop In Lane	0.12		0.88	1.00		1.00	1.00		0.09	0.06		0.01
Lane Grp Cap(c), veh/h	461	0	0	602	0	223	852	0	716	876	0	0
V/C Ratio(X)	0.33	0.00	0.00	0.06	0.00	0.10	0.05	0.00	0.39	0.52	0.00	0.00
Avail Cap(c_a), veh/h	1582	0	0	1508	0	1159	1488	0	1887	1990	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	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.0	0.0	0.0	7.4	0.0	7.4	3.8	0.0	4.4	5.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.5	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	0.4	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	0.0	0.0	7.5	0.0	7.6	3.9	0.0	4.8	5.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	150			62			318			452		
Approach Delay, s/veh	8.4			7.5			4.7			5.5		
Approach LOS	A			A			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	13.0			8.1			13.0			8.1		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	22.5			18.5			22.5			18.5		
Max Q Clear Time (g_c+l1), s	4.3			3.8			6.4			2.4		
Green Ext Time (p_c), s	1.4			0.7			2.2			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	5.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	34	10	258	321	5
Future Volume (vph)	17	34	10	258	321	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.909				0.998	
Flt Protected	0.984			0.998		
Satd. Flow (prot)	1666	0	0	1859	1859	0
Flt Permitted	0.984			0.998		
Satd. Flow (perm)	1666	0	0	1859	1859	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	655			872	798	
Travel Time (s)	14.9			10.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	18	37	11	280	349	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	0	0	291	354	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	34	10	258	321	5
Future Volume (Veh/h)	17	34	10	258	321	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	37	11	280	349	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				872		
pX, platoon unblocked						
vC, conflicting volume	654	352	354			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	654	352	354			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	99			
cM capacity (veh/h)	428	692	1205			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	55	291	354			
Volume Left	18	11	0			
Volume Right	37	0	5			
cSH	576	1205	1700			
Volume to Capacity	0.10	0.01	0.21			
Queue Length 95th (ft)	8	1	0			
Control Delay (s)	11.9	0.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.9	0.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.1				
Intersection Capacity Utilization		31.7%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	34	10	258	321	5
Future Vol, veh/h	17	34	10	258	321	5
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	18	37	11	280	349	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	654	352	354	0	-	0
Stage 1	352	-	-	-	-	-
Stage 2	302	-	-	-	-	-
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	431	692	1205	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	426	692	1205	-	-	-
Mov Cap-2 Maneuver	426	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1205	-	573	-	-	
HCM Lane V/C Ratio	0.009	-	0.097	-	-	
HCM Control Delay (s)	8	0	12	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	156	39	0	8	49	285	11	3	487	0
Future Volume (vph)	0	0	156	39	0	8	49	285	11	3	487	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.976			0.994				
Flt Protected					0.960		0.950					
Satd. Flow (prot)	0	1611	0	0	1745	0	1770	1852	0	0	1863	0
Flt Permitted					0.960		0.950					
Satd. Flow (perm)	0	1611	0	0	1745	0	1770	1852	0	0	1863	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		669			577			3271			968	
Travel Time (s)		15.2			13.1			40.5			12.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	170	42	0	9	53	310	12	3	529	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	170	0	0	51	0	53	322	0	0	532	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	60.3%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

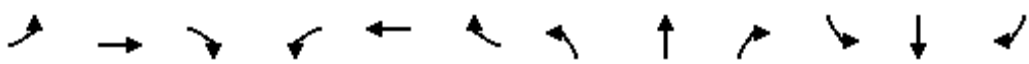
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	156	39	0	8	49	285	11	3	487	0
Future Volume (Veh/h)	0	0	156	39	0	8	49	285	11	3	487	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	170	42	0	9	53	310	12	3	529	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	960	963	529	1127	957	316	529	322				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	960	963	529	1127	957	316	529	322				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	100	100	69	65	100	99	95	100				
cM capacity (veh/h)	224	242	550	120	244	724	1038	1238				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	170	51	53	322	532							
Volume Left	0	42	53	0	3							
Volume Right	170	9	0	12	0							
cSH	550	141	1038	1700	1238							
Volume to Capacity	0.31	0.36	0.05	0.19	0.00							
Queue Length 95th (ft)	33	37	4	0	0							
Control Delay (s)	14.5	44.3	8.7	0.0	0.1							
Lane LOS	B	E	A		A							
Approach Delay (s)	14.5	44.3	1.2		0.1							
Approach LOS	B	E										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			60.3%	ICU Level of Service					B			
Analysis Period (min)			15									

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↱	↰			↕	
Traffic Vol, veh/h	0	0	156	39	0	8	49	285	11	3	487	0
Future Vol, veh/h	0	0	156	39	0	8	49	285	11	3	487	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	170	42	0	9	53	310	12	3	529	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	962	963	529	1042	957	316	529	0	0	322	0	0
Stage 1	535	535	-	422	422	-	-	-	-	-	-	-
Stage 2	427	428	-	620	535	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	235	256	550	208	258	724	1038	-	-	1238	-	-
Stage 1	529	524	-	609	588	-	-	-	-	-	-	-
Stage 2	606	585	-	476	524	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	223	242	550	138	244	724	1038	-	-	1238	-	-
Mov Cap-2 Maneuver	223	242	-	138	244	-	-	-	-	-	-	-
Stage 1	502	522	-	578	558	-	-	-	-	-	-	-
Stage 2	568	555	-	328	522	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.4		37.7		1.2		0					
HCM LOS	B		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1038	-	-	550	160	1238	-	-				
HCM Lane V/C Ratio	0.051	-	-	0.308	0.319	0.003	-	-				
HCM Control Delay (s)	8.7	-	-	14.4	37.7	7.9	0	-				
HCM Lane LOS	A	-	-	B	E	A	A	-				
HCM 95th %tile O(veh)	0.2	-	-	1.3	1.3	0	-	-				

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frnt		0.999						0.923			0.856	
Flt Protected								0.979		0.950		
Satd. Flow (prot)	0	1859	0	0	1827	0	0	1502	0	1687	1509	0
Flt Permitted								0.869		0.748		
Satd. Flow (perm)	0	1859	0	0	1827	0	0	1333	0	1328	1509	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1						25			118	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		768			512			309			804	
Travel Time (s)		11.6			7.8			7.0			18.3	
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Heavy Vehicles (%)	0%	2%	20%	0%	4%	0%	0%	0%	25%	7%	50%	6%
Adj. Flow (vph)	0	1145	6	0	786	0	6	0	8	145	5	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1151	0	0	786	0	0	14	0	145	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Detector 1 Position(ft)		0		0	0		0	0		0	0	
Detector 1 Size(ft)		6		20	6		20	6		20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Detector Phase		2		6	6		4	4		8	8	
Switch Phase												

Lanes, Volumes, Timings

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)		22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)		51.0		51.0	51.0		14.0	14.0		14.0	14.0	
Total Split (%)		78.5%		78.5%	78.5%		21.5%	21.5%		21.5%	21.5%	
Maximum Green (s)		46.5		46.5	46.5		9.5	9.5		9.5	9.5	
Yellow Time (s)		3.5		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	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5			4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode		Min		Min	Min		Min	Min		Min	Min	
Act Effect Green (s)		39.9			39.9			9.2		9.2	9.2	
Actuated g/C Ratio		0.68			0.68			0.16		0.16	0.16	
v/c Ratio		0.91			0.63			0.06		0.69	0.36	
Control Delay		19.8			7.6			8.0		46.8	10.0	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		19.8			7.6			8.0		46.8	10.0	
LOS		B			A			A		D	B	
Approach Delay		19.8			7.6			8.0			29.9	
Approach LOS		B			A			A			C	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 58.4

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 16.6

Intersection LOS: B

Intersection Capacity Utilization 72.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Limmer Loop & US 130 FB Frontage

 Ø2	 Ø4
51 s	14 s
 Ø6	 Ø8
51 s	14 s

Queues

1: Limmer Loop & US 130 FB Frontage

08/08/2023



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1151	786	14	145	123
v/c Ratio	0.91	0.63	0.06	0.69	0.36
Control Delay	19.8	7.6	8.0	46.8	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	7.6	8.0	46.8	10.0
Queue Length 50th (ft)	262	120	0	56	2
Queue Length 95th (ft)	#620	199	2	78	19
Internal Link Dist (ft)	688	432	229		724
Turn Bay Length (ft)					
Base Capacity (vph)	1484	1458	244	222	351
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.78	0.54	0.06	0.65	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Limmer Loop & US 130 FB Frontage

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩			↩			↕		↩	↩	
Traffic Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (vph)	0	1019	5	0	739	0	3	0	4	96	3	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frt		1.00			1.00			0.92		1.00	0.86	
Flt Protected		1.00			1.00			0.98		0.95	1.00	
Satd. Flow (prot)		1860			1827			1502		1687	1509	
Flt Permitted		1.00			1.00			0.87		0.75	1.00	
Satd. Flow (perm)		1860			1827			1334		1329	1509	
Peak-hour factor, PHF	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Adj. Flow (vph)	0	1145	6	0	786	0	6	0	8	145	5	118
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	99	0
Lane Group Flow (vph)	0	1151	0	0	786	0	0	2	0	145	24	0
Heavy Vehicles (%)	0%	2%	20%	0%	4%	0%	0%	0%	25%	7%	50%	6%
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		39.9			39.9			9.2		9.2	9.2	
Effective Green, g (s)		39.9			39.9			9.2		9.2	9.2	
Actuated g/C Ratio		0.69			0.69			0.16		0.16	0.16	
Clearance Time (s)		4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1277			1254			211		210	238	
v/s Ratio Prot		c0.62			0.43						0.02	
v/s Ratio Perm								0.00		c0.11		
v/c Ratio		0.90			0.63			0.01		0.69	0.10	
Uniform Delay, d1		7.5			5.0			20.6		23.1	20.9	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		9.0			1.0			0.0		9.4	0.2	
Delay (s)		16.5			6.0			20.6		32.5	21.1	
Level of Service		B			A			C		C	C	
Approach Delay (s)		16.5			6.0			20.6			27.3	
Approach LOS		B			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			14.1									B
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			58.1							9.0		
Intersection Capacity Utilization			72.2%								C	
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

1: Limmer Loop & US 130 FB Frontage

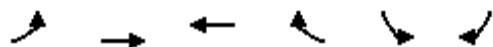
08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1019	5	0	739	0	3	0	4	96	3	78
Future Volume (veh/h)	0	1019	5	0	739	0	3	0	4	96	3	78
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	0	1870	1604	1900	1841	0	1900	1900	1530	1796	1159	1811
Adj Flow Rate, veh/h	0	1145	6	0	786	0	6	0	8	145	5	0
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.50	0.50	0.50	0.66	0.66	0.66
Percent Heavy Veh, %	0	2	20	0	4	0	0	0	25	7	50	6
Cap, veh/h	0	1289	7	0	1276	0	158	32	127	325	162	
Arrive On Green	0.00	0.69	0.69	0.00	0.69	0.00	0.14	0.00	0.14	0.14	0.14	0.00
Sat Flow, veh/h	0	1859	10	0	1841	0	452	229	908	1352	1159	0
Grp Volume(v), veh/h	0	0	1151	0	786	0	14	0	0	145	5	0
Grp Sat Flow(s),veh/h/ln	0	0	1869	0	1841	0	1590	0	0	1352	1159	0
Q Serve(g_s), s	0.0	0.0	26.5	0.0	12.3	0.0	0.0	0.0	0.0	5.1	0.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	26.5	0.0	12.3	0.0	0.4	0.0	0.0	5.5	0.2	0.0
Prop In Lane	0.00		0.01	0.00		0.00	0.43		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	1296	0	1276	0	317	0	0	325	162	
V/C Ratio(X)	0.00	0.00	0.89	0.00	0.62	0.00	0.04	0.00	0.00	0.45	0.03	
Avail Cap(c_a), veh/h	0	0	1611	0	1586	0	373	0	0	374	204	
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)	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	6.6	0.0	4.4	0.0	20.1	0.0	0.0	22.3	20.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	5.5	0.0	0.5	0.0	0.1	0.0	0.0	1.0	0.1	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	0.0	0.0	5.1	0.0	1.6	0.0	0.1	0.0	0.0	1.7	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	12.1	0.0	4.9	0.0	20.2	0.0	0.0	23.2	20.1	0.0
LnGrp LOS	A	A	B	A	A	A	C	A	A	C	C	
Approach Vol, veh/h	1151			786			14			150		
Approach Delay, s/veh	12.1			4.9			20.2			23.1		
Approach LOS	B			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	41.9			12.0			41.9			12.0		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	46.5			9.5			46.5			9.5		
Max Q Clear Time (g_c+I1), s	28.5			2.4			14.3			7.5		
Green Ext Time (p_c), s	8.9			0.0			5.8			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	10.3											
HCM 6th LOS	B											
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings

2: Limmer Loop & US 130 NB Frontage

08/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	1087	747	111	0	0
Future Volume (vph)	47	1087	747	111	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	340			0	0	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.983			
Flt Protected	0.950					
Satd. Flow (prot)	1603	1735	1770	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1603	1735	1770	0	0	0
Link Speed (mph)		45	45		30	
Link Distance (ft)		512	199		878	
Travel Time (s)		7.8	3.0		20.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Heavy Vehicles (%)	7%	4%	5%	9%	0%	0%
Adj. Flow (vph)	52	1195	821	122	0	0
Shared Lane Traffic (%)	10%					
Lane Group Flow (vph)	47	1200	943	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	51.0%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		50	100		100	500		500
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	50			100			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1615	1752	1810	1442	1770	1845	1524	1703	1845	1468
Flt Permitted	0.172			0.152			0.163			0.207		
Satd. Flow (perm)	320	1863	1615	280	1810	1442	304	1845	1524	371	1845	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			127			246			131
Link Speed (mph)		50			50			50			55	
Link Distance (ft)		3016			735			1325			3271	
Travel Time (s)		41.1			10.0			18.1			40.5	
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Adj. Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265
Shared Lane Traffic (%)												
Lane Group Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7

Lanes, Volumes, Timings

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		4	4		8	6		2	2		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	18.0	31.0	31.0	16.0	29.0	29.0	13.0	33.0	33.0	10.0	30.0	18.0
Total Split (%)	20.0%	34.4%	34.4%	17.8%	32.2%	32.2%	14.4%	36.7%	36.7%	11.1%	33.3%	20.0%
Maximum Green (s)	13.5	26.5	26.5	11.5	24.5	24.5	8.5	28.5	28.5	5.5	25.5	13.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	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	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	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	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None
Act Effect Green (s)	37.8	26.3	26.3	37.8	24.3	24.3	33.1	27.6	27.6	33.1	24.6	42.6
Actuated g/C Ratio	0.43	0.30	0.30	0.43	0.27	0.27	0.37	0.31	0.31	0.37	0.28	0.48
v/c Ratio	0.98	0.96	0.31	0.94	0.88	0.23	0.93	0.79	0.60	0.77	0.93	0.34
Control Delay	68.3	62.1	9.2	60.3	52.3	5.3	63.4	39.9	13.4	43.9	58.0	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	62.1	9.2	60.3	52.3	5.3	63.4	39.9	13.4	43.9	58.0	8.3
LOS	E	E	A	E	D	A	E	D	B	D	E	A
Approach Delay		55.3			48.7			35.6			40.9	
Approach LOS		E			D			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 45.0

Intersection LOS: D

Intersection Capacity Utilization 87.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Ed Schmidt Blvd & Limmer Loop

 Ø1	 Ø2	 Ø3	 Ø4
10 s	33 s	16 s	31 s
 Ø5	 Ø6	 Ø7	 Ø8
13 s	30 s	18 s	29 s

Queues

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Group Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265		
v/c Ratio	0.98	0.96	0.31	0.94	0.88	0.23	0.93	0.79	0.60	0.77	0.93	0.34		
Control Delay	68.3	62.1	9.2	60.3	52.3	5.3	63.4	39.9	13.4	43.9	58.0	8.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	68.3	62.1	9.2	60.3	52.3	5.3	63.4	39.9	13.4	43.9	58.0	8.3		
Queue Length 50th (ft)	146	294	18	113	237	0	86	232	58	60	258	41		
Queue Length 95th (ft)	#326	#497	67	#269	#407	33	#222	#378	150	#109	#363	75		
Internal Link Dist (ft)	2936				655				1245		3191			
Turn Bay Length (ft)	150			150	200			50	100			100	500	500
Base Capacity (vph)	356	555	575	309	498	489	253	591	655	220	529	771		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.98	0.95	0.31	0.94	0.87	0.23	0.93	0.77	0.58	0.77	0.89	0.34		

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Ed Schmidt Blvd & Limmer Loop

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (vph)	322	496	167	263	396	103	214	413	348	138	382	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1615	1752	1810	1442	1770	1845	1524	1703	1845	1468
Flt Permitted	0.17	1.00	1.00	0.15	1.00	1.00	0.16	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	321	1863	1615	281	1810	1442	303	1845	1524	372	1845	1468
Peak-hour factor, PHF	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Adj. Flow (vph)	350	528	178	289	435	113	235	454	382	170	472	265
RTOR Reduction (vph)	0	0	94	0	0	82	0	0	170	0	0	75
Lane Group Flow (vph)	350	528	84	289	435	31	235	454	212	170	472	190
Heavy Vehicles (%)	2%	2%	0%	3%	5%	12%	2%	3%	6%	6%	3%	10%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8		4	4		8	6		2	2		6
Actuated Green, G (s)	37.8	26.3	26.3	37.8	24.3	24.3	33.1	27.6	27.6	33.1	24.6	38.1
Effective Green, g (s)	37.8	26.3	26.3	37.8	24.3	24.3	33.1	27.6	27.6	33.1	24.6	38.1
Actuated g/C Ratio	0.43	0.30	0.30	0.43	0.27	0.27	0.37	0.31	0.31	0.37	0.28	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	356	551	477	309	494	394	253	572	473	220	510	703
v/s Ratio Prot	c0.15	c0.28		0.12	0.24		c0.09	c0.25		0.05	0.26	0.04
v/s Ratio Perm	0.27		0.05	0.28		0.02	c0.26		0.14	0.24		0.09
v/c Ratio	0.98	0.96	0.18	0.94	0.88	0.08	0.93	0.79	0.45	0.77	0.93	0.27
Uniform Delay, d1	22.0	30.8	23.2	21.3	30.9	24.0	22.6	28.0	24.6	22.7	31.3	16.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.9	27.8	0.2	34.3	16.6	0.1	37.4	7.5	0.7	15.4	22.8	0.2
Delay (s)	64.9	58.6	23.4	55.6	47.5	24.1	60.0	35.5	25.2	38.1	54.0	16.6
Level of Service	E	E	C	E	D	C	E	D	C	D	D	B
Approach Delay (s)		54.8			47.1			37.2			40.1	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			44.8				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			88.9				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			87.6%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	322	496	167	263	396	103	214	413	348	138	382	215
Future Volume (veh/h)	322	496	167	263	396	103	214	413	348	138	382	215
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	1900	1856	1826	1722	1870	1856	1811	1811	1856	1752
Adj Flow Rate, veh/h	350	528	178	289	435	113	235	454	382	170	472	265
Peak Hour Factor	0.92	0.94	0.94	0.91	0.91	0.91	0.91	0.91	0.91	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	0	3	5	12	2	3	6	6	3	10
Cap, veh/h	392	556	479	325	502	401	272	575	475	242	512	635
Arrive On Green	0.15	0.30	0.30	0.13	0.28	0.28	0.10	0.31	0.31	0.06	0.28	0.28
Sat Flow, veh/h	1781	1870	1610	1767	1826	1459	1781	1856	1535	1725	1856	1485
Grp Volume(v), veh/h	350	528	178	289	435	113	235	454	382	170	472	265
Grp Sat Flow(s),veh/h/ln	1781	1870	1610	1767	1826	1459	1781	1856	1535	1725	1856	1485
Q Serve(g_s), s	12.5	24.6	7.8	10.0	20.2	5.4	8.5	19.9	20.4	5.5	22.0	11.1
Cycle Q Clear(g_c), s	12.5	24.6	7.8	10.0	20.2	5.4	8.5	19.9	20.4	5.5	22.0	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	392	556	479	325	502	401	272	575	475	242	512	635
V/C Ratio(X)	0.89	0.95	0.37	0.89	0.87	0.28	0.87	0.79	0.80	0.70	0.92	0.42
Avail Cap(c_a), veh/h	392	556	479	325	502	401	272	594	491	242	531	650
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	30.6	24.7	21.4	30.7	25.4	23.6	28.1	28.3	24.3	31.3	17.8
Incr Delay (d2), s/veh	21.8	26.0	0.5	24.9	14.7	0.4	24.0	6.9	9.2	8.8	21.3	0.4
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	6.9	14.0	2.8	5.8	10.1	1.8	5.0	9.1	8.0	2.8	11.8	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	56.6	25.2	46.3	45.5	25.8	47.6	35.0	37.4	33.1	52.6	18.2
LnGrp LOS	D	E	C	D	D	C	D	D	D	C	D	B
Approach Vol, veh/h		1056			837			1071			907	
Approach Delay, s/veh		46.9			43.1			38.6			38.9	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	32.1	16.0	31.0	13.0	29.1	18.0	29.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	28.5	11.5	26.5	8.5	25.5	13.5	24.5				
Max Q Clear Time (g_c+I1), s	7.5	22.4	12.0	26.6	10.5	24.0	14.5	22.2				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.0	0.0	0.6	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			41.9									
HCM 6th LOS			D									

Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Future Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.881				0.850		0.982			0.994	
Flt Protected		0.994			0.950		0.950				0.997	
Satd. Flow (prot)	0	1631	0	0	1770	1380	1770	1752	0	0	1791	0
Flt Permitted		0.945			0.870		0.576				0.972	
Satd. Flow (perm)	0	1551	0	0	1621	1380	1073	1752	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87				28		18			6	
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		667			992			468			872	
Travel Time (s)		15.2			22.5			5.8			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92
Heavy Vehicles (%)	2%	0%	2%	2%	0%	17%	2%	7%	3%	10%	5%	2%
Adj. Flow (vph)	12	0	87	70	0	28	148	294	40	26	401	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	99	0	0	70	28	148	334	0	0	448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	15		9	60		9	15		60
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

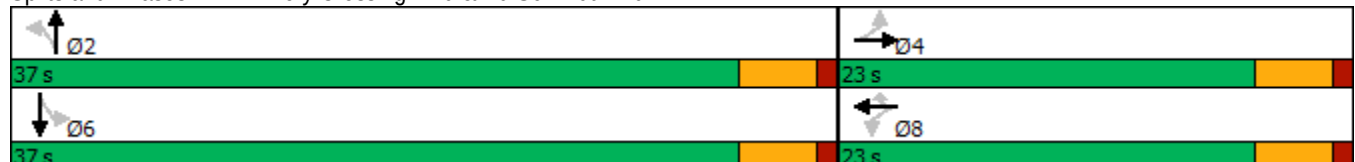
Lanes, Volumes, Timings

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	37.0	37.0		37.0	37.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%	38.3%	61.7%	61.7%		61.7%	61.7%	
Maximum Green (s)	18.5	18.5		18.5	18.5	18.5	32.5	32.5		32.5	32.5	
Yellow Time (s)	3.5	3.5		3.5	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	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-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)		7.0			7.2	7.2	21.1	21.1			21.1	
Actuated g/C Ratio		0.23			0.23	0.23	0.69	0.69			0.69	
v/c Ratio		0.24			0.19	0.08	0.20	0.28			0.37	
Control Delay		5.6			11.5	5.9	5.7	5.1			6.0	
Queue Delay		0.0			0.0	0.0	0.0	0.0			0.0	
Total Delay		5.6			11.5	5.9	5.7	5.1			6.0	
LOS		A			B	A	A	A			A	
Approach Delay		5.6			9.9			5.3			6.0	
Approach LOS		A			A			A			A	
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 30.8												
Natural Cycle: 45												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.37												
Intersection Signal Delay: 6.0	Intersection LOS: A											
Intersection Capacity Utilization 59.5%	ICU Level of Service B											
Analysis Period (min) 15												

Splits and Phases: 4: Emory Crossing Blvd & Ed Schmidt Blvd



Queues

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023



Lane Group	EBT	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	99	70	28	148	334	448
v/c Ratio	0.24	0.19	0.08	0.20	0.28	0.37
Control Delay	5.6	11.5	5.9	5.7	5.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	11.5	5.9	5.7	5.1	6.0
Queue Length 50th (ft)	1	8	0	12	27	41
Queue Length 95th (ft)	25	27	9	38	66	93
Internal Link Dist (ft)	587	912			388	792
Turn Bay Length (ft)				150		
Base Capacity (vph)	979	988	852	1040	1699	1692
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.03	0.14	0.20	0.26
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Future Volume (vph)	11	0	80	53	0	21	136	259	35	22	341	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Frt		0.88			1.00	0.85	1.00	0.98			0.99	
Flt Protected		0.99			0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1632			1770	1380	1770	1752			1790	
Flt Permitted		0.94			0.87	1.00	0.58	1.00			0.97	
Satd. Flow (perm)		1551			1620	1380	1073	1752			1746	
Peak-hour factor, PHF	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92
Adj. Flow (vph)	12	0	87	70	0	28	148	294	40	26	401	21
RTOR Reduction (vph)	0	75	0	0	0	24	0	7	0	0	2	0
Lane Group Flow (vph)	0	24	0	0	70	4	148	327	0	0	446	0
Heavy Vehicles (%)	2%	0%	2%	2%	0%	17%	2%	7%	3%	10%	5%	2%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		4.6			4.6	4.6	19.1	19.1			19.1	
Effective Green, g (s)		4.6			4.6	4.6	19.1	19.1			19.1	
Actuated g/C Ratio		0.14			0.14	0.14	0.58	0.58			0.58	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5			4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		218			227	194	626	1023			1019	
v/s Ratio Prot								0.19				
v/s Ratio Perm		0.02			c0.04	0.00	0.14				c0.26	
v/c Ratio		0.11			0.31	0.02	0.24	0.32			0.44	
Uniform Delay, d1		12.3			12.6	12.1	3.3	3.5			3.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2		0.2			0.8	0.0	0.2	0.2			0.3	
Delay (s)		12.5			13.4	12.2	3.5	3.7			4.1	
Level of Service		B			B	B	A	A			A	
Approach Delay (s)		12.5			13.0			3.6			4.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.4									
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			32.7									
Intersection Capacity Utilization			59.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 4: Emory Crossing Blvd & Ed Schmidt Blvd

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	80	53	0	21	136	259	35	22	341	19
Future Volume (veh/h)	11	0	80	53	0	21	136	259	35	22	341	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	1900	1870	1870	1900	1648	1870	1796	1856	1752	1826	1870
Adj Flow Rate, veh/h	12	0	87	70	0	28	148	294	40	26	401	21
Peak Hour Factor	0.92	0.92	0.92	0.76	0.76	0.76	0.92	0.88	0.88	0.85	0.85	0.92
Percent Heavy Veh, %	2	0	2	2	0	17	2	7	3	10	5	2
Cap, veh/h	216	9	229	586	0	227	872	631	86	201	670	34
Arrive On Green	0.16	0.00	0.16	0.16	0.00	0.16	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	141	53	1407	1490	0	1397	965	1548	211	47	1644	83
Grp Volume(v), veh/h	99	0	0	70	0	28	148	0	334	448	0	0
Grp Sat Flow(s),veh/h/ln	1601	0	0	1490	0	1397	965	0	1758	1774	0	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.4	0.0	0.0	2.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.7	0.0	0.4	1.2	0.0	2.9	4.1	0.0	0.0
Prop In Lane	0.12		0.88	1.00		1.00	1.00		0.12	0.06		0.05
Lane Grp Cap(c), veh/h	453	0	0	586	0	227	872	0	717	905	0	0
V/C Ratio(X)	0.22	0.00	0.00	0.12	0.00	0.12	0.17	0.00	0.47	0.50	0.00	0.00
Avail Cap(c_a), veh/h	1597	0	0	1545	0	1233	1975	0	2727	2886	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	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.8	0.0	0.0	7.6	0.0	7.5	4.0	0.0	4.5	4.9	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.5	0.4	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	0.2	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.1	0.0	0.0	7.7	0.0	7.7	4.1	0.0	5.0	5.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	99				98				482			
Approach Delay, s/veh	8.1				7.7				4.7			
Approach LOS	A				A				A			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	13.0			7.9			13.0			7.9		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	32.5			18.5			32.5			18.5		
Max Q Clear Time (g_c+I1), s	4.9			3.1			6.1			2.7		
Green Ext Time (p_c), s	2.5			0.4			2.5			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	5.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	22	39	252	359	19
Future Volume (vph)	11	22	39	252	359	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910				0.993	
Flt Protected	0.984			0.993		
Satd. Flow (prot)	1668	0	0	1850	1850	0
Flt Permitted	0.984			0.993		
Satd. Flow (perm)	1668	0	0	1850	1850	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	655			872	798	
Travel Time (s)	14.9			19.8	18.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	12	24	42	274	390	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	0	0	316	411	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60	60			60
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ed Schmidt Blvd & Driveway 1

08/08/2023

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	22	39	252	359	19
Future Volume (Veh/h)	11	22	39	252	359	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	24	42	274	390	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				872		
pX, platoon unblocked						
vC, conflicting volume	758	400	411			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758	400	411			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	96	96			
cM capacity (veh/h)	361	650	1148			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	316	411			
Volume Left	12	42	0			
Volume Right	24	0	21			
cSH	513	1148	1700			
Volume to Capacity	0.07	0.04	0.24			
Queue Length 95th (ft)	6	3	0			
Control Delay (s)	12.5	1.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.5	1.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		48.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM 6th TWSC
5: Ed Schmidt Blvd & Driveway 1

08/08/2023

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	22	39	252	359	19
Future Vol, veh/h	11	22	39	252	359	19
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	12	24	42	274	390	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	759	401	411	0	-	0
Stage 1	401	-	-	-	-	-
Stage 2	358	-	-	-	-	-
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	374	649	1148	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	358	649	1148	-	-	-
Mov Cap-2 Maneuver	358	-	-	-	-	-
Stage 1	647	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.6	1.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1148	-	511	-	-	
HCM Lane V/C Ratio	0.037	-	0.07	-	-	
HCM Control Delay (s)	8.3	0	12.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	

Lanes, Volumes, Timings

6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	103	27	0	6	175	427	35	9	465	0
Future Volume (vph)	0	0	103	27	0	6	175	427	35	9	465	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.974			0.989				
Flt Protected					0.961		0.950				0.999	
Satd. Flow (prot)	0	1611	0	0	1744	0	1770	1842	0	0	1861	0
Flt Permitted					0.961		0.950				0.999	
Satd. Flow (perm)	0	1611	0	0	1744	0	1770	1842	0	0	1861	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		669			577			3271			968	
Travel Time (s)		15.2			13.1			40.5			12.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	112	29	0	7	190	464	38	10	505	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	112	0	0	36	0	190	502	0	0	515	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	68.1%											
Analysis Period (min)	15											
	ICU Level of Service C											

HCM Unsignalized Intersection Capacity Analysis 6: Ed Schmidt Blvd & Driveway 2/Emory Crossing Driveway

08/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	103	27	0	6	175	427	35	9	465	0
Future Volume (Veh/h)	0	0	103	27	0	6	175	427	35	9	465	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	112	29	0	7	190	464	38	10	505	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1376	1407	505	1500	1388	483	505			502		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1376	1407	505	1500	1388	483	505			502		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	80	58	100	99	82			99		
cM capacity (veh/h)	104	113	567	69	116	584	1060			1062		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	112	36	190	502	515							
Volume Left	0	29	190	0	10							
Volume Right	112	7	0	38	0							
cSH	567	83	1060	1700	1062							
Volume to Capacity	0.20	0.43	0.18	0.30	0.01							
Queue Length 95th (ft)	18	44	16	0	1							
Control Delay (s)	12.9	77.8	9.1	0.0	0.3							
Lane LOS	B	F	A		A							
Approach Delay (s)	12.9	77.8	2.5		0.3							
Approach LOS	B	F										
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			68.1%		ICU Level of Service					C		
Analysis Period (min)			15									

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	0	0	103	27	0	6	175	427	35	9	465	0
Future Vol, veh/h	0	0	103	27	0	6	175	427	35	9	465	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	112	29	0	7	190	464	38	10	505	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1392	1407	505	1444	1388	483	505	0	0	502	0	0
Stage 1	525	525	-	863	863	-	-	-	-	-	-	-
Stage 2	867	882	-	581	525	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	119	139	567	110	143	584	1060	-	-	1062	-	-
Stage 1	536	529	-	349	372	-	-	-	-	-	-	-
Stage 2	348	364	-	499	529	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	100	113	567	75	116	584	1060	-	-	1062	-	-
Mov Cap-2 Maneuver	100	113	-	75	116	-	-	-	-	-	-	-
Stage 1	440	522	-	287	305	-	-	-	-	-	-	-
Stage 2	282	299	-	395	522	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.9		70.4		2.5		0.2					
HCM LOS	B		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1060	-	-	567	89	1062	-	-				
HCM Lane V/C Ratio	0.179	-	-	0.197	0.403	0.009	-	-				
HCM Control Delay (s)	9.1	-	-	12.9	70.4	8.4	0	-				
HCM Lane LOS	A	-	-	B	F	A	A	-				
HCM 95th %tile Q(veh)	0.7	-	-	0.7	1.6	0	-	-				

Appendix G: Background Projects



TRAFFIC IMPACT ANALYSIS SCOPE AND STUDY AREA

Project Name: Ed Schmidt Multi-Family South
Location: Ed Schmidt north of Limmer Loop
Owner's Agent: Benjamin Plett, P.E.
Kimley-Horn

Date: February 2, 2023

Phone: (512) 418-4523

Scope must be approved and signed by staff prior to submittal of a Traffic Impact Analysis (TIA).

I. Data Collection

1. Background Information:

- a. A Study Area Map that specifies study intersections and points of access to the site for the TIA is shown as Attachment A.
2. Intersections Capacity Analysis: Calculations for a.m. and p.m. peak hours must be performed for the following intersections, showing (a) existing traffic conditions and (b) projected traffic conditions, identifying site, non-site, and total traffic. Capacity analysis will be done with the 6th edition of the HCM (latest edition) wherever possible. Due to limitations of *Synchro* modeling software, some signalized intersections may be analyzed with HCM 2000. Capacity analysis should include the following elements, and will be presented for the overall intersection unless otherwise specified:
 - a. Intersection LOS
 - b. V/C (for intersection if signal, critical movements if unsignalized)
 - c. Delay (for intersection if signal, critical movements if unsignalized)
 - d. Queueing analysis with 95% queue length (for left and right turn lanes existing or proposed)

Existing Intersections

- a. Limmer Loop & Ed Schmidt
- b. Limmer Loop & US 130 NB Frontage Road
- c. Limmer Loop & US 130 FB Frontage Road
- d. Limmer Loop & Westfield St/Anderson St
- e. Ed Schmidt Boulevard & Emory Crossing Boulevard

Future Intersections:

1. SITE DRIVEWAYS AND FUTURE INTERSECTIONS CREATED BY DEVELOPMENT ACCESS

Ed Schmidt Multi-Family South– TIA scope

Mitigation shall be shown to achieve LOS D or better at all study intersections and with a $V/C < 1$. When physical constraints or inadequate right-of-way prevent construction of additional capacity, justification for the constraints shall be provided with approximate right-of-way based on parcel data from Williamson Central Appraisal District (WCAD) in an exhibit. If an intersection is below LOS D in the mitigated scenario due to these constraints, the delay and V/C shall be less than the no-build condition.

Segment Capacity Analysis:

- Capacity analysis shall be shown for all scenarios and phases of development for the following study area roadways. Turning movement counts in each phase may be used and grown to 24 hour counts with a k-factor of 0.1:
 1. N/A
- All internal site roadways shall be sized appropriately based on ADT range of different street classifications as shown in the UDC for Alley, Residential Local, or Residential Collector

Note: the TIA may be required to review and discuss the consequences of the following future build conditions:

Redistribution of existing traffic and background growth traffic should be shown as a result of the above future alignments in all phases of development.

Site Boundary and Internal Roadways:

- For adjacent roadways not yet built to the cross section in UDC 10.511.12 for the functional classification defined in the 2018 Mobility Plan, roadway capacities for the 2018 Mobility Plan ultimate section will be compared with site traffic volumes on the same roadway segment to determine a pro-rata share of improving the roadway to the 2018 Mobility Plan ultimate section. Pro-rata will be capped at 50% for roadway segments where the site borders the roadway on one side, and at 100% when the site borders both sides of a roadway alignment. Internal roadways shall be sized to accommodate site build out traffic based on ADT thresholds defined in the UDC 10.511.
- The following shall be used as the planning level cost of different street classifications on a per-mile basis to build the ultimate section from the 2018 Mobility Plan and UDC:
 - Residential Collector or Major Collector - \$5 million per mile
 - Minor Arterial - \$8 million per mile
 - Major Arterial - \$12 million per mile

II. Study Assumptions

1. **Data Assumptions:** The following assumptions must be included in the analysis. Any change in these assumptions must be approved prior to submittal of the TIA. The assumptions are based on data provided by ITE.
 - a. Growth of Existing Traffic — Average annual growth rate to be 6%, compounded annually
 - b. Trip Generation – ITE 11th Edition, attach trip generation to this scope with use of either average trip rate or equation for each land use and associated period (peak hour of generator, weekday AM, e.g.)
 - c. Background TIAs
 - i. Coordinate with staff on projects to be included for background traffic, in addition to the Growth of Existing Traffic in item (a)
 1. Alta Ed Schmidt MF
 2. Ed Schmidt Hutto SF North
 - d. Background City Projects
 - i. Coordinate with staff for projects to include as part of the no-build condition scenario in the TIA study
2. The following reduction factors are approved for the proposed land uses:
 - a. Internal trip capture rates: Internal Capture shall be calculated utilizing the methods prescribed by the ITE Trip Generation Handbook.
 - b. Pass-by Trips: Pass-by Trips shall be calculated utilizing the methods prescribed by the ITE Trip Generation Handbook.
 - c. Traffic Distribution Trip distribution for trips generated by the site should follow Section 3 of this scope.
 - d. Transit Trips: None.
3. **Trip Distribution:** The distribution of trips to/from the proposed development will be based upon the existing roadway network and traffic patterns. Where new roadways (and connections) are integral to the site, present these elements as part of the “build out” condition. Trip Distribution to be submitted for interim review and approval before capacity analysis is performed after collection of existing counts and comparison with existing distribution trends.

Direction	Roadway	Phase 1: 2026 Site Traffic To/From
North	Ed Schmidt	10
South	Ed Schmidt	35
West	Limmer Loop	45
East	Limmer Loop	10

4. **Other Considerations:**
Build-Out year for Phase 1 of Development: 2026
Build-Out year for Phase 2 of Development: N/A

Demonstration of adequate sight distance, turn lane warrants, appropriate spacing, and queueing analysis shall be provided for all proposed site access points.

5. Mitigations: Proposed mitigations shall show a pro-rata percentage for the share of the improvement attributable to the site development.
- For signal timing adjustments and deceleration left- or right-turn lanes into the site, pro-rata shall be 100%.
 - For new signals or full intersection control changes, pro-rata percentage shall be calculated as the site traffic entering the intersection divided by the total traffic entering the intersection for a given phase build-out.
 - For new turn lanes, pro-rata percentage shall be calculated for the approach for which the improvement is being made as the site traffic for the approach divided by the total traffic using the approach. Turn lanes cannot be achieved by restriping unless 12' lanes are maintained with a 4' shoulder on both sides of the roadway, when curb and gutter is not present. Mitigations shall be tied to each phase of development and pro-rata calculated for the phase in which the mitigation is required. Mitigations may be carried into subsequent phases of development as background improvements.
 - Pro-rata for site boundary and internal roadways shall follow method outlined in Section 2 with segment capacity analysis.

Costs for mitigations shall be \$350 per linear foot for each lane of roadway or turn lane, \$350,000 for new signals, and \$5,000 for signal timing adjustments at each intersection. If a new turn lane or roadway requires relocation of sidewalks, overhead utilities, bridge expansions, retaining walls, or other street elements, additional cost shall be estimated for relocation or construction of these facilities based on the latest TxDOT 3 month Statewide average low bid unit prices with supporting documentation of calculations. Costs for other mitigations shall be coordinated with and approved by City of Hutto.

6. Submittal Requirements

- Submit electronic copies to City of Hutto, and coordinate with TxDOT regarding their requirements. Submit CD's or .zip files containing the following: PDF of the TIA, Synchro network for all conditions analyzed, Excel spreadsheets for all calculations, and a CAD file for the site plan, if available.

Submittal Distribution is to be as follows:

City of Hutto: Electronic, Attention Sam Ray
TxDOT: Electronic, Attention Scott Cunningham

- Traffic signal modeling requirements (Synchro files must be in real world coordinates):
 - TxDOT timing sheets to be included in the appendix of the TIA
 - All intersections must be modeled in one Synchro file (including unsignalized intersections).
 - Synchro signal timing sheets to be included in the following format for each phase of development:
 - Existing conditions (am + pm),
 - Eight (8) future conditions:
 - (am background, am background + site, am background + site + mitigation)
 - (pm background, pm background + site, pm background + site + mitigation)
 - Eight (8) site + 10 year (horizon year) conditions:
 - (am background, am background + site, am background + site + mitigation)
 - (pm background, pm background + site, pm background + site + mitigation)

Ed Schmidt Multi-Family South– TIA scope

This scope and study is based upon the assumed development uses and intensities in the TIA Determination sheet in Attachment B. Any change in these assumptions may require a change in the scope. Preparation of the TIA shall follow City of Hutto Unified Development Code Chapter 10.515.4 requirements unless otherwise specified in this document.

Approved by (City of Hutto): _____ Phone: _____

Ed Schmidt Multi-Family South– TIA scope

Attachment A

SEE EXHIBIT ATTACHED

Existing Intersections

A. ALL STUDY INTERSECTIONS

Future Intersections:

1. PROPOSED SITE DRIVEWAYS AND NEW INTERSECTIONS CREATED BY SITE ACCESS



CITY OF HUTTO

TRAFFIC IMPACT ANALYSIS (TIA) DETERMINATION WORKSHEET

APPLICANT MUST FILL IN WORKSHEET PRIOR TO SUBMITTING FOR TIA DETERMINATION

PROJECT NAME: **Ed Schmidt MF South**

LOCATION: See Attached

APPLICANT'S AGENT: FIRM NAME **Kimley-Horn** (ENGINEER NAME) **Benjamin Plett, P.E.**TELEPHONE NO.: **512-418-4523** APPLICANT'S EMAIL ADDRESS: **Ben.Plett@Kimley-Horn.com**

APPLICATION STATUS: DEVELOPMENT ASSESSMENT: _____ ZONING _____ SITE PLAN: _____

EXISTING:

PARCEL NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS
N/A	N/A	N/A			

PROPOSED

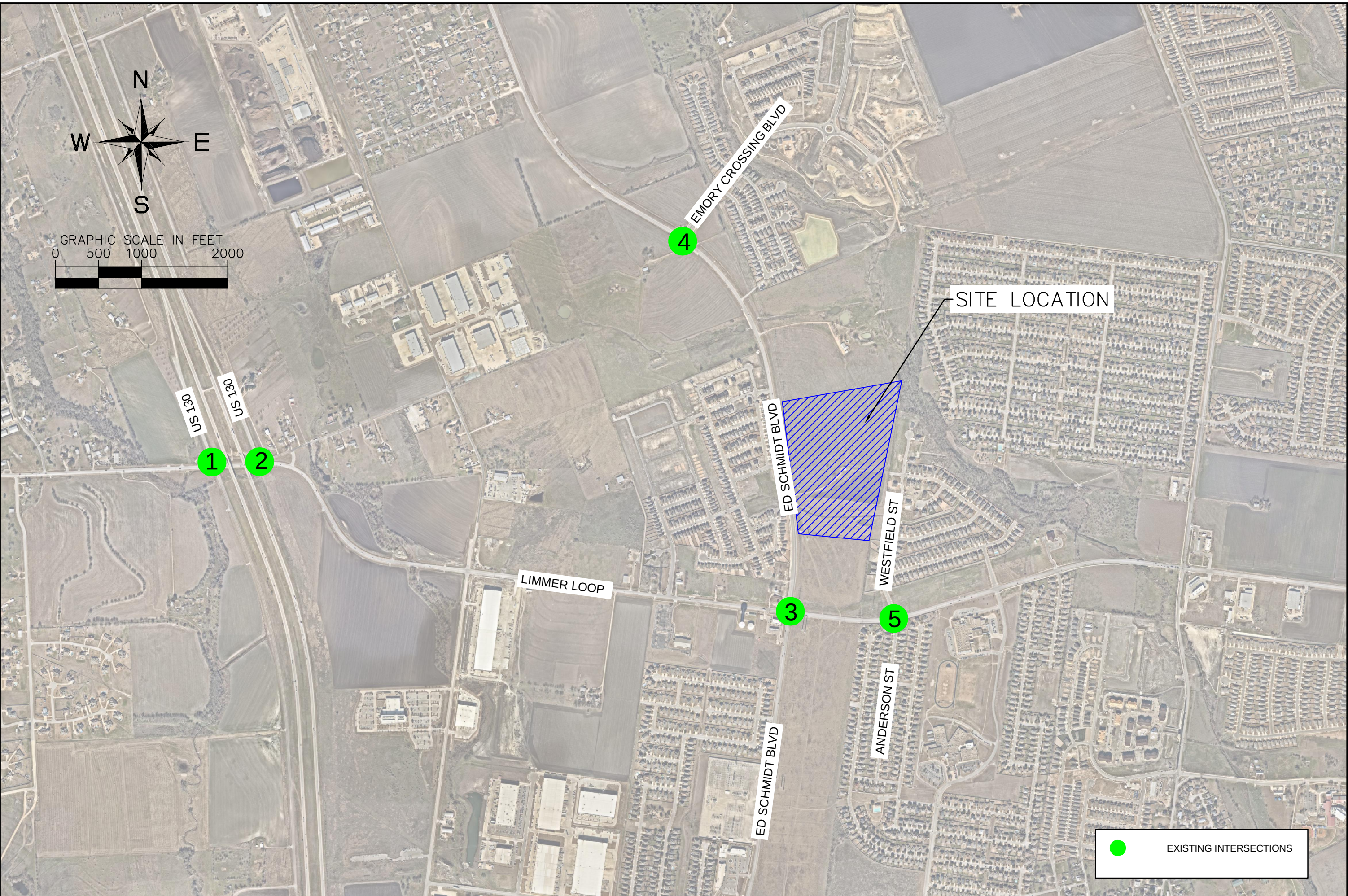
TRACT NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS	AM / PM TRIP RATE/EQ	AM TRIPS	PM TRIPS
1 (Phase)	360 DU	Multi-Family	220	T=6.41(X) +75.31	2384	T=0.31(X) +22.85 T=0.43(X) +20.55	136	176
2 (Phase)								
				Total				

ABUTTING ROADWAYS

STREET NAME	PROPOSED ACCESS?	PAVEMENT WIDTH	CLASSIFICATION*
Ed Schmidt	Yes	42'	Minor Arterial
Emory Crossing Blvd	Yes	60'	Not classified
Westfield St	Yes	30'	Minor Arterial

*Classification reflects Mobility Master Plan, 2018

NOTE: A TIA determination must be made prior to submittal of any zoning or site plan application. Therefore, this completed and reviewed form MUST ACCOMPANY any subsequent application for the IDENTICAL project. CHANGES to the proposed project will REQUIRE a new TIA determination to be made.





TRAFFIC IMPACT ANALYSIS SCOPE AND STUDY AREA

Project Name: Ed Schmidt Single-Family North
Location: Ed Schmidt north of Limmer Loop
Owner's Agent: Benjamin Plett, P.E.
Kimley-Horn

Date: February 2, 2023

Phone: (512) 418-4523

Scope must be approved and signed by staff prior to submittal of a Traffic Impact Analysis (TIA).

I. Data Collection

1. Background Information:

- a. A Study Area Map that specifies study intersections and points of access to the site for the TIA is shown as Attachment A.
2. Intersections Capacity Analysis: Calculations for a.m. and p.m. peak hours must be performed for the following intersections, showing (a) existing traffic conditions and (b) projected traffic conditions, identifying site, non-site, and total traffic. Capacity analysis will be done with the 6th edition of the HCM (latest edition) wherever possible. Due to limitations of *Synchro* modeling software, some signalized intersections may be analyzed with HCM 2000. Capacity analysis should include the following elements, and will be presented for the overall intersection unless otherwise specified:
 - a. Intersection LOS
 - b. V/C (for intersection if signal, critical movements if unsignalized)
 - c. Delay (for intersection if signal, critical movements if unsignalized)
 - d. Queueing analysis with 95% queue length (for left and right turn lanes existing or proposed)

Existing Intersections

- A. Limmer Loop & Ed Schmidt
- B. Limmer Loop & US 130 NB Frontage Road
- C. Limmer Loop & US 130 FB Frontage Road
- D. Ed Schmidt Boulevard & Emory Crossing Boulevard

Future Intersections:

1. SITE DRIVEWAYS AND FUTURE INTERSECTIONS CREATED BY DEVELOPMENT ACCESS

Ed Schmidt Single-Family North – TIA scope

Mitigation shall be shown to achieve LOS D or better at all study intersections and with a $V/C < 1$. When physical constraints or inadequate right-of-way prevent construction of additional capacity, justification for the constraints shall be provided with approximate right-of-way based on parcel data from Williamson Central Appraisal District (WCAD) in an exhibit. If an intersection is below LOS D in the mitigated scenario due to these constraints, the delay and V/C shall be less than the no-build condition.

Segment Capacity Analysis:

- Capacity analysis shall be shown for all scenarios and phases of development for the following study area roadways. Turning movement counts in each phase may be used and grown to 24 hour counts with a k-factor of 0.1:
 1. N/A
- All internal site roadways shall be sized appropriately based on ADT range of different street classifications as shown in the UDC for Alley, Residential Local, or Residential Collector

Note: the TIA may be required to review and discuss the consequences of the following future build conditions:

Redistribution of existing traffic and background growth traffic should be shown as a result of the above future alignments in all phases of development.

Site Boundary and Internal Roadways:

- For adjacent roadways not yet built to the cross section in UDC 10.511.12 for the functional classification defined in the 2018 Mobility Plan, roadway capacities for the 2018 Mobility Plan ultimate section will be compared with site traffic volumes on the same roadway segment to determine a pro-rata share of improving the roadway to the 2018 Mobility Plan ultimate section. Pro-rata will be capped at 50% for roadway segments where the site borders the roadway on one side, and at 100% when the site borders both sides of a roadway alignment. Internal roadways shall be sized to accommodate site build out traffic based on ADT thresholds defined in the UDC 10.511.
- The following shall be used as the planning level cost of different street classifications on a per-mile basis to build the ultimate section from the 2018 Mobility Plan and UDC:
 - Residential Collector or Major Collector - \$5 million per mile
 - Minor Arterial - \$8 million per mile
 - Major Arterial - \$12 million per mile

II. Study Assumptions

1. **Data Assumptions:** The following assumptions must be included in the analysis. Any change in these assumptions must be approved prior to submittal of the TIA. The assumptions are based on data provided by ITE.
 - a. Growth of Existing Traffic — Average annual growth rate to be 6%, compounded annually
 - b. Trip Generation – ITE 11th Edition, attach trip generation to this scope with use of either average trip rate or equation for each land use and associated period (peak hour of generator, weekday AM, e.g.)
 - c. Background TIAs
 - i. Coordinate with staff on projects to be included for background traffic, in addition to the Growth of Existing Traffic in item (a)
 1. Alta Ed Schmidt
 2. Ed Schmidt Hutto MF South
 - d. Background City Projects
 - i. Coordinate with staff for projects to include as part of the no-build condition scenario in the TIA study
2. The following reduction factors are approved for the proposed land uses:
 - a. Internal trip capture rates: Internal Capture shall be calculated utilizing the methods prescribed by the ITE Trip Generation Handbook.
 - b. Pass-by Trips: Pass-by Trips shall be calculated utilizing the methods prescribed by the ITE Trip Generation Handbook.
 - c. Traffic Distribution Trip distribution for trips generated by the site should follow Section 3 of this scope.
 - d. Transit Trips: None.
3. **Trip Distribution:** The distribution of trips to/from the proposed development will be based upon the existing roadway network and traffic patterns. Where new roadways (and connections) are integral to the site, present these elements as part of the “build out” condition. Trip Distribution to be submitted for interim review and approval before capacity analysis is performed after collection of existing counts and comparison with existing distribution trends.

Direction	Roadway	Phase 1: 2026 Site Traffic To/From
North	Ed Schmidt	10
South	Ed Schmidt	35
West	Limmer Loop	45
East	Limmer Loop	10

4. **Other Considerations:**
Build-Out year for Phase 1 of Development: 2026
Build-Out year for Phase 2 of Development: N/A

Demonstration of adequate sight distance, turn lane warrants, appropriate spacing, and queueing analysis shall be provided for all proposed site access points.

5. Mitigations: Proposed mitigations shall show a pro-rata percentage for the share of the improvement attributable to the site development.
 - a. For signal timing adjustments and deceleration left- or right-turn lanes into the site, pro-rata shall be 100%.
 - b. For new signals or full intersection control changes, pro-rata percentage shall be calculated as the site traffic entering the intersection divided by the total traffic entering the intersection for a given phase build-out.
 - c. For new turn lanes, pro-rata percentage shall be calculated for the approach for which the improvement is being made as the site traffic for the approach divided by the total traffic using the approach. Turn lanes cannot be achieved by restriping unless 12' lanes are maintained with a 4' shoulder on both sides of the roadway, when curb and gutter is not present. Mitigations shall be tied to each phase of development and pro-rata calculated for the phase in which the mitigation is required. Mitigations may be carried into subsequent phases of development as background improvements.
 - d. Pro-rata for site boundary and internal roadways shall follow method outlined in Section 2 with segment capacity analysis.

Costs for mitigations shall be \$350 per linear foot for each lane of roadway or turn lane, \$350,000 for new signals, and \$5,000 for signal timing adjustments at each intersection. If a new turn lane or roadway requires relocation of sidewalks, overhead utilities, bridge expansions, retaining walls, or other street elements, additional cost shall be estimated for relocation or construction of these facilities based on the latest TxDOT 3 month Statewide average low bid unit prices with supporting documentation of calculations. Costs for other mitigations shall be coordinated with and approved by City of Hutto.

6. Submittal Requirements

- a. Submit electronic copies to City of Hutto, and coordinate with TxDOT regarding their requirements. Submit CD's or .zip files containing the following: PDF of the TIA, Synchro network for all conditions analyzed, Excel spreadsheets for all calculations, and a CAD file for the site plan, if available.

Submittal Distribution is to be as follows:

City of Hutto: Electronic, Attention Sam Ray
TxDOT: Electronic, Attention Scott Cunningham

- b. Traffic signal modeling requirements (Synchro files must be in real world coordinates):
 - TxDOT timing sheets to be included in the appendix of the TIA
 - All intersections must be modeled in one Synchro file (including unsignalized intersections).
 - Synchro signal timing sheets to be included in the following format for each phase of development:
 1. Existing conditions (am + pm),
 2. Eight (8) future conditions:
 - (am background, am background + site, am background + site + mitigation)
 - (pm background, pm background + site, pm background + site + mitigation)
 3. Eight (8) site + 10 year (horizon year) conditions:
 - (am background, am background + site, am background + site + mitigation)
 - (pm background, pm background + site, pm background + site + mitigation)

This scope and study is based upon the assumed development uses and intensities in the TIA Determination sheet in Attachment B. Any change in these assumptions may require a change in the scope. Preparation of the TIA shall follow City of Hutto Unified Development Code Chapter 10.515.4 requirements unless otherwise specified in this document.

Approved by (City of Hutto):  Phone: _____

Ed Schmidt Single-Family North – TIA scope

Attachment A

SEE EXHIBIT ATTACHED

Existing Intersections

A. ALL STUDY INTERSECTIONS

Future Intersections:

1. PROPOSED SITE DRIVEWAYS AND NEW INTERSECTIONS CREATED BY SITE ACCESS



CITY OF HUTTO
TRAFFIC IMPACT ANALYSIS (TIA) DETERMINATION WORKSHEET
 APPLICANT MUST FILL IN WORKSHEET PRIOR TO SUBMITTING FOR TIA DETERMINATION

PROJECT NAME: **Ed Schmidt SF North**

LOCATION: See Attached

APPLICANT'S AGENT: FIRM NAME **Kimley-Horn** (ENGINEER NAME) **Benjamin Plett, P.E.**TELEPHONE NO.: **512-418-4523** APPLICANT'S EMAIL ADDRESS: **Ben.Plett@Kimley-Horn.com**

APPLICATION STATUS: DEVELOPMENT ASSESSMENT: _____ ZONING _____ SITE PLAN: _____

EXISTING:

PARCEL NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS
N/A	N/A	N/A			

PROPOSED

TRACT NUMBER	BLDG SQ.FT.	LAND USE	ITE CODE	DAILY TRIP RATE/EQ	DAILY TRIPS	AM / PM TRIP RATE/EQ	AM TRIPS	PM TRIPS
1 (Phase)	252 DU	SF Detached	210	$\ln(T) = 0.92\ln(X) + 2.68$	2362	$\ln(T) = 0.91(X) + 0.12$ $\ln(T) = 0.94\ln(X) + 0.27$	173	237
	78 DU	SF Attached	215	$T = 7.62(X) - 50.48$	544	$T = 0.52(X) - 5.70$ $T = 0.60(X) - 3.93$	36	44
2 (Phase)								
				Total				

ABUTTING ROADWAYS

STREET NAME	PROPOSED ACCESS?	PAVEMENT WIDTH	CLASSIFICATION*
Ed Schmidt Blvd	Yes	42'	Minor Arterial

*Classification reflects Mobility Master Plan, 2018

NOTE: A TIA determination must be made prior to submittal of any zoning or site plan application. Therefore, this completed and reviewed form **MUST ACCOMPANY** any subsequent application for the IDENTICAL project. CHANGES to the proposed project will **REQUIRE** a new TIA determination to be made.



Parkland Letter of Intent

PROJECT NAME: Alta Ed Schmidt

PROJECT ADDRESS: Intersection of Ed Schmidt Blvd and Emory Crossing Blvd

Total acreage 77.88 acres Proposed zoning MF-1

Location: Intersection of Ed Schmidt Blvd and Emory Crossing Blvd

This submittal is
not a Preliminary
Plat

☒ Preliminary Plat

☐ Final Plat

Parkland Contribution

All parkland dedication and or fees in lieu of dedication shall be in conformance with 10.609 of Hutto's Unified Development Code, as amended. Potential parkland dedication must be approved by the Parks and Recreation Director or designated agents at the conceptual plan stage, and approved by the Parks Advisory Board and Parks and Recreation Director at the preliminary plat stage.

Number of park acres *required* to be conveyed:

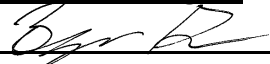
Number of park acres *proposed* to be conveyed:

AND/OR

Amount required for Fee in Lieu of Parkland Conveyance:

1392 Units x \$175 = \$243,600

Property owner or authorized agent

Signature: 

Printed Name: Benjamin L. Green, P.E.

Date: 6/19/2023

Contact Person: Andrew B. Graham, P.E.

Phone: 737 787 7268

Fax:

Email: andy.graham@kimley-horn.com

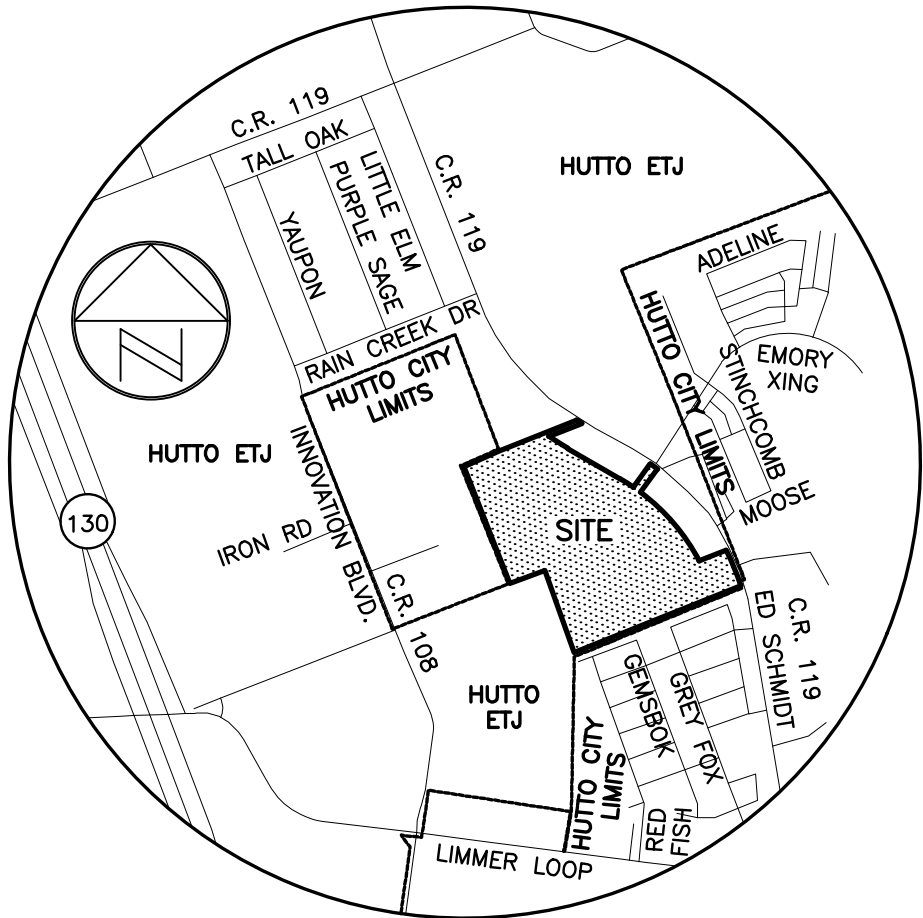
FOR DEPARTMENT USE ONLY:

Submittal date	Date accepted for review	Payment	Fees paid	Parks Mtg. date	Approved

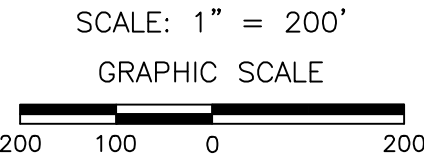
ALTA ED SCHMIDT SUBDIVISION

SHEET INDEX

Add Final Plat to the title



LOCATION MAP
1" = 2000'



LOT SUMMARY:

LOT 1 = 22.157 ACRES OR 965,169 SQ. FT.
LOT 2 = 20.560 ACRES OR 895,570 SQ. FT.
LOT 3 = 15.859 ACRES OR 690,814 SQ. FT.
LOT 4 = 15.809 ACRES OR 688,622 SQ. FT.

TOTAL LOTS: 4

TOTAL BLOCKS: 1

RIGHT-OF-WAY: 3.496 ACRES OR 152,303 SQ. FT.

TOTAL ACRES: 77.881 OR 3,392,478 SQ. FT.

JAMES SHELTON SURVEY, ABS. 560
AARON ARMSTRONG SURVEY NO. 9, ABS. 26

add linear ft of new streets

OWNER:

NO-COUNT, LLC.
311 ROYALE HEIGHTS LANE
HOUSTON, TX 77024

ENGINEERING BY:

KIMLEY-HORN
CONTACT: ANDY GRAHAM, P.E.
5301 SOUTHWEST PARKWAY, BUILDING 2
SUITE 100, AUSTIN, TX 78735
DIRECT: 512-646-2243

SURVEYING BY:

EARLY LAND SURVEYING, LLC
CONTACT: JOE BEN EARLY, JR., RPLS
P O BOX 92588
AUSTIN, TX 78709
512-202-8631

THIS IS A SURFACE DRAWING.

BEARING BASIS: THE TEXAS COORDINATE
SYSTEM OF 1983 (NAD83), CENTRAL ZONE,
BASED ON GPS OBSERVATIONS ON EARLY
LAND SURVEYING CONTROL POINT "BM #5"

MAG NAIL WITH WASHER SET IN CONCRETE

SURFACE COORDINATES:
N 10182678.60
E 3168954.68

TEXAS STATE PLANE COORDINATES:
N 10181456.83
E 3168574.46

ELEVATION = 711.46'
VERTICAL DATUM: NAVD 88 (GEOID 12B)

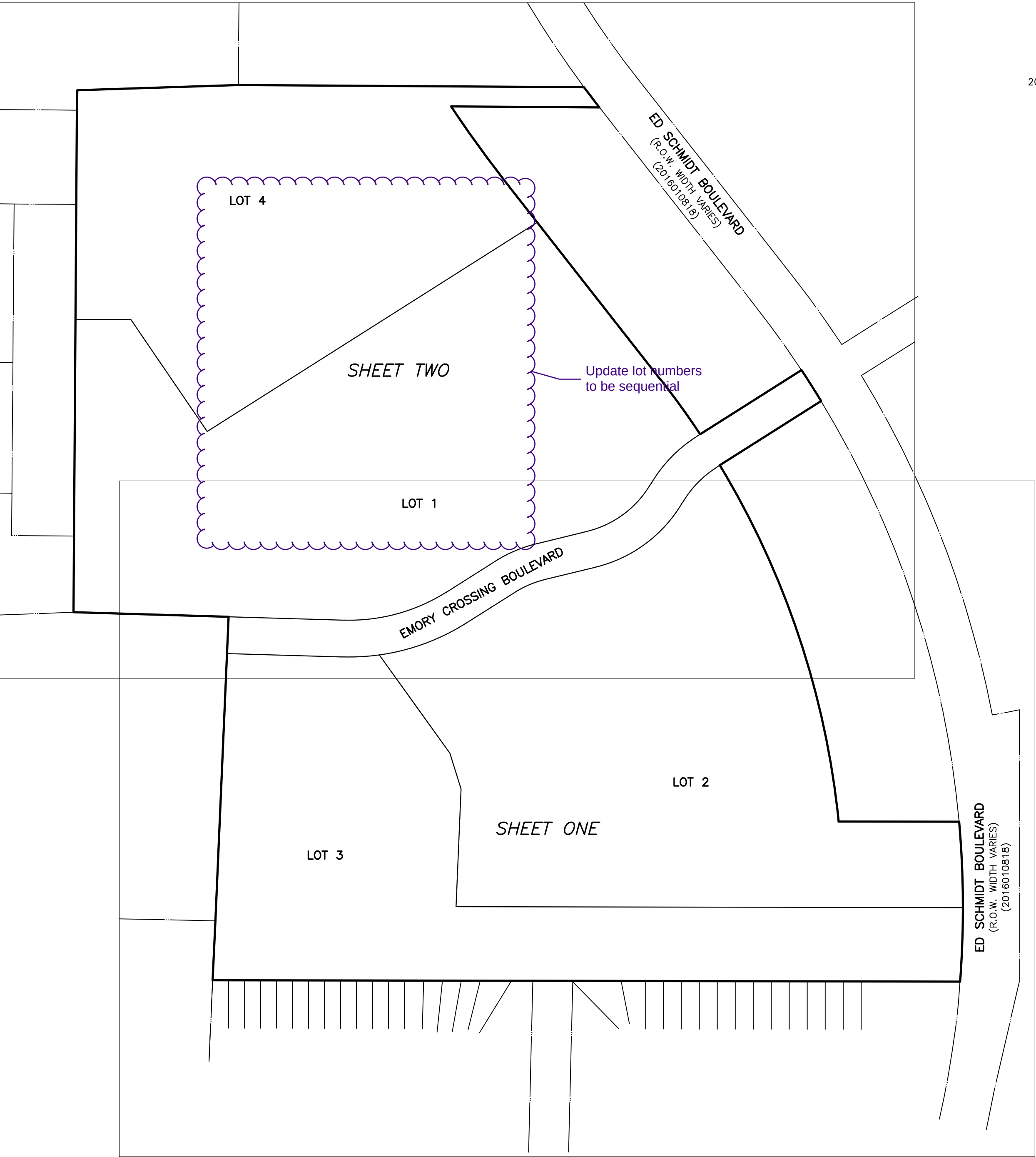
COMBINED SCALE FACTOR = 0.999880014
(FOR SURFACE TO GRID CONVERSION)

INVERSE SCALE FACTOR = 1.000120
(FOR GRID TO SURFACE CONVERSION)

SCALED ABOUT 0.0
THETA ANGLE: 1°25'41"

- LEGEND
- 1/2" REBAR FOUND (OR AS NOTED)
 - SAM 1/2" REBAR WITH "SAM INC." CAP FOUND
 - BGE 1/2" REBAR WITH "BGE" CAP FOUND
 - TLS 1/2" REBAR WITH "TLS" CAP FOUND
 - CRICHTON 1/2" REBAR WITH "CRICHTON" CAP FOUND
 - 1/2" REBAR WITH "EARLY BOUNDARY" CAP SET
 - ⊙ 3/4" IRON PIPE FOUND (OR AS NOTED)
 - ▲ MAG NAIL FOUND IN 4" POST
 - △ CALCULATED POINT
 - ⊕ CONTROL POINT/BENCHMARK LOCATION
 - P.U.E. PUBLIC UTILITY EASEMENT
 - W.E. WATER EASEMENT
 - W.W.E. WASTEWATER EASEMENT
 - () RECORD INFORMATION

Define any line types
used in the document
and provide any
acronyms



Preliminary, this document shall not be recorded for any purpose and shall not
be used or viewed or relied upon as a final survey document.

PROJECT NO.:
1006-032
DRAWING NO.:
1006-032-PL1
PLOT DATE:
2/23/24
PLOT SCALE:
1" = 200'

DRAWN BY:
MAW & JBE

SHEET
01 OF 05

EARLY
LAND SURVEYING

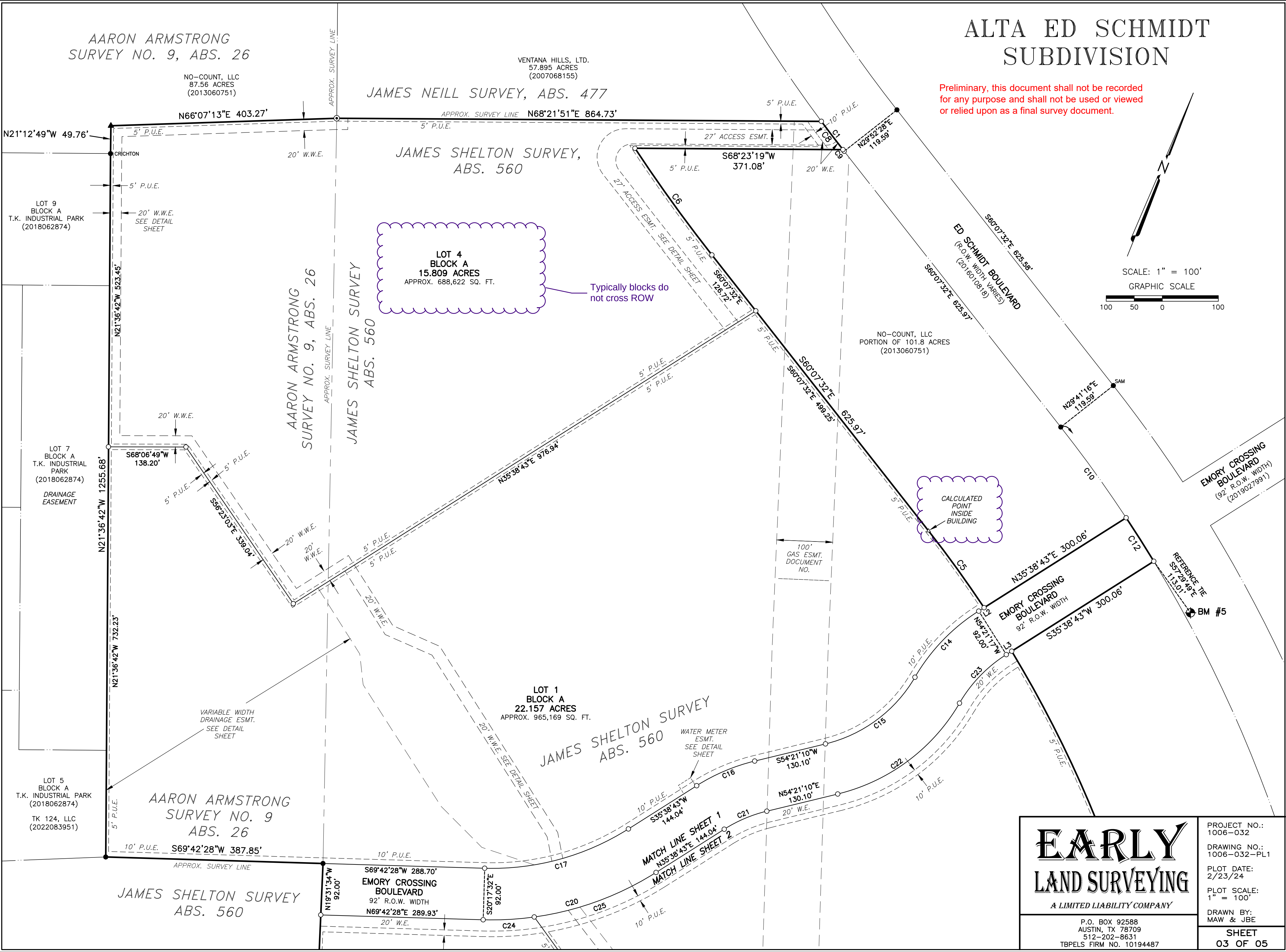
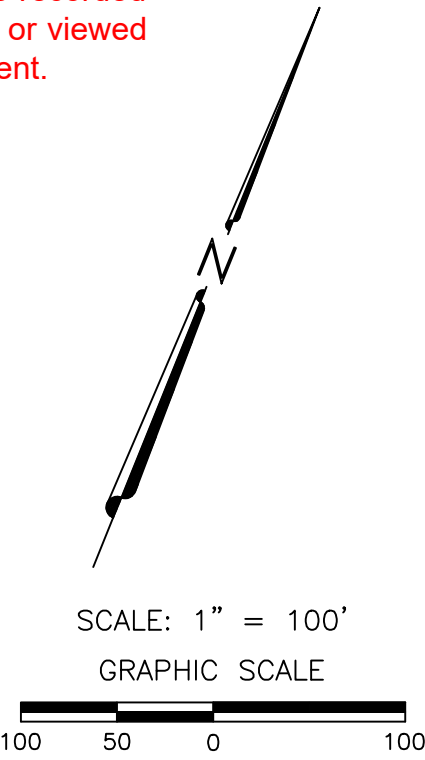
A LIMITED LIABILITY COMPANY

P.O. BOX 92588
AUSTIN, TX 78709
512-202-8631
TBPELS FIRM NO. 10194487

Page 280 of 323

ALTA ED SCHMIDT
SUBDIVISION

Preliminary, this document shall not be recorded
for any purpose and shall not be used or viewed
or relied upon as a final survey document.



EARLY
LAND SURVEYING
A LIMITED LIABILITY COMPANY

P.O. BOX 92588
AUSTIN, TX 78709
512-202-8631
TBPELS FIRM NO. 10194487

PROJECT NO.: 1006-032
DRAWING NO.: 1006-032-PL1
PLOT DATE: 2/23/24
PLOT SCALE: 1" = 100'
DRAWN BY: MAW & JBE
SHEET 03 OF 05

ALTA ED SCHMIDT SUBDIVISION

EASEMENT DETAIL SHEET
LINE/CURVE TABLE SHEET

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S60°07'32"E	27.35'
L2	S35°38'43"W	11.33'
L3	N35°38'43"E	11.34'
L50	S59°19'07"E	27.00'
L51	S30°46'15"W	2.89'
L52	S68°22'35"W	346.12'
L53	S60°07'32"E	343.50'
L54	S35°38'43"W	27.14'
L55	N60°07'32"W	353.21'
L56	N68°22'35"E	358.05'
L57	N30°46'15"E	2.34'
L58	S58°49'15"E	17.50'
L59	N35°38'43"E	37.19'
L60	S21°38'09"E	20.00'
L61	S68°21'51"W	19.37'
L62	S66°07'13"W	383.79'
L63	S21°12'49"E	30.60'
L64	S21°36'42"E	503.29'
L65	N68°06'49"E	128.63'
L66	S56°23'03"E	330.26'
L67	N35°38'43"E	109.81'
L68	S54°21'17"E	20.00'
L69	S54°21'17"E	128.21'
L70	S88°15'21"E	91.26'
L71	S54°21'17"E	393.62'
L72	S33°04'47"E	47.15'
L73	N33°04'47"W	44.70'
L74	N54°21'17"W	383.77'
L75	N88°15'21"W	91.26'
L76	N54°21'17"W	134.31'

L77	S35°38'43"W	56.87'
L78	S35°38'43"W	52.24'
L79	N68°21'51"E	19.76'
L80	S68°06'49"W	138.20'
L81	S54°21'17"E	139.07'
L82	S28°20'22"E	55.63'
L83	S54°40'03"E	257.63'
L84	S66°46'22"E	103.17'
L85	N86°29'17"E	98.83'
L86	S35°38'43"W	116.93'
L87	S35°38'43"W	25.50'
L88	S35°38'43"W	1.62'
L89	S54°21'17"E	18.00'
L90	S35°38'43"W	25.50'
L91	N54°21'17"W	18.00'
L92	S59°35'25"E	408.10'
L93	S59°35'25"E	25.86'
L94	S59°35'25"E	74.01'
L95	N69°45'31"E	106.35'
L96	S65°14'29"E	64.55'
L97	N68°06'47"E	56.49'
L98	N68°06'47"E	552.64'
L99	N27°30'36"W	20.10'
L100	N68°06'47"E	301.15'
L101	N65°14'29"W	143.19'
L102	S69°45'31"W	154.13'
L103	S69°45'31"W	25.86'
L104	N59°35'25"W	425.68'
L105	N69°45'31"E	178.81'
L106	S65°14'29"E	142.85'
L107	N68°06'47"E	542.04'
L108	S59°49'56"E	18.90'

CURVE TABLE					
CURVE	RADIUS	DELTA	ARC	BEARING	CHORD
C1	2560.00'	1°30'02"	67.05'	S59°22'31"E	67.05'
C2	2440.00'	42°28'33"	1808.88'	S38°53'13"E	1767.74'
C3	2440.00'	1°11'07"	50.47'	S18°04'26"E	50.47'
C4	2440.00'	6°59'45"	297.93'	S12°42'18"E	297.75'
C5	2140.00'	4°32'02"	169.34'	S57°51'28"E	169.29'
C6	2860.00'	4°42'28"	234.99'	S57°46'18"E	234.93'
C7	2140.00'	25°20'55"	946.77'	S40°27'12"E	939.06'
C8	2560.00'	1°25'08"	63.39'	S59°20'04"E	63.39'
C9	2560.00'	0°04'54"	3.65'	S60°05'05"E	3.65'
C10	2440.00'	4°41'09"	199.55'	N57°46'55"W	199.50'
C11	2440.00'	26°13'33"	1116.86'	S40°09'56"E	1107.13'
C12	2440.00'	2°09'38"	92.01'	S54°21'31"E	92.00'
C13	2440.00'	9°24'13"	400.46'	S22°21'03"E	400.01'
C14	346.00'	27°25'25"	165.61'	S21°56'00"W	164.03'
C15	254.00'	46°07'52"	204.51'	S31°17'14"W	199.03'
C16	346.00'	18°42'27"	112.97'	S44°59'56"W	112.47'
C17	454.00'	34°03'45"	269.90'	S52°40'36"W	265.95'
C18	2440.00'	5°03'20"	215.30'	S24°31'29"E	215.23'
C19	2440.00'	4°20'53"	185.16'	S19°49'23"E	185.12'
C20	546.00'	34°03'45"	324.60'	N52°40'36"E	319.84'
C21	254.00'	18°42'27"	82.93'	N44°59'56"E	82.56'
C22	346.00'	46°07'52"	278.58'	N31°17'14"E	271.11'
C23	254.00'	27°25'25"	121.57'	N21°56'00"E	120.42'
C24	546.00'	9°35'39"	91.43'	N64°54'39"E	91.32'
C25	546.00'	24°28'06"	233.17'	N47°52'46"E	231.40'
C50	25.50'	37°36'20"	16.74'	S49°34'25"W	16.44'
C51	29.50'	128°30'07"	66.16'	S04°07'32"W	53.14'
C52	50.50'	128°30'07"	113.26'	N04°07'32"E	90.97'
C53	454.00'	2°31'47"	20.04'	N53°10'53"E	20.04'
C54	454.00'	4°02'41"	32.05'	N56°28'07"E	32.04'
C55	454.00'	11°13'01"	88.88'	N64°05'58"E	88.74'
C56	454.00'	16°16'16"	128.93'	N43°46'51"E	128.50'
C57	546.00'	6°29'49"	61.91'	N56°51'55"E	61.88'
C58	546.00'	2°15'54"	21.58'	N52°29'04"E	21.58'
C59	2440.00'	0°28'17"	20.07'	S26°49'01"E	20.07'
C60	2440.00'	4°35'03"	195.22'	S24°17'21"E	195.17'
C61	2440.00'	4°20'53"	185.16'	S19°49'23"E	185.12'
C62	546.00'	15°42'24"	149.68'	N43°29'55"E	149.21'

callout document numbers or hereby dedicated for all easement callouts (Typ.)

Indicate Lone Star Easement existence

SCALE: 1" = 200'
GRAPHIC SCALE

If the easements will be dedicated with this Final Plat, write in "hereby dedicated". If not, provide space for the recorded document number to be written in prior to plat recordation.

Add ROW Deed info

EARLY
LAND SURVEYING
A LIMITED LIABILITY COMPANY

P.O. BOX 92588
AUSTIN, TX 78709
512-202-8631
TBPELS FIRM NO. 10194487

PROJECT NO.:
1006-032
DRAWING NO.:
1006-032-PL1
PLOT DATE:
2/23/24
PLOT SCALE:
1" = 100'
DRAWN BY:
MAW & JBE
SHEET
04 OF 05

ALTA ED SCHMIDT SUBDIVISION

STATE OF TEXAS { KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON {

I, NO-COUNT LLC, SOLE OWNER OF THOSE CERTAIN 101.8 ACRE, 8.36 ACRE AND 3.50 ACRE TRACTS DESCRIBED IN A DEED RECORDED IN DOCUMENT NO. 2013060751 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS, DO HEREBY STATE THAT THERE ARE NO LIEN HOLDERS OF THE SAID TRACTS AND DO HEREBY SUBDIVIDE 77.881 ACRES OUT OF THE SAID TRACTS AS SHOWN HEREON, AND DO HEREBY CONSENT TO ALL PLAT NOTE REQUIREMENTS SHOWN HEREON, AND DO HEREBY DEDICATE TO THE CITY OF HUTTO THE STREETS, ALLEYS, RIGHTS-OF-WAY, EASEMENTS AND PUBLIC PLACES SHOWN HEREON FOR SUCH PUBLIC PURPOSES AS THE CITY OF HUTTO MAY DEEM APPROPRIATE.

THIS SUBDIVISION IS TO BE KNOWN AS "_____"

TO CERTIFY WHICH, WITNESS BY MY HAND THIS ____ DAY OF _____, 20____.

BY: _____

_____ (PRINTED NAME)

NO-COUNT, LLC,
311 ROYALE HEIGHTS LANE
HOUSTON, TX 77024

STATE OF TEXAS { KNOW ALL MEN BY THESE PRESENTS
COUNTY OF TRAVIS {

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED _____, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT AND HE ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED.

WITNESS MY HAND AND SEALED IN MY OFFICE, THIS THE ____ DAY OF _____, 20____, AD.

NOTARY PUBLIC, STATE OF TEXAS

PRINTED NAME MY COMMISSION EXPIRES

STATE OF TEXAS { KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON {

I, JOE BEN EARLY, JR., REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THIS PLAT IS TRUE AND CORRECTLY MADE FROM AN ACTUAL SURVEY MADE ON THE GROUND OF THE PROPERTY LEGALLY DESCRIBED HEREON, AND THAT THERE ARE NO APPARENT DISCREPANCIES, CONFLICTS, OVERLAPPING OF IMPROVEMENTS, VISIBLE UTILITY LINES OR ROADS IN PLACE, EXCEPT AS SHOWN ON THE ACCOMPANYING PLAT, AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY SUPERVISION IN ACCORDANCE WITH THE SUBDIVISION REGULATIONS OF THE CITY OF HUTTO, TEXAS.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT AUSTIN, TRAVIS COUNTY, TEXAS,
THIS 23TH DAY OF FEBRUARY, 2024.

Preliminary, this document shall not be recorded for any purpose and shall not be used or viewed or relied upon as a final survey document.

JOE BEN EARLY, JR., RPLS NO. 6016
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS

EARLY LAND SURVEYING, LLC
P.O. BOX 92588
AUSTIN, TX 78709
FIRM NO. 10194487

STATE OF TEXAS { KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON {

NO PORTION OF THIS TRACT IS WITHIN THE 100 YEAR FLOOD PLAIN AS SHOWN ON FEDERAL FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 48491C0505F & 48491C0510F, DATED DECEMBER 20, 2019, FOR WILLIAMSON COUNTY, TEXAS.

I, ANDY GRAHAM, REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THIS PLAT IS IN COMPLIANCE WITH THE CODES AND ORDINANCES OF THE CITY OF HUTTO, TEXAS.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT AUSTIN, TRAVIS COUNTY, TEXAS, THIS

DAY OF _____, 20____.

ANDY GRAHAM, P.E.
REGISTERED PROFESSIONAL ENGINEER NO. _____
STATE OF TEXAS

KIMLEY-HORN
CONTACT: ANDY GRAHAM, P.E.
5301 SOUTHWEST PARKWAY, BUILDING 2 SUITE 100,
AUSTIN, TX 78735
DIRECT: 512 646 2243

METES AND BOUNDS DESCRIPTION:

A DESCRIPTION OF 77.881 ACRES (APPROXIMATELY 3,392,478 SQ. FT.) IN THE JAMES SHELTON SURVEY, ABSTRACT NO. 560, AND THE AARON ARMSTRONG SURVEY NO. 9, ABSTRACT 26, BOTH IN WILLIAMSON COUNTY, TEXAS, BEING A PORTION OF A 101.8 ACRE TRACT, ALL OF AN 8.36 ACRE TRACT AND ALL OF A 3.50 ACRE TRACT CONVEYED TO NO-COUNT, LLC, IN A DEED DATED JUNE 26, 2013 AND RECORDED IN DOCUMENT NO. 2013060751 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS, SAID 77.881 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at a 1/2" rebar with "Sam Inc." cap found in the west right-of-way line of Ed Schmidt Boulevard (right-of-way width varies) as described in Document No. 2016010818 of the Official Public Records of Williamson County, Texas, being in the south line of the said 101.8 acre tract, being also the northeast corner of a 2.405 acre tract described in Document No. 2020016624 of the Official Public Records of Williamson County, Texas, from which...

- a 1/2" rebar with "Sam Inc." cap found for an angle point in the east right-of-way line of Ed Schmidt Boulevard, bears North 68°06'47" East, a distance of 148.35 feet;
- a 1/2" rebar with "BGE" cap found for the northwest corner of the said 2.405 acre tract, being in the north line of a 66.192 acre tract described in Document No. 2019108110 of the Official Public Records of Williamson County, Texas;
- a 1/2" rebar found for the southwest corner of the said 66.192 acre tract, being in the east line of a 16.20 acre tract described in Document No. 2010069362 of the Official Public Records of Williamson County, Texas;
- a 1/2" rebar found for the northeast corner of the said 16.20 acre tract, being in the east line of a 16.20 acre tract described in Document No. 2010069362 of the Official Public Records of Williamson County, Texas;

THENCE South 68°06'47" West with the south line of the said 101.8 acre tract and the north line of the said 2.405 acre tract, a distance of 968.77 feet to a 1/2" rebar with "BGE" cap found for the northwest corner of the said 2.405 acre tract, being in the north line of a 66.192 acre tract described in Document No. 2019108110 of the Official Public Records of Williamson County, Texas;

THENCE South 68°06'47" West with the south line of the said 101.8 acre tract and the north line of the said 66.192 acre tract, a distance of 900.88 feet to a 1/2" rebar found for the southwest corner of the said 101.8 acre tract, being the northwest corner of the said 66.192 acre tract, being in the east line of a 16.20 acre tract described in Document No. 2010069362 of the Official Public Records of Williamson County, Texas;

THENCE North 19°21'34" West with the west line of the said 101.8 acre tract and the east line of the said 16.20 acre tract, a distance of 148.75 feet to a 1/2" rebar found for the northeast corner of the said 16.20 acre tract, being the southeast corner of a 27.895 acre tract described in Document No. 2007024092 of the Official Public Records of Williamson County, Texas;

THENCE North 19°31'34" West with the west line of the said 101.8 acre tract and the east line of the said 27.895 acre tract, a distance of 760.94 feet to a 1/2" rebar found for the northeast corner of the said 27.895 acre tract, being the southeast corner of the said 3.50 acre tract;

THENCE South 69°42'28" West with the south line of the said 3.5 acre tract and the north line of the said 27.895 acre tract, a distance of 387.85 feet to a 1/2" rebar found for the southwest corner of the said 3.50 acre tract, being the southeast corner of Lot 5, Block A, T.K. Industrial Park, a subdivision of record in Document No. 2018062874 of the Official Public Records of Williamson County, Texas;

THENCE North 21°36'42" West with the west line of the said 3.50 acre tract and said 8.36 acre tract, and the east line of Lots 5, 7, and 9, Block A of said T.K. Industrial Park, a distance of 1255.68 feet to a 1/2" rebar with "Crichton" cap found for the northeast corner of said Lot 9, being in the east line of an 87.56 acre tract described in Document No. 2013060751 of the Official Public Records of Williamson County, Texas;

THENCE North 21°12'49" West with the west line of the said 8.36 acre tract and the east line of the said 87.56 acre tract, a distance of 49.76 feet to a mag nail in fence post found for the northwest corner of the said 8.36 acre tract;

THENCE North 66°07'13" East with the north line of the said 8.36 acre tract and the south line of the said 87.56 acre tract, a distance of 403.27 feet to a 3/4" iron pipe found for the northwest corner of the said 101.8 acre tract, being the northeast corner of the said 8.36 acre tract, being a southeast corner of the said 87.56 acre tract, being also the southwest corner of a 57.895 acre tract described in Document No. 2007068155 of the Official Public Records of Williamson County, Texas;

THENCE North 68°21'51" East with the north line of the said 101.8 acre tract and the south line of the said 57.895 acre tract, a distance of 864.73 feet to a 1/2" rebar with "Early Boundary" cap set in the southwest right-of-way line of Ed Schmidt Boulevard, from which a 1/2" rebar found for the northeast corner of the said 101.8 acre tract, being the southeast corner of the said 57.895 acre tract, bears North 68°21'51" East, a distance of 1089.76 feet;

THENCE crossing the said 101.8 acre tract and with the southwest right-of-way line of Ed Schmidt Boulevard, with a curve to the left, having a radius of 2560.00 feet, a delta angle of 01°25'08", an arc length of 63.39 feet, and a chord which bears South 59°20'04" East, a distance of 63.39 feet to a 1/2" rebar with "Early Boundary" cap set;

THENCE crossing the said 101.8 acre tract, the following five (5) courses and distances:

- 1.South 68°23'19" West, a distance of 371.08 feet to a 1/2" rebar with "Early Boundary" cap set;
- 2.With a curve to the left, having a radius of 2860.00 feet, a delta angle of 04°42'28", an arc length of 234.99 feet, and a chord which bears South 57°46'18" East, a distance of 234.93 feet to a 1/2" rebar with "Early Boundary" cap set;
- 3.South 60°07'32" East, a distance of 625.97 feet to a calculated point inside a building;
- 4.With a curve to the right, having a radius of 2140.00 feet, a delta angle of 04°32'02", an arc length of 169.34 feet, and a chord which bears South 57°51'28" East, a distance of 169.29 feet to a 1/2" rebar with "Early Boundary" cap set;
- 5.North 35°38'43" East, a distance of 300.06 feet to a 1/2" rebar with "Early Boundary" cap set in the southwest right-of-way line of Ed Schmidt Boulevard, from which a 1/2" rebar found in the southwest right-of-way line of Ed Schmidt Boulevard, bears with a curve to the left, having a radius of 2440.00 feet, a delta angle of 04°41'09", an arc length of 199.55 feet, and a chord which bears North 57°46'55" West, a distance of 199.50 feet;

THENCE crossing the said 101.8 acre tract and with the southwest right-of-way line of Ed Schmidt Boulevard, with a curve to the right, having a radius of 2440.00 feet, a delta angle of 02°09'38", an arc length of 92.01 feet, and a chord which bears South 54°21'31" East, a distance of 92.00 feet to a 1/2" rebar with "Early Boundary" cap set;

THENCE crossing the said 101.8 acre tract, the following three (3) courses and distances:

- 1.South 35°38'43" West, a distance of 300.06 feet to a 1/2" rebar with "Early Boundary" cap set;
- 2.With a curve to the right, having a radius of 2140.00 feet, a delta angle of 25°20'55", an arc length of 946.77 feet, and a chord which bears South 40°27'12" East, a distance of 939.06 feet to a 1/2" rebar with "Early Boundary" cap set;
- 3.North 68°06'47" East, a distance of 301.40 feet to a 1/2" rebar with "Early Boundary" cap set in the southwest right-of-way line of Ed Schmidt Boulevard;

THENCE crossing the said 101.8 acre tract and with the west right-of-way line of Ed Schmidt Boulevard, with a curve to the right, having a radius of 2440.00 feet, a delta angle of 09°24'13", an arc length of 400.46 feet, and a chord which bears South 22°21'03" East, a distance of 400.01 feet to the POINT OF BEGINNING, containing 77.881 acres of land, more or less.

GENERAL NOTES:
1. NO BUILDING, FENCING, LANDSCAPING OR STRUCTURES ARE ALLOWED WITHIN ANY DRAINAGE AREA EXPRESSLY PERMITTED BY THE CITY OF HUTTO.
2. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTION IS MADE TO PUBLIC WASTEWATER UTILITIES.
3. REMAINING PARCELS OWNED BY NO COUNT, LLC. WILL REQUIRE TIA.
4. THE MAXIMUM IMPERVIOUS COVERAGE PER LOT IS 80%
5. BUILDING SETBACK LINES SHALL CONFORM TO UDC REQUIREMENTS, AS AMENDED.
6. A 10' PUE IS HEREBY DEDICATED ALONG AND ADJACENT TO ALL STREET SIDE PROPERTY LINES FOR WATER, SEWER, & STORM SEWER AS SHOWN.
7. A 5' PUE IS HEREBY DEDICATED ALONG AND ADJACENT TO ALL STREET SIDE PROPERTY LINES FOR UTILITIES OTHER THAN WATER, SEWER, & STORM SEWER LINES AS SHOWN.
8. A 5' PUE IS HEREBY DEDICATED ON EACH SIDE OF ALL INTERIOR SIDE LOT LINES FOR UTILITIES OTHER THAN WATER, SEWER, & STORM SEWER LINES AS SHOWN.
9. STREET LIGHTING SHALL BE PROVIDED BY THE DEVELOPER IN CONFORMANCE WITH THE UDC REQUIREMENTS, AS AMENDED.
10. SIDEWALKS SHALL BE CONSTRUCTED ON BOTH SIDES OF ALL STREETS WITHIN AND BOUNDING THIS SUBDIVISION, IN CONFORMANCE WITH THE UDC, AS AMENDED.
11. TREES SHALL BE INSTALLED ON BOTH SIDES OF ALL STREETS WITHIN AND BOUNDING THIS SUBDIVISION, IN CONFORMANCE WITH THE UDC AS AMENDED.
12. WASTEWATER SERVICE FOR THIS SUBDIVISION WILL BE AVAILABLE THROUGH THE CITY OF HUTTO AFTER THE APPROPRIATE WASTEWATER SYSTEM IMPROVEMENTS ARE INSTALLED TO THIS SITE. THE CITY OF HUTTO ASSUMES NO OBLIGATIONS FOR INSTALLING ANY WATER AND WASTEWATER IMPROVEMENTS REQUIRED TO SERVE THE SITE.
13. PROPOSED RIGHT-OF-WAY IS TO BE DEDICATED ONLY. CONSTRUCTION OF THE PUBLIC ROADWAY IS NOT THE RESPONSIBILITY OF THE OWNER/DEVELOPER FOR THIS PROJECT.
14. IN ORDER TO PROMOTE DRAINAGE AWAY FROM A STRUCTURE, THE SLAB ELEVATION SHOULD BE BUILT AT LEAST ONE-FOOT ABOVE THE SURROUNDING GROUND, AND THE GROUND SHOULD BE GRADED AWAY FROM THE STRUCTURE AT A SLOPE OF 21" PER FOOT FOR A DISTANCE OF AT LEAST 10 FEET.
15. SUBJECT TO A COST PARTICIPATION AGREEMENT TO BE EXECUTED BY THE CITY AND THE DEVELOPER PRIOR TO OR CONTEMPORANEOUSLY WITH THE APPROVAL OF THE FINAL PLAT OF THE PROPERTY, THE CITY SHALL BE RESPONSIBLE FOR CONSTRUCTION COSTS FOR EMORY CROSSING BLVD. (DEDICATED BY FINAL PLAT) THAT EXCEED DEVELOPER'S PRO RATA SHARE. THE DEVELOPER'S PRO RATA SHARE OF EMORY CROSSING BLVD. CONSTRUCTION COSTS IS 12%.

16. UTILITY PROVIDERS FOR THIS DEVELOPMENT ARE:
WATER: JONAH WATER - (512) 759-1286; WASTEWATER: CITY OF HUTTO - (512) 759-4023; ELECTRIC: ONCOR - (687) 816-2037; GAS: ATMOS - (512) 550-8857
- UTILITY NOTES:
· WITHIN THE CCN
· WASTEWATER WILL BE AVAILABLE THROUGH THE CITY OF HUTTO AFTER THE APPROPRIATE WATER AND WASTEWATER SYSTEMS ARE INSTALLED TO THIS SITE. THE CITY OF HUTTO ASSUMES NO OBLIGATIONS FOR INSTALLING ANY WATER AND WASTEWATER IMPROVEMENTS REQUIRED TO SERVE THIS SITE.
· OUTSIDE THE CCN
· WATER WILL BE AVAILABLE THROUGH JONAH WATER AFTER THE APPROPRIATE WATER SYSTEM IS INSTALLED TO THIS SITE. THE CITY OF HUTTO ASSUMES NO OBLIGATIONS FOR INSTALLING ANY WATER AND WASTEWATER IMPROVEMENTS REQUIRED TO SERVE THIS SITE.
- FLOODPLAIN NOTES:
· NO FENCES, STRUCTURES, STORAGE, OR FILL SHALL BE PLACED WITHIN THE LIMITS OF THE ULTIMATE 1% ANNUAL CHANCE FLOODPLAIN; UNLESS APPROVED BY THE CITY ENGINEER. FILL MAY ONLY BE PERMITTED BY THE CITY ENGINEER AFTER APPROVAL OF THE PROPER ANALYSIS.
· NO PORTION OF THIS TRACT IS ENCLOSED BY ANY SPECIAL FLOOD HAZARD ZONE.
· ANNUAL CHANCE FLOODPLAIN AS IDENTIFIED BY THE U.S. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) MAP COMMUNITY PANEL NUMBER 48491C0505F EFFECTIVE DATE DECEMBER 19, 2019 FOR WILLIAMSON COUNTY, TEXAS.
· FINISH FLOOR ELEVATION FOR RESIDENTIAL LOTS ADJACENT TO THE PROPOSED/EXISTING PONDS, PROPOSED/EXISTING CHANNELS OR EXISTING 100-YR FLOODPLAIN SHALL BE A MINIMUM OF TWO (2) FEET ABOVE THE ULTIMATE 100-YEAR FLOODPLAIN OR 100-YEAR WATER SURFACE ELEVATION, WHICHEVER IS GREATER.
· ALL SUBDIVISION CONSTRUCTION SHALL CONFORM TO THE CITY OF HUTTO UNIFIED DEVELOPMENT CODE, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
· ON SITE STORMWATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST-DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 2, 10, 25, 100-YEAR STORM EVENTS.
· ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
· THIS SUBDIVISION IS ZONED MULTIFAMILY

Only list the providers

Provide the PUD ordinance number

CITY DEVELOPMENT SERVICES

THIS SUBDIVISION IS LOCATED WITHIN THE CITY LIMITS OF THE CITY OF HUTTO ON

_____, 20____.

ASHLEY BAILEY
AICP, EXECUTIVE DIRECTOR,
DEVELOPMENT SERVICES DEPARTMENT

PLANNING AND ZONING COMMISSION CHAIR SIGNATURE:

THIS PLAT WAS APPROVED FOR RECORDING BY THE HUTTO PLANNING AND ZONING COMMISSION ON THE ____ DAY OF

_____, 20____.

RICHARD HUDSON, CHAIR

STATE OF TEXAS { KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON {

I, NANCY E. RISTER, CLERK OF THE COUNTY COURT OF SAID COUNTY, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT IN WRITING, WITH ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR RECORD IN MY OFFICE ON THE

____ DAY OF _____, 20____, A.D., AT ____ O'CLOCK, ____M., AND DULY RECORDED THIS THE ____ DAY

OF _____, 20____, A.D., AT ____ O'CLOCK, ____M., IN THE OFFICIAL PUBLIC RECORDS OF SAID COUNTY IN INSTRUMENT NO.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT THE COUNTY COURT OF SAID COUNTY, AT MY OFFICE IN GEORGETOWN, TEXAS, THE DATE LAST SHOWN ABOVE WRITTEN.

NANCY E. RISTER, CLERK COUNTY COURT
OF WILLIAMSON COUNTY, TEXAS

BY: _____
DEPUTY

EARLY
LAND SURVEYING
A LIMITED LIABILITY COMPANY

P.O. BOX 92588
AUSTIN, TX 78709
512-202-8631
TBPELS FIRM NO. 10194487

PROJECT NO.:
1006-032

DRAWING NO.:
1006-032-PL1

PLOT DATE:
2/23/24

PLOT SCALE:
1" = 100'

DRAWN BY:
MAW & JBE

SHEET
05 OF 05



ENGINEERING AND DRAINAGE STUDY

**Alta Ed Schmidt
Hutto, Texas 78634**

November 1, 2023

ENGINEERING REVIEW

Review is for general compliance only. Sole responsibility for correctness remains with the Engineer of Record.

- ☒ No Exceptions Taken
- ☐ Revise as Noted
- ☐ Denied. Revise and Resubmit.

Prepared For:

City of Hutto
500 W Live Oak Street
Hutto, TX 78634

Prepared By:

Kimley»»Horn

5301 Southwest Parkway
Building 2, Suite 100
Austin, Texas 78735

TEXAS REGISTRATION #928

TABLE OF CONTENTS

I. PROJECT OVERVIEW

II. CURRENT TRACT CONDITIONS

**Legal Description
Land Use**

III. PROPOSED DEVELOPMENT

IV. DRAINAGE ANALYSIS

**Waterway Classification
Flood Plain Information
Drainage
Existing Hydrologic Condition Analysis
Proposed Hydrologic Condition Analysis
Detention Analysis and Design**

V. ENGINEERING ANALYSIS

VI. SUMMARY AND CONCLUSIONS

VII. APPENDICIES

**Appendix A - Existing and Proposed Drainage Area Maps & Calculations
Appendix B - FEMA Flood Insurance Rate Map
Appendix C – FlowMaster Inputs and Outputs**

I. PROJECT OVERVIEW

The content of this report is based on a 77.88-acre tract of land. The property in acquisition is located on the south side of the intersection of Ed Schmidt Blvd and Emory Crossing Blvd within the Hutto city limits. The client is proposing a multi-Family development consisting of approximately 41 residential buildings (roughly 1400 units) and four amenity centers with associated utility and drainage improvements over four phases on four separate lots. This engineering and drainage report has been prepared for submittal with the Preliminary Plat for the multi-family tract only. Drainage assumptions were made based on additional impervious cover to be added to the proposed commercial lot in future conditions, however water and wastewater demand were not considered for the commercial property as the use for the lot has not been determined. A separate engineering report will be submitted by the applicant for the commercial site when that property develops. Kimley-Horn has prepared this Drainage and Engineering Report to evaluate the existing drainage conditions and highlight the proposed drainage system needed to serve a proposed multifamily development and the required public improvements for utilities.

This project is located within the Turkey Creek-Brushy Creek Watershed in the San Gabriel River sub-basin of the Brazos River basin. According to Flood Insurance Rate Map 48491C0505F dated December 20, 2019, for Williamson County, Texas, no portion of this site is in the Federal Emergency Management Agency's 100-year floodplain. No floodplain modifications are proposed. The entire 77.88-acre tract is located outside all the Edwards Aquifer's Zones.

II. CURRENT TRACT CONDITIONS

Legal Description

A 77.881 acre (3,392,478 square feet) tract of land situated in the James Shelton survey, abstract no. 560, and the Aaron Armstrong survey no. 9, abstract no. 26, both in Williamson County, Texas, being a portion of a 101.8 acre tract, an 8.36 acre tract, and a 3.50 acre tract conveyed to No-Count, LLC, in a deed dated June 26, 2013 and recorded in Document No. 2013060751 of the Official Public Records of Williamson County, Texas.

Land Use

The land is currently being used for two single-family residential structures and is otherwise used for agricultural purposes.

III. PROPOSED DEVELOPMENT

The proposed development includes the construction of a multi-family residential development, sidewalks, landscaping, stormwater management infrastructure, water, and sanitary sewer. The development will consist of four multi-family lots totaling 77.81-acres. The multi-family structures and necessary private improvements are to be constructed with the associated site plans for each lot. The full development is to gain access from Ed Schmidt Blvd through three proposed driveways at the east of the property.

IV. DRAINAGE ANALYSIS

Waterway Classification

This project is located within the Turkey Creek-Brushy Creek Watershed in the San Gabriel River sub-basin of the Brazos River basin.

Flood Plain Information

According to Flood Insurance Rate Map 48491C0505F dated December 20, 2019, for Williamson County, Texas, no portion of this site is located in the Federal Emergency Management Agency's 100-year floodplain per. A copy of the FEMA FIRM Map is included in the **Appendix**.

Drainage

This 77.881-acre tract contains relatively flat slopes generally ranging from 1% to 3% in most areas with steeper slopes near the small draw through the center of the site. The site drains to one point of analysis (POA-A) located along the southeastern property boundary. The site drains through POA-A and is conveyed offsite through an existing culvert under Ed Schmidt Blvd. Reference Appendix A for the drainage area maps used in analysis.

Existing Hydrologic Conditions Analysis

The site has one existing drainage areas (EDA-01) that outfalls at point of analysis POA-A. POA-A is at the southeast corner of the property and water flows to it from the northwest. The delineated drainage basins account for all onsite runoff as well as water running onto the site from the adjacent tracts to the north and east. Drainage conditions have been maintained by assuring the design peak flows do not exceed those in the existing conditions and the major points of analyses are not adversely affected.

The time of concentrations were calculated using the equations given in the City of Round Rock Drainage Criteria Manual (CORR DCM) for sheet flow, shallow concentrated flow, and channel flow. City of Round Rock 24-hour rainfall hyetographs (CORR DCM) were used to define the 2, 10, 25, and 100-year rainfall events. The result of the calculation of the existing flows through the watershed is summarized in Table 4.1. The Time of Concentration analysis for this drainage area assumes a constant-geometry channel as defined by the existing grade and average slope along the channel flow path for EDA-01. Bentley FlowMaster hydraulic modeling software was utilized to determine the average channel flow velocity. The channel geometries and channel flow results utilized in this analysis can be found within this report as Appendix C – FlowMaster Inputs and Outputs. Time of Concentration calculations were performed in accordance with the CORR DCM specifications to model the existing drainage conditions in HEC-HMS Hydrologic modeling software.

Table 4.1 Existing Drainage Areas Summary

EXISTING CONDITIONS									
DRAINAGE AREA	AREA (AC.)	IMPERVIOUS COVER	CN (BASE)	T _c (MIN)	LAG (MIN)	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₂₅ (CFS)	Q ₁₀₀ (CFS)
EDA-01	175.10	15.3%	84	34.9	20.9	341.80	580.90	742.20	1006.50
Point Of Analysis - A						341.80	580.90	742.20	1006.50

Proposed Hydrologic Conditions Analysis

The proposed drainage delineations consider additional impervious cover added to the proposed site under development. Some of the upstream flow is routed through an existing pond which will be made to accept flow in the fully developed conditions through grading improvements. The time of concentrations were reduced for onsite drainage areas from the existing TOCs due to the increased impervious cover and proposed underground conduit system. Flow from the northwestern portion of the site surface drains to the proposed onsite detention pond at POA-B then will be conveyed by a proposed culvert under the proposed private drive and discharge into an existing stream that will run towards a second detention pond and then to POA-A. Flow patterns upstream of the subject property match existing conditions.

The proposed conditions modeled in this analysis assume maximum impervious cover of 85% for the two commercial lots which lie at the east of the property in order to account for future development in these lots. The drainage areas for these two lots are labeled PDA-05 and PDA-06 on the Proposed Drainage Area Exhibit included in this report. The analysis of offsite contributing areas was modeled based off of existing conditions and are labeled as PDA-01 and PDA-02 in the Proposed Drainage Area Map Exhibit. All other proposed drainage areas were analyzed based off of the fully developed condition for the overall development.

The proposed conditions Time of Concentration(TC) analysis for drainage areas PDA-03, PDA-04, PDA-07 and PDA-08 were analyzed assuming conduit flow through reinforced concrete pipe(RCP) at an average slope of 0.5%. The Time of Concentration Analysis for drainage areas PDA-01, PDA-02, and PDA-09 assume a channel flow velocity of 6 ft/s. These assumptions were based off of the future design intent for the storm infrastructure for the master developed condition The Time of Concentration analysis for all other drainage areas assume a constant-geometry channel as defined by the existing grade and average slope found along the channel flow path for each respective drainage area. Bentley FlowMaster hydraulic modeling software was utilized to respectively determine the average channel flow velocities for all drainage areas. The channel geometries and channel flow results utilized in this analysis for the proposed drainage condition can be found within this report as Appendix C – FlowMaster Inputs and Outputs.

The time of concentrations were calculated using the equations given in the City of Round Rock Drainage Criteria Manual (CORR DCM) for sheet flow, shallow concentrated flow, and channel flow. City of Round Rock 24-hour rainfall hyetographs (per the CORR DCM) were used to define the 2, 10, 25, and 100-year rainfall events. Detailed time of concentration calculations are included in the **Appendix**. The result of the calculation of the proposed flows through the watershed as determined by HEC-HMS Hydrologic Modeling Software is summarized in Table 4.2.

Table 4.2 Proposed Drainage Areas Summary

DEVELOPED CONDITIONS									
DRAINAGE AREA	AREA (AC.)	IMPERVIOUS COVER	CN (BASE)	T _c (MIN)	LAG (MIN)	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₂₅ (CFS)	Q ₁₀₀ (CFS)
PDA-01	63.87	38.2%	84	31.9	19.2	141.00	229.90	289.90	388.50
PDA-02	16.27	0.0%	84	31.9	13.7	35.90	63.30	81.80	111.90
PDA-03	21.30	57.5%	84	15.6	9.4	68.60	107.50	133.80	176.60
PDA-04	18.50	53.5%	84	22.4	13.4	51.50	81.30	101.40	134.30
Point Of Analysis - B						241.50	399.30	502.10	676.30
PDA-05	8.62	85.0%	84	24.9	14.9	25.20	37.80	46.40	60.40
PDA-06	8.86	85.0%	84	21.8	13.1	27.90	41.80	51.20	66.60
PDA-07	23.01	35.9%	84	12.0	7.2	76.80	124.50	156.70	208.90
PDA-08	10.59	49.2%	84	14.2	8.5	34.90	55.30	69.20	91.70
PDA-09	3.97	8.4%	84	13.1	7.9	11.50	19.70	25.30	34.30
Point Of Analysis - A						309.70	488.60	643.40	880.20

Detention Analysis & Design

On-site detention is required to maintain previously determined flows. After water is detained by the two onsite in-line detention ponds, the proposed flow is less than existing as shown below in Table 4.3. The goal of the in-line detention is to maintain an existing drainage ditch while maintaining flow throughout the site, minimizing erosion. The detention ponds referenced in this analysis were preliminarily sized for the footprint indicated in the attached Proposed Drainage Area Exhibit. Stage Storage of the detention ponds can be found in Table 4.4.

Table 4.3 Existing vs. Proposed Summary

EXISTING VS. DEVELOPED SUMMARY				
POINT OF ANALYSIS	Q₂ (CFS)	Q₁₀ (CFS)	Q₂₅ (CFS)	Q₁₀₀ (CFS)
Point Of Analysis - A (EXISTING)	341.80	580.90	742.20	1006.50
Point Of Analysis - A (DEVELOPED)	309.70	488.60	643.40	880.20
Point Of Analysis - A (CFS)	32.10	92.30	98.80	126.30

Table 4.4 Detention Pond Stage Storage

Detention Pond 1 - Stage Storage			
Stage (ft) (Elevation)	Area (sf)	Storage Volume (cf)	Event
702.00	0.00	0.00	-
703.00	5552.59	1851.00	-
704.00	19271.82	13574.00	-
704.80	-	37069.56	2-Year
705.00	64717.09	43472.88	-
705.90	64717.09	94612.32	10-Year
706.00	64717.09	94612.32	-
706.30	-	116697.24	25-Year
706.90	-	162391.68	100-Year
707.00	85551.84	170281.00	-
708.00	108834.66	267241.00	-

Detention Pond 2 - Stage Storage			
Stage (ft) (Elevation)	Area (sf)	Storage Volume (cf)	Event
689.00	419.95	0.00	-
690.00	11214.96	5817.45	-
691.00	24122.22	23486.04	-
692.00	39029.32	55061.82	-
692.50	-	74661.84	2-Year
693.00	55896.19	102524.57	-
693.60	-	138912.84	10-Year
693.90	-	159386.04	25-year
694.00	69643.73	165294.53	-
694.40	-	189921.60	100-year
695.00	80172.18	240202.49	-

V. ENGINEERING ANALYSIS

Existing Infrastructure

This site will be served by the City of Hutto for wastewater and served by Jonah Water for water service. There is an existing 12" wastewater line stubbed out to the southwest corner of the property boundary of the subdivision across Ed Schmidt Blvd. An existing 12" waterline is stubbed out from Emory Crossing Blvd. that will serve as the connection for water extensions. The Phase 1 public extensions will be serviced exclusively by these utility connections. Future Phases Two through Four will require additional infrastructure as described below.

Proposed Infrastructure

The proposed development includes 41 multi-family buildings (roughly 1400 units) and four amenity centers, with each building being served by private water and wastewater services that connect to the public mains proposed herein.

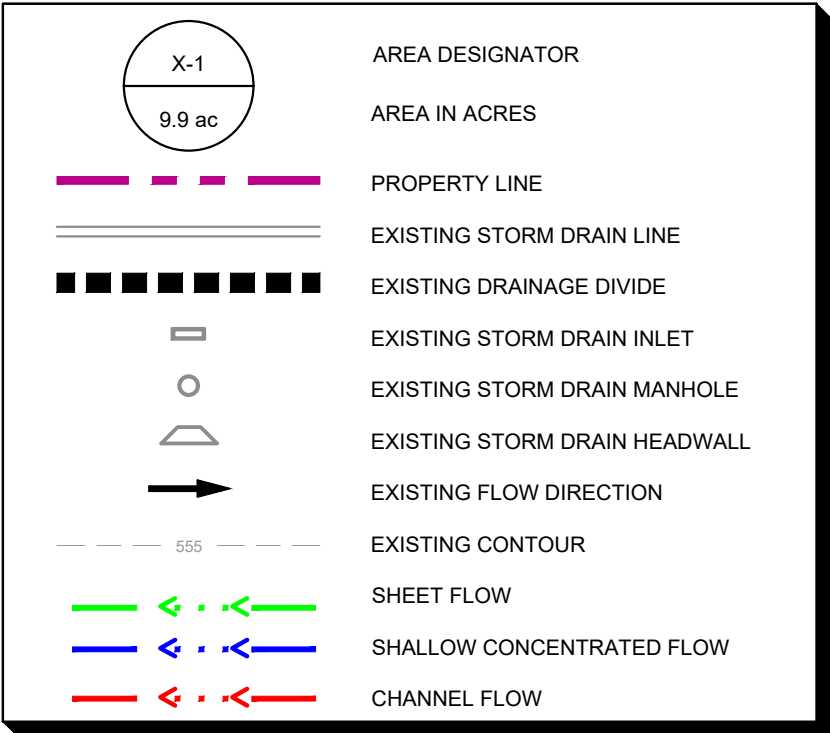
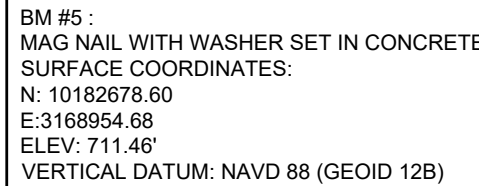
This property is currently located within the CCN of Jonah Water for water service. This project will extend a 16" water main within Ed Schmidt Blvd ROW northeast to the intersection Emory Crossing Blvd and Ed Schmidt Blvd. The development will be served by the 16" through multiple proposed 8" stub outs for future phases.

The wastewater services will be provided by the City of Hutto. With this development, we are proposing a 15" wastewater extension that will run from a stub out off a property east of Ed Schmidt Blvd. The line will run northwest to the intersection of Emory Crossing Blvd and Ed Schmidt. This 15" wastewater line will service all development on this site with 8" stub outs to each property. This 15" line ties into an existing 12" wastewater line. All phases beyond Phase 1 will require an off-site wastewater interceptor per the SER for this property. It is understood that this interceptor will be designed and built by others at this time.

VI. CONCLUSIONS

This report has fully documented the design of Alta Ed Schmidt Development. Standard engineering design methods were used to develop the plan and were described throughout this report. This report is meant to serve as an attendant document to the plan drawings to aid the reviewer in evaluating the different technical components of the plan.

Appendix A - Existing and Proposed Drainage Area Maps & Calculations



ALTA ED SCHMIDT															
Existing Drainage Calculations - SCS Method															
DRAINAGE AREA	SHEET FLOW				SHALLOW CONCENTRATED FLOW						*		TOTAL Tc (min)	LAG (min)	
	P-2yr24hr N	L (ft)	S (ft/ft)	3.97 Tt(min)	Unpaved Surface			Paved Surface			Channel Flow 3				
					L (ft)	S (ft/ft)	Tt(min)	L	S	Tt(min)	L	V (FPS)			Tt(min)
EDA-01	0.170	300	0.012	11.93	1739	0.014	15.18	-	-	0.00	3328	7.16	7.75	34.9	20.9
CN Values based on CDRB Drainage Criteria Criteria Manual (2005).															

DRAINAGE AREA	CORRESPONDING CHANNEL FLOW CROSS SECTION
EDA-01	SECTION A-B

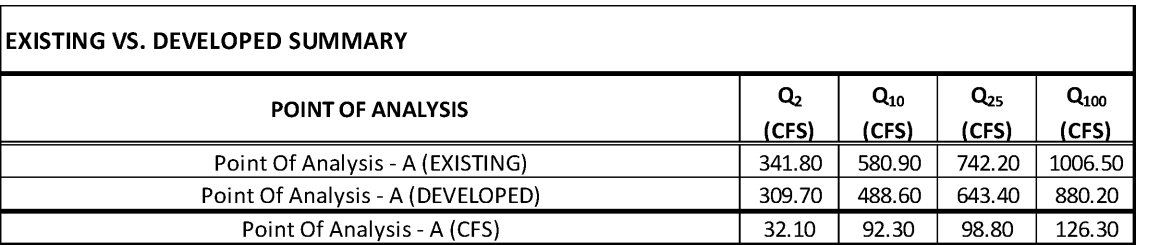
EXISTING CONDITIONS									
DRAINAGE AREA	AREA (AC)	IMPERVIOUS COVER	CN (BASE)	Tc (MIN)	LAG (MIN)	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₂₅ (CFS)	Q ₁₀₀ (CFS)
EDA-01	175.10	15.3%	84	34.8	20.9	341.80	580.90	742.20	1006.50
Point Of Analysis - A						341.80	580.90	742.20	1006.50

11/01/23
KHA PROJECT 067780342
DATE OCTOBER 2023
SCALE: AS SHOWN
DESIGNED BY: ABG
DRAWN BY: ARP
CHECKED BY: ABG

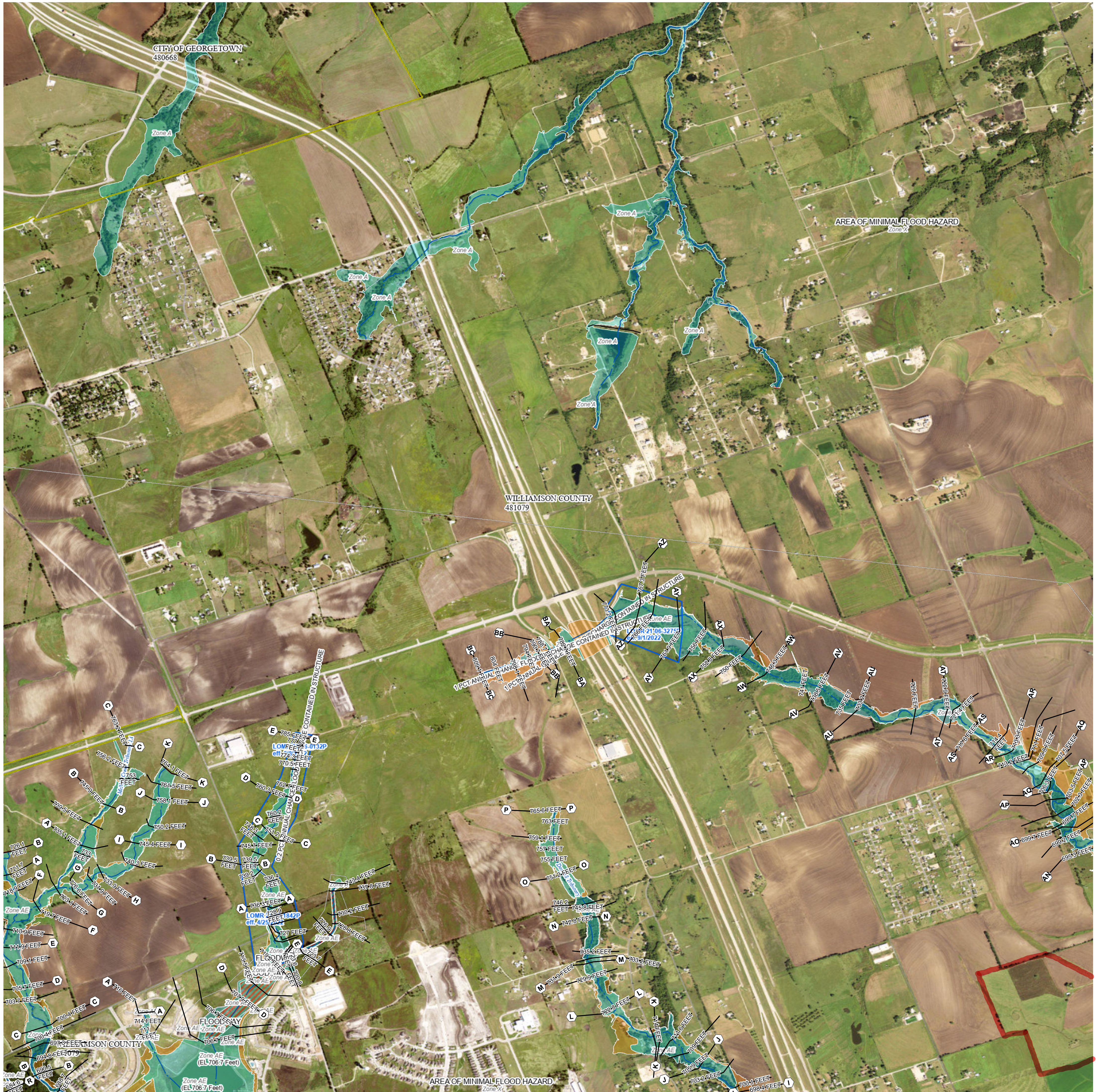
EXISTING DRAINAGE AREA MAP

ALTA ED SCHMIDT
PRELIMINARY PLAT
CITY OF HUTTO
WILLIAMSON COUNTY, TEXAS

CITY OF HUTTO
WILLIAMSON COUNTY, TEXAS

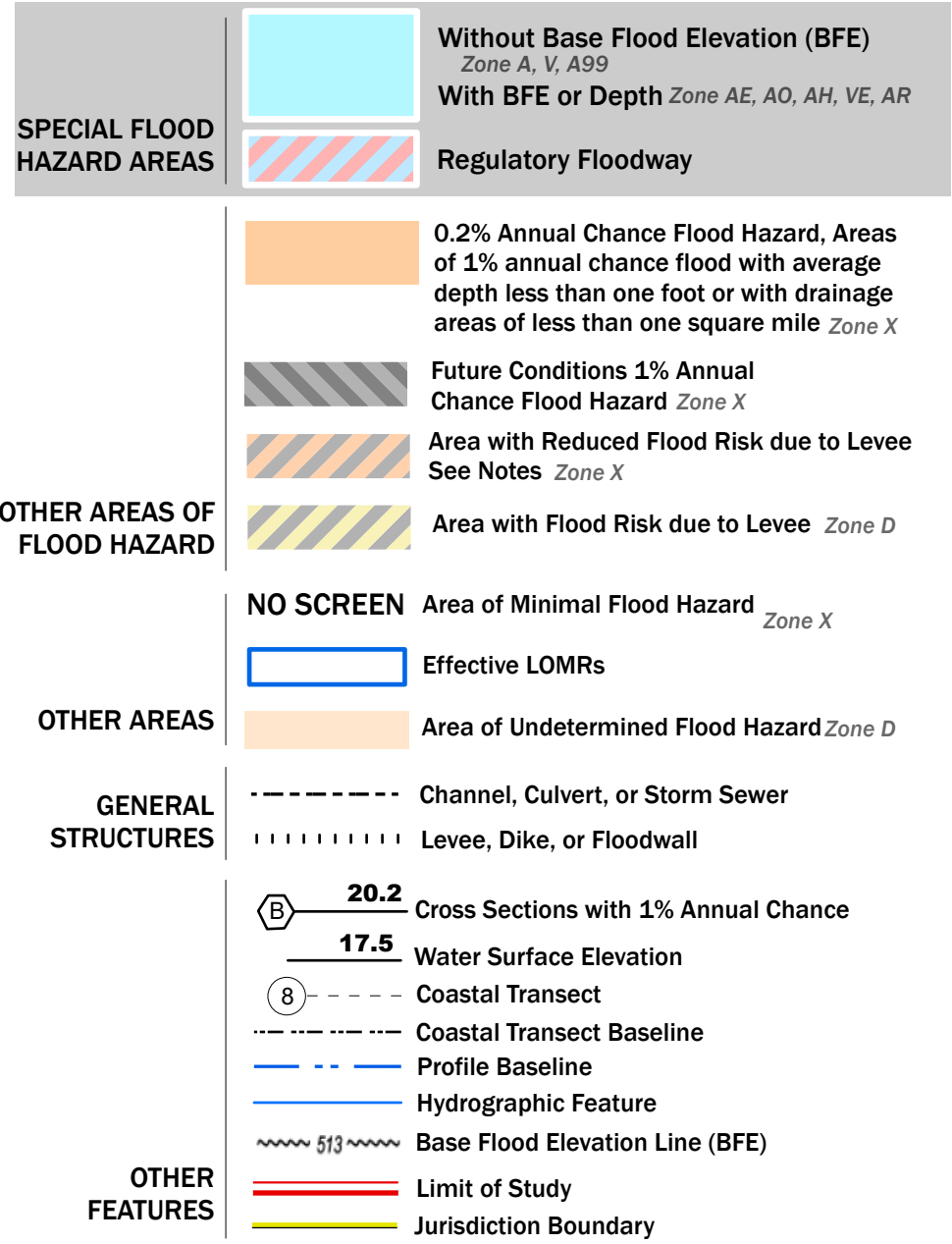


Appendix B - FEMA Flood Insurance Rate Map



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT



NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6267) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

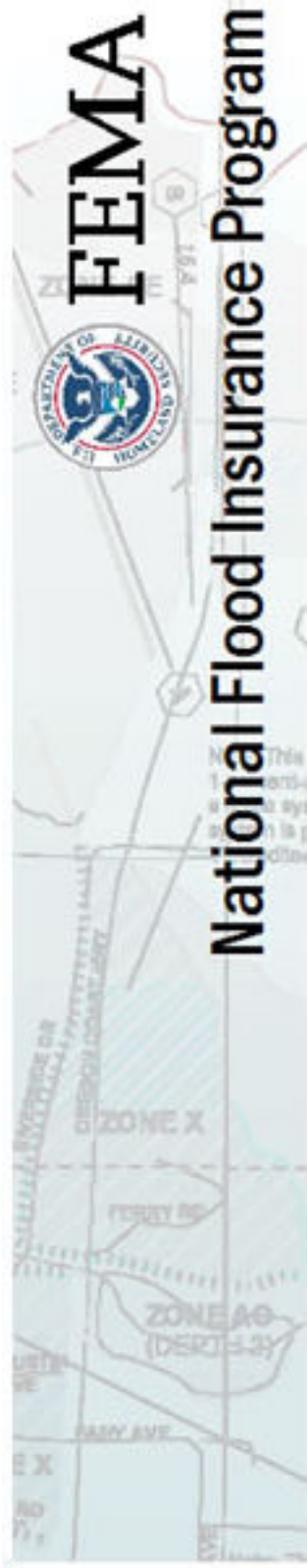
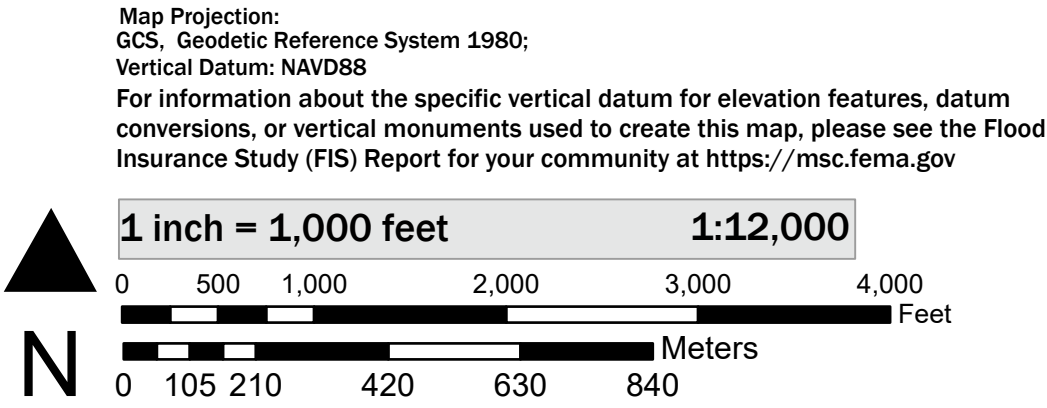
To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 9/12/2022 1:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

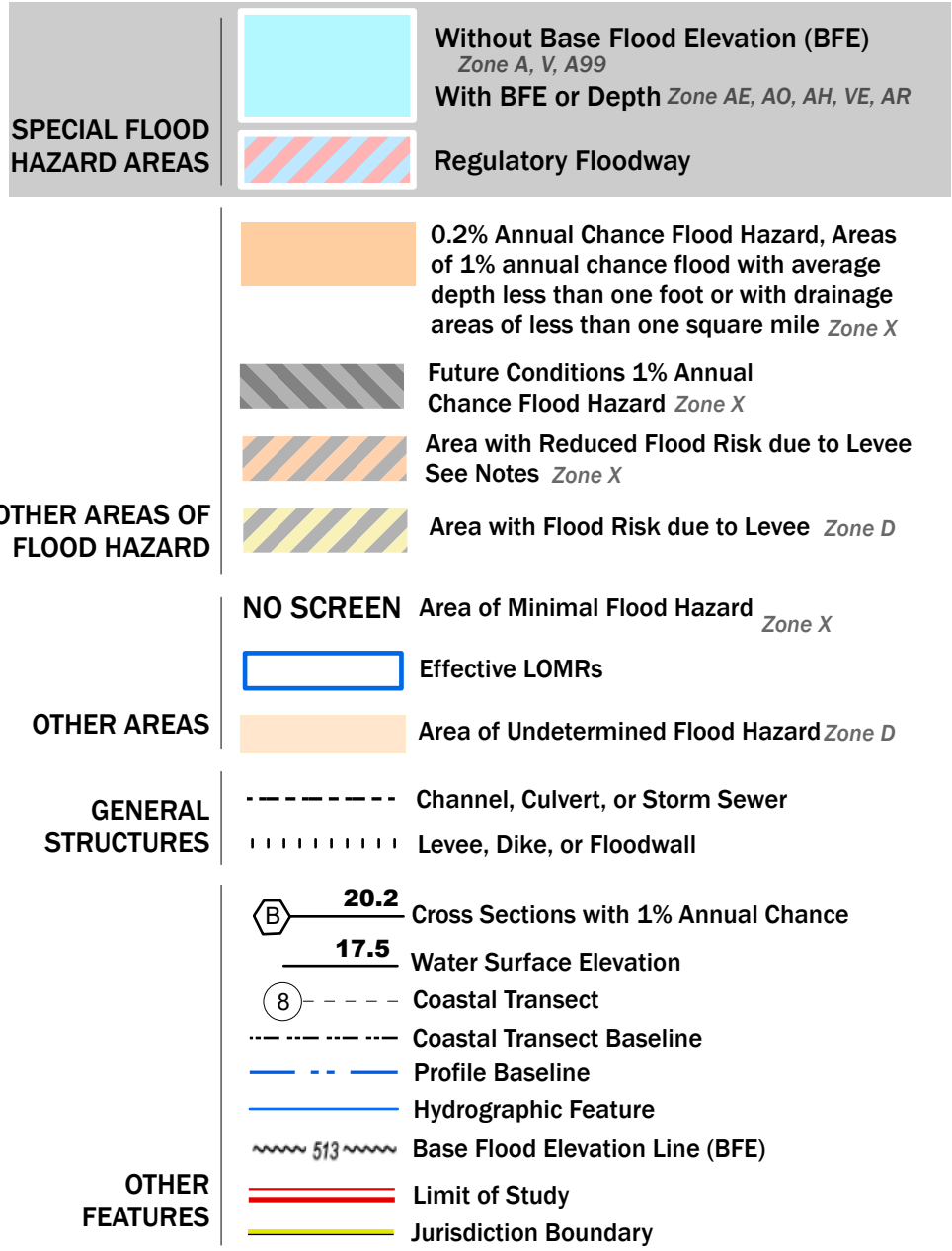
PANEL 505 OF 750

Panel Contains:		
COMMUNITY	NUMBER	PANEL
CITY OF GEORGETOWN	480668	0505
CITY OF ROUND ROCK	481048	0505
WILLIAMSON COUNTY	481079	0505



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT



NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

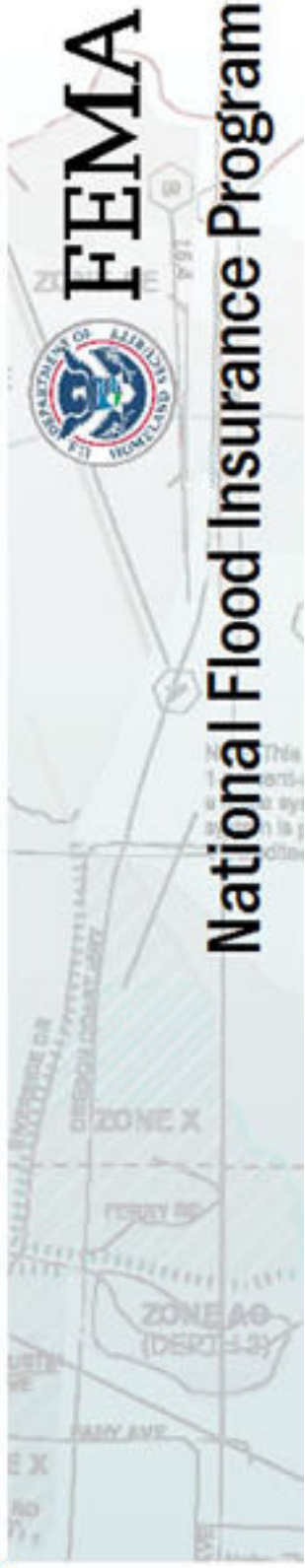
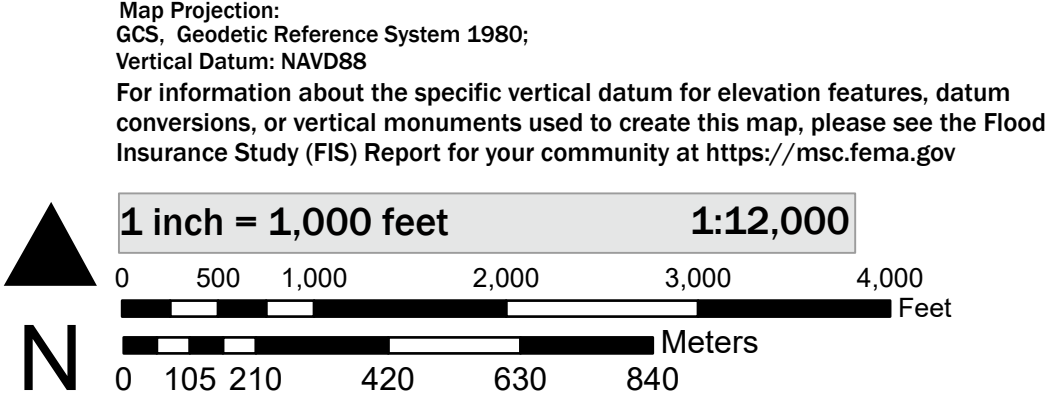
To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 9/12/2022 1:49 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

PANEL 510 OF 750

Panel Contains:

COMMUNITY	NUMBER	PANEL
WILLIAMSON COUNTY	481079	0510
CITY OF HUTTO	481047	0510
CITY OF TAYLOR	480670	0510

Appendix C - FlowMaster Inputs and Outputs

CROSS SECTION A-B

Worksheet for EDA-01

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.030
Channel Slope	1.380 %
Left Side Slope	5.100 %
Right Side Slope	5.560 %
Bottom Width	0.00 ft
Discharge	1,006.50 cfs
Results	
Normal Depth	32.8 in
Flow Area	140.5 ft ²
Wetted Perimeter	102.9 ft
Hydraulic Radius	16.4 in
Top Width	102.80 ft
Critical Depth	33.8 in
Critical Slope	1.172 %
Velocity	7.16 ft/s
Velocity Head	0.80 ft
Specific Energy	3.53 ft
Froude Number	1.080
Flow Type	Supercritical

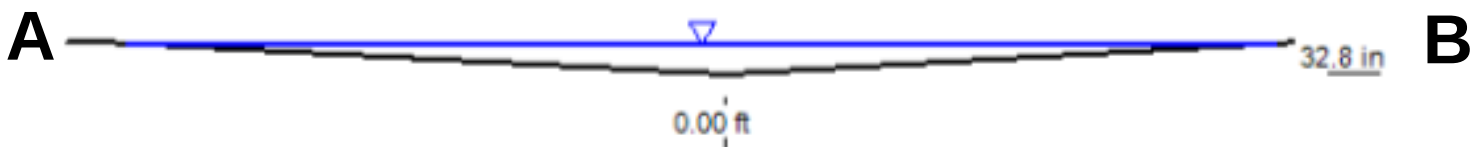
Cross Section for EDA-01

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030
Channel Slope	1.380 %
Normal Depth	32.8 in
Left Side Slope	5.100 %
Right Side Slope	5.560 %
Bottom Width	0.00 ft
Discharge	1,006.50 cfs



PIPE SECTION 4

Worksheet for PDA-03

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.50 %
Diameter	60.0 in
Discharge	176.60 cfs
Results	
Normal Depth	47.1 in
Flow Area	16.5 ft ²
Wetted Perimeter	10.9 ft
Hydraulic Radius	18.2 in
Top Width	4.11 ft
Critical Depth	45.7 in
Percent Full	78.5 %
Critical Slope	0.53 %
Velocity	10.68 ft/s
Velocity Head	1.77 ft
Specific Energy	5.70 ft
Froude Number	0.938
Maximum Discharge	198.09 cfs
Discharge Full	184.15 cfs
Slope Full	0.46 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	63.4 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	47.1 in
Critical Depth	45.7 in
Channel Slope	0.50 %
Critical Slope	0.53 %

PIPE SECTION 1

Worksheet for PDA-04

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.500 %
Diameter	54.0 in
Discharge	134.30 cfs
Results	
Normal Depth	42.7 in
Flow Area	13.5 ft ²
Wetted Perimeter	9.9 ft
Hydraulic Radius	16.4 in
Top Width	3.66 ft
Critical Depth	40.9 in
Percent Full	79.1 %
Critical Slope	0.548 %
Velocity	9.96 ft/s
Velocity Head	1.54 ft
Specific Energy	5.10 ft
Froude Number	0.915
Maximum Discharge	149.57 cfs
Discharge Full	139.04 cfs
Slope Full	0.466 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	34.2 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	42.7 in
Critical Depth	40.9 in
Channel Slope	0.500 %
Critical Slope	0.548 %

CROSS SECTION G-H

Worksheet for PDA-05

Project Description	
Friction Method	Manning Formula
Solve For	Equal Side Slopes
Input Data	
Roughness Coefficient	0.030
Channel Slope	1.700 %
Normal Depth	14.1 in
Bottom Width	4.70 ft
Discharge	60.20 cfs
Results	
Left Side Slope	24.854 %
Right Side Slope	24.854 %
Flow Area	11.1 ft ²
Wetted Perimeter	14.5 ft
Hydraulic Radius	9.2 in
Top Width	14.18 ft
Critical Depth	14.7 in
Critical Slope	1.446 %
Velocity	5.42 ft/s
Velocity Head	0.46 ft
Specific Energy	1.63 ft
Froude Number	1.079
Flow Type	Supercritical

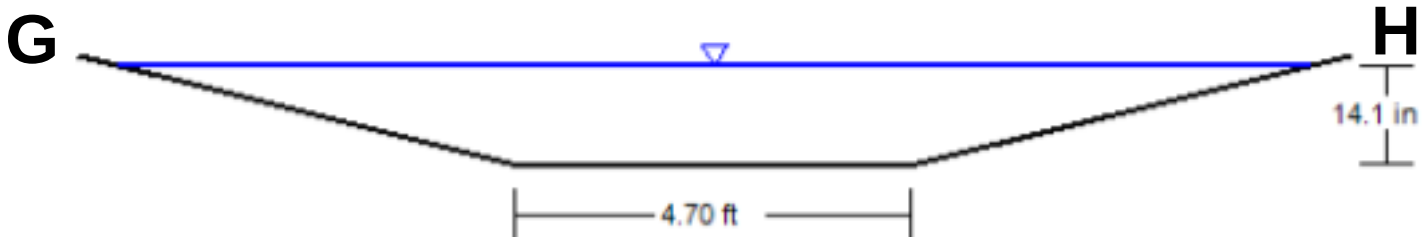
Cross Section for PDA-05

Project Description

Friction Method	Manning Formula
Solve For	Equal Side Slopes

Input Data

Roughness Coefficient	0.030
Channel Slope	1.700 %
Normal Depth	14.1 in
Left Side Slope	24.854 %
Right Side Slope	24.854 %
Bottom Width	4.70 ft
Discharge	60.20 cfs



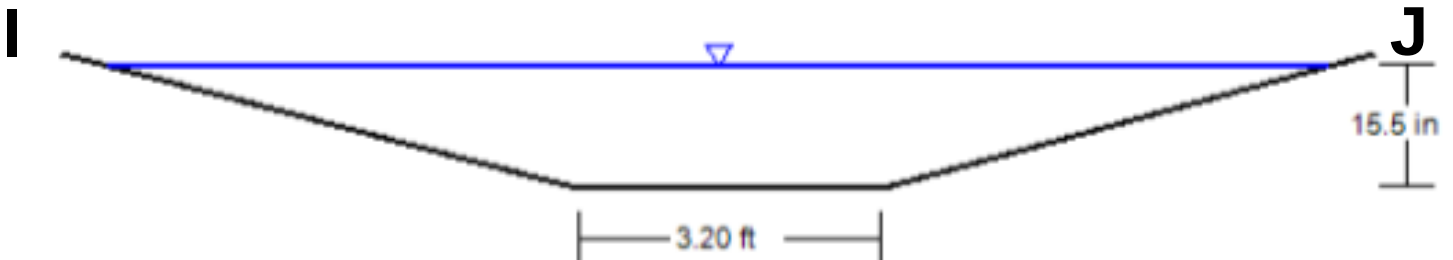
CROSS SECTION I-J

Worksheet for PDA-06

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.030
Channel Slope	2.300 %
Left Side Slope	26.000 %
Right Side Slope	27.300 %
Bottom Width	3.20 ft
Discharge	66.60 cfs
Results	
Normal Depth	15.5 in
Flow Area	10.4 ft ²
Wetted Perimeter	13.2 ft
Hydraulic Radius	9.4 in
Top Width	12.91 ft
Critical Depth	17.3 in
Critical Slope	1.414 %
Velocity	6.40 ft/s
Velocity Head	0.64 ft
Specific Energy	1.93 ft
Froude Number	1.256
Flow Type	Supercritical

Cross Section for PDA-06

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.030
Channel Slope	2.300 %
Normal Depth	15.5 in
Left Side Slope	26.000 %
Right Side Slope	27.300 %
Bottom Width	3.20 ft
Discharge	66.60 cfs



PIPE SECTION 2

Worksheet for PDA-07

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.500 %
Diameter	66.0 in
Discharge	208.90 cfs
Results	
Normal Depth	48.0 in
Flow Area	18.5 ft ²
Wetted Perimeter	11.2 ft
Hydraulic Radius	19.8 in
Top Width	4.90 ft
Critical Depth	48.6 in
Percent Full	72.8 %
Critical Slope	0.487 %
Velocity	11.28 ft/s
Velocity Head	1.98 ft
Specific Energy	5.98 ft
Froude Number	1.022
Maximum Discharge	255.42 cfs
Discharge Full	237.44 cfs
Slope Full	0.387 %
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	72.8 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	48.0 in
Critical Depth	48.6 in
Channel Slope	0.500 %
Critical Slope	0.487 %

PIPE SECTION 3

Worksheet for PDA-08

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.500 %
Diameter	48.0 in
Discharge	91.70 cfs
Results	
Normal Depth	35.7 in
Flow Area	10.0 ft ²
Wetted Perimeter	8.3 ft
Hydraulic Radius	14.5 in
Top Width	3.49 ft
Critical Depth	34.8 in
Percent Full	74.4 %
Critical Slope	0.530 %
Velocity	9.15 ft/s
Velocity Head	1.30 ft
Specific Energy	4.28 ft
Froude Number	0.952
Maximum Discharge	109.25 cfs
Discharge Full	101.57 cfs
Slope Full	0.408 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	69.2 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	35.7 in
Critical Depth	34.8 in
Channel Slope	0.500 %
Critical Slope	0.530 %

CROSS SECTION E-F

Worksheet for PDA-09

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.700 %
Discharge	31.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+55	690.80
1+98	688.23
2+25	685.92
2+64	688.84
2+80	689.73

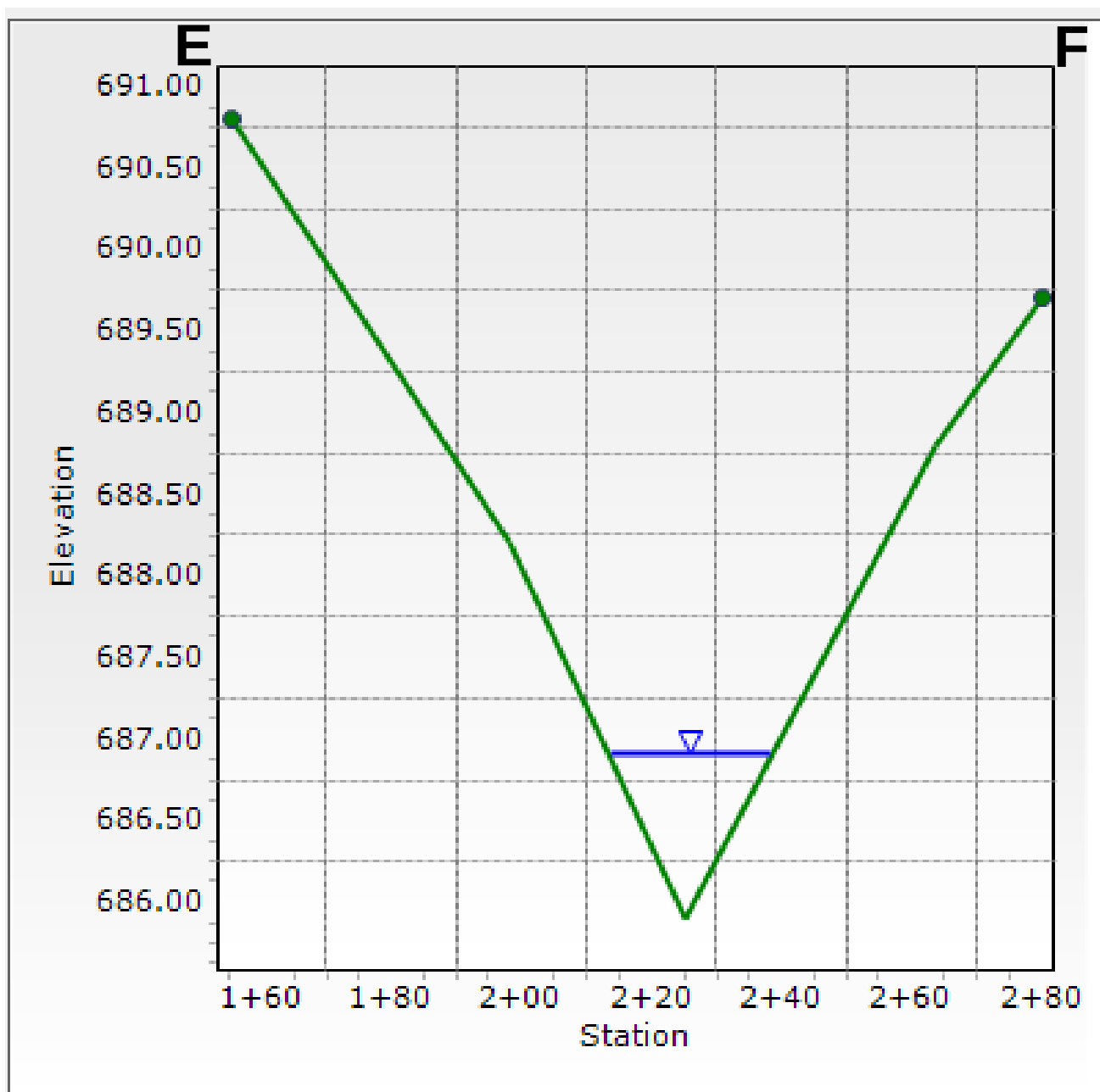
Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+55, 690.80)	(2+80, 689.73)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	11.8 in
Roughness Coefficient	0.030
Elevation	686.91 ft
Elevation Range	685.9 to 690.8 ft
Flow Area	12.1 ft ²
Wetted Perimeter	24.7 ft
Hydraulic Radius	5.9 in
Top Width	24.61 ft
Normal Depth	11.8 in
Critical Depth	9.9 in
Critical Slope	1.767 %
Velocity	2.58 ft/s
Velocity Head	0.10 ft
Specific Energy	1.09 ft
Froude Number	0.648
Flow Type	Subcritical

CROSS SECTION E-F



CROSS SECTION C-D

Worksheet for REACH(POA-A TO POA-B)

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	1.040 %
Discharge	682.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+92	698.50
2+05	695.40
2+20	693.92
2+41	697.17
2+43	698.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+92, 698.50)	(2+43, 698.50)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	41.4 in
Roughness Coefficient	0.030
Elevation	697.37 ft
Elevation Range	693.9 to 698.5 ft
Flow Area	87.2 ft ²
Wetted Perimeter	45.3 ft
Hydraulic Radius	23.1 in
Top Width	44.64 ft
Normal Depth	41.4 in
Critical Depth	41.2 in
Critical Slope	1.071 %
Velocity	7.82 ft/s
Velocity Head	0.95 ft
Specific Energy	4.40 ft
Froude Number	0.987
Flow Type	Subcritical

CROSS SECTION C-D

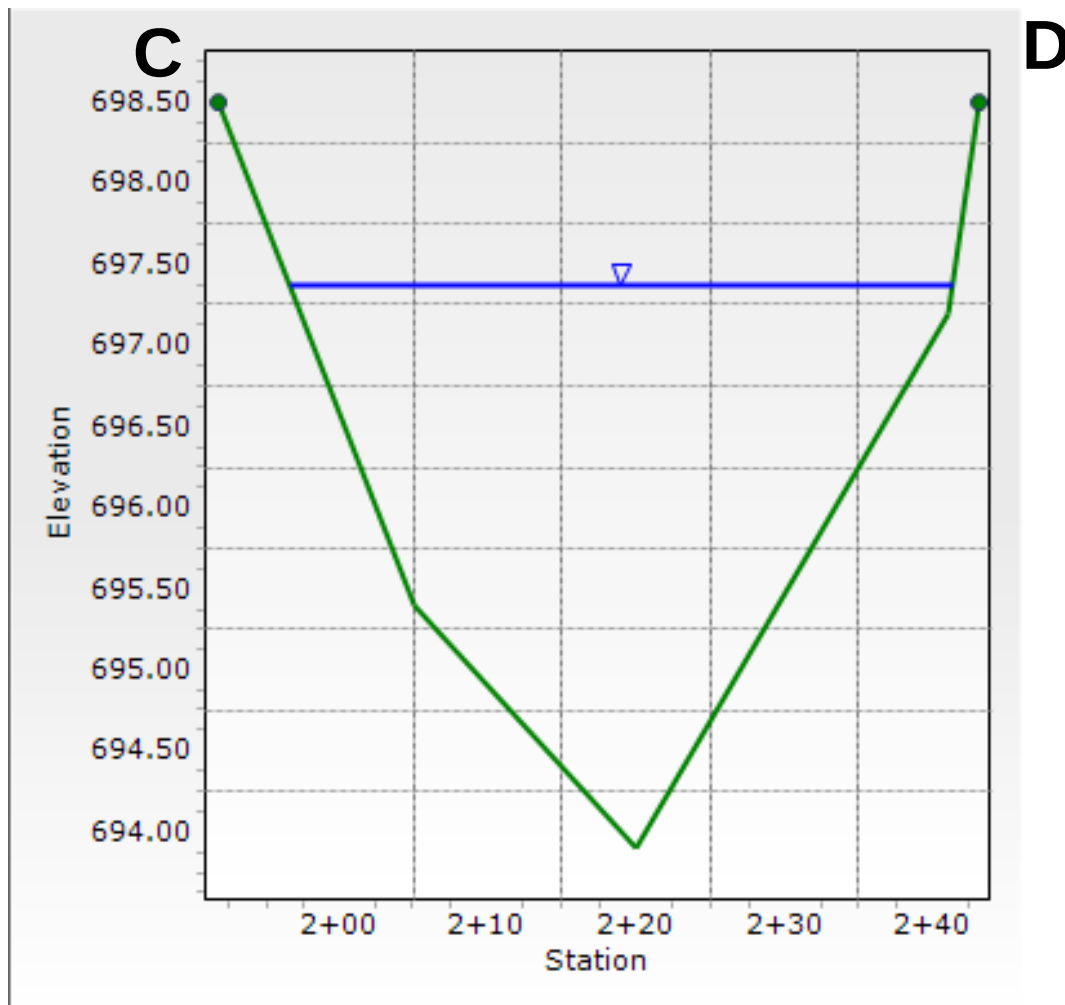
Worksheet for REACH(POA-A TO POA-B)

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	41.4 in
Critical Depth	41.2 in
Channel Slope	1.040 %
Critical Slope	1.071 %





March 11, 2024

City of Hutto Planning Department
500 W Live Oak Street
Hutto, TX 78634

RE: *Alta Ed Schmidt Subdivision*
Final Plat – Purpose Statement

To whom it may concern:

Kimley-Horn is the applicant for a Final Plat application for the subject tract located at the intersection of Ed Schmidt Boulevard and Emory Crossing Boulevard, Hutto, Williamson County, Texas. This letter is to serve as the “purpose statement indicating the reason for the application” as requested on the City’s Plat Application checklist.

The reason for this final plat application is the subdivide the subject tract, some 77.8 acres, more or less, into four lots and to dedicate right-of-way for the proposed Emory Crossing Boulevard. With this application, please find attached all relevant documents listed on the City’s Plat Application checklist as well as two draft cost participation agreements. The two cost participation agreements are for the Emory Crossing ROW and for work associated with SER 38. The cost participation agreements are provided in Word format for ease of redline editing.

Should you have any questions or require additional information, please feel free to contact me directly at (737) 787-7268 or andy.graham@kimley-horn.com.

Sincerely,

Easements have a separate
process through the Real Estate
Department. Please contact
Sara.Cervantes@huttotx.gov

Andrew Graham, P.E.

Project Manager

KIMLEY-HORN AND ASSOCIATES, INC.

03702
THE STATE OF TEXAS,)

Update the title of this attachment - it's labeled "easements" and included a ROW deed.

KNOW ALL MEN BY THESE PRESENTS:

Thirty Four & no/100

(\$ 34.00-) Dollars.

il & wife, Ida Keil

(herein
id, the receipt of which is hereby acknowledged the said grantor does hereby GRANT, SELL
MPNAY, a corporation, (herein styled Grantee), its successors and assigns, the right of way and
e pipe lines and appurtenances thereto, and to construct, maintain and operate telegraph and tel-
ether with the necessary poles, guy wires and anchors, over and through the following described

lands situate in Williamson County, State of Texas, to-wit:

One Hundred & Twelve (112) acres more or less, out of the J. Shelton survey

more fully described in deed from Ben Blackman to Max Keil

recorded in Volume 195, Page 606 Deed Records of said county, to which reference is here made for further description.

TO HAVE AND TO HOLD unto said Grantee, its successors and assigns, so long as such lines and appurtenances thereto shall be maintained, with ingress to and egress from the premises, for the purpose of constructing, inspecting, repairing, maintaining and replacing the property of grantee above described, and the removal of such at will, in whole or in part.

The said grantor is to fully use and enjoy the said premises, except for the purposes hereinbefore granted to the said grantee, which hereby agrees to bury all pipes to a sufficient depth so as not to interfere with cultivation of soil, and to pay any damages which may arise to growing crops or fences from the construction, maintenance and operation of said pipe, telegraph and telephone lines; said damages, if not mutually agreed upon, to be ascertained and determined by three disinterested persons, one thereof to be appointed by the said Grantor, one by the said Grantee, and the third by the two so appointed as aforesaid, and the written award of such three persons shall be final and conclusive. Should more than one pipe line be laid under this grant, at any time, the sum of twenty-five cents per lineal rod for each additional line shall be paid, besides the damages above provided for.

Upon written application to the grantee at Dallas, Texas, the grantee will make or cause to be made, a tap on any gas pipe line constructed by grantee on grantor's premises for the purpose of supplying gas to the grantor for domestic use only, the cost of meter, saddle and labor to be borne by said grantee, all other expenses, including fittings to be borne by grantor, gas to be measured and furnished at the main line of grantee at the same price and under the same rules and regulations as prevail in the nearest city or town where grantee is supplying gas.

It is agreed and understood that all telegraph & telephone poles are to be placed
along fences, roads, or property lines of the above described property

The consideration first above recited as being paid to Grantor by Grantee is in full satisfaction of every right hereby granted. All covenants and agreements herein contained shall extend to and be binding upon the respective heirs, legal representatives, successors and assigns of the parties hereto.

It is hereby understood that party securing this grant in behalf of Grantee is without authority to make any covenant or agreement not herein expressed.

Witness the execution hereof on this the 5th day of July A. D. 19 28

Signed and delivered in the presence
of the undersigned witnesses:

MAX KEIL

IDA KEIL

T. E. Warden

Right of Way Agent.

THE STATE OF TEXAS,)

County of Williamson } Before me, M. C. COOKE, a Notary Public,

in and for said county and state, on this day personally appeared Max Keil, 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 consideration therein expressed.

Given under my hand and seal of office, on this 5th day of July A. D. 1928.

M. C. COOKE

(LS)

Notary Public, in and for Williamson County, Texas.

THE STATE OF TEXAS,)

County of Williamson } Before me, M. C. COOKE, a Notary Public, in and for said county and state,

on this day personally appeared Ida Keil wife of Max Keil

known to me to be the person whose name is subscribed to the foregoing instrument, and having been examined by me privily and apart from her husband, and having the same fully explained to her, she, the said Ida Keil acknowledged such instrument to be her act and deed and declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.

Given under my hand and seal of office, on this the 5th day of July A. D. 19 28.

M. C. COOKE

(LS)

Notary Public, in and for Williamson County, Texas.

Filed for record 26 day of July, 1928, at 10 o'clock A. M.

Recorded 7 day of August, 1928, at 11:40 o'clock A. M.

R. E. Moore
Clerk County Court Williamson County, Texas

Glossie Sutton Page 341 of 323

NOTICE OF CONFIDENTIALITY RIGHTS: If you are a natural person, you may remove or strike any or all of the following information from any instrument that transfers an interest in real property before it is filed for record in the public records: your Social Security number or your driver's license number.

RIGHT OF WAY DEED

Date: April 2, 2019

Grantor: **NO-COUNT, LLC, a Texas limited liability company**

Grantor's Address:

City: **CITY OF HUTTO, TEXAS, a Texas municipal corporation**

City's Address: 401 West Front Street, Hutto, Texas 78634

Property: All that parcel of land situated in Williamson County, Texas, described in the attached **Exhibit A**

Consideration: Ten Dollars (\$10.00) and other good and valuable consideration paid to Grantor for which no lien either express or implied is retained

Permitted Encumbrances: Any easements, liens, encumbrances, general real estate taxes on the Property for the current year, zoning laws, regulations and ordinances of municipal and other governmental authorities, and other matters not subordinated to the Property and of record in the Real Property Records of the Texas county in which the Property is located that are valid, existing, and affect the Property as of the Date.

GRANTOR, for the Consideration, does **GRANT, SELL, AND CONVEY** unto **CITY** the Property, together with all improvements on it and all rights and appurtenances thereto.

TO HAVE AND TO HOLD the Property, together with all and singular the rights and appurtenances thereto in anywise belonging, unto City forever; and Grantor binds Grantor and Grantor's heirs, successors, and assigns to **WARRANT AND FOREVER DEFEND**, all and singular, the title to the Property, subject to the Permitted Encumbrances, to the City against every person whomsoever lawfully claiming, or to claim the Property, or any part of the Property, when the claim is by, through, or under Grantor, but not otherwise

City assumes the payment of ad valorem taxes and assessments for the current year and for subsequent years, but not subsequent assessments for that and prior years due to change in land usage, ownership, or both, the payment of which Grantor assumes.

Except where the context otherwise requires, *Grantor* includes *Grantor's heirs, successors, and assigns* and *City* includes *City's employees, agents, consultants, contractors, successors, and assigns*; and where the context requires, singular nouns and pronouns include the plural.

--- The remainder of this page is intentionally blank ---

Executed effective the Date first above stated.

NO-COUNT, LLC, A TEXAS LIMITED LIABILITY COMPANY

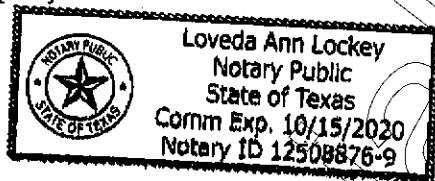
By: [Signature]
 Name: GARY CLANDER
 Title: VIC - PRESIDENT / MGR

STATE OF TEXAS §
 COUNTY OF TARRANT §

Before me, the undersigned notary, on this day personally appeared GARY CLANDER of No-Count, LLC, a Texas limited liability company, known to me through valid identification to be the person whose name is subscribed to the preceding instrument and acknowledged to me that the person executed the instrument in the person's official capacity for the purposes and consideration expressed in the instrument.

Given under my hand and seal of office on 2nd April 2019.

[Seal]



[Signature]
 Notary Public, State of Texas

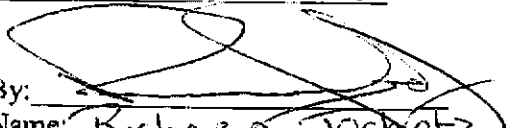
CONSENT OF MORTGAGEE

The undersigned financial institution, being the owner and holder of an existing mortgage lien upon and against the land and property described as the Property in the foregoing Right of Way Deed, hereby consents to the Right of Way Deed and subordinates its lien to the terms and conditions of the Right of Way Deed.

This consent shall not be construed or operate as a release of said mortgage or liens owned and held by the undersigned, or any part thereof.

LIENHOLDER:

Texas Gulf Bank

By: 

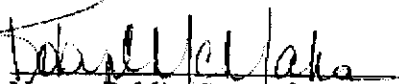
Name: Richard Jochetz

Title: PRESIDENT

***** NOTARY ACKNOWLEDGEMENT *****

The foregoing instrument was executed before me by Richard Jochetz of Texas Gulf Bank on this the 2 day of April, 2019.

(Seal and Expiration)


Notary Public, State of Texas

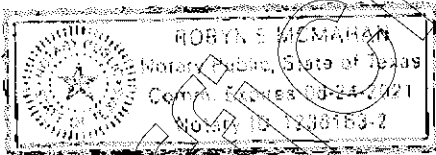


EXHIBIT A

1.057 Acre Parcel

THAT PART OF THE J. SHELTON SURVEY, ABSTRACT NO. 560 IN WILLIAMSON COUNTY, TEXAS, BEING A PART OF THAT 101.8 ACRE TRACT OF LAND CONVEYED TO NO-COUNT, LLC BY DEED RECORDED IN DOCUMENT NUMBER 2013060751 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS (OPRWC); MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGIN at a 1/2" iron rod set on the east line of the above referenced tract, same being the west line of a 181.329 acre tract conveyed to Patsy Louise Overton by deed recorded in Document Number 2013031396, OPRWC, for the POINT OF BEGINNING of this parcel, from which a 1/2" iron rod found monumenting the northeast corner of said 101.8 acre tract and the southeast corner of a 57.895 acre tract conveyed to Ventana Hill Ltd. by deed recorded in Document Number 2007068155, OPRWC bears, N22°26'10"W a distance of 352.61 feet;

THENCE along said west line, S22°26'10"E a distance of 109.13 feet to a 1/2" iron rod set on a non-tangent curve to the right;

THENCE across said 101.8 acre tract the following two courses:

1. Southwesterly, along the arc of said curve a length of 3.28 feet, having a radius of 3046.00 feet, a central angle of 00°03'42" and a chord bearing S35°36'52"W, 3.28 feet;
2. S35°38'43"W a distance of 468.97 feet to a 1/2" iron rod set on a non-tangent curve to the left on the northeast right-of-way line of a 7.402 acre tract of land conveyed to Williamson County, Texas by deed recorded in Document Number 2016010818, OPRWC, from which a 1/2" iron rod found with cap stamped "SAM" bears, S43°04'48"E a distance of 910.66 feet;

THENCE along said northeast right-of-way line, Northwesterly, along the arc of said curve a length of 92.00 feet, having a radius of 2560.00 feet, a central angle of 02°03'33" and a chord bearing N54°21'17"W, 92.00 feet a 1/2" iron rod set;

THENCE across said 101.8 acre tract the following two courses:

1. N35°38'43"E a distance of 468.97 feet to a point of curvature of a curve to the left;
2. Northeasterly, along the arc of said curve a length of 60.98 feet, having a radius of 2954.00 feet, a central angle of 01°10'58", and a chord bearing N35°03'14"E, 60.98 feet to the said Point of Beginning.

Containing 1.057 acres, more or less, as shown on the sketch attached.

***Note:

This parcel is accompanied by 25' Temporary Work Space Easements on either side, being contiguous and 25' offset from and parallel with the northwest and southeast lines of the above described parcel. Said easement lines to be lengthened or shortened so as to terminate on said west line of the 181.329 acre tract and on said northeast right-of-way line as shown on said attached sketch.

 3/27/2019
Stephen R. Lawrence
Registered Professional Land Surveyor No. 6352
State of Texas

RJ Surveying & Associates, Inc.
2900 Jazz Street, Round Rock, Texas 78664
All iron rods set have RJ Surveying caps
Bearings are Texas State Plane Central Zone NAD 83



CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	CH. BRNG.	CH. DIST.
C1	92.00'	2560.00'	002°03'33"	N54°21'17"W	92.00'
C2	212.07'	2560.00'	004°44'47"	N57°45'28"W	212.01'
C3	915.53'	2560.00'	020°29'26"	N43°04'48"W	910.66'
C4	1219.61'	2560.00'	027°17'47"	N46°28'58"W	1208.11'
	(1220.99')		(027°19'38")	(N46°29'15"W)	(1209.45)
C5	60.98'	2954.00'	001°10'58"	N35°03'14"E	60.98'
C6	3.28'	3046.00'	000°03'42"	S35°36'52"W	3.28'

VENTANA HILL LTD
57.895 ACRES
DOC. No. 2007068155
OPRWC

JOHN DYKES SURVEY
ABSTRACT NO. 186

ONCOR ELECTRIC DELIVERY
COMPANY LLC EASEMENT
10.232 ACRES
DOC. No. 2009058278

LEGEND:

- = 1/2" IRON ROD FOUND
(UNLESS OTHERWISE NOTED)
- = 1/2" IRON ROD SET
- △ = CALCULATED POINT
- () = RECORD INFORMATION DOC. No. 2013031396
- OPRWC = OFFICIAL PUBLIC RECORDS WILLIAMSON COUNTY

PATSY LOUISE OVERTON
181.329 ACRES
DOC. No. 2013031396
OPRWC

TEMPORARY WORKSPACE
EASEMENT

J. SHELTON
ABSTRACT NO. 560

1.057 ACRE
PARCEL

TEMPORARY WORKSPACE
EASEMENT

NO-COUNT, LLC
101.8 ACRES
DOC. No. 2013060751 OPRWC

HARRY HANSON
103.111 ACRES
DOC. No. 2006074636
OPRWC

WILLIAMSON COUNTY, TEXAS
2.402 ACRES
DOC. No. 2016010818
OPRWC

SKETCH TO ACCOMPANY DESCRIPTION
(SEE DESCRIPTION ON A SEPARATE ATTACHMENT)

DATE: MARCH 25, 2019 SCALE: 1" = 100'

RJ SURVEYING & ASSOCIATES, INC.

2900 JAZZ STREET, ROUND ROCK, TEXAS, 78664

F-10015400 (512) 836-4793 FAX: (512) 836-4817

**ELECTRONICALLY RECORDED
OFFICIAL PUBLIC RECORDS**

2019027991

Pages: 7 Fee: \$41.00
04/04/2019 11:06 AM



Nancy E. Rister

Nancy E. Rister, County Clerk
Williamson County, Texas

Unofficial Document

AGENDA ITEM REPORT

5.1.



To: Planning and Zoning Commission
Subject: Conduct a public hearing and consider possible action on the proposed Hutto Gateway Preliminary Plat, 46.777 acres, more or less, of land, located on the east side of County Road 119 and north of Limmer Loop.
Meeting: Tuesday, April 9, 2024
Department: Development Services
Staff Contact:

BACKGROUND INFORMATION:

The proposed Preliminary Plat consists of approximately 46.77 acres of land, on the east side of County Road 119 and north of Limmer Loop. The tract was zoned as Schmidt Fields PUD in June 2023.

Adjacent Properties:

WEST: SF-1

NORTH: PUD (RSI Planned Unit Development)

EAST: SF-1

SOUTH: ETJ with Development Agreement

SUMMARY OF REQUEST:

The Planned Unit Development allows for a multi-family and commercial development that will consist of a multi-story, multi-family housing product across three phases with a maximum density of 20 units per acre across approximately 42 acres and approximately 5 acres of General Commercial (B-2).

STAFF REVIEW:

Staff recommends approval of the proposed preliminary plat.

FISCAL NOTES:

POLICY IMPLICATIONS:

ATTACHMENTS:

1. HuttoGatewaySubdiv-Prelim-U3-Plat(2-13-24)

Plotted By: Marquez, K/ve Date: February 12, 2024 08:31:08am File Path: K:\NSAU-Civil\064427802 - Thompson Hutto\Kod\Preliminary\Plan Sheets\3 - Cover Sheet.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

SUBMITTAL LOG
FIRST SUBMITTAL
SECOND SUBMITTAL
THIRD SUBMITTAL

NOVEMBER 3, 2023
DECEMBER 11, 2023
JANUARY 10, 2024

ZONING:

PUD 0-2023-031

FLOODPLAIN INFORMATION:

THE SITE IS LOCATED WITHIN THE 100 AND 500 YEAR FLOODPLAIN. FIRM PANEL NO. 48491C0510F AND 48491F0520F WILLIAMSON COUNTY, TEXAS AND INCORPORATED AREAS.

LEGAL DESCRIPTION:

A DESCRIPTION OF 103.096 ACRES IN THE JOHN DYKES SURVEY ABSTRACT NO. 186, AND THE JAMES SHELTON SURVEY, ABSTRACT NO. 560, IN WILLIAMSON COUNTY, TEXAS, BEING ALL OF A CALL 103.111 ACRE TRACT OF LAND SAVE AND EXCEPT A 4.634 ACRE TRACT OF LAND CONVEYED TO HARRY RONALD HANSON IN DOCUMENT NO. 2006074636 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; SAVE AND EXCEPT A 0.4164 ACRE TRACT CONVEYED TO WILLIAMSON COUNTY, TEXAS IN DOCUMENT NO. 2015088346 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; AND BEING ALL OF A CALLED 4.63 ACRE TRACT OF LAND CONVEYED TO HARRY RON HANSON IN DOCUMENT NO. 199928615 OF THE OFFICIAL RECORDS OF WILLIAMSON COUNTY, TEXAS

BENCHMARK NOTE:

SITE BENCHMARK:
MAG NAIL W/ WASHER SET IN CONCRETE

TEXAS STATE PLANE COORDINATES:
N: 10180878.54
E: 3169596.39

VERTICAL DATUM: NAVD 88

GENERAL PLAN NOTES:

- THIS PROJECT IS SUBJECT TO ALL CITY STANDARD SPECIFICATIONS AND DETAILS IN EFFECT AT THE TIME OF SUBMITTAL OF THE PROJECT TO THE CITY.
- THIS SITE IS APPROXIMATELY 46.777 ACRES.
- ALL INFRASTRUCTURE SHOWN ON THIS PRELIMINARY PLAN IS SCHEMATIC IN NATURE, SUBJECT TO FINAL DESIGN PLANS AND APPROVALS.

OWNER:
REAL INTERNATIONAL REALTY
11700 JOLLEYVILLE RD
AUSTIN, TX 78759
PH: (713) 623-2854
ATTN: LYNN YUAN

ENGINEER:
KIMLEY-HORN & ASSOCIATES
5301 SOUTHWEST PKWY, BUILDING 2, SUITE 100
AUSTIN, TX 78735
PH: (512) 646-2243
ATTN: BEN GREEN

SURVEYOR
EARLY LAND SURVEYING
P.O. BOX 92588
AUSTIN, TX 78709
PH: (512) 202-8631
ATTN: JOE BEN EARLY, JR.

PREPARED BY:

Kimley»Horn

5301 SOUTHWEST PARKWAY, BUILDING 2, SUITE 100
AUSTIN, TEXAS 78735
CERTIFICATE OF REGISTRATION #928

Tel. No. (512) 418-1771
Fax No. (512) 418-1791

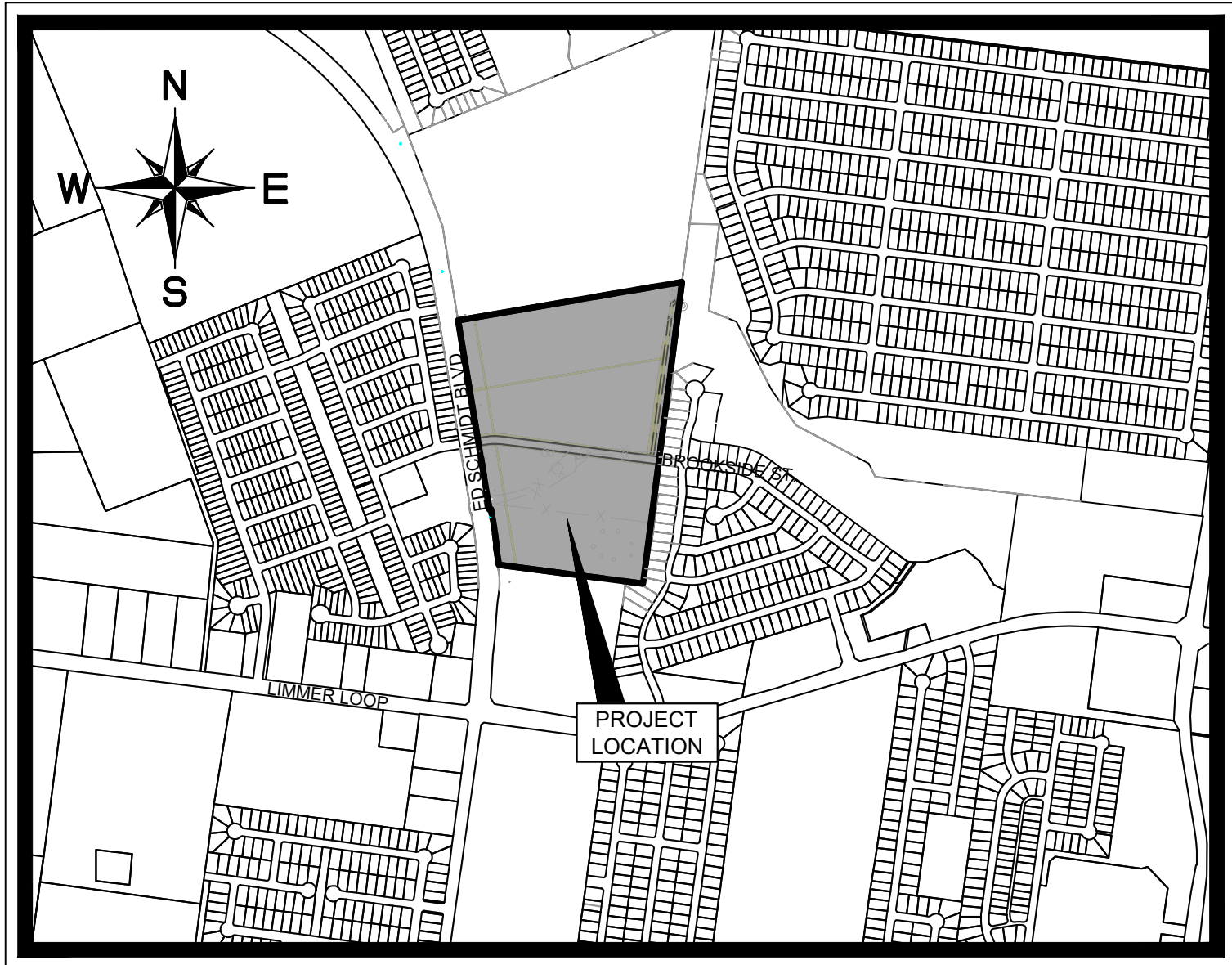
UTILITY CONTACTS:
1. TELECOM COMPANY: WILLIAM THROCKMORTON, SPECTRUM, 512-560-4834
2. ELECTRIC COMPANY: BETTY HARRIS, ONCOR, 682-690-4761
3. GAS COMPANY: EMILY PACK, ATMOS ENERGY, 512-695-9024
4. WATER: JONAH WATER, 512-759-1286
5. WASTEWATER: CITY OF HUTTO, 512-759-4023

PRELIMINARY SUBDIVISION PLAT

FOR

HUTTO GATEWAY

SUBDIVISION



VICINITY MAP

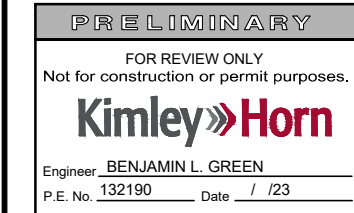
SCALE: 1" = 1,000'

I CERTIFY THAT THESE ENGINEERING DOCUMENTS ARE COMPLETE, ACCURATE AND ADEQUATE FOR THE INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION PRIOR TO FORMAL CITY APPROVAL.

DATE

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	PLAT SHEET
3	PRELIMINARY PLAT NOTES



02/12/2024

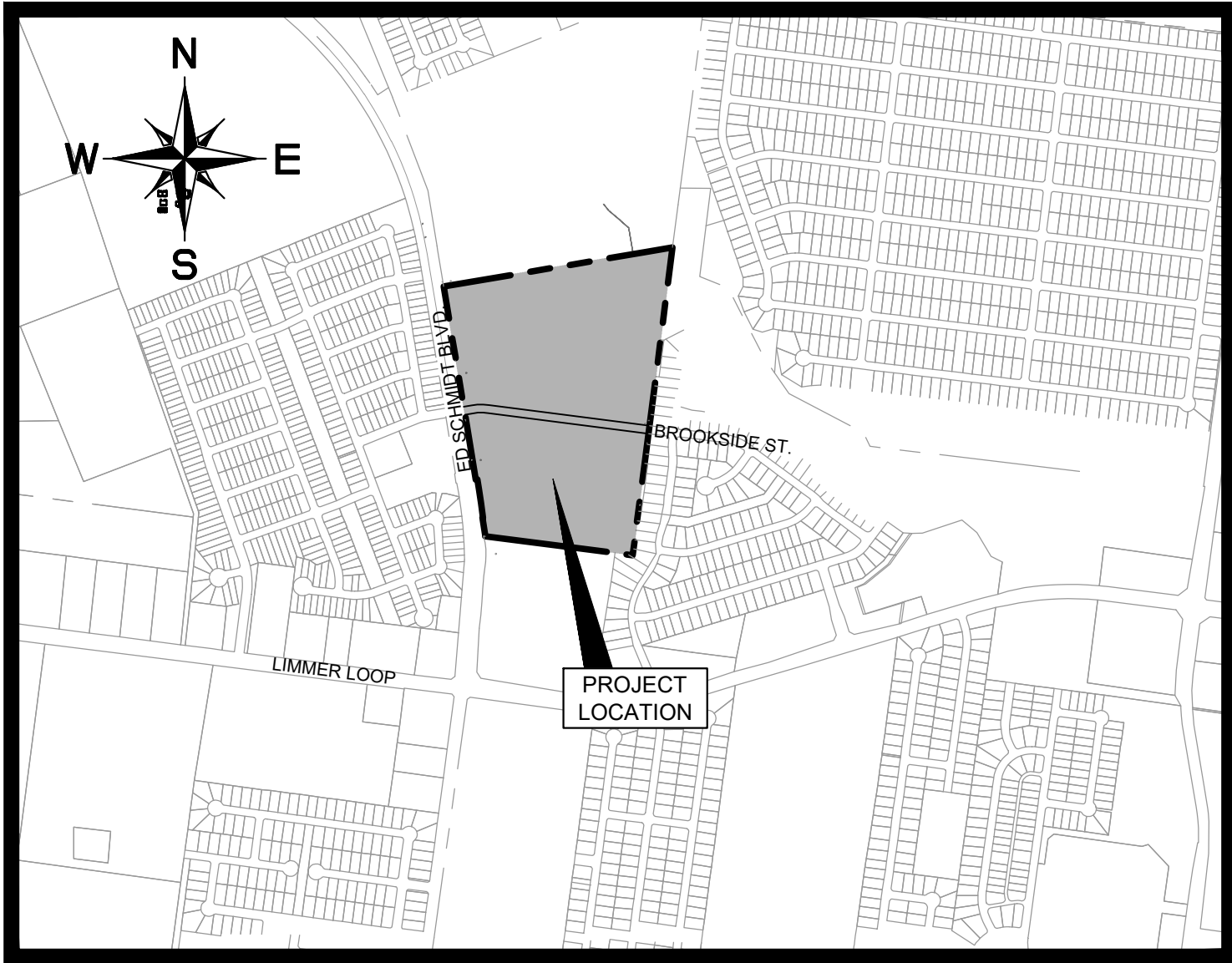
KHA PROJECT	064427802	DATE	October 2023	SCALE:	AS SHOWN	DESIGNED BY:	BLG	DRAWN BY:	KJM	CHECKED BY:	BLG
-------------	-----------	------	--------------	--------	----------	--------------	-----	-----------	-----	-------------	-----

COVER SHEET

PRELIMINARY PLAT
HUTTO GATEWAY

CITY OF HUTTO
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
1 OF 3



AGENDA ITEM REPORT

5.2.



To: Planning and Zoning Commission
Subject: Presentation and discussion on the 2025 Capital Improvement Plan.
Meeting: Tuesday, April 9, 2024
Department: Engineering
Staff Contact: Matt Rector

BACKGROUND INFORMATION:

This is the first of two presentations to the Planning and Zoning Commission regarding the 2025 Capital Improvement Plan (CIP).

SUMMARY OF REQUEST:

STAFF REVIEW:

This item is a presentation only, no action is requested.

FISCAL NOTES:

POLICY IMPLICATIONS:

ATTACHMENTS:

None