MAYFAIR

City of New Braunfels ETJ. Texas

Comal County

Planning Level

Traffic Impact Analysis

March 2021
(Rev. November 2020)
(Rev. March 2021)

PAPE-DAWSON ENGINEERS

Transportation | Water Resources | Land Development | Surveying | Environmental

MAYFAIR

City of New Braunfels ETJ, Texas
Comal County

Planning Level
Traffic Impact Analysis

March 2020
(Rev. November 2020)
(Rev. March 2021)

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

03/17/2021

TABLE OF CONTENTS

LIST OF FIGURES

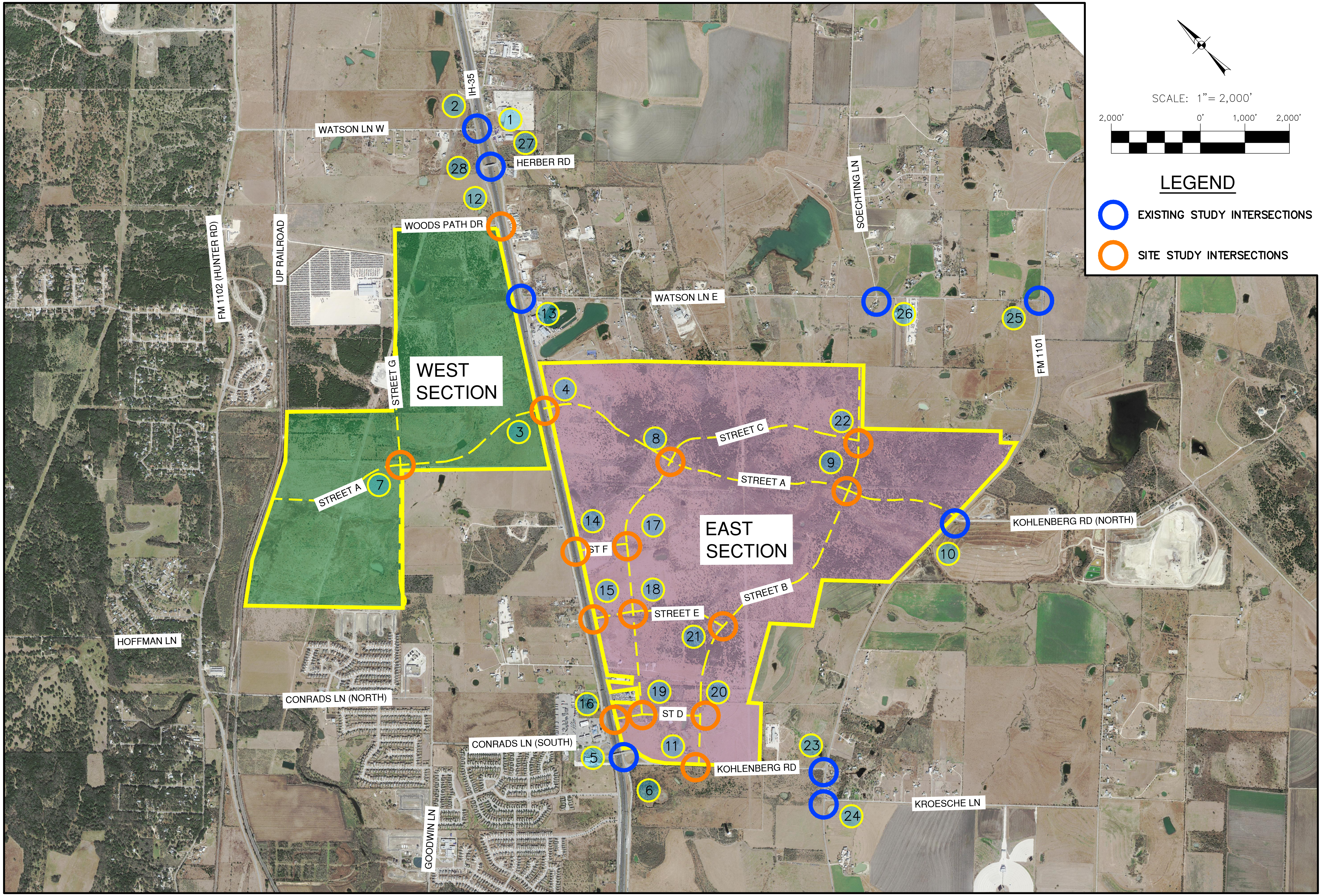
LIST OF TABLES

APPENDICES

INTRODUCTION

Pape-Dawson Engineers, Inc. was retained to prepare a Planning Level Traffic Impact Analysis (TIA) for the Mayfair development. Mayfair is a mixed-use development of approximately 1,888 acres located along IH-35 north of Conrads Lane/Kohlenberg Road and south of W Watson lane and E Watson Lane in the City of New Braunfels Extraterritorial Jurisdiction (ETJ), Comal County, Texas (see **Figure 1**). Mayfair will be developed primarily with single-family residential, as well as two elementary schools, a middle school, a high school, multi-family, light industrial, and commercial uses. **Figure 2** shows the schematic master development plan with the internal roadway layout for Mayfair. The Mayfair development is expected to be completed over a period of approximately twenty (20) years. As the site develops the land use densities and locations will change. However, the intent of this study is to plan the overall roadway network needed to support the development, size the roadways and right-of-way, and determine likely major intersection improvements.

In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements are required.



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

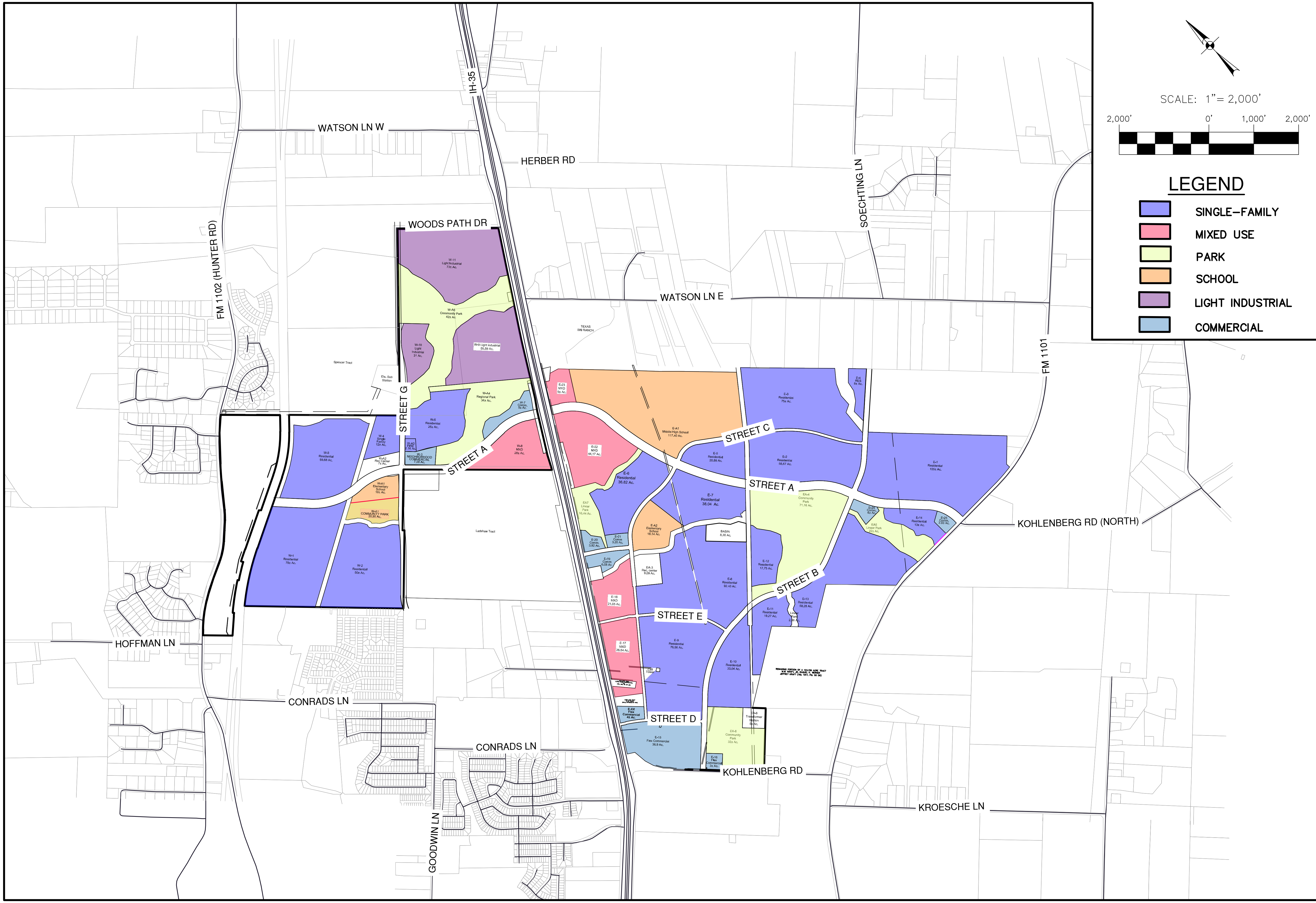
CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 1: LOCATION MAP

JOB NO. 30002-01
DATE FEB 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Nov 16, 2020, 3:51pm User ID: JHohenstein
File: P:\300\02\01\Design\Exhibit\3000201 Location Map.dwg



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 2: DEVELOPMENT SCHEMATIC

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Nov 16, 2020, 3:47pm User ID: JHohenstein
File: P:\300\02\01\Design\Exhibit\3000201 FIG 2.dwg

PURPOSE

This study assesses important transportation and circulation issues in the absence of detailed land use and density information for the site. This Planning Level Traffic Impact Analysis will establish the existing transportation network, identify planned projects and roadway improvements in the area, project future trips generated by the development, distribute and assign the trips onto roadways, and recommend the transportation network layout and site access points. It will further define roadway hierarchies and right-of-way requirements for both roadway segments and major intersections.

STUDY PROCEDURE

The following sections provide a summary of field data, engineering analyses, and conclusions and recommendations. The following tasks were completed during the study:

- Determined analysis parameters during a meeting with City of New Braunfels staff as outlined in the Conference Memo contained in **Appendix J**.
- Established the boundaries of the study area and identified the major roadways and intersections serving the site.
- Identified planned roadway and preliminary intersection improvements through the study area.
- Projected No Build Condition traffic volumes by growing out existing volumes to the year 2040 by applying an annual growth rate and combining any external development site trips.
- Estimated the projected number of trips to be generated by the development during the AM and PM peak hours and daily using the trip generation rates provided in *Trip Generation*, *10th Edition*, published by the Institute of Transportation Engineers[1].
- Prepared a global trip distribution based on the existing and future roadway network.
- Assigned entering and exiting site traffic to site roadways and to the local street network using the global trip distribution.
- Developed Build Condition volumes for (2040) by combining the site-generated traffic with No Build Condition volumes.

[1] Institute of Transportation Engineers (ITE). *Trip Generation. 10th Edition*, 2017, Washington, D.C.

- Evaluated right-of-way adequacy for internal and external roadways within the immediate boundaries of the project site based on projected future traffic volumes.
- Performed capacity analyses of study intersections for No Build and Build Conditions for the AM and PM peak hours.
- The evaluation of peak hour operations for each intersection and scenario was performed using Synchro, Version 10.2[2]. All intersections were analyzed with traffic volumes, intersection geometry, and traffic control.
- The general characteristics associated with each level of service for unsignalized and signalized intersections based on the Highway Capacity Manual[3] are presented in **Appendix F**, and the detailed Synchro Capacity Analysis Worksheets can be found in **Appendix G**.
- Traffic impacts are identified when the Build Condition level of service (LOS) at the study intersections is below LOS C.
- Compared and analyzed the results of the capacity analyses to identify potential traffic impacts and propose suitable mitigation measures.
- Provided functional design recommendations for lane configurations at major intersections within the immediate boundaries of the project site.

AREA CONDITIONS

Mayfair is located along IH-35 north of Conrads Lane/Kohlenberg Road and south of W Watson lane and E Watson Lane and is currently undeveloped.

ROADWAY NETWORK

IH-35 and FM 1101 are expected to provide regional access to Mayfair. The study area encompasses the following key intersections:

1) IH-35 Northbound Frontage Road at Watson Lane (West)
2) IH-35 Southbound Frontage Road at Watson Lane (West)
3) IH-35 Southbound Frontage Road at Proposed Street A (future bridge)

[2] Trafficware®. 2019. *Synchro Studio 10.2, Synchro Plus SimTraffic and 3D Viewer*. Sugarland, Texas.
[3] Transportation Research Board/National Research Council. 2000. *Highway Capacity Manual. Third Edition*, Washington, D.C.

4) IH-35 Northbound Frontage Road at Proposed Street A (future bridge)
5) IH-35 Southbound Frontage Roads at Conrad Lane/Kohlenberg Road (x2)
6) IH-35 Northbound Frontage Roads at Conrad Lane/Kohlenberg Road (x2)
7) Proposed Street G at Proposed Street A
8) Proposed Street A at Proposed Street C
9) Proposed Street A at Proposed Street B
10) Proposed Street A/ Kohlenberg Rd (north) at FM 1101
11) Kohlenberg Road at Proposed Street B
12) IH-35 Southbound Frontage Road at Woods Path Drive
13) IH-35 Northbound Frontage Road at Watson Lane (East)
14) IH-35 Northbound Frontage Road at Proposed Street F
15) IH-35 Northbound Frontage Road at Proposed Street E
16) IH-35 Northbound Frontage Road at Proposed Street D
17) Proposed Street F at Proposed Street C
18) Proposed Street C at Proposed Street E
19) Proposed Street C at Proposed Street D
20) Proposed Street D at Proposed Street B
21) Proposed Street B at Proposed Street E
22) Proposed Street B at Proposed Street C
23) Kohlenberg Road (South) at FM 1101
24) Kroesche Lane at FM 1101
25) Watson Lane East at FM 1101
26) Watson Lane East at Soechting Lane
27) IH-35 Frontage Roads Northbound Frontage Road at Herber Road (existing bridge)
28) IH-35 Frontage Roads Southbound Frontage Road at Herber Road (existing bridge)

Each of the existing study intersections are shown in **Figure 1**. Brief descriptions of each roadway are provided below. TxDOT roadway improvements can be found in **Appendix E**.

IH-35

IH-35, which is under TxDOT jurisdiction, is identified on the City of New Braunfels 2012 Major Thoroughfare Plan (MTP) as an interstate with 300 feet to 450 feet of right-of-way. The segment of IH-35 through the study area will be upgraded to a freeway section with continuous one-way frontage roads that generally runs in a north-south direction. In addition, the ramps will be converted to a x-pattern and a new overpass is proposed at Street A. Also, the Conrads Lane/Kohlenburg Road interchange is being replaced and the Herber Road bridge will be relocated to Watson Lane W. TxDOT schematic is shown in **Appendix E**.

FM 1101

FM 1101 is shown on the City of New Braunfels 2012 MTP as a Principal Arterial with 150 feet of right-of-way. It generally runs in a north-south direction through the study area. Currently it is a two-lane, undivided rural highway. The posted speed limit is 55 miles per hour.

Herber Road

Herber Road is a two-lane, undivided roadway that runs in an east-west direction. The posted speed limit is 30 miles per hour. Herber Road aligns with an existing IH-35 turnaround bridge north of the site. With the proposed TxDOT roadway improvements on IH-35, this turnaround will be removed as shown in **Appendix E**.

Woods Path Drive

Woods Path Drive is a two-lane, undivided rural roadway that begins at IH-35 and terminates at Goodwin Lane. It generally runs in an east-west direction through the study area. The posted speed limit is 30 miles per hour.

Godwin Lane

Goodwin Lane is a two-lane disconnected, undivided rural roadway that begins at FM 306 and terminates at Conrads Lane. There is also another segment of Goodwin Lane that starts at an electrical service station and terminates at Woods Path Drive. It generally runs in a north-south direction through the study area. The posted speed limit is 30 miles per hour.

Kohlenberg Road (South)

Kohlenberg Road (South) is a two-lane, undivided rural roadway that begins at IH-35 and terminates at FM 1101. It generally runs in an east-west direction through the study area. The posted speed limit is 40 miles per hour.

Kohlenberg Road (North)

Kohlenberg Road (North) is a two-lane, undivided rural roadway that begins at FM 1101 and terminates at Schwartzlose Road. It generally runs in an east-west direction through the study area. The posted speed limit is 30 miles per hour.

Conrads Lane

Conrads Lane is identified on the City of New Braunfels 2012 MTP as a Major Collector with 90 feet of right-of-way. The posted speed limit is 40 miles per hour. It generally runs in an east-west direction through the study area. Currently it is a two-lane, undivided roadway that consists of two disconnected segments. The north segment runs between FM 1102 and Goodwin Lane, and the south segment runs between Goodwin Lane and IH-35 approximately 1,000 feet south of the northern segment. The 2012 MTP align the two disconnected segments with a proposed major collector.

Soechting Lane

Soechting Lane is identified on the City of New Braunfels 2012 MTP as a Minor Collector with 60 feet of right-of-way. The posted speed limit is 30 miles per hour. It generally runs in a north-south direction near the study area. Currently it is a two-lane, undivided roadway that begins at Watson Lane (East) and terminates at York Creek Road.

Kroesche Lane

Kroesche Lane is a two-lane, undivided roadway that begins at FM 1101 and terminates at Westmeyer Road. The posted speed limit is 30 miles per hour. It generally runs in an east-west direction near the study area.

New Braunfels 2012 Regional Transportation Plan

Several roadways are included in the New Braunfels 2012 Regional Transportation Plan. **Figure 3** shows the site plan overlaid with the thoroughfare plan.

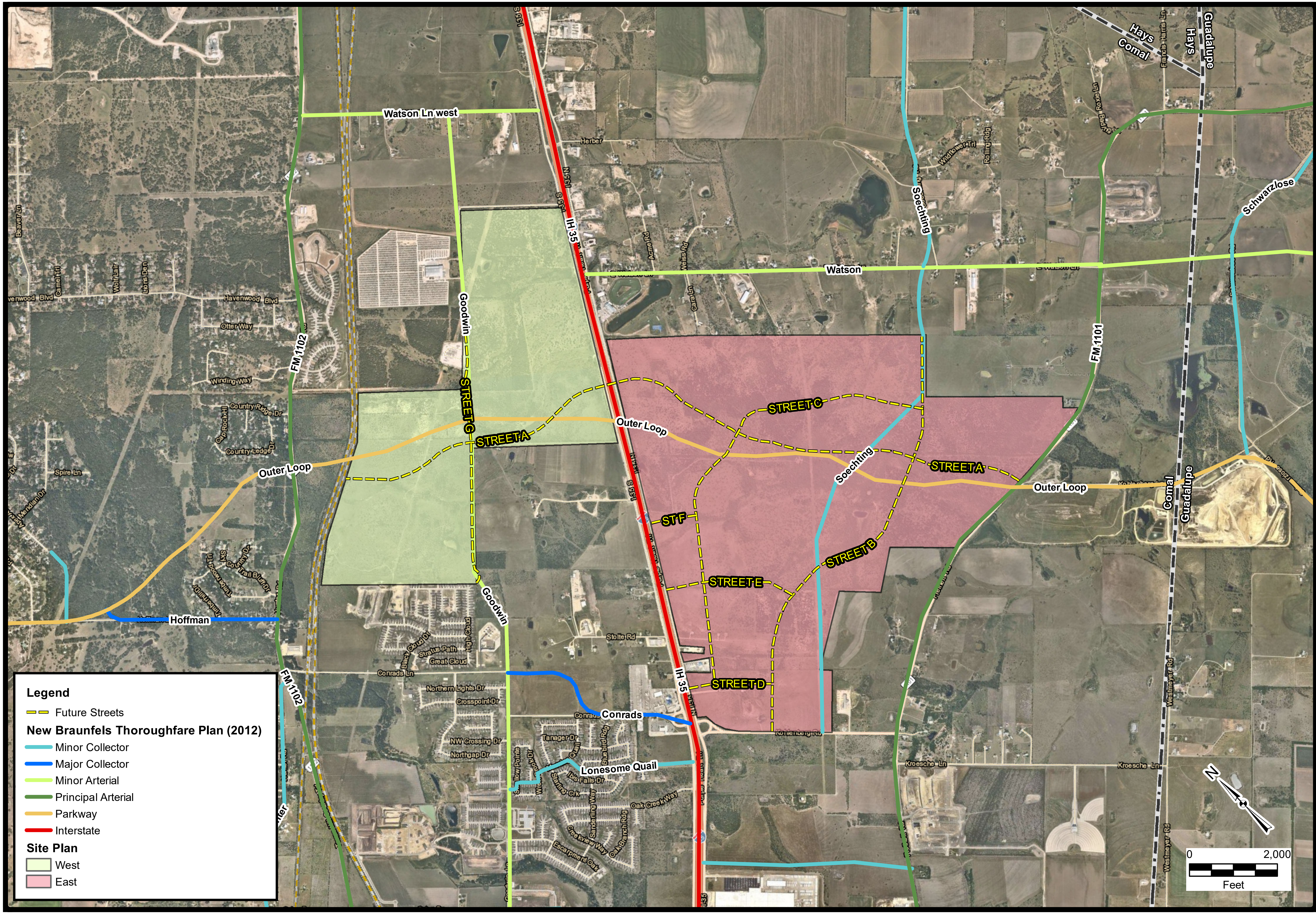


FIGURE 3: NEW BRAUNFELS 2012 REGIONAL TRANSPORTATION PLAN WITH SITE PLAN

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

JOB NO.	30002-01
DATE	Nov 2020
DESIGNER	JH
DRAWN	LR
CHECKED	JH
SHEET	1.0

Date: Nov 12, 2020 9:17:37 AM User: AlexisRamirez
File: \\pape-dawson.com\sat-pd\30002\01\Design\GIS\200521_MTP_Map\MXD\201112_MTP_Map_11x17L.mxd

TRAFFIC VOLUMES

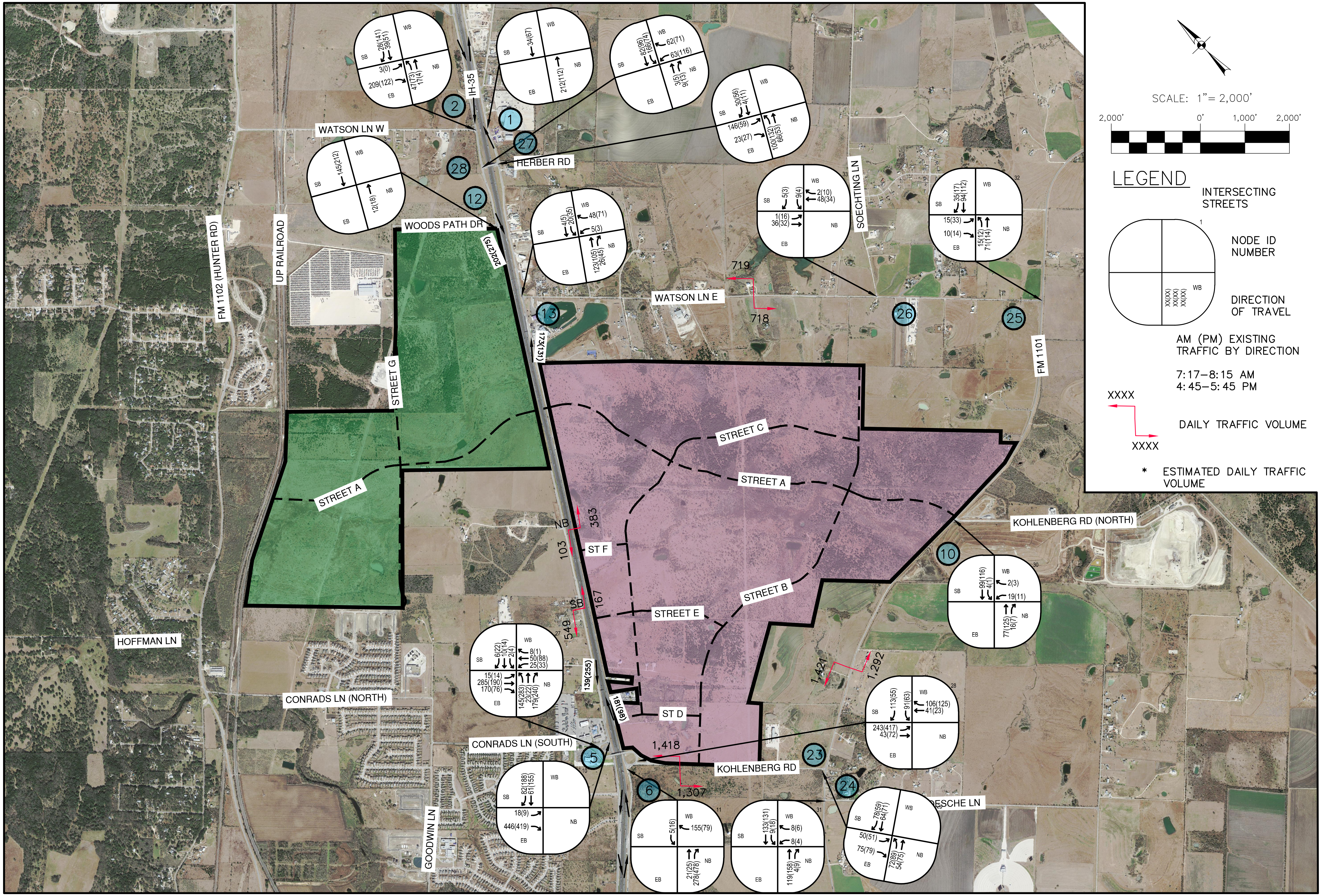
Intersection turning movement counts (TMC) were performed during the AM peak hours and PM peak hours at the key intersections. Counts were collected on Wednesday, January 22, 2020. The peak hours identified from the turning movement counts collected were 7:15-8:15 AM and 4:45-5:45 PM. Additional 24-hour bi-directional and uni-directional traffic volumes in the area were obtained using an Automatic Traffic recorder (ATR). Existing counts are presented in **Appendix C**. **Figure 4** shows the ADT data along with intersection locations with available turning movement count data. **Table 1** summarizes the daily trips on the major area roadways.

Table 1: Daily Traffic on Major Roadways (2020)

Roadway	Location	Daily Trips (vpd)
IH-35 NB Main Lanes	North of Conrads Ln/Kohlenberg Rd	44,439
IH-35 SB Main Lanes	North of Conrads Ln/Kohlenberg Rd	45,006
IH-35 NB Entrance Ramp 193	North of Conrads Ln/Kohlenberg Rd	1,710
IH-35 SB Exit Ramp 193	North of Conrads Ln/Kohlenberg Rd	3,560
IH-35 NB Exit Ramp 195	South of Watson Lane	2,135
IH-35 SB Entrance Ramp 195	South of Woods Path	2,989
Watson Lane	East of IH-35	1,437
Kohlenberg Road	Between IH-35 and FM 1101	2,725
FM 1101	Between Kohlenberg (South) and Kohlenberg (North)	2,713

REDISTRIBUTED TRAFFIC VOLUMES

TxDOT is planning major roadway improvements along IH-35. Two-way frontage roads will be converted to one-way frontage roads. Turnaround access at Herber Road will be relocated north at Watson Lane W. The IH-35 at Kohlenberg Rd/Conrads Lane intersection will be converted from a partial clover leaf to a diamond intersection. Additionally, there will ramp relocations throughout the area. **Appendix E** shows the preliminary TxDOT schematic. Due to these improvements, the existing volumes were redistributed. **Figure 5** shows the redistributed turning movement count data.



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

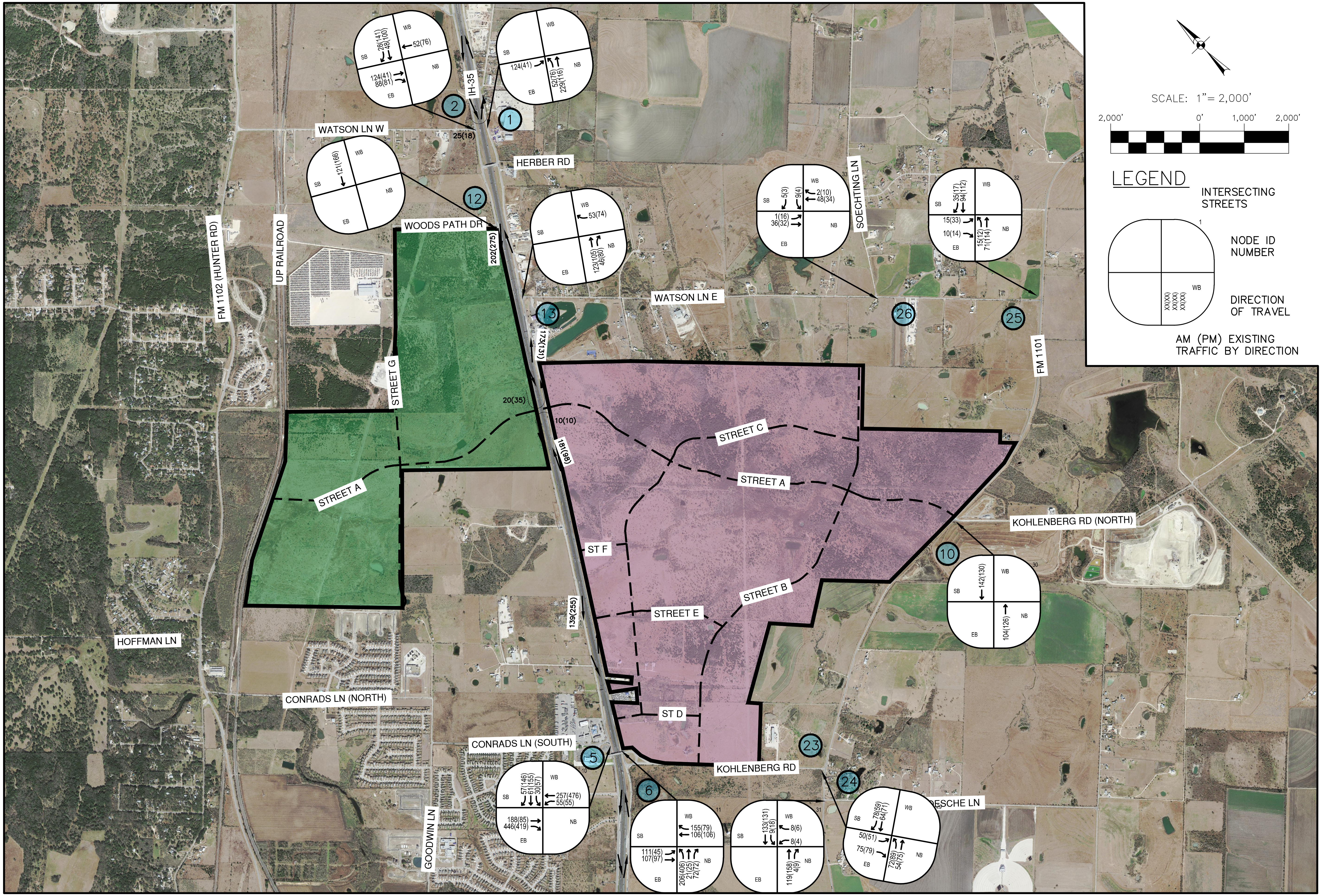
CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 4: EXISTING COUNTS (2020)

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:21pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 5: REDISTRIBUTED EXISTING COUNTS (2020)

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:21pm User ID: JHohenstein
File: C:\Users\Vocal_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg

BACKGROUND GROWTH

An annual growth rate was estimated at **2%** based on historical average daily traffic (ADT) counts performed by TxDOT[4] between 2014 and 2018. This rate represents the average growth rate for the area surrounding the site. The background growth rate will be reevaluated with each submittal of a detailed traffic study associated with sector plans or plats for development. **Table 2** illustrates historical ADT data near the development site. **Appendix A** shows the location of each projection location.

Table 2: Rate of Traffic Growth

Location	Year	AADT	Rate of Growth (%)	Growth (%)
IH -35, S of FM 306	2014	115,761		**-0.8%**
	2015	120,760	4.3%	
	2016	131,392	8.8%	
	2017	135,102	2.8%	
	2018	109,481	-19.0%	
IH-35, S of FM 1102	2014	100,064		**1.3%**
	2015	98,003	-2.1%	
	2016	103,864	6.0%	
	2017	105,734	1.8%	
	2018	105,359	-0.4%	
FM 306, W of IH-35	2014	19,381		**13.6%**
	2015	23,157	19.5%	
	2016	25,580	10.5%	
	2017	31,949	24.9%	
	2018	31,870	-0.2%	
Calculated Weighted Average Growth				**2%**

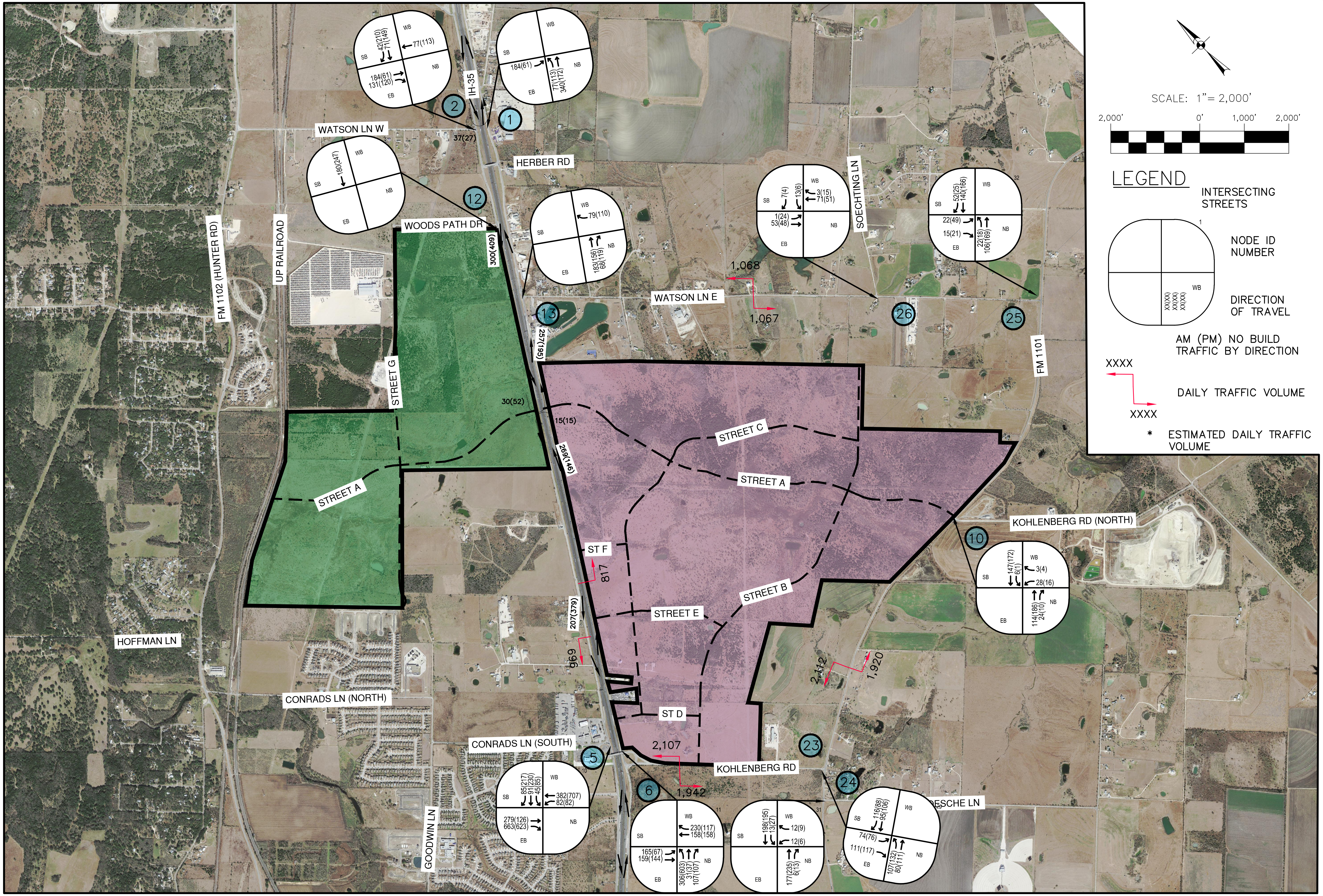
Additionally, the 2% growth rate was verified with the TxDOT Planning Map[4] future traffic and percent growth overlay. As shown in **Table 3** all external roadways have a 2% projected growth rate. However, it should be noted that because the majority of these roadways are low volume, and there is potential for other developments to come along FM 1101, the projected growth rate may be underestimated. The background growth rate will be reevaluated with each submittal of a detailed traffic study associated with sector plans or plats for development.

4 TxDOT Planning Map Website, www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html

Table 3: TxDOT Planning Map Calculated Growth

Road	2018 AADT	2038 Estimated AADT	% Growth
IH-35 NBFR	2,070	2,894	2%
IH-35 SBFR	2,552	3,573	2%
IH-35 ML	100,737	141,032	2%
Kohlenberg S	1,474	2,064	2%
FM 1101	2,418	3,385	2%
Watson E	1,067	1,494	2%
Watson W	2,618	3,665	2%
FM 1102	6,427	8,998	2%

The No Build peak hour traffic volumes were developed by applying the annual growth factor to the existing redistributed volumes to project them over a period of approximately twenty (20) years and adding any external site traffic. The No Build Condition traffic volumes and resulting weekday average daily traffic (ADT) on major internal and external roadways is summarized of the roadway network are presented in **Figure 6**.



MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 6: NO BUILD CONDITION (2040)

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

JOB NO.	30002-01
DATE	NOV 2020
DESIGNER	JCH
CHECKED	JWC
DRAWN	JCH
SHEET	1 of 1

Date: Mar 22, 2021, 1:21pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg

PROPOSED DEVELOPMENT

PROPOSED ROADWAYS

Several roadways are being proposed to be constructed to serve Mayfair, as shown in **Figure 2**. The site is divided into two major sections: East and West.

- Proposed Street A will serve as the primary east-west connection through sections of Mayfair.
- The proposed Street B, located in the East section of Mayfair, will generally run in a north-south direction. Street B will be constructed from north of Street C up to Kohlenberg Road (South).
- The proposed Street C, located in the East section of Mayfair, will generally run in a north-south direction and begin west of Street B and terminate north of Street D.
- The proposed Street D, located in the East section of Mayfair, will generally run in an east-west direction. Street D will be constructed from IH-35 to Street B.
- The proposed Street E, located in the East section of Mayfair, will generally run in an east-west direction. Street E will be constructed from IH-35 to Street B.
- The proposed Street F, located in the East section of Mayfair, will generally run in an east-west direction. Street F will be constructed from IH-35 to Street C.
- The proposed Street G, located in the West section of Mayfair, will generally run in a north-south direction. Street G will be constructed from Woods Path Drive and will end at the site boundary.

PROPOSED LAND USES

Mayfair is a mixed-use site that will be developed primarily for residential uses, as well as two proposed elementary schools, one middle school, one high school, multi-family sites, light-industrial, parks, offices, and commercial uses. Mayfair is anticipated to be complete over a period of approximately twenty (20) years. At the time of this study the definite land uses and densities are not available. Therefore, it is necessary to make some general assumptions that are reasonable and conservative in terms of projecting the trip generation for land uses and density mix. It is understood that the assumed land use and density plan is conceptual and likely to change as individual parcels are developed over time in the future. The retail/commercial land uses typically could include a variety of businesses with different trip generation rates. However, it is not feasible to make detailed assumptions for the retail/commercial land uses at the master development plan stage. **Table 4** shows the following land use density assumptions. A Floor Area Ratio (F.A.R.) is the area of land that will have a building footprint. For the various commercial land uses, conservative F.A.R. were assumed.

Table 4: Proposed Land Use Summary

Trip Generation Land Use	Master Plan Land Use	F.A.R.	DU/ac
Residential			
Single-Family Detached Housing (210)	40'-45's Single Family	-	4.9
	50'-55's Single Family	-	3.9
	60'-65's Single Family	-	3.2
	Single Family/Townhome	-	6
Multifamily Housing (Low-Rise) (220)	Multi Family	-	18
Commercial			
Trip Generation Land Use	**Master Plan Land Use**	**F.A.R.**	**TSFGFA/ac**
Shopping Center (820)	Flex Commercial MXD	20%	8.712
	Flex Commercial	15%	6.534
	Comm	100%	43.56
General Office Building (710)	Office	20%	8.712
General Light Industrial (110)	Light Industrial	17.5%	7.623
Fire and Rescue Station (575)	Fire	20%	8.712
Educational			
Trip Generation Land Use	**Master Plan Land Use**	**F.A.R.**	**students/ac**
Elementary School (520)	Elementary School	-	800
Middle School (522)	Middle/High School	-	1,100
High School (530)	Middle/High School	-	2,000

Certain areas in the site plan are labeled Mixed Use. **Table 5** shows the assumed land uses for the Mixed Use areas.

Table 5: Proposed Land Use for Mixed Use

MXD	%
Single Family/Townhome	40
Multi Family	35
Flex Commercial	10
Office	15

Following the above assumptions, the most likely and reasonable land uses and densities for Mayfair is summarized in **Table 6**.

Table 6: Proposed Land Use Summary

Land Use	ITE Code	Size	Unit
Single-Family Homes	210	4,209	DU
Apartments	220	808	DU
Elementary School (2 schools)	520	1,600	Students
Middle School	522	1,100	Students
High School	530	2,000	Students
General Office Building	710	167.68	TSFGFA
General Light Industrial	110	1219.29	TSFGFA
Public Park	411	226.18	Acres
Fire and Rescue Station	575	21.95	TSFGFA
Shopping Center	820	1,662.34	TSFGLA

DU = Dwelling Unit; TSFGLA = 1,000 square feet gross leasable area; TSFGFA = 1,000 square feet gross floor area

PROJECTED TRAFFIC

Trip Generation

The amount of site traffic generated by the proposed development is a function of the density and type of land use. The projected number of vehicle trips generated by the proposed development was calculated using statistical data contained in *Trip Generation*, 10*th Edition*, published by the Institute of Transportation Engineers (ITE) and considered an industry standard.

The traffic generated by the project was calculated for the AM and PM peak hours of traffic on the adjacent roadways, since these periods experience the greatest roadway congestion during an average weekday. The trip generation rates for each land use are summarized in **Table 7**. The resulting unadjusted projected site traffic is shown in **Table 8**. A summary of the trip generation data broken out by tract and phase is provided in **Appendix B**. It should be noted that phasing will change based on developers of future tracts.

Table 7: Trip Generation Rates

		Weekday AM Peak Hour		Weekday PM Peak Hour		Weekday Daily	
Land Use (ITE Code)	Unit	Rate Per Unit	In/Out Split	Rate per Unit	In/Out Split	Rate per Unit	In/Out Split
Single-Family Homes (210)	DU	0.74	25/75	0.99	63/37	9.44	50/50
Apartments (220)	DU	0.46	23/77	0.56	63/37	7.32	50/50
Elementary School (520)	Students	0.67	54/46	0.34	45/55	1.89	50/50
Middle School (522)	Students	0.58	54/46	0.35	46/54	2.13	50/50
High School (530)	Students	0.52	67/66	0.14	48/52	2.03	50/50
General Office Building (710)	TSFGFA	1.16	86/14	1.15	16/84	9.74	50/50
General Light Industrial (110)	TSFGFA	0.7	88/12	0.63	13/84	4.96	50/50
Public Park (411)	Acres	0.02	59/41	0.11	55/45	0.78	50/50
Fire and Rescue Station (575)	TSFGFA	NA	NA	NA	NA	0.48	50/50
Shopping Center (820)	TSFGLA	0.94	62/38	3.81	48/52	37.75	50/50

DU = Dwelling Unit; TSFGLA = 1,000 square feet gross leasable area; TSFGFA = 1,000 square feet gross floor area

Table 8: Projected Site Traffic

Land Use (ITE Code)	Size	Unit	AM Peak Hour Enter	AM Peak Hour Exit	PM Peak Hour Enter	PM Peak Hour Exit	Daily Total
East Section							
Single-Family Homes (210)	3,108	DU	574	1,727	1,938	1,137	29,341
Apartments (220)	629	DU	66	223	222	131	4,605
Elementary School (520)	800	Students	289	247	122	150	1,512
Middle School (522)	1,100	Students	345	293	177	208	2,343
High School (530)	2,000	Students	697	343	134	146	4,060
General Office Building (710)	130.45	TSFGFA	131	20	24	127	1,270
General Light Industrial (110)	-	TSFGFA	-	-	-	-	-
Public Park (411)	137.18	Acres	1	1	8	8	107
Fire and Rescue Station (575)	-	TSFGFA	-	-	-	-	-
Shopping Center (820)	1,273.79	TSFGLA	742	454	2,330	2,525	48,084
			2,845	**3,308**	**4,955**	**4,432**	**91,322**
			6,153		**9,387**		
West Section							
Single-Family Homes (210)	1,101	DU	203	611	687	402	10,393
Apartments (220)	179	DU	19	63	63	37	1,310
Elementary School (520)	800	Students	289	247	122	150	1,512
Middle School (522)	-	Students	-	-	-	-	-
High School (530)	-	Students	-	-	-	-	-
General Office Building (710)	37.23	TSFGFA	37	6	7	36	363
General Light Industrial (110)	1219.29	TSFGFA	751	103	100	668	6,048
Public Park (411)	89.00	Acres	0	0	5	4	69
Fire and Rescue Station (575)	21.95	TSFGFA	0	0	0	0	11
Shopping Center (820)	388.55	TSFGLA	226	139	711	770	14,668
Subtotal			**1,525**	**1,169**	**1,695**	**2,067**	**34,374**
Total			**2,694**		**3,762**		
Total							
Single-Family Homes (210)	4,209	DU	777	2,338	2,625	1,539	39,734
Apartments (220)	808	DU	85	286	285	168	5,915
Elementary School (520)	1,600	Students	578	494	244	300	3,024
Middle School (522)	1100	Students	345	293	177	208	2,343
High School (530)	2000	Students	697	343	134	146	4,060
General Office Building (710)	167.68	TSFGFA	168	26	31	163	1,633
General Light Industrial (110)	1219.29	TSFGFA	751	103	100	668	6,048
Public Park (411)	226.18	Acres	1	1	13	12	176
Fire and Rescue Station (575)	21.95	TSFGFA	0	0	0	0	11
Shopping Center (820)	1,662.34	TSFGLA	968	593	3,041	3,295	62,752
Subtotal			**4,370**	**4,477**	**6,650**	**6,499**	**125,696**
Total			**8,847**		**13,149**		

DU = Dwelling Unit; TSFGLA = 1,000 square feet gross leasable area; TSFGFA = 1,000 square feet gross floor area

TRIP REDUCTIONS

Internal Trips

Internal trips are defined as trips occurring between uses contained on the site. These internal trips are captured on the site as traffic and are not required to exit the site to use the external roadway network. Internal capture rates are the percentage reductions that can be applied to trip generation estimates based on the relationship of the uses contained on the site. No internal trip reduction was considered for the purposes of this study because all trips will be using the internal roadways and should be part of the roadway sizing calculations.

Pass-By Trips

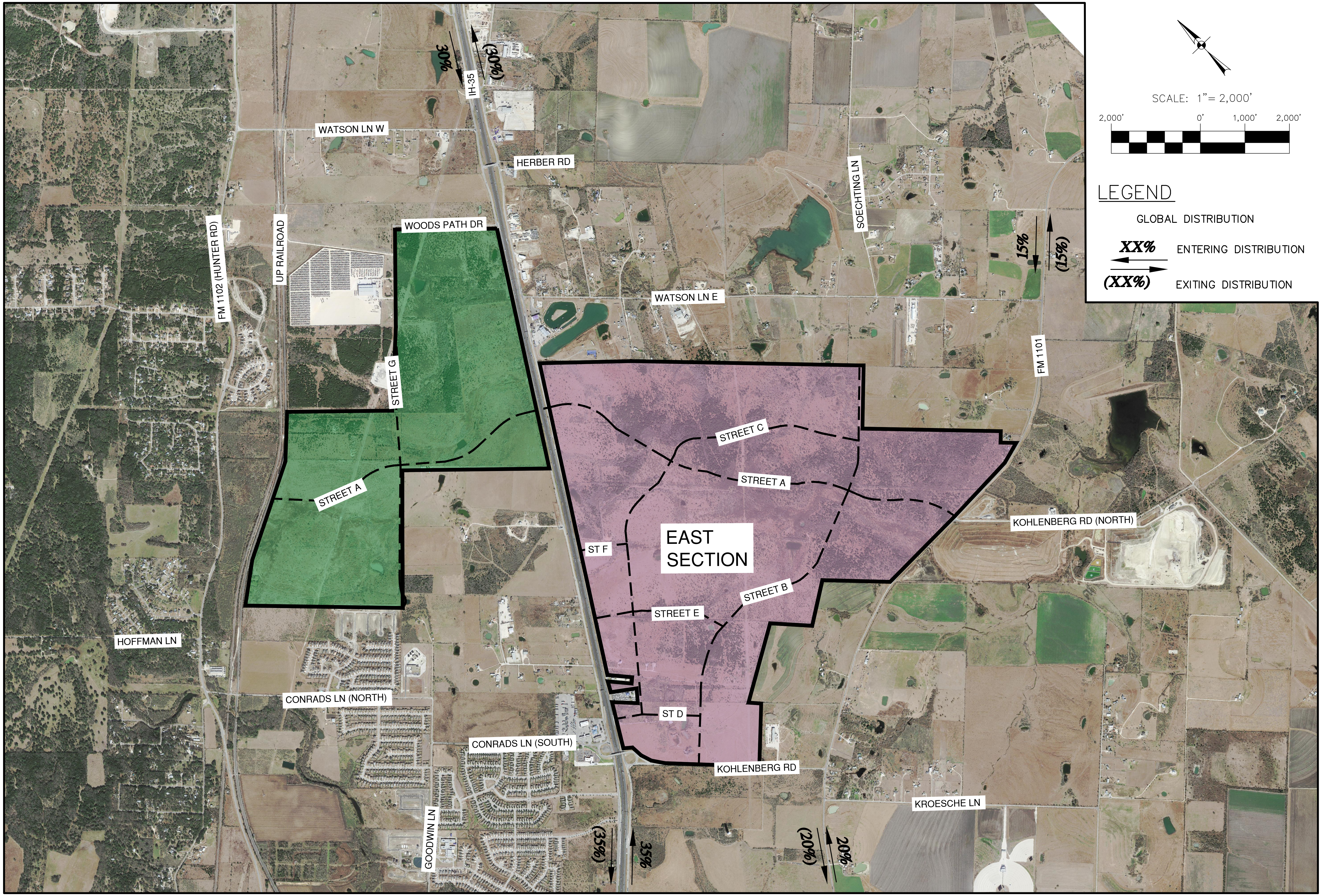
Pass-by trips are defined as intermediate stops on the way from an origin to a primary destination. Pass-by traffic is traffic already on the roadway traveling by the site. In other words, pass-by traffic would not be new traffic added to the roadway network. Factoring for pass-by trips does not affect the site driveway volumes, but it may reduce the amount of project traffic added to the adjacent street network. No pass-by trip reduction was considered for the purposes of this study.

TRIP DISTRIBUTION

The directions from which drivers are expected to approach and depart the site are based on several variables. These variables include the configuration and characteristics of the existing and future external street network, the proposed internal roadway layout, traffic volumes on the street network, and the population distribution within the region. A special emphasis is placed on viable arterials and freeways that provide access to the site. The expected global trip distribution for the proposed development is presented in **Table 9** and **Figure 7** through **Figure 8**.

Table 9: Global Trip Distribution per Section

Direction	Primary Roadways	% of Site Traffic	Daily Volume
East Section			
North	IH-35	30%	27,397
North	FM 1101	15%	13,698
South	IH-35	35%	31,963
South	FM 1101	20%	18,264
Total		100%	91,322
West Section			
North	IH-35	35%	12,031
South	IH-35	65%	22,343
Total		100%	34,374



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

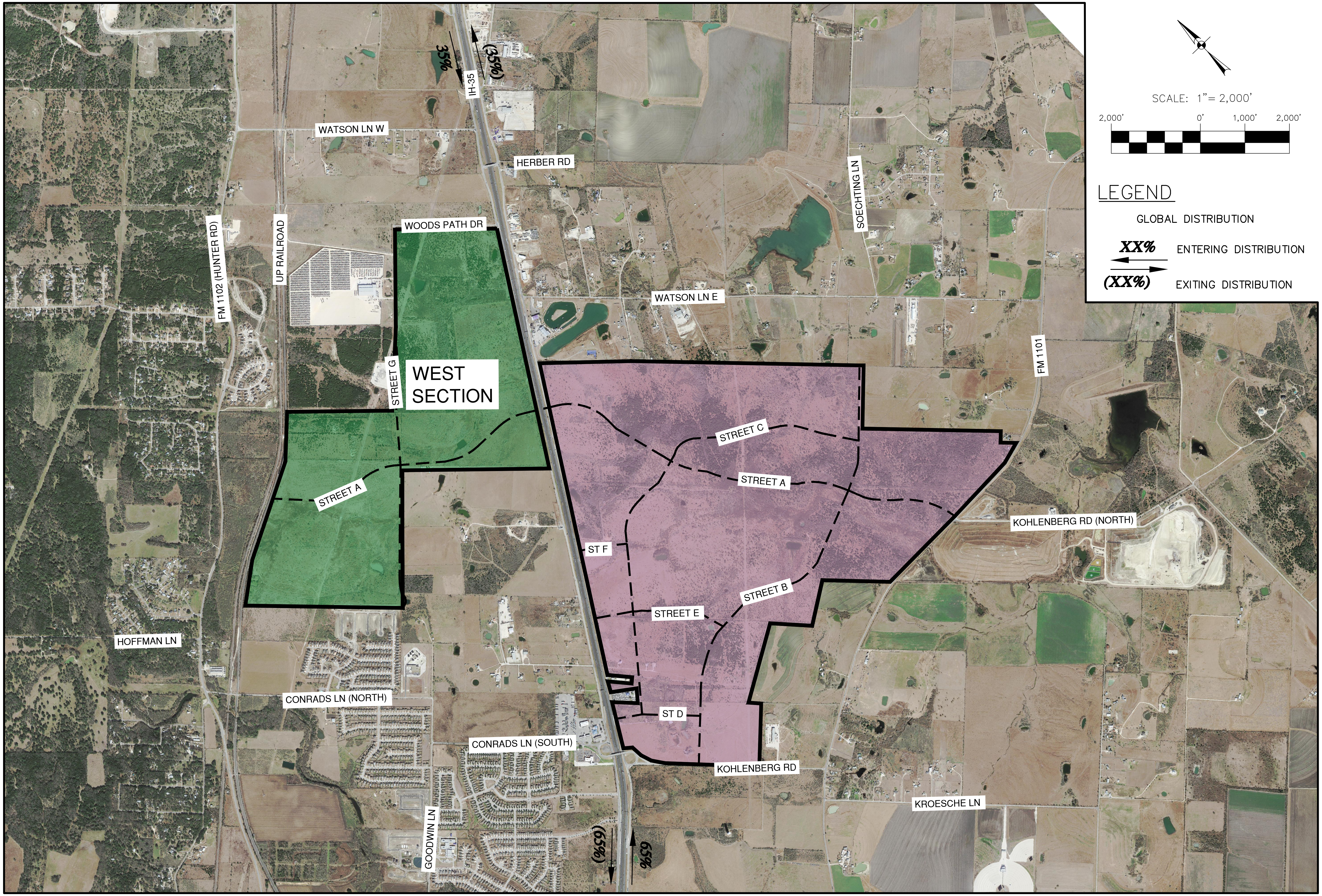
CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 7: GLOBAL TRIP DISTRIBUTION EAST SECTION

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:21pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 8: GLOBAL TRIP DISTRIBUTION WEST SECTION

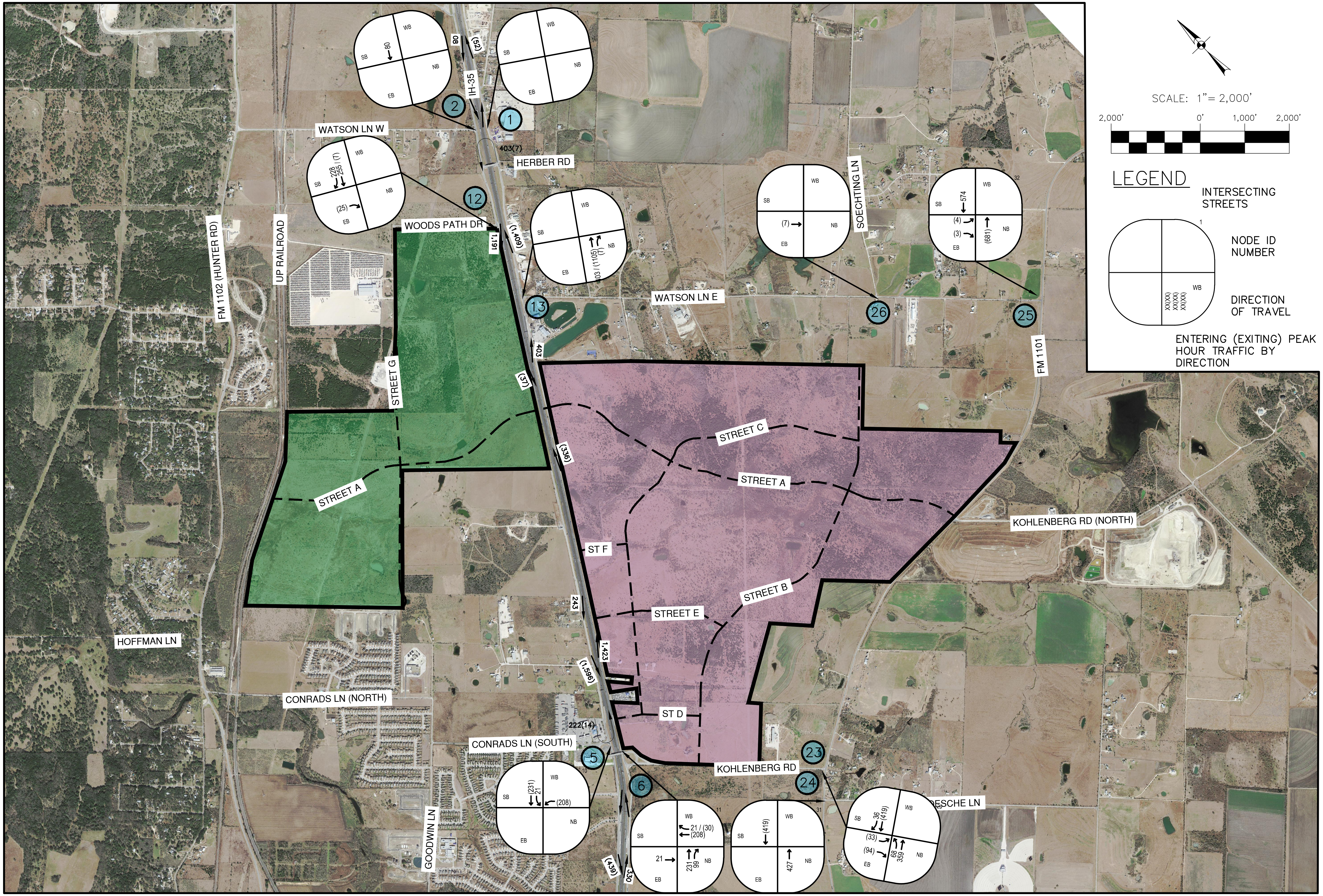
JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:21pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg

SITE TRAFFIC ASSIGNMENT

Trip distributions along major internal roadways were performed for site generated traffic using the global trip distribution in conjunction with the area roadway system expected to be in place when the development is complete. The net projected site traffic presented in **Table 8** was assigned to the local roadway network for the AM peak hour, PM peak hour, and daily using the trip distribution. The site traffic peak hour volumes are shown in **Figure 9** through **Figure 12** for the AM and PM peak hours, respectively. Ramp volumes were also included. The Build Condition peak hour traffic volumes were developed by combining the No Build Condition volumes with the site-generated volumes. The Build Condition volumes for the AM and PM peak hours of the roadway network are illustrated in **Figure 13** and **Figure 14**. The resulting weekday average daily traffic (ADT) of site generated trips on major internal and external roadways is summarized in **Figure 15**. The site peak hour trips, daily trips, and Build Condition will be reevaluated with each submittal of a detailed traffic study associated with sector plans or plats for development.



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

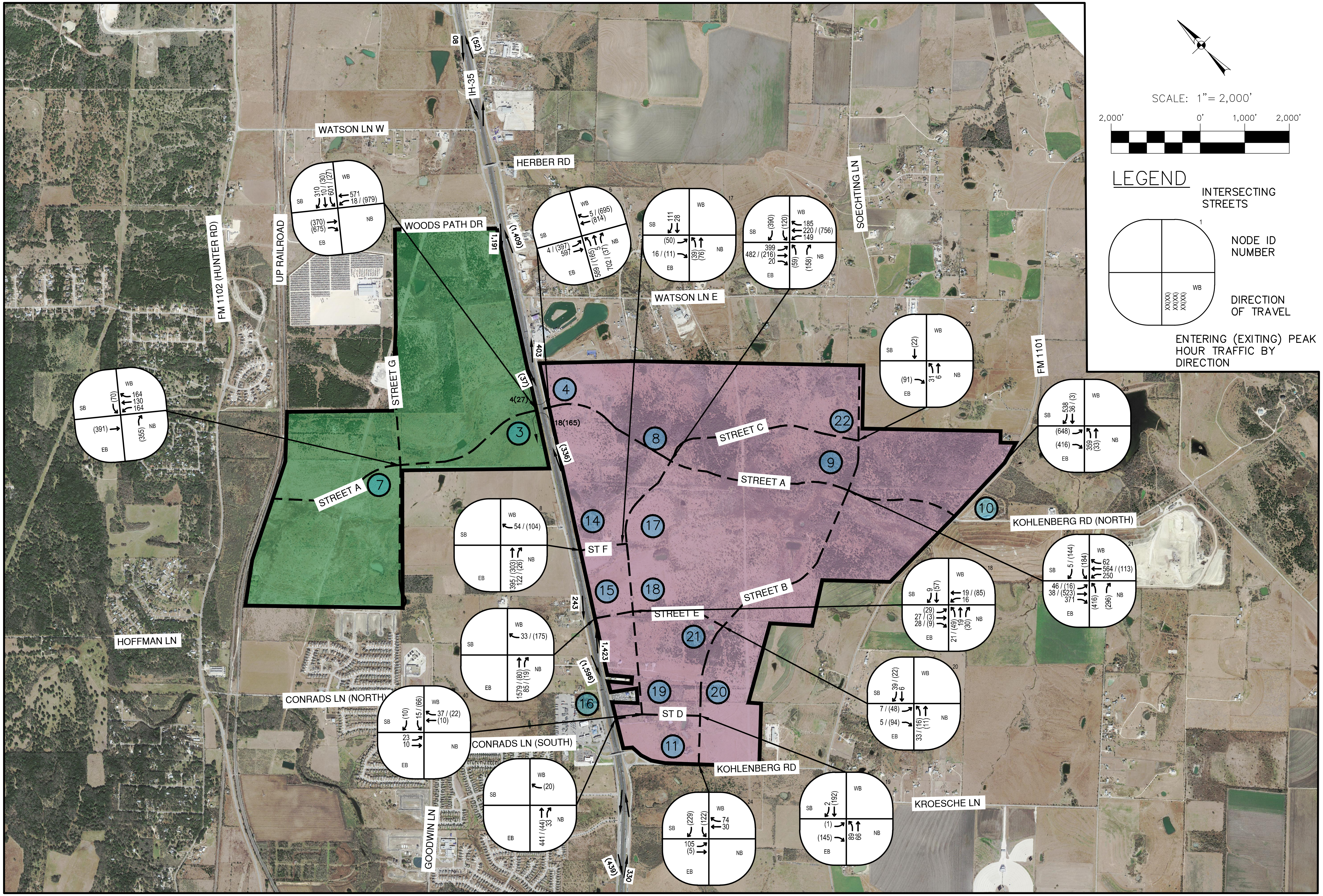
CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 9: AM PEAK HOUR EXTERNAL SITE TRIPS (2040)

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:21pm User ID: JHohenstein
File: C:\Users\Vocal_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 10: AM PEAK HOUR INTERNAL SITE TRIPS (2040)

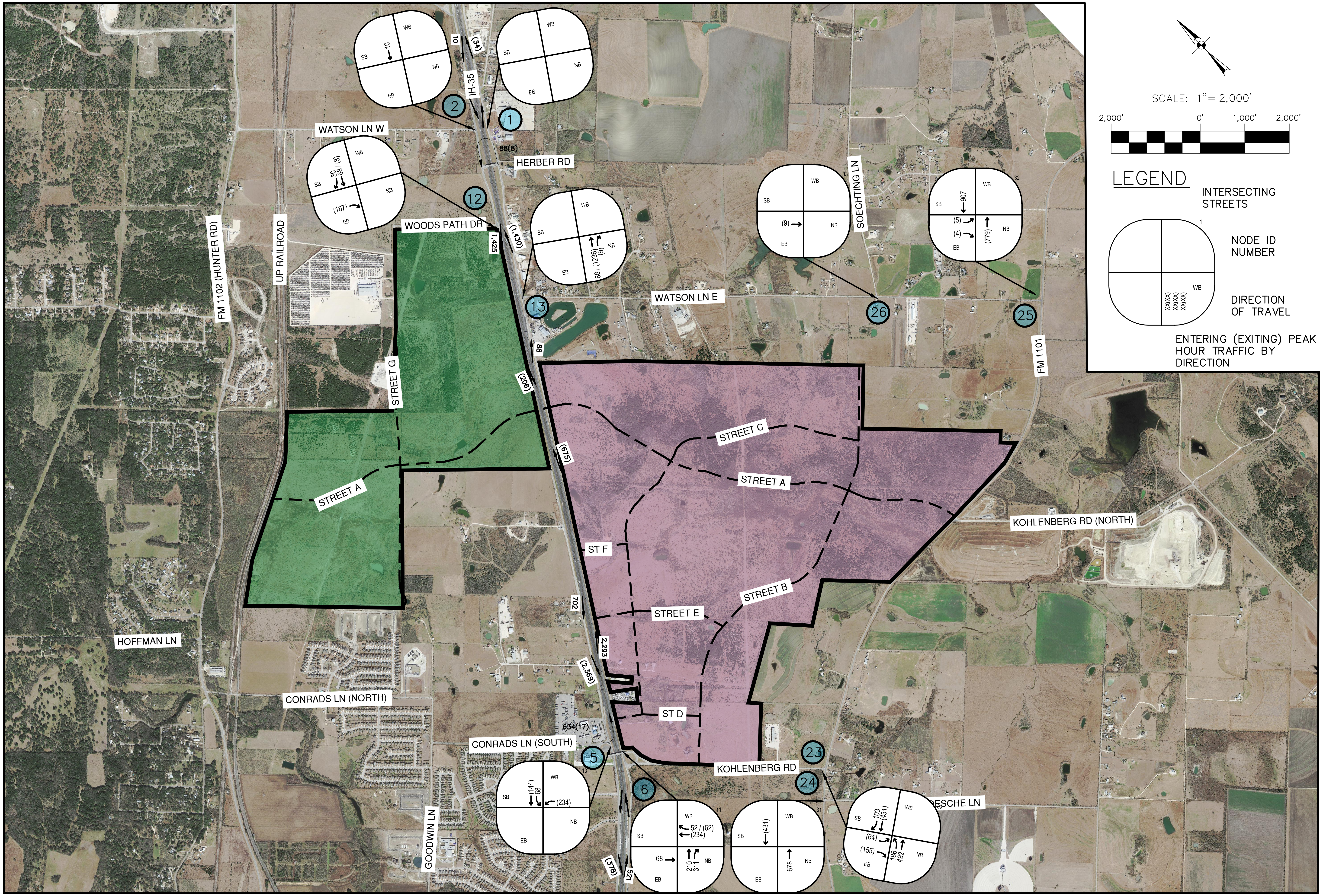
PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:22pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\30002-01 FIG 4 TO 29 & 34 to 36.dwg



MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

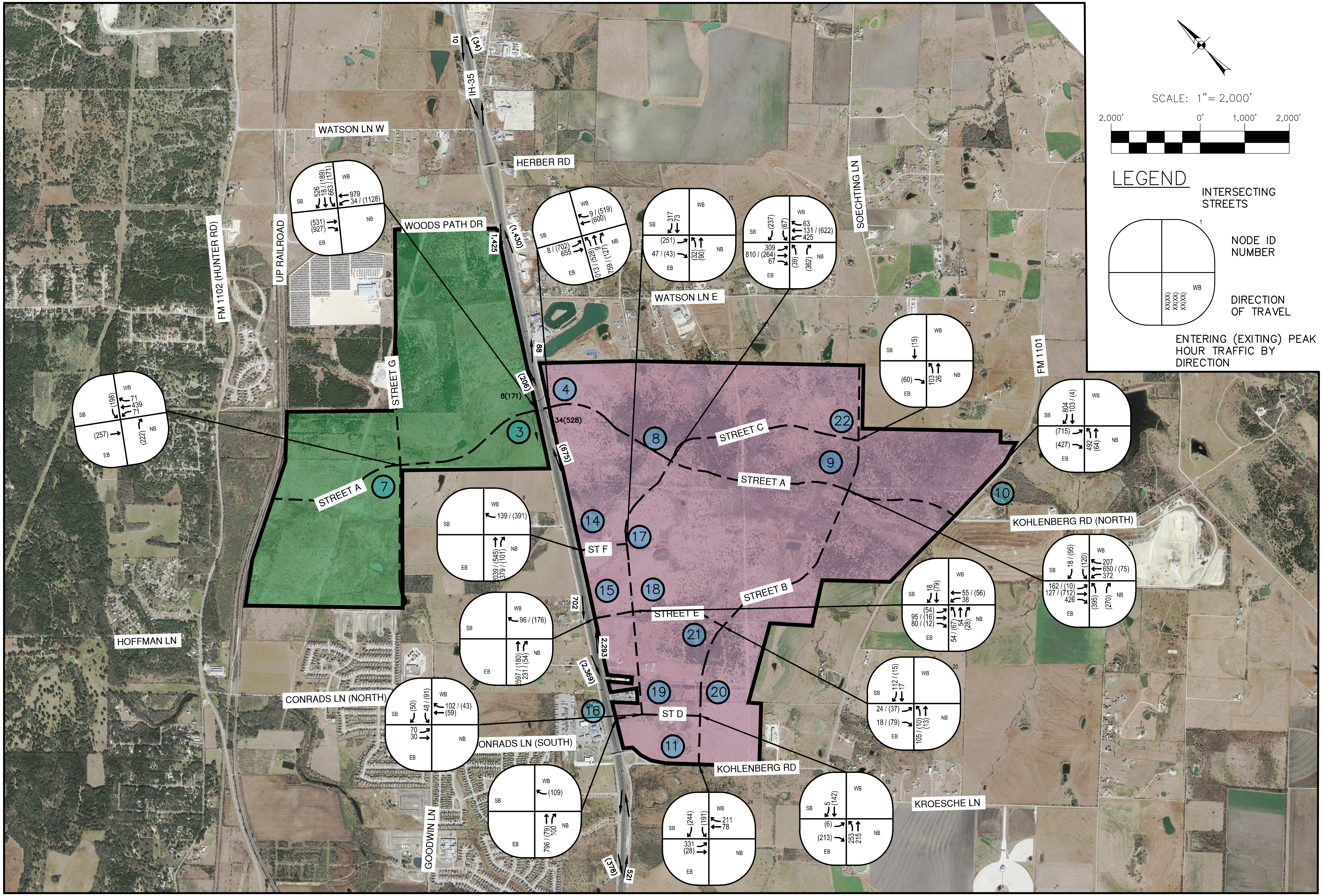
FIGURE 11: PM PEAK HOUR EXTERNAL SITE TRIPS (2040)

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH
SHEET 1 of 1

Date: Mar 22, 2021, 1:22pm User ID: JHohenstein
File: C:\Users\Vocal_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

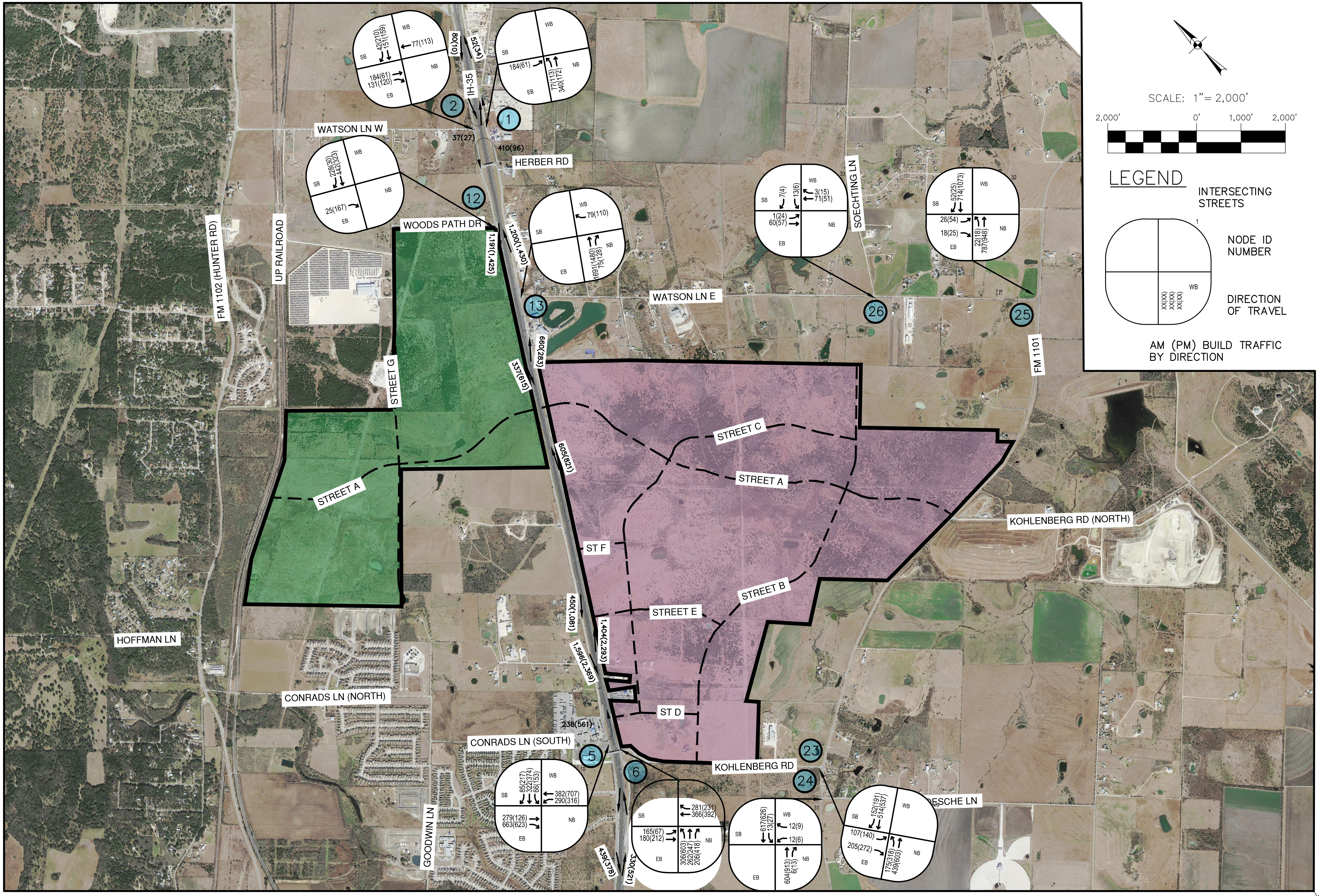
FIGURE 12: PM PEAK HOUR INTERNAL SITE TRIPS (2040)

PAPE-DAWSON ENGINEERS
NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:22pm User ID: JHohenstein
File: C:\Users\Local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

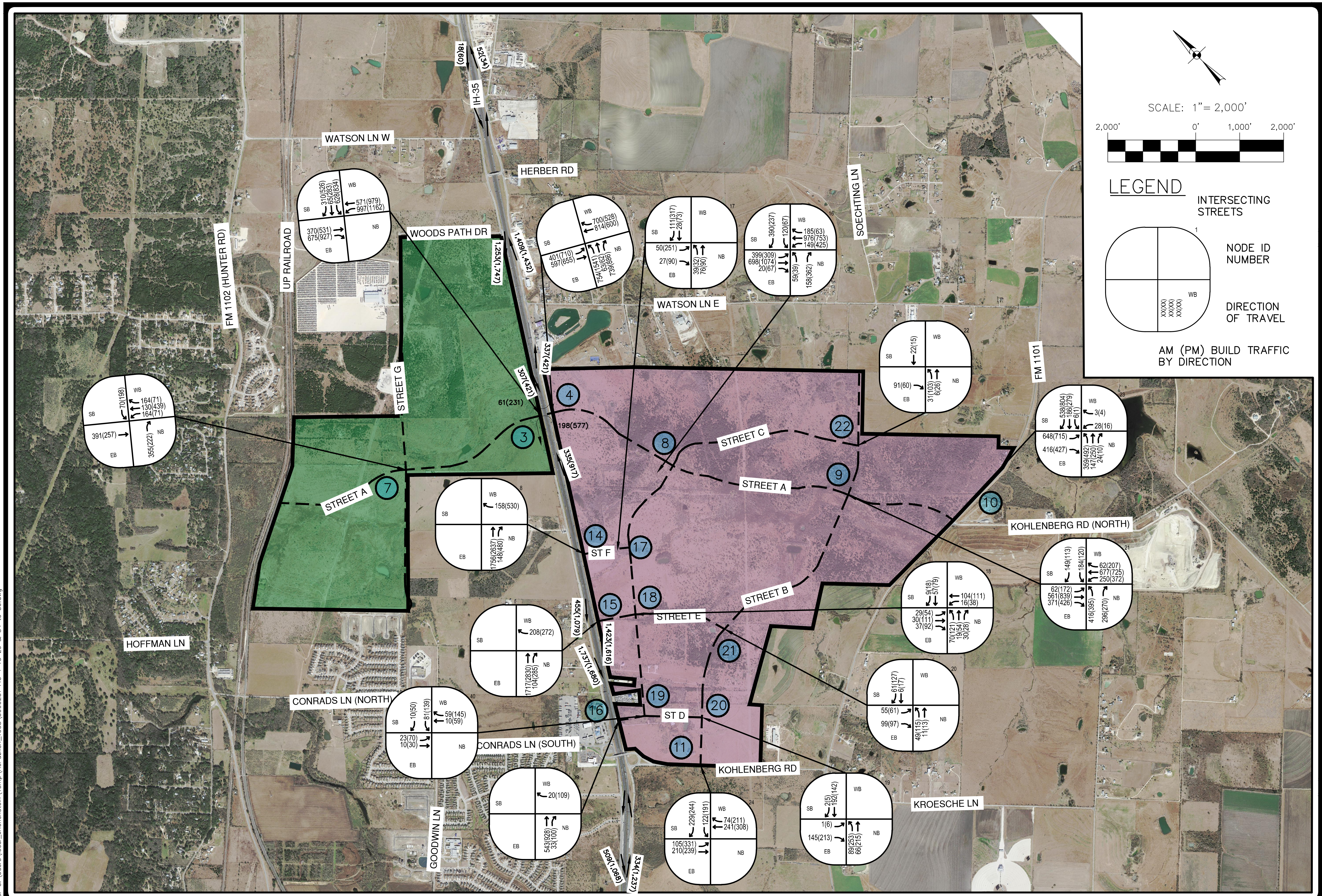
FIGURE 13: AM & PM PEAK HOUR BUILD CONDITION EXTERNAL TRIPS (2040)

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH
SHEET 1 of 1

Date: Mar 22, 2021, 1:22pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

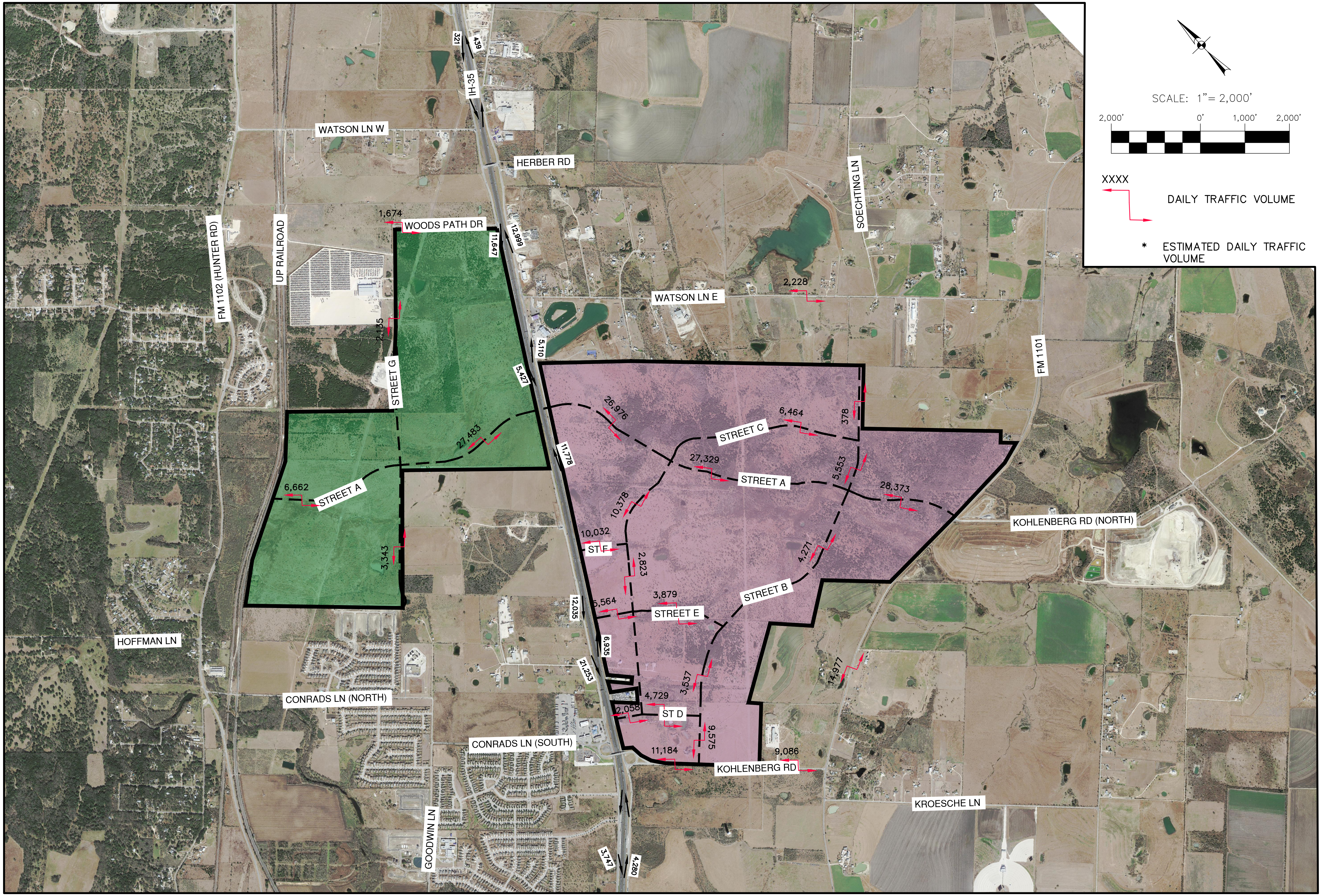
FIGURE 14: AM & PM PEAK HOUR BUILD CONDITION INTERNAL TRIPS (2040)

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH
SHEET 1 of 1

Date: Mar 22, 2021, 1:22pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS
1672 INDEPENDENCE DR, STE 102 I NEW BRAUNFELS, TX 78132 I 830.632.5633
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 15: BUILD 2040 AVERAGE DAILY TRAFFIC (ADT)

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:22pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_10081\3000201 FIG 4 TO 29 & 34 to 36.dwg

PROPOSED ROAD NETWORK

Daily Trip Volume

The 2040 No Build and Build Daily Volumes were calculated and are shown in **Table 10**. The percent of daily volume from the development is also calculated and included. The No Build and Build Daily Volumes will be reevaluated with each submittal of a detailed traffic study associated with sector plans or plats for development.

Table 10: 2040 Daily Volume on External Roadways and Percentage from Development

Location	No Build	Site	Build	% from Developer
Watson Ln E	2,135	93	2,228	4%
FM 1101	4,032	10,945	14,977	73%
Kohlenberg, W of ST B	4,049	7,135	11,184	64%
Kohlenberg, E of ST B	4,049	5,037	9,086	55%
IH-35 NBFR, between Kohlenberg and St A	817	29,754	30,571	97%
IH-35 SBFR, between Kohlenberg and St A	969	29274	30,243	97%

Site Access

IH-35 and FM 1101 are expected to provide regional and direct access to Mayfair. Mayfair is analyzed with access to FM 1101 through Street A and IH-35 through Street A, Street D, Street E, and Street F. Access will be provided to Kohlenberg Road through Street B. Additionally Street B and Street C will provide north-south connectivity for the East Section. In the west section, access will be provided to IH-35 through Street A and Woods Path Drive. Street G will provide north-south connectivity for the East Section. The proposed Streets C, D, E, F and G will provide internal connections within Mayfair.

RIGHT-OF-WAY RECOMMENDATIONS

Major roadways and intersections falling within the immediate boundaries of Mayfair were evaluated for right-of-way adequacy and intersection lane configurations, using the projected site traffic. As the project evolves, individual tracts within the site will be developed within different time frames. A TIA should be performed for each sector plan and individual parcels platted or submitted for site plan approval. Each subsequent TIA submitted should be checked against this study for conformance or to ascertain that justification for a deviation is provided in the TIA.

The projected site-generated average daily traffic presented in **Figure 15** in conjunction with ADT Threshold from Florida DOT "Generalized Annual Average Daily Volumes" Table 2 was [5]used to evaluate the right-of-way requirements for the major roadways serving Mayfair. The 2012 FDOT Quality/Level of Service Handbook Tables for roadway volumes was used in determining roadway sizing since the City of New Braunfels does not have daily volume thresholds by street type and operating agency. In addition, separate FDOT QLOS tables are developed for different area types. For the development roadway sizing the transitioning area was selected since the site within the City of New Braunfels ETJ which us currently mostly undeveloped. The transitioning area tables provide a lower maximum volume threshold compared to the urban area which provides a conservative roadway sizing. In addition, a +10% adjustment factor was applied for both the left-turn and right-turn lanes with a LOS D as the threshold values. **Appendix D** shows how the threshold values are calculated for each roadway type. The projected future traffic volumes were also used to evaluate lane configurations at major intersections. The right-of-way recommendations for major site roadways are shown in **Figure 30**. **Table 11** shows the recommended roadway types and threshold volumes.

Table 11: Roadway Types and Thresholds

Roadway Types	R.O.W.	Min Volume	Max Volume
Local Street (one-family large lot)*	60'	0	1,000
Local Street (one & two family)*	50'	0	1,000
Local Street (multi-family, industrial, & commercial)*	60'	0	1,000
Residential Collector(Non-TxDOT Roads)*	60'	0	5,000
Residential Collector(TxDOT Roads)*	60'	0	13,300
Minor Collector without bike lanes	60'	5,000	13,300
Minor Collector with bike lanes	72'		
Major Collector with bike lanes	90'	13,300	31,680
Major Collector with bike lanes	102'		
Minor Arterial without bike lanes	98'	31,680	39,050
Minor Arterial with bike lanes	110'		
Principal Arterial	150'	39,050	58,850
Parkway	200'	58,850	

*From New Braunfels Platting Ordinance Ch 18 Article IV Section 118-46 (s)

[5] 2009 Quality /Level of Service Handbook, Florida Department of Transportation, 2009, Tallahassee

For the minor collector with bike lanes, it is recommended that the minor collector have a shared use path instead of a buffered bike lane because of the high speed and high volume. **Figure 16** from the FHWA Bikeway Selection Guide[6] shows what type of bike facility is recommended based on volume and speed.

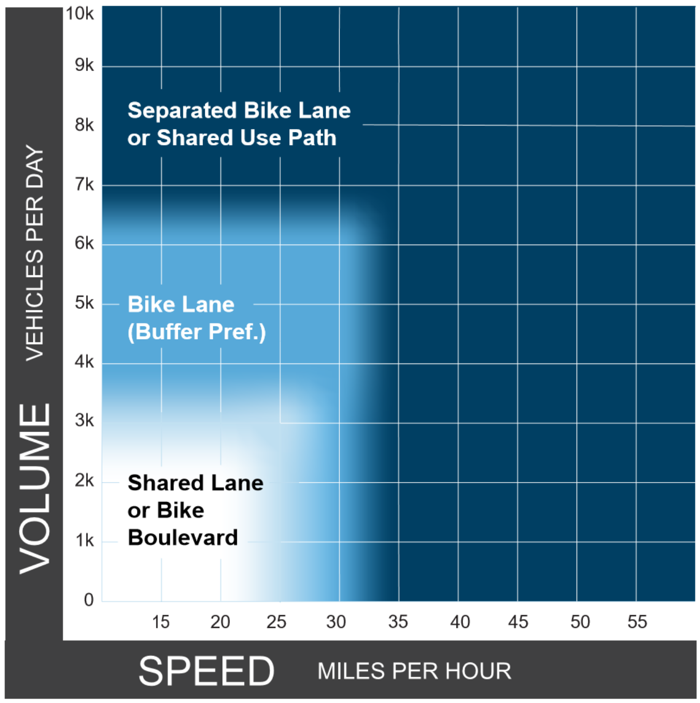


Figure 16: FHWA Bikeway Selection Guide

Additionally, a protected bike loop trail will be provided in the east section along Street A, B, C, D and various on-street and off-street nature trails as shown in **Appendix K**.

[6] 2019 Bikeway Selection Guide, FHWA, 2019, USDOT

Mayfair

The major roadways that were evaluated for right-of-way adequacy within the study area of Mayfair include:

1. IH-35 Northbound Frontage Road and IH-35 Southbound Frontage Road
2. FM 1101
3. Wood Path Drive
4. Kohlenberg Road (South)
5. Proposed Streets A, B, C, D, E, F, and G

FM 1101

FM 1101 is an existing two-lane, undivided rural highway with 28 feet of pavement and is a TxDOT Roadway. It will need to be widened when the daily volume is increases higher than 13,300 daily trips. FM 1101 is identified on the City of New Braunfels Major Thoroughfare Plan as a Principal Arterial with 150 feet of right-of-way. The results suggest that a minimum right-of-way of 150 feet should be reserved to accommodate three travel lanes in each direction with a 30-foot median. The projected 20-year build volume is estimated to be 14,977 daily trips. A Major Collector would be able to accommodate the projected Build volume. However, a 4-lane minor arterial with 98 feet of right-of-way is recommended to be more conservative. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at FM 1101.

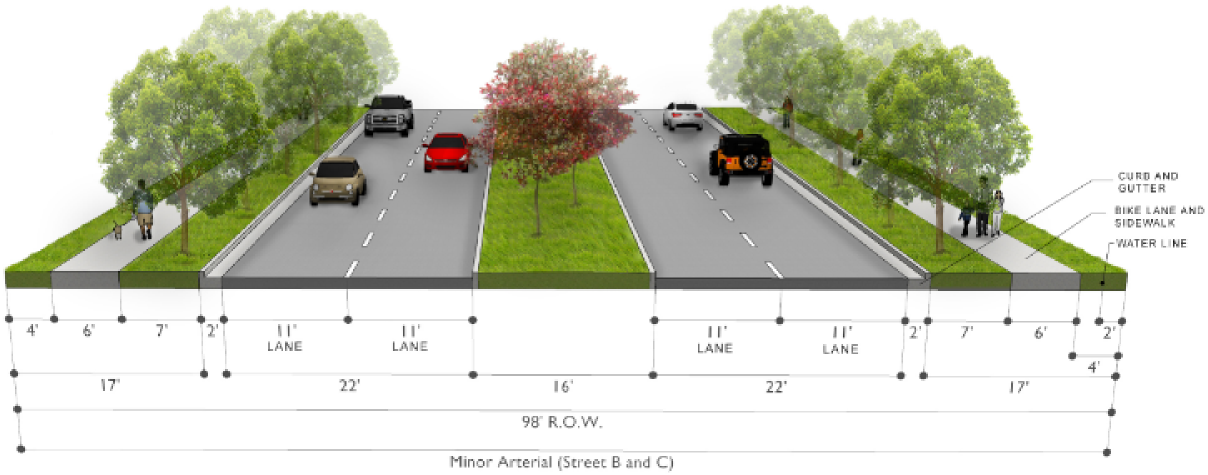


Figure 17: Proposed FM 1101 Minor Arterial 98' ROW

Woods Path Drive

Woods Path Drive is an existing two-lane, undivided roadway with 24 feet of pavement and is a non-TxDOT Roadway. It will need to be widened when it increases higher than the 5,000 daily trip threshold. Woods Path Drive is not identified on the City of New Braunfels Major Thoroughfare Plan. The projected 20-year build volume is estimated to be 1,674 daily trips. A Residential Collector would be able to accommodate the projected Build volume. However, it is recommended to be conservative that a minimum right-of-way of 60 feet should be reserved to accommodate one travel lanes in each direction and a two-way left-turn lane for a Minor Collector cross-section. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Woods Path Drive.

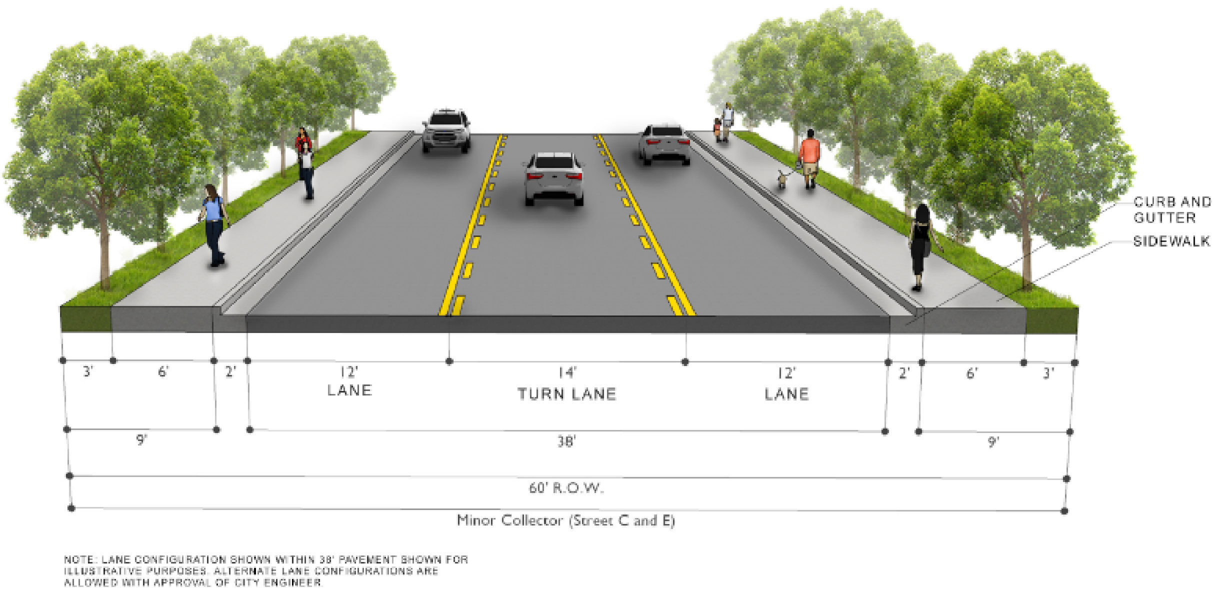


Figure 18: Woods Path Drive Minor Collector 60' ROW

Kohlenberg Road (South)

Kohlenberg Road (South) is an existing two-lane, undivided roadway with 24 feet of pavement. It will need to be widened when it increases higher than the 5,000 daily trip threshold. Kohlenberg Road (South) is not identified on the City of New Braunfels Major Thoroughfare Plan. Kohlenberg is planned to be included in the next MTP update as a minor arterial, was considered in the 2019 bond program, and is being submitted in the AAMPO 2021 Call for Projects. The projected 20-year build volume is estimated to be 11,184 daily trips. A Minor Collector would be able to accommodate the projected Build volume. However, it is recommended to be conservative that a Minor Arterial with a minimum right-of-way of 98 feet should be reserved to accommodate two travel lanes in each direction with a 12-foot median between IH-35 and Street B for site traffic. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Kohlenberg Road (South).

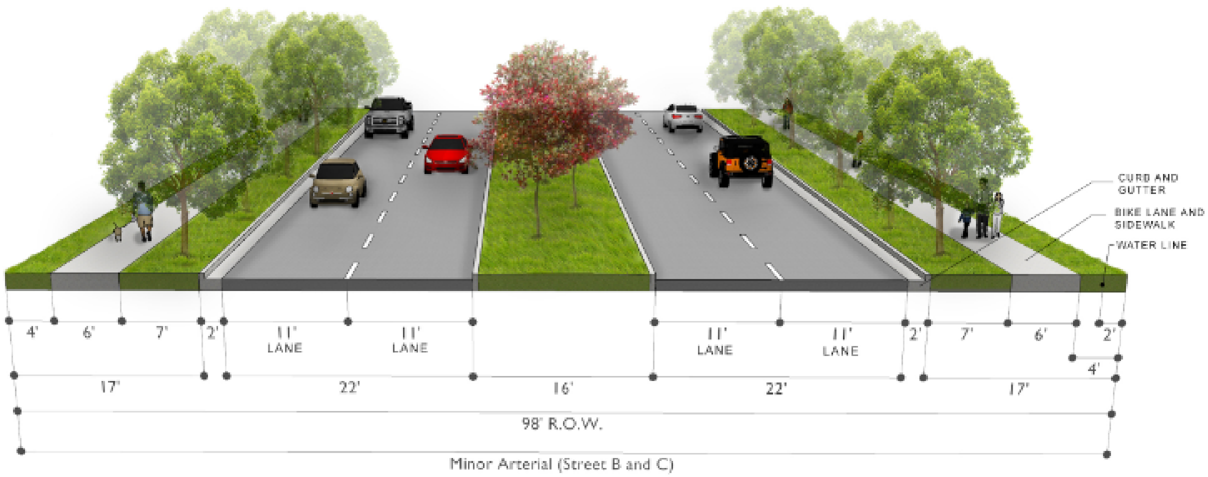


Figure 20: Kohlenberg Road (South) Minor Arterial 98' ROW

Proposed Street A

Proposed Street A will be a primary east-west interconnection for both the east and west sections of the site. It is identified on the City of New Braunfels Major Thoroughfare Plan as a Parkway with 200 feet of right-of-way. The projected 20-year build volume is estimated to be 27,483 daily trips. A Major Collector would be able to accommodate the projected Build volume. The results suggest that a minimum right-of-way of 200 feet should be reserved to accommodate four travel lanes in each direction with median. However, only a 4-lane Major Collector is needed with site traffic and with projected 20-year build volume traffic. Additionally, a separated bike facility will be provided along Street A from Street B to Street C as part of the protected bike loop trail. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Street A.

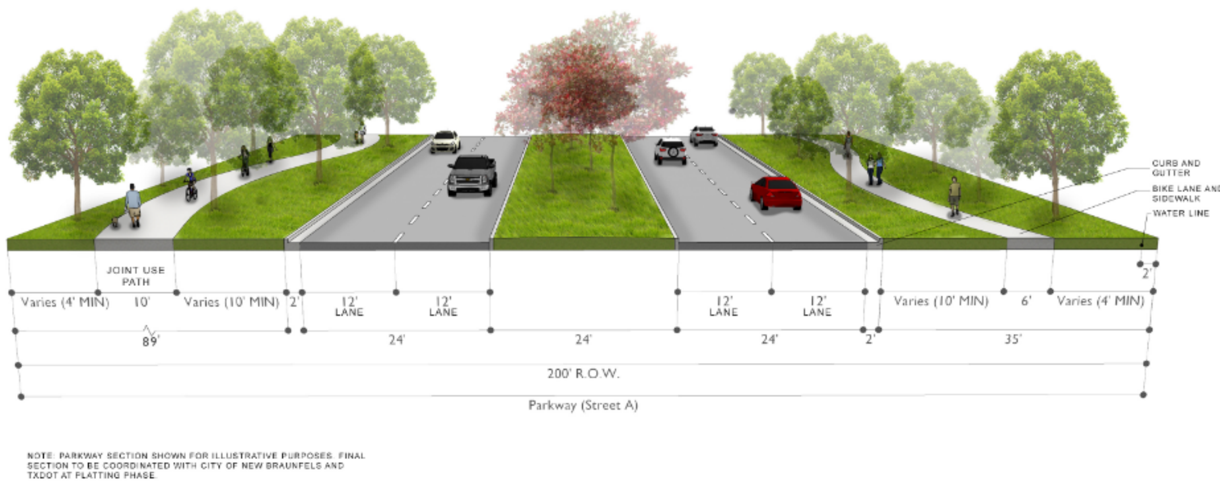


Figure 21: Proposed Street A Parkway 200' ROW

Proposed Street B

The proposed Street B will be a primary north-south interconnection for the residential and commercial uses within the east section of Mayfair site. Street B is identified on the City of New Braunfels Major Thoroughfare Plan as a Minor Collector with 60 feet of right-of-way. The projected 20-year build volume is estimated to be 9,575 daily trips. A Minor Collector would be able to accommodate the projected Build volume. However, to be conservative Street B should be upsized and planned as a Minor Arterial with 98 feet of right-of-way. Additionally, a separated bike facility will be provided along Street B from Street A to Street D as part of the protected bike loop trail. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Street B.

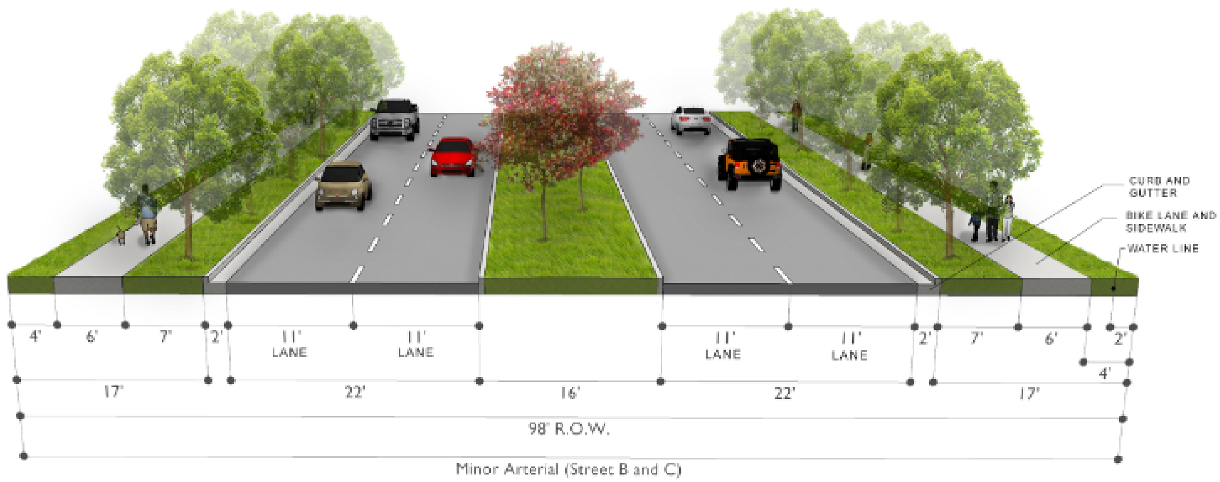


Figure 22: Proposed Street B Minor Arterial 98' ROW

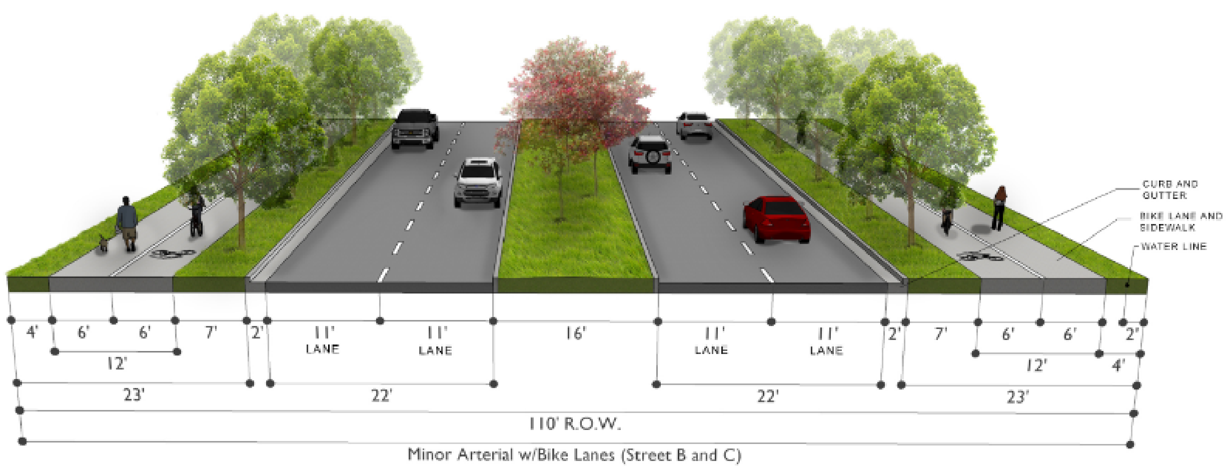


Figure 23: Proposed Street B Modified Minor Arterial 110' ROW

Proposed Street C

The proposed Street C will be a primary north-south interconnection for the residential and school uses within the east section of the Mayfair site. A separated bike facility will be provided along Street C from Street A to Street D as part of the protected bike loop trail. The projected 20-year build volume is estimated to be 10,378 daily trips. A Minor Collector would be able to accommodate the projected Build volume. However, to be conservative Street C adjacent to the schools not between Street A to Street D should be planned as a Major Collector with no bike facility with a right-of-way of 90 feet and as a Major Collector with bike facility with a right-of-way of 102 feet adjacent to the schools between Street A and Street D. It should also be planned adjacent to the single-family homes not between Street A to Street D as a Minor Collector with no bike facility with 60 feet of right-of-way and as a Minor Collector with bike facility with 72 feet of right-of-way between Street A and Street D. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Street C.

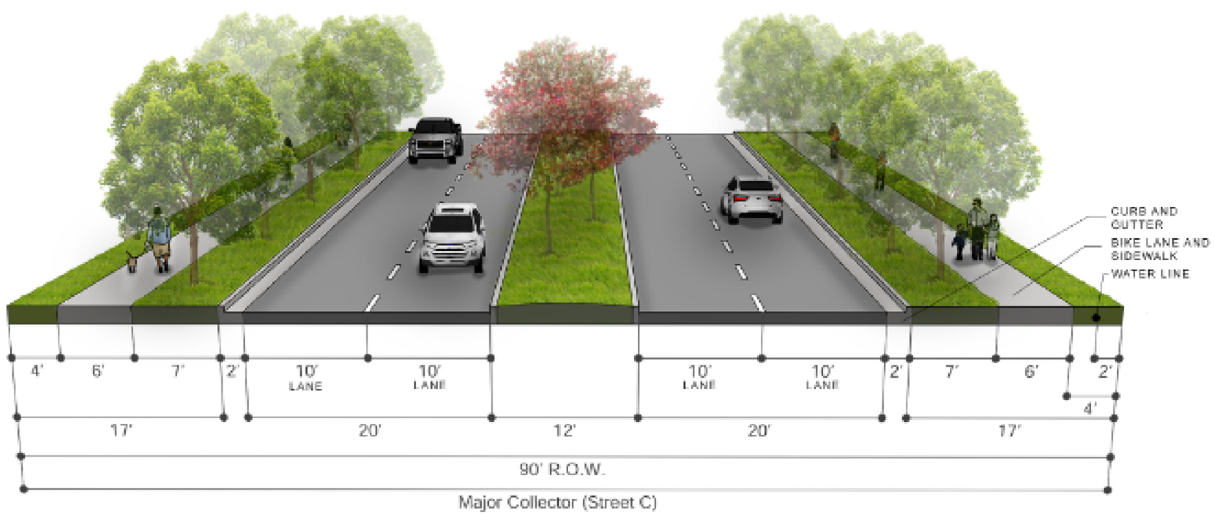


Figure 24: Proposed Street C Major Collector Adjacent to School 90' ROW

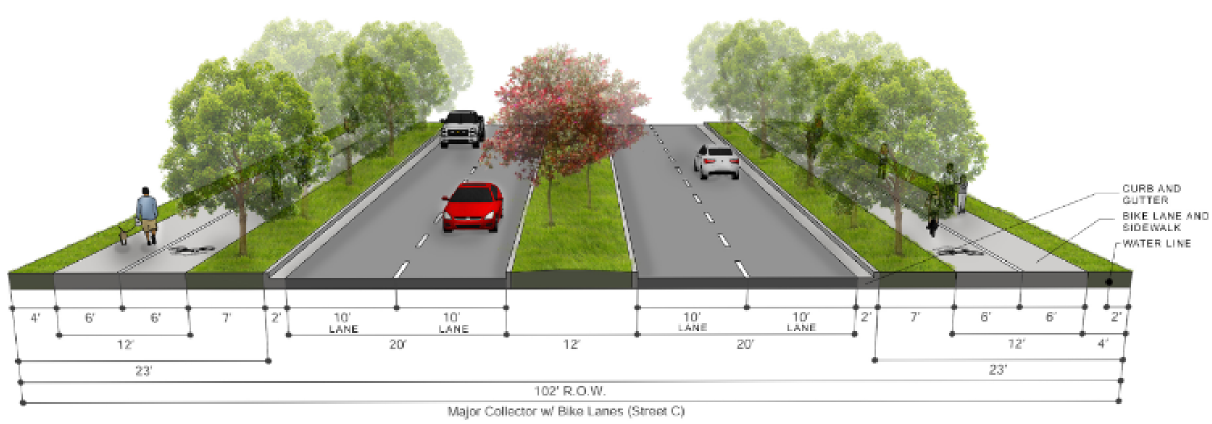


Figure 25: Proposed Street C Major Collector Adjacent to School with Separated Bike Lanes 102' ROW

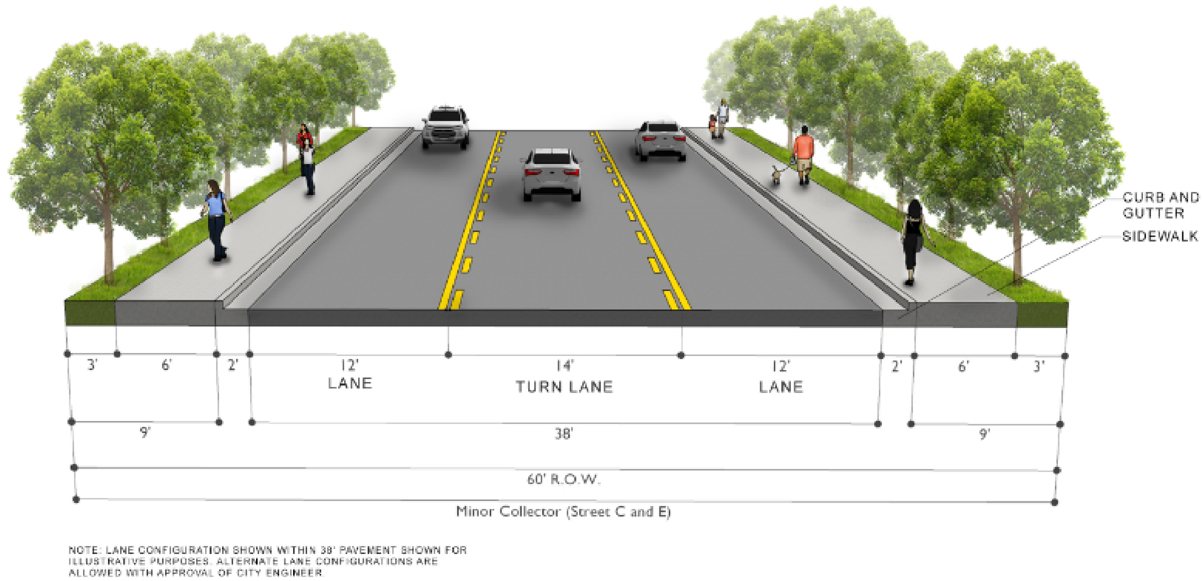


Figure 26: Proposed Street C Minor Collector Adjacent to Single-Family Homes 60' ROW

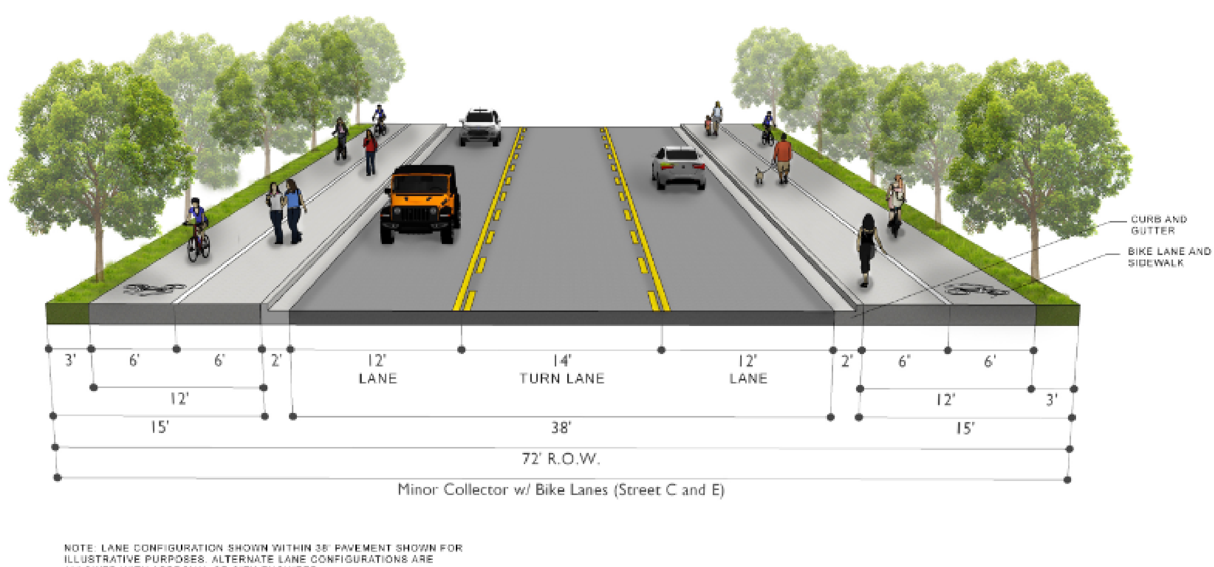


Figure 27: Proposed Street C Minor Collector Adjacent to Single-Family Homes with Separated Bike Lanes 72' ROW

Proposed Street D

The proposed Street D will be an east-west interconnection for the residential and commercial uses within the east section of the Mayfair site. The projected 20-year build volume is estimated to be 4,729 daily trips. A Residential Collector would be able to accommodate the projected Build volume. However, to be conservative Street D should be planned as a Minor Collector with a right-of-way of 60 feet. Additionally, a separated bike facility will be provided along Street D from Street B to Street C as part of the protected bike loop trail with a right-of-way of 72 feet. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Street D.

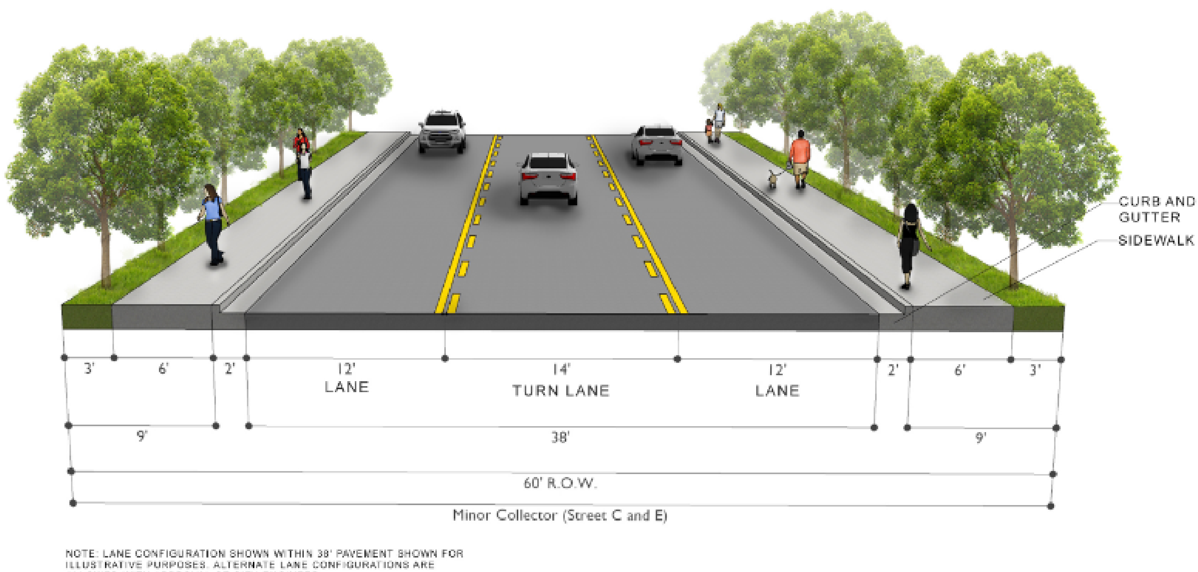


Figure 28: Proposed Street D Minor Collector 60' ROW

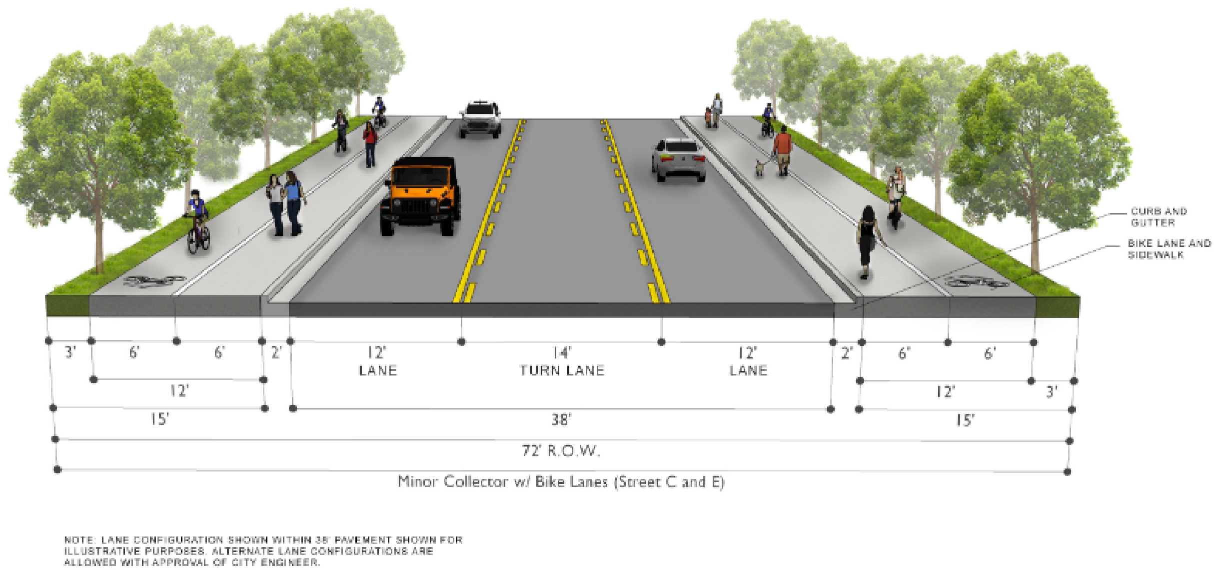


Figure 29: Proposed Street D Modified Minor Collector from Street B to Street C 72' ROW

Proposed Street E

The proposed Street E will be a primary east-west interconnection for the residential and commercial uses within the east section of the Mayfair site. The projected 20-year build volume is estimated to be 5,564 daily trips. The results suggest that Street E should be planned as a Minor Collector with 80 feet of right-of-way. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Street E.

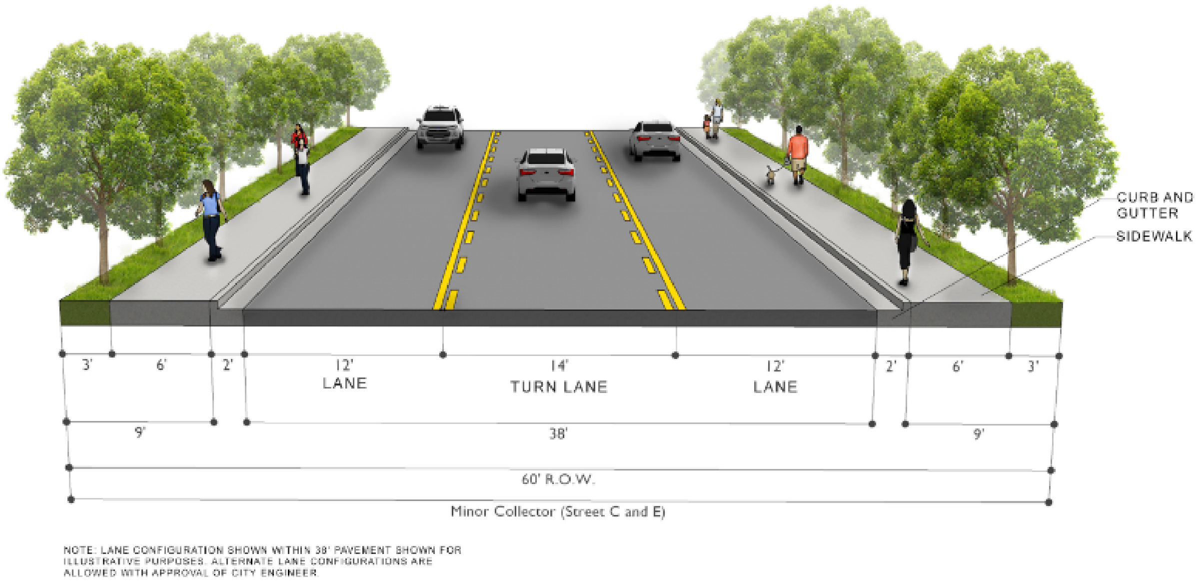


Figure 30: Proposed Street E Minor Collector 60' ROW

Proposed Street F

The proposed Street F will be a primary east-west interconnection for the residential and commercial uses within the east section of the Mayfair site. The projected 20-year build volume is estimated to be 10,032 daily trips. A Minor Collector would be able to accommodate the projected Build volume. However, to be conservative Street F should be planned as a Major Collector with 90 feet of right-of-way. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Street F.

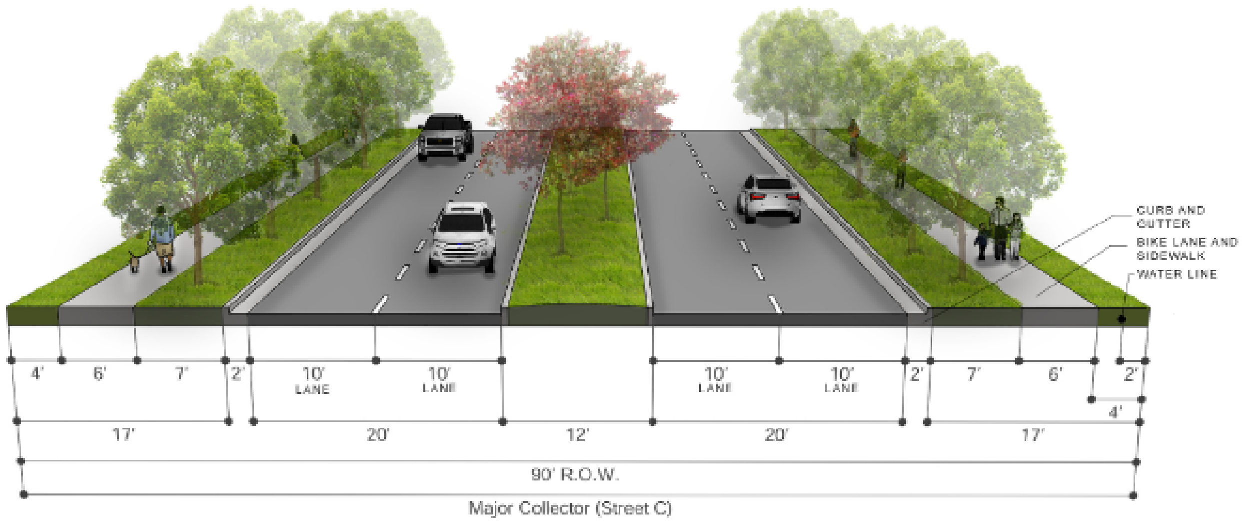


Figure 31: Proposed Street F Major Collector 90' ROW

Street G

Street G is identified on the City of New Braunfels Major Thoroughfare Plan as a Minor Arterial with 100 feet of right-of-way. The projected 20-year build volume is estimated to be 3,343 daily trips. A Residential Collector would be able to accommodate the projected Build volume. However, to be conservative a minimum right-of-way of 98 feet should be reserved to accommodate two travel lanes in each direction with a 12-foot median and a 6-foot sidewalk. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine what improvements is required at Street G.

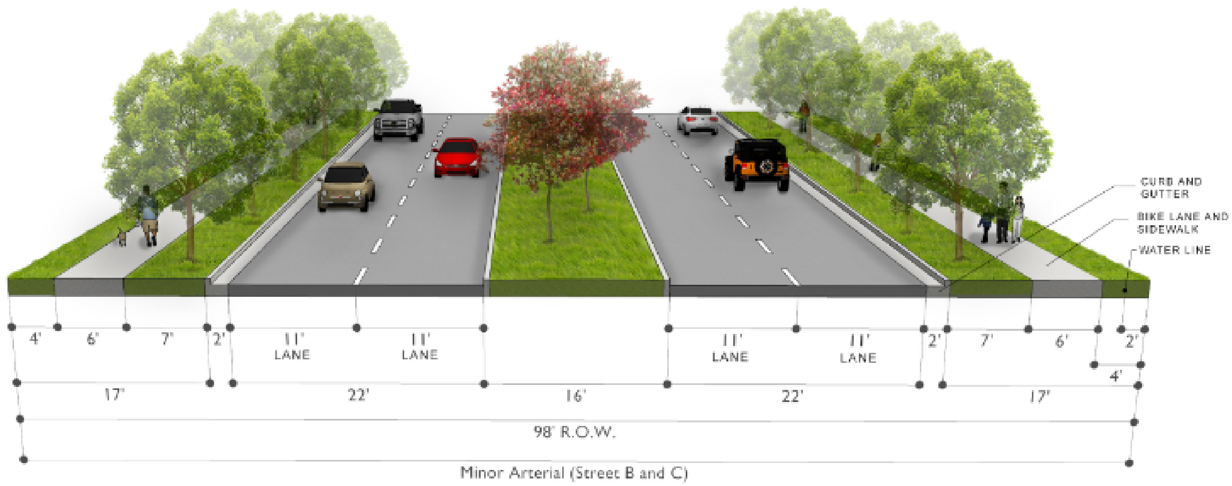
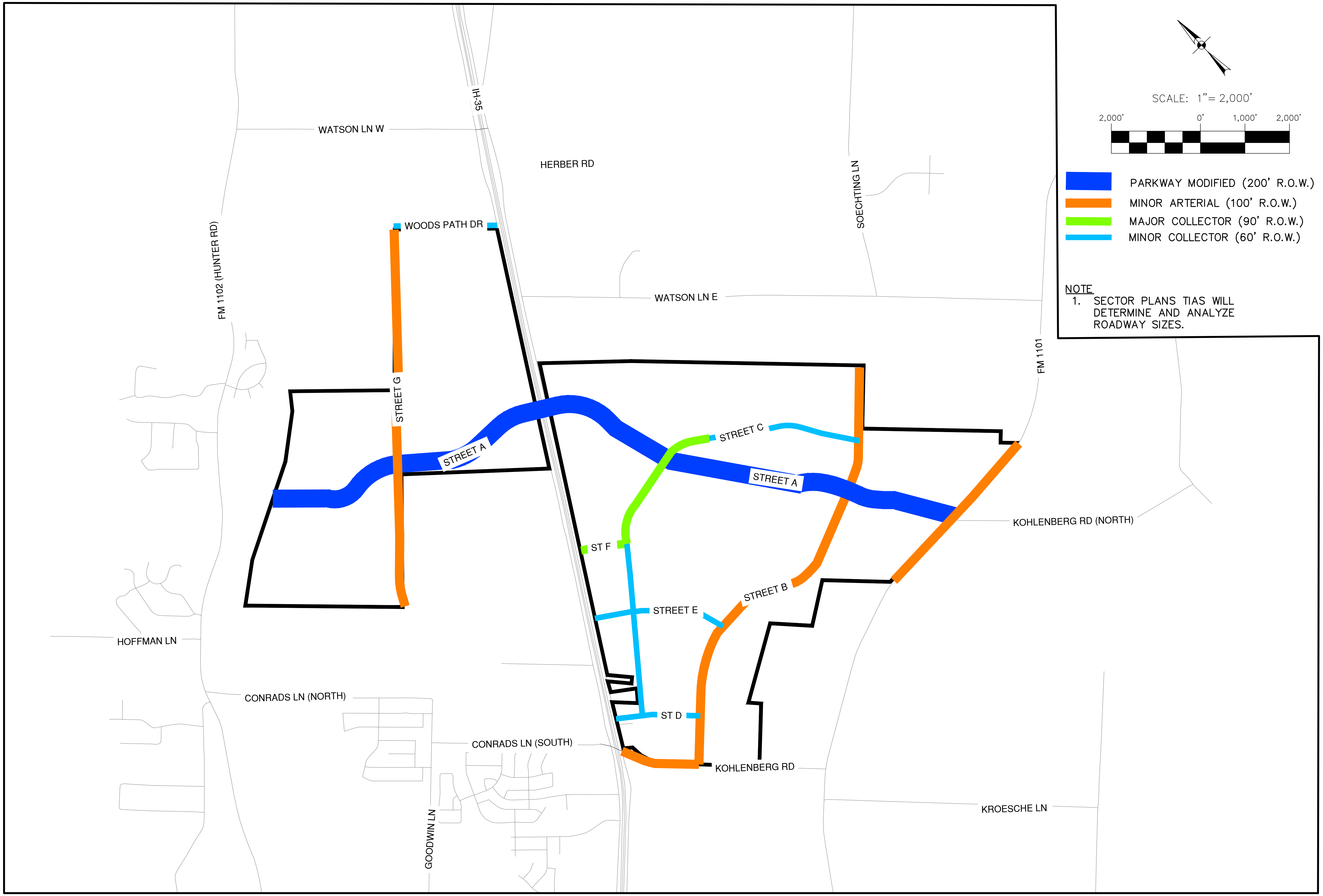


Figure 32: Proposed Street G Minor Arterial 98' ROW



NOTE

1. SECTOR PLANS TIAS WILL DETERMINE AND ANALYZE ROADWAY SIZES.

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS
1672 INDEPENDENCE DR, STE 102 I NEW BRAUNFELS, TX 78132 I 830.632.5633
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 33: ULTIMATE ROADWAY SIZES

JOB NO. 30002-01
DATE MARCH 2021
DESIGNER JCH
CHECKED JWC
DRAWN JCH

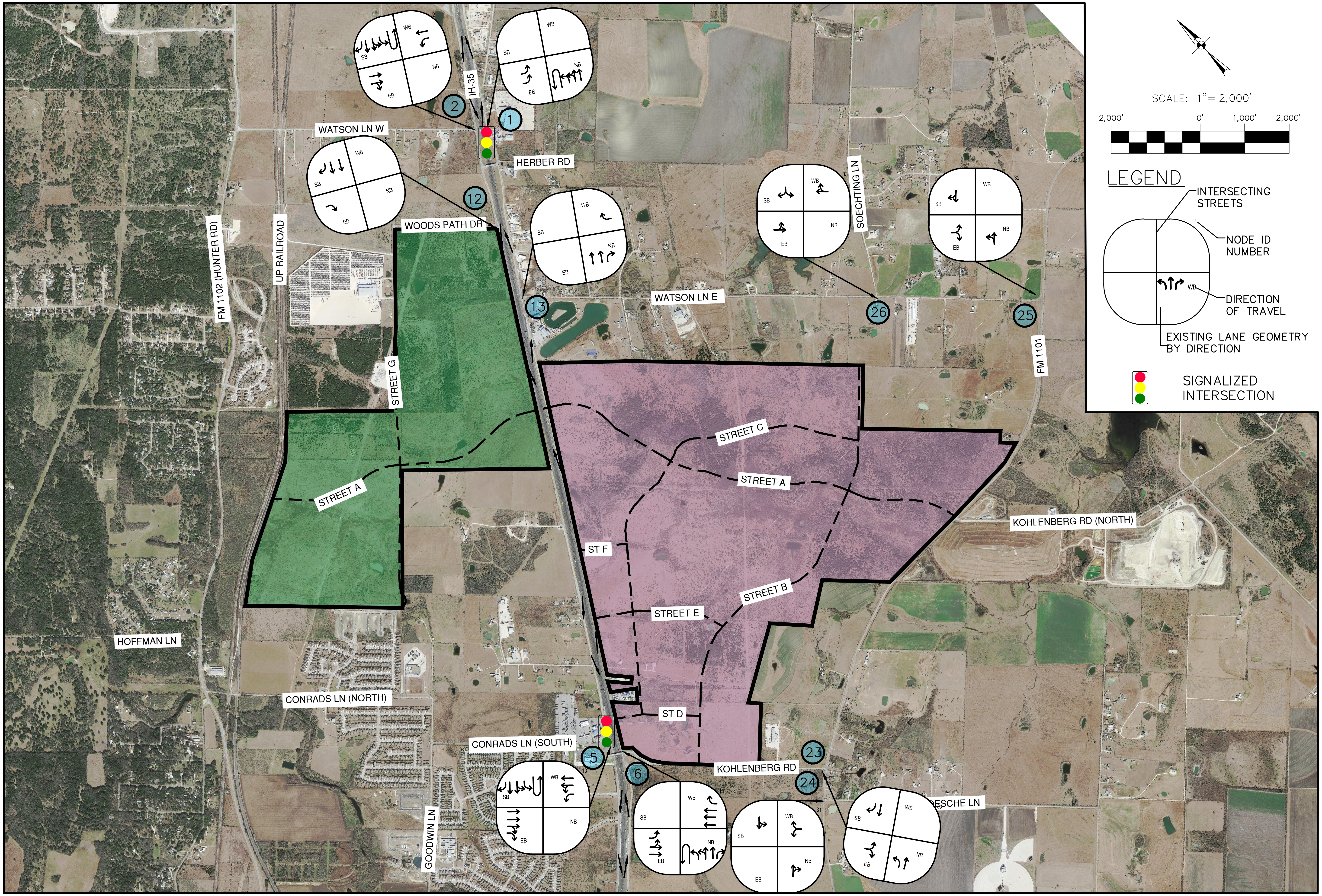
SHEET 1 of 1

Date: Mar 22, 2021, 1:26pm User ID: JHohenstein
File: P:\300\02\01\Design\Exhibit\3000201 FIG 33.dwg

IMPACT ANALYSIS

Build Synchro Model Improvements – 2040

Build improvements including turn lanes and signalization were recommended for any internal intersections with heavy turn lane volumes and where significant impacts have been identified. The cycle length was assumed to be 90 seconds for all signals. The signals are coordinated along Proposed Street A and the offset was optimized. At the intersection of IH-35 Southbound Frontage Road at Conrads Lane/Kohlenberg Road the recommended proposed eastbound configuration differs from the proposed TxDOT schematic configuration. Instead of a T-T-T-R a T-T-TR-R is recommended to help alleviate the heavy eastbound right-turn volume. These recommendations are summarized in **Figure 34** and **Figure 35**. These figures show the geometries used for the Synchro Models during the Build Condition. In the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to confirm how signals will operate.



PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MAYFAIR

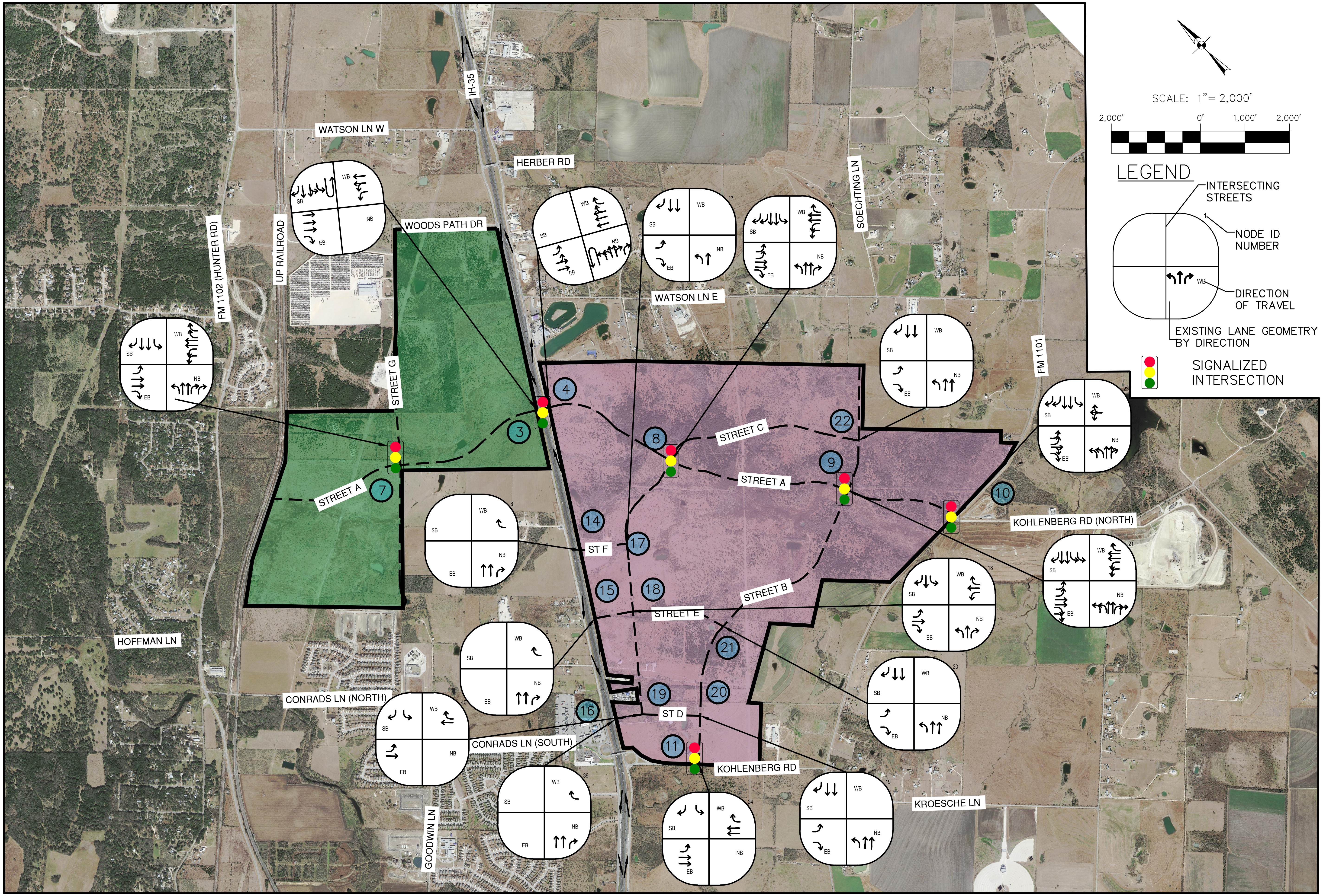
CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 34: BUILD CONDITION EXTERNAL STUDY INTERSECTION GEOMETRIES

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:22pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg



MAYFAIR

CITY OF NEW BRAUNFELS ETJ, TEXAS

FIGURE 35: BUILD CONDITION INTERNAL STUDY INTERSECTION GEOMETRIES

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH

SHEET 1 of 1

Date: Mar 22, 2021, 1:23pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg

Build HCM Results– 2040

The capacity analyses for the key intersections of the development are summarized in **Table 12** for the Build Condition. Detailed Capacity Analysis Worksheets are presented in **Appendix G**.

Table 12: Intersection Capacity Analysis (2040)

					AM Peak Hour		PM Peak Hour	
No.	Intersection	Condition	Approach	Movement	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)
Signalized Intersections:								
1	**IH-35 NBFR at Watson Ln W**							
		Build			B	15.1	B	10.7
2	**IH-35 SBFR at Watson Ln W**							
		Build			C	21.4	C	20.6
3	**IH-35 SBFR at Street A**							
		Build			**D**	**52.3**	**F**	**167.4**
4	**IH-35 NBFR at Street A**							
		Build			**D**	**37.5**	**E**	**69.9**
5	**IH-35 SBFR at Conrads Ln/Kohlenberg Rd**							
		Build			C	22.6	C	23.7
6	**IH-35 NBFR at Conrads Ln/Kohlenberg Rd**							
		Build			C	30.7	C	28.8
7	**Street G at Street A**							
		Build			C	24.0	C	23.4
8	**Street C at Street A**							
		Build			C	30.8	C	32.9
9	**Street B at Street A**							
		Build			C	28.7	C	29.0
10	**FM 1101 at Street A/ Kohlenberg Rd (north)**							
		Build			C	25.4	C	28.5
11	**Kohlenberg Rd at Street B**							
		Build			C	27.9	C	28.9
Unsignalized Intersections:								
12	**IH-35 SBFR at Woods Path**							
		Build	EB	R	A	9.9	B	10.5
14	**IH-35 NBFR at Street F***							
		Build	WB	R	**E**	**42.6**	**F**	**1728.3**
15	**IH-35 NBFR at Street E***							
		Build	WB	R	**F**	**62.9**	**F**	**906.5**
16	**IH-35 NBFR at Street D***							
		Build	WB	R	B	10.4	C	15.2
17	**Street F at Street C**							
		Build	EB	L-R	A	9.4	B	11.2
			NB	L	A	7.6	A	8.3
18	**Street C at Street E**							
		Build	EB	L	A	7.5	A	7.6
			WB	L	A	7.4	A	7.8
			NB	L-T-R	B	10.3	B	12.8
			SB	L-T-R	B	10.5	B	12.2
19	**Street C at Street D**							
		Build	EB	L	A	7.4	A	7.8

No.	Intersection	Condition	Approach	Movement	AM Peak Hour LOS	AM Peak Hour Control Delay (sec/veh)	PM Peak Hour LOS	PM Peak Hour Control Delay (sec/veh)
			SB	L	A	9.2	B	10.3
20	**Street B at Street D**							
		Build	EB	L-R	A	9.7	B	10.2
			NB	L	A	7.9	A	8.1
21	**Street B at Street E**							
		Build	EB	L-R	A	9.0	A	9.7
			NB	L	A	7.4	A	7.8
22	**Street B at Street C**							
		Build	EB	L-R	A	8.7	A	8.6
			NB	L	A	7.3	A	7.4
23	**FM 1101 at Kohlenberg Rd**							
		Build	EB	LR	**F**	**317.5**	**F**	**Err**
			NB	LT	A	5.1	A	9.8
24	**FM 1101 at Kroesche Ln**							
		Build	WB	LR	C	21.9	**D**	**31.1**
			SB	LT	A	0.4	A	1.1
25	**FM 1101 at Watson Ln E**							
		Build	EB	LR	**E**	**43.2**	**F**	**390.2**
			NB	LT	A	0.8	A	1.2
26	**Watson Ln E at Soechting Ln**							
		Build	EB	LT	A	0.1	A	2.3
			SB	LR	A	9.1	A	9.2

*2010 HCM

The results in **Table 12** show that eight (8) intersections will operate a LOS D or worse; therefore, mitigation improvements are required. The capacity analyses will be reevaluated with each submittal of a detailed traffic study associated with sector plans or plats for development.

MITIGATION IMPROVEMENTS – 2040

Mitigation improvements and associated probable costs are required for any intersections where impacts have been identified. As shown in **Table 12**, fifteen (15) intersections will experience impacts due to the traffic generated by the proposed Mayfair development; therefore, mitigation improvements are required.

Summary of Recommended Mitigation

Although mitigation results will be reevaluated with each submittal of a detailed traffic study associated with sector plans or plats for development, the following are initial recommendations using the best-known information about future condition.

The mitigation measures and turn lanes required to bring the intersections to an acceptable level of service is shown in **Table 13** and summarized in **Figure 36**. However, in the future, when detailed internal site plans are developed and sector planned and platted, traffic impact analyses will be prepared for each sector to determine and verify what improvements are required. The intersections of IH-35 Northbound Frontage Road at Street F and IH-35 Northbound Frontage Road at Street E initially assumed stop-control for the westbound approach. With the proposed acceleration lanes, the westbound approaches are proposed to operate free in the Synchro model, because they will be able to turn into their acceleration lanes on IH-35 Northbound Frontage Road without any conflicts. The acceleration lane along IH-35 northbound frontage road will need to be verified with TxDOT.

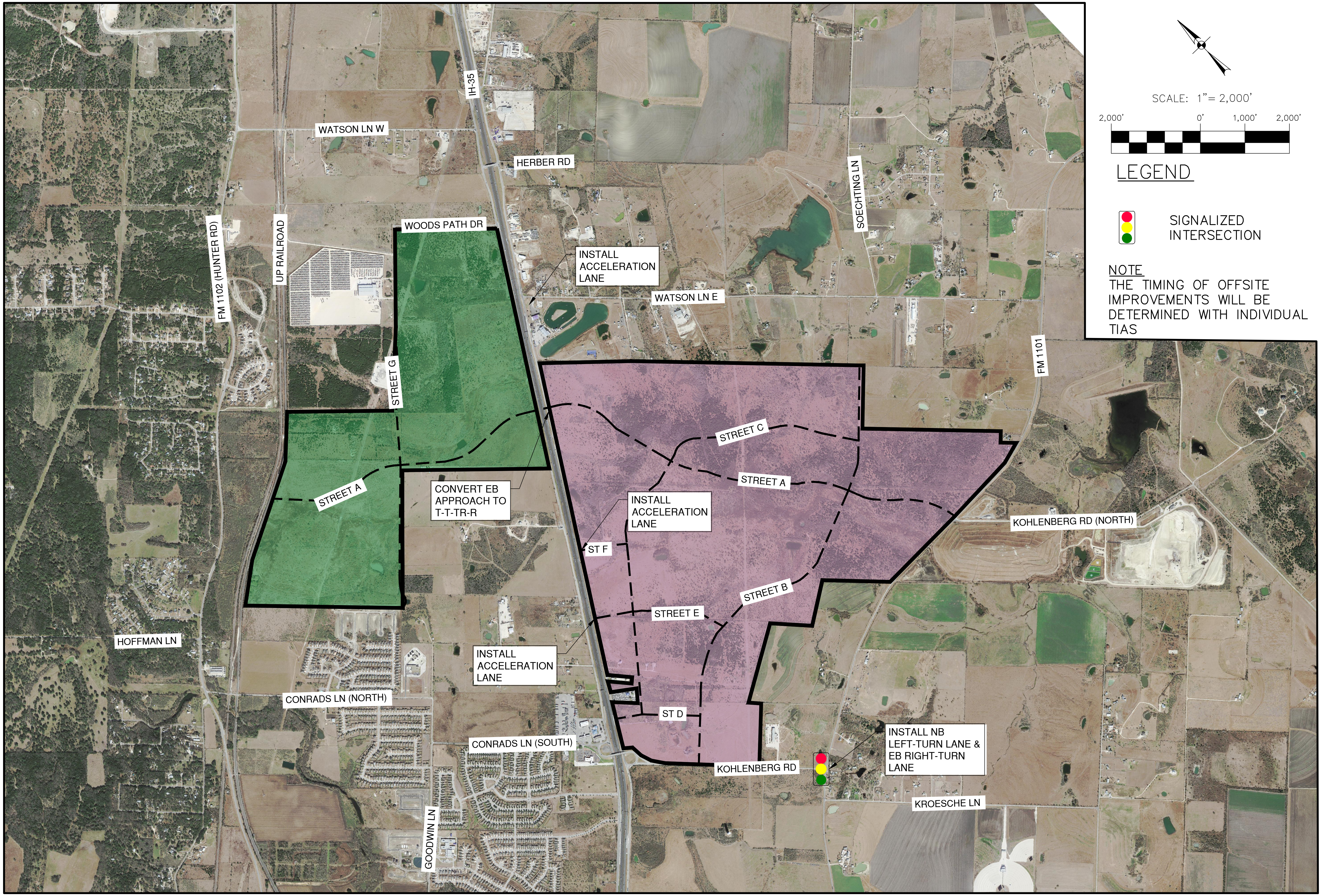
Only the external intersections with recommended mitigation are shown in **Table 13**. Several intersections could not be mitigated without recommending additional thru-lanes. Because this is an initial recommendation, these intersections will be reevaluated in the future with each sector plan TIAs with more accurate recommendations. More detail is explained in **Appendix H.** For the internal intersection recommendations refer to **Figure 35**.

Table 13: Mitigation Summary–(2040)

No.	Intersection	Condition	Movement	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	Recommended Improvements
3	**IH-35 SBFR at Street A**	Build		**D**	**52.3**	**F**	**167.4**	Convert EB Approach to T-T-TR-R
		Mitigation		**D**	**37.0**	**F**	**97.3**	
4	**IH-35 NBFR at Street A**	Build		**D**	**37.5**	**E**	**69.9**	
		Mitigation		**D**	**37.5**	**E**	**69.4**	
14	**IH-35 NBFR at St F***	Build	WB: R	**E**	**42.6**	**F**	**1728.3**	Install Acceleration Lane
		Mitigation	WB: R	A	0.0	A	0.0	
15	**IH-35 NBFR at St E***	Build	WB: R	**F**	**62.9**	**F**	**906.5**	Install Acceleration Lane
		Mitigation	WB: R	A	0.0	A	0.0	
23	**FM 1101 at Kohlenberg Rd**	Build	EB: LR	**F**	**317.5**	**F**	**Err**	Install Signal, NB Left-turn Lane, & EB Right-turn Lane
			NB: LT	A	5.1	A	9.8	
		Mitigation		A	8.7	C	22.6	

*HCM 2010

Detailed cost estimates were calculated for the roadway widening and mitigation improvements. They are shown in **Appendix I**. The timing of offsite improvements will be determined with individual sector plan TIAs.



PAPE-DAWSON ENGINEERS
NEW BRAUNFELS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS
1672 INDEPENDENCE DR, STE 102 I NEW BRAUNFELS, TX 78132 I 830.632.5633
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MAYFAIR
CITY OF NEW BRAUNFELS ETJ, TEXAS
FIGURE 36: MITIGATION SUMMARY

JOB NO. 30002-01
DATE NOV 2020
DESIGNER JCH
CHECKED JWC
DRAWN JCH
SHEET 1 of 1

Date: Mar 22, 2021, 1:23pm User ID: JHohenstein
File: C:\Users\local_JHohenstein\Temp\AcPublish_1008\3000201 FIG 4 TO 29 & 34 to 36.dwg

CONCLUSIONS AND RECOMMENDATIONS

This Planning Level Traffic Impact Analysis assesses important transportation and circulation issues in the absence of detailed land use and density information for the Mayfair Development. Based on the current Master Development Plan, the most likely and reasonable land-use plan for the tract was established to calculate trip generation. The Mayfair Development is estimated to generate 8,847 AM peak-hour trips, 13,149 PM peak-hour trips, and a total of 125,696-weekday trips in approximately 20 years. Based on projected volumes generated by the development, the following recommendations are provided:

- Traffic volumes along the Proposed Street A/Kohlenberg Road (North) at FM 1101, the Proposed Street A at Street B, the Proposed Street A at Street C, the Proposed Street A at IH-35, the Proposed Street A at Street G, and Street B at Kohlenberg Road (South) intersections are expected to meet one or more warrants for signalization. Appropriate spacing should be reserved between major intersections to ensure safe and efficient traffic flow progression through the site. A summary is also shown in **Figure 34.**

- Traffic volumes along Street C at Street B, Street C at Street F, Street C at Street E, Street C at Street D, Street B at Street E, and Street B at Street D intersections are expected to operate at an acceptable level-of-service with two-way stop-control (TWSC). Appropriate spacing should be reserved between major intersections to ensure safe and efficient traffic flow progression through the site.

- The following table summarizes the recommended mitigation, site improvements and roadway sizes:

Mitigation, Site Improvements, and Roadway Sizes Summary–(2040)

No.	Intersection	Condition	Movement	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	Recommended Improvements
Mitigation Summary (Figure 37)								
3	**IH-35 SBFR at Street A**	Build		**D**	**52.3**	**F**	**167.4**	Signalize & Convert EB Approach to T-T-TR-R
		Mitigation		**D**	**37.0**	**F**	**97.3**	
4	**IH-35 NBFR at Street A**	Build		**D**	**37.5**	**E**	**69.9**	
		Mitigation		**D**	**37.5**	**E**	**69.4**	
14	**IH-35 NBFR at St F***	Build	WB: R	**E**	**42.6**	**F**	**1728.3**	Install Acceleration Lane
		Mitigation	WB: R	A	0.0	A	0.0	
15	**IH-35 NBFR at St E***	Build	WB: R	**F**	**62.9**	**F**	**906.5**	Install Acceleration Lane
		Mitigation	WB: R	A	0.0	A	0.0	
23	**FM 1101 at Kohlenberg Rd**	Build	EB: LR	**F**	**317.5**	**F**	**Err**	Install Signal, NB Left-turn Lane, & EB Right-turn Lane
			NB: LT	A	5.1	A	9.8	
		Mitigation		A	8.7	C	22.6	

Site Improvements Summary (Build Condition Figure 36)

No.	Intersection	Condition	Movement	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	Recommended Improvements
7	**Street G at Street A**	Build		C	24.0	C	23.4	Signalize
8	**Street C at Street A**	Build		C	30.8	C	32.9	Signalize
9	**Street B at Street A**	Build		C	28.7	C	29.0	Signalize
10	**FM 1101 at Street A/ Kohlenberg Rd (north)**	Build		C	25.4	C	28.5	Signalize
11	**Kohlenberg Rd at Street B**	Build		C	27.9	C	28.9	Signalize

*HCM 2010

External Recommended Roadway Sizes (Figure 34)		
Roadway	**Roadway Classification**	**R.O.W.**
Woods Path Dr	Minor Collector without Bike Lane	60’
FM 1101	Minor Arterial without Bike Lane	98’
Kohlenberg Rd (South)	Minor Arterial without Bike Lane	98’

Internal Roadway Sizes (Figure 34)		
Roadway	**Roadway Classification**	**R.O.W.**
Street A	Parkway	200’
Street B excluding from Street A to Street D	Minor Arterial without Bike Lane	98’
Street B from Street A to Street D	Minor Arterial with Bike Lane	110’
Street C Adjacent to Single-family homes excluding from Street A to Street D	Minor Collector without Bike Lane	60’
Street C Adjacent to Single-family homes from Street A to Street D	Minor Collector with Bike Lane	72’
Street C Adjacent to School excluding from Street A to Street D	Major Collector without Bike Lane	90’
Street C Adjacent to School from Street A to Street D	Major Collector with Bike Lane	102’
Street D excluding from Street B to Street C	Minor Collector without Bike Lane	60’
Street D from Street B to Street C	Minor Collector with Bike Lane	72’
Street E	Minor Collector without Bike Lane	60’
Street F	Major Collector without Bike Lane	90’
Street G	Minor Arterial without Bike Lane	98’

- Access Management practices should be implemented along the Proposed Street A. Specifically, median openings should be limited and adequately spaced. Driveways located within ¼ mile of a major intersection should be restricted to right-in/right-out only operation.

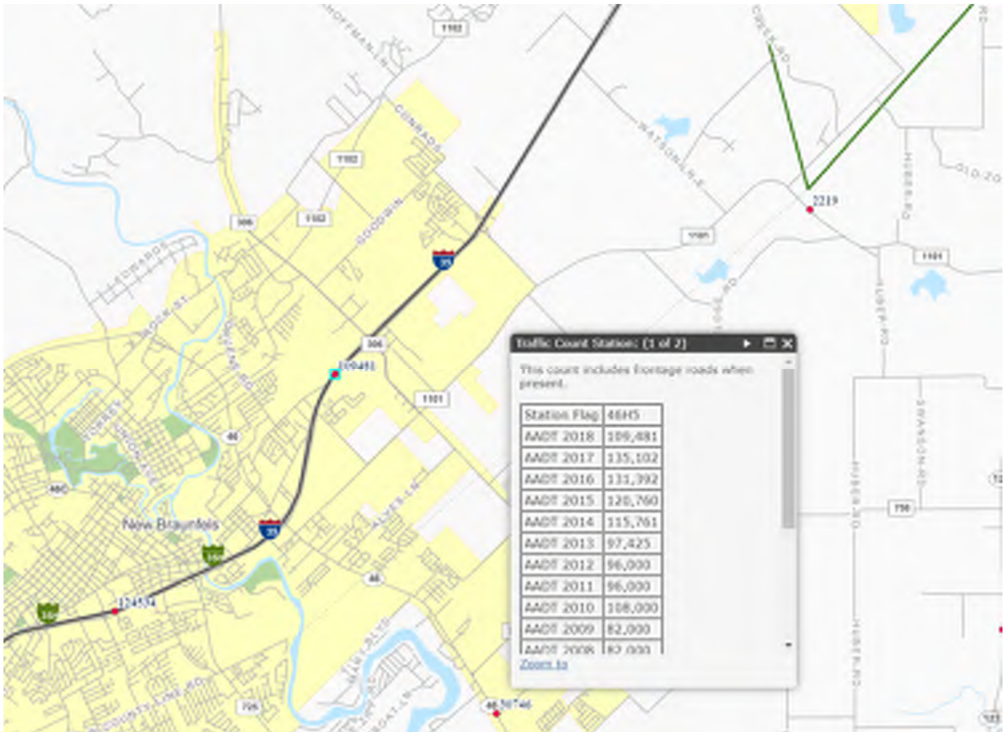
- As the Mayfair Development evolves, individual tracts will be developed within different time frames. A TIA should be performed for each individual sector planned or platted or submitted for site plan approval in accordance with the guidelines of the Unified Development Code. Each subsequent TIA submitted should be checked against this study for conformance or to ascertain that justification for a deviation is provided in the TIA.

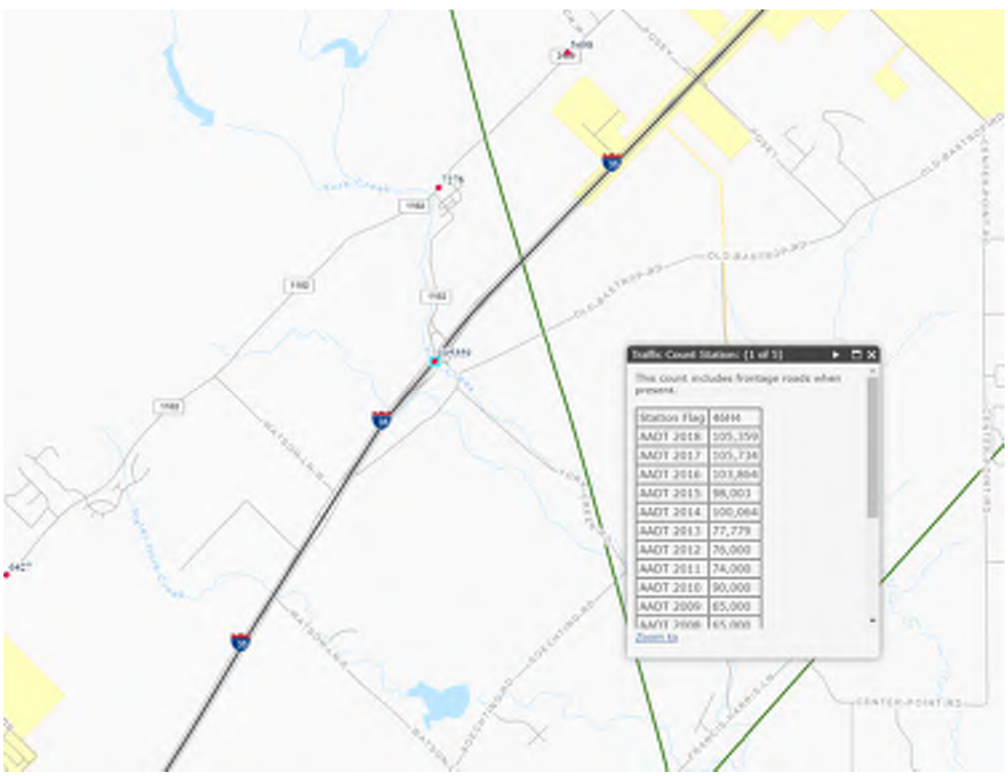
- Signs and markings should conform to the latest edition of the Texas Manual on Uniform Traffic Control Devices.
- Adequate turning radii and on-site circulation should be provided to accommodate delivery trucks. Signs directing delivery trucks to the appropriate location may be provided around the site.
- Driveway throat lengths should be constructed in accordance with the City of New Braunfels requirements to facilitate safe and efficient traffic flow.
- Landscaping, parking, and signs should be placed so they do not obstruct visibility for motorists exiting streets and site driveways.

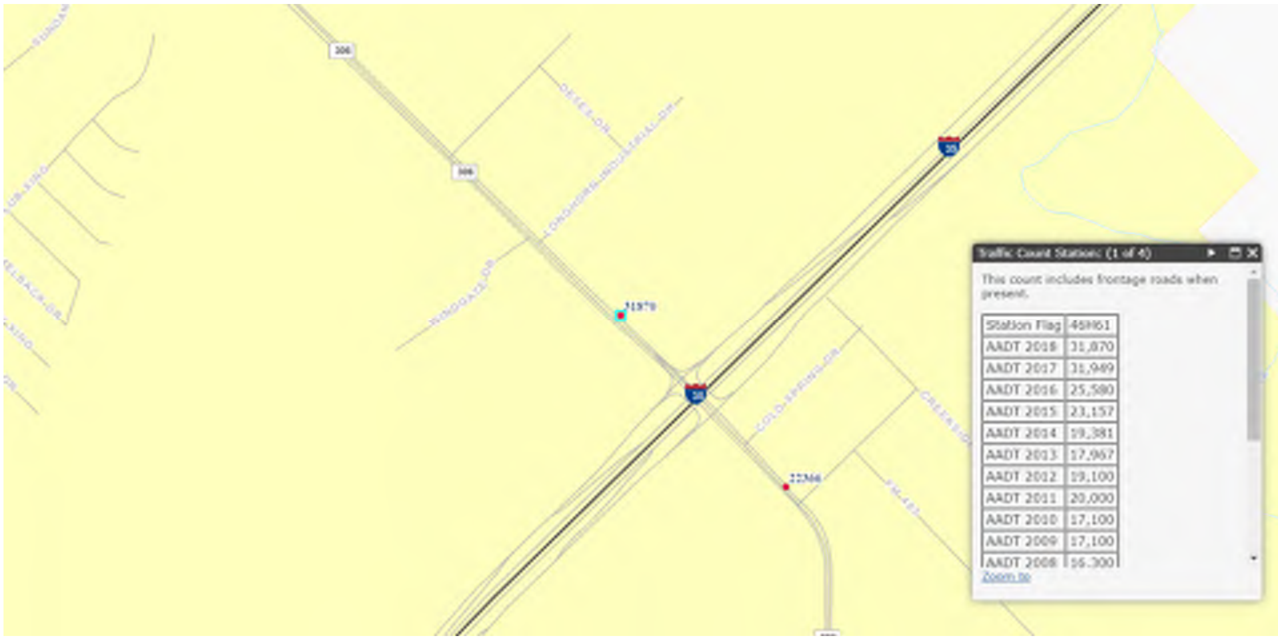
APPENDIX A
Background Growth Rate

Appendix A: Background Growth Rate

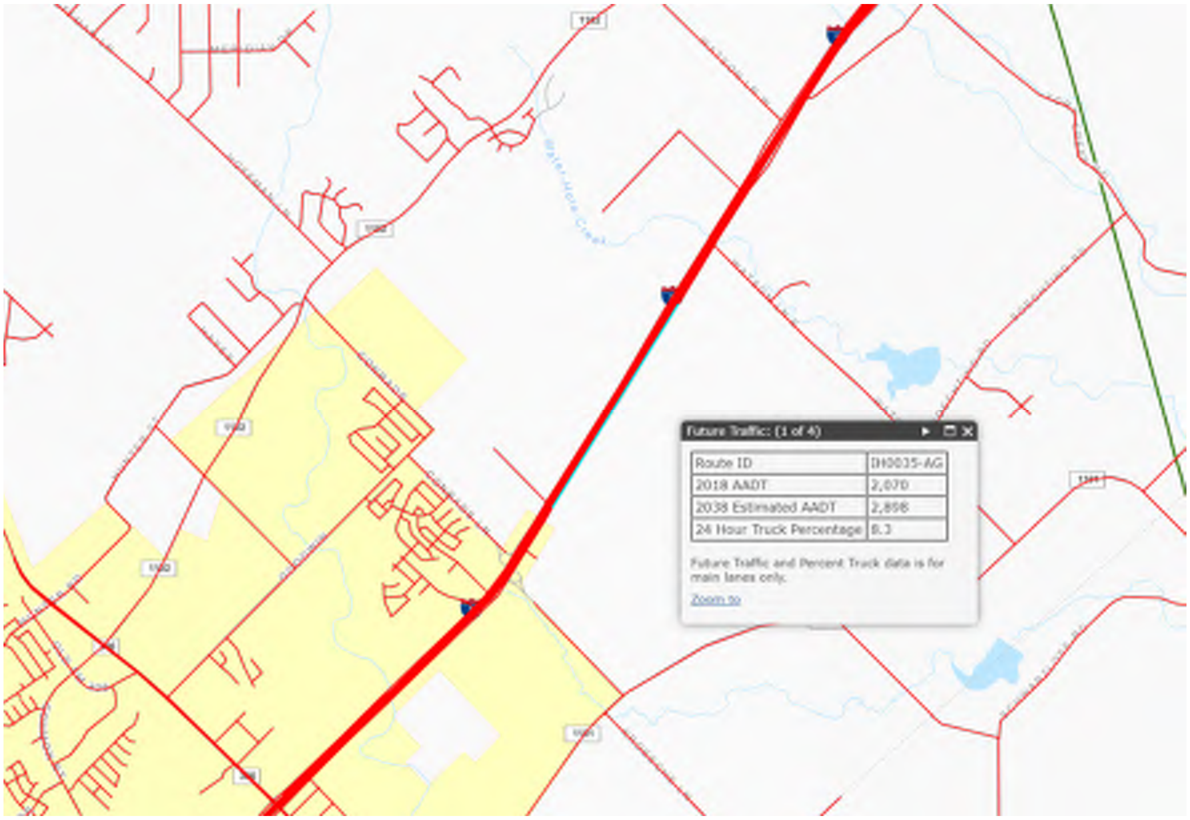
https://www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html

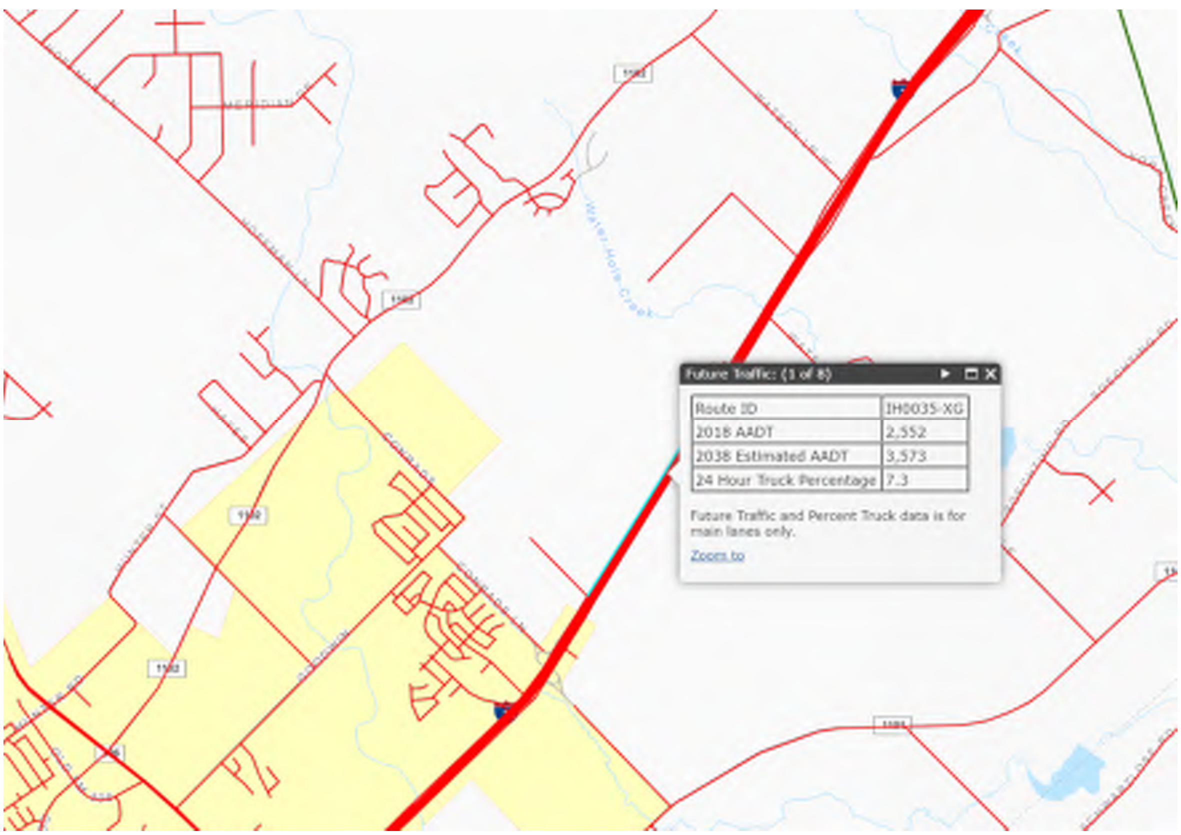


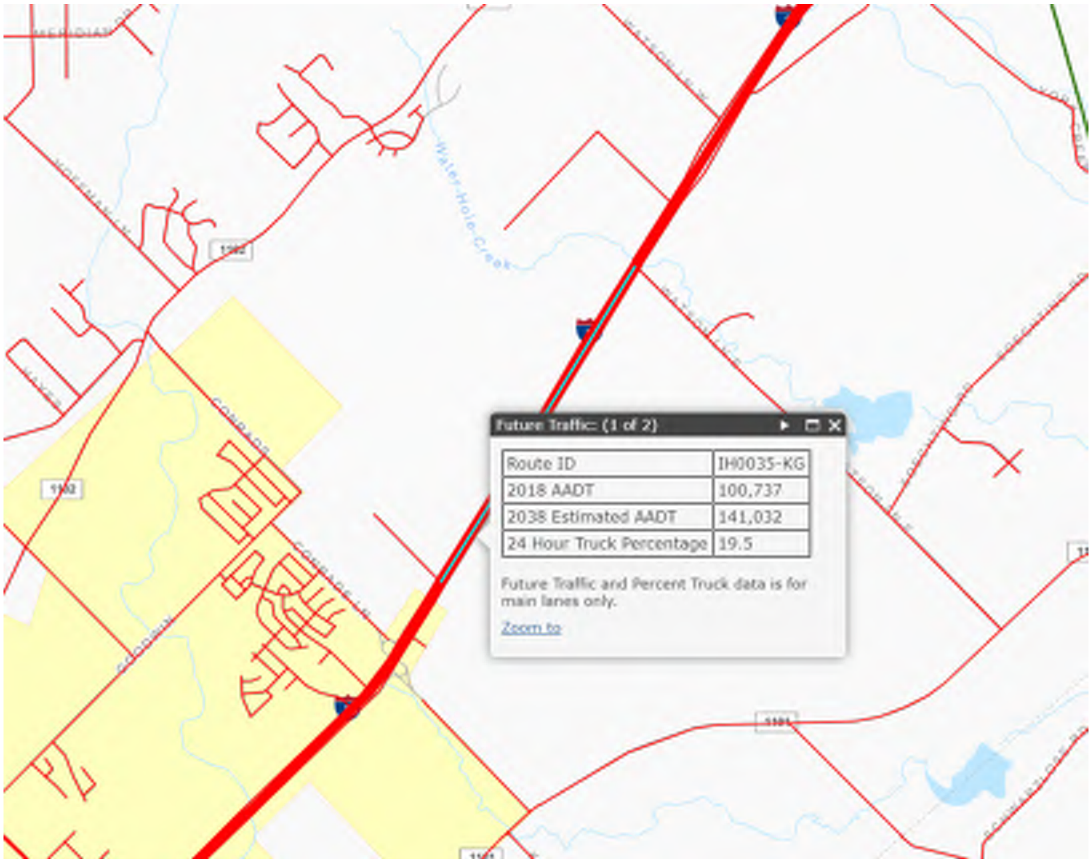


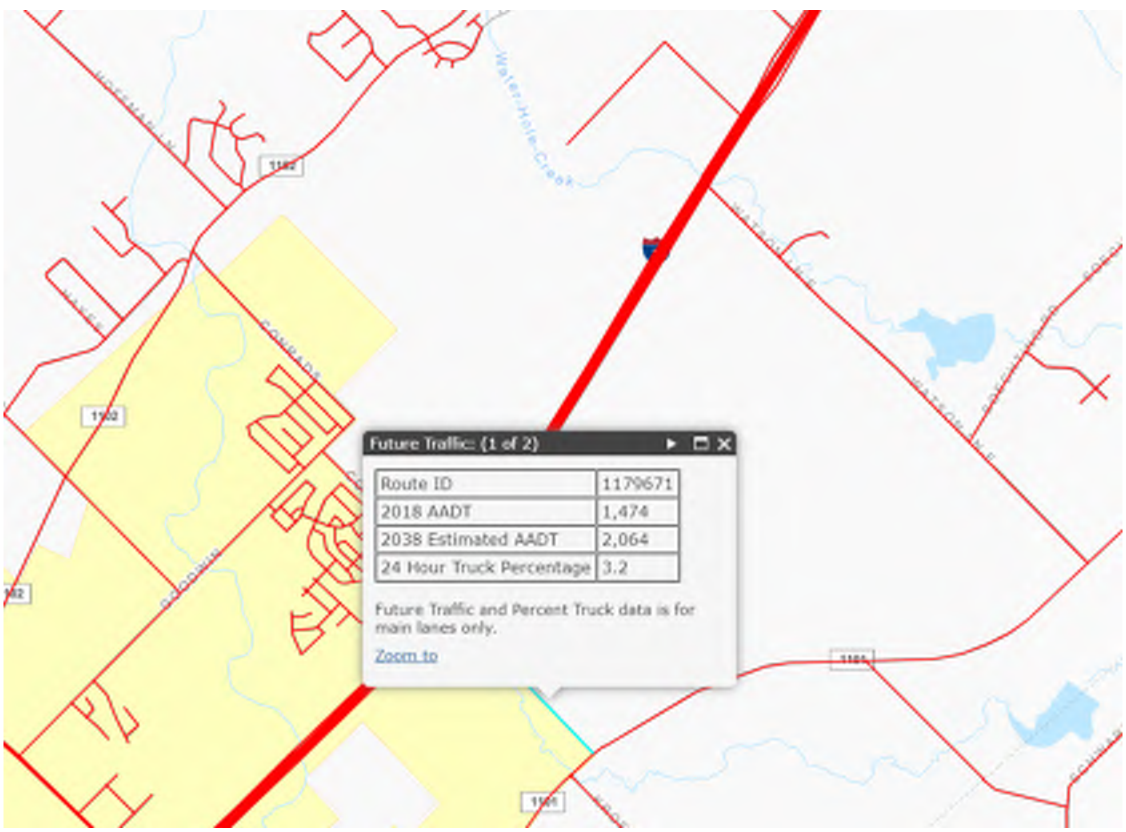


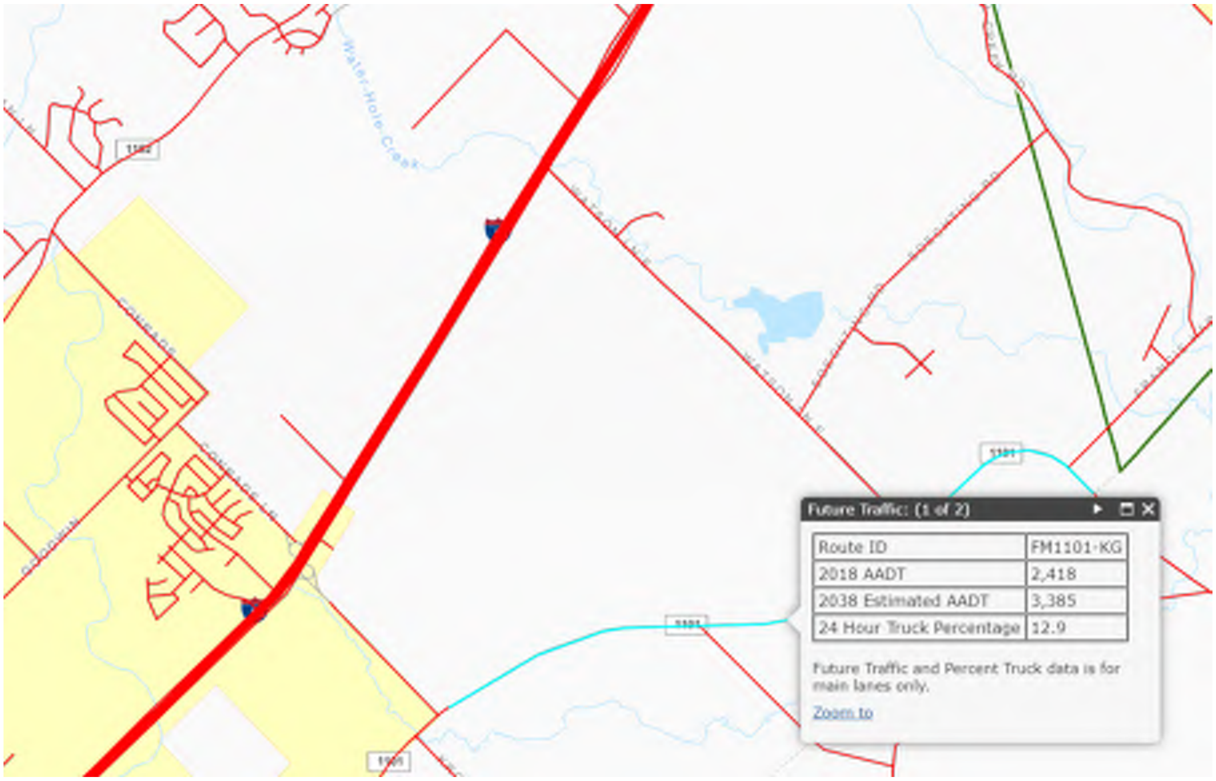
306
306
35
35
31870
22366
DEER DR
LONGHORN INDUSTRIAL DR
COLD SPRING DR
Traffic Count Station: (1 of 4)
This count includes frontage roads when present.
Station Flag 46H61
AADT 2018 31,870
AADT 2017 31,949
AADT 2016 25,580
AADT 2015 23,157
AADT 2014 19,381
AADT 2013 17,967
AADT 2012 19,100
AADT 2011 20,000
AADT 2010 17,100
AADT 2009 17,100
AADT 2008 16,300
Zoom to

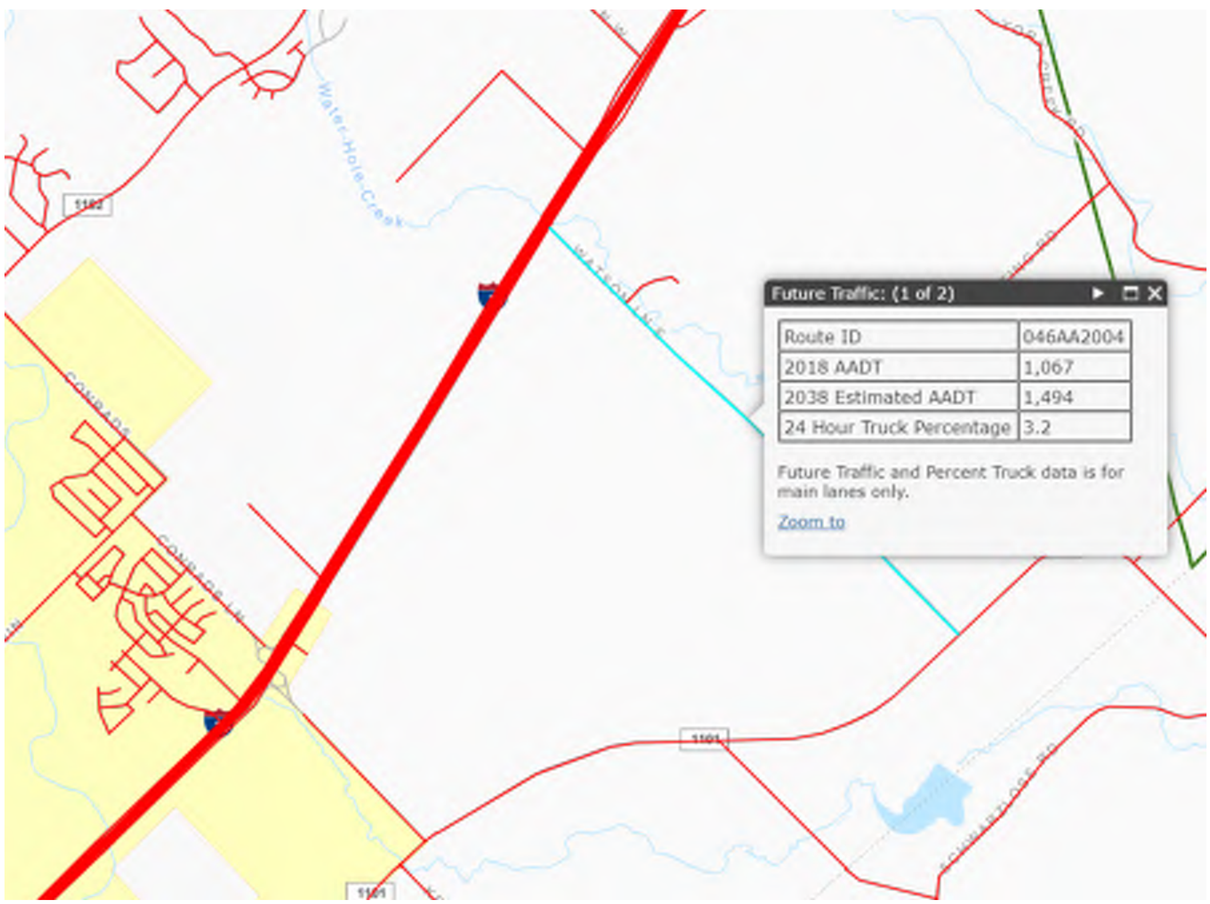

Future Traffic: (1 of 4)
Route ID | IH0035-AG
2018 AADT | 2,070
2038 Estimated AADT | 2,898
24 Hour Truck Percentage | 8.3
Future Traffic and Percent Truck data is for main lanes only.
Zoom to

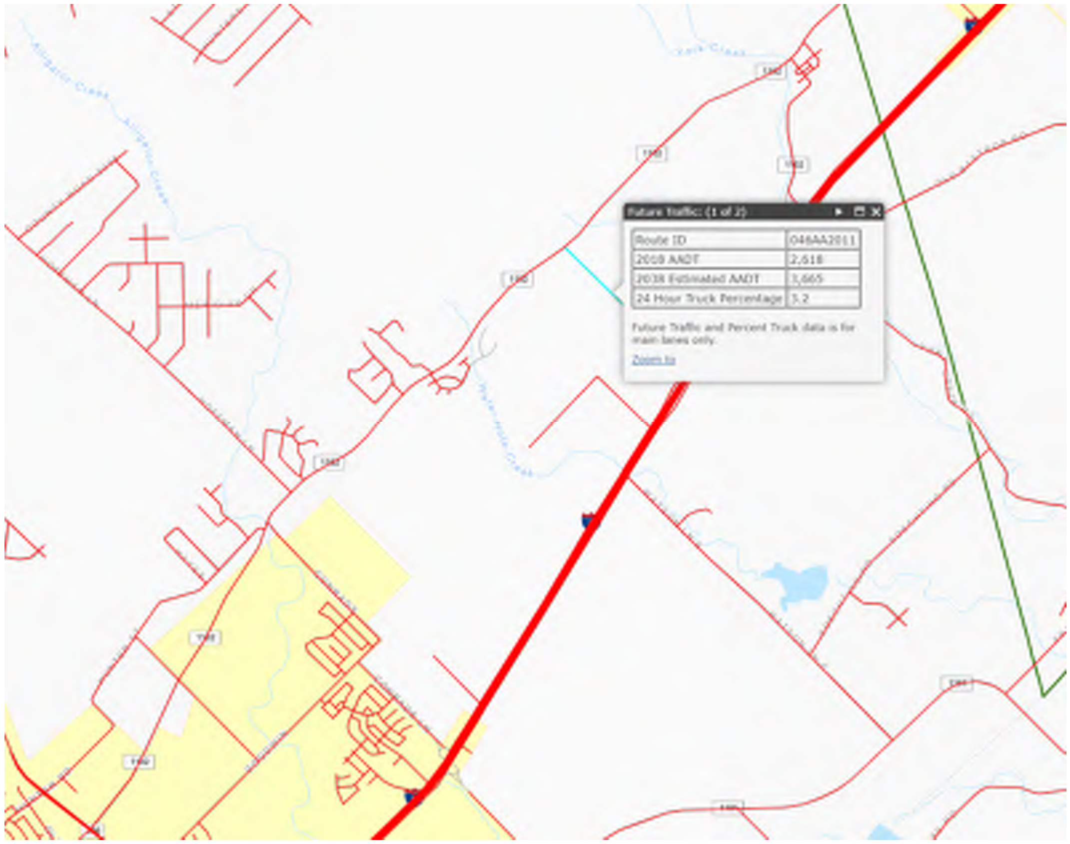

Water Hole Creek
Future Traffic: (1 of 8)
Route ID | IH0035-XG
2018 AADT | 2,552
2038 Estimated AADT | 3,573
24 Hour Truck Percentage | 7.3
Future Traffic and Percent Truck data is for main lanes only.
Zoom to

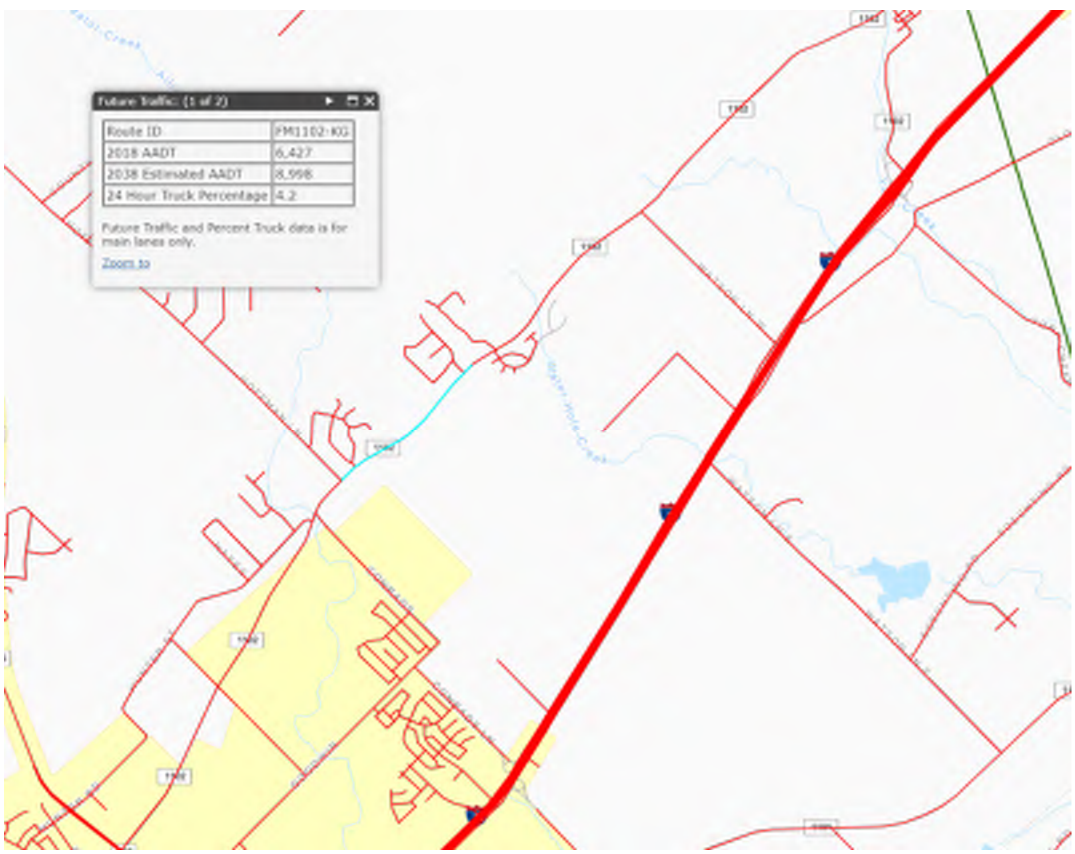

Future Traffic: (1 of 2)
Route ID IH0035-KG
2018 AADT 100,737
2038 Estimated AADT 141,032
24 Hour Truck Percentage 19.5
Future Traffic and Percent Truck data is for main lanes only.
Zoom to
Water Hole Creek


Future Traffic: (1 of 2)
Route ID 1179671
2018 AADT 1,474
2038 Estimated AADT 2,064
24 Hour Truck Percentage 3.2
Future Traffic and Percent Truck data is for main lanes only.
Zoom to
Water Hole Creek


Water-Hole-Creek
1102
1101
Future Traffic: (1 of 2)
Route ID FM1101-KG
2018 AADT 2,418
2038 Estimated AADT 3,385
24 Hour Truck Percentage 12.9
Future Traffic and Percent Truck data is for main lanes only.
Zoom to


Water-Hole-Creek
1102
1101
Future Traffic: (1 of 2)
Route ID 046AA2004
2018 AADT 1,067
2038 Estimated AADT 1,494
24 Hour Truck Percentage 3.2
Future Traffic and Percent Truck data is for main lanes only.
Zoom to


Future Traffic: (1 of 2)
Route ID 048AA2011
2018 AADT 2,618
2038 Estimated AADT 3,665
24 Hour Truck Percentage 3.2
Future Traffic and Percent Truck data is for main lanes only.
Zoom to


Future Traffic: (1 of 2)
Route ID FM1102-KG
2018 AADT 6,427
2038 Estimated AADT 8,998
24 Hour Truck Percentage 4.2
Future Traffic and Percent Truck data is for main lanes only.
Zoom to

APPENDIX B
Trip Generation Data

						AM Peak Hour		PM Peak Hour		Daily	AM Peak Hour		PM Peak Hour		Daily
Tract	**E/W**	**AC**	**Landuse From Master Plan (11/10/2020)**	**Size**	**Units**	Enter	Exit	Enter	Exit		Enter	Exit	Enter	Exit	
E-1	E	106.01	40'-45's Single Family	520	DU	0.19	0.56	0.62	0.37	9.44	96	289	324	190	4909
E-2	E	58.64	40'-45's Single Family	288	DU	0.19	0.56	0.62	0.37	9.44	53	160	180	105	2719
E-3	E	76.09	40'-45's Single Family	373	DU	0.19	0.56	0.62	0.37	9.44	69	207	233	137	3521
E-5	E	20.77	50'-55's Single Family	82	DU	0.19	0.56	0.62	0.37	9.44	15	46	51	30	774
E-7	E	37.9	50'-55's Single Family	148	DU	0.19	0.56	0.62	0.37	9.44	27	82	92	54	1397
E-4	E	8	40'-45's Single Family	40	DU	0.19	0.56	0.62	0.37	9.44	7	22	25	15	378
E-26	E	4.05	Comm	176.42	TSFGLA	0.58	0.36	1.83	1.98	37.75	103	63	323	350	6660
E-8	E	96.02	50'-55's Single Family	375	DU	0.19	0.56	0.62	0.37	9.44	69	208	234	137	3540
E-12	E	17.75	60'-65's Single Family	57	DU	0.19	0.56	0.62	0.37	9.44	11	32	36	21	538
E-10	E	33.02	50'-55's Single Family	129	DU	0.19	0.56	0.62	0.37	9.44	24	72	80	47	1218
E-11	E	18.97	60'-65's Single Family	61	DU	0.19	0.56	0.62	0.37	9.44	11	34	38	22	576
E-13	E	57.53	60'-65's Single Family	185	DU	0.19	0.56	0.62	0.37	9.44	34	103	115	68	1746
E-14	E	13.16	50'-55's Single Family	52	DU	0.19	0.56	0.62	0.37	9.44	10	29	32	19	491
E-19	E	20.67	MXD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
E-19.1	E	8.268	Single Family/Townhome	50	DU	0.19	0.56	0.62	0.37	9.44	9	28	31	18	472
E-19.2	E	7.2345	Multi Family	130	DU	0.11	0.35	0.35	0.21	7.32	14	46	46	27	952
E-19.3	E	2.067	Flex Commercial MXD	18.01	TSFGLA	0.58	0.36	1.83	1.98	37.75	10	6	33	36	680
E-19.4	E	3.1005	Office	27.01	TSFGFA	1.00	0.16	0.18	0.97	9.74	27	4	5	26	263
E-20_21	E	5.92	Comm	257.88	TSFGLA	0.58	0.36	1.83	1.98	37.75	150	92	472	511	9735
E-A1	E	121.15	Middle/High School	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
E-A1.1	E		Middle School	1100	students	0.31	0.27	0.16	0.19	2.13	345	293	177	208	2343
E-A1.2	E		High School	2000	students	0.35	0.17	0.07	0.07	2.03	697	343	134	146	4060
E-A6	E	36.81	40'-45's Single Family	181	DU	0.19	0.56	0.62	0.37	9.44	33	100	113	66	1709
E-A3	E	9.78	Rec Center	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
E-A4	E	71.15	Regional Park	71.15	Acres	0.01	0.01	0.06	0.05	0.78	1	1	4	4	55
W-A4	W	18	Elementary School	800	Students	0.36	0.31	0.15	0.19	1.89	289	247	122	150	1512
W-11	W	72.8	Light Industrial	554.95	TSFGFA	0.62	0.08	0.08	0.55	4.96	342	47	45	304	2753
W-A3	W	7.02	Rec Center	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
W-A2	W	2.52	Fire	21.95	TSFGFA	0.00	0.00	0.00	0.00	0.48	0	0	0	0	11
E-A5	E	2.5	Water Tower	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
E-9	E	76.65	40'-45's Single Family	376	DU	0.19	0.56	0.62	0.37	9.44	70	209	235	138	3549
E-18	E	25.88	MXD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
E-18.1	E	10.352	Single Family/Townhome	63	DU	0.19	0.56	0.62	0.37	9.44	12	35	39	23	595
E-18.2	E	9.058	Multi Family	163	DU	0.11	0.35	0.35	0.21	7.32	17	58	58	34	1193
E-18.3	E	2.588	Flex Commercial MXD	22.55	TSFGLA	0.58	0.36	1.83	1.98	37.75	13	8	41	45	851
E-18.4	E	3.882	Office	33.82	TSFGFA	1.00	0.16	0.18	0.97	9.74	34	5	6	33	329
E-24	E	44.14	MXD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
E-24.1	E	17.656	Single Family/Townhome	106	DU	0.19	0.56	0.62	0.37	9.44	20	59	66	39	1001
E-24.2	E	15.449	Multi Family	278	DU	0.11	0.35	0.35	0.21	7.32	29	98	98	58	2035
E-14.3	E	4.414	Flex Commercial MXD	38.45	TSFGLA	0.58	0.36	1.83	1.98	37.75	22	14	70	76	1451
E-24.4	E	6.621	Office	57.68	TSFGFA	1.00	0.16	0.18	0.97	9.74	58	9	11	56	562
E-25	E	9.14	MXD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
E-25.1	E	3.656	Single Family/Townhome	22	DU	0.19	0.56	0.62	0.37	9.44	4	12	14	8	208
E-25.2	E	3.199	Multi Family	58	DU	0.11	0.35	0.35	0.21	7.32	6	21	20	12	425
E-25.3	E	0.914	Flex Commercial MXD	7.96	TSFGLA	0.58	0.36	1.83	1.98	37.75	5	3	15	16	300
E-25.4	E	1.371	Office	11.94	TSFGFA	1.00	0.16	0.18	0.97	9.74	12	2	2	12	116
E-A7	E	16.55	Linear Park	16.55	Acres	0.01	0.01	0.06	0.05	0.78	0	0	1	1	13

						AM Peak Hour		PM Peak Hour		Daily	AM Peak Hour		PM Peak Hour		Daily
Tract	**E/W**	**AC**	**Landuse From Master Plan (11/10/2020)**	**Size**	**Units**	Enter	Exit	Enter	Exit		Enter	Exit	Enter	Exit	
E-22_23	E	6.88	Comm	299.69	TSFGLA	0.58	0.36	1.83	1.98	37.75	175	107	548	594	11313
E-17	E	4.41	Flex Commercial	28.81	TSFGLA	0.58	0.36	1.83	1.98	37.75	17	10	53	57	1088
E-16	E	24.56	Flex Commercial	160.48	TSFGLA	0.58	0.36	1.83	1.98	37.75	94	57	293	318	6058
W-6	W	34.03	60'-65's Single Family	109	DU	0.19	0.56	0.62	0.37	9.44	20	60	68	40	1029
W-2	W	49.66	50'-55's Single Family	194	DU	0.19	0.56	0.62	0.37	9.44	36	108	121	71	1831
W-5	W	12.61	50'-55's Single Family	50	DU	0.19	0.56	0.62	0.37	9.44	9	28	31	18	472
W-1	W	78.73	40'-45's Single Family	386	DU	0.19	0.56	0.62	0.37	9.44	71	214	241	141	3644
W-4	W	59.68	40'-45's Single Family	293	DU	0.19	0.56	0.62	0.37	9.44	54	163	183	107	2766
W-8	W	28.49	MXD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
W-8.1	W	11.396	Single Family/Townhome	69	DU	0.19	0.56	0.62	0.37	9.44	13	38	43	25	651
W-8.2	W	9.9715	Multi Family	179	DU	0.11	0.35	0.35	0.21	7.32	19	63	63	37	1310
W-8.3	W	2.849	Flex Commercial MXD	24.82	TSFGLA	0.58	0.36	1.83	1.98	37.75	14	9	45	49	937
W-8.4	W	4.2735	Office	37.23	TSFGFA	1.00	0.16	0.18	0.97	9.74	37	6	7	36	363
W-7	W	9	Flex Commercial	58.81	TSFGLA	0.58	0.36	1.83	1.98	37.75	34	21	108	117	2220
W-9	W	55.59	Light Industrial	423.76	TSFGFA	0.62	0.08	0.08	0.55	4.96	261	36	35	232	2102
W-3	W	7	Comm	304.92	TSFGLA	0.58	0.36	1.83	1.98	37.75	178	109	558	604	11511
W-10	W	31.56	Light Industrial	240.58	TSFGFA	0.62	0.08	0.08	0.55	4.96	148	20	20	132	1193
EA-6	E	31.44	Regional Park	31.44	Acres	0.01	0.01	0.06	0.05	0.78	0	0	2	2	25
W-A5	W	27.95	Linear Park	27.95	Acres	0.01	0.01	0.06	0.05	0.78	0	0	2	1	22
W-A6	W	40.1	Linear Park	40.1	Acres	0.01	0.01	0.06	0.05	0.78	0	0	2	2	31
W-A1	W	20.95	Regional Park	20.95	Acres	0.01	0.01	0.06	0.05	0.78	0	0	1	1	16
E-A2	E	0	Elementary School	800	Students	0.36	0.31	0.15	0.19	1.89	289	247	122	150	1512
E-15	E	3.05	Comm	132.86	TSFGLA	0.58	0.36	1.83	1.98	37.75	77	47	243	263	5015
E-27	E	3	Comm	130.68	TSFGLA	0.58	0.36	1.83	1.98	37.75	76	47	239	259	4933
E-A5	E	2.96	Linear Park	18.04	Acres	0.01	0.01	0.06	0.05	0.78	0	0	1	1	14
										Total	**4370**	**4477**	**6650**	**6499**	**125696**

APPENDIX C
Traffic Count Data

North/South Street:	IH35 Frontage Rd
East/West Street:	Herber Rd /

TOD:	AM	Date:	22-Jan-20	Synchro Node:	1	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd			Herber Rd					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	16	32	0	0	0	7	30	0	5	0	0	0
7:15 AM	18	20	0	0	1	11	31	0	2	0	0	0
7:30 AM	25	17	0	0	1	7	38	0	2	0	0	0
7:45 AM	34	19	0	0	1	7	48	0	9	0	0	0
8:00 AM	23	10	0	0	1	5	29	0	10	0	0	0
8:15 AM	22	16	0	0	0	5	37	0	7	0	0	0
8:30 AM	32	9	0	0	1	18	20	0	7	0	0	0
8:45 AM	24	10	0	0	2	6	19	0	6	0	0	0
Total	194	133	0	0	7	66	252	0	48	0	0	0
Peak Hour	93	88	0	0	3	32	147	0	18	0	0	0

Pedestrians				
	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.68	1.00	0.00		0	0.00
30	4	0		0	0.00
				0	0.00
0.76	146				
0.00	0		100	66	0
0.58	23		0.74	0.83	0.00

Diagram for: 07:15 AM-08:15 AM

Peak Hour: 07:00 AM-08:00 AM

PAPE-DAWSON ENGINEERS

North/South Street:	IH35 Frontage Rd											
East/West Street:	Herber Rd /											
TOD:	PM	Date:	22-Jan-20		Synchro Node:		1	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd			Herber Rd					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	21	10	0	0	2	13	11	0	5	0	0	0
4:15 PM	32	19	0	0	2	13	19	0	9	0	0	0
4:30 PM	36	14	0	0	0	12	18	0	9	0	0	0
4:45 PM	32	12	0	0	3	13	13	0	4	0	0	0
5:00 PM	35	20	0	0	1	19	13	0	11	0	0	0
5:15 PM	41	9	0	0	3	17	13	0	5	0	0	0
5:30 PM	24	12	0	0	4	7	20	0	7	0	0	0
5:45 PM	22	20	0	0	2	4	11	0	4	0	0	0
Total	243	116	0	0	17	98	118	0	54	0	0	0
Peak Hour	135	65	0	0	6	57	63	0	33	0	0	0

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.74	0.69	0.00		0	0.00
56	11	0		0	0.00
				0	0.00
0.74	59				
0.00	0		132	53	0
0.61	27		0.80	0.66	0.00

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**04:15 PM-05:15 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	**IH35 Frontage Rd**
East/West Street:	**/ Herber Rd**

TOD:	**AM**	Date:	22-Jan-20	Synchro Node:	2	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd						Herber Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	3	0	37	27	0	0	0	0	31	0	13
7:15 AM	0	0	1	35	22	0	0	0	0	11	0	15
7:30 AM	0	0	3	50	19	0	0	0	0	17	0	22
7:45 AM	0	3	0	41	21	0	0	0	0	22	0	17
8:00 AM	0	0	5	40	20	0	0	0	0	13	0	8
8:15 AM	0	0	3	36	28	0	0	0	0	25	0	12
8:30 AM	0	0	1	24	18	0	0	0	0	24	0	13
8:45 AM	0	1	3	21	12	0	0	0	0	21	0	8
Total	0	7	16	284	167	0	0	0	0	164	0	108
Peak Hour	0	6	4	163	89	0	0	0	0	81	0	67

Pedestrians				
	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.93	0.83		62	0.70
0	82	166		0	0.00
				63	0.72
0.00	0				
0.00	0		0	3	9
0.00	0		0.00	0.25	0.45

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	**IH35 Frontage Rd**
East/West Street:	**/ Herber Rd**

TOD:	**PM**	Date:	22-Jan-20	Synchro Node:	2	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd						Herber Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	3	3	16	22	0	0	0	0	20	0	13
4:15 PM	0	0	3	27	24	0	0	0	0	32	0	21
4:30 PM	0	0	2	19	19	0	0	0	0	21	0	23
4:45 PM	0	2	4	13	20	0	0	0	0	19	0	19
5:00 PM	0	0	2	26	31	0	0	0	0	50	0	20
5:15 PM	0	2	5	16	27	0	0	0	0	30	0	21
5:30 PM	0	1	2	19	18	0	0	0	0	17	0	11
5:45 PM	0	2	2	11	26	0	0	0	0	5	0	21
Total	0	10	23	147	187	0	0	0	0	194	0	149
Peak Hour	0	2	11	85	94	0	0	0	0	122	0	83

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.77	0.71		71	0.85
0	96	74		0	0.00
				116	0.58
0.00	0				
0.00	0		0	5	13
0.00	0		0.00	0.63	0.65

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**04:15 PM-05:15 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	**IH35 Frontage Rd**											
East/West Street:	**/ Watson Ln**											
TOD:	**AM**	Date:	22-Jan-20		Synchro Node:		3	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd						Watson Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	43	12	5	1	0	0	0	0	0	0	15
7:15 AM	0	36	4	4	0	0	0	0	0	0	0	6
7:30 AM	0	33	5	1	1	0	0	0	0	2	0	11
7:45 AM	0	33	8	6	2	0	0	0	0	3	0	21
8:00 AM	0	21	9	9	1	0	0	0	0	0	0	10
8:15 AM	0	24	6	6	0	0	0	0	0	3	0	15
8:30 AM	0	25	5	6	2	0	0	0	0	0	0	14
8:45 AM	0	23	6	8	2	0	0	0	0	0	0	8
Total	0	238	55	45	9	0	0	0	0	8	0	100
Peak Hour	0	145	29	16	4	0	0	0	0	5	0	53

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.50	0.56		48	0.57
0	4	20		0	0.00
				5	0.42
0.00	0				
0.00	0		0	123	26
0.00	0		0.00	0.85	0.72

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	**IH35 Frontage Rd**
East/West Street:	**/ Watson Ln**

TOD:	**PM**	Date:	22-Jan-20	Synchro Node:	3	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd						Watson Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	22	6	6	1	0	0	0	0	1	0	16
4:15 PM	0	33	7	8	1	0	0	0	0	0	0	15
4:30 PM	0	38	7	7	1	0	0	0	0	0	0	9
4:45 PM	0	32	11	6	1	0	0	0	0	0	0	8
5:00 PM	0	29	12	14	1	0	0	0	0	2	0	28
5:15 PM	0	30	9	4	2	0	0	0	0	0	0	19
5:30 PM	0	14	13	11	1	0	0	0	0	1	0	16
5:45 PM	0	37	9	3	2	0	0	0	0	2	0	8
Total	0	235	74	59	10	0	0	0	0	6	0	119
Peak Hour	0	132	37	35	4	0	0	0	0	2	0	60

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.63	0.63		71	0.63
0	5	35		0	0.00
				3	0.38
0.00	0				
0.00	0		0	105	45
0.00	0		0.00	0.82	0.87

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**04:15 PM-05:15 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	IH35 Frontage Rd											
East/West Street:	Watson Ln /											
TOD:	AM	Date:	22-Jan-20		Synchro Node:		4	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd			Watson Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	15	3	0	0	6	4	1	0	56	0	0	0
7:15 AM	9	5	0	0	9	11	1	0	47	0	0	0
7:30 AM	14	5	0	0	5	7	2	0	61	0	0	0
7:45 AM	16	6	0	0	12	4	0	0	55	0	0	0
8:00 AM	8	1	0	0	13	6	0	0	46	0	0	0
8:15 AM	10	0	0	0	16	7	0	0	55	0	0	0
8:30 AM	14	0	0	0	8	2	0	0	24	0	0	0
8:45 AM	8	2	0	0	9	4	0	0	24	0	0	0
Total	94	22	0	0	78	45	4	0	368	0	0	0
Peak Hour	54	19	0	0	32	26	4	0	219	0	0	0

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.64	0.75	0.00		0	0.00
28	39	0		0	0.00
				0	0.00
0.38	3				
0.00	0		47	17	0
0.86	209		0.73	0.71	0.00

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	IH35 Frontage Rd											
East/West Street:	Watson Ln /											
TOD:	PM	Date:	22-Jan-20		Synchro Node:		4	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd			Watson Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	14	2	0	0	12	22	0	0	27	0	0	0
4:15 PM	9	0	0	0	14	31	1	0	37	0	0	0
4:30 PM	23	0	0	0	16	22	0	0	22	0	0	0
4:45 PM	20	2	0	0	9	29	0	0	24	0	0	0
5:00 PM	21	0	0	0	14	37	0	0	46	0	0	0
5:15 PM	21	1	0	0	16	38	0	0	28	0	0	0
5:30 PM	11	1	0	0	12	37	0	0	24	0	0	0
5:45 PM	23	1	0	0	10	29	0	0	27	0	0	0
Total	142	7	0	0	103	245	1	0	235	0	0	0
Peak Hour	76	3	0	0	52	141	0	0	125	0	0	0

Pedestrians				
	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.93	0.80	0.00		0	0.00
141	51	0		0	0.00
				0	0.00
0.00	0				
0.00	0		73	4	0
0.66	122		0.87	0.50	0.00

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**05:00 PM-06:00 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	Conrads/Kohlenberg Crossover / Driveway
East/West Street:	Conrads Ln

TOD:	AM	Date:	22-Jan-20	Synchro Node:	5	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	Conrads/Kohlenberg Crossover			Driveway			Conrads Ln			Conrads Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	28	4	37	0	1	6	4	61	41	4	7	0
7:15 AM	18	2	41	1	1	2	5	68	46	3	12	0
7:30 AM	43	6	32	0	3	0	2	89	53	5	11	8
7:45 AM	50	10	66	0	4	1	4	65	33	12	14	0
8:00 AM	34	5	40	1	2	3	4	63	38	5	13	0
8:15 AM	44	7	29	4	4	3	3	61	24	6	12	0
8:30 AM	36	6	42	1	1	5	2	43	26	5	7	0
8:45 AM	30	5	39	1	2	5	4	45	20	2	9	0
Total	283	45	326	8	18	25	28	495	281	42	85	8
Peak Hour	145	23	179	2	10	6	15	285	170	25	50	8

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.50	0.63	0.50		8	0.25
6	10	2		50	0.89
				25	0.52
0.75	15				
0.80	285		145	23	179
0.80	170		0.73	0.58	0.68

Diagram for:	Peak Hour
Peak Hour:	**07:15 AM-08:15 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	Conrads/Kohlenberg Crossover / Driveway											
East/West Street:	Conrads Ln											
TOD:	**PM**	Date:	22-Jan-20		Synchro Node:		5	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	Conrads/Kohlenberg Crossover			Driveway			Conrads Ln			Conrads Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	60	6	66	2	4	5	5	46	16	6	23	0
4:15 PM	76	3	69	2	2	7	9	32	14	8	16	0
4:30 PM	91	8	68	1	4	2	5	39	15	3	20	1
4:45 PM	67	5	54	0	4	3	5	50	12	7	28	0
5:00 PM	72	7	69	2	2	9	2	51	26	5	16	1
5:15 PM	70	4	63	1	2	3	2	42	19	12	17	0
5:30 PM	74	6	54	1	6	7	5	47	19	9	27	0
5:45 PM	74	3	62	4	3	5	5	33	12	5	25	0
Total	584	42	505	13	27	41	38	340	133	55	172	2
Peak Hour	306	23	260	5	12	21	21	172	67	23	80	2

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.61	0.58	0.50		1	0.25
22	14	4		88	0.79
				33	0.69
0.70	14				
0.93	190		283	22	240
0.73	76		0.96	0.79	0.87

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**04:15 PM-05:15 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	**IH35 Frontage Rd**
East/West Street:	**Conrads Ln /**

TOD:	**AM**	Date:	22-Jan-20	Synchro Node:	6	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd			Conrads Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	10	12	5	0	87	0	0	0
7:15 AM	0	0	0	0	14	11	3	0	95	0	0	0
7:30 AM	0	0	0	0	12	19	3	0	112	0	0	0
7:45 AM	0	0	0	0	13	27	7	0	121	0	0	0
8:00 AM	0	0	0	0	22	25	5	0	118	0	0	0
8:15 AM	0	0	0	0	12	14	4	0	95	0	0	0
8:30 AM	0	0	0	0	15	17	0	0	79	0	0	0
8:45 AM	0	0	0	0	15	17	3	0	93	0	0	0
Total	0	0	0	0	113	142	30	0	800	0	0	0
Peak Hour	0	0	0	0	59	85	19	0	446	0	0	0

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.76	0.69	0.00		0	0.00
82	61	0		0	0.00
				0	0.00
0.64	18				
0.00	0		0	0	0
0.92	446		0.00	0.00	0.00

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:30 AM-08:30 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	IH35 Frontage Rd
East/West Street:	Conrads Ln /

TOD:	PM	Date:	22-Jan-20	Synchro Node:	6	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd			Conrads Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	0	23	27	2	0	113	0	0	0
4:15 PM	0	0	0	0	31	29	5	0	108	0	0	0
4:30 PM	0	0	0	0	26	21	3	0	107	0	0	0
4:45 PM	0	0	0	0	34	36	1	0	102	0	0	0
5:00 PM	0	0	0	0	34	22	3	0	103	0	0	0
5:15 PM	0	0	0	0	57	28	3	0	120	0	0	0
5:30 PM	0	0	0	0	30	32	2	0	94	0	0	0
5:45 PM	0	0	0	0	34	37	1	0	117	0	0	0
Total	0	0	0	0	269	232	20	0	864	0	0	0
Peak Hour	0	0	0	0	155	119	9	0	434	0	0	0

Pedestrians				
	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.82	0.68	0.00		0	0.00
118	155	0		0	0.00
				0	0.00
0.75	9				
0.00	0		0	0	0
0.87	419		0.00	0.00	0.00

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**05:00 PM-06:00 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	**IH35 Frontage Rd**											
East/West Street:	**/ Kohlenberg Rd**											
TOD:	**AM**	Date:	22-Jan-20	Synchro Node:	7	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01					
	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd						Kohlenberg Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	7	53	1	0	0	0	0	0	0	0	36
7:15 AM	0	7	47	1	0	0	0	0	0	0	0	36
7:30 AM	0	2	62	3	0	0	0	0	0	0	0	45
7:45 AM	0	9	85	1	0	0	0	0	0	0	0	48
8:00 AM	0	3	84	0	0	0	0	0	0	0	0	26
8:15 AM	0	6	57	0	0	0	0	0	0	0	0	30
8:30 AM	0	7	68	1	0	0	0	0	0	0	0	22
8:45 AM	0	4	61	1	0	0	0	0	0	0	0	19
Total	0	45	517	8	0	0	0	0	0	0	0	262
Peak Hour	0	20	288	4	0	0	0	0	0	0	0	149

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.00	0.42		155	0.81
0	0	5		0	0.00
				0	0.00
0.00	0				
0.00	0		0	21	278
0.00	0		0.00	0.58	0.82

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:30 AM-08:30 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	IH35 Frontage Rd											
East/West Street:	/ Kohlenberg Rd											
TOD:	**PM**	Date:	22-Jan-20	Synchro Node:		7	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01				
	Northbound			Southbound			Eastbound			Westbound		
	IH35 Frontage Rd			IH35 Frontage Rd						Kohlenberg Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	6	129	3	0	0	0	0	0	0	0	12
4:15 PM	0	5	124	2	0	0	0	0	0	0	0	20
4:30 PM	0	7	125	3	0	0	0	0	0	0	0	19
4:45 PM	0	9	113	1	0	0	0	0	0	0	0	17
5:00 PM	0	2	128	2	0	0	0	0	0	0	0	25
5:15 PM	0	5	118	6	0	0	0	0	0	0	0	15
5:30 PM	0	9	119	7	0	0	0	0	0	0	0	22
5:45 PM	0	0	127	6	0	0	0	0	0	0	0	16
Total	0	43	983	30	0	0	0	0	0	0	0	146
Peak Hour	0	16	492	21	0	0	0	0	0	0	0	78

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.00	0.57		79	0.79
0	0	16		0	0.00
				0	0.00
0.00	0				
0.00	0		0	25	478
0.00	0		0.00	0.69	0.93

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**05:00 PM-06:00 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	**/ Conrads/Kohlenberg Crossover**											
East/West Street:	**Kohlenberg Rd**											
TOD:	**AM**	Date:	22-Jan-20		Synchro Node:	8	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01				
	Northbound			Southbound			Eastbound			Westbound		
				Conrads/Kohlenberg Crossover			Kohlenberg Rd			Kohlenberg Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	18	0	31	41	14	0	0	4	26
7:15 AM	0	0	0	21	0	27	36	13	0	0	7	21
7:30 AM	0	0	0	26	0	30	59	7	0	0	17	29
7:45 AM	0	0	0	20	0	36	72	13	0	0	12	39
8:00 AM	0	0	0	24	0	20	76	10	0	0	5	17
8:15 AM	0	0	0	16	0	23	54	1	0	0	8	23
8:30 AM	0	0	0	16	0	14	60	9	0	0	8	23
8:45 AM	0	0	0	8	0	18	52	7	0	0	3	21
Total	0	0	0	149	0	199	450	74	0	0	64	199
Peak Hour	0	0	0	91	0	113	243	43	0	0	41	106

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.78	0.00	0.88		106	0.68
113	0	91		41	0.60
				0	0.00
0.80	243				
0.83	43		0	0	0
0.00	0		0.00	0.00	0.00

Diagram for:	Peak Hour
Peak Hour:	**07:15 AM-08:15 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	**/ Conrads/Kholenberg Crossover**											
East/West Street:	**Kohlenberg Rd**											
TOD:	**PM**	Date:		22-Jan-20		Synchro Node:		8	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01		
	Northbound			Southbound			Eastbound			Westbound		
				Conrads/Kholenberg Crossover			Kohlenberg Rd			Kohlenberg Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	9	0	10	122	16	0	0	3	23
4:15 PM	0	0	0	11	0	17	117	11	0	0	3	31
4:30 PM	0	0	0	9	0	14	116	11	0	0	5	50
4:45 PM	0	0	0	11	0	14	99	13	0	0	3	35
5:00 PM	0	0	0	11	0	16	105	21	0	0	8	30
5:15 PM	0	0	0	25	0	12	106	19	0	0	4	32
5:30 PM	0	0	0	16	0	13	107	19	0	0	8	28
5:45 PM	0	0	0	11	0	9	120	15	0	0	7	29
Total	0	0	0	103	0	105	892	125	0	0	41	258
Peak Hour	0	0	0	63	0	50	438	74	0	0	27	119

Pedestrians				
	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.86	0.00	0.63		125	0.89
55	0	63		23	0.72
				0	0.00
0.97	417				
0.86	72		0	0	0
0.00	0		0.00	0.00	0.00

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**05:00 PM-06:00 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1101											
East/West Street:	Kohlenberg Rd /											
TOD:	**AM**	Date:	22-Jan-20		Synchro Node:		9	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			

	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101			Kohlenberg Rd					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	10	6	0	0	22	20	9	0	12	0	0	0
7:15 AM	15	18	0	0	15	11	14	0	21	0	0	0
7:30 AM	23	12	0	0	14	17	14	0	11	0	0	0
7:45 AM	18	13	0	0	13	30	11	0	26	0	0	0
8:00 AM	16	11	0	0	22	20	11	0	17	0	0	0
8:15 AM	19	3	0	0	13	10	10	0	19	0	0	0
8:30 AM	13	13	0	0	10	14	10	0	12	0	0	0
8:45 AM	16	11	0	0	17	15	8	0	12	0	0	0
Total	130	87	0	0	126	137	87	0	130	0	0	0
Peak Hour	72	54	0	0	64	78	50	0	75	0	0	0

Pedestrians				
	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.65	0.73	0.00		0	0.00
78	64	0		0	0.00
				0	0.00
0.89	50				
0.00	0		72	54	0
0.72	75		0.78	0.75	0.00

Diagram for:	Peak Hour
Peak Hour:	**07:15 AM-08:15 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1101
East/West Street:	Kohlenberg Rd /

TOD:	PM	Date:	22-Jan-20	Synchro Node:	9	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101			Kohlenberg Rd					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	7	12	0	0	17	12	10	0	16	0	0	0
4:15 PM	16	13	0	0	16	12	13	0	11	0	0	0
4:30 PM	43	16	0	0	19	16	9	0	12	0	0	0
4:45 PM	21	18	0	0	17	9	8	0	18	0	0	0
5:00 PM	24	22	0	0	16	16	11	0	13	0	0	0
5:15 PM	16	20	0	0	16	20	16	0	27	0	0	0
5:30 PM	28	15	0	0	22	14	16	0	21	0	0	0
5:45 PM	30	22	0	0	16	9	13	0	25	0	0	0
Total	185	138	0	0	139	108	96	0	143	0	0	0
Peak Hour	98	79	0	0	70	59	56	0	86	0	0	0

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.74	0.81	0.00		0	0.00
59	71	0		0	0.00
				0	0.00
0.80	51				
0.00	0		89	75	0
0.73	79		0.79	0.85	0.00

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**05:00 PM-06:00 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1101
East/West Street:	/ Kohlenberg Rd

TOD:	AM	Date:	22-Jan-20	Synchro Node:	10	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101						Kohlenberg Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	20	7	0	23	0	0	0	0	2	0	2
7:15 AM	0	22	5	2	20	0	0	0	0	2	0	0
7:30 AM	0	25	4	0	32	0	0	0	0	3	0	0
7:45 AM	0	16	3	0	29	0	0	0	0	6	0	0
8:00 AM	0	14	4	2	18	0	0	0	0	8	0	2
8:15 AM	0	13	1	1	17	0	0	0	0	4	0	0
8:30 AM	0	17	3	2	23	0	0	0	0	5	0	1
8:45 AM	0	17	3	1	18	0	0	0	0	2	0	1
Total	0	144	30	8	180	0	0	0	0	32	0	6
Peak Hour	0	83	19	2	104	0	0	0	0	13	0	2

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.77	0.50		2	0.25
0	99	4		0	0.00
				19	0.59
0.00	0				
0.00	0		0	77	16
0.00	0		0.00	0.77	0.80

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1101											
East/West Street:	/ Kohlenberg Rd											
TOD:	PM	Date:	22-Jan-20		Synchro Node:		10	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101						Kohlenberg Rd		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	21	4	1	18	0	0	0	0	11	0	1
4:15 PM	0	21	1	0	28	0	0	0	0	4	0	0
4:30 PM	0	19	1	5	25	0	0	0	0	4	0	0
4:45 PM	0	30	1	0	31	0	0	0	0	2	0	0
5:00 PM	0	39	3	0	31	0	0	0	0	3	0	1
5:15 PM	0	21	3	0	29	0	0	0	0	3	0	1
5:30 PM	0	35	0	1	25	0	0	0	0	3	0	1
5:45 PM	0	19	3	2	24	0	0	0	0	4	0	1
Total	0	205	16	9	211	0	0	0	0	34	0	5
Peak Hour	0	125	7	1	116	0	0	0	0	11	0	3

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.94	0.25		3	0.75
0	116	1		0	0.00
				11	0.92
0.00	0				
0.00	0		0	125	7
0.00	0		0.00	0.80	0.58

Diagram for:	Peak Hour
Peak Hour:	**04:45 PM-05:45 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1101
East/West Street:	/ Kroesche Ln

TOD:	AM	Date:	22-Jan-20	Synchro Node:	11	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101						Kroesche Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	14	0	0	22	0	0	0	0	1	0	1
7:15 AM	0	29	1	3	32	0	0	0	0	1	0	3
7:30 AM	0	34	1	2	27	0	0	0	0	1	0	1
7:45 AM	0	28	1	2	33	0	0	0	0	4	0	2
8:00 AM	0	28	1	2	41	0	0	0	0	2	0	2
8:15 AM	0	19	0	0	31	0	0	0	0	3	0	1
8:30 AM	0	26	1	1	21	0	0	0	0	0	0	1
8:45 AM	0	26	1	2	26	0	0	0	0	1	0	1
Total	0	204	6	12	233	0	0	0	0	13	0	12
Peak Hour	0	119	4	9	133	0	0	0	0	8	0	8

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.81	0.75		8	0.67
0	133	9		0	0.00
				8	0.50
0.00	0				
0.00	0		0	119	4
0.00	0		0.00	0.88	1.00

Diagram for: Peak Hour

Peak Hour: 07:15 AM-08:15 AM

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1101											
East/West Street:	/ Kroesche Ln											
TOD:	PM	Date:	22-Jan-20		Synchro Node:		11	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101						Kroesche Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	18	0	1	31	0	0	0	0	3	0	2
4:15 PM	0	25	1	2	29	0	0	0	0	1	0	2
4:30 PM	0	56	2	7	21	0	0	0	0	4	0	2
4:45 PM	0	41	3	6	29	0	0	0	0	0	0	1
5:00 PM	0	43	2	4	27	0	0	0	0	3	0	1
5:15 PM	0	35	1	4	32	0	0	0	0	0	0	3
5:30 PM	0	39	3	4	43	0	0	0	0	1	0	1
5:45 PM	0	50	1	5	34	0	0	0	0	2	0	2
Total	0	307	13	33	246	0	0	0	0	14	0	14
Peak Hour	0	167	7	17	136	0	0	0	0	6	0	7

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.76	0.75		6	0.50
0	131	18		0	0.00
				4	0.33
0.00	0				
0.00	0		0	158	9
0.00	0		0.00	0.92	0.75

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**05:00 PM-06:00 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1101
East/West Street:	Watson Ln /

TOD:	AM	Date:	22-Jan-20	Synchro Node:	12	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101			Watson Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	6	14	0	0	22	12	2	0	6	0	0	0
7:15 AM	2	24	0	0	16	6	3	0	7	0	0	0
7:30 AM	5	19	0	0	27	6	3	0	0	0	0	0
7:45 AM	4	12	0	0	35	15	6	0	0	0	0	0
8:00 AM	4	16	0	0	16	8	3	0	3	0	0	0
8:15 AM	2	10	0	0	15	5	6	0	2	0	0	0
8:30 AM	3	20	0	0	22	3	6	0	3	0	0	0
8:45 AM	4	14	0	0	17	4	2	0	5	0	0	0
Total	30	129	0	0	170	59	31	0	26	0	0	0
Peak Hour	17	69	0	0	100	39	14	0	13	0	0	0

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.58	0.67	0.00		0	0.00
35	94	0		0	0.00
				0	0.00
0.63	15				
0.00	0		15	71	0
0.36	10		0.75	0.74	0.00

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	**FM 1101**
East/West Street:	**Watson Ln /**

TOD:	**PM**	Date:	22-Jan-20	Synchro Node:	12	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1101			FM 1101			Watson Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	2	16	0	0	13	4	5	0	5	0	0	0
4:15 PM	3	20	0	0	23	3	7	0	1	0	0	0
4:30 PM	1	19	0	0	22	3	3	0	5	0	0	0
4:45 PM	2	24	0	0	30	2	5	0	4	0	0	0
5:00 PM	2	39	0	0	31	5	12	0	1	0	0	0
5:15 PM	2	23	0	0	31	6	6	0	2	0	0	0
5:30 PM	6	28	0	0	20	4	10	0	7	0	0	0
5:45 PM	3	22	0	0	22	2	5	0	2	0	0	0
Total	21	191	0	0	192	29	53	0	27	0	0	0
Peak Hour	12	114	0	0	112	17	33	0	14	0	0	0

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.71	0.90	0.00		0	0.00
17	112	0		0	0.00
				0	0.00
0.69	33				
0.00	0		12	114	0
0.50	14		0.50	0.73	0.00

Diagram for:	Peak Hour
Peak Hour:	**04:45 PM-05:45 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	**/ Soechting Ln**											
East/West Street:	**Watson Ln**											
TOD:	**AM**	Date:	22-Jan-20		Synchro Node:		13	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
				Soechting Ln			Watson Ln			Watson Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	1	0	2	1	11	0	0	9	1
7:15 AM	0	0	0	1	0	3	0	8	0	0	9	2
7:30 AM	0	0	0	4	0	0	0	8	0	0	10	0
7:45 AM	0	0	0	2	0	1	1	12	0	0	17	0
8:00 AM	0	0	0	2	0	1	0	8	0	0	12	0
8:15 AM	0	0	0	1	0	3	0	10	0	0	4	0
8:30 AM	0	0	0	2	0	1	1	6	0	0	5	1
8:45 AM	0	0	0	2	0	0	3	5	0	0	4	0
Total	0	0	0	15	0	11	6	68	0	0	70	4
Peak Hour	0	0	0	8	0	6	2	39	0	0	45	3

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.42	0.00	0.56		2	0.25
5	0	9		48	0.71
				0	0.00
0.25	1				
0.75	36		0	0	0
0.00	0		0.00	0.00	0.00

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	**/ Soechting Ln**
East/West Street:	**Watson Ln**

TOD:	**PM**	Date:	22-Jan-20	Synchro Node:	13	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
				Soechting Ln			Watson Ln			Watson Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	3	0	1	3	8	0	0	9	1
4:15 PM	0	0	0	3	0	1	5	6	0	0	6	2
4:30 PM	0	0	0	1	0	0	0	12	0	0	5	1
4:45 PM	0	0	0	1	0	0	7	5	0	0	11	2
5:00 PM	0	0	0	2	0	1	2	11	0	0	9	2
5:15 PM	0	0	0	1	0	0	3	10	0	0	9	1
5:30 PM	0	0	0	0	0	2	4	6	0	0	5	5
5:45 PM	0	0	0	1	0	2	2	12	0	0	5	0
Total	0	0	0	12	0	7	26	70	0	0	59	14
Peak Hour	0	0	0	4	0	3	16	32	0	0	34	10

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.38	0.00	0.50		10	0.50
3	0	4		34	0.77
				0	0.00
0.57	16				
0.73	32		0	0	0
0.00	0		0.00	0.00	0.00

Diagram for:	Peak Hour
Peak Hour:	**04:45 PM-05:45 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1102
East/West Street:	/ Watson Ln

TOD:	AM	Date:	22-Jan-20	Synchro Node:	14	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1102			FM 1102						Watson Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	29	41	12	10	0	0	0	0	8	0	17
7:15 AM	0	34	37	12	18	0	0	0	0	12	0	4
7:30 AM	0	50	49	9	10	0	0	0	0	2	0	9
7:45 AM	0	49	48	4	15	0	0	0	0	10	0	8
8:00 AM	0	34	37	6	15	0	0	0	0	9	0	6
8:15 AM	0	36	39	23	21	0	0	0	0	11	0	6
8:30 AM	0	36	20	2	14	0	0	0	0	10	0	6
8:45 AM	0	17	20	5	17	0	0	0	0	6	0	4
Total	0	285	291	73	120	0	0	0	0	68	0	60
Peak Hour	0	169	173	42	61	0	0	0	0	32	0	29

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.81	0.65		27	0.75
0	58	31		0	0.00
				33	0.69
0.00	0				
0.00	0		0	167	171
0.00	0		0.00	0.84	0.87

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:30 AM-08:30 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	**FM 1102**
East/West Street:	**/ Watson Ln**

TOD:	**PM**	Date:	22-Jan-20	Synchro Node:	14	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1102			FM 1102						Watson Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	22	17	8	34	0	0	0	0	28	0	1
4:15 PM	0	23	30	12	48	0	0	0	0	37	0	0
4:30 PM	0	29	17	5	50	0	0	0	0	45	0	4
4:45 PM	0	28	18	18	51	0	0	0	0	41	0	3
5:00 PM	0	46	16	23	39	0	0	0	0	40	0	1
5:15 PM	0	42	15	15	63	0	0	0	0	42	0	3
5:30 PM	0	28	16	7	81	0	0	0	0	65	0	1
5:45 PM	0	31	10	10	49	0	0	0	0	48	0	3
Total	0	249	139	98	415	0	0	0	0	346	0	16
Peak Hour	0	144	65	63	234	0	0	0	0	188	0	8

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.72	0.68		8	0.67
0	234	63		0	0.00
				188	0.72
0.00	0				
0.00	0		0	144	65
0.00	0		0.00	0.78	0.90

Diagram for:	Peak Hour
Peak Hour:	**04:45 PM-05:45 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1102
East/West Street:	Hoffman Ln /

TOD:	AM	Date:	22-Jan-20	Synchro Node:	15	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1102			FM 1102			Hoffman Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	11	28	0	0	36	18	36	0	38	0	0	0
7:15 AM	10	23	0	0	48	19	51	0	44	0	0	0
7:30 AM	10	38	0	0	42	11	58	0	65	0	0	0
7:45 AM	15	24	0	0	49	3	37	0	42	0	0	0
8:00 AM	12	30	0	0	60	9	15	0	41	0	0	0
8:15 AM	16	29	0	0	39	10	23	0	46	0	0	0
8:30 AM	17	35	0	0	46	3	22	0	25	0	0	0
8:45 AM	11	38	0	0	37	3	18	0	22	0	0	0
Total	102	245	0	0	357	76	260	0	323	0	0	0
Peak Hour	46	113	0	0	175	51	182	0	189	0	0	0

Pedestrians				
	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.55	0.83	0.00			0	0.00
42	199	0			0	0.00
					0	0.00
0.69	161					
0.00	0			47	115	0
0.74	192			0.78	0.76	0.00

Diagram for: 07:15 AM-08:15 AM

Peak Hour: **07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	**FM 1102**											
East/West Street:	**Hoffman Ln /**											
TOD:	**PM**	Date:	22-Jan-20		Synchro Node:		15	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	FM 1102			FM 1102			Hoffman Ln					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	26	60	0	0	38	23	17	0	22	0	0	0
4:15 PM	35	64	0	0	54	28	14	0	17	0	0	0
4:30 PM	38	53	0	0	51	38	15	0	17	0	0	0
4:45 PM	42	63	0	0	52	38	17	0	24	0	0	0
5:00 PM	44	66	0	0	63	30	11	0	22	0	0	0
5:15 PM	40	69	0	0	67	43	12	0	26	0	0	0
5:30 PM	53	63	0	0	71	59	10	0	33	0	0	0
5:45 PM	38	55	0	0	52	29	15	0	25	0	0	0
Total	316	493	0	0	448	288	111	0	186	0	0	0
Peak Hour	179	261	0	0	253	170	50	0	105	0	0	0

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.72	0.89	0.00		0	0.00
170	253	0		0	0.00
				0	0.00
0.74	50				
0.00	0		179	261	0
0.80	105		0.84	0.95	0.00

Diagram for:	Peak Hour
Peak Hour:	**04:45 PM-05:45 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	**FM 1102**
East/West Street:	**/ Conrads Ln**

TOD:	**AM**	Date:	22-Jan-20	Synchro Node:	16	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	FM 1102			FM 1102						Conrads Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	24	5	21	54	0	0	0	0	5	0	14
7:15 AM	0	22	2	22	71	0	0	0	0	6	0	11
7:30 AM	0	31	3	23	82	0	0	0	0	8	0	16
7:45 AM	0	31	7	19	75	0	0	0	0	11	0	9
8:00 AM	0	33	5	21	79	0	0	0	0	3	0	10
8:15 AM	0	37	7	20	64	0	0	0	0	7	0	9
8:30 AM	0	45	3	10	64	0	0	0	0	12	0	5
8:45 AM	0	43	8	9	49	0	0	0	0	8	0	4
Total	0	266	40	145	538	0	0	0	0	60	0	78
Peak Hour	0	132	22	83	300	0	0	0	0	29	0	44

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.94	0.92		46	0.72
0	307	85		0	0.00
				28	0.64
0.00	0				
0.00	0		0	117	17
0.00	0		0.00	0.89	0.61

Diagram for:	07:15 AM-08:15 AM
Peak Hour:	**07:30 AM-08:30 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	FM 1102											
East/West Street:	/ Conrads Ln											
TOD:	PM	Date:	22-Jan-20		Synchro Node:		16	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	FM 1102			FM 1102						Conrads Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	78	14	17	44	0	0	0	0	8	0	13
4:15 PM	0	76	9	14	60	0	0	0	0	5	0	18
4:30 PM	0	70	13	13	57	0	0	0	0	7	0	21
4:45 PM	0	96	14	17	59	0	0	0	0	6	0	16
5:00 PM	0	80	7	22	64	0	0	0	0	7	0	19
5:15 PM	0	92	12	23	69	0	0	0	0	3	0	16
5:30 PM	0	87	13	23	79	0	0	0	0	6	0	25
5:45 PM	0	74	5	12	65	0	0	0	0	7	0	15
Total	0	653	87	141	497	0	0	0	0	49	0	143
Peak Hour	0	355	46	85	271	0	0	0	0	22	0	76

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.86	0.92		76	0.76
0	271	85		0	0.00
				22	0.79
0.00	0				
0.00	0		0	355	46
0.00	0		0.00	0.92	0.82

Diagram for:	Peak Hour
Peak Hour:	**04:45 PM-05:45 PM**

PAPE-DAWSON ENGINEERS

North/South Street:	Goodwin Ln						
East/West Street:	/ Conrads Ln						
TOD:	**AM**	Date:	22-Jan-20	Synchro Node:	17	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01

	Northbound			Southbound			Eastbound			Westbound		
	Goodwin Ln			Goodwin Ln						Conrads Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	6	44	44	30	0	0	0	0	22	0	9
7:15 AM	0	19	42	47	34	0	0	0	0	18	0	6
7:30 AM	0	31	60	57	21	0	0	0	0	14	0	17
7:45 AM	0	0	23	54	5	0	0	0	0	8	0	18
8:00 AM	0	4	26	48	3	0	0	0	0	15	0	18
8:15 AM	0	4	12	49	2	0	0	0	0	16	0	20
8:30 AM	0	1	9	27	3	0	0	0	0	13	0	9
8:45 AM	0	2	14	21	2	0	0	0	0	8	0	11
Total	0	67	230	347	100	0	0	0	0	114	0	108
Peak Hour	0	56	169	202	90	0	0	0	0	62	0	50

Pedestrians

	NB	SB	EB	WB
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM				
8:15 AM				
8:30 AM				
8:45 AM				

0.00	0.46	0.90		59	0.82
0	63	206		0	0.00
				55	0.76
0.00	0				
0.00	0		0	54	151
0.00	0		0.00	0.44	0.63

Diagram for: 07:15 AM-08:15 AM
Peak Hour: **07:00 AM-08:00 AM**

PAPE-DAWSON ENGINEERS

North/South Street:	Goodwin Ln											
East/West Street:	/ Conrads Ln											
TOD:	**PM**	Date:	22-Jan-20		Synchro Node:		17	Raw Data:	P:\300\02\01\Data\RAW\Pape-Dawson - 01			
	Northbound			Southbound			Eastbound			Westbound		
	Goodwin Ln			Goodwin Ln						Conrads Ln		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	9	13	30	5	0	0	0	0	30	0	20
4:15 PM	0	7	17	17	7	0	0	0	0	40	0	22
4:30 PM	0	9	13	32	5	0	0	0	0	52	0	29
4:45 PM	0	13	16	28	7	0	0	0	0	41	0	26
5:00 PM	0	9	24	26	7	0	0	0	0	38	0	17
5:15 PM	0	6	17	23	10	0	0	0	0	36	0	23
5:30 PM	0	12	19	37	5	0	0	0	0	43	0	24
5:45 PM	0	12	15	20	5	0	0	0	0	45	0	25
Total	0	77	134	213	51	0	0	0	0	325	0	186
Peak Hour	0	37	70	109	29	0	0	0	0	167	0	95

Pedestrians

	NB	SB	EB	WB
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM				
5:15 PM				
5:30 PM				
5:45 PM				

0.00	0.73	0.77		90	0.87
0	29	114		0	0.00
				158	0.92
0.00	0				
0.00	0		0	40	76
0.00	0		0.00	0.77	0.79

Diagram for:	04:45 PM-05:45 PM
Peak Hour:	**04:30 PM-05:30 PM**

PAPE-DAWSON ENGINEERS

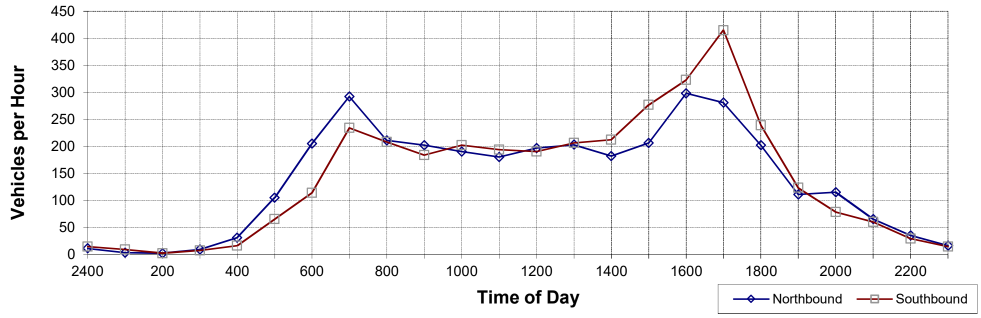
Pape-Dawson Engineers, Inc. — Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: FM 1102, N of Hoffman



Time	Peak	Northbound	TMC	Southbound	TMC	Time	Peak	Northbound	TMC	Southbound	TMC
24:00		4		4		12:00		37		55	
0:15		3		5		12:15		41		45	
0:30		2		2		12:30	*	59		36	
0:45		2	11	3	14	12:45	*	60	197	54	190
1:00		2		1		13:00	*	52		44	
1:15		1		2		13:15	*	52		53	
1:30		0		1		13:30		43		50	
1:45		0	3	5	9	13:45		56	203	59	206
2:00		0		0		14:00		53		39	
2:15		0		1		14:15		30		48	
2:30		2		0		14:30		53		58	
2:45		0	2	1	2	14:45		46	182	67	212
3:00		5		1		15:00		47		57	
3:15		3		4		15:15		54		67	
3:30		1		2		15:30		65		65	
3:45		0	9	0	7	15:45		40	206	88	277
4:00		3		4		16:00		77		61	
4:15		6		2		16:15		74		82	
4:30		7		3		16:30		65		89	
4:45		15	31	7	16	16:45	*	82	298	91	323
5:00		21		8		17:00	*	75		95	
5:15		21		16		17:15	*	72		110	
5:30		30		18		17:30	*	67		128	
5:45		33	105	23	65	17:45		67	281	82	415
6:00		40		25		18:00		59		74	
6:15		48		22		18:15		43		67	
6:30		60		37		18:30		58		52	
6:45		57	205	30	114	18:45		42	202	46	239
7:00	*	64		53		19:00		33		40	
7:15	*	71		73		19:15		23		37	
7:30	*	97		51		19:30		27		25	
7:45	*	60	292	57	234	19:45		28	111	21	123
8:00		45		68		20:00		36		17	
8:15		55		49		20:15		26		23	
8:30		58		49		20:30		22		21	
8:45		53	211	42	208	20:45		31	115	17	78
9:00		48		49		21:00		25		13	
9:15		42		41		21:15		24		19	
9:30		53		45		21:30		9		16	
9:45		59	202	49	184	21:45		7	65	12	60
10:00		49		43		22:00		9		8	
10:15		48		53		22:15		13		8	
10:30		49		64		22:30		5		5	
10:45		44	190	42	202	22:45		8	35	8	29
11:00		35		47		23:00		5		3	
11:15		48		54		23:15		5		3	
11:30		46		58		23:30		4		5	
11:45		51	180	35	194	23:45		2	16	3	14

AM Peak Hour	7:00-8:00	Directional Volumes	3,352	3,415
% of ADT	7.8%	**24-Hour Volume**		6,767
PM Peak Hour	16:45-17:45			
% of ADT	10.6%			

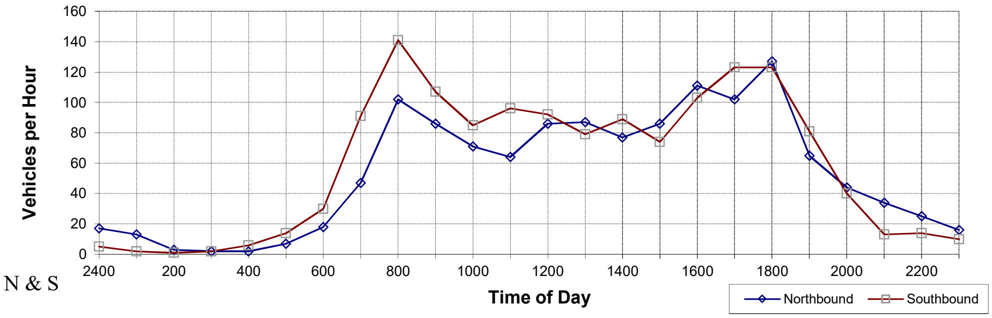
Pape-Dawson Engineers, Inc.	Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: FM 1101, btwn Kohlenberg N & S



Time	Peak	Northbound	TMC	Southbound	TMC	Time	Peak	Northbound	TMC	Southbound	TMC
24:00		8		2		12:00		18		25	
0:15		4		1		12:15		26		18	
0:30		1		2		12:30	*	22		25	
0:45		4	17	0	5	12:45	*	20	86	24	92
1:00		4		1		13:00	*	24		21	
1:15		4		0		13:15	*	21		26	
1:30		2		1		13:30		21		14	
1:45		3	13	0	2	13:45		21	87	18	79
2:00		1		0		14:00		28		13	
2:15		0		0		14:15		23		27	
2:30		1		0		14:30		15		24	
2:45		1	3	1	1	14:45		11	77	25	89
3:00		0		1		15:00		21		13	
3:15		0		0		15:15		23		20	
3:30		1		1		15:30		27		23	
3:45		1	2	0	2	15:45		15	86	18	74
4:00		0		0		16:00		34		32	
4:15		1		1		16:15		19		21	
4:30		1		5		16:30		31		26	
4:45		0	2	0	6	16:45		27	111	24	103
5:00		0		1		17:00		28		29	
5:15		3		3		17:15		22		27	
5:30		1		5		17:30		23		33	
5:45		3	7	5	14	17:45	*	29	102	34	123
6:00		2		5		18:00	*	44		34	
6:15		2		9		18:15	*	24		35	
6:30		1		7		18:30	*	36		28	
6:45		13	18	9	30	18:45		23	127	26	123
7:00		6		15		19:00		27		27	
7:15		12		16		19:15		12		21	
7:30		17		26		19:30		18		19	
7:45		12	47	34	91	19:45		8	65	14	81
8:00		21		29		20:00		9		8	
8:15	*	34		31		20:15		17		8	
8:30	*	27		35		20:30		11		16	
8:45	*	20	102	46	141	20:45		7	44	8	40
9:00	*	22		29		21:00		8		2	
9:15		15		21		21:15		7		4	
9:30		20		33		21:30		10		3	
9:45		29	86	24	107	21:45		9	34	4	13
10:00		13		24		22:00		6		5	
10:15		21		24		22:15		9		5	
10:30		18		17		22:30		5		1	
10:45		19	71	20	85	22:45		5	25	3	14
11:00		15		29		23:00		3		6	
11:15		13		27		23:15		7		2	
11:30		15		23		23:30		3		1	
11:45		21	64	17	96	23:45		3	16	1	10

AM Peak Hour	8:15-9:15	Directional Volumes	1,292	1,421
% of ADT	9.0%	24-Hour Volume		2,713
PM Peak Hour	17:45-18:45			
% of ADT	9.7%			

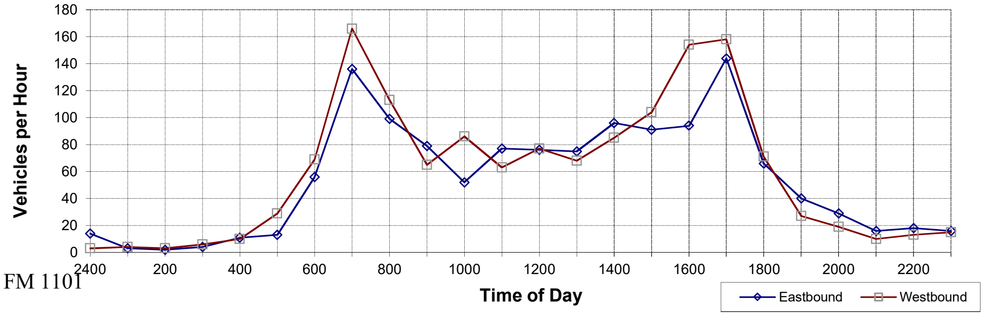
Pape-Dawson Engineers, Inc.	Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: Kohlenberg, btwn IH-35 and FM 1101



Time	Peak	Eastbound	TMC	Westbound	TMC	Time	Peak	Eastbound	TMC	Westbound	TMC
24:00		2		3		12:00		22		15	
0:15		3		0		12:15		19		21	
0:30		6		0		12:30		15		17	
0:45		3	14	0	3	12:45		20	76	24	77
1:00		2		1		13:00		22		19	
1:15		0		2		13:15		21		17	
1:30		0		0		13:30		19		16	
1:45		1	3	1	4	13:45		13	75	16	68
2:00		0		2		14:00	*	23		16	
2:15		0		0		14:15	*	25		21	
2:30		1		1		14:30	*	30		23	
2:45		1	2	0	3	14:45	*	18	96	25	85
3:00		1		0		15:00		21		33	
3:15		2		0		15:15		14		19	
3:30		1		5		15:30		21		29	
3:45		0	4	1	6	15:45		35	91	23	104
4:00		1		1		16:00		30		25	
4:15		5		3		16:15		20		42	
4:30		1		3		16:30		21		50	
4:45		4	11	3	10	16:45		23	94	37	154
5:00		2		4		17:00	*	38		42	
5:15		1		5		17:15	*	40		37	
5:30		0		7		17:30	*	41		39	
5:45		10	13	13	29	17:45	*	25	144	40	158
6:00		6		7		18:00		24		22	
6:15		12		15		18:15		15		22	
6:30		21		21		18:30		16		19	
6:45		17	56	26	69	18:45		11	66	8	71
7:00	*	31		41		19:00		14		9	
7:15	*	35		29		19:15		16		6	
7:30	*	37		46		19:30		8		10	
7:45	*	33	136	50	166	19:45		2	40	2	27
8:00		33		25		20:00		9		9	
8:15		18		26		20:15		6		5	
8:30		26		44		20:30		5		3	
8:45		22	99	18	113	20:45		9	29	2	19
9:00		17		17		21:00		3		1	
9:15		23		18		21:15		6		3	
9:30		27		14		21:30		5		2	
9:45		12	79	16	65	21:45		2	16	4	10
10:00		10		20		22:00		4		1	
10:15		12		21		22:15		5		6	
10:30		10		28		22:30		3		2	
10:45		20	52	17	86	22:45		6	18	4	13
11:00		10		16		23:00		8		3	
11:15		28		13		23:15		1		5	
11:30		17		15		23:30		3		4	
11:45		22	77	19	63	23:45		4	16	3	15

AM Peak Hour	7:00-8:00
% of ADT	11.1%
PM Peak Hour	17:00-18:00
% of ADT	11.1%

	Eastbound	Westbound
Directional Volumes	1,307	1,418
24-Hour Volume		2,725

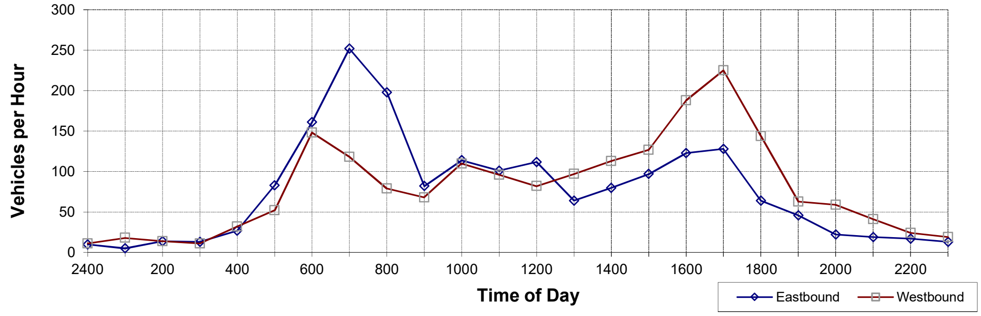
Pape-Dawson Engineers, Inc.	Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: Watson Ln W, W of IH 35



Time	Peak	Eastbound	TMC	Westbound	TMC	Time	Peak	Eastbound	TMC	Westbound	TMC
24:00		4		6		12:00	*	38		29	
0:15		2		3		12:15	*	25		23	
0:30		1		0		12:30		14		16	
0:45		3	10	2	11	12:45		35	112	14	82
1:00		0		1		13:00		20		20	
1:15		2		9		13:15		14		26	
1:30		3		5		13:30		14		30	
1:45		0	5	3	18	13:45		16	64	21	97
2:00		3		4		14:00		23		29	
2:15		6		3		14:15		24		27	
2:30		3		3		14:30		9		22	
2:45		2	14	4	14	14:45		24	80	35	113
3:00		5		3		15:00		19		30	
3:15		2		3		15:15		22		33	
3:30		5		3		15:30		30		31	
3:45		1	13	2	11	15:45		26	97	33	127
4:00		5		6		16:00		33		38	
4:15		5		2		16:15		40		46	
4:30		8		11		16:30		23		50	
4:45		9	27	13	32	16:45		27	123	54	188
5:00		19		6		17:00	*	44		59	
5:15		13		14		17:15	*	28		64	
5:30		21		14		17:30	*	27		49	
5:45		30	83	18	52	17:45	*	29	128	53	225
6:00		40		28		18:00		8		33	
6:15		39		34		18:15		17		52	
6:30		38		54		18:30		18		38	
6:45		44	161	32	148	18:45		21	64	21	144
7:00		62		30		19:00		14		21	
7:15		61		27		19:15		10		13	
7:30	*	68		33		19:30		13		20	
7:45	*	61	252	28	118	19:45		9	46	9	63
8:00	*	51		21		20:00		4		16	
8:15	*	90		18		20:15		5		18	
8:30		28		21		20:30		5		12	
8:45		29	198	19	79	20:45		8	22	13	59
9:00		24		16		21:00		7		14	
9:15		13		17		21:15		4		11	
9:30		23		11		21:30		5		7	
9:45		22	82	24	68	21:45		3	19	9	41
10:00		34		24		22:00		4		9	
10:15		17		26		22:15		3		0	
10:30		35		27		22:30		7		6	
10:45		28	114	33	110	22:45		3	17	9	24
11:00		25		22		23:00		2		5	
11:15		28		20		23:15		4		4	
11:30	*	26		27		23:30		3		5	
11:45	*	22	101	27	96	23:45		4	13	5	19

AM Peak Hour	7:30-8:30 *	Directional Volumes	1,845	1,939
% of ADT	9.8%	**24-Hour Volume**	3,784	
PM Peak Hour	17:00-18:00			
% of ADT	9.3%			

* More than 1peak hour period

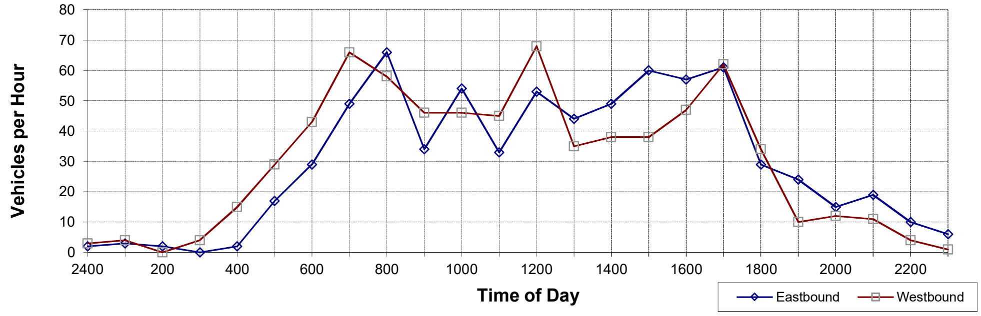
Pape-Dawson Engineers, Inc.	**Automatic Traffic Counts**

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: Watson Ln E, E of IH 35



Time	Peak	Eastbound	TMC	Westbound	TMC	Time	Peak	Eastbound	TMC	Westbound	TMC
24:00		0		1		12:00	*	17		19	
0:15		0		0		12:15	*	15		16	
0:30		2		0		12:30	*	11		18	
0:45		0	2	2	3	12:45	*	10	53	15	68
1:00		1		0		13:00		6		4	
1:15		1		1		13:15		9		10	
1:30		1		2		13:30		18		10	
1:45		0	3	1	4	13:45		11	44	11	35
2:00		1		0		14:00		17		11	
2:15		1		0		14:15		13		5	
2:30		0		0		14:30		11		4	
2:45		0	2	0	0	14:45		8	49	18	38
3:00		0		0		15:00		12		11	
3:15		0		2		15:15		6		5	
3:30		0		2		15:30		20		9	
3:45		0	0	0	4	15:45		22	60	13	38
4:00		1		0		16:00		9		15	
4:15		0		0		16:15		14		17	
4:30		1		6		16:30		17		9	
4:45		0	2	9	15	16:45	*	17	57	6	47
5:00		3		2		17:00	*	18		31	
5:15		2		6		17:15	*	12		15	
5:30		8		10		17:30	*	19		12	
5:45		4	17	11	29	17:45		12	61	4	62
6:00		7		12		18:00		8		15	
6:15		2		13		18:15		7		7	
6:30		8		9		18:30		8		4	
6:45		12	29	9	43	18:45		6	29	8	34
7:00		17		20		19:00		5		2	
7:15		10		5		19:15		3		3	
7:30		9		13		19:30		9		2	
7:45	*	13	49	28	66	19:45		7	24	3	10
8:00	*	19		14		20:00		2		6	
8:15	*	15		22		20:15		9		2	
8:30	*	18		11		20:30		1		2	
8:45		14	66	11	58	20:45		3	15	2	12
9:00		10		10		21:00		5		1	
9:15		4		3		21:15		5		5	
9:30		11		17		21:30		3		1	
9:45		9	34	16	46	21:45		6	19	4	11
10:00		15		14		22:00		1		2	
10:15		14		12		22:15		3		1	
10:30		12		13		22:30		3		0	
10:45		13	54	7	46	22:45		3	10	1	4
11:00		10		11		23:00		4		0	
11:15		8		17		23:15		1		1	
11:30		6		11		23:30		0		0	
11:45		9	33	6	45	23:45		1	6	0	1

AM Peak Hour	7:45-8:45	Directional Volumes	718	719
% of ADT	9.7%	**24-Hour Volume**		1,437
PM Peak Hour	16:45-17:45			
% of ADT	9.0%			

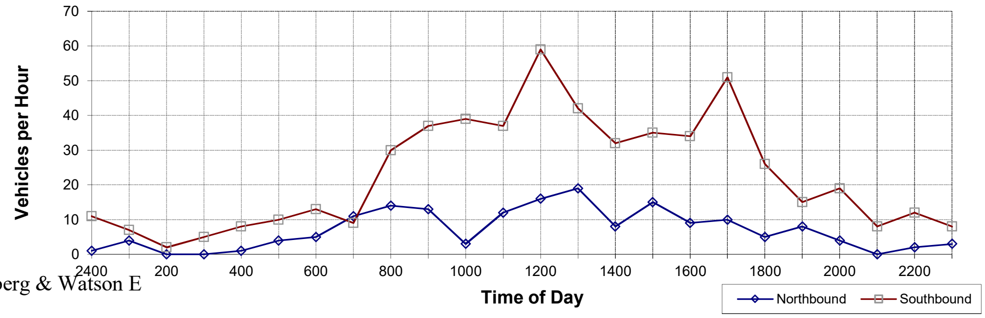
Pape-Dawson Engineers, Inc.	**Automatic Traffic Counts**

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: IH 35 SBFR , btwn Kohlenberg & Watson E



Time	Peak	Northbound	TMC	Southbound	TMC	Time	Peak	Northbound	TMC	Southbound	TMC
24:00		0		3		12:00	*	3		24	
0:15		0		2		12:15	*	6		10	
0:30		1		4		12:30	*	4		10	
0:45		0	1	2	11	12:45	*	3	16	15	59
1:00		0		6		13:00		7		11	
1:15		4		1		13:15		3		11	
1:30		0		0		13:30		8		9	
1:45		0	4	0	7	13:45		1	19	11	42
2:00		0		0		14:00		4		12	
2:15		0		0		14:15		3		9	
2:30		0		2		14:30		0		2	
2:45		0	0	0	2	14:45		1	8	9	32
3:00		0		0		15:00		0		8	
3:15		0		2		15:15		3		9	
3:30		0		0		15:30		6		4	
3:45		0	0	3	5	15:45		6	15	14	35
4:00		0		6		16:00		2		9	
4:15		1		0		16:15		1		12	
4:30		0		1		16:30		2		9	
4:45		0	1	1	8	16:45		4	9	4	34
5:00		0		0		17:00	*	3		12	
5:15		1		2		17:15	*	2		16	
5:30		1		2		17:30	*	3		14	
5:45		2	4	6	10	17:45	*	2	10	9	51
6:00		1		3		18:00		1		8	
6:15		0		0		18:15		2		6	
6:30		1		7		18:30		0		6	
6:45		3	5	3	13	18:45		2	5	6	26
7:00		2		1		19:00		4		4	
7:15		2		2		19:15		2		4	
7:30		4		5		19:30		1		3	
7:45		3	11	1	9	19:45		1	8	4	15
8:00		10		5		20:00		1		10	
8:15		3		5		20:15		0		2	
8:30		1		10		20:30		2		4	
8:45		0	14	10	30	20:45		1	4	3	19
9:00		3		3		21:00		0		1	
9:15	*	1		10		21:15		0		3	
9:30	*	1		14		21:30		0		0	
9:45	*	8	13	10	37	21:45		0	0	4	8
10:00	*	1		7		22:00		1		1	
10:15		1		9		22:15		0		2	
10:30		1		9		22:30		1		7	
10:45		0	3	14	39	22:45		0	2	2	12
11:00		2		15		23:00		1		1	
11:15		5		5		23:15		0		3	
11:30		2		15		23:30		0		1	
11:45		3	12	2	37	23:45		2	3	3	8

AM Peak Hour	9:15-10:15	Directional Volumes	167	549
% of ADT	7.3%	**24-Hour Volume**		716
PM Peak Hour	17:00-18:00			
% of ADT	8.5%			

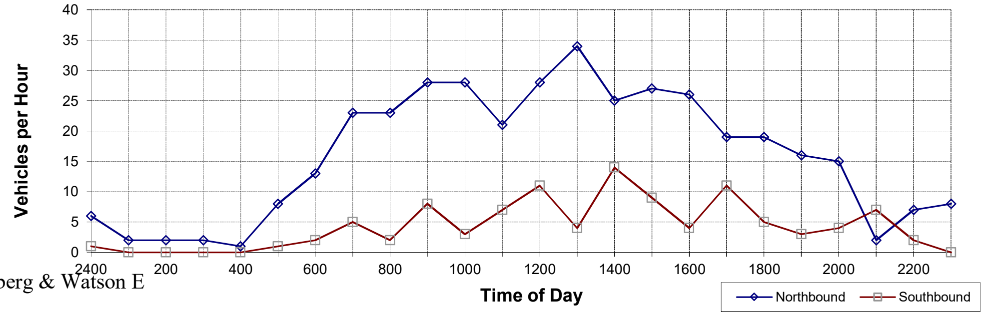
Pape-Dawson Engineers, Inc.	Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: IH 35 NBFR , btwn Kohlenberg & Watson E



Time	Peak	Northbound	TMC	Southbound	TMC	Time	Peak	Northbound	TMC	Southbound	TMC
24:00		0		0		12:00		6		2	
0:15		1		0		12:15		4		2	
0:30		0		0		12:30	*	8		3	
0:45		5	6	1	1	12:45	*	10	28	4	11
1:00		2		0		13:00	*	12		2	
1:15		0		0		13:15	*	9		2	
1:30		0		0		13:30		7		0	
1:45		0	2	0	0	13:45		6	34	0	4
2:00		2		0		14:00		3		2	
2:15		0		0		14:15		11		4	
2:30		0		0		14:30		3		5	
2:45		0	2	0	0	14:45		8	25	3	14
3:00		0		0		15:00	*	7		5	
3:15		0		0		15:15	*	9		0	
3:30		0		0		15:30	*	9		2	
3:45		2	2	0	0	15:45	*	2	27	2	9
4:00		0		0		16:00		7		1	
4:15		0		0		16:15		3		2	
4:30		0		0		16:30		8		0	
4:45		1	1	0	0	16:45		8	26	1	4
5:00		0		0		17:00		1		2	
5:15		1		0		17:15		6		2	
5:30		6		1		17:30		9		0	
5:45		1	8	0	1	17:45		3	19	7	11
6:00		2		0		18:00		4		2	
6:15		2		0		18:15		3		3	
6:30		4		1		18:30		6		0	
6:45		5	13	1	2	18:45		6	19	0	5
7:00		8		1		19:00		4		0	
7:15		4		1		19:15		3		3	
7:30		2		2		19:30		4		0	
7:45		9	23	1	5	19:45		5	16	0	3
8:00		4		0		20:00		4		2	
8:15		7		0		20:15		3		1	
8:30		4		1		20:30		3		0	
8:45	*	8	23	1	2	20:45		5	15	1	4
9:00	*	6		2		21:00		0		0	
9:15	*	8		3		21:15		1		0	
9:30	*	10		1		21:30		0		7	
9:45		4	28	2	8	21:45		1	2	0	7
10:00		6		0		22:00		0		1	
10:15		6		0		22:15		2		0	
10:30		7		1		22:30		4		0	
10:45		9	28	2	3	22:45		1	7	1	2
11:00		6		3		23:00		2		0	
11:15		2		2		23:15		1		0	
11:30		4		2		23:30		5		0	
11:45		9	21	0	7	23:45		0	8	0	0

AM Peak Hour	8:45-9:45	Directional Volumes	383	103
% of ADT	8.0%	**24-Hour Volume**	486	
PM Peak Hour	15:00-16:00			
% of ADT	6.8%			

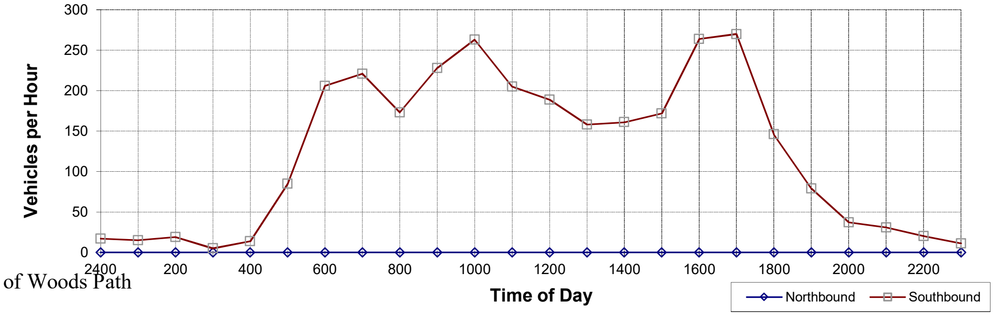
Pape-Dawson Engineers, Inc.	Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: IH 35 SB entrance ramp, S of Woods Path



Time	Peak	Northbound	TMC	Southbound	TMC
24:00		0		3	
0:15		0		1	
0:30		0		0	
0:45		0	0	13	17
1:00		0		5	
1:15		0		1	
1:30		0		1	
1:45		0	0	8	15
2:00		0		4	
2:15		0		5	
2:30		0		5	
2:45		0	0	5	19
3:00		0		0	
3:15		0		3	
3:30		0		1	
3:45		0	0	1	5
4:00		0		4	
4:15		0		1	
4:30		0		5	
4:45		0	0	4	14
5:00		0		13	
5:15		0		23	
5:30		0		14	
5:45		0	0	35	85
6:00		0		40	
6:15		0		50	
6:30		0		43	
6:45		0	0	73	206
7:00		0		70	
7:15		0		57	
7:30		0		32	
7:45		0	0	62	221
8:00		0		51	
8:15		0		54	
8:30		0		32	
8:45		0	0	36	173
9:00		0		41	
9:15		0		39	
9:30		0		70	
9:45	*	0	0	78	228
10:00	*	0		76	
10:15	*	0		70	
10:30	*	0		73	
10:45		0	0	44	263
11:00		0		65	
11:15		0		42	
11:30		0		44	
11:45	*	0	0	54	205

Time	Peak	Northbound	TMC	Southbound	TMC
12:00	*	0		53	
12:15	*	0		54	
12:30	*	0		44	
12:45		0	0	38	189
13:00		0		45	
13:15		0		40	
13:30		0		43	
13:45		0	0	30	158
14:00		0		41	
14:15		0		39	
14:30		0		34	
14:45		0	0	47	161
15:00		0		47	
15:15		0		33	
15:30		0		34	
15:45		0	0	58	172
16:00		0		96	
16:15		0		52	
16:30		0		55	
16:45	*	0	0	61	264
17:00	*	0		81	
17:15	*	0		73	
17:30	*	0		60	
17:45		0	0	56	270
18:00		0		41	
18:15		0		36	
18:30		0		40	
18:45		0	0	29	146
19:00		0		20	
19:15		0		22	
19:30		0		15	
19:45		0	0	22	79
20:00		0		18	
20:15		0		7	
20:30		0		7	
20:45		0	0	5	37
21:00		0		11	
21:15		0		9	
21:30		0		7	
21:45		0	0	4	31
22:00		0		2	
22:15		0		5	
22:30		0		10	
22:45		0	0	3	20
23:00		0		1	
23:15		0		2	
23:30		0		1	
23:45		0	0	7	11
		Directional Volumes	0		2,989
		24-Hour Volume			2,989

AM Peak Hour	9:45-10:45
% of ADT	9.9%
PM Peak Hour	16:45-17:45
% of ADT	9.2%

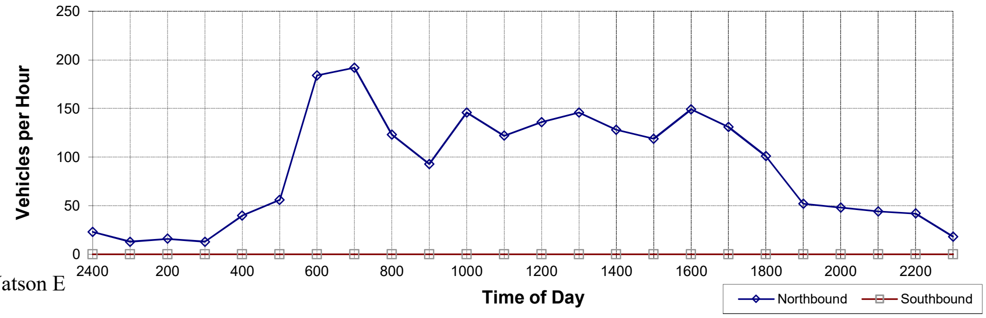
Pape-Dawson Engineers, Inc.	Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: IH 35 NB exit ramp, S of Watson E



Time	Peak	Northbound	TMC	Southbound	TMC	Time	Peak	Northbound	TMC	Southbound	TMC
24:00		10		0		12:00		41		0	
0:15		2		0		12:15		31		0	
0:30		9		0		12:30		38		0	
0:45		2	23	0	0	12:45		26	136	0	0
1:00		3		0		13:00		31		0	
1:15		0		0		13:15		36		0	
1:30		7		0		13:30	*	45		0	
1:45		3	13	0	0	13:45	*	34	146	0	0
2:00		7		0		14:00	*	43		0	
2:15		2		0		14:15	*	40		0	
2:30		4		0		14:30		21		0	
2:45		3	16	0	0	14:45		24	128	0	0
3:00		3		0		15:00		25		0	
3:15		4		0		15:15		40		0	
3:30		3		0		15:30		26		0	
3:45		3	13	0	0	15:45		28	119	0	0
4:00		10		0		16:00		25		0	
4:15		6		0		16:15	*	40		0	
4:30		11		0		16:30	*	44		0	
4:45		13	40	0	0	16:45	*	40	149	0	0
5:00		7		0		17:00	*	38		0	
5:15		22		0		17:15		32		0	
5:30		9		0		17:30		21		0	
5:45		18	56	0	0	17:45		40	131	0	0
6:00		35		0		18:00		23		0	
6:15		43		0		18:15		33		0	
6:30	*	57		0		18:30		21		0	
6:45	*	49	184	0	0	18:45		24	101	0	0
7:00	*	51		0		19:00		15		0	
7:15	*	52		0		19:15		12		0	
7:30		48		0		19:30		13		0	
7:45		41	192	0	0	19:45		12	52	0	0
8:00		32		0		20:00		13		0	
8:15		30		0		20:15		11		0	
8:30		32		0		20:30		9		0	
8:45		29	123	0	0	20:45		15	48	0	0
9:00		29		0		21:00		8		0	
9:15		16		0		21:15		12		0	
9:30		25		0		21:30		8		0	
9:45		23	93	0	0	21:45		16	44	0	0
10:00		27		0		22:00		9		0	
10:15		35		0		22:15		11		0	
10:30		38		0		22:30		5		0	
10:45		46	146	0	0	22:45		17	42	0	0
11:00		25		0		23:00		8		0	
11:15		20		0		23:15		5		0	
11:30		42		0		23:30		1		0	
11:45		35	122	0	0	23:45		4	18	0	0

AM Peak Hour	6:30-7:30	Directional Volumes	2,135	0
% of ADT	9.8%	24-Hour Volume		2,135
PM Peak Hour	16:15-17:15			
% of ADT	7.6%			

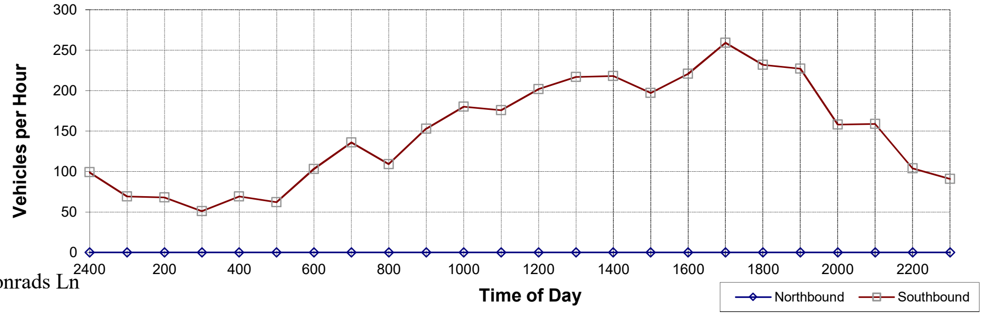
Pape-Dawson Engineers, Inc. **Automatic Traffic Counts**

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: IH 35 SB exit ramp, N of Conrads Ln



Time	Peak	Northbound		Southbound		Time	Peak	Northbound		Southbound	
			TMC		TMC				TMC		TMC
24:00		0		25		12:00		0		48	
0:15		0		26		12:15		0		46	
0:30		0		33		12:30		0		57	
0:45		0	0	15	99	12:45		0	0	51	202
1:00		0		20		13:00		0		48	
1:15		0		10		13:15		0		53	
1:30		0		17		13:30		0		66	
1:45		0	0	22	69	13:45		0	0	50	217
2:00		0		12		14:00	*	0		39	
2:15		0		25		14:15	*	0		63	
2:30		0		16		14:30	*	0		57	
2:45		0	0	15	68	14:45	*	0	0	59	218
3:00		0		6		15:00		0		50	
3:15		0		11		15:15		0		59	
3:30		0		21		15:30		0		32	
3:45		0	0	13	51	15:45		0	0	56	197
4:00		0		6		16:00		0		59	
4:15		0		16		16:15		0		45	
4:30		0		31		16:30		0		59	
4:45		0	0	16	69	16:45		0	0	58	221
5:00		0		4		17:00		0		56	
5:15		0		19		17:15	*	0		73	
5:30		0		17		17:30	*	0		68	
5:45		0	0	22	62	17:45	*	0	0	62	259
6:00		0		21		18:00	*	0		70	
6:15		0		21		18:15		0		64	
6:30		0		23		18:30		0		48	
6:45		0	0	38	103	18:45		0	0	50	232
7:00		0		23		19:00		0		42	
7:15		0		29		19:15		0		76	
7:30		0		41		19:30		0		53	
7:45		0	0	43	136	19:45		0	0	56	227
8:00		0		26		20:00		0		44	
8:15		0		34		20:15		0		41	
8:30		0		26		20:30		0		45	
8:45		0	0	23	109	20:45		0	0	28	158
9:00		0		31		21:00		0		51	
9:15		0		44		21:15		0		36	
9:30		0		34		21:30		0		42	
9:45		0	0	44	153	21:45		0	0	30	159
10:00	*	0		40		22:00		0		26	
10:15	*	0		48		22:15		0		21	
10:30	*	0		38		22:30		0		14	
10:45	*	0	0	54	180	22:45		0	0	43	104
11:00		0		55		23:00		0		21	
11:15		0		44		23:15		0		23	
11:30		0		51		23:30		0		22	
11:45		0	0	26	176	23:45		0	0	25	91

AM Peak Hour	10:00-11:00	Directional Volumes	0	3,560
% of ADT	5.1%	**24-Hour Volume**		3,560
PM Peak Hour	17:15-18:15			
% of ADT	7.7%			

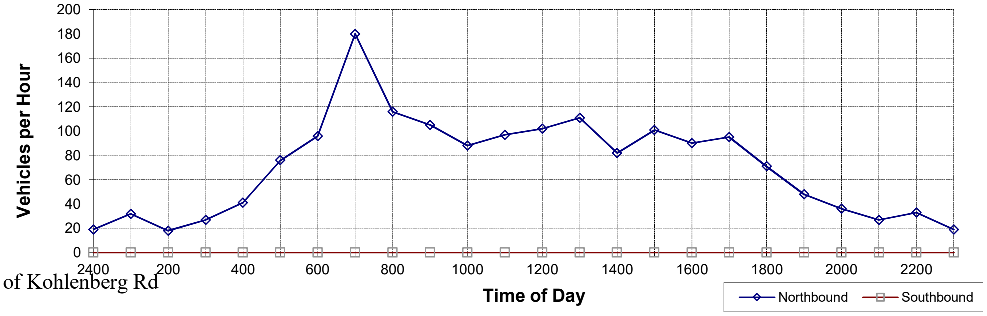
Pape-Dawson Engineers, Inc.	**Automatic Traffic Counts**

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: IH 35 NB entrance ramp, N of Kohlenberg Rd



Time	Peak	Northbound		Southbound		Time	Peak	Northbound		Southbound	
			TMC		TMC				TMC		TMC
24:00		5		0		12:00		27		0	
0:15		3		0		12:15		29		0	
0:30		5		0		12:30		23		0	
0:45		6	19	0	0	12:45		23	102	0	0
1:00		4		0		13:00	*	27		0	
1:15		8		0		13:15	*	23		0	
1:30		10		0		13:30	*	32		0	
1:45		10	32	0	0	13:45	*	29	111	0	0
2:00		2		0		14:00		18		0	
2:15		9		0		14:15		20		0	
2:30		2		0		14:30		29		0	
2:45		5	18	0	0	14:45		15	82	0	0
3:00		8		0		15:00		26		0	
3:15		14		0		15:15		23		0	
3:30		0		0		15:30		16		0	
3:45		5	27	0	0	15:45	*	36	101	0	0
4:00		3		0		16:00	*	21		0	
4:15		4		0		16:15	*	25		0	
4:30		19		0		16:30	*	23		0	
4:45		15	41	0	0	16:45		21	90	0	0
5:00		15		0		17:00		30		0	
5:15		21		0		17:15		16		0	
5:30		15		0		17:30		31		0	
5:45		25	76	0	0	17:45		18	95	0	0
6:00		19		0		18:00		23		0	
6:15		24		0		18:15		9		0	
6:30		23		0		18:30		20		0	
6:45		30	96	0	0	18:45		19	71	0	0
7:00		33		0		19:00		13		0	
7:15	*	45		0		19:15		16		0	
7:30	*	49		0		19:30		15		0	
7:45	*	53	180	0	0	19:45		4	48	0	0
8:00	*	34		0		20:00		14		0	
8:15		35		0		20:15		8		0	
8:30		27		0		20:30		11		0	
8:45		20	116	0	0	20:45		3	36	0	0
9:00		27		0		21:00		7		0	
9:15		31		0		21:15		6		0	
9:30		31		0		21:30		5		0	
9:45		16	105	0	0	21:45		9	27	0	0
10:00		23		0		22:00		8		0	
10:15		21		0		22:15		6		0	
10:30		17		0		22:30		10		0	
10:45		27	88	0	0	22:45		9	33	0	0
11:00		24		0		23:00		2		0	
11:15		21		0		23:15		6		0	
11:30		20		0		23:30		9		0	
11:45		32	97	0	0	23:45		2	19	0	0

AM Peak Hour	7:15-8:15	Directional Volumes	1,710	0
% of ADT	10.6%	**24-Hour Volume**		1,710
PM Peak Hour	15:45-16:45			
% of ADT	5.8%			

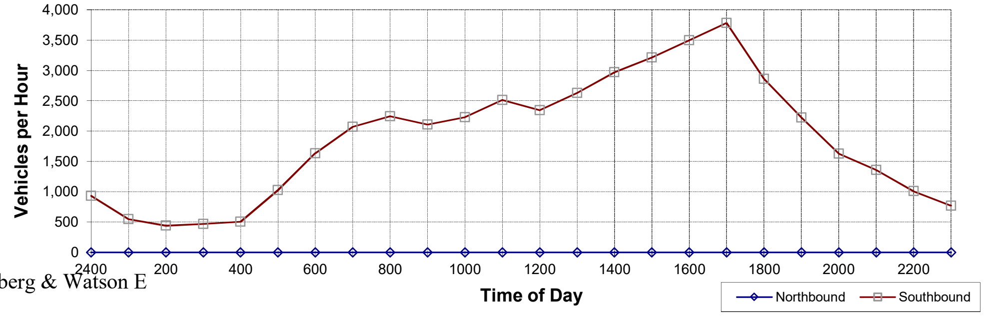
Pape-Dawson Engineers, Inc.	Automatic Traffic Counts

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: ML IH 35 SB , btwn Kohlenberg & Watson E



Time	Peak	Northbound		Southbound		Time	Peak	Northbound		Southbound	
			TMC		TMC				TMC		TMC
24:00		0		246		12:00		0		571	
0:15		0		262		12:15		0		549	
0:30		0		265		12:30		0		580	
0:45		0	0	161	934	12:45		0	0	643	2,343
1:00		0		196		13:00		0		632	
1:15		0		126		13:15		0		639	
1:30		0		114		13:30		0		684	
1:45		0	0	110	546	13:45		0	0	675	2,630
2:00		0		114		14:00	*	0		681	
2:15		0		108		14:15	*	0		762	
2:30		0		117		14:30	*	0		773	
2:45		0	0	101	440	14:45	*	0	0	756	2,972
3:00		0		111		15:00		0		680	
3:15		0		109		15:15		0		744	
3:30		0		114		15:30		0		861	
3:45		0	0	133	467	15:45		0	0	929	3,214
4:00		0		120		16:00		0		898	
4:15		0		105		16:15		0		810	
4:30		0		123		16:30		0		896	
4:45		0	0	157	505	16:45		0	0	895	3,499
5:00		0		186		17:00	*	0		887	
5:15		0		237		17:15	*	0		1,024	
5:30		0		289		17:30	*	0		961	
5:45		0	0	316	1,028	17:45	*	0	0	909	3,781
6:00		0		388		18:00		0		757	
6:15		0		371		18:15		0		760	
6:30		0		421		18:30		0		698	
6:45		0	0	453	1,633	18:45		0	0	647	2,862
7:00		0		427		19:00		0		578	
7:15		0		502		19:15		0		567	
7:30		0		537		19:30		0		547	
7:45	*	0	0	602	2,068	19:45		0	0	530	2,222
8:00	*	0		585		20:00		0		456	
8:15	*	0		531		20:15		0		433	
8:30	*	0		604		20:30		0		409	
8:45		0	0	526	2,246	20:45		0	0	331	1,629
9:00		0		531		21:00		0		359	
9:15		0		484		21:15		0		378	
9:30		0		527		21:30		0		333	
9:45		0	0	565	2,107	21:45		0	0	290	1,360
10:00		0		541		22:00		0		280	
10:15		0		567		22:15		0		254	
10:30		0		556		22:30		0		233	
10:45		0	0	566	2,230	22:45		0	0	242	1,009
11:00		0		599		23:00		0		236	
11:15		0		702		23:15		0		203	
11:30		0		616		23:30		0		184	
11:45		0	0	597	2,514	23:45		0	0	144	767

AM Peak Hour	7:45-8:45	Directional Volumes	0	45,006
% of ADT	5.2%	**24-Hour Volume**		45,006
PM Peak Hour	17:00-18:00			
% of ADT	8.4%			

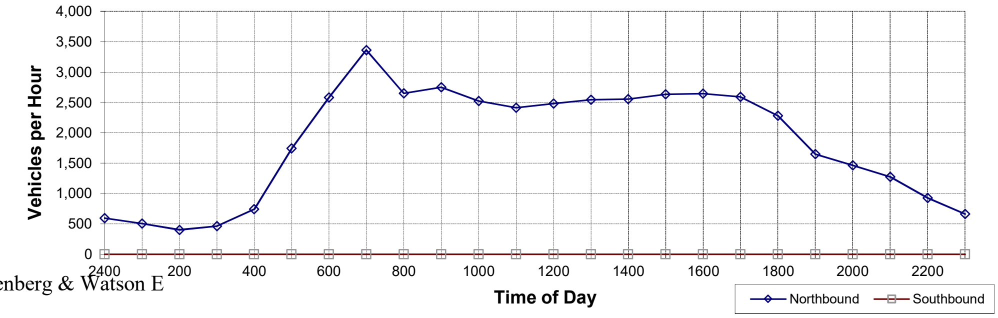
Pape-Dawson Engineers, Inc. **Automatic Traffic Counts**

Average Daily Traffic

Project No. : 30002-01
Station No. : January 22, 2020
Counter No. : 1

Location:
City/State: San Antonio, TX
Date: February 4, 2014
Day of Week: Tuesday

Site: ML IH 35 NB , btwn Kohlenberg & Watson E



Time	Peak	Northbound	TMC	Southbound	TMC	Time	Peak	Northbound	TMC	Southbound	TMC
24:00		146		0		12:00		654		0	
0:15		142		0		12:15		587		0	
0:30		153		0		12:30		599		0	
0:45		154	595	0	0	12:45		640	2,480	0	0
1:00		130		0		13:00		603		0	
1:15		133		0		13:15	*	653		0	
1:30		132		0		13:30	*	649		0	
1:45		112	507	0	0	13:45	*	640	2,545	0	0
2:00		97		0		14:00	*	620		0	
2:15		112		0		14:15		649		0	
2:30		98		0		14:30		646		0	
2:45		95	402	0	0	14:45		640	2,555	0	0
3:00		104		0		15:00		622		0	
3:15		108		0		15:15		663		0	
3:30		123		0		15:30		669		0	
3:45		128	463	0	0	15:45		680	2,634	0	0
4:00		137		0		16:00		614		0	
4:15		155		0		16:15	*	699		0	
4:30		204		0		16:30	*	661		0	
4:45		246	742	0	0	16:45	*	668	2,642	0	0
5:00		333		0		17:00	*	642		0	
5:15		382		0		17:15		697		0	
5:30		483		0		17:30		643		0	
5:45		546	1,744	0	0	17:45		608	2,590	0	0
6:00		531		0		18:00		632		0	
6:15		623		0		18:15		586		0	
6:30		705		0		18:30		570		0	
6:45		720	2,579	0	0	18:45		491	2,279	0	0
7:00	*	751		0		19:00		406		0	
7:15	*	796		0		19:15		422		0	
7:30	*	958		0		19:30		405		0	
7:45	*	858	3,363	0	0	19:45		418	1,651	0	0
8:00		663		0		20:00		373		0	
8:15		713		0		20:15		379		0	
8:30		635		0		20:30		371		0	
8:45		639	2,650	0	0	20:45		342	1,465	0	0
9:00		701		0		21:00		337		0	
9:15		703		0		21:15		314		0	
9:30		666		0		21:30		332		0	
9:45		681	2,751	0	0	21:45		292	1,275	0	0
10:00		663		0		22:00		263		0	
10:15		665		0		22:15		231		0	
10:30		588		0		22:30		229		0	
10:45		605	2,521	0	0	22:45		205	928	0	0
11:00		601		0		23:00		209		0	
11:15		616		0		23:15		178		0	
11:30		604		0		23:30		150		0	
11:45		594	2,415	0	0	23:45		126	663	0	0

AM Peak Hour	7:00-8:00	Directional Volumes	44,439	0
% of ADT	7.6%	**24-Hour Volume**		44,439
PM Peak Hour	16:15-17:15			
% of ADT	6.0%			

APPENDIX D
FDOT Roadway Sizing

Minor C
Major C
Minor A
Principal A
Parkway

13300
31680
39050
58850

TABLE 2

Generalized **Annual Average Daily** Volumes for Florida's **Transitioning Areas** and **Areas Over 5,000 Not In Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	14,400	16,200	**
4	Divided	*	34,000	35,500	**
6	Divided	*	52,100	53,500	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	6,500	13,300	14,200
4	Divided	*	9,900	28,800	31,600
6	Divided	*	16,000	44,900	47,600

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5% x2

+5% x2
+5% x2

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,600	6,100	19,500
50-84%	1,900	5,500	18,400	>19,500
85-100%	7,500	19,500	>19,500	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,400
50-84%	*	1,600	8,600	15,600
85-100%	3,800	10,500	17,100	>19,500

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	44,100	57,600	68,900	71,700
6	65,100	85,600	102,200	111,000
8	85,100	113,700	135,200	150,000
10	106,200	141,700	168,800	189,000

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 20,000	+ 5%

28,800 * 1.1 = 31,6800
35,500 × 1.1 = 39,050
53,500 × 1.1 = 58,850

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	9,200	17,300	24,400	33,300
4	Divided	35,300	49,600	62,900	69,600
6	Divided	52,800	74,500	94,300	104,500

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

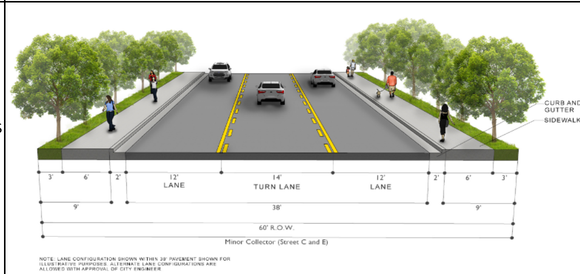
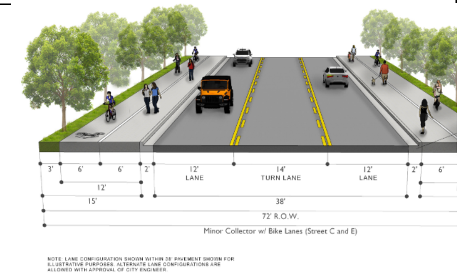
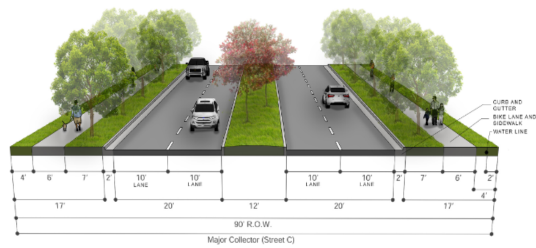
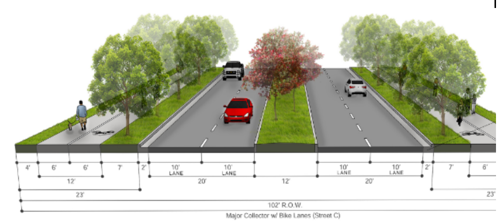
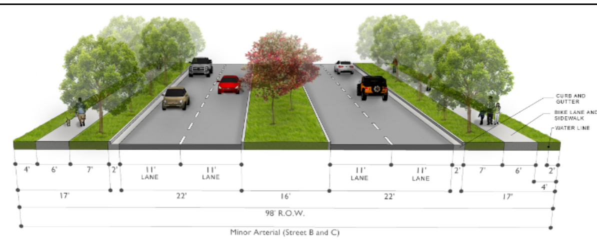
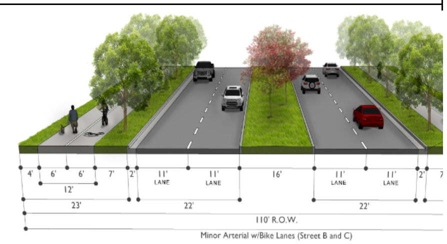
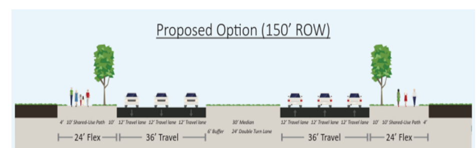
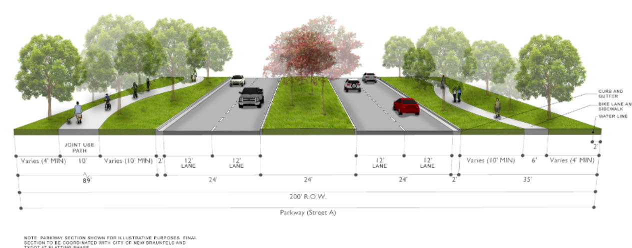
[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

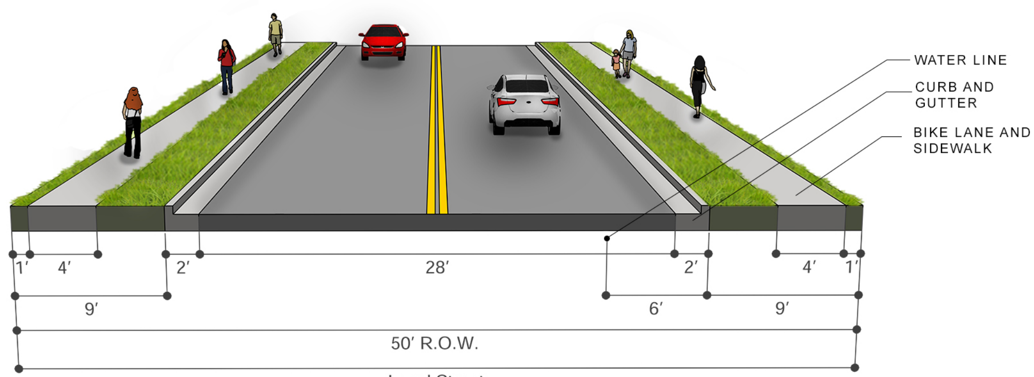
[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

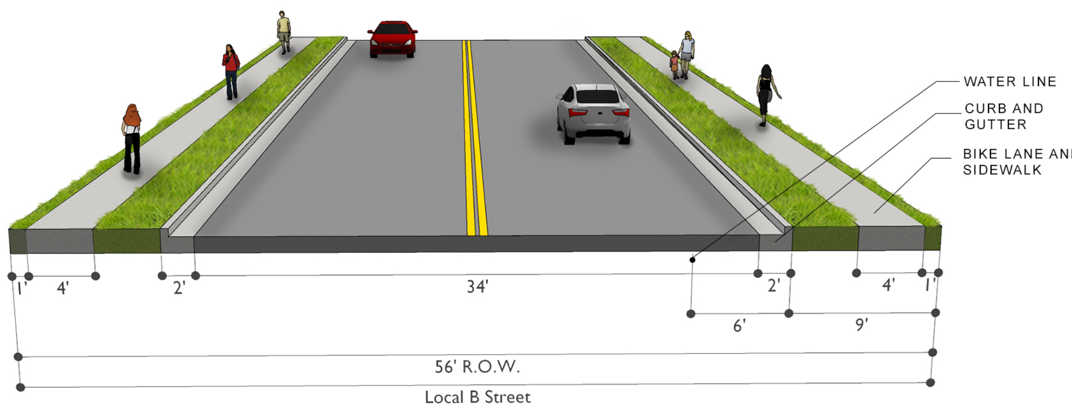
** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

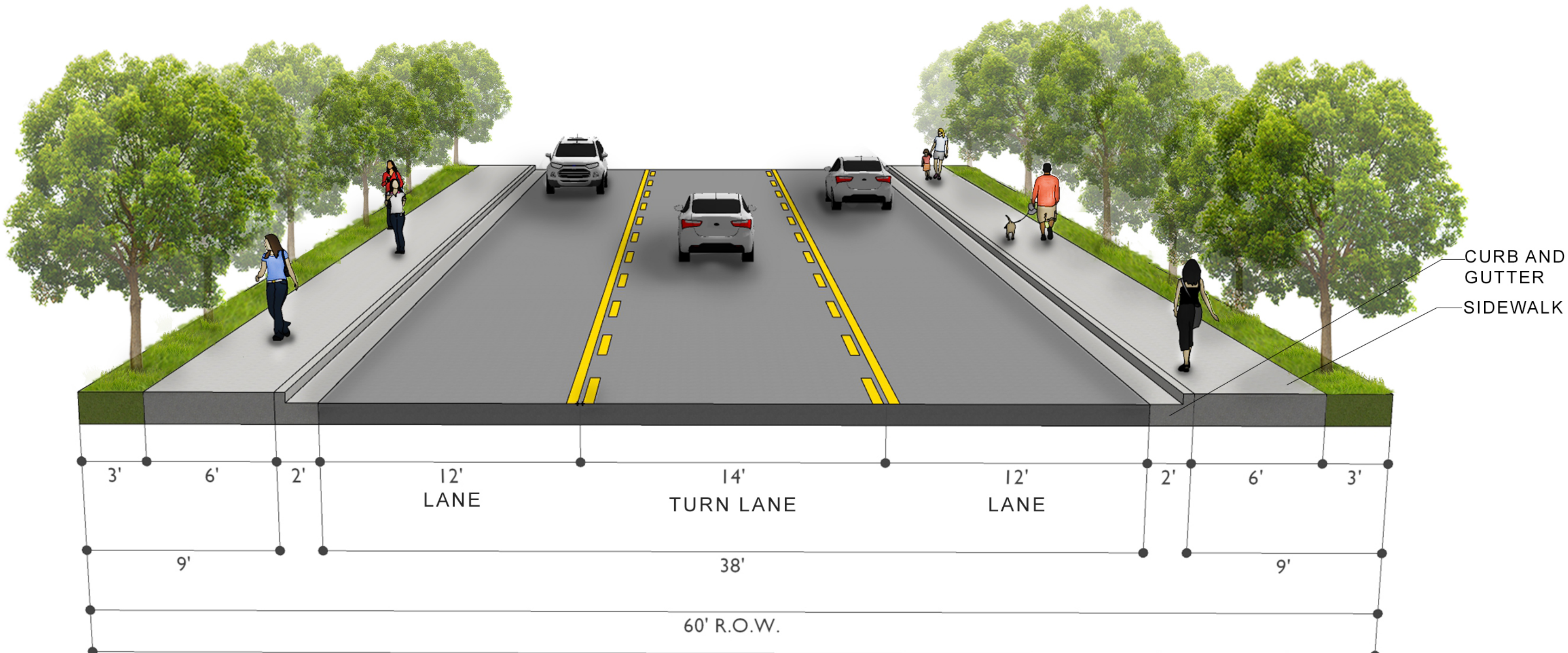
Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

Roadway Sizes	Min Volume	Max Volume	Assumptions	Cross Section
Minor Collector	-	13,300	< 35 mph, 2 lanes with TWTL, LOS D, Transitioning Area, Assumed Adjustment 0% bc L&R	 
Major Collector	13,300	31,680	< 35 mph, 4 lanes with TL, LOS D, Transitioning Area, Assumed Adjustment +10% bc L&R	 
Minor Arterial	31,680	39,050	>40 mph, 4 lanes with TL, LOS D, Transitioning Area, Assumed Adjustment +10% bc L&R	 
Principal Arterial	39,050	58,850	>40 mph, 6 lanes with TL, LOS D, Transitioning Area, Assumed Adjustment +10% bc L&R	
Parkway	58,850		Parkway (Tentative)	



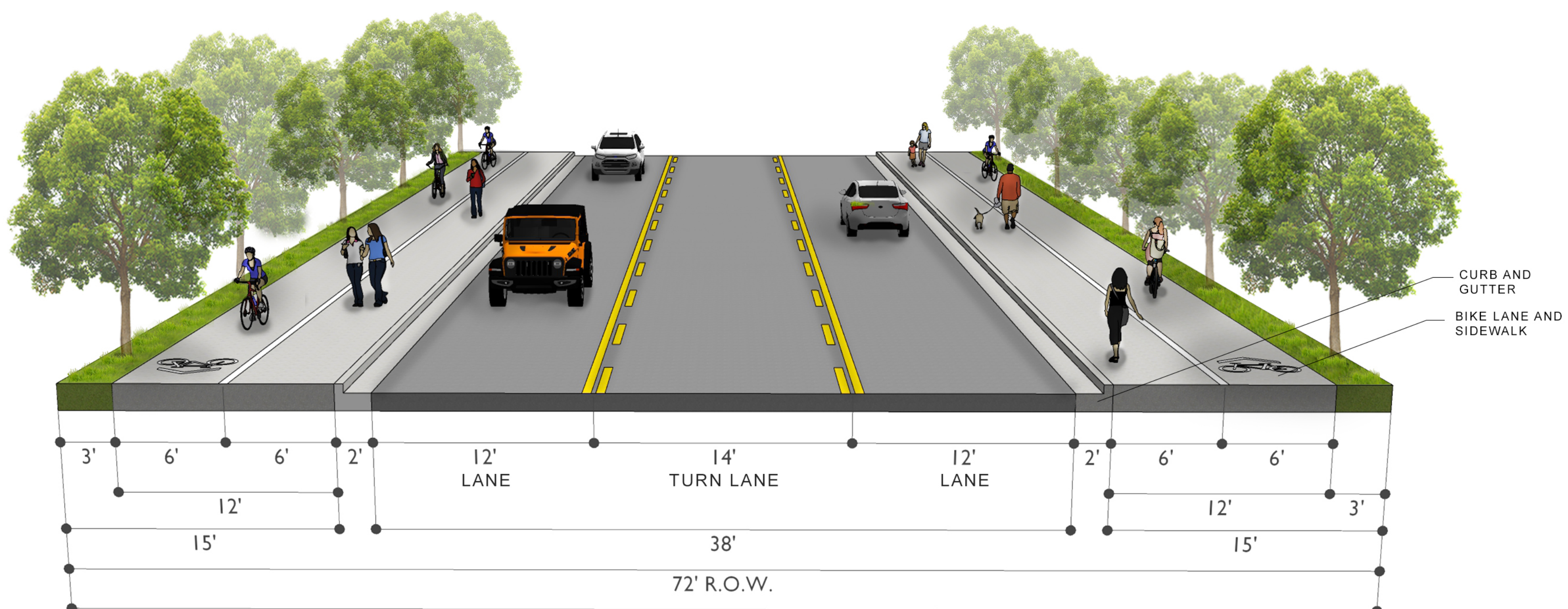
Local Street


WATER LINE
CURB AND GUTTER
BIKE LANE AND SIDEWALK
1'
4'
2'
34'
2'
4'
1'
6'
9'
56' R.O.W.
Local B Street



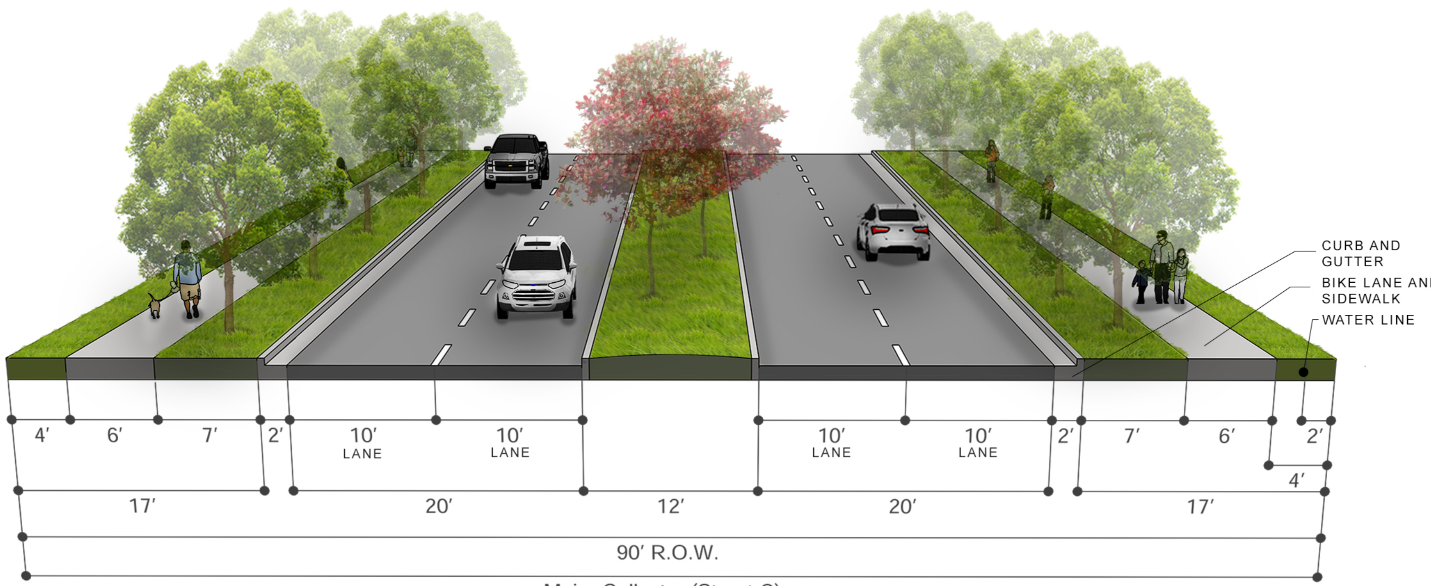
Minor Collector (Street C and E)

NOTE: LANE CONFIGURATION SHOWN WITHIN 38' PAVEMENT SHOWN FOR ILLUSTRATIVE PURPOSES. ALTERNATE LANE CONFIGURATIONS ARE ALLOWED WITH APPROVAL OF CITY ENGINEER.

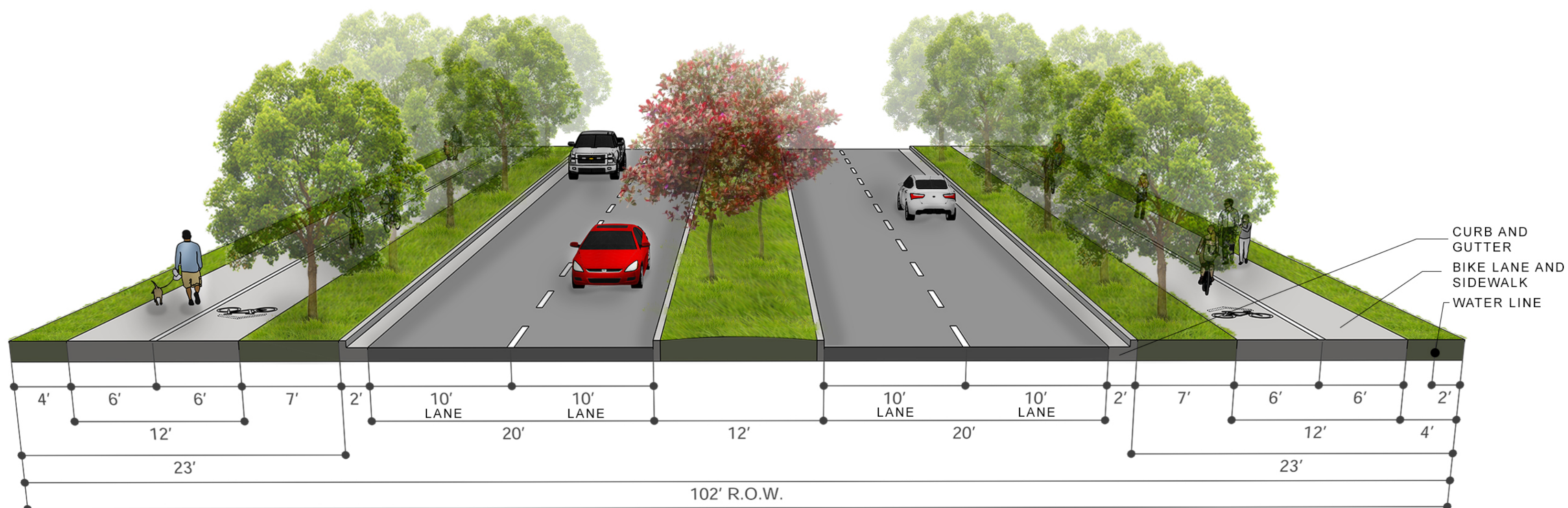


Minor Collector w/ Bike Lanes (Street C and E)

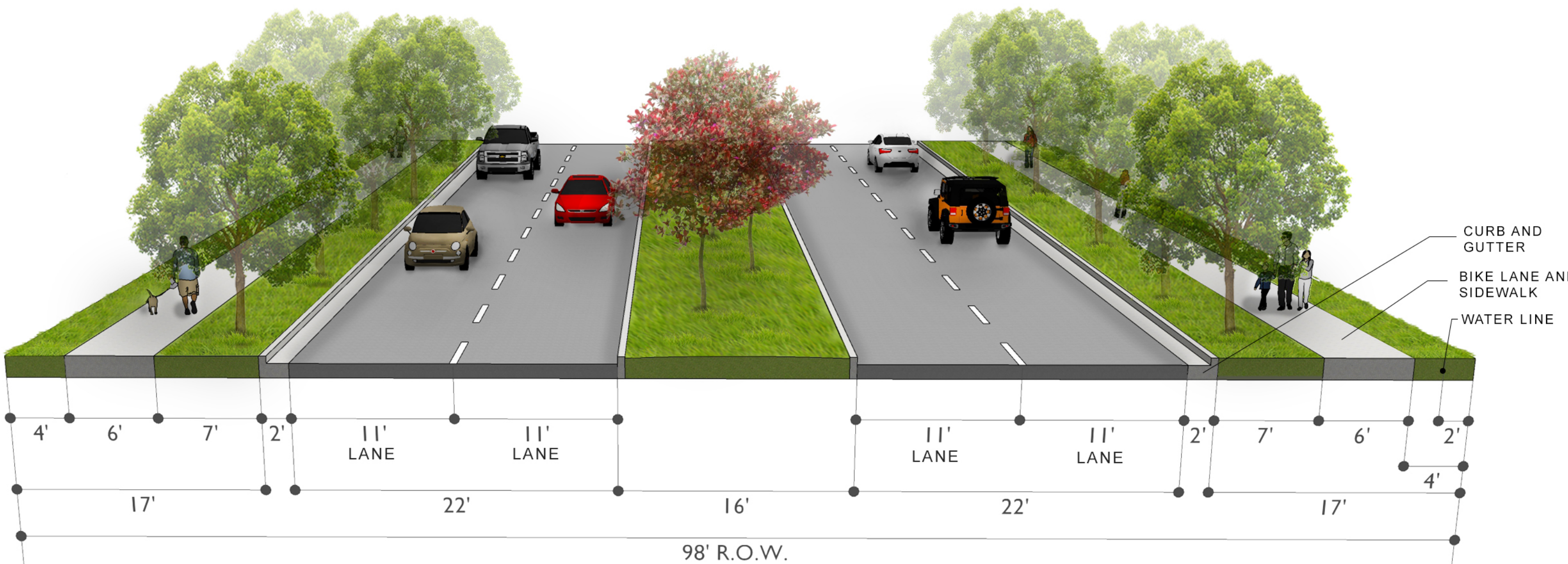
NOTE: LANE CONFIGURATION SHOWN WITHIN 38' PAVEMENT SHOWN FOR ILLUSTRATIVE PURPOSES. ALTERNATE LANE CONFIGURATIONS ARE ALLOWED WITH APPROVAL OF CITY ENGINEER.



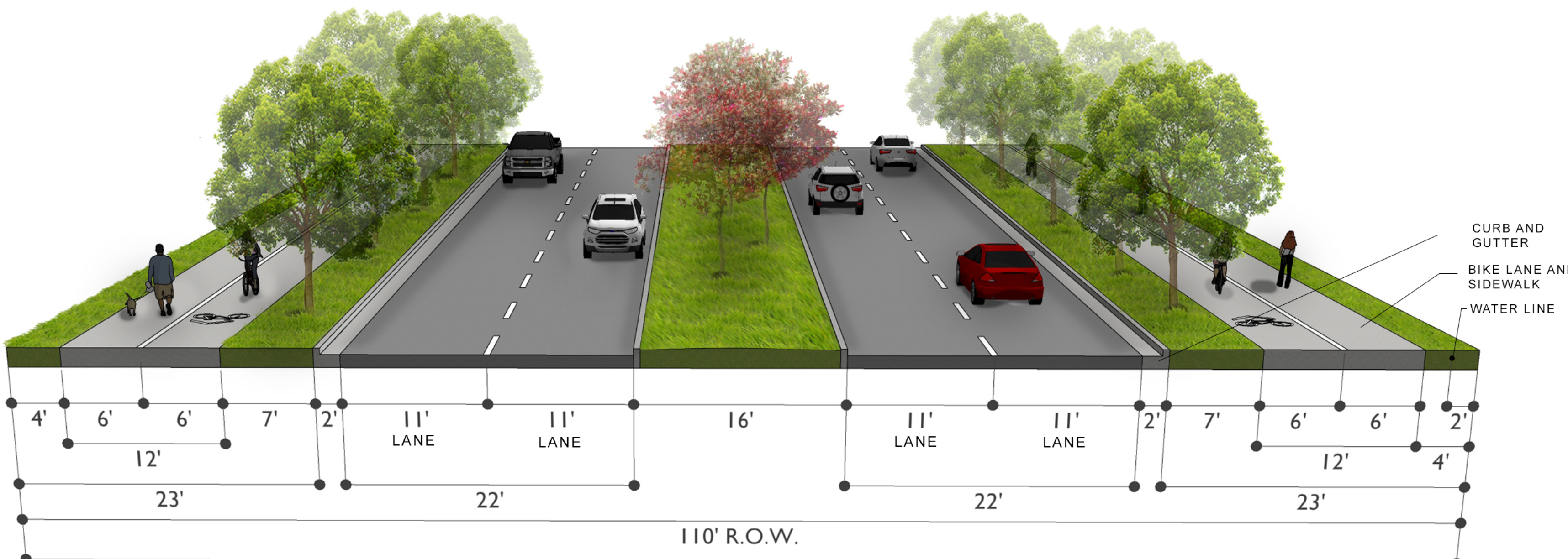
Major Collector (Street C)



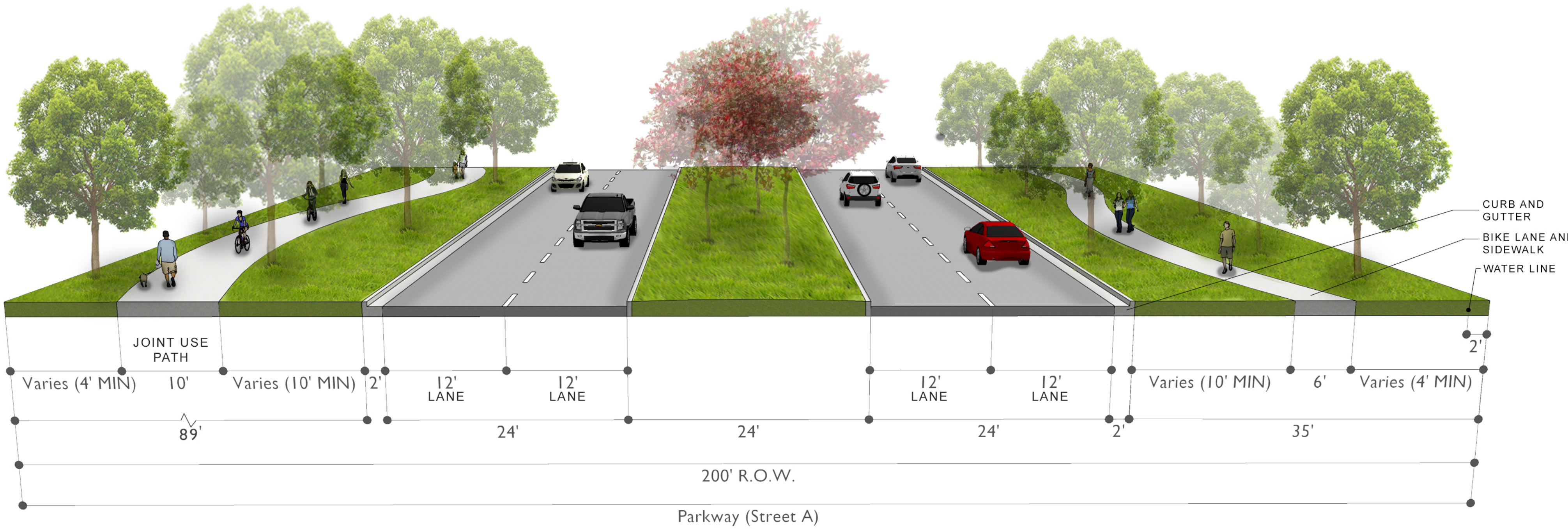
Major Collector w/ Bike Lanes (Street C)



Minor Arterial (Street B and C)



Minor Arterial w/Bike Lanes (Street B and C)



NOTE: PARKWAY SECTION SHOWN FOR ILLUSTRATIVE PURPOSES. FINAL SECTION TO BE COORDINATED WITH CITY OF NEW BRAUNFELS AND TXDOT AT PLATTING PHASE.

https://library.municode.com/tx/new_braunfels/codes/code_of_ordinances?nodeId=PTIICOOR_CH118PL_ARTIVDEST_S118-46ST

(s) *Pavement and rights-of-way widths, street grades and horizontal curves for public streets* . Pavement widths shall be measured from the face of one curb to the face of the other curb. Pavement and rights-of-way widths, street grades, horizontal curves and sidewalks shall be in accordance with the adopted regional transportation plan and as follows, unless an exception is granted by the city council after review and recommendation by planning commission and the city engineer:

(1) *Interstate.*

a. Right-of-way (min.): 300—450 feet.

(2) *Expressway.*

a. Right-of-way (min.): 200—300 feet.

(3) *Parkway.*

a. Right-of-way (min.): 200 feet.

(4) *Principal arterial.*

a. Right-of-way (min.): 150 feet.

b. Pavement width (min.): 72 feet.

c. Centerline radius (min.): 1,200 feet.

d. Tangent between reverse curves (min.): 375 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: Five percent.

g. Design speed: 50 miles per hour.

h. Sidewalks: Yes.

i. Parking allowed: No.

(5) *Minor arterial.*

a. Right-of-way (min.): 120 feet.

b. Pavement width (min.): 48 feet.

c. Centerline radius (min.): 1,200 feet.

d. Tangent between reverse curves (min.): 375 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: Five percent.

g. Design speed: 45 miles per hour.

h. Sidewalks: Yes.

i. Parking allowed: No.

(6) *Major collector.*

a. Right-of-way (min.): 90 feet.

b. Pavement width (min.): 48 feet.

c. Centerline radius (min.): 770 feet.

d. Tangent between reverse curves (min.): 250 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: Six percent.

g. Design speed: 40 miles per hour.

h. Sidewalks: Yes.

i. Parking allowed: Varies depending on lane configuration.

(7) *Minor collector.*

a. Right-of-way (min.): 60 feet.

b. Pavement width (min.): 40 feet.

c. Centerline radius (min.): 510 feet.

d. Tangent between reverse curves (min.): 100 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: Eight percent.

g. Design speed: 35 miles per hour.

h. Sidewalks: Yes.

i. Parking allowed: Varies depending on lane configuration.

(8) *Residential collector.*

a. Right-of-way (min.): 60 feet.

b. Pavement width (min.): 36 feet.

c. Centerline radius (min.): 340 feet.

d. Tangent between reverse curves (min.): 100 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: Ten percent.

g. Design speed: 30 miles per hour.

h. Sidewalks: Yes.

i. Parking allowed: Yes.

j. Average daily traffic: Less than 5,000.

(9) *Local street, multifamily, industrial and commercial.*

a. Right-of-way (min.): 60 feet.

b. Pavement width (min.): 40 feet.

c. Centerline radius (min.): 340 feet.

d. Tangent between reverse curves (min.): 50 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: Ten percent.

g. Design speed: 30 miles per hour.

h. Sidewalks: Yes.

i. Parking allowed: Yes.

j. Average daily traffic: Less than 1,000.

(10) *Local street, one- and two-family residential.*

a. Right-of-way (min.): 50 feet.

b. Pavement width (min.): 30 feet.

c. Centerline radius (min.): 125 feet.

d. Tangent between reverse curves (min.): 50 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: 12 percent.

g. Design speed: 20 miles per hour.

h. Sidewalks: Yes.

i. Parking allowed: Yes.

j. Average daily traffic: Less than 1,000.

(11) *Local street, one-family large lot residential (minimum 100 feet lot frontage).*

a. Right-of-way (min.): 60 feet.

b. Pavement width (min.): 24 feet.

c. Centerline radius (min.): 125 feet.

d. Tangent between reverse curves (min.): 50 feet.

e. Minimum grade: One-half percent.

f. Maximum grade: 12 percent.

g. Design speed: 20 miles per hour.

h. Sidewalks: No.

i. Parking allowed: No.

j. Average daily traffic: Less than 1,000.

Design standards not specified in this section shall conform to the latest edition of the American Association of State Highway and Transportation Officials A Policy on Geometric Design of Highways and Streets. Design standards on state highways shall conform to the requirements of the Texas Department of Transportation.

APPENDIX E
TxDOT Roadway Improvements

Plotted on: 10/27/2017 2:19:10 PM

Design Filename: \\pcis-fs01\datagate\Jobs\15\009\Techprod\01-CSJ*0016-04-112*IH35\Schematic\35NB-SCHEM-PBLC-EXHIB.dgn

TEXAS DEPARTMENT OF TRANSPORTATION

SCHEMATIC LAYOUT

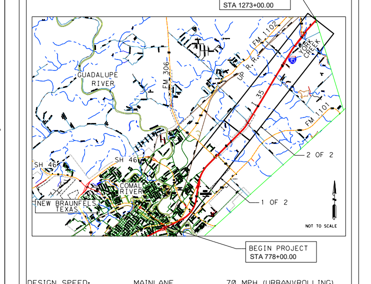
I-35

COMAL COUNTY

LIMITS: GUADALUPE RIVER
TO HAYS/COMAL COUNTY LINE
LENGTH: 48,500 FT = 9.186 MI

OFFICE OF THE DISTRICT ENGINEER
SAN ANTONIO DISTRICT

CSJ: 0016-04-112



DESIGN SPEED: MAINLANE 70 MPH (URBAN)(ROLLING)
FRONTAGE ROAD 45 MPH (URBAN)(ROLLING)
RAMP 50 MPH (URBAN)(ROLLING)

CURRENT ADT(2020): 106,156

PROJECTED ADT(2040): 200,261

FUNCTIONAL CLASSIFICATION: URBAN INTERSTATE

PROPOSED DESIGN STANDARDS(STRUCTURES): LRFD

PROPOSED DESIGN STANDARDS(ROADWAY): ROADWAY DESIGN MANUAL CHAPTER 3; 4R,SECTION 6;FREEWAYS

PROPOSED DESIGN STANDARDS(TRAFFIC): TMUTCD & APPLICABLE TRAFFIC STANDARDS

PLOT SCALE: 1":100' (HORZ.)
1":10' (VERT.)

SUBMITTED: ____________,2017	RECOMMEND FOR APPROVAL: ____________,2017
PROJECT MANAGER	DIRECTOR OF TRANSPORTATION, PLANNING AND DEVELOPMENT
CORRECT: ____________,2017	APPROVAL: ____________,2017
TRANSPORTATION PLANNING DIRECTOR	DESIGN ENGINEER
	APPROVED: DESIGN DIVISION LETTER DATE
	APPROVED: F.H.W.A. LETTER DATE

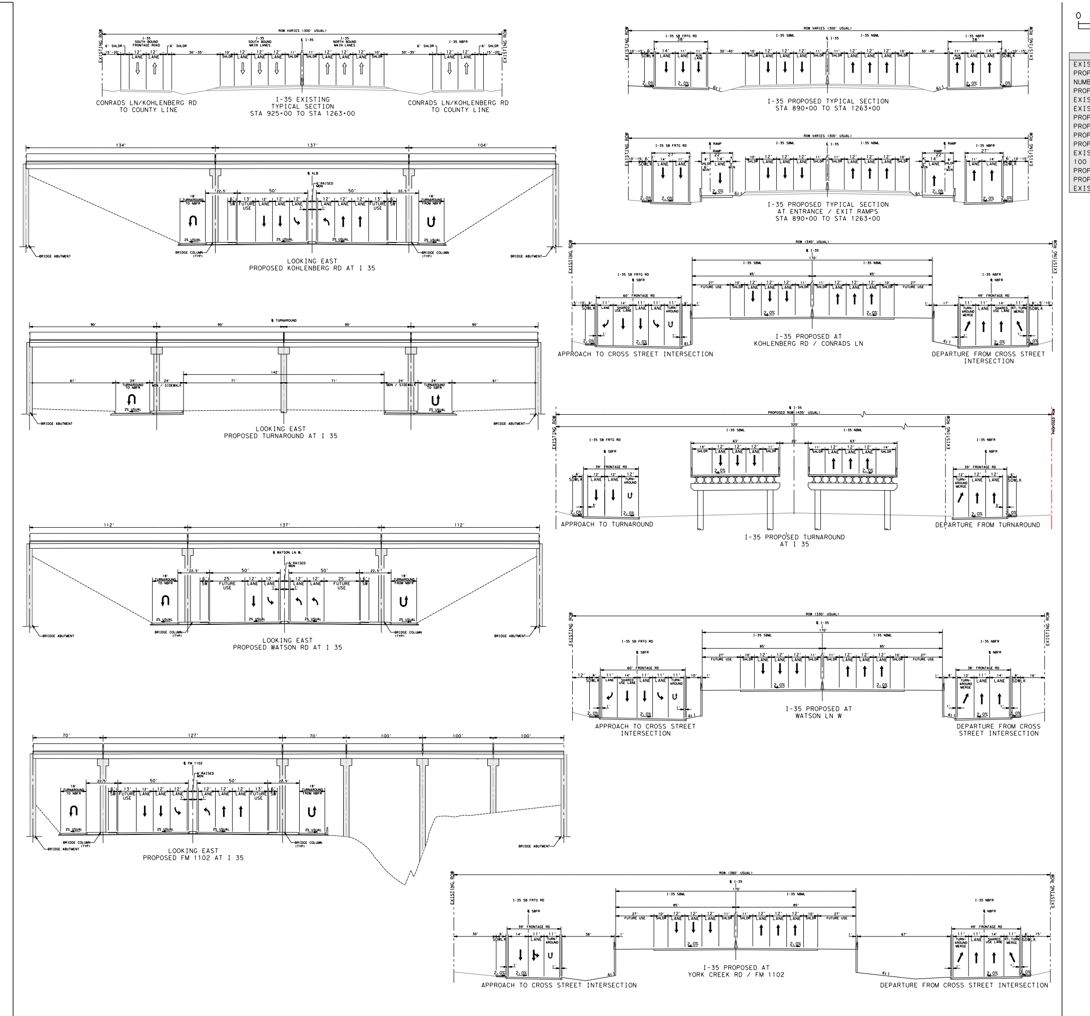
90% SUBMITTAL

INTERIM REVIEW ONLY
DOCUMENT IS FOR INTERIM REVIEW AND NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.
Engineer: FERNANDO CAMARILLO
P.E. Serial No.: 86882
Date: 10/27/2017

ROLL 2 OF 2

POZNECKI CAMARILLO INC
TBPE REG. NO. F-483
5835 CALLAGHAN RD. SUITE 200
SAN ANTONIO, TEXAS, 78228
(210) 349-3273
(210) 349-4395 (FAX)
http://www.pozcam.com/

Texas Department of Transportation®



APPENDIX F
Level of Service Descriptions

Level of Service at Signalized Intersections

Level of Service	Average Intersection Delay (sec/veh)	Description
A	≤ 10	No delays at intersection, smooth progression of traffic. Uncongested operations. All vehicles clear in a single signal cycle.
B	> 10 and ≤ 20	No delays at intersection, smooth progression of traffic. Uncongested operations. All vehicles clear in a single signal cycle.
C	> 20 and ≤ 35	Moderate delay, satisfactory to good progression of traffic. Light congestion, occasional backups on critical (high volume) approaches.
D	> 35 and ≤ 55	Little or no progression of traffic along the roadway with a high probability of stopping at signalized intersections operating at this level of service. Significant congestion on critical approaches, but intersection is functional. Vehicles required to wait through more than one cycle during short peak periods.
E	> 55 and ≤ 80	Heavy traffic flow conditions. Delays of two or more traffic signal cycles probably. No progression may occur if signal does not provide for protected turning movements.
F	> 80	Unstable traffic flow. Heavy congestion. Traffic moves in forced flow condition. Three or more cycles required to pass intersection. Total breakdown with stop and go conditions.
*	> > 80	Very unstable traffic flow. Very heavy congestion. Traffic moves in forced flow condition. More than three cycles required to pass intersection. Total breakdown. Stop and go only. Delays are beyond the range of the *Highway Capacity Manual* equations. Represents an extreme level of over saturation.

Level of service at signalized intersections is determined by the average vehicle delay at the intersection. Values can be reported for the intersection as a whole or for each individual movement. The general characteristics associated with each level of service for signalized intersections are presented in the table above.

Level of Service at Unsignalized Intersections

Level of Service	Average Intersection Delay (sec/veh)	Description
A	≤ 10	Little or no delay
B	> 10 and ≤ 15	Short traffic delay
C	> 15 and ≤ 25	Average traffic delay
D	> 25 and ≤ 35	Long traffic delay
E	> 35 and ≤ 50	Very long traffic delay
F	> 50	Extreme delays, possibly severe congestion

Level of service at unsignalized intersections is determined by the average delay a vehicle experiences at each intersection approach. An overall intersection delay and LOS is reported for All-Way-Stop-Controlled (AWSC) intersections. However, at Two-Way-Stop-Controlled (TWSC) intersections, delay is primarily experienced by vehicles on the stop-controlled approaches only. Therefore, a different level of service is reported for each stop-controlled approach at TWSC intersections. The general characteristics associated with each level of service for unsignalized intersections are based on the *Highway Capacity Manual*. [1]

[1] Transportation Research Board/National Research Council. 2000. *Highway Capacity Manual. Third Edition*, Washington, D.C.

APPENDIX G
Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	184	0	77	340	0	0
Future Volume (vph)	184	0	77	340	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5		
Lane Util. Factor	0.97		0.91	0.91		
Frt	1.00		1.00	1.00		
Flt Protected	0.95		0.95	1.00		
Satd. Flow (prot)	3433		1610	3387		
Flt Permitted	0.95		0.95	1.00		
Satd. Flow (perm)	3433		1610	3387		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	0	84	370	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	200	0	76	378	0	0
Turn Type	Prot		Prot	NA		
Protected Phases	1 2		12 4	4		
Permitted Phases						
Actuated Green, G (s)	38.0		43.0	43.0		
Effective Green, g (s)	38.0		43.0	43.0		
Actuated g/C Ratio	0.42		0.48	0.48		
Clearance Time (s)				4.5		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	1449		769	1618		
v/s Ratio Prot	c0.06		0.05	c0.11		
v/s Ratio Perm						
v/c Ratio	0.14		0.10	0.23		
Uniform Delay, d1	16.0		12.9	13.8		
Progression Factor	1.13		1.00	1.00		
Incremental Delay, d2	0.0		0.1	0.1		
Delay (s)	18.1		12.9	13.9		
Level of Service	B		B	B		
Approach Delay (s)	18.1			13.7	0.0	
Approach LOS	B			B	A	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	28.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	184	131	0	77	0	0	0	0	0	151	42
Future Volume (vph)	0	184	131	0	77	0	0	0	0	0	151	42
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
Lane Util. Factor		0.95			1.00						0.91	1.00
Frt		0.94			1.00						1.00	0.85
Flt Protected		1.00			1.00						1.00	1.00
Satd. Flow (prot)		3319			1863						3390	1583
Flt Permitted		1.00			1.00						1.00	1.00
Satd. Flow (perm)		3319			1863						3390	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	200	142	0	84	0	0	0	0	0	164	46
RTOR Reduction (vph)	0	92	0	0	0	0	0	0	0	0	0	37
Lane Group Flow (vph)	0	250	0	0	84	0	0	0	0	0	164	9
Turn Type		NA		Prot	NA					Prot	NA	Perm
Protected Phases		6		5	5 6					8 16	8	
Permitted Phases												8
Actuated Green, G (s)		31.5			54.2						18.0	18.0
Effective Green, g (s)		31.5			54.2						18.0	18.0
Actuated g/C Ratio		0.35			0.60						0.20	0.20
Clearance Time (s)		4.5									4.5	4.5
Vehicle Extension (s)		3.0									3.0	3.0
Lane Grp Cap (vph)		1161			1121						678	316
v/s Ratio Prot		c0.08			c0.05						c0.05	
v/s Ratio Perm												0.01
v/c Ratio		0.22			0.07						0.24	0.03
Uniform Delay, d1		20.6			7.5						30.3	29.0
Progression Factor		1.00			0.03						1.00	1.00
Incremental Delay, d2		0.4			0.0						0.8	0.2
Delay (s)		21.0			0.3						31.1	29.1
Level of Service		C			A						C	C
Approach Delay (s)		21.0			0.3			0.0			30.7	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	25	0	0	442	228
Future Volume (Veh/h)	0	25	0	0	442	228
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)	0	27	0	0	480	248
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	480	240	728			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	480	240	728			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	100			
cM capacity (veh/h)	515	761	871			

Direction, Lane #	EB 1	SB 1	SB 2	SB 3
Volume Total	27	240	240	248
Volume Left	0	0	0	0
Volume Right	27	0	0	248
cSH	761	1700	1700	1700
Volume to Capacity	0.04	0.14	0.14	0.15
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	9.9	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	9.9	0.0		
Approach LOS	A			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	370	675	997	571	0	0	0	0	628	65	310
Future Volume (vph)	0	370	675	997	571	0	0	0	0	628	65	310
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
Lane Util. Factor		0.91	1.00	0.91	0.91					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.98					0.95	0.96	1.00
Satd. Flow (prot)		5085	1583	1610	3315					1610	3255	1583
Flt Permitted		1.00	1.00	0.95	0.63					0.95	0.96	1.00
Satd. Flow (perm)		5085	1583	1610	2127					1610	3255	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	402	734	1084	621	0	0	0	0	683	71	337
RTOR Reduction (vph)	0	0	335	0	0	0	0	0	0	0	0	223
Lane Group Flow (vph)	0	402	399	564	1141	0	0	0	0	341	413	114
Turn Type		NA	Perm	Prot	NA					Prot	NA	custom
Protected Phases		6		5	5 6					16 8	8	
Permitted Phases			6									16 8
Actuated Green, G (s)		27.1	27.1	38.9	66.0					40.5	40.5	40.5
Effective Green, g (s)		27.1	27.1	38.9	66.0					40.5	40.5	40.5
Actuated g/C Ratio		0.23	0.23	0.32	0.55					0.34	0.34	0.34
Clearance Time (s)		4.5	4.5	4.5							4.5	
Vehicle Extension (s)		3.0	3.0	3.0							3.0	
Lane Grp Cap (vph)		1148	357	521	1554					543	1098	534
v/s Ratio Prot		0.08		c0.35	0.24					c0.21	0.13	
v/s Ratio Perm			c0.25		0.17							0.07
v/c Ratio		0.35	1.12	1.08	0.73					0.63	0.38	0.21
Uniform Delay, d1		39.0	46.5	40.5	20.4					33.4	30.2	28.4
Progression Factor		1.00	1.00	0.65	0.60					1.00	1.00	1.00
Incremental Delay, d2		0.8	83.2	53.7	1.0					2.3	0.2	0.2
Delay (s)		39.9	129.6	80.2	13.1					35.7	30.4	28.6
Level of Service		D	F	F	B					D	C	C
Approach Delay (s)		97.9			35.3			0.0			31.5	
Approach LOS		F			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	130.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	597	0	0	814	700	754	63	739	0	0	0
Future Volume (vph)	401	597	0	0	814	700	754	63	739	0	0	0
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			
Lane Util. Factor	0.91	0.91			0.86	0.86	0.91	0.86	0.91			
Frt	1.00	1.00			0.95	0.85	1.00	0.93	0.85			
Flt Protected	0.95	0.99			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (prot)	1610	3371			4589	1362	1610	2911	1441			
Flt Permitted	0.95	0.57			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (perm)	1610	1943			4589	1362	1610	2911	1441			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	436	649	0	0	885	761	820	68	803	0	0	0
RTOR Reduction (vph)	0	0	0	0	65	271	0	142	326	0	0	0
Lane Group Flow (vph)	353	732	0	0	1201	109	443	705	75	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	1	1 2			2		12 4	4				
Permitted Phases						2			4			
Actuated Green, G (s)	31.0	65.4			34.4	34.4	41.1	41.1	22.5			
Effective Green, g (s)	31.0	65.4			34.4	34.4	41.1	41.1	22.5			
Actuated g/C Ratio	0.26	0.55			0.29	0.29	0.34	0.34	0.19			
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)	415	1427			1315	390	551	997	270			
v/s Ratio Prot	c0.22	0.13			c0.26		c0.28	0.24				
v/s Ratio Perm		0.15				0.08			0.05			
v/c Ratio	0.85	0.51			0.91	0.28	0.80	0.71	0.28			
Uniform Delay, d1	42.3	17.2			41.4	33.2	35.8	34.2	41.8			
Progression Factor	0.58	0.53			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	14.1	0.3			9.9	0.4	8.3	2.3	0.6			
Delay (s)	38.8	9.5			51.2	33.6	44.1	36.5	42.4			
Level of Service	D	A			D	C	D	D	D			
Approach Delay (s)		19.0			47.1			39.9			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	130.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	279	663	290	382	0	0	0	0	66	322	85
Future Volume (vph)	0	279	663	290	382	0	0	0	0	66	322	85
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
Lane Util. Factor		0.86	0.86	0.91	0.91					0.91	0.91	1.00
Frt		0.92	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.99					0.95	1.00	1.00
Satd. Flow (prot)		4414	1362	1610	3363					1610	3387	1583
Flt Permitted		1.00	1.00	0.95	0.76					0.95	1.00	1.00
Satd. Flow (perm)		4414	1362	1610	2575					1610	3387	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	303	721	315	415	0	0	0	0	72	350	92
RTOR Reduction (vph)	0	147	156	0	0	0	0	0	0	0	0	71
Lane Group Flow (vph)	0	517	204	236	494	0	0	0	0	65	357	21
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		6		5	5 6					16 8	16 8	
Permitted Phases			6									16 8
Actuated Green, G (s)		50.3	50.3	29.3	79.6					26.9	26.9	26.9
Effective Green, g (s)		50.3	50.3	29.3	79.6					26.9	26.9	26.9
Actuated g/C Ratio		0.42	0.42	0.24	0.66					0.22	0.22	0.22
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		1850	570	393	1900					360	759	354
v/s Ratio Prot		0.12		c0.15	0.06					0.04	c0.11	
v/s Ratio Perm			c0.15		0.11							0.01
v/c Ratio		0.28	0.36	0.60	0.26					0.18	0.47	0.06
Uniform Delay, d1		22.9	23.8	40.2	8.2					37.6	40.4	36.6
Progression Factor		1.00	1.00	0.36	0.53					1.00	1.00	1.00
Incremental Delay, d2		0.4	1.8	2.5	0.1					0.2	0.5	0.1
Delay (s)		23.3	25.6	16.8	4.4					37.9	40.8	36.7
Level of Service		C	C	B	A					D	D	D
Approach Delay (s)		24.1			8.4			0.0			39.7	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	180	0	0	366	281	306	262	206	0	0	0
Future Volume (vph)	165	180	0	0	366	281	306	262	206	0	0	0
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			
Lane Util. Factor	0.91	0.91			0.91	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	0.99			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (prot)	1610	3352			5085	1583	1610	3338	1583			
Flt Permitted	0.95	0.88			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (perm)	1610	2982			5085	1583	1610	3338	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	196	0	0	398	305	333	285	224	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	261	0	0	133	0	0	0
Lane Group Flow (vph)	122	253	0	0	398	44	203	415	91	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	1	1 2			2		12 4	12 4				
Permitted Phases						2			12 4			
Actuated Green, G (s)	40.3	57.8			17.5	17.5	48.7	48.7	48.7			
Effective Green, g (s)	40.3	57.8			17.5	17.5	48.7	48.7	48.7			
Actuated g/C Ratio	0.34	0.48			0.15	0.15	0.41	0.41	0.41			
Clearance Time (s)	4.5				4.5	4.5						
Vehicle Extension (s)	3.0				3.0	3.0						
Lane Grp Cap (vph)	540	1560			741	230	653	1354	642			
v/s Ratio Prot	c0.08	0.05			c0.08		c0.13	0.12				
v/s Ratio Perm		0.02				0.03			0.06			
v/c Ratio	0.23	0.16			0.54	0.19	0.31	0.31	0.14			
Uniform Delay, d1	28.6	17.5			47.5	45.0	24.2	24.2	22.5			
Progression Factor	0.62	0.82			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.0			0.8	0.4	0.3	0.1	0.1			
Delay (s)	17.9	14.4			48.2	45.5	24.5	24.3	22.6			
Level of Service	B	B			D	D	C	C	C			
Approach Delay (s)		15.6			47.0			23.9			0.0	
Approach LOS		B			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	391	0	164	130	164	0	0	355	70	0	0
Future Volume (vph)	0	391	0	164	130	164	0	0	355	70	0	0
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		0.95		0.97	0.95	0.88			0.88	1.00		
Frt		1.00		1.00	1.00	0.85			0.85	1.00		
Flt Protected		1.00		0.95	1.00	1.00			1.00	0.95		
Satd. Flow (prot)		3539		3433	3539	2787			2787	1770		
Flt Permitted		1.00		0.95	1.00	1.00			1.00	0.76		
Satd. Flow (perm)		3539		3433	3539	2787			2787	1410		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	425	0	178	141	178	0	0	386	76	0	0
RTOR Reduction (vph)	0	0	0	0	0	117	0	0	171	0	0	0
Lane Group Flow (vph)	0	425	0	178	141	61	0	0	215	76	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Prot	D.P+P		Perm	D.Pm		Perm
Protected Phases	7	4		3	8	8	5	2			6	
Permitted Phases			4				6		2	2		6
Actuated Green, G (s)		16.3		10.0	30.8	30.8			50.2	50.2		
Effective Green, g (s)		16.3		10.0	30.8	30.8			50.2	50.2		
Actuated g/C Ratio		0.18		0.11	0.34	0.34			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)		640		381	1211	953			1554	786		
v/s Ratio Prot		c0.12		c0.05	0.04	0.02						
v/s Ratio Perm									c0.08	0.05		
v/c Ratio		0.66		0.47	0.12	0.06			0.14	0.10		
Uniform Delay, d1		34.3		37.5	20.3	19.9			9.5	9.3		
Progression Factor		1.00		1.00	1.00	1.00			1.00	0.72		
Incremental Delay, d2		2.6		0.9	0.0	0.0			0.2	0.2		
Delay (s)		36.9		38.4	20.3	19.9			9.7	7.0		
Level of Service		D		D	C	B			A	A		
Approach Delay (s)		36.9			26.7			9.7			7.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	399	698	20	149	976	185	59	0	158	120	0	390
Future Volume (vph)	399	698	20	149	976	185	59	0	158	120	0	390
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
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00		1.00	1.00		0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770		1583	1770		2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.76		1.00	0.76		1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1410		1583	1410		2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	434	759	22	162	1061	201	64	0	172	130	0	424
RTOR Reduction (vph)	0	0	13	0	0	117	0	0	133	0	0	117
Lane Group Flow (vph)	434	759	9	162	1061	84	64	0	39	130	0	307
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P		Perm	D.P+P		pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases			4			8	6		2	2		
Actuated Green, G (s)	14.1	37.3	37.3	8.8	32.0	32.0	25.9		20.2	25.9		40.1
Effective Green, g (s)	14.1	37.3	37.3	8.8	32.0	32.0	25.9		20.2	25.9		40.1
Actuated g/C Ratio	0.16	0.41	0.41	0.10	0.36	0.36	0.29		0.22	0.29		0.45
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)	537	1466	656	335	1258	562	423		355	428		1241
v/s Ratio Prot	c0.13	0.21		0.05	c0.30		0.01			c0.02		0.11
v/s Ratio Perm			0.01			0.05	0.04		0.02	c0.07		
v/c Ratio	0.81	0.52	0.01	0.48	0.84	0.15	0.15		0.11	0.30		0.25
Uniform Delay, d1	36.6	19.6	15.5	38.4	26.7	19.7	23.7		27.7	24.6		15.5
Progression Factor	1.00	1.00	1.00	0.92	1.16	2.48	1.00		1.00	1.01		1.10
Incremental Delay, d2	8.7	0.3	0.0	0.9	4.5	0.1	0.2		0.6	0.4		0.1
Delay (s)	45.4	20.0	15.5	36.4	35.4	49.1	23.9		28.4	25.4		17.2
Level of Service	D	B	B	D	D	D	C		C	C		B
Approach Delay (s)		29.0			37.4			27.1			19.1	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	27	39	76	28	111
Future Volume (Veh/h)	50	27	39	76	28	111
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)	54	29	42	83	30	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	197	15	151			
vC1, stage 1 conf vol	30					
vC2, stage 2 conf vol	167					
vCu, unblocked vol	197	15	151			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	97	97			
cM capacity (veh/h)	797	1061	1428			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	54	29	42	83	15	15	121
Volume Left	54	0	42	0	0	0	0
Volume Right	0	29	0	0	0	0	121
cSH	797	1061	1428	1700	1700	1700	1700
Volume to Capacity	0.07	0.03	0.03	0.05	0.01	0.01	0.07
Queue Length 95th (ft)	5	2	2	0	0	0	0
Control Delay (s)	9.8	8.5	7.6	0.0	0.0	0.0	0.0
Lane LOS	A	A	A				
Approach Delay (s)	9.4		2.6		0.0		
Approach LOS	A						

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	18.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	30	37	16	104	0	70	19	30	0	57	9
Future Volume (Veh/h)	29	30	37	16	104	0	70	19	30	0	57	9
Sign Control		Free			Free			Stop			Stop	
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)	32	33	40	17	113	0	76	21	33	0	62	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			4
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	113			73			280	244	33	271	284	113
vC1, stage 1 conf vol							97	97		147	147	
vC2, stage 2 conf vol							183	147		124	137	
vCu, unblocked vol	113			73			280	244	33	271	284	113
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			89	97	97	100	91	99
cM capacity (veh/h)	1476			1527			679	699	1041	736	690	940

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	32	33	40	17	113	0	76	54	0	72
Volume Left	32	0	0	17	0	0	76	0	0	0
Volume Right	0	0	40	0	0	0	0	33	0	10
cSH	1476	1700	1700	1527	1700	1700	679	1703	1700	801
Volume to Capacity	0.02	0.02	0.02	0.01	0.07	0.00	0.11	0.03	0.00	0.09
Queue Length 95th (ft)	2	0	0	1	0	0	9	2	0	7
Control Delay (s)	7.5	0.0	0.0	7.4	0.0	0.0	11.0	9.2	0.0	10.5
Lane LOS	A			A			B	A	A	B
Approach Delay (s)	2.3			1.0			10.3		10.5	
Approach LOS							B		B	

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	145	89	66	192	2
Future Volume (Veh/h)	1	145	89	66	192	2
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)	1	158	97	72	209	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1233		
pX, platoon unblocked						
vC, conflicting volume	439	104	211			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	439	104	211			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	83	93			
cM capacity (veh/h)	507	930	1357			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	1	158	97	36	36	104	104	2
Volume Left	1	0	97	0	0	0	0	0
Volume Right	0	158	0	0	0	0	0	2
cSH	507	930	1357	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.17	0.07	0.02	0.02	0.06	0.06	0.00
Queue Length 95th (ft)	0	15	6	0	0	0	0	0
Control Delay (s)	12.1	9.7	7.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	A	A					
Approach Delay (s)	9.7		4.5			0.0		
Approach LOS	A							

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	99	49	11	6	61
Future Volume (Veh/h)	55	99	49	11	6	61
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)	60	108	53	12	7	66
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	119	4	73			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	119	4	73			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	90	97			
cM capacity (veh/h)	834	1079	1525			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	60	108	53	6	6	4	4	66
Volume Left	60	0	53	0	0	0	0	0
Volume Right	0	108	0	0	0	0	0	66
cSH	834	1079	1525	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.10	0.03	0.00	0.00	0.00	0.00	0.04
Queue Length 95th (ft)	6	8	3	0	0	0	0	0
Control Delay (s)	9.7	8.7	7.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A	A					
Approach Delay (s)	9.0		6.1			0.0		
Approach LOS	A							

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	561	371	250	677	62	416	0	296	184	0	149
Future Volume (vph)	62	561	371	250	677	62	416	0	296	184	0	149
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
Lane Util. Factor	0.97	0.95	0.88	0.97	0.95	1.00	0.97		0.88	0.97		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (prot)	3433	3539	2787	3433	3539	1583	3433		2787	3433		1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (perm)	3433	3539	2787	3433	3539	1583	3433		2787	3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	610	403	272	736	67	452	0	322	200	0	162
RTOR Reduction (vph)	0	0	211	0	0	45	0	0	55	0	0	121
Lane Group Flow (vph)	67	610	192	272	736	22	452	0	267	200	0	41
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot		pt+ov	Prot		Perm
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						6
Actuated Green, G (s)	4.2	22.3	42.9	10.9	29.0	29.0	16.1		44.8	9.4		22.7
Effective Green, g (s)	4.2	22.3	42.9	10.9	29.0	29.0	16.1		44.8	9.4		22.7
Actuated g/C Ratio	0.05	0.25	0.48	0.12	0.32	0.32	0.18		0.50	0.10		0.25
Clearance Time (s)	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
Lane Grp Cap (vph)	160	876	1328	415	1140	510	614		1387	358		399
v/s Ratio Prot	0.02	0.17	0.07	c0.08	c0.21		c0.13		c0.10	0.06		
v/s Ratio Perm						0.01						0.03
v/c Ratio	0.42	0.70	0.14	0.66	0.65	0.04	0.74		0.19	0.56		0.10
Uniform Delay, d1	41.7	30.8	13.2	37.8	26.1	21.0	34.9		12.6	38.3		25.8
Progression Factor	1.41	0.68	2.63	0.74	0.90	1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2	1.6	2.2	0.0	3.5	1.2	0.0	4.6		0.1	1.9		0.5
Delay (s)	60.4	23.1	34.9	31.3	24.7	21.0	39.5		12.6	40.2		26.3
Level of Service	E	C	C	C	C	C	D		B	D		C
Approach Delay (s)		29.8			26.1			28.3			34.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	91	31	6	22	0
Future Volume (Veh/h)	0	91	31	6	22	0
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)	0	99	34	7	24	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)				1163		
pX, platoon unblocked						
vC, conflicting volume	96	12	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	12	24			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	91	98			
cM capacity (veh/h)	874	1065	1589			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	99	34	4	4	12	12	0
Volume Left	0	0	34	0	0	0	0	0
Volume Right	0	99	0	0	0	0	0	0
cSH	1700	1065	1589	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.09	0.02	0.00	0.00	0.01	0.01	0.00
Queue Length 95th (ft)	0	8	2	0	0	0	0	0
Control Delay (s)	0.0	8.7	7.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A	A					
Approach Delay (s)	8.7		6.1			0.0		
Approach LOS	A							

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	15.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	648	0	416	28	0	3	359	147	24	6	186	538
Future Volume (vph)	648	0	416	28	0	3	359	147	24	6	186	538
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	0.97	0.95	0.95		1.00		0.97	0.95		1.00	0.95	0.88
Frt	1.00	0.85	0.85		0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1504	1504		1760		3433	3465		1770	3539	2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1504	1504		1840		3433	3465		1770	3539	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	704	0	452	30	0	3	390	160	26	7	202	585
RTOR Reduction (vph)	0	152	133	0	32	0	0	10	0	0	0	211
Lane Group Flow (vph)	704	74	93	0	1	0	390	176	0	7	202	374
Turn Type	Prot	NA	custom	Perm	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4	7 5		8		5	2		1	6	6 7
Permitted Phases				8								
Actuated Green, G (s)	21.5	29.3	37.2		3.3		15.7	45.8		1.4	31.5	57.5
Effective Green, g (s)	21.5	29.3	37.2		3.3		15.7	45.8		1.4	31.5	57.5
Actuated g/C Ratio	0.24	0.33	0.41		0.04		0.17	0.51		0.02	0.35	0.64
Clearance Time (s)	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	
Lane Grp Cap (vph)	820	489	621		67		598	1763		27	1238	1780
v/s Ratio Prot	c0.21	c0.05	0.06				c0.11	0.05		0.00	0.06	c0.13
v/s Ratio Perm					0.00							
v/c Ratio	0.86	0.15	0.15		0.02		0.65	0.10		0.26	0.16	0.21
Uniform Delay, d1	32.8	21.5	16.5		41.8		34.6	11.4		43.8	20.2	6.8
Progression Factor	1.05	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.9	0.1	0.1		0.1		2.6	0.1		5.1	0.3	0.1
Delay (s)	42.4	21.6	16.6		41.9		37.2	11.5		48.8	20.4	6.8
Level of Service	D	C	B		D		D	B		D	C	A
Approach Delay (s)		33.3			41.9			28.9			10.7	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	105	210	241	74	122	229
Future Volume (vph)	105	210	241	74	122	229
Ideal Flow (vphpl)	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	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.33	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	621	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	228	262	80	133	249
RTOR Reduction (vph)	0	0	0	64	0	192
Lane Group Flow (vph)	114	228	262	16	133	57
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		5	
Permitted Phases	8			8		6
Actuated Green, G (s)	23.7	28.2	17.7	17.7	27.7	20.6
Effective Green, g (s)	23.7	28.2	17.7	17.7	27.7	20.6
Actuated g/C Ratio	0.26	0.31	0.20	0.20	0.31	0.23
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)	240	583	366	311	544	362
v/s Ratio Prot	0.03	c0.12	c0.14		c0.08	
v/s Ratio Perm	0.09			0.01		c0.04
v/c Ratio	0.47	0.39	0.72	0.05	0.24	0.16
Uniform Delay, d1	26.5	24.2	33.8	29.3	23.3	27.8
Progression Factor	1.00	1.00	0.84	0.59	1.00	1.01
Incremental Delay, d2	1.5	0.4	6.5	0.1	1.1	0.9
Delay (s)	28.0	24.6	35.0	17.3	24.4	28.8
Level of Service	C	C	D	B	C	C
Approach Delay (s)		25.7	30.9		27.3	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	107	205	175	439	514	152
Future Volume (Veh/h)	107	205	175	439	514	152
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)	116	223	190	477	559	165
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	1498	642	724			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1498	642	724			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	53	78			
cM capacity (veh/h)	106	474	879			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	339	667	724
Volume Left	116	190	0
Volume Right	223	0	165
cSH	216	879	1700
Volume to Capacity	1.57	0.22	0.43
Queue Length 95th (ft)	533	21	0
Control Delay (s)	317.5	5.1	0.0
Lane LOS	F	A	
Approach Delay (s)	317.5	5.1	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	64.2		
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	12	604	6	13	617
Future Volume (Veh/h)	12	12	604	6	13	617
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)	13	13	657	7	14	671
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	1360	660			664	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1360	660			664	
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	97			98	
cM capacity (veh/h)	161	463			925	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	664	685
Volume Left	13	0	14
Volume Right	13	7	0
cSH	239	1700	925
Volume to Capacity	0.11	0.39	0.02
Queue Length 95th (ft)	9	0	1
Control Delay (s)	21.9	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	21.9	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	18	22	787	714	52
Future Volume (Veh/h)	26	18	22	787	714	52
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)	28	20	24	855	776	57
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	1708	804	833			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1708	804	833			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	71	95	97			
cM capacity (veh/h)	97	383	800			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	48	879	833
Volume Left	28	24	0
Volume Right	20	0	57
cSH	141	800	1700
Volume to Capacity	0.34	0.03	0.49
Queue Length 95th (ft)	35	2	0
Control Delay (s)	43.2	0.8	0.0
Lane LOS	E	A	
Approach Delay (s)	43.2	0.8	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	60	71	3	13	7
Future Volume (Veh/h)	1	60	71	3	13	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	65	77	3	14	8
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	80				146	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80				146	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	99
cM capacity (veh/h)	1518				846	982

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	66	80	22
Volume Left	1	0	14
Volume Right	0	3	8
cSH	1518	1700	891
Volume to Capacity	0.00	0.05	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.1	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	0.1	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	10	10	59	81	10
Future Volume (Veh/h)	23	10	10	59	81	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	11	11	64	88	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	75				72	11
vC1, stage 1 conf vol					11	
vC2, stage 2 conf vol					61	
vCu, unblocked vol	75				72	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	99
cM capacity (veh/h)	1524				921	1070

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	25	11	11	64	99
Volume Left	25	0	0	0	88
Volume Right	0	0	0	64	11
cSH	1524	1700	1700	1700	1037
Volume to Capacity	0.02	0.01	0.01	0.04	0.10
Queue Length 95th (ft)	1	0	0	0	8
Control Delay (s)	7.4	0.0	0.0	0.0	9.2
Lane LOS	A				A
Approach Delay (s)	5.1		0.0		9.2
Approach LOS					A

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	543	33	0	0
Future Vol, veh/h	0	20	543	33	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	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	0	22	590	36	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	313	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	683	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	683	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	10.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	683
HCM Lane V/C Ratio	-	-	0.032
HCM Control Delay (s)	-	-	10.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	208	1717	104	0	0
Future Vol, veh/h	0	208	1717	104	0	0
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	-	145	-	-
Veh in Median Storage, #	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	0	226	1866	113	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	933	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	268	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	268	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	62.9	0
HCM LOS	F	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	268
HCM Lane V/C Ratio	-	-	0.844
HCM Control Delay (s)	-	-	62.9
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	7

Intersection						
Int Delay, s/veh	3.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	158	1756	148	0	0
Future Vol, veh/h	0	158	1756	148	0	0
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	-	145	-	-
Veh in Median Storage, #	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	0	172	1909	161	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	955	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	259	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	259	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	42.6	0
HCM LOS	E	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	259
HCM Lane V/C Ratio	-	-	0.663
HCM Control Delay (s)	-	-	42.6
HCM Lane LOS	-	-	E
HCM 95th %tile Q(veh)	-	-	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	61	0	113	172	0	0
Future Volume (vph)	61	0	113	172	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5		
Lane Util. Factor	0.97		0.91	0.91		
Frt	1.00		1.00	1.00		
Flt Protected	0.95		0.95	0.99		
Satd. Flow (prot)	3433		1610	3372		
Flt Permitted	0.95		0.95	0.99		
Satd. Flow (perm)	3433		1610	3372		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	0	123	187	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	66	0	101	209	0	0
Turn Type	Prot		Prot	NA		
Protected Phases	1 2		12 4	4		
Permitted Phases						
Actuated Green, G (s)	26.0		55.0	55.0		
Effective Green, g (s)	26.0		55.0	55.0		
Actuated g/C Ratio	0.29		0.61	0.61		
Clearance Time (s)				4.5		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	991		983	2060		
v/s Ratio Prot	c0.02		c0.06	0.06		
v/s Ratio Perm						
v/c Ratio	0.07		0.10	0.10		
Uniform Delay, d1	23.2		7.3	7.3		
Progression Factor	1.15		1.00	1.00		
Incremental Delay, d2	0.0		0.0	0.0		
Delay (s)	26.7		7.3	7.3		
Level of Service	C		A	A		
Approach Delay (s)	26.7			7.3	0.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.10		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↱		↰	↑					↰	↰↑	↱
Traffic Volume (vph)	0	61	120	0	113	0	0	0	0	0	159	210
Future Volume (vph)	0	61	120	0	113	0	0	0	0	0	159	210
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
Lane Util. Factor		0.95			1.00						0.91	1.00
Frt		0.90			1.00						1.00	0.85
Flt Protected		1.00			1.00						1.00	1.00
Satd. Flow (prot)		3187			1863						3390	1583
Flt Permitted		1.00			1.00						1.00	1.00
Satd. Flow (perm)		3187			1863						3390	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	66	130	0	123	0	0	0	0	0	173	228
RTOR Reduction (vph)	0	74	0	0	0	0	0	0	0	0	0	178
Lane Group Flow (vph)	0	122	0	0	123	0	0	0	0	0	173	50
Turn Type		NA		Prot	NA					Prot	NA	Perm
Protected Phases		6		5	5 6					8 16	8	
Permitted Phases												8
Actuated Green, G (s)		38.7			61.1						19.9	19.9
Effective Green, g (s)		38.7			61.1						19.9	19.9
Actuated g/C Ratio		0.43			0.68						0.22	0.22
Clearance Time (s)		4.5									4.5	4.5
Vehicle Extension (s)		3.0									3.0	3.0
Lane Grp Cap (vph)		1370			1264						749	350
v/s Ratio Prot		0.04			c0.07						c0.05	
v/s Ratio Perm												0.03
v/c Ratio		0.09			0.10						0.23	0.14
Uniform Delay, d1		15.2			5.0						28.8	28.2
Progression Factor		1.00			0.20						1.00	1.00
Incremental Delay, d2		0.1			0.0						0.7	0.9
Delay (s)		15.3			1.0						29.5	29.1
Level of Service		B			A						C	C
Approach Delay (s)		15.3			1.0			0.0			29.2	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	167	0	0	323	30
Future Volume (Veh/h)	0	167	0	0	323	30
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)	0	182	0	0	351	33
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	351	176	384			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	351	176	384			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	100			
cM capacity (veh/h)	620	837	1171			

Direction, Lane #	EB 1	SB 1	SB 2	SB 3
Volume Total	182	176	176	33
Volume Left	0	0	0	0
Volume Right	182	0	0	33
cSH	837	1700	1700	1700
Volume to Capacity	0.22	0.10	0.10	0.02
Queue Length 95th (ft)	21	0	0	0
Control Delay (s)	10.5	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	10.5	0.0		
Approach LOS	B			

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	531	927	1162	979	0	0	0	0	834	283	526
Future Volume (vph)	0	531	927	1162	979	0	0	0	0	834	283	526
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
Lane Util. Factor		0.91	1.00	0.91	0.91					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.98					0.95	0.97	1.00
Satd. Flow (prot)		5085	1583	1610	3337					1610	3292	1583
Flt Permitted		1.00	1.00	0.95	0.60					0.95	0.97	1.00
Satd. Flow (perm)		5085	1583	1610	2031					1610	3292	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	577	1008	1263	1064	0	0	0	0	907	308	572
RTOR Reduction (vph)	0	0	136	0	0	0	0	0	0	0	0	268
Lane Group Flow (vph)	0	577	872	758	1569	0	0	0	0	453	762	304
Turn Type		NA	Perm	Prot	NA					Prot	NA	custom
Protected Phases		6		5	5 6					16 8	8	
Permitted Phases			6									16 8
Actuated Green, G (s)		33.5	33.5	32.5	66.0					40.5	40.5	40.5
Effective Green, g (s)		33.5	33.5	32.5	66.0					40.5	40.5	40.5
Actuated g/C Ratio		0.28	0.28	0.27	0.55					0.34	0.34	0.34
Clearance Time (s)		4.5	4.5	4.5							4.5	
Vehicle Extension (s)		3.0	3.0	3.0							3.0	
Lane Grp Cap (vph)		1419	441	436	1470					543	1111	534
v/s Ratio Prot		0.11		c0.47	0.29					c0.28	0.23	
v/s Ratio Perm			c0.55		0.30							0.19
v/c Ratio		0.41	1.98	1.74	1.07					0.83	0.69	0.57
Uniform Delay, d1		35.2	43.2	43.8	27.0					36.7	34.3	32.6
Progression Factor		1.00	1.00	0.89	0.87					1.00	1.00	1.00
Incremental Delay, d2		0.9	448.4	333.2	32.0					10.6	1.8	1.4
Delay (s)		36.0	491.6	372.2	55.6					47.3	36.0	34.0
Level of Service		D	F	F	E					D	D	C
Approach Delay (s)		325.8			158.7			0.0			38.2	
Approach LOS		F			F			A			D	

Intersection Summary			
HCM 2000 Control Delay	167.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	158.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	710	655	0	0	600	528	1541	62	886	0	0	0
Future Volume (vph)	710	655	0	0	600	528	1541	62	886	0	0	0
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			
Lane Util. Factor	0.91	0.91			0.86	0.86	0.91	0.86	0.91			
Frt	1.00	1.00			0.95	0.85	1.00	0.96	0.85			
Flt Protected	0.95	0.99			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	1610	3342			4586	1362	1610	2966	1441			
Flt Permitted	0.95	0.57			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	1610	1943			4586	1362	1610	2966	1441			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	772	712	0	0	652	574	1675	67	963	0	0	0
RTOR Reduction (vph)	0	0	0	0	66	234	0	31	324	0	0	0
Lane Group Flow (vph)	486	998	0	0	873	53	837	1250	263	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	1	1 2			2		12 4	4				
Permitted Phases						2			4			
Actuated Green, G (s)	30.0	52.3			22.3	22.3	54.2	54.2	28.2			
Effective Green, g (s)	30.0	52.3			22.3	22.3	54.2	54.2	28.2			
Actuated g/C Ratio	0.25	0.44			0.19	0.19	0.45	0.45	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)	402	1196			852	253	727	1339	338			
v/s Ratio Prot	c0.30	0.21			c0.19		c0.52	0.42				
v/s Ratio Perm		0.15				0.04			0.18			
v/c Ratio	1.21	0.83			1.02	0.21	1.15	1.11dl	0.78			
Uniform Delay, d1	45.0	30.0			48.9	41.4	32.9	31.2	43.0			
Progression Factor	0.84	0.83			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	111.2	4.1			37.3	0.4	83.5	12.0	10.7			
Delay (s)	149.1	28.9			86.1	41.8	116.4	43.2	53.7			
Level of Service	F	C			F	D	F	D	D			
Approach Delay (s)		68.3			75.7			68.1			0.0	
Approach LOS		E			E			E			A	

Intersection Summary			
HCM 2000 Control Delay	69.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	158.8%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	126	623	316	707	0	0	0	0	153	374	217
Future Volume (vph)	0	126	623	316	707	0	0	0	0	153	374	217
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
Lane Util. Factor		0.86	0.86	0.91	0.91					0.91	0.91	1.00
Frt		0.89	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		4292	1362	1610	3383					1610	3383	1583
Flt Permitted		1.00	1.00	0.95	0.93					0.95	1.00	1.00
Satd. Flow (perm)		4292	1362	1610	3158					1610	3383	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	137	677	343	768	0	0	0	0	166	407	236
RTOR Reduction (vph)	0	142	142	0	0	0	0	0	0	0	0	176
Lane Group Flow (vph)	0	334	196	309	802	0	0	0	0	149	424	60
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		6		5	5 6					16 8	16 8	
Permitted Phases			6									16 8
Actuated Green, G (s)		41.8	41.8	35.2	77.0					29.5	29.5	29.5
Effective Green, g (s)		41.8	41.8	35.2	77.0					29.5	29.5	29.5
Actuated g/C Ratio		0.35	0.35	0.29	0.64					0.25	0.25	0.25
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		1495	474	472	2092					395	831	389
v/s Ratio Prot		0.08		c0.19	0.11					0.09	c0.13	
v/s Ratio Perm			c0.14		0.13							0.04
v/c Ratio		0.22	0.41	0.65	0.38					0.38	0.51	0.15
Uniform Delay, d1		27.6	29.8	37.1	10.2					37.6	39.0	35.5
Progression Factor		1.00	1.00	0.44	0.42					1.00	1.00	1.00
Incremental Delay, d2		0.3	2.6	3.0	0.1					0.6	0.5	0.2
Delay (s)		28.0	32.4	19.4	4.4					38.2	39.6	35.6
Level of Service		C	C	B	A					D	D	D
Approach Delay (s)		29.8			8.6			0.0			38.2	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	212	0	0	392	231	603	247	418	0	0	0
Future Volume (vph)	67	212	0	0	392	231	603	247	418	0	0	0
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			
Lane Util. Factor	0.91	0.91			0.91	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	1610	3385			5085	1583	1610	3299	1583			
Flt Permitted	0.95	0.95			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	1610	3238			5085	1583	1610	3299	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	230	0	0	426	251	655	268	454	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	213	0	0	261	0	0	0
Lane Group Flow (vph)	66	237	0	0	426	38	327	596	193	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	1	1 2			2		12 4	12 4				
Permitted Phases						2			12 4			
Actuated Green, G (s)	37.4	55.4			18.0	18.0	51.1	51.1	51.1			
Effective Green, g (s)	37.4	55.4			18.0	18.0	51.1	51.1	51.1			
Actuated g/C Ratio	0.31	0.46			0.15	0.15	0.43	0.43	0.43			
Clearance Time (s)	4.5				4.5	4.5						
Vehicle Extension (s)	3.0				3.0	3.0						
Lane Grp Cap (vph)	501	1540			762	237	685	1404	674			
v/s Ratio Prot	0.04	c0.05			c0.08		c0.20	0.18				
v/s Ratio Perm		0.02				0.02			0.12			
v/c Ratio	0.13	0.15			0.56	0.16	0.48	0.42	0.29			
Uniform Delay, d1	29.6	18.7			47.3	44.4	24.8	24.1	22.5			
Progression Factor	0.53	0.41			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.0			0.9	0.3	0.5	0.2	0.2			
Delay (s)	15.9	7.8			48.2	44.7	25.4	24.4	22.8			
Level of Service	B	A			D	D	C	C	C			
Approach Delay (s)		9.6			46.9			24.1			0.0	
Approach LOS		A			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	257	0	71	439	71	0	0	222	198	0	0
Future Volume (vph)	0	257	0	71	439	71	0	0	222	198	0	0
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		0.95		0.97	0.95	0.88			0.88	1.00		
Frt		1.00		1.00	1.00	0.85			0.85	1.00		
Flt Protected		1.00		0.95	1.00	1.00			1.00	0.95		
Satd. Flow (prot)		3539		3433	3539	2787			2787	1770		
Flt Permitted		1.00		0.95	1.00	1.00			1.00	0.76		
Satd. Flow (perm)		3539		3433	3539	2787			2787	1410		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	279	0	77	477	77	0	0	241	215	0	0
RTOR Reduction (vph)	0	0	0	0	0	56	0	0	88	0	0	0
Lane Group Flow (vph)	0	279	0	77	477	21	0	0	153	215	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Prot	D.P+P		Perm	D.Pm		Perm
Protected Phases	7	4		3	8	8	5	2			6	
Permitted Phases			4				6		2	2		6
Actuated Green, G (s)		13.2		6.3	24.0	24.0			57.0	57.0		
Effective Green, g (s)		13.2		6.3	24.0	24.0			57.0	57.0		
Actuated g/C Ratio		0.15		0.07	0.27	0.27			0.63	0.63		
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)		519		240	943	743			1765	893		
v/s Ratio Prot		0.08		0.02	c0.13	0.01						
v/s Ratio Perm									0.05	c0.15		
v/c Ratio		0.54		0.32	0.51	0.03			0.09	0.24		
Uniform Delay, d1		35.6		39.8	28.0	24.4			6.4	7.1		
Progression Factor		1.00		1.00	1.00	1.00			1.00	0.94		
Incremental Delay, d2		1.1		0.8	0.4	0.0			0.1	0.6		
Delay (s)		36.6		40.6	28.4	24.4			6.5	7.3		
Level of Service		D		D	C	C			A	A		
Approach Delay (s)		36.6			29.4			6.5			7.3	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	1074	67	425	753	63	39	0	362	67	0	237
Future Volume (vph)	309	1074	67	425	753	63	39	0	362	67	0	237
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
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00		1.00	1.00		0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770		1583	1770		2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.76		1.00	0.76		1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1410		1583	1410		2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	336	1167	73	462	818	68	42	0	393	73	0	258
RTOR Reduction (vph)	0	0	46	0	0	43	0	0	297	0	0	142
Lane Group Flow (vph)	336	1167	27	462	818	25	42	0	96	73	0	116
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P		Perm	D.P+P		pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases			4			8	6		2	2		
Actuated Green, G (s)	14.2	33.9	33.9	13.5	33.2	33.2	24.6		20.5	24.6		40.3
Effective Green, g (s)	14.2	33.9	33.9	13.5	33.2	33.2	24.6		20.5	24.6		40.3
Actuated g/C Ratio	0.16	0.38	0.38	0.15	0.37	0.37	0.27		0.23	0.27		0.45
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)	541	1333	596	514	1305	583	397		360	401		1247
v/s Ratio Prot	0.10	c0.33		c0.13	0.23		0.00			c0.01		0.04
v/s Ratio Perm			0.02			0.02	0.03		c0.06	0.04		
v/c Ratio	0.62	0.88	0.05	0.90	0.63	0.04	0.11		0.27	0.18		0.09
Uniform Delay, d1	35.4	26.1	17.8	37.6	23.3	18.2	24.3		28.6	24.8		14.3
Progression Factor	1.00	1.00	1.00	0.87	1.00	1.00	1.00		1.00	1.00		3.20
Incremental Delay, d2	2.2	6.7	0.0	14.1	0.7	0.0	0.1		1.8	0.2		0.0
Delay (s)	37.6	32.8	17.8	46.9	24.0	18.2	24.5		30.4	25.1		45.8
Level of Service	D	C	B	D	C	B	C		C	C		D
Approach Delay (s)		33.1			31.6			29.8			41.2	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	251	90	32	90	73	317
Future Volume (Veh/h)	251	90	32	90	73	317
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)	273	98	35	98	79	345
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	247	40	424			
vC1, stage 1 conf vol	79					
vC2, stage 2 conf vol	168					
vCu, unblocked vol	247	40	424			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	90	97			
cM capacity (veh/h)	782	1023	1132			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	273	98	35	98	40	40	345
Volume Left	273	0	35	0	0	0	0
Volume Right	0	98	0	0	0	0	345
cSH	782	1023	1132	1700	1700	1700	1700
Volume to Capacity	0.35	0.10	0.03	0.06	0.02	0.02	0.20
Queue Length 95th (ft)	39	8	2	0	0	0	0
Control Delay (s)	12.1	8.9	8.3	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	11.2		2.2		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	111	92	38	111	0	121	54	28	0	79	18
Future Volume (Veh/h)	54	111	92	38	111	0	121	54	28	0	79	18
Sign Control		Free			Free			Stop			Stop	
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)	59	121	100	41	121	0	132	59	30	0	86	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			4
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	121			221			495	442	121	486	542	121
vC1, stage 1 conf vol							239	239		203	203	
vC2, stage 2 conf vol							256	203		284	339	
vCu, unblocked vol	121			221			495	442	121	486	542	121
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			75	90	97	100	84	98
cM capacity (veh/h)	1467			1348			528	587	930	541	536	930

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	59	121	100	41	121	0	132	89	0	106
Volume Left	59	0	0	41	0	0	132	0	0	0
Volume Right	0	0	100	0	0	0	0	30	0	20
cSH	1467	1700	1700	1348	1700	1700	528	885	1700	660
Volume to Capacity	0.04	0.07	0.06	0.03	0.07	0.00	0.25	0.10	0.00	0.16
Queue Length 95th (ft)	3	0	0	2	0	0	25	8	0	14
Control Delay (s)	7.6	0.0	0.0	7.8	0.0	0.0	14.1	10.9	0.0	12.2
Lane LOS	A			A			B	B	A	B
Approach Delay (s)	1.6			2.0			12.8		12.2	
Approach LOS							B		B	

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	213	253	215	142	5
Future Volume (Veh/h)	6	213	253	215	142	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)	7	232	275	234	154	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)				1233		
pX, platoon unblocked						
vC, conflicting volume	821	77	159			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	821	77	159			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	76	81			
cM capacity (veh/h)	252	968	1418			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	7	232	275	117	117	77	77	5
Volume Left	7	0	275	0	0	0	0	0
Volume Right	0	232	0	0	0	0	0	5
cSH	252	968	1418	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.19	0.07	0.07	0.05	0.05	0.00
Queue Length 95th (ft)	2	23	18	0	0	0	0	0
Control Delay (s)	19.7	9.9	8.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	A	A					
Approach Delay (s)	10.2		4.4			0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	97	115	13	17	127
Future Volume (Veh/h)	61	97	115	13	17	127
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)	66	105	125	14	18	138
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	275	9	156			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275	9	156			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	90	91			
cM capacity (veh/h)	631	1070	1422			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	66	105	125	7	7	9	9	138
Volume Left	66	0	125	0	0	0	0	0
Volume Right	0	105	0	0	0	0	0	138
cSH	631	1070	1422	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.10	0.09	0.00	0.00	0.01	0.01	0.08
Queue Length 95th (ft)	9	8	7	0	0	0	0	0
Control Delay (s)	11.4	8.7	7.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	A	A					
Approach Delay (s)	9.7		7.0			0.0		
Approach LOS	A							

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	839	426	372	725	207	395	0	270	120	0	113
Future Volume (vph)	172	839	426	372	725	207	395	0	270	120	0	113
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
Lane Util. Factor	0.97	0.95	0.88	0.97	0.95	1.00	0.97		0.88	0.97		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (prot)	3433	3539	2787	3433	3539	1583	3433		2787	3433		1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (perm)	3433	3539	2787	3433	3539	1583	3433		2787	3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	912	463	404	788	225	429	0	293	130	0	123
RTOR Reduction (vph)	0	0	237	0	0	147	0	0	38	0	0	96
Lane Group Flow (vph)	187	912	226	404	788	78	429	0	255	130	0	27
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot		pt+ov	Prot		Perm
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						6
Actuated Green, G (s)	9.1	26.2	44.0	12.5	29.6	29.6	13.3		43.2	7.1		20.0
Effective Green, g (s)	9.1	26.2	44.0	12.5	29.6	29.6	13.3		43.2	7.1		20.0
Actuated g/C Ratio	0.10	0.29	0.49	0.14	0.33	0.33	0.15		0.48	0.08		0.22
Clearance Time (s)	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
Lane Grp Cap (vph)	347	1030	1362	476	1163	520	507		1337	270		351
v/s Ratio Prot	0.05	c0.26	0.08	c0.12	c0.22		c0.12		c0.09	0.04		
v/s Ratio Perm						0.05						0.02
v/c Ratio	0.54	0.89	0.17	0.85	0.68	0.15	0.85		0.19	0.48		0.08
Uniform Delay, d1	38.5	30.5	12.8	37.8	26.1	21.3	37.4		13.4	39.7		27.7
Progression Factor	1.45	0.52	0.92	0.76	0.99	1.38	1.00		1.01	1.00		1.00
Incremental Delay, d2	1.0	6.2	0.0	11.7	1.4	0.1	12.3		0.1	1.4		0.4
Delay (s)	56.7	22.0	11.8	40.4	27.1	29.6	49.6		13.6	41.0		28.1
Level of Service	E	C	B	D	C	C	D		B	D		C
Approach Delay (s)		23.1			31.3			35.0			34.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	103	26	15	0
Future Volume (Veh/h)	0	60	103	26	15	0
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)	0	65	112	28	16	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)				1163		
pX, platoon unblocked						
vC, conflicting volume	254	8	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	254	8	16			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	93			
cM capacity (veh/h)	663	1072	1600			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	65	112	14	14	8	8	0
Volume Left	0	0	112	0	0	0	0	0
Volume Right	0	65	0	0	0	0	0	0
cSH	1700	1072	1600	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.06	0.07	0.01	0.01	0.00	0.00	0.00
Queue Length 95th (ft)	0	5	6	0	0	0	0	0
Control Delay (s)	0.0	8.6	7.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A	A					
Approach Delay (s)	8.6		5.9			0.0		
Approach LOS	A							

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	715	0	427	16	0	4	492	250	10	1	279	804
Future Volume (vph)	715	0	427	16	0	4	492	250	10	1	279	804
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	0.97	0.95	0.95		1.00		0.97	0.95		1.00	0.95	0.88
Frt	1.00	0.85	0.85		0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1504	1504		1744		3433	3519		1770	3539	2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1504	1504		1815		3433	3519		1770	3539	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	777	0	464	17	0	4	535	272	11	1	303	874
RTOR Reduction (vph)	0	162	125	0	20	0	0	2	0	0	0	358
Lane Group Flow (vph)	777	70	107	0	1	0	535	281	0	1	303	516
Turn Type	Prot	NA	custom	Perm	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4	7 5		8		5	2		1	6	6 7
Permitted Phases				8								
Actuated Green, G (s)	20.5	27.2	41.7		2.2		21.2	48.1		1.2	28.1	53.1
Effective Green, g (s)	20.5	27.2	41.7		2.2		21.2	48.1		1.2	28.1	53.1
Actuated g/C Ratio	0.23	0.30	0.46		0.02		0.24	0.53		0.01	0.31	0.59
Clearance Time (s)	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	
Lane Grp Cap (vph)	781	454	696		44		808	1880		23	1104	1644
v/s Ratio Prot	c0.23	c0.05	0.07				c0.16	0.08		0.00	0.09	c0.19
v/s Ratio Perm					0.00							
v/c Ratio	0.99	0.15	0.15		0.01		0.66	0.15		0.04	0.27	0.31
Uniform Delay, d1	34.7	23.0	14.0		42.8		31.2	10.6		43.8	23.3	9.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.8	0.1	0.1		0.1		2.1	0.2		0.8	0.6	0.1
Delay (s)	60.4	23.1	14.0		42.9		33.2	10.8		44.6	23.9	9.4
Level of Service	E	C	B		D		C	B		D	C	A
Approach Delay (s)		44.7			42.9			25.4			13.2	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	331	239	308	211	191	244
Future Volume (vph)	331	239	308	211	191	244
Ideal Flow (vphpl)	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	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.23	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	434	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	360	260	335	229	208	265
RTOR Reduction (vph)	0	0	0	179	0	237
Lane Group Flow (vph)	360	260	335	50	208	28
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		5	
Permitted Phases	8			8		6
Actuated Green, G (s)	38.1	42.6	19.8	19.8	24.4	9.5
Effective Green, g (s)	38.1	42.6	19.8	19.8	24.4	9.5
Actuated g/C Ratio	0.42	0.47	0.22	0.22	0.27	0.11
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)	455	881	409	348	479	167
v/s Ratio Prot	c0.16	0.14	c0.18		c0.12	
v/s Ratio Perm	0.17			0.03		c0.02
v/c Ratio	0.79	0.30	0.82	0.14	0.43	0.17
Uniform Delay, d1	19.9	14.5	33.4	28.3	27.1	36.6
Progression Factor	1.00	1.00	0.84	0.56	0.98	1.01
Incremental Delay, d2	9.1	0.2	12.1	0.2	2.9	2.2
Delay (s)	29.0	14.7	40.2	16.0	29.5	39.2
Level of Service	C	B	D	B	C	D
Approach Delay (s)		23.0	30.4		35.0	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	140	272	318	603	537	191
Future Volume (Veh/h)	140	272	318	603	537	191
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)	152	296	346	655	584	208
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	2035	688	792			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2035	688	792			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	34	58			
cM capacity (veh/h)	36	446	829			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	448	1001	792
Volume Left	152	346	0
Volume Right	296	0	208
cSH	93	829	1700
Volume to Capacity	4.83	0.42	0.47
Queue Length 95th (ft)	Err	52	0
Control Delay (s)	Err	9.8	0.0
Lane LOS	F	A	
Approach Delay (s)	Err	9.8	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	2003.3		
Intersection Capacity Utilization	123.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	9	913	13	27	626
Future Volume (Veh/h)	6	9	913	13	27	626
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)	7	10	992	14	29	680
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	1737	999			1006	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1737	999			1006	
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	97			96	
cM capacity (veh/h)	92	295			689	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	17	1006	709
Volume Left	7	0	29
Volume Right	10	14	0
cSH	155	1700	689
Volume to Capacity	0.11	0.59	0.04
Queue Length 95th (ft)	9	0	3
Control Delay (s)	31.1	0.0	1.1
Lane LOS	D		A
Approach Delay (s)	31.1	0.0	1.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	54	25	18	948	1073	25
Future Volume (Veh/h)	54	25	18	948	1073	25
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)	59	27	20	1030	1166	27
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	2250	1180	1193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2250	1180	1193			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	88	97			
cM capacity (veh/h)	44	232	585			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	86	1050	1193
Volume Left	59	20	0
Volume Right	27	0	27
cSH	59	585	1700
Volume to Capacity	1.45	0.03	0.70
Queue Length 95th (ft)	190	3	0
Control Delay (s)	390.2	1.2	0.0
Lane LOS	F	A	
Approach Delay (s)	390.2	1.2	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	14.9		
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	24	57	51	15	6	4
Future Volume (Veh/h)	24	57	51	15	6	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	62	55	16	7	4
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	71				177	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71				177	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	100
cM capacity (veh/h)	1529				799	1002

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	88	71	11
Volume Left	26	0	7
Volume Right	0	16	4
cSH	1529	1700	862
Volume to Capacity	0.02	0.04	0.01
Queue Length 95th (ft)	1	0	1
Control Delay (s)	2.3	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	30	59	145	139	50
Future Volume (Veh/h)	70	30	59	145	139	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	33	64	158	151	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	222				249	64
vC1, stage 1 conf vol					64	
vC2, stage 2 conf vol					185	
vCu, unblocked vol	222				249	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				80	95
cM capacity (veh/h)	1347				770	1000

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	76	33	64	158	205
Volume Left	76	0	0	0	151
Volume Right	0	0	0	158	54
cSH	1347	1700	1700	1700	1046
Volume to Capacity	0.06	0.02	0.04	0.09	0.20
Queue Length 95th (ft)	4	0	0	0	18
Control Delay (s)	7.8	0.0	0.0	0.0	10.3
Lane LOS	A				B
Approach Delay (s)	5.5		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection						
Int Delay, s/veh	1.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	109	928	100	0	0
Future Vol, veh/h	0	109	928	100	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	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	0	118	1009	109	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	559	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	472	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	472	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	15.2	0
HCM LOS	C	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	472
HCM Lane V/C Ratio	-	-	0.251
HCM Control Delay (s)	-	-	15.2
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	1

Intersection						
Int Delay, s/veh	72.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	272	2830	285	0	0
Future Vol, veh/h	0	272	2830	285	0	0
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	-	145	-	-
Veh in Median Storage, #	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	0	296	3076	310	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	1538	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	~ 105	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	~ 105	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	$ 906.5	0
HCM LOS	F	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	105
HCM Lane V/C Ratio	-	-	2.816
HCM Control Delay (s)	-	-	$ 906.5
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	27.8

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

Intersection	
Int Delay, s/veh	251.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	530	2637	480	0	0
Future Vol, veh/h	0	530	2637	480	0	0
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	-	145	-	-
Veh in Median Storage, #	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	0	576	2866	522	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	1433	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	~ 123	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	~ 123	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	$ 1728.3	0
HCM LOS	F	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	123
HCM Lane V/C Ratio	-	-	4.684
HCM Control Delay (s)	-	-	$ 1728.3
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	60.2

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	370	675	997	571	0	0	0	0	628	65	310
Future Volume (vph)	0	370	675	997	571	0	0	0	0	628	65	310
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
Lane Util. Factor		0.86	0.86	0.91	0.91					0.91	0.91	1.00
Frt		0.93	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.98					0.95	0.96	1.00
Satd. Flow (prot)		4462	1362	1610	3315					1610	3255	1583
Flt Permitted		1.00	1.00	0.95	0.56					0.95	0.96	1.00
Satd. Flow (perm)		4462	1362	1610	1914					1610	3255	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	402	734	1084	621	0	0	0	0	683	71	337
RTOR Reduction (vph)	0	138	284	0	0	0	0	0	0	0	0	223
Lane Group Flow (vph)	0	631	83	564	1141	0	0	0	0	341	413	114
Turn Type		NA	Perm	Prot	NA					Prot	NA	custom
Protected Phases		6		5	5 6					16 8	8	
Permitted Phases			6									16 8
Actuated Green, G (s)		27.1	27.1	38.9	66.0					40.5	40.5	40.5
Effective Green, g (s)		27.1	27.1	38.9	66.0					40.5	40.5	40.5
Actuated g/C Ratio		0.23	0.23	0.32	0.55					0.34	0.34	0.34
Clearance Time (s)		4.5	4.5	4.5							4.5	
Vehicle Extension (s)		3.0	3.0	3.0							3.0	
Lane Grp Cap (vph)		1007	307	521	1506					543	1098	534
v/s Ratio Prot		0.14		c0.35	0.25					c0.21	0.13	
v/s Ratio Perm			0.06		c0.17							0.07
v/c Ratio		0.63	0.27	1.08	0.76					0.63	0.38	0.21
Uniform Delay, d1		41.9	38.3	40.5	20.8					33.4	30.2	28.4
Progression Factor		1.00	1.00	0.65	0.63					1.00	1.00	1.00
Incremental Delay, d2		3.0	2.2	53.7	1.2					2.3	0.2	0.2
Delay (s)		44.8	40.4	80.2	14.3					35.7	30.4	28.6
Level of Service		D	D	F	B					D	C	C
Approach Delay (s)		43.4			36.1			0.0			31.5	
Approach LOS		D			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	116.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	597	0	0	814	700	754	63	739	0	0	0
Future Volume (vph)	401	597	0	0	814	700	754	63	739	0	0	0
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			
Lane Util. Factor	0.91	0.91			0.86	0.86	0.91	0.86	0.91			
Frt	1.00	1.00			0.95	0.85	1.00	0.93	0.85			
Flt Protected	0.95	0.99			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (prot)	1610	3371			4589	1362	1610	2911	1441			
Flt Permitted	0.95	0.57			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (perm)	1610	1943			4589	1362	1610	2911	1441			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	436	649	0	0	885	761	820	68	803	0	0	0
RTOR Reduction (vph)	0	0	0	0	65	271	0	142	326	0	0	0
Lane Group Flow (vph)	353	732	0	0	1201	109	443	705	75	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	1	1 2			2		12 4	4				
Permitted Phases						2			4			
Actuated Green, G (s)	31.0	65.4			34.4	34.4	41.1	41.1	22.5			
Effective Green, g (s)	31.0	65.4			34.4	34.4	41.1	41.1	22.5			
Actuated g/C Ratio	0.26	0.55			0.29	0.29	0.34	0.34	0.19			
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)	415	1427			1315	390	551	997	270			
v/s Ratio Prot	c0.22	0.13			c0.26		c0.28	0.24				
v/s Ratio Perm		0.15				0.08			0.05			
v/c Ratio	0.85	0.51			0.91	0.28	0.80	0.71	0.28			
Uniform Delay, d1	42.3	17.2			41.4	33.2	35.8	34.2	41.8			
Progression Factor	0.61	0.56			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	13.1	0.3			9.9	0.4	8.3	2.3	0.6			
Delay (s)	38.7	9.9			51.2	33.6	44.1	36.5	42.4			
Level of Service	D	A			D	C	D	D	D			
Approach Delay (s)		19.3			47.1			39.9			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	116.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
29: FM 1101 & Kohlenburg

03 Mit AM.syn
03/09/2021

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	107	205	175	439	514	152
Future Volume (vph)	107	205	175	439	514	152
Ideal Flow (vphpl)	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	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	1805	
Flt Permitted	0.95	1.00	0.27	1.00	1.00	
Satd. Flow (perm)	1770	1583	506	1863	1805	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	116	223	190	477	559	165
RTOR Reduction (vph)	0	177	0	0	16	0
Lane Group Flow (vph)	116	46	190	477	708	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	8.7	8.7	24.4	24.4	24.4	
Effective Green, g (s)	8.7	8.7	24.4	24.4	24.4	
Actuated g/C Ratio	0.21	0.21	0.58	0.58	0.58	
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)	365	327	293	1079	1046	
v/s Ratio Prot	c0.07			0.26	c0.39	
v/s Ratio Perm		0.03	0.38			
v/c Ratio	0.32	0.14	0.65	0.44	0.68	
Uniform Delay, d1	14.2	13.6	6.0	5.0	6.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.2	4.9	0.3	1.8	
Delay (s)	14.7	13.8	10.8	5.3	7.9	
Level of Service	B	B	B	A	A	
Approach Delay (s)	14.1			6.9	7.9	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	208	1717	104	0	0
Future Vol, veh/h	0	208	1717	104	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	-	-	145	-	-
Veh in Median Storage, #	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	0	226	1866	113	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	-	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	-
Pot Cap-1 Maneuver	0	0	-	-
Stage 1	0	0	-	-
Stage 2	0	0	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB		NB
HCM Control Delay, s	0		0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	0
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	158	1756	148	0	0
Future Vol, veh/h	0	158	1756	148	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	145	-	-
Veh in Median Storage, #	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	0	172	1909	161	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	-	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	-
Pot Cap-1 Maneuver	0	0	-	-
Stage 1	0	0	-	-
Stage 2	0	0	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	0
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	531	927	1162	979	0	0	0	0	834	283	526
Future Volume (vph)	0	531	927	1162	979	0	0	0	0	834	283	526
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
Lane Util. Factor		0.86	0.86	0.91	0.91					0.91	0.91	1.00
Frt		0.93	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.98					0.95	0.97	1.00
Satd. Flow (prot)		4470	1362	1610	3337					1610	3292	1583
Flt Permitted		1.00	1.00	0.95	0.54					0.95	0.97	1.00
Satd. Flow (perm)		4470	1362	1610	1839					1610	3292	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	577	1008	1263	1064	0	0	0	0	907	308	572
RTOR Reduction (vph)	0	131	136	0	0	0	0	0	0	0	0	278
Lane Group Flow (vph)	0	950	368	758	1569	0	0	0	0	453	762	294
Turn Type		NA	Perm	Prot	NA					Prot	NA	custom
Protected Phases		6		5	5 6					16 8	8	
Permitted Phases			6									16 8
Actuated Green, G (s)		33.5	33.5	32.5	66.0					40.5	40.5	40.5
Effective Green, g (s)		33.5	33.5	32.5	66.0					40.5	40.5	40.5
Actuated g/C Ratio		0.28	0.28	0.27	0.55					0.34	0.34	0.34
Clearance Time (s)		4.5	4.5	4.5							4.5	
Vehicle Extension (s)		3.0	3.0	3.0							3.0	
Lane Grp Cap (vph)		1247	380	436	1417					543	1111	534
v/s Ratio Prot		0.21		c0.47	0.30					c0.28	0.23	
v/s Ratio Perm			0.27		c0.31							0.19
v/c Ratio		0.91dr	0.97	1.74	1.11					0.83	0.69	0.55
Uniform Delay, d1		39.6	42.7	43.8	27.0					36.7	34.3	32.3
Progression Factor		1.00	1.00	0.89	0.89					1.00	1.00	1.00
Incremental Delay, d2		4.4	39.2	333.2	49.4					10.6	1.8	1.2
Delay (s)		44.0	81.9	372.2	73.4					47.3	36.0	33.6
Level of Service		D	F	F	E					D	D	C
Approach Delay (s)		56.1			170.7			0.0			38.1	
Approach LOS		E			F			A			D	

Intersection Summary			
HCM 2000 Control Delay	97.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	139.6%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	710	655	0	0	600	528	1541	62	886	0	0	0
Future Volume (vph)	710	655	0	0	600	528	1541	62	886	0	0	0
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			
Lane Util. Factor	0.91	0.91			0.86	0.86	0.91	0.86	0.91			
Frt	1.00	1.00			0.95	0.85	1.00	0.96	0.85			
Flt Protected	0.95	0.99			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	1610	3342			4586	1362	1610	2966	1441			
Flt Permitted	0.95	0.57			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	1610	1943			4586	1362	1610	2966	1441			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	772	712	0	0	652	574	1675	67	963	0	0	0
RTOR Reduction (vph)	0	0	0	0	66	234	0	31	324	0	0	0
Lane Group Flow (vph)	486	998	0	0	873	53	837	1250	263	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	1	1 2			2		12 4	4				
Permitted Phases						2			4			
Actuated Green, G (s)	30.0	52.3			22.3	22.3	54.2	54.2	28.2			
Effective Green, g (s)	30.0	52.3			22.3	22.3	54.2	54.2	28.2			
Actuated g/C Ratio	0.25	0.44			0.19	0.19	0.45	0.45	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)	402	1196			852	253	727	1339	338			
v/s Ratio Prot	c0.30	0.21			c0.19		c0.52	0.42				
v/s Ratio Perm		0.15				0.04			0.18			
v/c Ratio	1.21	0.83			1.02	0.21	1.15	1.11dl	0.78			
Uniform Delay, d1	45.0	30.0			48.9	41.4	32.9	31.2	43.0			
Progression Factor	0.83	0.82			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	107.9	3.3			37.3	0.4	83.5	12.0	10.7			
Delay (s)	145.5	27.8			86.1	41.8	116.4	43.2	53.7			
Level of Service	F	C			F	D	F	D	D			
Approach Delay (s)		66.3			75.7			68.1			0.0	
Approach LOS		E			E			E			A	

Intersection Summary			
HCM 2000 Control Delay	69.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	139.6%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	140	272	318	603	537	191
Future Volume (vph)	140	272	318	603	537	191
Ideal Flow (vphpl)	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	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	1797	
Flt Permitted	0.95	1.00	0.10	1.00	1.00	
Satd. Flow (perm)	1770	1583	191	1863	1797	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	296	346	655	584	208
RTOR Reduction (vph)	0	249	0	0	15	0
Lane Group Flow (vph)	152	47	346	655	777	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	11.4	11.4	51.6	51.6	34.6	
Effective Green, g (s)	11.4	11.4	51.6	51.6	34.6	
Actuated g/C Ratio	0.16	0.16	0.72	0.72	0.48	
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)	280	250	411	1335	863	
v/s Ratio Prot	c0.09		c0.15	0.35	0.43	
v/s Ratio Perm		0.03	c0.46			
v/c Ratio	0.54	0.19	0.84	0.49	0.90	
Uniform Delay, d1	27.9	26.3	19.5	4.5	17.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	0.4	14.4	0.3	12.4	
Delay (s)	30.0	26.6	33.9	4.7	29.6	
Level of Service	C	C	C	A	C	
Approach Delay (s)	27.8			14.8	29.6	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection						
Int Delay, s/veh	0					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱		
Traffic Vol, veh/h	0	530	2637	480	0	0
Future Vol, veh/h	0	530	2637	480	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	145	-	-
Veh in Median Storage, #	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	0	576	2866	522	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	-	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	-
Pot Cap-1 Maneuver	0	0	-	-
Stage 1	0	0	-	-
Stage 2	0	0	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	0
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	272	2830	285	0	0
Future Vol, veh/h	0	272	2830	285	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	-	-	145	-	-
Veh in Median Storage, #	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	0	296	3076	310	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	-	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	-
Pot Cap-1 Maneuver	0	0	-	-
Stage 1	0	0	-	-
Stage 2	0	0	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	0
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	-

APPENDIX H
Mitigation Summary

GLO TRACT Appendix H
Mitigation Summary

1. **IH-35 SBFR at Street A & IH-35 NBFR at Street A** Convert the EB approach from T-T-T-R to T-T-TR-R will help reduce delay but not fully mitigate. This intersection is considered fully built-out.

2. **IH-35 NBFR at Watson Ln E** An acceleration Lane is recommended, because it will help WB right-turn volume delay.

3. **IH-35 NBFR at Street F** An acceleration Lane is recommended, because it will help WB right-turn volume delay.

4. **IH-35 NBFR at Street E** An acceleration Lane is recommended, because it will help WB right-turn volume delay.

5. **FM 1101 at Kohlenberg Rd** Signalization is recommended, and it is likely to meet warrants. Additionally, it is recommended to install NB left-turn lane and EB right-turn lane.

6. **FM 1101 at Kroesche Ln** No Improvements recommended. Signalization will help but it is unlikely to meet warrants.

7. **FM 1101 at Watson Ln E** No Improvements recommended. Right-turn and left-turn lanes were tried, but the delay did not improve. Signalization will help but it is unlikely to meet warrants.

APPENDIX I
Detailed Cost Estimate

GLO TRACT
OPINION OF PROBABLE CONSTRUCTION COST
SUMMARY

January 24, 2020

		N/A LOTS	
		2315 ACRE	
I.	PHASE 1	$	44,794,800
II.	PHASE 2	$	38,553,750
III.	PHASE 3	$	42,516,650
IV.	PHASE 4	$	16,975,150
V.	PHASE 5	$	483,000
VI.	OFFSITE STREET IMPROVEMENTS	$	17,796,250
PROJECT TOTAL:			***$161,119,600***

UNIT COST ANALYSIS:

Cost per Lot =	N/A	☑	NO DESIGN COMPLETED
Cost per Acre =	$69,598	☐	PRELIMINARY DESIGN
		☐	FINAL DESIGN
		☐	OTHER

PREPARED BY: Pape-Dawson Engineers, Inc.
DATE: 1/24/2020
JOB NO.: 30002-00
DOC ID: P:\300\02\00\Excel\Cost Estimates\OPC January 2020

GLO TRACT - PHASE 1
PUBLIC STREET IMPROVEMENTS

(INCLUDES COLLECTORS, MINOR AND MAJOR ARTERIALS, OFFSITE/MAJOR DRAINAGE

STREET C - ROW VARIES (60'-90' ROW)
4,925 lf ~ Major Collector w/divided 4 lanes and 2,650 lf ~ Minor Collector w/3 lanes and bike lanes

STREET	LF	No. of Lanes	Street Cost Summary	
Street C (Major Collector)	4,000	5	$	3,788,000
Street C (Minor Colletor)	2,700	4	$	2,045,000
Right Turn Decel Lane at Street D			$	75,000
Right Turn Decel Lane at Street A (2)			$	150,000
Right Turn Decel Lane at Street B			$	75,000
Traffic Signal at Street C/Street B Intersection			$	300,000
Traffic Signal at Street C/Street D Intersection			$	300,000
		Subtotal Streets	*$*	*6,733,000*
OTHER	**LF**	**Cost/LF**	**Other Cost Summary**	
12" Water	4,800	$ 100	$	480,000
24" Water	2,100	$ 180	$	378,000
Culvert Crossing #10			$	105,000
		Subtotal Other	*$*	*963,000*
Engineering			*$*	*769,600*
Contingency (5%)			*$*	*384,800*
		TOTAL STREET C COST	**$**	**8,850,400**

STREET D (90' ROW)
Major Collector w/divided 4 lanes

STREET	LF	No. of Lanes	Street Cost Summary	
Street D	1,000	5	$	947,000
Right Turn Decel Lane at Street C			$	75,000
Right Turn Decel Lane at IH35			$	75,000
		Subtotal Streets	*$*	*1,097,000*
OTHER	**LF**	**Cost/LF**	**Water Cost Summary**	
12" Water	300	$ 100	$	30,000
24" Water	700	$ 180	$	126,000
		Subtotal Other	*$*	*156,000*
Engineering			*$*	*125,300*
Contingency (5%)			*$*	*62,650*
		TOTAL STREET D COST	**$**	**1,440,950**

STREET B (100' ROW) 4 Lane Minor Arterial w/median				
STREET	LF	No. of Lanes	Street Cost Summary	
Street B	1,400	5	$	1,326,000
Right Turn Decel Lane at Street C			$	75,000
Right Turn Decel Lane at Street A			$	75,000
		Subtotal Streets	*$*	*1,476,000*
OTHER	LF	Cost/LF	Water Cost Summary	
12" Water	1,400	100	$	140,000
Culvert Crossing #4			$	105,000
		Subtotal Other	*$*	*245,000*
Engineering			*$*	*172,100*
Contingency (5%)			*$*	*86,050*
		TOTAL STREET B COST	**$**	**1,979,150**

STREET A (200' ROW) 4 lane Half-Parkway				
STREET	LF	No. of Lanes	Street Cost Summary	
Street A	2,900	5	$	2,746,000
Right Turn Decel Lane at Street B			$	75,000
Right Turn Decel Lane at FM1101 (2)			$	150,000
Traffic Signal at FM1101			$	300,000
		Subtotal Streets	*$*	*3,271,000*
OTHER	LF	Cost/LF	Water Cost Summary	
12" Water	2,900	100	$	290,000
		Subtotal Other	*$*	*290,000*
Engineering			*$*	*356,100*
Contingency (5%)			*$*	*178,050*
		TOTAL STREET A COST	**$**	**4,095,150**

PHASE 1 OFFSITE WATER, DETENTION AND SEWER IMPROVMENTS

DETENTION				
Detention Basin 1			$	225,000
Detention Basin 2			$	375,000
Detention Basin 3			$	135,000
Detention Basin 4			$	8,000,000
Detention Basin 10			$	345,000
		Subtotal Detention	*$*	*9,080,000*
OFFSITE WATER	LF	Cost/LF	Water Cost Summary	
24" Water (Off-site to EST)	6,800	$ 180	$	1,224,000
Elevated Storage Tank			$	5,000,000
		Subtotal Offsite Water	*$*	*6,224,000*
OFFSITE SEWER	LF	Cost/LF	Sewer Cost Summary	
8" Sewer Main	8,000	$ 80	$	640,000
10" Sewer Main	900	$ 100	$	90,000
12" Sewer Main	3,100	$ 120	$	372,000
24" Sewer Main	300	$ 250	$	75,000
30" Sewer Main	4,800	$ 300	$	1,440,000
Lift Station #3			$	1,300,000
Wastewater Treatment Plant (Phase 1A)			$	5,500,000
		Subtotal Offsite Sewer	*$*	*9,417,000*
Engineering			*$*	*2,472,100*
Contingency (5%)			*$*	*1,236,050*
		TOTAL PHASE 1 OFFSITE IMPROVEMENTS	**$**	**28,429,150**
		TOTAL PHASE 1 IMPROVEMENTS	**$**	**44,794,800**

GLO TRACT - PHASE 2
PUBLIC STREET IMPROVEMENTS

(INCLUDES COLLECTORS, MINOR AND MAJOR ARTERIALS, OFFSITE/MAJOR DRAINAGE IMPROVEMENTS, WATER MAINS)

STREET E (60' ROW)
Minor Collector w/3 lanes and bike lanes

STREET	LF	No. of Lanes	Street Cost Summary	
Street E	1,800	4	$	1,364,000
Right Turn Decel Lane at Street D			$	75,000
Right Turn Decel Lane at Street B			$	75,000
Traffic Signal at Street D/Street E			$	300,000
Traffic Signal at Street B/Street E			$	300,000
		Subtotal Streets	*$*	*2,114,000*
Engineering			*$*	*211,400*
Contingency (5%)			*$*	*105,700*
		TOTAL STREET E COST	**$**	**2,431,100**

STREET D (60' ROW)
Minor Collector w/3 lanes and bike lanes

STREET	LF	No. of Lanes	Street Cost Summary	
Street D	1,400	4	$	1,061,000
Right Turn Decel Lane at Street E			$	75,000
		Subtotal Streets	*$*	*1,136,000*
OTHER	LF	Cost/LF	Water Cost Summary	
12" Water	1,400	$ 100	$	140,000
Culvert #5			$	150,000
		Subtotal Other	*$*	*290,000*
Engineering			*$*	*142,600*
Contingency (5%)			*$*	*71,300*
		TOTAL STREET D COST	**$**	**1,639,900**

STREET B (100' ROW) 4 Lane Minor Arterial w/median				
STREET	LF	No. of Lanes	Street Cost Summary	
Street B	6,900	5	$	6,534,000
Right Turn Decel Lane at Street E			$	75,000
Right Turn Decel Lane at Street A			$	75,000
Traffic Signal at Street A			$	300,000
		Subtotal Streets	*$*	*6,984,000*
OTHER	LF	Cost/LF	Water Cost Summary	
16" Water	5,000	140	$	700,000
Culvert #6			$	365,000
Culvert #9			$	185,000
		Subtotal Other	*$*	*1,250,000*
Engineering			*$*	*823,400*
Contingency (5%)			*$*	*411,700*
		TOTAL STREET B COST	**$**	**9,469,100**

STREET F (60' ROW) Minor Collector w/3 lanes and bike lanes				
STREET	LF	No. of Lanes	Street Cost Summary	
Street F	2,400	4	$	1,818,000
Right Turn Decel Lane at IH35			$	125,000
		Subtotal Streets	*$*	*1,943,000*
OTHER	LF	Cost/LF	Water Cost Summary	
12" Water	2,400	100	$	240,000
12" Water bore across IH35	500	1000	$	500,000
		Subtotal Other	*$*	*740,000*
Engineering			*$*	*268,300*
Contingency (5%)			*$*	*134,150*
		TOTAL STREET F COST	**$**	**3,085,450**

STREET A (200' ROW) 4 lane Half-Parkway				
STREET	LF	No. of Lanes	Street Cost Summary	
Right Turn Decel Lane at FM1102			$	75,000
		Subtotal Streets	*$*	*75,000*
OTHER	LF	Cost/LF	Water Cost Summary	
12" Water adjacent to Hunter Road	5,000	100	$	500,000
		Subtotal Other	*$*	*500,000*
Engineering			*$*	*57,500*
Contingency (5%)			*$*	*28,750*
		TOTAL STREET A COST	**$**	**661,250**

PHASE 2 OFFSITE WATER, DETENTION AND SEWER IMPROVMENTS			
DETENTION			
Detention Basin 5			$ 535,000
Detention Basin 6			$ 8,000,000
		Subtotal Detention	*$ 8,535,000*
OFFSITE SEWER	LF	Cost/LF	Sewer Cost Summary
8" Sewer Main	6,800	$ 80	$ 544,000
10" Sewer Main	3,800	$ 100	$ 380,000
12" Sewer Main	7,200	$ 120	$ 864,000
15" Sewer Main	5,300	$ 150	$ 795,000
24" Sewer Main	2,300	$ 250	$ 575,000
Lift Station #2			$ 2,300,000
Wastewater Treatment Plant (Phase 1B)			$ 4,500,000
		Subtotal Offsite Sewer	*$ 9,958,000*
Engineering			*$ 1,849,300*
Contingency (5%)			*$ 924,650*
		TOTAL PHASE 2 OFFSITE IMPROVEMENTS	**$ 21,266,950**
		TOTAL PHASE 2 IMPROVEMENTS	**$ 38,553,750**

GLO TRACT - PHASE 3
PUBLIC STREET IMPROVEMENTS

(INCLUDES COLLECTORS, MINOR AND MAJOR ARTERIALS, OFFSITE/MAJOR DRAINAGE IMPROVEMENTS, WATER MAINS)

STREET A (200' ROW)
12,000 lf ~ 4 lane half Parkway and 2,600 lf ~ Minor Collector w/3 lanes and bike lanes

STREET	LF	No. of Lanes	Street Cost Summary	
Street A (4 lane half Parkway)	12,000	5	$	11,364,000
Street A (Minor Collector)	2,600	4	$	1,970,000
Right Turn Decel Lane at IH35 (2)			$	250,000
Right Turn Decel Lane at Street C (2)			$	150,000
Right Turn Decel Lane at Street B			$	75,000
Right Turn Decel Lane at Street F			$	75,000
Right Turn Decel Lane at Street G (2)			$	150,000
Traffic Signal at Street C			$	300,000
Traffic Signal at IH35			$	600,000
Traffic Signal at Street F			$	300,000
Traffic Signal at Street G			$	300,000
		Subtotal Streets	*$*	*15,534,000*
OTHER	**LF**	**Cost/LF**	**Water Cost Summary**	
24" Water	15,000	$ 180	$	2,700,000
24" Water bore across IH35	500	$ 1,200	$	600,000
Culvert #11			$	350,000
Culvert #1			$	1,290,000
Culvert #12			$	206,000
Culvert #13			$	475,000
		Subtotal Other	*$*	*5,621,000*
Engineering			*$*	*2,115,500*
Contingency (5%)			*$*	*1,057,750*
		TOTAL STREET A COST	**$**	**24,328,250**

STREET G (100' ROW)
4 Lane Minor Arterial w/median

STREET	LF	No. of Lanes	Street Cost Summary	
Street G	2,200	5	$	2,083,000
Right Turn Decel Lane at Street A			$	75,000
		Subtotal Streets	*$*	*2,158,000*
OTHER	**LF**	**Cost/LF**	**Water Cost Summary**	
16" Water	2,400	180	$	432,000
Culvert #7			$	290,000
		Subtotal Other	*$*	*722,000*
Engineering			*$*	*288,000*
Contingency (5%)			*$*	*144,000*
		TOTAL STREET G COST	**$**	**3,312,000**

PHASE 3 OFFSITE WATER, DETENTION AND SEWER IMPROVMENTS			
DETENTION			
Detention Basin 8			$ 560,000
Detention Basin 9			$ 310,000
Detention Basin 7			$ 350,000
		Subtotal Detention	*$ 1,220,000*
OFFSITE WATER	LF	Cost/LF	Water Cost Summary
12" Water adjacent to IH35	3,200	$ 100	$ 320,000
		Subtotal Offsite Water	*$ 320,000*
OFFSITE SEWER	LF	Cost/LF	Sewer Cost Summary
8" Sewer Main	200	$ 80	$ 16,000
10" Sewer Main	3,000	$ 100	$ 300,000
15" Sewer Main	2,000	$ 150	$ 300,000
18" Sewer Main	900	$ 200	$ 180,000
Lift Station #1			$ 1,600,000
Wastewater Treatment Plant (Phase 2)			$ 9,000,000
		Subtotal Offsite Sewer	*$ 11,396,000*
Engineering			*$ 1,293,600*
Contingency (5%)			*$ 646,800*
		TOTAL PHASE 3 OFFSITE IMPROVEMENTS	**$ 14,876,400**
		TOTAL PHASE 3 IMPROVEMENTS	**$ 42,516,650**

GLO TRACT - PHASE 4
PUBLIC STREET IMPROVEMENTS

(INCLUDES COLLECTORS, MINOR AND MAJOR ARTERIALS, OFFSITE/MAJOR DRAINAGE IMPROVEMENTS, WATER MAINS)

STREET D (60' ROW)
Minor Collector w/3 lanes and bike lanes

STREET	LF	No. of Lanes	Street Cost Summary
Street D	3,300	4	$ 2,500,000
Right Turn Decel Lane at Street B			$ 75,000
Right Turn Decel Lane at Street E			$ 75,000
Traffic Signal at Street B			$ 300,000
		Subtotal Streets	*$ 2,950,000*
OTHER	**LF**	**Cost/LF**	**Water Cost Summary**
12" Water	3,300	$ 100	$ 330,000
		Subtotal Other	*$ 330,000*
Engineering			*$ 328,000*
Contingency (5%)			*$ 164,000*
		TOTAL STREET D COST	**$ 3,772,000**

STREET E (60' ROW)
Minor Collector w/3 lanes and bike lanes

STREET	LF	No. of Lanes	Street Cost Summary
Street E	825	4	$ 625,000
Right Turn Decel Lane at IH35			$ 75,000
		Subtotal Streets	*$ 700,000*
Engineering			*$ 70,000*
Contingency (5%)			*$ 35,000*
		TOTAL STREET E COST	**$ 805,000**

STREET F (60' ROW)
Minor Collector w/3 lanes and bike lanes

STREET	LF	No. of Lanes	Street Cost Summary
Street F	2,000	4	$ 1,515,000
Right Turn Decel Lane at Street A			$ 75,000
		Subtotal Streets	*$ 1,590,000*
OTHER	**LF**	**Cost/LF**	**Water Cost Summary**
12" Water	2,000	100	$ 200,000
Culvert #8			$ 105,000
		Subtotal Other	*$ 305,000*
Engineering			*$ 189,500*
Contingency (5%)			*$ 94,750*
		TOTAL STREET F COST	**$ 2,179,250**

STREET B (100' ROW) 4 Lane Minor Arterial w/median				
STREET	LF	No. of Lanes	Street Cost Summary	
Street B	1,000	5	$	947,000
Right Turn Decel Lane at Kohlenberg			$	75,000
Traffic Signal at Kohlenberg			$	300,000
		Subtotal Streets	*$*	*1,322,000*
Engineering			*$*	*132,200*
Contingency (5%)			*$*	*66,100*
		TOTAL STREET B COST	**$**	**1,520,300**

STREET G (100' ROW) 4 Lane Minor Arterial w/median				
STREET	LF	No. of Lanes	Street Cost Summary	
Street G	3,900	5	$	3,693,000
Right Turn Decel Lane at Street A			$	75,000
		Subtotal Streets	*$*	*3,768,000*
OTHER	LF	Cost/LF	Water Cost Summary	
16" Water	3,900	140	$	546,000
Culvert #2			$	250,000
Culvert #3 (Existing Goodwin Lane)			$	540,000
		Subtotal Other	*$*	*1,336,000*
Engineering			*$*	*510,400*
Contingency (5%)			*$*	*255,200*
		TOTAL STREET A COST	**$**	**5,869,600**

PHASE 4 OFFSITE WATER, DETENTION AND SEWER IMPROVMENTS						
DETENTION						
Detention Basin 11					$	220,000
			Subtotal Detention		*$*	*220,000*
OFFSITE WATER	LF	Cost/LF			Water Cost Summary	
12" Water adjacent to IH35	3,800	$	100		$	380,000
			Subtotal Offsite Water		*$*	*380,000*
OFFSITE SEWER	LF	Cost/LF			Sewer Cost Summary	
8" Sewer Main	6,800	$	80		$	544,000
10" Sewer Main	1,400	$	100		$	140,000
12" Sewer Main	3,000	$	120		$	360,000
Lift Station #4					$	816,000
			Subtotal Offsite Sewer		*$*	*1,860,000*
Engineering					*$*	*246,000*
Contingency (5%)					*$*	*123,000*
			TOTAL PHASE 4 OFFSITE IMPROVEMENTS		**$**	**2,829,000**
			TOTAL PHASE 4 IMPROVEMENTS		**$**	**16,975,150**

GLO TRACT - PHASE 5
PUBLIC STREET IMPROVEMENTS

(INCLUDES COLLECTORS, MINOR AND MAJOR ARTERIALS, OFFSITE/MAJOR DRAINAGE IMPROVEMENTS, WATER MAINS)

PHASE 5 OFFSITE WATER, DETENTION AND SEWER IMPROVMENTS

DETENTION				
Detention Basin #12			$	420,000
		Subtotal Detention	*$*	*420,000*
Engineering			*$*	*42,000*
Contingency (5%)			*$*	*21,000*
		TOTAL PHASE 5 OFFSITE IMPROVEMENTS	**$**	**483,000**
		TOTAL PHASE 5 IMPROVEMENTS	**$**	**483,000**

GLO TRACT - OFFSITE STREET IMPROVEMENTS
PUBLIC STREET IMPROVEMENTS

(INCLUDES OFFSITE STREET IMPROVEMENTS BASED ON PRELIMINARY TIA)

OFFSITE STREET IMPROVEMENTS			
FM1101			
Assumes improving approx. 3,700 lf FM1101 to a Minor Arterial along the GLO East frontage.		$	5,960,000
KOHLENBERG			
Assumes improving approx. 3,100 lf Kohlenberg to a Minor Arterial along the GLO East frontage.		$	4,990,000
KOHLENBERG/FM1101 INTERSECTION			
Assumes improving the Kohlenberg/FM1101 intersection to include a traffic signal, dual left-turns and right turn lanes in all directions.		$	1,100,000
FM1101/STREET A INTERSECTION			
Assumes adding dual left-turns and right turn lanes on FM1101		$	500,000
STREET B EXTENSION			
Assumes construction of approx. 1,400 lf ~ half of a Minor Arterial (3 lanes)		$	795,000
STREET G EXTENSION			
Assumes improving approx. 2,200 lf Street G (Goodwin Lane) to half of a Minor Arterial (3 lanes) along the GLO West frontage.		$	2,130,000
	Subtotal Offsite Street	*$*	*15,475,000*
Engineering		*$*	*1,547,500*
Contingency (5%)		*$*	*773,750*
	TOTAL OFFSITE STREET IMPROVEMENTS	**$**	**17,796,250**

GLO TRACT
OPINION OF PROBABLE COST
NOTES

January 24, 2020

Below is a summary of notes, assumptions and exclusions related to the GLO Tract site planning and cost estimates:

GENERAL

- These estimates exclude any internal improvements to the multi-family, single family, or commercial pods.
- Estimates based on land plan dated 12/22/19.
- Estimates include phasing provided by SouthStar.
- Costs were based on average construction costs for similar project in the area.
- Costs do not include permitting fees, platting fees, or other soft costs.
- Estimates do not include any landscaping, trees or fencing.
- Estimates do not include inflation of construction costs over time.

WATER

- Estimates assume that New Braunfels Utilities will be the water provider.
- Impact Fees were not included in the cost estimates.
- This cost estimate does not include any offsite water improvements. NBU is currently researching offsite infrastructure requirements and costs.
- Two tanks will be required to serve the GLO Tract: the onsite 1.4 MG Kohlenberg elevated storage tank and the offsite 2.0 MG Goodwin elevated storage tank.
- Estimates exclude the future NBU Goodwin elevated storage tank.
- Estimates include the total cost of the Kohlenberg 1.4 MG elevated storage tank to be located on GLO – East. Cost sharing will be negotiated.
- Water main sizes are estimates provided by Pape-Dawson. No water modelling has been conducted at this time.

SEWER

- Estimates include a total fee of $19,000,000 for the wastewater sewer treatment plan provided by Integrated Water Services. Phasing of the plant, and flows for each phase, was provided by Integrated Water Services and assumed constructing the plant in three phases. Flows for each phase of the plant were provided by Integrated Water Services.
- Maximum sewer depth was assumed to be 20 ft when determining location of lift stations.

STREETS

- Bike lanes were excluded from these estimates with the exception of Minor Collectors. All other street sections assume joint use paths.
- Proposed right-of-way widths were estimated based on the preliminary Traffic Impact Analysis. Number of lanes assumed for this OPC do not include oversizing by the City and/or County.
- These estimates exclude cost sharing for adjacent road improvements by the City and/or County.
- External traffic improvements have been excluded from this estimate since preparation of the Traffic Impact Analysis is ongoing and has not yet been completed. Once the TIA is complete, the estimates will need to be updated to include the required offsite improvements.
- Estimates exclude any slope, retaining wall, drainage improvements at the IH 35 intersection. Further coordination is required with TxDOT to determine what additional improvements may be required for the addition of a turnaround lane.
- For the proposed streets, an estimate of 1.0 million/lane/mile was used to estimate the collector and arterial type roads. As directed by SouthStar, these estimates include a 5% contingency.
- Except where noted, proposed improvements to existing offsite and adjacent roads were not included. These estimates exclude any reconstruction of existing streets (Goodwin Lane and Woods Path).
- If required, turn lanes and signals were included at proposed intersections with existing streets.
- Street estimates do include a separate line item for engineering which was assumed to be 10% of construction cost.

FLOODPLAIN/DRAINAGE

- Detention basins were sized using an estimate of 0.3 acre-ft/acre for the contributing watershed.
- Basin areas were calculated assuming an average depth of 3 ft.
- Basin quantities assumed 50% excavation and 50% embankment based on the required volume.

- There are no existing models or hydrology for the existing FEMA floodplain. A FEMA LOMR will need to be prepared with the first unit to determine the limits of the floodplain.
- Existing contours shown are based on aerial topography. Field survey will be required for the flood study to determine the actual limits of the floodplain.
- Bridge sizing was based on $100/sf of required area which includes contingency. No additional aesthetics or facades are included in this assumption.
- Detention Basins 4 and 6 will be regulated dams. Further evaluation and pricing is required.

END OF NOTES

APPENDIX J
New Braunfels Scoping Meeting

Conference Memo

PROJECT:	GLO New Braunfels	DATE:	11/7/2019
CONFERENCE LOCATION:	City of New Braunfels (Landa-Public Works Conference Room)	CONFERENCE DATE:	11/7/2019
PURPOSE OF MEETING:	Traffic Study Scoping Meeting		
ATTENDEES:	Jim (SouthStar), Trey Marsh (Bitterblue), Todd Blackmon, Garry Ford, Mary Hamman, Mathew (Planning)		
FROM:	Justin Clark, P.E. PTOE	PROJECT NO.:	N/A
CC:	All Attendees		

DISCUSSION:

- Parkway is planned to go out to SH 130 and a gateway
  - One alignment uses FM 1101
  - One alignment goes to FM 758
  - Quarter Mile spacing of major intersections and very limited access otherwise
  - City desires to build the entire cross section for Parkway Section
- Western Tract
  - Extend Goodwin-Conrads Roadway from Bond project to the north through the site
- Collector Roadway
  - Need a network of collector roadways within the site to handle traffic
- Major Thoroughfare Plan to be completed in January
- They have talked to Comal ISD about schools
- Have talked to the Fire Department and need a station west of IH-35
- Have talked to Parks and are planning for regional and linear park.
- Traffic Impacts Analysis
  - Roadway Sizes and Capacity
  - Intersections and Capacity
  - Access is important
  - Future improvements from TxDOT and City of New Braunfels
  - Do true TIAs as we each small segment
  - Boundaries of Study Area
    - Kohlenburg Interchange

    - FM 1101 - Kohlenburg Signal trigger by adjacent development
        - Been pushing TxDOT to Widen from FM 306 to Kohlenburg
    - Watson (East and West)
- Project Timeline and Development
    - Start Building in December 2020 or Construction in early 2021
    - Utilities are the biggest issue
    - 7,000 Dwelling Units
    - MUD district is established and therefore Develop Agreement is required.
    - PCI, Brown and Gay, and WSP did the schematic
        - Get counts thorough TxDOT (Clayton)
        - Look at Traffic Projections to check distribution

END MEMO

APPENDIX K
Preliminary Master Development Plan

Combined Land Use Totals	
Single Family Residential (East)	657.32 ac
Single Family Residential (West)	234.71 ac
MXD	128.32 ac
Neighborhood Commercial	19.73 ac
Flex-Commercial	58.14 ac
Light Industrial	159.95 ac
Middle / High School	117.27 ac
Elementary School	36.00 ac
Recreation Center	12.52 ac
Fire Station	2.52 ac
Transformer Station	5.16 ac
Community Parks	123.54 ac
Linear Parks	102.64 ac
Drainage / Setback Open Space	37.85 ac
Easement Open Space	54.76 ac
ROW	137.57 ac
TOTAL	**1888.00**

PRELIMINARY

The information shown is based on the best information available and is subject to change without notice.

Landuses and Locations per client direction.

Aerial Photography: July, 2019
Contour Interval: 2 ft

RVi
1611 West 5th Street
Suite 175
Austin, Texas 78703
Tel: 512.480.0032
www.rviplanning.com

MAYFAIR • MASTER FRAMEWORK PLAN (G4)

New Braunfels, Texas
October 5, 2020
19003216
Southstar Communities

ESTD · 2020 MAYFAIR New Braunfels

SOUTHSTAR COMMUNITIES

0 300' 600' 1200'

L:\2019\19003216 Southstar GLO\Concept Plans\Framework Plan\Con G4.dwg