



Traffic Impact Analysis

Heritage TIA

Dripping Springs, Hays County, Texas

Prepared for:
M/I Homes of Austin,LLC



Santiago A. Araque Rojas

11/19/2020

Prepared by:

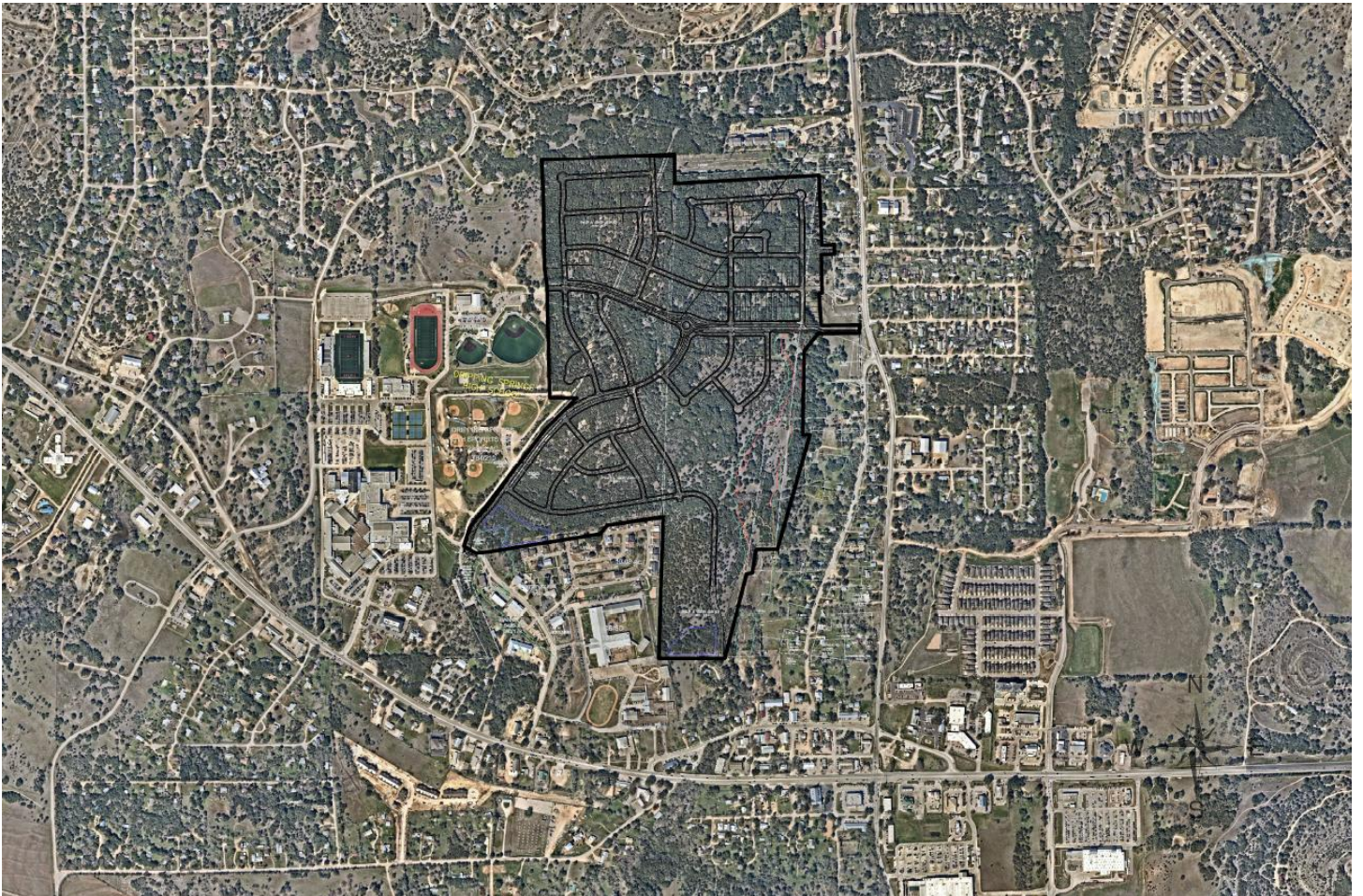
Kimley»»Horn

10814 Jollyville Road, Building 4, Suite 200
Austin, Texas 78759
(512) 418-1771
F-928

KH Project No. 067783119

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Prepared By:

Kimley»»Horn

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EXECUTIVE SUMMARY

The proposed Heritage development is 187-acre site northwest of the intersection of US 290 and RR 12 in the City of Dripping Springs, Hays County, Texas. The site is anticipated to contain 595 single-family and 105 multi-family dwelling units. The project is assumed to be completed in 2026. A previous traffic impact analysis was approved for this development in 2015. This study updates the previous study by determining traffic generation characteristics, analyzing potential traffic impacts on the adjacent road network, and identifying mitigations required for identified impacts.

Three new connections will be constructed as part of the project. The connections completed as part of this project include RR 12 at Brookside, US 290 at Roger Hanks via the Brookside extension, and Sportsplex Drive at Baird Lane. Three additional connections may be completed by others. Intersections to be analyzed were determined after discussion with City staff and are listed below.

- US 290 at RR 12
- US 290 at Sportsplex Drive
- RR 12 at Old Fitzhugh Road
- RR 12 at Brookside Street
- Sportsplex Drive at Baird Lane
- US 290 at Roger Hanks Parkway
- Internal intersection along Brookside Street extension
- Internal roundabout along Brookside Street extension

Existing turning movement counts were collected at the above intersections during weekday AM and PM peak demand periods. Traffic operations were analyzed at the study intersections for existing conditions, 2026 no-build, and 2026 site build-out. Background traffic was projected to 2026 by applying a four percent (4.0%) annual growth rate that was determined by using historical traffic counts in the area.

For the proposed land uses, projected site traffic is calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual* 10th Edition. The development is anticipated to generate approximately 465 new trips during the AM peak-hour and 609 new trips during PM peak-hour.

Analysis of the 2026 Build-Out scenario showed some study intersections operate below acceptable LOS C. To restore operating conditions to acceptable LOS, the following mitigations are:

1. US 290 at RR 12
 - a. Adjust signal timing
 - b. Install a 275' westbound right-turn lane with a 100' taper
 - c. Install a 275' eastbound right-turn lane with a 100' taper
 - d. Install 150' eastbound dual left-turn lanes with a 25' taper
 - e. Install 150' westbound dual left-turn lanes with a 25' taper
 - f. Install 150' northbound dual left-turn lanes with a 100' taper
 - g. Install 130' southbound dual left-turn lanes with a 100' taper
2. US 290 at Sportsplex Drive
 - a. Adjust signal timings
 - b. Install a 275' westbound right-turn lane with a 100' taper
 - c. Install 250' southbound dual left-turn lanes with a 50' taper

3. RR 12 at Brookside Street
 - a. Install traffic signal
 - b. Install a 400' southbound right-turn deceleration lane
4. Sportsplex Drive at Baird Lane
 - a. Install 100' eastbound left turn lane and 50' taper
 - b. Install 175' southbound left turn lane and 50' taper
 - c. Install 100 southbound right turn lane and 50' taper
 - d. Install 150 westbound right turn lane and 25' taper
5. US 290 at Roger Hanks
 - a. Signal head modifications
 - b. Adjust signal timing

A mitigation agreement with TxDOT was agreed upon. The developer is responsible for design and construction of a new traffic signal at the intersection of RR 12 and Brookside Street. No other improvements on TxDOT roadways are required. The intersection is to be built with channelized right turns for the eastbound and southbound approaches.

Per discussion with City staff, the developer is responsible for design and construction of a southbound left-turn lane and westbound right-turn lane at the intersection of Sportsplex Drive and Baird Lane.

INTRODUCTION

A. PURPOSE

Kimley-Horn and Associates, Inc. (K-H) was retained to conduct a Traffic Impact Analysis (TIA) of future traffic conditions associated with the Heritage development. This TIA is an update to a previously approved TIA for the same development conducted in 2015 by Bury, Inc. The proposed development is located northwest of the intersection of US 290 and RR 12 in the City of Dripping Springs, Hays County, Texas. A site vicinity map is provided in **Figure 1**.

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

B. GENERAL PROJECT DESCRIPTION

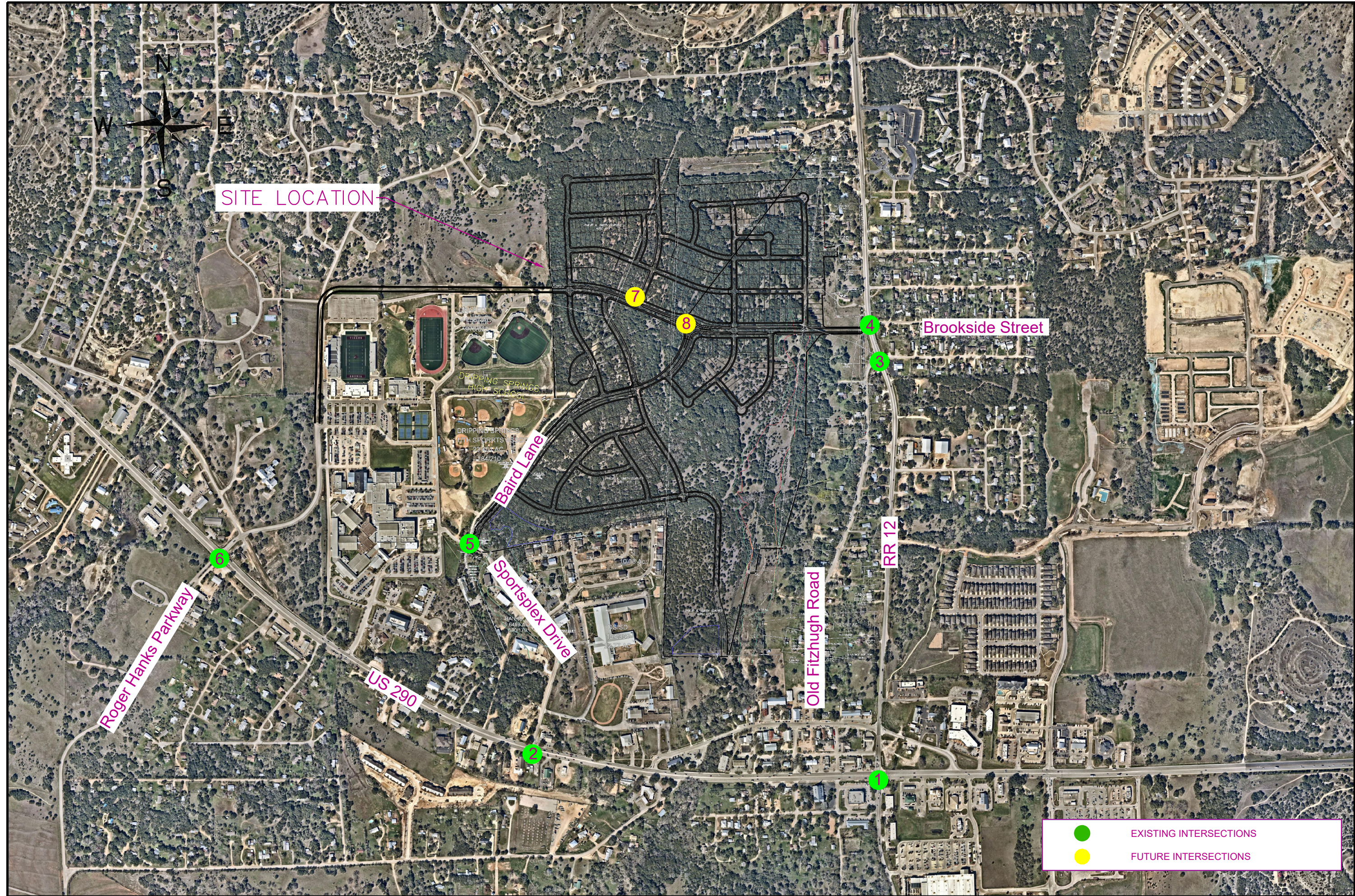
This 187-acre development will consist of 595 single-family dwelling units and 105 multi-family (mid-rise) dwelling units. The scope of analysis for this study was prepared in consultation with Dripping Springs City staff and is provided in **Appendix A**. The development is anticipated to be completed by 2026. The following scenarios were analyzed in this study:



- 2020 Existing Conditions
- 2026 No Build
- 2026 Site Build-Out

For the above scenarios, the intersections studied are listed below. **Figure 1** shows the study intersections.

- US 290 at RR 12
- US 290 at Sportsplex Drive
- RR 12 at Old Fitzhugh Road
- RR 12 at Brookside Street
- Sportsplex Drive at Baird Lane
- US 290 at Roger Hanks Parkway
- Internal intersection along Brookside Street extension
- Internal roundabout along Brookside Street extension

Analysis periods for this study included AM and PM peak hours for each study intersections.



	EXISTING INTERSECTIONS
	FUTURE INTERSECTIONS

EXISTING AND FUTURE AREA CONDITIONS

A. EXISTING & BACKGROUND DEVELOPMENT

The proposed site is currently vacant and undeveloped. In the approved scope and study area, The City of Dripping Springs identified one (1) development to be included in the analysis. Details of the approved development are listed in **Table 1**.

Table 1 – Approved Background Projects

Project Name	Land Use(s)	Size	% Build-Out
Big Sky Ranch	Single-Family Housing	772 DU	100%

Traffic generation for Big Sky Ranch was included in the background growth. Estimated construction start year and full Build-Out year were 2019 and 2025, respectively. Trip generation in 2026 was assumed to be 100% of full Build-Out volume.

B. PROPOSED LAND USES

Land-uses for the development are summarized in **Table 2**.

Table 2 – Proposed Land-Uses

Land Uses	Size	ITE Code
Single-family detached	595 DU	210
Multifamily Housing (Mid-Rise)	105 DU	221

C. ROADWAY CHARACTERISTICS

The major study area roadways are described below:

US 290 – is currently a four (4) lane roadway divided by a center two-way left turn lane, with two (2) lanes in each direction of travel. It is classified as a Major Arterial Divided (MAD 4) roadway in the Hays County Transportation Plan. It runs generally in the east-west direction. Currently, there are no sidewalks or designated bike lanes along either side of US 290. There is a posted speed limit of 45 mph in the project vicinity.

RR 12 – is currently a two (2) lane roadway divided by a center two-way left turn lane between Grand Prairie Circle and Glosson Road. RR 12 south of Grand Prairie Circle is a two (2) lane undivided roadway with one (1) lane in each direction of travel. It is classified as a Major Arterial Undivided (MAU 2) roadway in the Hays County Transportation Plan. It runs generally in the north-south direction. Sidewalks and designated bike lanes are not provided on either side of RR 12. There is a posted speed limit of 45 mph in the project vicinity.

Old Fitzhugh Road – is currently a two (2) lane undivided roadway with one (1) lane in each direction of travel. The road runs generally in the north-south direction with a posted speed limit of 30 mph. It is not included in the Hays County Transportation Plan. Currently, there are not sidewalks or designated bike lanes along either side of Old Fitzhugh Road.

Brookside Street – is currently a two (2) lane undivided roadway with one (1) lane in each direction of travel. The road runs generally in the east-west direction with a posted speed limit of 25 mph and currently ends at RR 12. It is not included in the Hays County Transportation Plan. Sidewalks and designated bike lanes are not provided on either side of Brookside Street.

Sportsplex Drive – is currently a two (2) lane roadway with one (1) lane in each direction of travel divided by one (1) fire lane in the center between Parade Way and the North Hays County Fire Department. The road runs generally in the north-south direction near US 290 and generally in an east-west direction near Baird Lane. It is not included in the Hays County Transportation Plan. Sportsplex Drive has a posted speed limit of 30 mph. Currently, there is a sidewalk on the west side of Sportsplex Drive between Baird Lane and Hanks Way but no designated bike lanes along either side of the roadway.

Baird Lane – is currently a two (2) lane undivided roadway with one (1) lane in each direction of travel. The road runs generally in the north-south direction with a posted speed limit of 30 mph on the north side of US 290 and 35 mph on the south side of US 290. It is not included in the Hays County Transportation Plan. Sidewalks and designated bike lanes are not provided on either side of Baird Lane.

Roger Hanks Parkway – is currently a two (2) lane roadway divided by a center two-way left turn lane, with one (1) lane in each direction of travel. The road runs generally in the north-south direction with a posted speed limit of 30 mph on the north side of US 290 and 35 mph on the south side of US 290. Currently, there are no sidewalks or designated bike lanes along either side of Roger Hanks Parkway. The roadway will be extended through the Heritage development to connect with Brookside Drive. The offsite extension is assumed that the extension will have the same cross-section as the existing roadway, per the Hays County

Transportation Plan (MAD 2). Throughout the site the extension is proposed to be a two (2) lane undivided roadway with bike lanes.

Timberline Road – is currently a two (2) lane undivided roadway with one (1) lane in each direction of travel. The road generally in the east-west direction with a posted speed limit of 25 mph. There are no sidewalks or designated bike lanes on either side of Timberline Road.

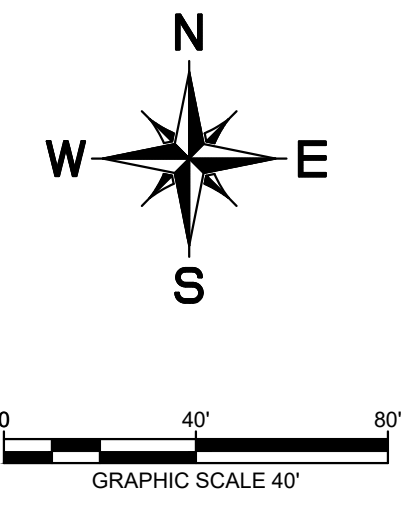
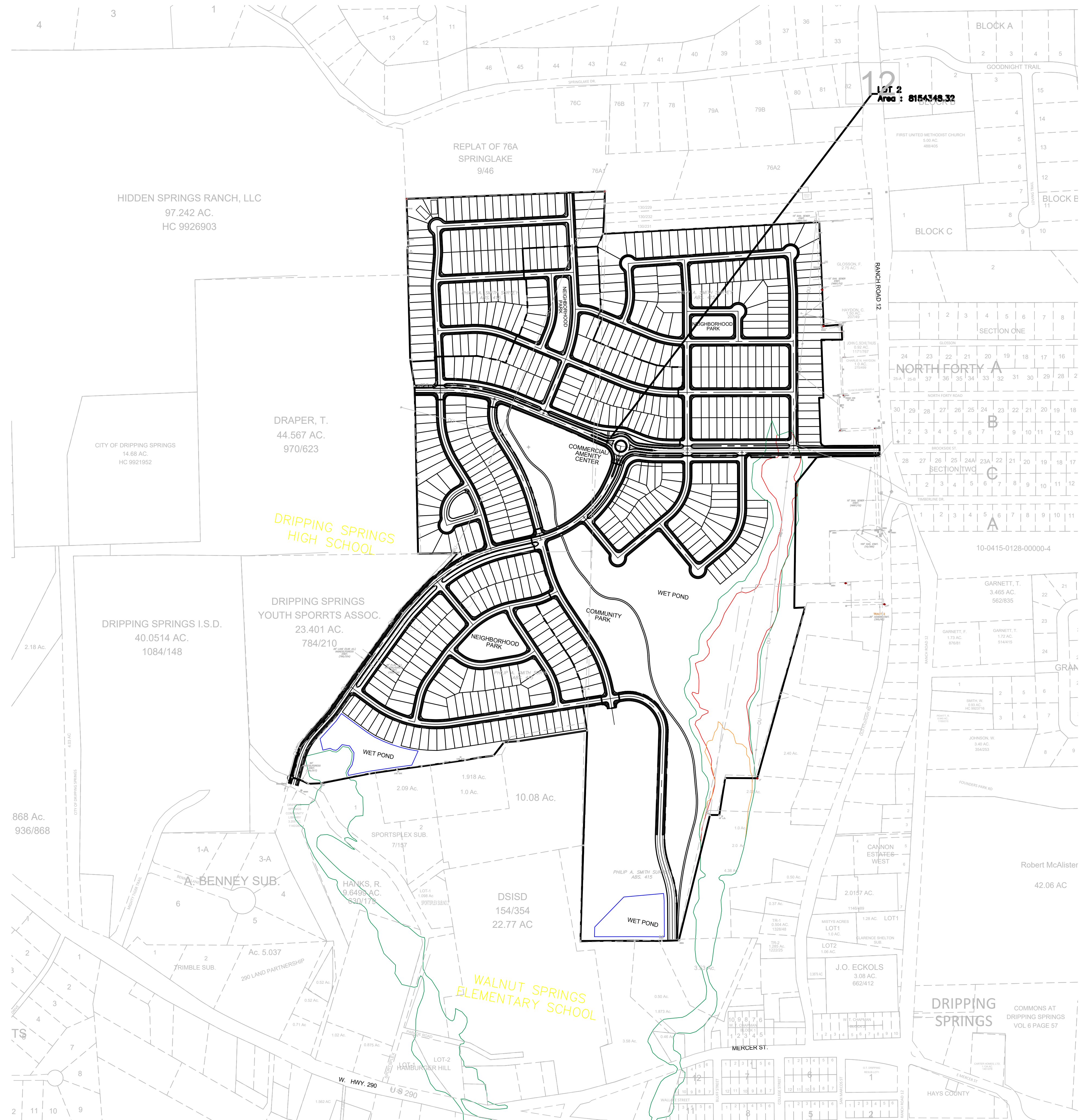
Proposed Site Access

The proposed site will have six (6) total access points, including three constructed as part of the project. The connections completed as part of this project include one off RR 12 at Brookside, one off US 290 at Roger Hanks via the Brookside extension, and one off Sportsplex Drive at Baird Lane. The connections developed by others will connect to Old Fitzhugh Road, Mercer Street, and Springlake Drive. **Figure 2** shows the proposed site plan.

Existing Traffic Volumes

Weekday AM and PM peak period turning movement counts were collected at the study intersections on two separate occasions. Turning movements counts were collected on Tuesday, January 30, 2018 at the intersections of US 290 at RR 12, US 290 at Sportsplex, and RR 12 at Old Fitzhugh. A 4% growth rate was applied to these counts to reach 2020 volumes. Turning movement counts were collected on Tuesday, March 10, 2020 at the intersections of RR 12 at Brookside, Sportsplex at Baird, and US 290 at Roger Hanks. **Figure 3** shows existing weekday AM and PM peak hour traffic volumes. The raw count sheets are provided in **Appendix B**.

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No.	REVISIONS	DATE	BY

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
 10814 JOLLYVILLE ROAD, AVALON IV, SUITE 200, AUSTIN, TX 78759
 PHONE: 512-418-1771 FAX: 512-418-1791
 WWW.KIMLEY-HORN.COM

TEXAS REGISTERED ENGINEERING FIRM F-928

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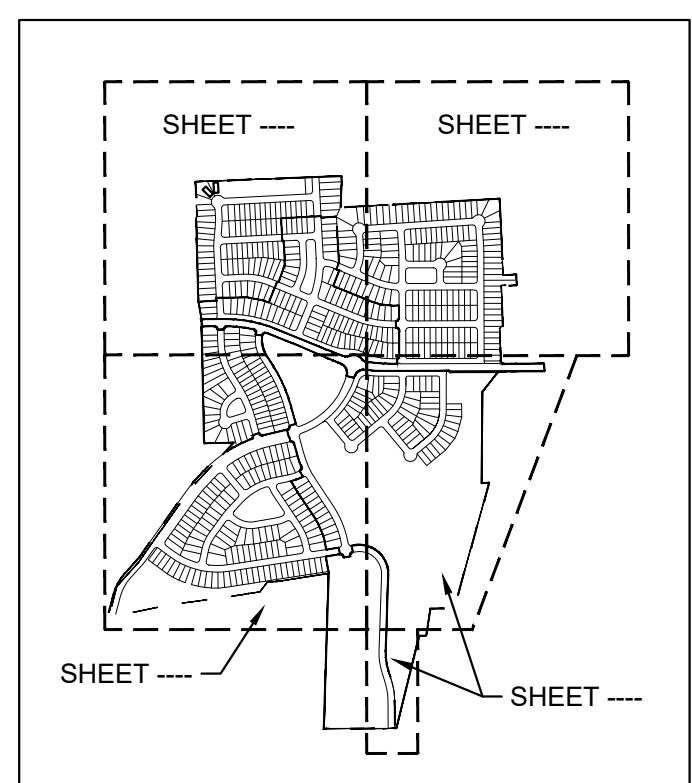
Engineer: ALEJANDRO E. GRANADOS RICO
 P.E. No. 130084 Date: / / 18

KHA PROJECT	06778317
DATE	APRIL 2020
SCALE	AS SHOWN
DESIGNED BY:	AGD
DRAWN BY:	RRJ
CHECKED BY:	AEC

**FIGURE 2:
 OVERALL PRELIMINARY
 PLAN**

**HERITAGE
 PRELIMINARY PLAN
 CITY OF DRIPPING SPRINGS
 HAYS COUNTY, TEXAS**

SHEET NUMBER



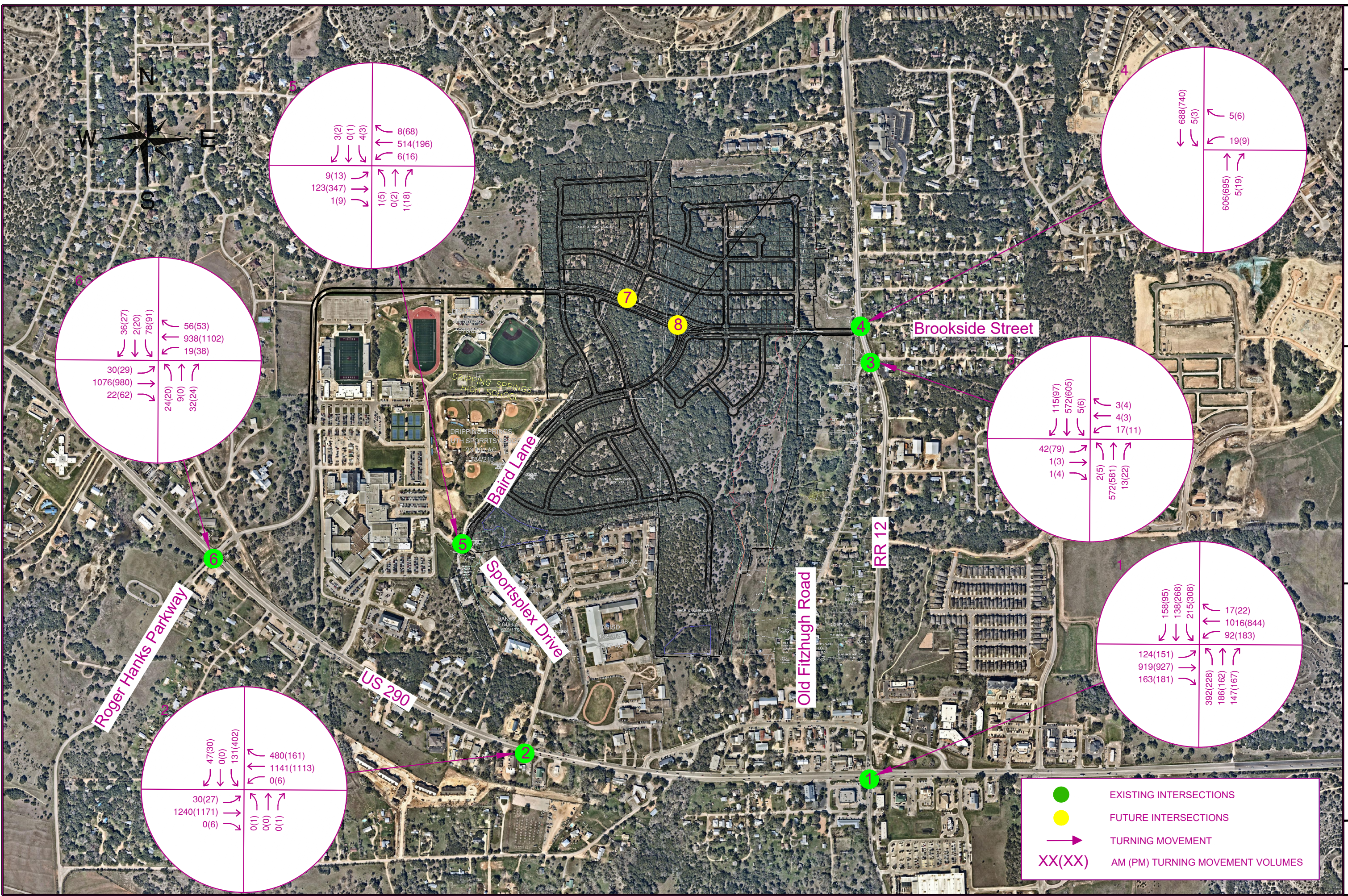
**KEY MAP
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**Know what's below.
 Call before you dig.**

BENCHMARKS

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2026 DEVELOPMENT

A. SITE TRAFFIC

Site-generated traffic estimates are determined through a process known as trip generation. The acknowledged source for trip generation rates is the 10th edition of *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are one-way trips or trip ends, where one vehicle entering and exiting the site is counted as two trips (one inbound trip and one outbound trip).

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

Table 3 – 2026 Site Trip Generation

Land Uses	Quantity	ITE Code	Daily Trips	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Single-Family Detached Housing	595 du	210	5,366	107	320	427	355	208	563
Multifamily Housing (Mid-Rise)	105 du	221	572	10	28	38	28	18	46
Subtotal			5,938	117	348	465	383	226	609
Internal Capture Trip Adjustment			-	-	-	-	-	-	-
Pass-By Trip Adjustment			-	-	-	-	-	-	-
TOTAL TRIPS			5,938	117	348	465	383	226	609

B. TRIP DISTRIBUTION AND ASSIGNMENT

Site traffic is distributed into and out of the site connections and onto the street system based on the area street system characteristics, existing traffic patterns, “journey to work” assumptions, and the location of driveway access to/from the site. **Table 4** displays the general directional distribution percentages assumed for the proposed development. **Figure 4** and **Figure 5** display the trip distribution graphically.

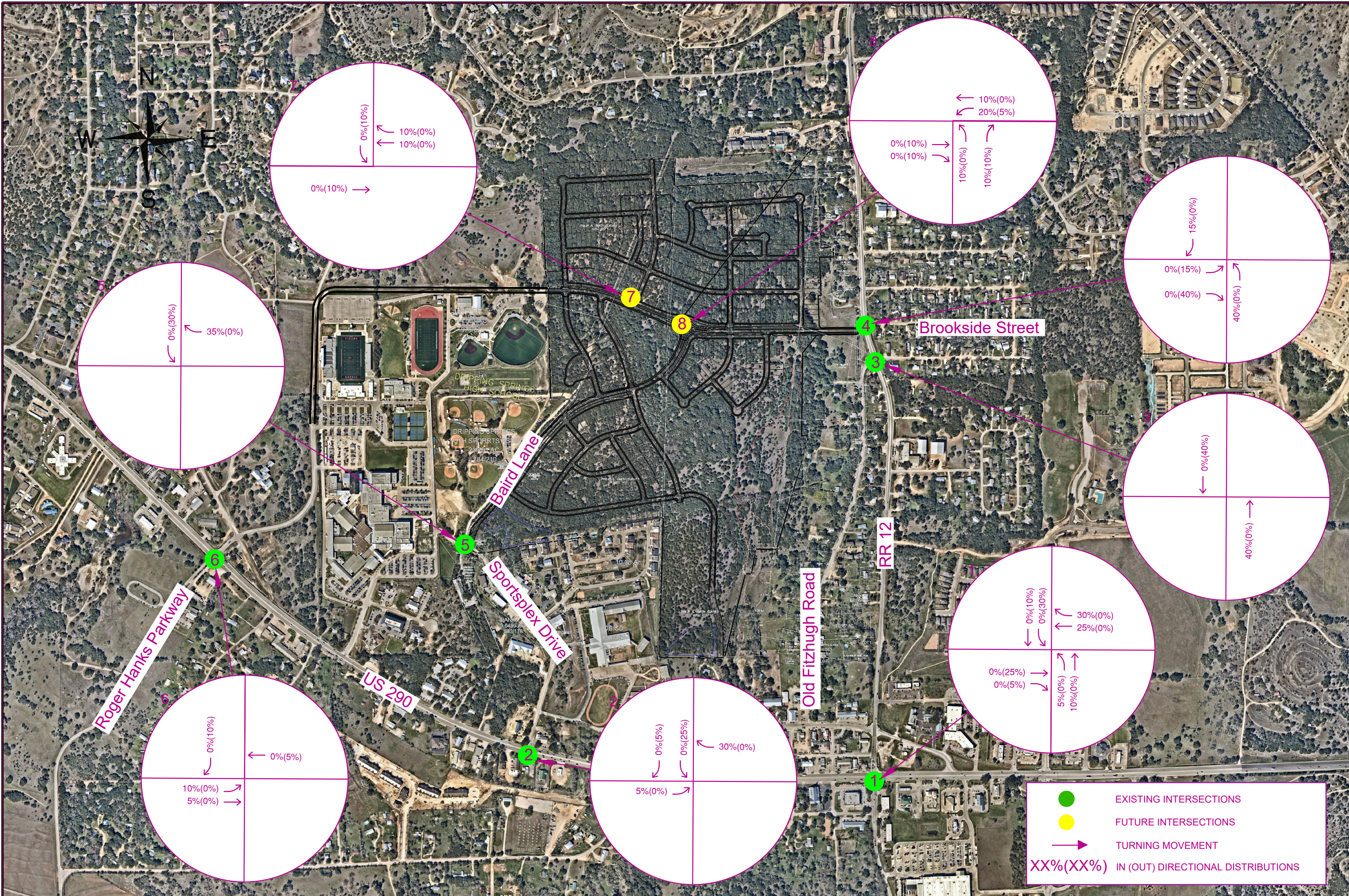
Table 4 – Site Trip Distribution

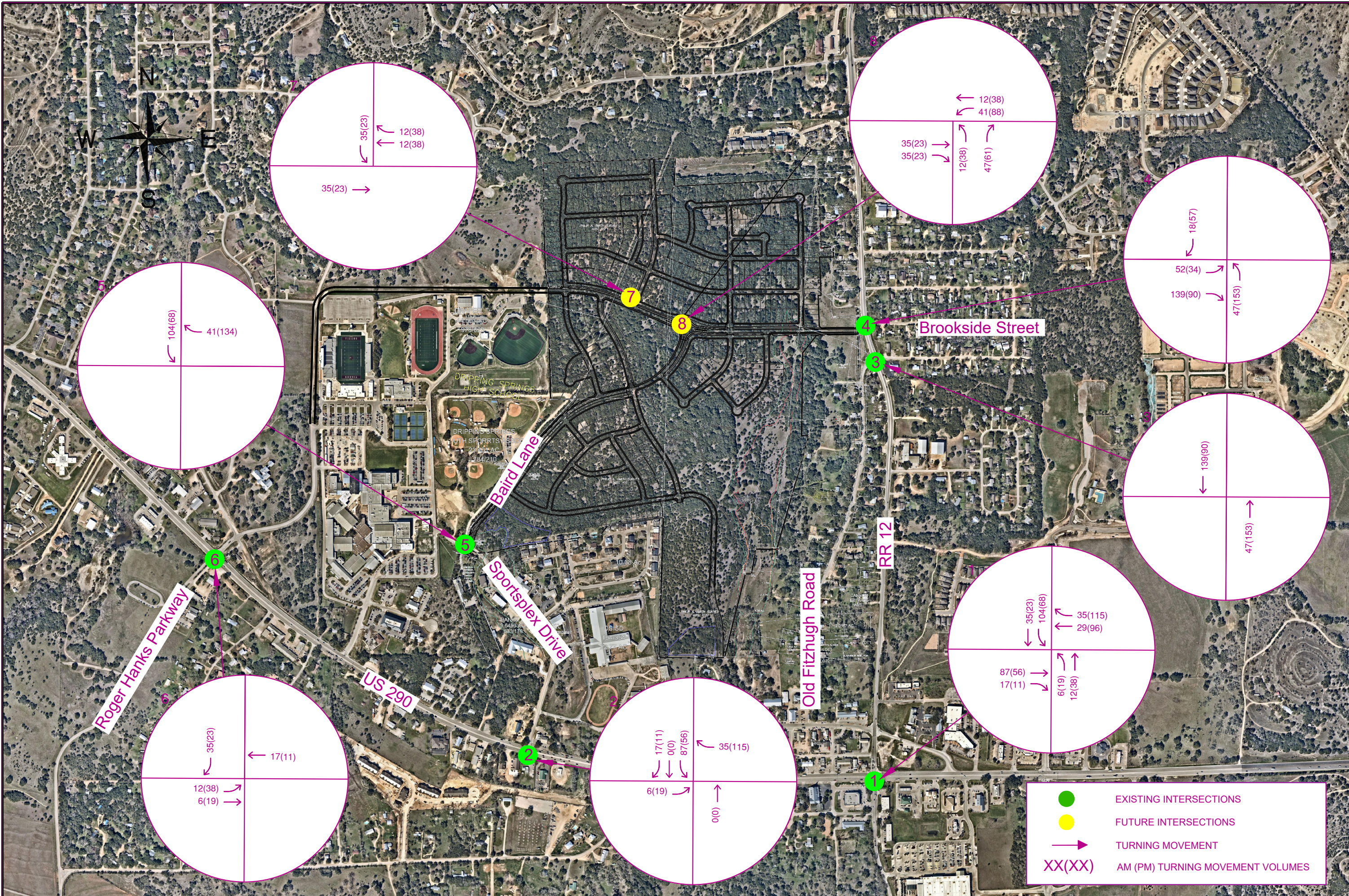
Direction	Percent To/From Commercial Component
To/From E US 290	55%
To/From W US 290	15%
To/From N RR 12	15%
To/From S RR 12	15%

Figure 4 show the resulting weekday AM and PM peak hour site trip distribution at all study intersections for the site developments. These distributions are the same as those determined in the 2015 Bury report. **Figure 5** shows the total site traffic after being calculated using the percentages for each trip assignment group in **Figure 4**.

ASSUMPTIONS

- Site trip distributions were assumed to match those determined in the 2015 Bury report for the same development.
- Signal timings were provided by TxDOT for all existing traffic signals.
- The traffic generated by the site was assigned to the future roadway network using the appropriate trip distribution percentages for the AM and PM peak hours.
- Site trips are added to the forecasted year 2026 background trips to determine the total 2026 traffic volumes.
- Existing volumes were balanced between intersection 3 (RR 12 at Old Fitzhugh Road) and intersection 4 (RR 12 at Brookside Street) due to their proximity. No other volume balancing was required for these study intersections. Volume balancing was done in order to remove existing sink/source since there are no existing possible sinks or sources. Balancing was done by bringing the volumes at the intersection with lower volumes up.
- Peak Hour Factors (PHF) from existing counts were used.
- AM and PM peak hours were determined from the existing count data. Peak hours were used by intersection.





C. DEVELOPMENT OF 2026 BACKGROUND TRAFFIC

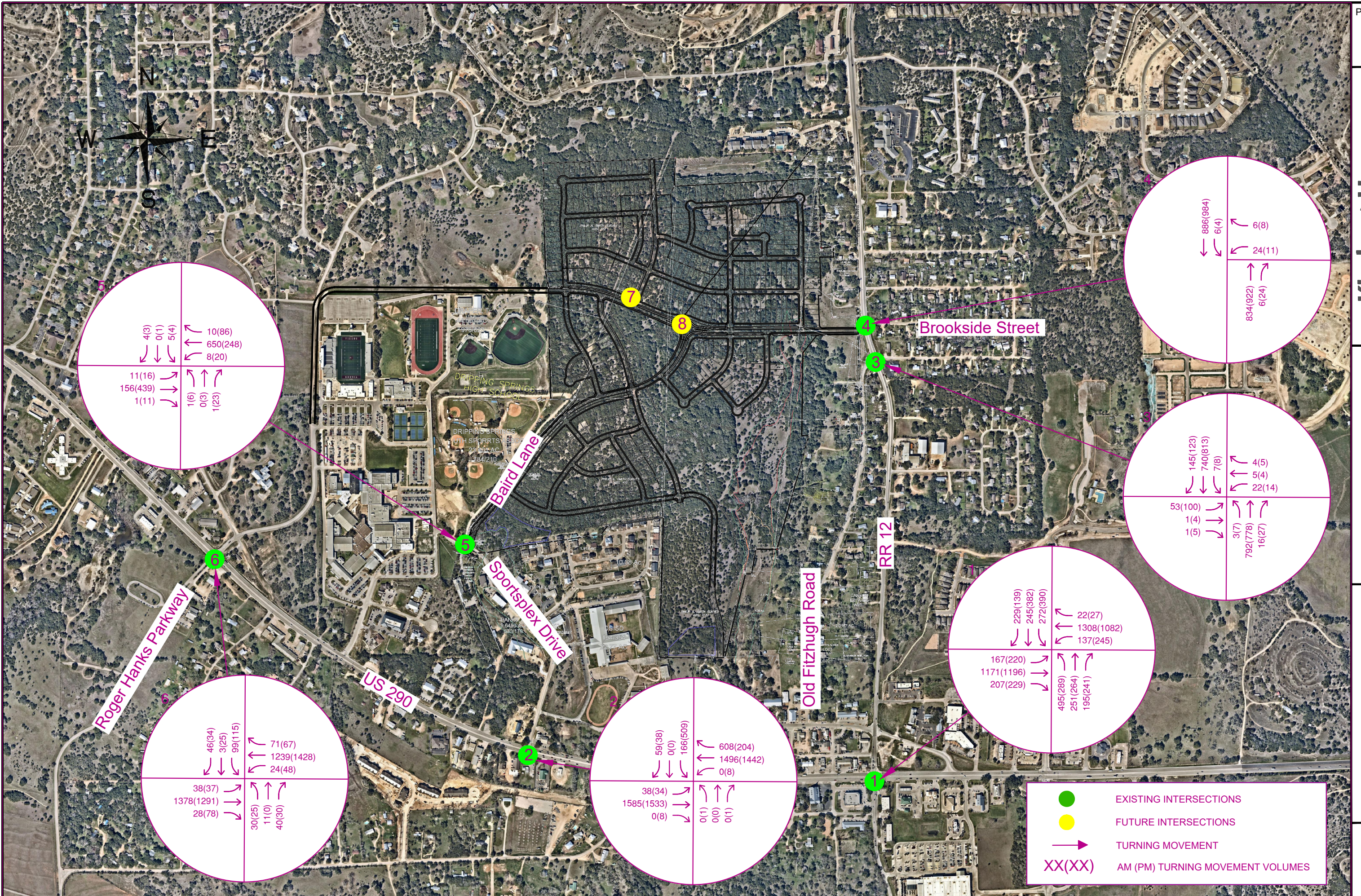
To obtain 2026 background traffic projections, existing traffic counts and historic counts near the site were compared to find expected growth trends within the study area. Based on data from TxDOT and guidance from City staff, traffic volumes were assumed to increase at a growth rate of 4.0% per year.

Background development projects identified in the scope were reviewed and relevant background traffic was added to the networks existing traffic counts.

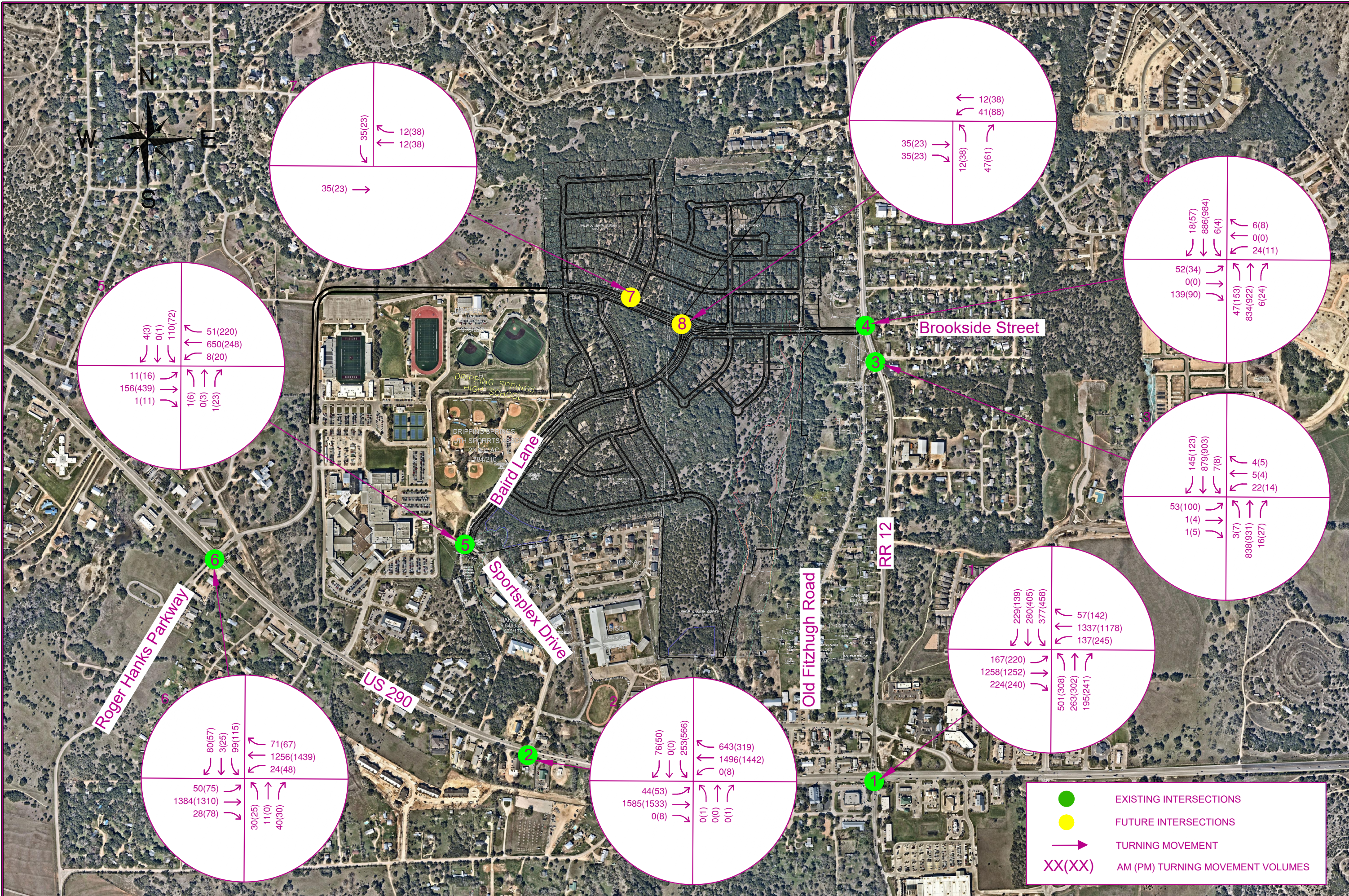
The resulting 2026 no build weekday AM and PM peak hour traffic volumes including background traffic projections are shown in ***Figure 6***.

D. 2026 BUILD-OUT TRAFFIC

Site traffic was added to the background volumes to represent estimated total Build-Out (background plus site-generated) traffic conditions in 2026 after the completion of the proposed development. The resulting 2026 total weekday AM and PM peak hour traffic volumes are shown in ***Figure 8***.



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TRAFFIC OPERATIONS ANALYSIS

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

A. ANALYSIS METHODOLOGY

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

Table 5 – Level of Service

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

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

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

Where possible, HCM 6th Edition analysis is used. For intersections not possible to analyze using HCM 6th or HCM 2010, HCM 2000 is used. Calculations for the level of service at the study intersections are provided in **Appendix F-1**.

B. ANALYSIS RESULTS & MITIGATIONS

2020 EXISTING TRAFFIC OPERATIONS

Existing conditions measures of effectiveness (MOEs) are summarized in **Table 6** and the detailed *Synchro* reports are provided in **Appendix F**.

Table 6 – MOEs – Existing Peak Hours

Intersection	Existing AM		Existing PM	
	Delay	LOS	Delay	LOS
1: US 290 & RR 12	60.7	E	61.1	E
2: US 290 & Sportsplex Drive	8.2	A	35.8	D
3: RR 12 & Old Fitzhugh Road*	94.4 (EB)	F	206.8 (EB)	F
4: RR 12 & Brookside Street*	21.2 (WB)	C	17.8 (WB)	C
5: Baird Lane & Sportsplex Drive*	16.8 (SB)	C	20.2 (SB)	C
6: US 290 & Roger Hanks Parkway	22.2	C	18.4	B

*Stop controlled approach analyzed at two-way stop intersections

2026 BACKGROUND/NO-BUILD TRAFFIC OPERATIONS

The 2026 No-Build condition represents traffic operations if this project is never built. The 2026 No-Build conditions also assume a traffic growth rate of 4% as discussed above.

No Build conditions MOEs are summarized in **Table 7** and **Table 8** and the detailed *Synchro* reports are provided in **Appendix G**.

2026 BUILD-OUT TRAFFIC OPERATIONS

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

Build-Out conditions MOEs are summarized in **Table 7** and **Table 8** and the detailed *Synchro* reports are provided in **Appendix H**.

2026 MITIGATIONS

The mitigation plan developed for this project is designed to show the recommended improvements to bring intersection operations back to Level of Service (LOS) C or to at least the operating conditions of the No Build scenario.

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

1. US 290 at RR 12
 - a. Adjust signal timing
 - b. Install a 275' westbound right-turn lane with a 100' taper
 - c. Install a 275' eastbound right-turn lane with a 100' taper
 - d. Install 150' eastbound dual left-turn lanes with a 25' taper
 - e. Install 150' westbound dual left-turn lanes with a 25' taper
 - f. Install 150' northbound dual left-turn lanes with a 100' taper
 - g. Install 130' southbound dual left-turn lanes with a 100' taper
2. US 290 at Sportsplex Drive
 - a. Adjust signal timings
 - b. Install a 275' westbound right-turn lane with a 100' taper
 - c. Install 250' southbound dual left-turn lanes with a 50' taper
3. RR 12 at Brookside Street
 - a. Install traffic signal
 - b. Install a 400' southbound right-turn deceleration lane
4. Sportsplex Drive at Baird Lane
 - a. Install 100' eastbound left turn lane and 50' taper
 - b. Install 175' southbound left turn lane and 50' taper
 - c. Install 100 southbound right turn lane and 50' taper
 - d. Install 150 westbound right turn lane and 25' taper
5. US 290 at Roger Hanks
 - a. Signal head modifications
 - b. Adjust signal timing

The above mitigations bring all movements to an acceptable LOS if reasonably possible.

Mitigation results are summarized in **Table 9**, with the modified intersections indicated by bold red lettering; detailed *Synchro* reports are provided in **Appendix I**.

Table 7 – 2026 MOEs – AM Peak Hour

Intersection	No Build 2026		Build-Out 2026	
	Delay	LOS	Delay	LOS
1: US 290 & RR 12	157.0	F	197.6	F
2: US 290 & Sportsplex Drive	13.2	B	26.1	C
3: RR 12 & Old Fitzhugh Road*	712.3 (EB)	F	1300.2 (EB)	F
4. RR 12 & Brookside Street*	33.7 (WB)	D	1710.1 (WB)	F
5. Baird Lane & Sportsplex Drive*	21.9 (SB)	C	384.8 (SB)	F
6: US 290 & Roger Hanks Parkway	28.9	C	31.5	C
7: Brookside Extension at Internal Intersection	--	--	9.0 (SB)	A
8: Brookside Extension at Internal Roundabout	--	--	3.2	A

*Stop controlled approach analyzed at two-way stop intersections

Table 8 – 2026 MOEs – PM Peak Hour

Intersection	No Build 2026		Build-Out 2026	
	Delay	LOS	Delay	LOS
1: US 290 & RR 12	143.9	F	193.5	F
2: US 290 & Sportsplex Drive	83.6	F	124.3	F
3: RR 12 & Old Fitzhugh Road*	1252.5 (EB)	F	2252.6 (EB)	F
4. RR 12 & Brookside Street*	24.5 (WB)	C	1026.7 (EB)	F
5. Baird Lane & Sportsplex Drive*	28.9 (SB)	D	401.3 (SB)	F
6: US 290 & Roger Hanks Parkway	26.9	C	29.2	C
7: Brookside Extension at Internal Intersection	--	--	9.0 (SB)	A
8: Brookside Extension at Internal Roundabout	--	--	3.5	A

*Stop controlled approach analyzed at two-way stop intersections

Table 9 – 2026 MOEs – Mitigated Peak Hours

Intersection	Mitigated AM		Mitigated PM	
	Delay	LOS	Delay	LOS
1: US 290 & RR 12	114.7	F	124.7	F
2: US 290 & Sportsplex Drive	14.8	B	62.8	E
3: RR 12 & Old Fitzhugh Road*	1300.2 (EB)	F	2252.6 (EB)	F
4: RR 12 & Brookside Street	27.6	C	19.8	B
5: Baird Lane & Sportsplex Drive*	90.4 (SB)	F	59.8 (SB)	F
6: US 290 & Roger Hanks Parkway	26.5	C	34.4	C
7: Brookside Extension at Internal Intersection	9.0 (SB)	A	9.0 (SB)	A
8: Brookside Extension at Internal Roundabout	3.2	A	3.5	A

*Stop controlled approach analyzed at two-way stop intersections

US 290 & RR 12 – remains below the acceptable LOS C despite mitigations. However, the proposed mitigations bring operations at the intersection back to the projected No Build conditions. All mitigations proposed in the previously approved TIA have been included. No further mitigation is recommended at this point.

US 290 & Sportsplex Drive – remains below the acceptable LOS C in the PM peak despite mitigations. However, the proposed mitigations bring operations at the intersection back to the projected No Build conditions. All mitigations proposed in the previously approved TIA have been included. No further mitigation is recommended at this point.

RR 12 & Old Fitzhugh Road – remains below the acceptable LOS C despite mitigations. It is not uncommon for side streets of unsignalized intersections to fail at peak hour. It is more important to keep the flow of traffic through the major streets. For this intersection, the major street is RR 12. This intersection also does meet peak hour warrant; however, it is located approximately 300 feet south of RR12 & Brookside Street, which is too close in proximity for two signalized intersections. This study recommends the signalization of RR 12 & Brookside Street instead of RR 12 & Old Fitzhugh Road since only one of the two can be recommended to be signalized due to the spacing between the intersections. The proposed development will include a stub out for Old Fitzhugh Road to be realigned in the future. This would connect Old Fitzhugh Road to Brookside Street and the new signal to be constructed by the development.

Baird Lane & Sportsplex Drive – remains below the acceptable LOS C or better than the No Build scenario despite mitigations. This intersection has unusually low peak hour factors. Since site traffic is anticipated to be a large proportion of traffic through this intersection, the overall intersection peak hour factor was utilized in the mitigated scenario instead of the peak hour factor by movement. This intersection does not meet the peak hour signal warrants and it is not expected to meet the 4-hour or 8-hour warrant. Additional geometrical changes would not fix operations for the intersection. All mitigations proposed in the previously approved TIA have been included.

A peak hour signal warrant analysis was conducted for RR 12 & Brookside Street and can be found in **Appendix J**.

ROAD SIZING ANALYSIS FOR 2026 BUILD-OUT SCENARIO

Per the project scope, a roadway sizing analysis must be performed for the Build-Out year of development as a part of this study to determine the most appropriate size and type of roadway for five project roadways, which are all currently two-lane undivided. These roadways are listed below.

1. Brookside Street Extension (Proposed) between RR 12 and US 290 (two locations – at RR 12, at US 290)
2. Baird Lane (Proposed Extension) between Sportsplex Trail and Brookside Street
3. Proposed N/S Road between Brookside Street and Springlake Drive
4. Proposed N/S Road between Mercer St and Baird Lane (Proposed Extension)
5. Proposed E/W Road between Old Fitzhugh Road and Baird Lane (Proposed Extension)

A road sizing analysis was previously performed in the 2015 Bury TIA report. This prior analysis utilized the Highway Capacity Manual (HCM) 2010. The full Bury TIA is included in **Appendix D**.

The Bury report resulted in all future connections operating at an acceptable LOS; however, if bypass traffic proves to be higher than anticipated in that study, further evaluation of the roadway capacity would be needed. At the time that the 2015 Bury report was performed, the 9th Edition of ITE's *Trip Generation* was utilized, and the development was anticipated to consist of 701 single-family dwelling units. As a result, the anticipated number of trips generated was higher in the 2015 approved TIA than in the current development analysis. The Bury report is a more conservative analysis of road sizing and therefore is sufficient for anticipated 2026 Build-Out conditions. All study roads are proposed to remain as two lane undivided roadways.

QUEUING ANALYSIS

When evaluating the traffic operations in the study area, the queue lengths were calculated using *Synchro 10*TM. The queue lengths are summarized for the AM and PM peak hours in Table 10 and Table 11 respectively. Queue length is recorded according to the analysis methodology specified in the second column from the left.

Table 10 – Queue Lengths (AM)

Intersection	Methodology (unit)	Turning Movement	Existing (2020)		No Build (2026)		Build Out (2026)		Mitigation (2026)	
			Queue Length	Storage	Queue Length	Storage	Queue Length	Storage	Queue Length	Storage
RR 12 at US 290	Synchro (feet)	EBL1	#180	300	#277	300	#279	300	#170	150
		EBL2	-	-	-	-	-	-	-	150
		EBR	-	-	-	-	-	-	-	275
		WBL1	107	250	#208	250	#208	250	#137	150
		WBL2	-	-	-	-	-	-	-	150
		WBR	-	-	-	-	-	-	-	275
		NBL1	#487	130	#694	130	#718	130	#306	150
		NBL2	-	-	-	-	-	-	-	150
		NBR	76	130	111	130	111	130	161	150
		SBL1	#308	70	#467	70	#695	70	201	130
		SBL2	-	-	-	-	-	-	-	130
Sportsplex Dr at US 290	Synchro (feet)	EBL	9	TWLTL	27	TWLTL	36	TWLTL	71	TWLTL
		WBL	-	TWLTL	-	TWLTL	-	TWLTL	-	TWLTL
		WBR	-	-	-	-	-	-	122	275
		SBL1	177	1000	215	1000	291	1000	144	250
		SBL2	-	-	-	-	-	-	-	250
RR 12 at Fitzhugh Road	HCM 6th Ed (vehicles)	NBL	0	TWLTL	0	TWLTL	0	TWLTL	0	TWLTL
		SBL	0	TWLTL	0	TWLTL	0.1	TWLTL	0.1	TWLTL
RR 12 at Brookside St	HCM 6th Ed (vehicles) [Mitigation: Synchro (feet)]	NBL	-	TWLTL	-	TWLTL	0.2	TWLTL	19	TWLTL
		SBL	0	TWLTL	0.1	TWLTL	0.1	TWLTL	3	TWLTL
		SBR	-	-	-	-	-	-	0	400
Baird Ln at Sportsplex Dr	HCM 6th Ed (vehicles)	EBL	-	-	-	-	-	-	0.1	100
		WBR	-	-	-	-	-	-	0	100
		SBL	-	-	-	-	-	-	6.6	100
		SBR	-	-	-	-	-	-	0	100
Roger Hanks Parkway at US 290	Synchro (feet)	EBL	20	TWLTL	26	TWLTL	33	TWLTL	33	TWLTL
		WBL	16	TWLTL	18	TWLTL	17	TWLTL	19	TWLTL
		NBR	0	100	0	100	0	100	0	100
		SBL	132	150	158	150	156	150	156	150

- 95th Percentile volume exceeds capacity, queue may be longer

Table 11 – Queue Lengths (PM)

Intersection	Methodology (unit)	Turning Movement	Existing (2020)		No Build (2026)		Build Out (2026)		Mitigation (2026)	
			Queue Length	Storage	Queue Length	Storage	Queue Length	Storage	Queue Length	Storage
RR 12 at US 290	Synchro (feet)	EBL1	#164	300	#331	300	#313	300	#248	150
		EBL2	-	-	-	-	-	-	-	150
		EBR	-	-	-	-	-	-	-	275
		WBL1	#311	250	#458	250	#458	250	#281	150
		WBL2	-	-	-	-	-	-	-	150
		WBR	-	-	-	-	-	-	-	275
		NBL1	#307	130	#482	130	#525	130	199	150
		NBL2	-	-	-	-	-	-	-	150
		NBR	90	130	145	130	145	130	240	150
		SBL1	#453	70	#647	70	#784	70	#308	130
		SBL2	-	-	-	-	-	-	-	130
Sportsplex Dr at US 290	Synchro (feet)	EBL	27	TWLTL	25	TWLTL	37	TWLTL	91	TWLTL
		WBL	2	TWLTL	3	TWLTL	3	TWLTL	16	TWLTL
		WBR	-	-	-	-	-	-	38	275
		SBL1	#328	1000	#471	1000	#572	1000	350	250
		SBL2	-	-	-	-	-	-	-	250
RR 12 at Fitzhugh Road	HCM 6th Ed (vehicles)	NBL	0	TWLTL	0.1	TWLTL	0.1	TWLTL	3	TWLTL
		SBL	0	TWLTL	0.1	TWLTL	0.1	TWLTL	2	TWLTL
RR 12 at Brookside St	HCM 6th Ed (vehicles) [Mitigation: Synchro (feet)]	NBL	-	TWLTL	-	TWLTL	1.1	TWLTL	#104	TWLTL
		SBL	0	TWLTL	0	TWLTL	0	TWLTL	2	TWLTL
		SBR	-	-	-	-	-	-	8	400
Baird Ln at Sportsplex Dr	HCM 6th Ed (vehicles)	EBL	-	-	-	-	-	-	0.1	100
		WBR	-	-	-	-	-	-	0.1	100
		SBL	-	-	-	-	-	-	4	100
		SBR	-	-	-	-	-	-	0	100
Roger Hanks Parkway at US 290	Synchro (feet)	EBL	17	TWLTL	20	TWLTL	54	TWLTL	47	TWLTL
		WBL	8	TWLTL	13	TWLTL	8	TWLTL	34	TWLTL
		NBR	0	100	0	100	0	100	0	100
		SBL	138	150	#179	150	#179	150	149	150

- 95th Percentile volume exceeds capacity, queue may be longer

The following queues are projected to exceed the storage capacity in the Mitigated 2026 scenario:

- RR 12 at US 290:
 - NBL (AM) – despite providing two 150-foot left turn bays, the queue still exceeds capacity.
 - SBR (AM) – the storage is limited due to the proximity of the upstream signalized intersection of Mercer Street at RR 12.
- Roger Hanks Parkway at US 290:
 - SBL (AM) – storage is limited by the adjacent intersection to the north (Roger Hanks Pkwy at Old Hwy 290); however, left-turning vehicles can queue in the center two-way left turn lane behind Old Hwy 290.

CONCLUSION AND RECOMMENDATION

This study analyzes traffic impacts of the proposed Heritage development located northwest of the intersection of US 290 and RR 12 in the City of Dripping Springs, Hays County, Texas. The scenarios studied include – Existing conditions, 2026 No-Build, and 2026 Build-Out.

Analysis of the 2026 Build-Out scenario showed some study intersections operate below acceptable LOS C. To restore operating conditions to acceptable LOS, the following mitigations are recommended:

1. US 290 at RR 12
 - a. Adjust signal timing
 - b. Install a 275' westbound right-turn lane with a 100' taper
 - c. Install a 275' eastbound right-turn lane with a 100' taper
 - d. Install 150' eastbound dual left-turn lanes with a 25' taper
 - e. Install 150' westbound dual left-turn lanes with a 25' taper
 - f. Install 150' northbound dual left-turn lanes with a 100' taper
 - g. Install 130' southbound dual left-turn lanes with a 100' taper
2. US 290 at Sportsplex Drive
 - a. Adjust signal timings
 - b. Install a 275' westbound right-turn lane with a 100' taper
 - c. Install 250' southbound dual left-turn lanes with a 50' taper
3. RR 12 at Brookside Street
 - a. Install traffic signal
 - b. Install a 400' southbound right-turn deceleration lane
4. Sportsplex Drive at Baird Lane
 - a. Install 100' eastbound left turn lane and 50' taper
 - b. Install 175' southbound left turn lane and 50' taper
 - c. Install 100 southbound right turn lane and 50' taper
 - d. Install 150 westbound right turn lane and 25' taper
5. US 290 at Roger Hanks
 - a. Signal head modifications
 - b. Adjust signal timing

For the above mitigation measures, the total contribution by the developer is broken down in **Table 12**.

A mitigation agreement with TxDOT was agreed upon. The developer is responsible for design and construction of a new traffic signal at the intersection of RR 12 and Brookside Street. No other improvements on TxDOT roadways are required. The intersection is to be built with channelized right turns for the eastbound and southbound approaches.

Per discussion with City staff, the developer is responsible for design and construction of a southbound left-turn lane and westbound right-turn lane at the intersection of Sportsplex Drive and Baird Lane. The constraints of this intersection have been evaluated and a concept figure for the construction of these improvements is provided in **Appendix K**.

Table 12 – Mitigation Cost Estimate

Intersection	Approach	Mitigation Measure	Unit Cost	Total Estimated Cost	% Site Traffic at Location	Pro-Rata Cost Share	TxDOT Improvements		City of Dripping Springs Improvements	
							% Contribution	\$ Contribution	% Contribution	\$ Contribution
RR 12 at US 290	All	Adjust Signal Timing	\$5,000 per signal	\$5,000	100.0%	\$ 5,000	0%	\$ -	TxDOT Improvements	
RR 12 at US 290	EB	Install 275' EB Right Turn Lane with 100' Taper	\$350 per linear foot/min \$150,000/min \$150,000	\$150,000	7.8%	\$ 11,657	0%	\$ -		
RR 12 at US 290	EB	Install 150' EB Dual Left Turn Lanes with 25' Taper	\$350 per linear foot/min \$150,000	\$150,000	0.0%	\$ -	0%	\$ -		
RR 12 at US 290	WB	Install 275' WB Right Turn Lane with 100' Taper	\$350 per linear foot/min \$150,000	\$150,000	80.8%	\$ 121,142	0%	\$ -		
RR 12 at US 290	WB	Install 150' WB Dual Left Turn Lanes with 25' Taper	\$350 per linear foot/min \$150,000	\$150,000	0.0%	\$ -	0%	\$ -		
RR 12 at US 290	NB	Install 150' NB Dual Left Turn Lanes with 100' Taper	\$350 per linear foot/min \$150,000	\$150,000	6.2%	\$ 9,329	0%	\$ -		
RR 12 at US 290	SB	Install 130' SB Dual Left Turn Lanes with 100' Taper	\$350 per linear foot/min \$150,000	\$150,000	27.7%	\$ 41,588	0%	\$ -		
US 290 at Sportsplex	All	Adjust Signal Timing	\$5,000 per signal	\$5,000	100.0%	\$ 5,000	0%	\$ -		
US 290 at Sportsplex	WB	Install 275' WB Right Turn Lane with 100' Taper	\$350 per linear foot/min \$150,000	\$150,000	36.0%	\$ 54,059	0%	\$ -		
US 290 at Sportsplex	SB	Install 250' SB Dual Left Turn Lanes with 50' Taper	\$350 per linear foot/min \$150,000	\$150,000	38.7%	\$ 58,026	0%	\$ -		0.0%
RR 12 at Brookside	All	Install Signal	\$300,000 per signal	\$300,000	14.7%	\$ 43,977	100%	\$ 300,000	TxDOT Improvements	
RR 12 at Brookside	EB	Install 100' EB Left Turn Lane with 25' Taper	DRIVEWAY TO BE BUILT AS TWO LANE APPROACH							
RR 12 at Brookside	SB	Install 400' SB Right Turn Deceleration Lane	\$350 per linear foot/min \$150,000	\$150,000	100.0%	\$ 150,000	0%	\$ -	TxDOT Improvements	
Baird at Sportsplex	EB	Install 100' EB Left Turn Lane with 50' Taper	\$350 per linear foot/min \$150,000	\$150,000	0.0%	\$ -	0%	\$ -	0.0%	\$ -
Baird at Sportsplex	WB	Install 150' WB Right Turn Lane with 25' Taper	\$350 per linear foot/min \$150,000	\$150,000	80.2%	\$ 120,270	0%	\$ -	100.0%	\$ 150,000
Baird at Sportsplex	SB	Install 175' SB Left Turn Lane with 50' Taper	\$350 per linear foot/min \$150,000	\$150,000	96.0%	\$ 144,020	0%	\$ -	100.0%	\$ 150,000
Baird at Sportsplex	SB	Install 100' SB Right Turn Lane with 50' Taper	\$350 per linear foot/min \$150,000	\$150,000	0.0%	\$ -	0%	\$ -	0.0%	\$ -
US 290 at Roger Hanks	All	Signal Head Modifications	\$5,000 per signal	\$5,000	100.0%	\$ 5,000	0%	\$ -	TxDOT Improvements	
US 290 at Roger Hanks	All	Adjust Signal Timing	\$5,000 per signal	\$5,000	2.8%	\$ 140	0%	\$ -	TxDOT Improvements	
TOTAL				\$2,105,000	-	\$ 919,207	-	\$ 300,000	-	\$ 300,000

CERTIFICATION STATEMENT

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

KIMLEY-HORN AND ASSOCIATES



Santiago A. Araque Rojas P.E.
Project Manager

Exhibit A: Peak Hour Factor Calculations

APPENDIX

Appendix A: Scoping Documents

TECHNICAL MEMORANDUM

DATE: MARCH 26, 2020

TO: CHAD GILPIN, P.E.
CITY OF DRIPPING SPRINGS

COLBY MACHACEK.
HAYS COUNTY DEVELOPMENT SERVICES

FROM: SANTIAGO A. ARAQUE ROJAS, P.E.
KIMLEY-HORN

RE: TRAFFIC IMPACT ANALYSIS SCOPING MATERIALS – HERITAGE DEVELOPMENT

A Traffic Impact Analysis (TIA) for the Heritage Development, dated March 25, 2016, was previously approved by the City of Dripping Springs. A TIA Update is recommended for the preliminary plat for the Heritage Development based on a revision to the redevelopment timeline.

Kimley-Horn has been retained to perform the TIA for the single-family residential development located at northwest of the intersection of West U.S. Highway 290 and RR 12 in the City of Dripping Springs, Hays County, Texas. The development will consist of 595 single family detached housing units and 105 residential attached units. Based on City of Dripping Springs guidelines the below intersections are proposed to be studied. The TIA will meet all requirements and standards set forth in the City of Dripping Springs UDC.

INTERSECTIONS FOR ANALYSIS

Level of service calculations for the AM and PM peak periods shall be performed for the following intersections for projected traffic conditions:

1. US 290 and RR 12
2. US 290 and Sportsplex Drive
3. Old Fitzhugh Road and RR 12
4. RR 12 and Brookside
5. Baird and Sportsplex
6. US 290 and Roger Hanks Parkway
7. Brookside and N/S Extension
8. Brookside Roundabout
9. All Site Driveways

AM and PM peak-hour turning movement counts will be collected at the study intersections to determine existing background traffic and will be collected when school is in session.

A map displaying study intersections and segment capacity analysis intersections is included at the end of this scope document.

ROAD SIZING ANALYSIS

A roadway sizing analysis will be performed for the following roadway segments.

1. Brookside Street Extension (Proposed) between RM 12 and US 290 (two locations – at RM 12, at US 290)
2. Baird Lane (Proposed Extension) between Sportsplex Trail and Brookside Street
3. Proposed N/S Road between Brookside Street and Springlake Drive
4. Proposed N/S Road between Mercer St and Baird Lane (Proposed Extension)
5. Proposed E/S Road between Old Fitzhugh Road and Baird Lane (Proposed Extension)

A map displaying study intersections and segment capacity analysis intersections is included at the end of this scope document.

ANALYSIS SCENARIOS

The planned development schedule would occur annually from 2021 to 2026. The following scenarios will be evaluated in the analysis, with one build out year (2026):

1. Existing Conditions: 2020
2. No Build Conditions: 2026
3. Build Out Conditions: 2026

PROPOSED LAND USES

Proposed land uses per the *ITE Trip Generation Handbook, 3rd Edition* are shown in Table 1. Trip generations have been calculated via equations, since number of studies exceeds 25 and R² values are greater than 0.75 for Daily, AM, and PM peaks.

Daily trips for single family developments are calculated by $\ln(\text{Trips}) = 0.92 \cdot \ln(X) + 2.71$. AM peak trips for single family developments are calculated by $\text{Trips} = 0.71 \cdot X + 4.80$. PM peak trips for single family developments are calculated by $\ln(\text{Trips}) = 0.96 \cdot \ln(X) + 0.20$.

Daily trips for multi-family developments are calculated by $\text{Trips} = 7.56 \cdot X - 40.86$. AM peak trips for multi-family developments are calculated by $\ln(\text{Trips}) = 0.95 \cdot \ln(X) - 0.51$. PM peak trips for multi-family developments are calculated by $\ln(\text{Trips}) = 0.89 \cdot \ln(X) - 0.02$.

Table 1: Trip Generation

Land Uses	Quantity	Units	ITE Code	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single Family	595	DU	210	5,366	427	563	107	320	355	208
Multi-Family	105	DU	220	754	50	62	11	39	39	23
Internal Capture Trip Reduction				-	-	-	-	-	-	-
Pass-By Trip Reduction				-	-	-	-	-	-	-
TOTAL TRIPS				6,120	477	625	118	359	394	231

BACKGROUND TRAFFIC GROWTH RATE

One background TIA was identified for study and is listed below.

1. Big Sky Ranch

The growth rate was calculated as 3.87% per year. The proposed 4.0% growth rate is recommended based on historical counts.

Table 2: TxDOT Historical Counts

Location	2015	2016	2017	2018	Avg Annual Growth
RR 12 S	11,245	12,791	12,241	13,635	7.08%
US 290 E	29,826	30,305	25,305	31,572	1.95%
RR 12 N	11,448	12,681	13,503	14,199	8.01%
US 290 W	30,618	31,805	27,667	29,171	-1.58%
				Average	3.87%
				Assumed	4.00%

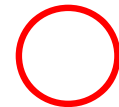



Prepared by: _____ Phone: (512)-418-4514






Santiago A. Araque Rojas, P.E.

Approved by: _____ Phone: (512)-858-4725

Chad Gilpin, P.E.

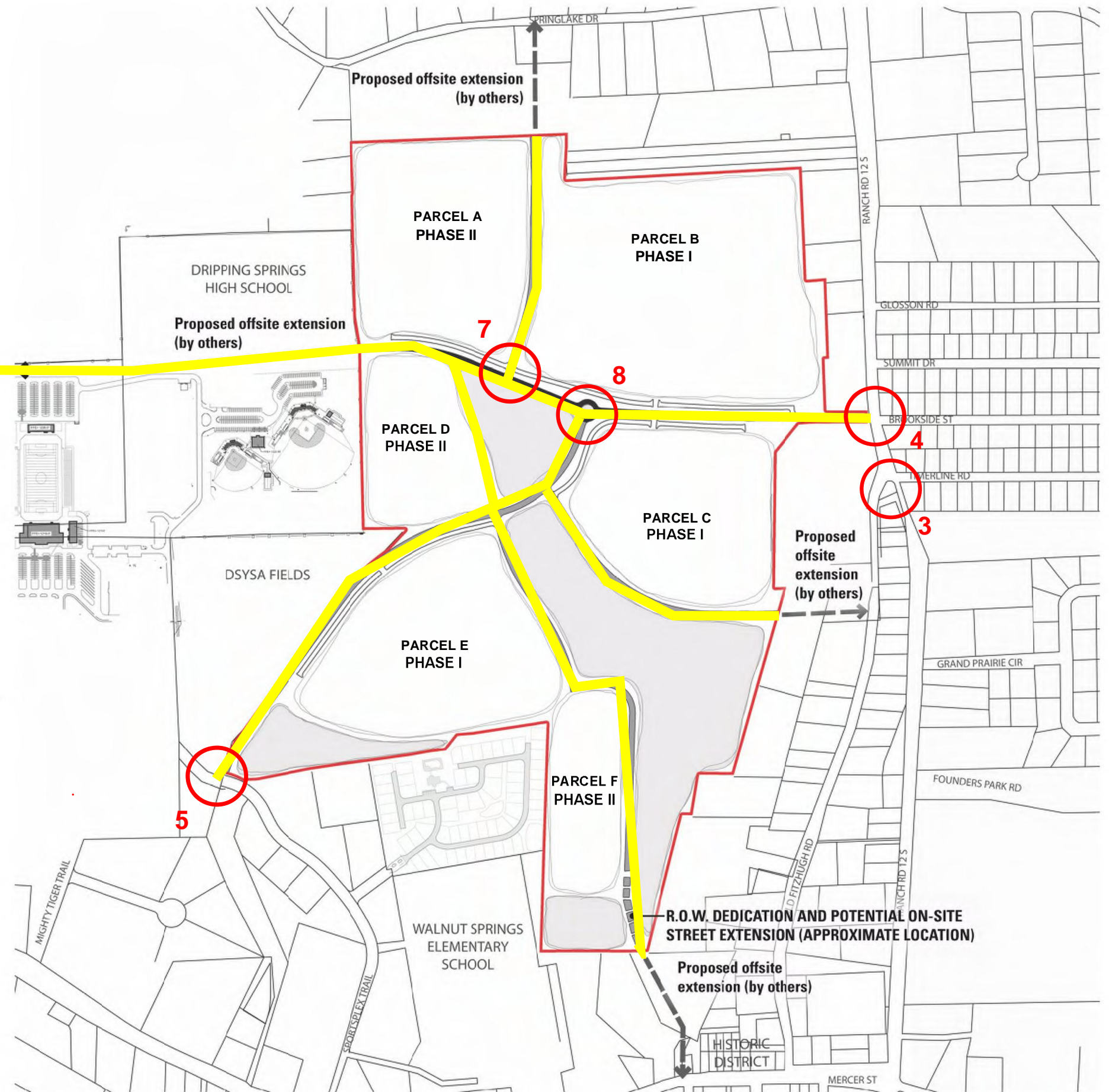
 INTERSECTION CAPACITY
 SEGMENT CAPACITY ANALYSIS

PD STREET TYPES

-  MINOR COLLECTOR
-  LOCAL RESIDENTIAL STREET
-  SLIP STREET
-  R.O.W. DEDICATION AND POTENTIAL ON-SITE STREET EXTENSION (APPROXIMATE LOCATION)
-  PROPOSED OFF SITE EXTENSION (BY OTHERS)

NOTES:

1. Exact alignment of minor collector to be determined at Preliminary Plat stage.
2. Locations and alignments of Local Residential, Slip Streets, and Alleys are diagrammatic only and to be determined at Preliminary Plat stage



TBG EXHIBIT F - PD STREET STANDARDS - REFERENCE PLAN

Dripping Springs, TX

27 October 2015


 2 Sportsplex & US 290


 1 RR 12 & US 290



Appendix B: Existing Traffic Counts and Signal Timings

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626

512-832-8650

File Name : Site 5 - US 290 & Sports Plex Dr-AM

Site Code : 5

Start Date : 1/30/2018

Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

Start Time	Sports Plex Southbound					Hwy 290 Westbound					Driveway Northbound					Hwy 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00	34	0	11	0	45	0	249	88	0	337	0	0	0	0	0	8	239	0	0	247	629
07:15	25	0	20	0	45	0	276	133	0	409	0	0	0	0	0	5	274	1	0	280	734
07:30	33	0	6	0	39	0	276	109	0	385	0	0	0	0	0	7	327	0	0	334	758
07:45	29	0	6	0	35	0	264	114	0	378	0	0	0	0	0	8	306	4	0	318	731
Total	121	0	43	0	164	0	1065	444	0	1509	0	0	0	0	0	28	1146	5	0	1179	2852
08:00	35	0	6	0	41	0	191	43	0	234	0	0	0	0	0	2	258	7	0	267	542
08:15	10	0	1	0	11	0	194	43	0	237	0	0	0	0	0	1	226	1	0	228	476
08:30	18	0	7	0	25	2	212	19	0	233	0	0	0	0	0	7	192	2	0	201	459
08:45	18	0	6	0	24	4	207	28	0	239	0	0	0	0	0	5	210	0	0	215	478
Total	81	0	20	0	101	6	804	133	0	943	0	0	0	0	0	15	886	10	0	911	1955
Grand Total	202	0	63	0	265	6	1869	577	0	2452	0	0	0	0	0	43	2032	15	0	2090	4807
Apprch %	76.2	0	23.8	0		0.2	76.2	23.5	0		0	0	0	0		2.1	97.2	0.7	0		
Total %	4.2	0	1.3	0	5.5	0.1	38.9	12	0	51	0	0	0	0	0	0.9	42.3	0.3	0	43.5	
Vehicles	202	0	60	0	262	3	1760									1957					
% Vehicles	100	0	95.2	0	98.9	50	94.2	100	0	95.4	0	0	0	0	0	100	96.3	0	0	95.7	95.7
Heavy Vehicles																					
% Heavy Vehicles	0	0	4.8	0	1.1	50	5.8	0	0	4.6	0	0	0	0	0	0	3.7	100	0	4.3	4.3

Start Time	Sports Plex Southbound					Hwy 290 Westbound					Driveway Northbound					Hwy 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00																					
07:00	34	0	11	0	45	0	249	88	0	337	0	0	0	0	0	8	239	0	0	247	629
07:15	25	0	20	0	45	0	276	133	0	409	0	0	0	0	0	5	274	1	0	280	734
07:30	33	0	6	0	39	0	276	109	0	385	0	0	0	0	0	7	327	0	0	334	758
07:45	29	0	6	0	35	0	264	114	0	378	0	0	0	0	0	8	306	4	0	318	731
Total Volume	121	0	43	0	164	0	1065	444	0	1509	0	0	0	0	0	28	1146	5	0	1179	2852
% App. Total	73.8	0	26.2	0		0	70.6	29.4	0		0	0	0	0		2.4	97.2	0.4	0		
PHF	.890	.000	.538	.000	.911	.000	.965	.835	.000	.922	.000	.000	.000	.000	.000	.875	.876	.313	.000	.882	.941
Vehicles	121	0	41	0	162	0	992	444	0	1436	0	0	0	0	0	28	1115				
% Vehicles	100	0	95.3	0	98.8	0	93.1	100	0	95.2	0	0	0	0	0	100	97.3	0	0	96.9	96.1
Heavy Vehicles																					
% Heavy Vehicles	0	0	4.7	0	1.2	0	6.9	0	0	4.8	0	0	0	0	0	0	2.7	100	0	3.1	3.9

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Site 5 - US 290 & Sports Plex Dr-AM
Site Code : 5
Start Date : 1/30/2018
Page No : 2

Start Time	Sports Plex Southbound					Hwy 290 Westbound					Driveway Northbound					Hwy 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:00					07:00					07:00					07:15					
+0 mins.	34	0	11	0	45	0	249	88	0	337	0	0	0	0	0	5	274	1	0	280	
+15 mins.	25	0	20	0	45	0	276	133	0	409	0	0	0	0	0	7	327	0	0	334	
+30 mins.	33	0	6	0	39	0	276	109	0	385	0	0	0	0	0	8	306	4	0	318	
+45 mins.	29	0	6	0	35	0	264	114	0	378	0	0	0	0	0	2	258	7	0	267	
Total Volume	121	0	43	0	164	0	1065	444	0	1509	0	0	0	0	0	22	1165	12	0	1199	
% App. Total	73.8	0	26.2	0		0	70.6	29.4	0		0	0	0	0		1.8	97.2	1	0		
PHF	.890	.000	.538	.000	.911	.000	.965	.835	.000	.922	.000	.000	.000	.000	.000	.688	.891	.429	.000	.897	
Vehicles	121	0	41	0	162	0	992	444	0	1436	0	0	0	0	0	22	1126	0	0	1148	
% Vehicles																					
Heavy Vehicles	0	0	2	0	2	0	73	0	0	73	0	0	0	0	0	0	39	12	0	51	
% Heavy Vehicles	0	0	4.7	0	1.2	0	6.9	0	0	4.8	0	0	0	0	0	0	3.3	100	0	4.3	

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Site 5 - US 290 & Sports Plex Dr-PM
Site Code : 5
Start Date : 1/30/2018
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

Start Time	Sports Plex Dr Southbound					Hwy 290 Westbound					Driveway Northbound					Hwy 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
15:00	42	0	6	0	48	4	312	71	0	387	0	0	0	0	0	7	230	1	0	238	673
15:15	150	0	13	0	163	2	251	27	0	280	0	0	0	0	0	12	354	2	0	368	811
15:30	128	0	6	0	134	0	235	27	0	262	0	0	0	0	0	5	278	1	0	284	680
15:45	52	0	3	0	55	0	231	24	0	255	1	0	1	0	2	1	221	2	0	224	536
Total	372	0	28	0	400	6	1029	149	0	1184	1	0	1	0	2	25	1083	6	0	1114	2700
16:00	62	0	7	0	69	2	277	24	0	303	0	0	1	0	1	2	269	4	0	275	648
16:15	56	0	3	0	59	2	225	40	0	267	1	0	2	0	3	4	267	0	0	271	600
16:30	47	0	3	0	50	0	228	32	0	260	0	0	1	0	1	2	267	1	0	270	581
16:45	60	0	2	0	62	0	243	31	0	274	1	0	1	0	2	1	274	2	0	277	615
Total	225	0	15	0	240	4	973	127	0	1104	2	0	5	0	7	9	1077	7	0	1093	2444
17:00	31	0	4	0	35	0	226	13	0	239	0	0	0	0	0	1	243	0	0	244	518
17:15	29	0	2	0	31	0	211	14	0	225	0	0	0	0	0	2	170	0	0	172	428
17:30	23	0	4	0	27	0	186	8	0	194	0	0	0	0	0	2	168	0	0	170	391
17:45	37	0	3	0	40	0	166	13	0	179	0	0	0	0	0	0	117	2	0	119	338
Total	120	0	13	0	133	0	789	48	0	837	0	0	0	0	0	5	698	2	0	705	1675
Grand Total	717	0	56	0	773	10	2791	324	0	3125	3	0	6	0	9	39	2858	15	0	2912	6819
Apprch %	92.8	0	7.2	0		0.3	89.3	10.4	0		33.3	0	66.7	0		1.3	98.1	0.5	0		
Total %	10.5	0	0.8	0	11.3	0.1	40.9	4.8	0	45.8	0	0	0.1	0	0.1	0.6	41.9	0.2	0	42.7	
Vehicles	702	0	56	0	758	5	2729									2708					
% Vehicles	97.9	0	100	0	98.1	50	97.8	100	0	97.9	100	0	100	0	100	100	94.8	13.3	0	94.4	96.4
Heavy Vehicles																					
% Heavy Vehicles	2.1	0	0	0	1.9	50	2.2	0	0	2.1	0	0	0	0	0	0	5.2	86.7	0	5.6	3.6

Start Time	Sports Plex Dr Southbound					Hwy 290 Westbound					Driveway Northbound					Hwy 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Thru	Right	Peds	App. Total				
Peak Hour Analysis From 15:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 15:00																					
15:00	42	0	6	0	48	4	312	71	0	387	0	0	0	0	0	7	230	1	0	238	673
15:15	150	0	13	0	163	2	251	27	0	280	0	0	0	0	0	12	354	2	0	368	811
15:30	128	0	6	0	134	0	235	27	0	262	0	0	0	0	0	5	278	1	0	284	680
15:45	52	0	3	0	55	0	231	24	0	255	1	0	1	0	2	1	221	2	0	224	536
Total Volume	372	0	28	0	400	6	1029	149	0	1184	1	0	1	0	2	25	1083	6	0	1114	2700
% App. Total	93	0	7	0		0.5	86.9	12.6	0		50	0	50	0		2.2	97.2	0.5	0		
PHF	.620	.000	.538	.000	.613	.375	.825	.525	.000	.765	.250	.000	.250	.000	.250	.521	.765	.750	.000	.757	.832
Vehicles	357	0	28	0	385	3	1010									1029					
% Vehicles	96.0	0	100	0	96.3	50.0	98.2	100	0	98.1	100	0	100	0	100	100	95.0	16.7	0	94.7	96.4
Heavy Vehicles																					
% Heavy Vehicles	4.0	0	0	0	3.8	50.0	1.8	0	0	1.9	0	0	0	0	0	0	5.0	83.3	0	5.3	3.6

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Site 5 - US 290 & Sports Plex Dr-PM
Site Code : 5
Start Date : 1/30/2018
Page No : 2

Start Time	Sports Plex Dr Southbound					Hwy 290 Westbound					Driveway Northbound					Hwy 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	

Peak Hour Analysis From 15:00 to 17:45 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	15:15					15:00					15:45					15:15				
+0 mins.	150	0	13	0	163	4	312	71	0	387	1	0	1	0	2	12	354	2	0	368
+15 mins.	128	0	6	0	134	2	251	27	0	280	0	0	1	0	1	5	278	1	0	284
+30 mins.	52	0	3	0	55	0	235	27	0	262	1	0	2	0	3	1	221	2	0	224
+45 mins.	62	0	7	0	69	0	231	24	0	255	0	0	1	0	1	2	269	4	0	275
Total Volume	392	0	29	0	421	6	1029	149	0	1184	2	0	5	0	7	20	1122	9	0	1151
% App. Total	93.1	0	6.9	0		0.5	86.9	12.6	0		28.6	0	71.4	0		1.7	97.5	0.8	0	
PHF	.653	.000	.558	.000	.646	.375	.825	.525	.000	.765	.500	.000	.625	.000	.583	.417	.792	.563	.000	.782
Vehicles	377	0	29	0	406	3	¹⁰¹ ₀	149	0	1162	2	0	5	0	7	20	¹⁰⁶ ₆	2	0	1088
% Vehicles																				
Heavy Vehicles	15	0	0	0	15	3	19	0	0	22	0	0	0	0	0	0	56	7	0	63
% Heavy Vehicles	3.8	0	0	0	3.6	50	1.8	0	0	1.9	0	0	0	0	0	0	5	^{77.} ₈	0	5.5

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626
512-832-8650

File Name : Site 8 - US 290 & RM 12 - AM
Site Code : 8
Start Date : 1/30/2018
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

Start Time	RM 12 Southbound					US 290 Westbound					RM 12 Northbound					US 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00	29	15	26	0	70	19	127	7	0	153	41	38	49	0	128	29	151	61	0	241	592
07:15	48	20	22	0	90	20	131	2	0	153	97	40	41	0	178	31	140	50	0	221	642
07:30	72	36	27	0	135	25	162	10	0	197	86	38	25	0	149	34	162	53	0	249	730
07:45	79	37	25	0	141	30	187	5	0	222	103	58	51	0	212	35	202	1	0	238	813
Total	228	108	100	0	436	94	607	24	0	725	327	174	166	0	667	129	655	165	0	949	2777
08:00	58	42	31	0	131	20	200	3	0	223	93	46	39	0	178	25	174	22	0	221	753
08:15	36	32	33	0	101	22	291	3	0	316	90	30	29	0	149	29	206	30	0	265	831
08:30	54	29	42	0	125	25	213	7	0	245	101	51	26	0	178	34	224	54	0	312	860
08:45	51	25	40	0	116	18	235	3	0	256	78	45	42	0	165	27	246	45	0	318	855
Total	199	128	146	0	473	85	939	16	0	1040	362	172	136	0	670	115	850	151	0	1116	3299
Grand Total	427	236	246	0	909	179	1546	40	0	1765	689	346	302	0	1337	244	1505	316	0	2065	6076
Apprch %	47	26	27.1	0		10.1	87.6	2.3	0		51.5	25.9	22.6	0		11.8	72.9	15.3	0		
Total %	7	3.9	4	0	15	2.9	25.4	0.7	0	29	11.3	5.7	5	0	22	4	24.8	5.2	0	34	
Vehicles	415	229	232	0	876	164	1493	35	0	1692	663	330	294	0	1287	224	1474	306	0	2004	5859
% Vehicles	97.2	97	94.3	0	96.4	91.6	96.6	87.5	0	95.9	96.2	95.4	97.4	0	96.3	91.8	97.9	96.8	0	97	96.4
Heavy Vehicles	12	7	14	0	33	15	53	5	0	73	26	16	8	0	50	20	31	10	0	61	217
% Heavy Vehicles	2.8	3	5.7	0	3.6	8.4	3.4	12.5	0	4.1	3.8	4.6	2.6	0	3.7	8.2	2.1	3.2	0	3	3.6

Start Time	RM 12 Southbound					US 290 Westbound					RM 12 Northbound					US 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	58	42	31	0	131	20	200	3	0	223	93	46	39	0	178	25	174	22	0	221	753
08:15	36	32	33	0	101	22	291	3	0	316	90	30	29	0	149	29	206	30	0	265	831
08:30	54	29	42	0	125	25	213	7	0	245	101	51	26	0	178	34	224	54	0	312	860
08:45	51	25	40	0	116	18	235	3	0	256	78	45	42	0	165	27	246	45	0	318	855
Total Volume	199	128	146	0	473	85	939	16	0	1040	362	172	136	0	670	115	850	151	0	1116	3299
% App. Total	42.1	27.1	30.9	0		8.2	90.3	1.5	0		54	25.7	20.3	0		10.3	76.2	13.5	0		
PHF	.858	.762	.869	.000	.903	.850	.807	.571	.000	.823	.896	.843	.810	.000	.941	.846	.864	.699	.000	.877	.959
Vehicles	194	127	133	0	454	78	901	16	0	995	343	163	131	0	637	106	835	146	0	1087	3173
% Vehicles	97.5	99.2	91.1	0	96.0	91.8	96.0	100	0	95.7	94.8	94.8	96.3	0	95.1	92.2	98.2	96.7	0	97.4	96.2
Heavy Vehicles	5	1	13	0	19	7	38	0	0	45	19	9	5	0	33	9	15	5	0	29	126
% Heavy Vehicles	2.5	0.8	8.9	0	4.0	8.2	4.0	0	0	4.3	5.2	5.2	3.7	0	4.9	7.8	1.8	3.3	0	2.6	3.8

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626
512-832-8650

File Name : Site 8 - US 290 & RM 12 - AM
Site Code : 8
Start Date : 1/30/2018
Page No : 2

Start Time	RM 12 Southbound					US 290 Westbound					RM 12 Northbound					US 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:30					08:00					07:15					08:00					
+0 mins.	72	36	27	0	135	20	200	3	0	223	97	40	41	0	178	25	174	22	0	221	
+15 mins.	79	37	25	0	141	22	291	3	0	316	86	38	25	0	149	29	206	30	0	265	
+30 mins.	58	42	31	0	131	25	213	7	0	245	103	58	51	0	212	34	224	54	0	312	
+45 mins.	36	32	33	0	101	18	235	3	0	256	93	46	39	0	178	27	246	45	0	318	
Total Volume	245	147	116	0	508	85	939	16	0	1040	379	182	156	0	717	115	850	151	0	1116	
% App. Total	48.2	28.9	22.8	0		8.2	90.3	1.5	0		52.9	25.4	21.8	0		10.3	76.2	13.5	0		
PHF	.775	.875	.879	.000	.901	.850	.807	.571	.000	.823	.920	.784	.765	.000	.846	.846	.864	.699	.000	.877	
Vehicles	237	142	105	0	484	78	901	16	0	995	370	176	152	0	698	106	835	146	0	1087	
% Vehicles	96.	96.	90.	0	95.3	91.	96	100	0	95.7	97.	96.	97.	0	97.4	92.	98.	96.	0	97.4	
	7	6	5			8					6	7	4			2	2	7			
Heavy Vehicles	8	5	11	0	24	7	38	0	0	45	9	6	4	0	19	9	15	5	0	29	
% Heavy Vehicles	3.3	3.4	9.5	0	4.7	8.2	4	0	0	4.3	2.4	3.3	2.6	0	2.6	7.8	1.8	3.3	0	2.6	

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626
512-832-8650

File Name : Site 8 - US 290 & RM 12 - PM
Site Code : 8
Start Date : 1/30/2018
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

Start Time	RM 12 Southbound					US 290 Westbound					RM 12 Northbound					US 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
15:00	90	38	26	0	154	37	183	3	0	223	57	35	36	0	128	40	202	35	0	277	782
15:15	56	55	13	0	124	29	172	7	0	208	54	28	31	0	113	35	202	46	0	283	728
15:30	72	48	24	0	144	48	166	7	0	221	53	36	40	0	129	45	137	36	0	218	712
15:45	52	37	29	0	118	53	232	5	0	290	54	19	43	0	116	25	168	45	0	238	762
Total	270	178	92	0	540	167	753	22	0	942	218	118	150	0	486	145	709	162	0	1016	2984
16:00	55	46	28	0	129	35	228	4	0	267	83	35	38	0	156	35	180	42	0	257	809
16:15	52	59	21	0	132	48	209	7	0	264	57	36	38	0	131	38	213	42	0	293	820
16:30	65	45	19	0	129	41	177	4	0	222	59	49	37	0	145	20	250	19	0	289	785
16:45	83	67	25	0	175	43	171	3	0	217	52	37	35	0	124	34	219	38	0	291	807
Total	255	217	93	0	565	167	785	18	0	970	251	157	148	0	556	127	862	141	0	1130	3221
17:00	58	55	27	0	140	34	231	10	0	275	43	41	51	0	135	30	231	43	0	304	854
17:15	83	61	27	0	171	42	177	4	0	223	56	34	37	0	127	30	181	60	0	271	792
17:30	61	65	9	0	135	50	201	3	0	254	60	38	31	0	129	46	226	26	0	298	816
17:45	41	75	20	0	136	49	190	1	0	240	65	39	36	0	140	34	176	48	0	258	774
Total	243	256	83	0	582	175	799	18	0	992	224	152	155	0	531	140	814	177	0	1131	3236
Grand Total	768	651	268	0	1687	509	2337	58	0	2904	693	427	453	0	1573	412	2385	480	0	3277	9441
Apprch %	45.5	38.6	15.9	0		17.5	80.5	2	0		44.1	27.1	28.8	0		12.6	72.8	14.6	0		
Total %	8.1	6.9	2.8	0	17.9	5.4	24.8	0.6	0	30.8	7.3	4.5	4.8	0	16.7	4.4	25.3	5.1	0	34.7	
Vehicles	752	640	249	0	1641	499	2246	57	0	2802	678	419	444	0	1541	394	2283	455	0	3132	9116
% Vehicles	97.9	98.3	92.9	0	97.3	98	96.1	98.3	0	96.5	97.8	98.1	98	0	98	95.6	95.7	94.8	0	95.6	96.6
Heavy Vehicles	16	11	19	0	46	10	91	1	0	102	15	8	9	0	32	18	102	25	0	145	325
% Heavy Vehicles	2.1	1.7	7.1	0	2.7	2	3.9	1.7	0	3.5	2.2	1.9	2	0	2	4.4	4.3	5.2	0	4.4	3.4

Start Time	RM 12 Southbound					US 290 Westbound					RM 12 Northbound					US 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 15:00 to 16:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:00																					
16:00	55	46	28	0	129	35	228	4	0	267	83	35	38	0	156	35	180	42	0	257	809
16:15	52	59	21	0	132	48	209	7	0	264	57	36	38	0	131	38	213	42	0	293	820
16:30	65	45	19	0	129	41	177	4	0	222	59	49	37	0	145	20	250	19	0	289	785
16:45	83	67	25	0	175	43	171	3	0	217	52	37	35	0	124	34	219	38	0	291	807
Total Volume	255	217	93	0	565	167	785	18	0	970	251	157	148	0	556	127	862	141	0	1130	3221
% App. Total	45.1	38.4	16.5	0		17.2	80.9	1.9	0		45.1	28.2	26.6	0		11.2	76.3	12.5	0		
PHF	.768	.810	.830	.000	.807	.870	.861	.643	.000	.908	.756	.801	.974	.000	.891	.836	.862	.839	.000	.964	.982
Vehicles	250	213	89	0	552	162	761	17	0	940	248	154	145	0	547	116	813	135	0	1064	3103
% Vehicles	98.0	98.2	95.7	0	97.7	97.0	96.9	94.4	0	96.9	98.8	98.1	98.0	0	98.4	91.3	94.3	95.7	0	94.2	96.3
Heavy Vehicles	5	4	4	0	13	5	24	1	0	30	3	3	3	0	9	11	49	6	0	66	118
% Heavy Vehicles	2.0	1.8	4.3	0	2.3	3.0	3.1	5.6	0	3.1	1.2	1.9	2.0	0	1.6	8.7	5.7	4.3	0	5.8	3.7

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626

512-832-8650

File Name : Site 8 - US 290 & RM 12 - PM

Site Code : 8

Start Date : 1/30/2018

Page No : 2

Start Time	RM 12 Southbound					US 290 Westbound					RM 12 Northbound					US 290 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	

Peak Hour Analysis From 15:00 to 16:45 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	16:00					15:45					16:00					16:00				
+0 mins.	55	46	28	0	129	53	232	5	0	290	83	35	38	0	156	35	180	42	0	257
+15 mins.	52	59	21	0	132	35	228	4	0	267	57	36	38	0	131	38	213	42	0	293
+30 mins.	65	45	19	0	129	48	209	7	0	264	59	49	37	0	145	20	250	19	0	289
+45 mins.	83	67	25	0	175	41	177	4	0	222	52	37	35	0	124	34	219	38	0	291
Total Volume	255	217	93	0	565	177	846	20	0	1043	251	157	148	0	556	127	862	141	0	1130
% App. Total	45.1	38.4	16.5	0		17	81.1	1.9	0		45.1	28.2	26.6	0		11.2	76.3	12.5	0	
PHF	.768	.810	.830	.000	.807	.835	.912	.714	.000	.899	.756	.801	.974	.000	.891	.836	.862	.839	.000	.964
Vehicles	250	213	89	0	552	171	814	20	0	1005	248	154	145	0	547	116	813	135	0	1064
% Vehicles	98	98.	95.	0	97.7	96.	96.	100	0	96.4	98.	98.	98	0	98.4	91.	94.	95.	0	94.2
		2	7			6	2				8	1				3	3	7		
Heavy Vehicles	5	4	4	0	13	6	32	0	0	38	3	3	3	0	9	11	49	6	0	66
% Heavy Vehicles	2	1.8	4.3	0	2.3	3.4	3.8	0	0	3.6	1.2	1.9	2	0	1.6	8.7	5.7	4.3	0	5.8

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626

512-832-8650

File Name : Site 14 - RM 12 and Old Fitzhugh Rd- AM

Site Code : 14

Start Date : 1/30/2018

Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

Start Time	RM 12 Southbound					Old Fitzhugh Rd Westbound					RM 12 Northbound					Old Fitzhugh Rd Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00	3	85	9	0	97	1	1	1	0	3	0	109	2	0	111	9	1	0	0	10	221
07:15	2	99	17	0	118	6	1	0	0	7	1	158	5	0	164	10	0	0	0	10	299
07:30	2	153	33	0	188	4	1	3	0	8	0	165	3	0	168	9	0	1	0	10	374
07:45	0	172	31	0	203	5	0	0	0	5	0	114	3	0	117	11	1	0	0	12	337
Total	7	509	90	0	606	16	3	4	0	23	1	546	13	0	560	39	2	1	0	42	1231
08:00	1	105	25	0	131	1	2	0	0	3	1	92	1	0	94	9	0	0	0	9	237
08:15	0	112	34	0	146	3	2	0	0	5	2	75	3	0	80	6	0	3	0	9	240
08:30	0	111	32	0	143	2	0	0	0	2	0	142	1	0	143	10	0	1	0	11	299
08:45	0	116	24	0	140	1	0	0	0	1	1	127	1	0	129	20	0	3	0	23	293
Total	1	444	115	0	560	7	4	0	0	11	4	436	6	0	446	45	0	7	0	52	1069
Grand Total	8	953	205	0	1166	23	7	4	0	34	5	982	19	0	1006	84	2	8	0	94	2300
Apprch %	0.7	81.7	17.6	0		67.6	20.6	11.8	0		0.5	97.6	1.9	0		89.4	2.1	8.5	0		
Total %	0.3	41.4	8.9	0	50.7	1	0.3	0.2	0	1.5	0.2	42.7	0.8	0	43.7	3.7	0.1	0.3	0	4.1	
Vehicles	8	919	202	0	1129	23	7	4	0	34	5	932	18	0	955	84	2	8	0	94	2212
% Vehicles																					
Heavy Vehicles	0	34	3	0	37	0	0	0	0	0	0	50	1	0	51	0	0	0	0	0	88
% Heavy Vehicles	0	3.6	1.5	0	3.2	0	0	0	0	0	0	5.1	5.3	0	5.1	0	0	0	0	0	3.8

Start Time	RM 12 Southbound					Old Fitzhugh Rd Westbound					RM 12 Northbound					Old Fitzhugh Rd Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15																					
07:15	2	99	17	0	118	6	1	0	0	7	1	158	5	0	164	10	0	0	0	10	299
07:30	2	153	33	0	188	4	1	3	0	8	0	165	3	0	168	9	0	1	0	10	374
07:45	0	172	31	0	203	5	0	0	0	5	0	114	3	0	117	11	1	0	0	12	337
08:00	1	105	25	0	131	1	2	0	0	3	1	92	1	0	94	9	0	0	0	9	237
Total Volume	5	529	106	0	640	16	4	3	0	23	2	529	12	0	543	39	1	1	0	41	1247
% App. Total	0.8	82.7	16.6	0		69.6	17.4	13	0		0.4	97.4	2.2	0		95.1	2.4	2.4	0		
PHF	.625	.769	.803	.000	.788	.667	.500	.250	.000	.719	.500	.802	.600	.000	.808	.886	.250	.250	.000	.854	.834
Vehicles	5	508	104	0	617	16	4	3	0	23	2	502	11	0	515	39	1	1	0	41	1196
% Vehicles		96.0	98.1	0	96.4	100	100	100	0	100	100	94.9	91.7	0	94.8	100	100	100	0	100	95.9
Heavy Vehicles																					
% Heavy Vehicles	0	4.0	1.9	0	3.6	0	0	0	0	0	0	5.1	8.3	0	5.2	0	0	0	0	0	4.1

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Site 14 - RM 12 and Old Fitzhugh Rd- AM
Site Code : 14
Start Date : 1/30/2018
Page No : 2

Start Time	RM 12 Southbound					Old Fitzhugh Rd Westbound					RM 12 Northbound					Old Fitzhugh Rd Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:30					07:00					07:00					08:00					
+0 mins.	2	153	33	0	188	1	1	1	0	3	0	109	2	0	111	9	0	0	0	9	
+15 mins.	0	172	31	0	203	6	1	0	0	7	1	158	5	0	164	6	0	3	0	9	
+30 mins.	1	105	25	0	131	4	1	3	0	8	0	165	3	0	168	10	0	1	0	11	
+45 mins.	0	112	34	0	146	5	0	0	0	5	0	114	3	0	117	20	0	3	0	23	
Total Volume	3	542	123	0	668	16	3	4	0	23	1	546	13	0	560	45	0	7	0	52	
% App. Total	0.4	81.1	18.4	0		69.6	13	17.4	0		0.2	97.5	2.3	0		86.5	0	13.5	0		
PHF	.375	.788	.904	.000	.823	.667	.750	.333	.000	.719	.250	.827	.650	.000	.833	.563	.000	.583	.000	.565	
Vehicles	3	517	122	0	642	16	3	4	0	23	1	519	12	0	532	45	0	7	0	52	
% Vehicles																					
Heavy Vehicles	0	25	1	0	26	0	0	0	0	0	0	27	1	0	28	0	0	0	0	0	
% Heavy Vehicles	0	4.6	0.8	0	3.9	0	0	0	0	0	0	4.9	7.7	0	5	0	0	0	0	0	

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626

512-832-8650

File Name : Site 14 - RM 12 and Old Fitzhugh Rd- PM

Site Code : 14

Start Date : 1/30/2018

Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

Start Time	RM 12 Southbound					Old Fitzhugh Rd Westbound					RM 12 Northbound					Old Fitzhugh Rd Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
15:00	0	103	11	0	114	1	0	1	0	2	0	110	3	0	113	14	0	0	0	14	243
15:15	2	132	25	0	159	5	0	1	0	6	3	112	2	0	117	13	0	0	0	13	295
15:30	0	113	19	0	132	2	0	1	0	3	0	104	3	0	107	8	1	0	0	9	251
15:45	1	121	19	0	141	3	0	0	0	3	1	90	3	0	94	12	3	0	0	15	253
Total	3	469	74	0	546	11	0	3	0	14	4	416	11	0	431	47	4	0	0	51	1042
16:00	2	111	19	0	132	1	2	0	0	3	2	123	2	0	127	13	0	2	0	15	277
16:15	0	105	36	0	141	2	0	0	0	2	1	113	5	0	119	26	0	3	0	29	291
16:30	0	117	21	0	138	2	0	0	0	2	3	121	3	0	127	33	1	3	0	37	304
16:45	0	127	22	0	149	5	0	0	0	5	2	137	6	0	145	17	0	0	0	17	316
Total	2	460	98	0	560	10	2	0	0	12	8	494	16	0	518	89	1	8	0	98	1188
17:00	0	129	16	0	145	4	1	3	0	8	1	143	10	0	154	24	2	1	0	27	334
17:15	3	109	29	0	141	2	1	1	0	4	1	124	4	0	129	17	1	0	0	18	292
17:30	1	159	22	0	182	1	0	0	0	1	0	128	3	0	131	7	0	0	0	7	321
17:45	2	162	23	0	187	3	1	0	0	4	3	142	3	0	148	25	0	3	0	28	367
Total	6	559	90	0	655	10	3	4	0	17	5	537	20	0	562	73	3	4	0	80	1314
Grand Total	11	1488	262	0	1761	31	5	7	0	43	17	1447	47	0	1511	209	8	12	0	229	3544
Apprch %	0.6	84.5	14.9	0		72.1	11.6	16.3	0		1.1	95.8	3.1	0		91.3	3.5	5.2	0		
Total %	0.3	42	7.4	0	49.7	0.9	0.1	0.2	0	1.2	0.5	40.8	1.3	0	42.6	5.9	0.2	0.3	0	6.5	
Vehicles	11	1444										1415									
% Vehicles	100	97	98.1	0	97.2	100	100	100	0	100	100	97.8	97.9	0	97.8	100	100	100	0	100	97.7
Heavy Vehicles																					
% Heavy Vehicles	0	3	1.9	0	2.8	0	0	0	0	0	0	2.2	2.1	0	2.2	0	0	0	0	0	2.3

Start Time	RM 12 Southbound					Old Fitzhugh Rd Westbound					RM 12 Northbound					Old Fitzhugh Rd Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
17:00	0	129	16	0	145	4	1	3	0	8	1	143	10	0	154	24	2	1	0	27	334
17:15	3	109	29	0	141	2	1	1	0	4	1	124	4	0	129	17	1	0	0	18	292
17:30	1	159	22	0	182	1	0	0	0	1	0	128	3	0	131	7	0	0	0	7	321
17:45	2	162	23	0	187	3	1	0	0	4	3	142	3	0	148	25	0	3	0	28	367
Total Volume	6	559	90	0	655	10	3	4	0	17	5	537	20	0	562	73	3	4	0	80	1314
% App. Total	0.9	85.3	13.7	0		58.8	17.6	23.5	0		0.9	95.6	3.6	0		91.2	3.8	5	0		
PHF	.500	.863	.776	.000	.876	.625	.750	.333	.000	.531	.417	.939	.500	.000	.912	.730	.375	.333	.000	.714	.895
Vehicles	6	551	88	0	645	10	3	4	0	17	5	527	20	0	552	73	3	4	0	80	1294
% Vehicles		98.6	97.8	0	98.5	100	100	100	0	100	100	98.1	100	0	98.2	100	100	100	0	100	98.5
Heavy Vehicles																					
% Heavy Vehicles	0	1.4	2.2	0	1.5	0	0	0	0	0	0	1.9	0	0	1.8	0	0	0	0	0	1.5

Peak Hour Analysis From 15:00 to 17:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 17:00

GRAM Traffic Counting Inc.

3751 FM 1105 Bldg A
Georgetown, TX 78626

512-832-8650

File Name : Site 14 - RM 12 and Old Fitzhugh Rd- PM

Site Code : 14

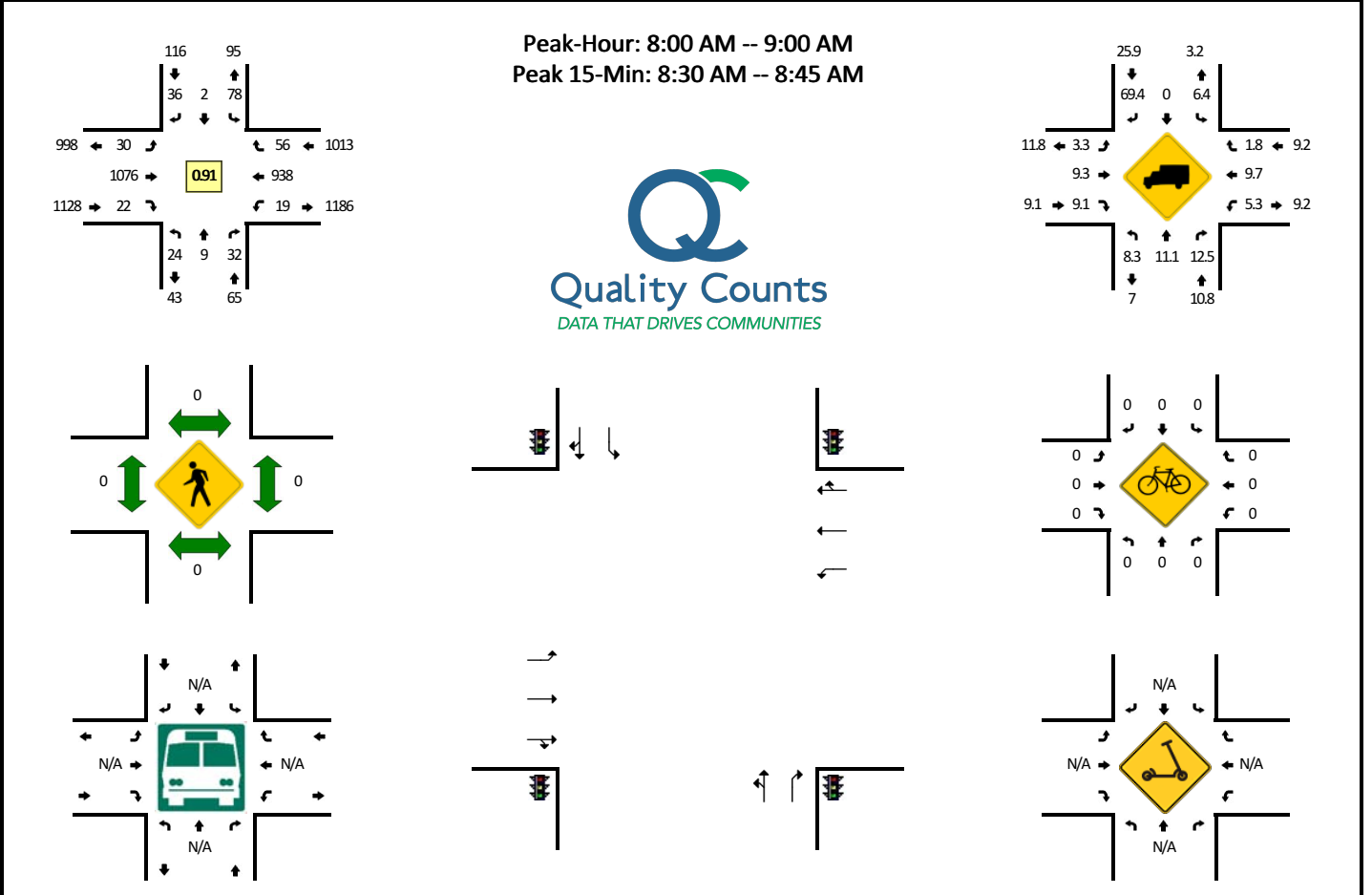
Start Date : 1/30/2018

Page No : 2

Start Time	RM 12 Southbound					Old Fitzhugh Rd Westbound					RM 12 Northbound					Old Fitzhugh Rd Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 15:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	17:00					16:30					17:00					16:15					
+0 mins.	0	129	16	0	145	2	0	0	0	2	1	143	10	0	154	26	0	3	0	29	
+15 mins.	3	109	29	0	141	5	0	0	0	5	1	124	4	0	129	33	1	3	0	37	
+30 mins.	1	159	22	0	182	4	1	3	0	8	0	128	3	0	131	17	0	0	0	17	
+45 mins.	2	162	23	0	187	2	1	1	0	4	3	142	3	0	148	24	2	1	0	27	
Total Volume	6	559	90	0	655	13	2	4	0	19	5	537	20	0	562	100	3	7	0	110	
% App. Total	0.9	85.3	13.7	0		68.4	10.5	21.1	0		0.9	95.6	3.6	0		90.9	2.7	6.4	0		
PHF	.500	.863	.776	.000	.876	.650	.500	.333	.000	.594	.417	.939	.500	.000	.912	.758	.375	.583	.000	.743	
Vehicles	6	551	88	0	645	13	2	4	0	19	5	527	20	0	552	100	3	7	0	110	
% Vehicles																					
Heavy Vehicles	0	8	2	0	10	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	
% Heavy Vehicles	0	1.4	2.2	0	1.5	0	0	0	0	0	0	1.9	0	0	1.8	0	0	0	0	0	

LOCATION: Roger Hanks Pkwy -- US 290
CITY/STATE: Dripping Springs, TX

QC JOB #: 15207101
DATE: Tue, Mar 10 2020

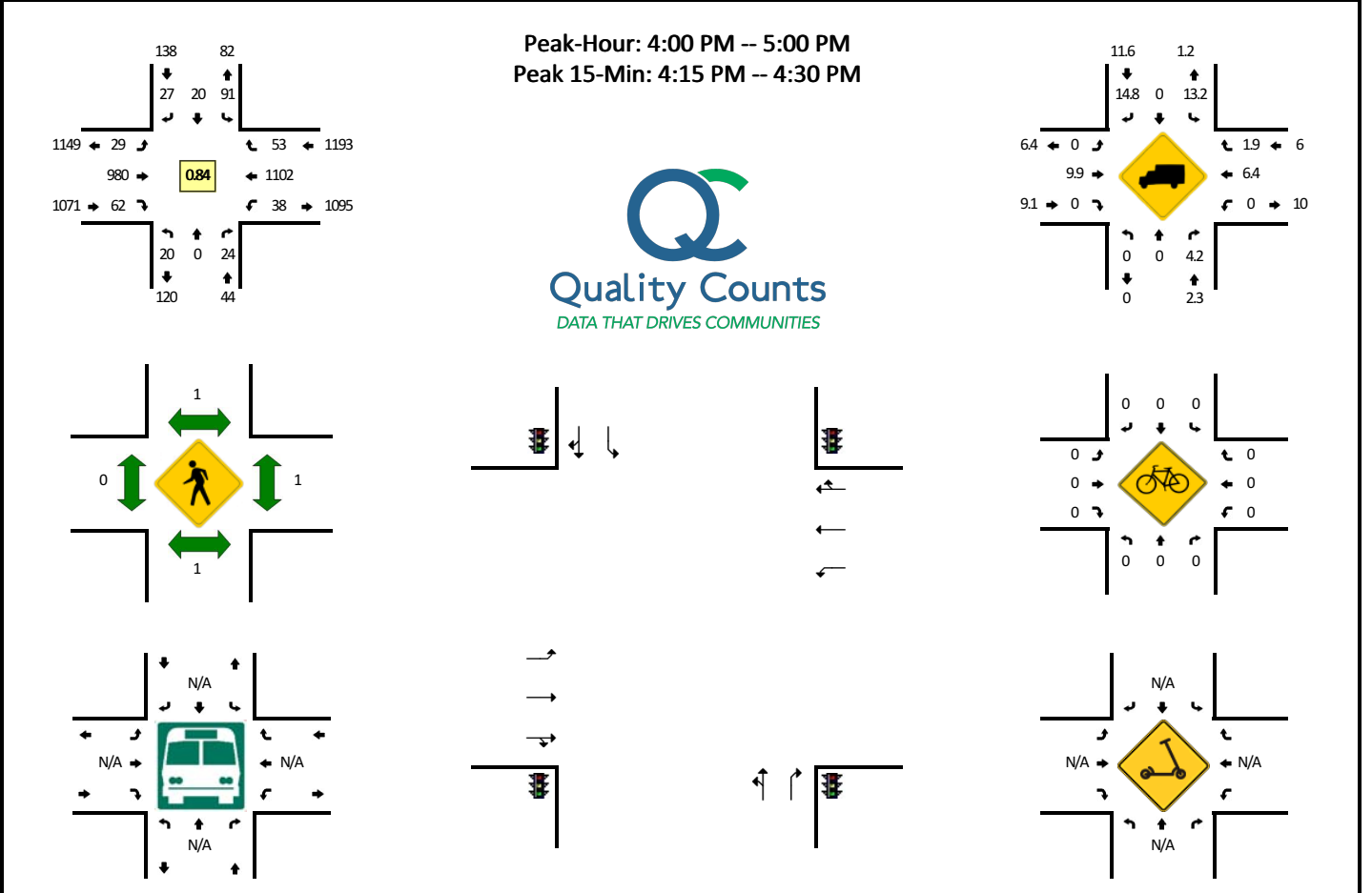


15-Min Count Period Beginning At	Roger Hanks Pkwy (Northbound)				Roger Hanks Pkwy (Southbound)				US 290 (Eastbound)				US 290 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	1	1	0	4	0	0	0	1	163	1	0	0	117	15	0	304	
7:15 AM	3	1	13	0	8	0	0	0	2	236	0	0	5	144	9	0	421	
7:30 AM	4	1	13	0	8	0	0	0	2	234	1	0	9	173	9	0	454	
7:45 AM	4	0	7	0	15	0	3	0	2	202	2	0	8	211	21	0	475	1654
8:00 AM	3	2	6	0	16	0	1	0	5	213	3	0	6	178	11	0	444	1794
8:15 AM	6	1	14	0	22	0	12	0	6	282	6	0	2	237	19	0	607	1980
8:30 AM	9	3	4	0	20	1	18	0	12	289	7	0	7	258	13	0	641	2167
8:45 AM	6	3	8	0	20	1	5	0	7	292	6	0	4	265	13	0	630	2322
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	36	12	16	0	80	4	72	0	48	1156	28	0	28	1032	52	0	2564	
Heavy Trucks	0	0	0		4	0	60		0	96	4		0	92	0		256	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																	0	

Comments:

LOCATION: Roger Hanks Pkwy -- US 290
CITY/STATE: Dripping Springs, TX

QC JOB #: 15207102
DATE: Tue, Mar 10 2020



15-Min Count Period Beginning At	Roger Hanks Pkwy (Northbound)				Roger Hanks Pkwy (Southbound)				US 290 (Eastbound)				US 290 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	0	8	0	11	1	4	0	7	230	7	0	6	272	13	0	562	
4:15 PM	3	0	5	0	39	7	7	0	15	310	20	0	10	302	13	0	731	
4:30 PM	6	0	8	0	21	7	9	0	1	233	26	0	14	266	18	0	609	
4:45 PM	8	0	3	0	20	5	7	0	6	207	9	0	8	262	9	0	544	2446
5:00 PM	8	1	7	0	20	2	2	0	1	202	9	0	10	237	13	0	512	2396
5:15 PM	7	3	5	0	27	0	1	0	1	272	3	0	6	253	20	0	598	2263
5:30 PM	0	1	3	0	20	1	1	0	4	238	6	0	6	238	17	0	535	2189
5:45 PM	6	0	5	0	15	0	7	0	4	227	4	0	6	278	22	0	574	2219

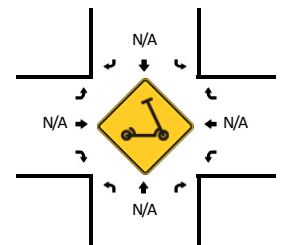
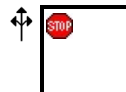
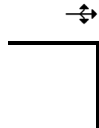
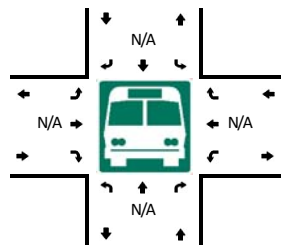
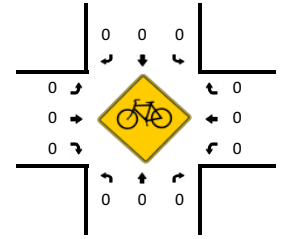
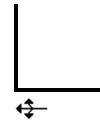
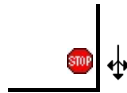
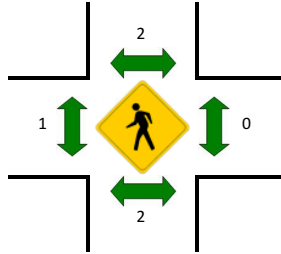
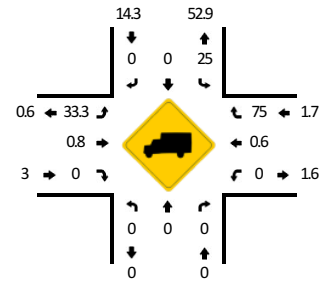
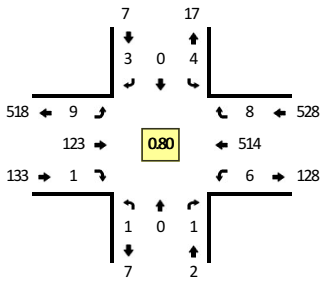
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	0	20	0	156	28	28	0	60	1240	80	0	40	1208	52	0	2924
Heavy Trucks	0	0	4		32	0	0		0	108	0		0	80	0		224
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scoters																	

Comments:

LOCATION: Baird Ln -- Sportsplex Dr
CITY/STATE: Dripping Springs, TX

QC JOB #: 15207103
DATE: Tue, Mar 10 2020

Peak-Hour: 8:00 AM -- 9:00 AM
 Peak 15-Min: 8:30 AM -- 8:45 AM



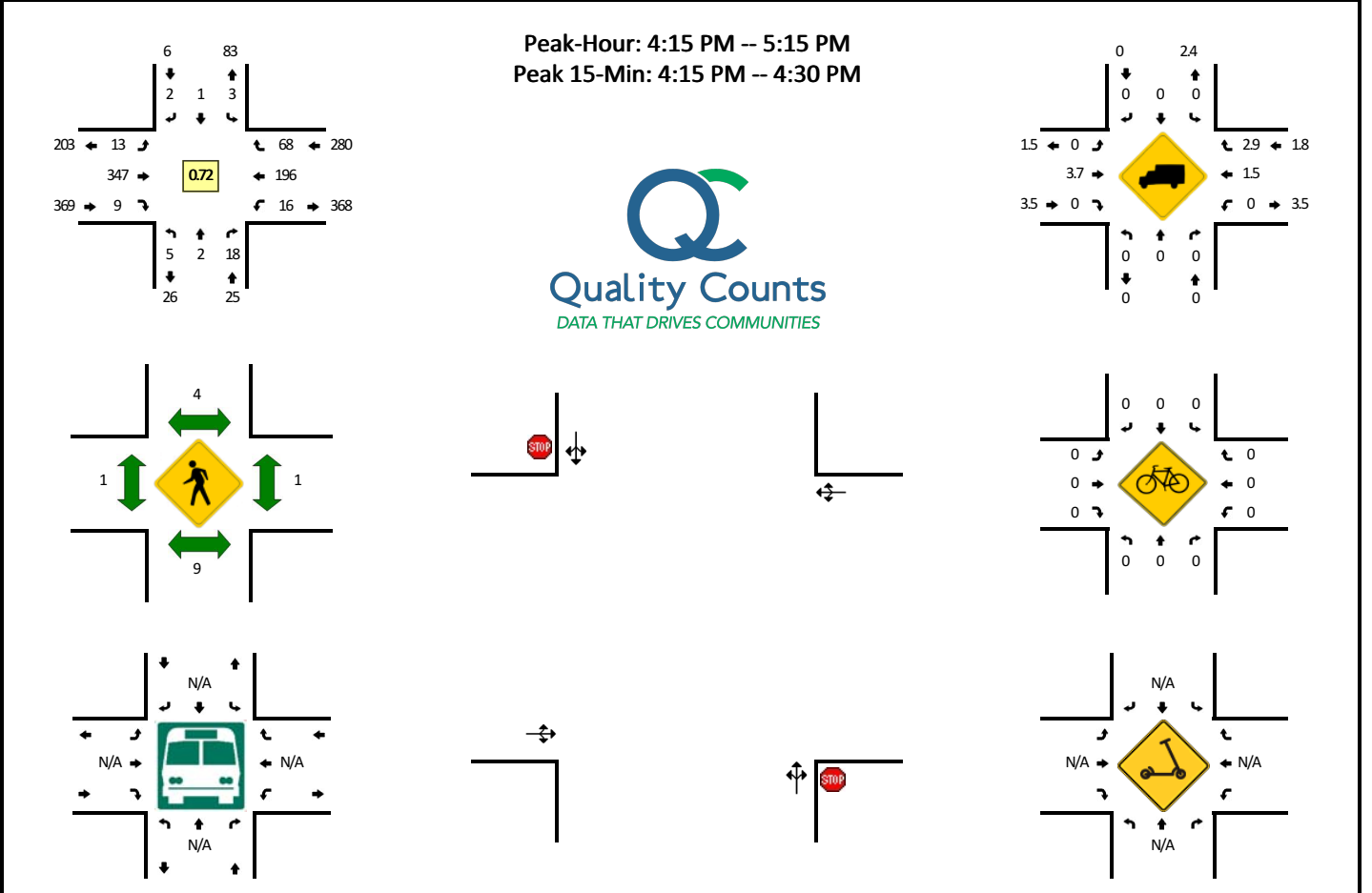
15-Min Count Period Beginning At	Baird Ln (Northbound)				Baird Ln (Southbound)				Sportsplex Dr (Eastbound)				Sportsplex Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	12	0	0	15	
7:15 AM	0	0	0	0	0	0	0	0	0	23	0	0	0	21	0	0	44	
7:30 AM	0	0	0	0	0	0	0	0	0	54	1	0	1	70	0	0	126	
7:45 AM	0	0	2	0	0	0	0	0	2	11	0	0	2	79	1	0	97	282
8:00 AM	0	0	0	0	0	0	0	0	0	18	0	0	3	113	1	0	135	402
8:15 AM	0	0	1	0	0	0	2	0	2	36	0	0	1	134	0	0	176	534
8:30 AM	1	0	0	0	2	0	0	0	5	43	1	0	0	154	4	0	210	618
8:45 AM	0	0	0	0	2	0	1	0	2	26	0	0	2	113	3	0	149	670

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	0	0	8	0	0	0	20	172	4	0	0	616	16	0	840
Heavy Trucks	0	0	0	0	4	0	0	0	4	0	0	0	0	0	12	0	20
Buses																	
Pedestrians		0				4				4				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scoters																	

Comments:

LOCATION: Baird Ln -- Sportsplex Dr
CITY/STATE: Dripping Springs, TX

QC JOB #: 15207104
DATE: Tue, Mar 10 2020



15-Min Count Period Beginning At	Baird Ln (Northbound)				Baird Ln (Southbound)				Sportsplex Dr (Eastbound)				Sportsplex Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	5	0	0	0	0	0	0	50	4	0	4	89	1	0	155	
4:15 PM	1	0	5	0	0	0	1	0	0	147	3	0	5	75	0	0	237	
4:30 PM	2	0	2	0	1	0	0	0	2	66	1	0	5	44	5	0	128	
4:45 PM	1	1	7	0	1	0	0	0	6	68	3	0	2	39	21	0	149	669
5:00 PM	1	1	4	0	1	1	1	0	5	66	2	0	4	38	42	0	166	680
5:15 PM	2	0	5	0	3	1	1	0	5	81	1	0	3	41	63	0	206	649
5:30 PM	3	0	8	0	5	0	2	0	2	45	1	0	3	38	41	0	148	669
5:45 PM	3	0	5	0	7	0	3	0	10	26	0	0	4	35	44	0	137	657

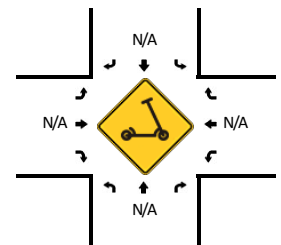
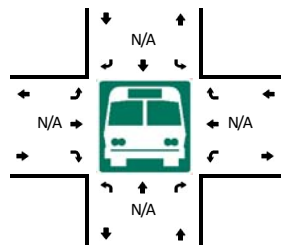
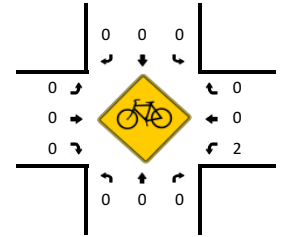
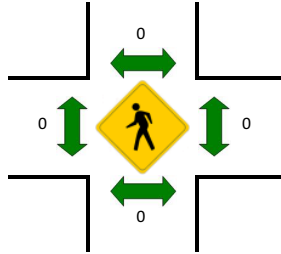
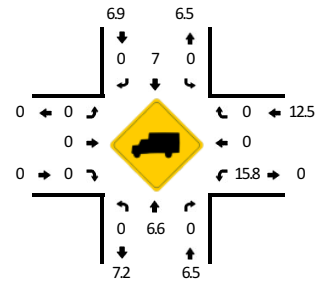
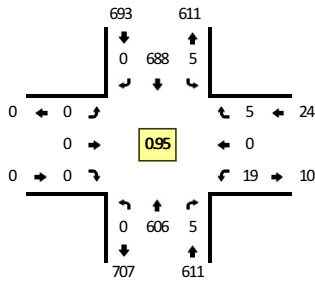
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	20	0	0	0	4	0	0	588	12	0	20	300	0	0	948
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	4	0		12
Buses																	
Pedestrians		24				12				0				4			40
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scoters																	

Comments:

LOCATION: RR 12 -- Brookside St
CITY/STATE: Dripping Springs, TX

QC JOB #: 15207105
DATE: Tue, Mar 10 2020

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:15 AM -- 7:30 AM



15-Min Count Period Beginning At	RR 12 (Northbound)				RR 12 (Southbound)				Brookside St (Eastbound)				Brookside St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	109	1	0	0	94	0	0	0	0	0	0	3	0	0	0	207	
7:15 AM	0	197	1	0	3	140	0	0	0	0	0	0	5	0	3	0	349	
7:30 AM	0	157	1	0	2	187	0	0	0	0	0	0	1	0	1	0	349	
7:45 AM	0	128	2	0	0	190	0	0	0	0	0	0	9	0	0	0	329	1234
8:00 AM	0	124	1	0	0	171	0	0	0	0	0	0	4	0	1	0	301	1328
8:15 AM	0	120	0	0	1	161	0	0	0	0	0	0	4	0	0	0	286	1265
8:30 AM	0	134	3	0	1	167	0	0	0	0	0	0	2	0	0	0	307	1223
8:45 AM	0	166	2	0	1	143	0	0	0	0	0	0	2	0	1	0	315	1209

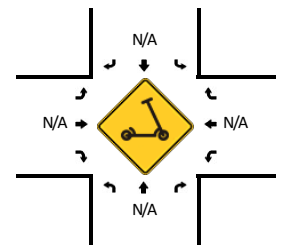
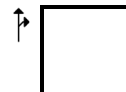
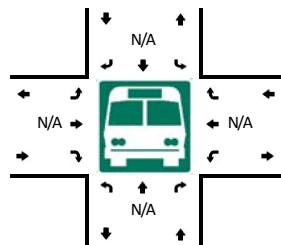
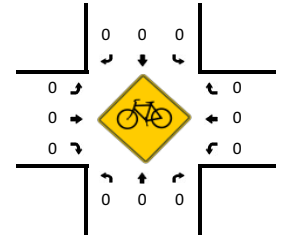
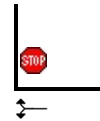
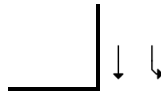
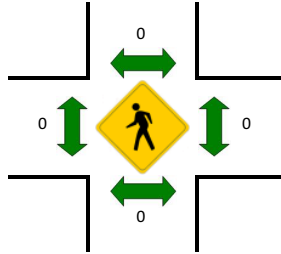
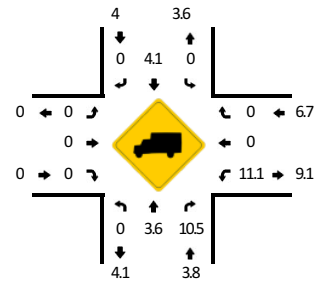
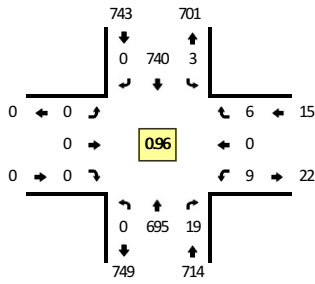
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	788	4	0	12	560	0	0	0	0	0	0	20	0	12	0	1396
Heavy Trucks	0	56	0		0	28	0		0	0	0		4	0	0		88
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		4	0	0		4
Scoters																	

Comments:

LOCATION: RR 12 -- Brookside St
CITY/STATE: Dripping Springs, TX

QC JOB #: 15207106
DATE: Tue, Mar 10 2020

Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:45 PM -- 6:00 PM



15-Min Count Period Beginning At	RR 12 (Northbound)				RR 12 (Southbound)				Brookside St (Eastbound)				Brookside St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	145	0	0	2	204	0	0	0	0	0	0	1	0	1	0	353	
4:15 PM	0	180	2	0	0	188	0	0	0	0	0	0	1	0	2	0	373	
4:30 PM	0	182	1	0	1	146	0	0	0	0	0	0	0	0	1	0	331	
4:45 PM	0	149	1	0	0	169	0	0	0	0	0	0	2	0	0	0	321	1378
5:00 PM	0	179	3	0	0	193	0	0	0	0	0	0	3	0	1	0	379	1404
5:15 PM	0	160	5	0	2	208	0	0	0	0	0	0	3	0	1	0	379	1410
5:30 PM	0	187	7	0	0	132	0	0	0	0	0	0	1	0	3	0	330	1409
5:45 PM	0	169	4	0	1	207	0	0	0	0	0	0	2	0	1	0	384	1472

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	676	16	0	4	828	0	0	0	0	0	0	8	0	4	0	1536	
Heavy Trucks	0	28	4		0	32	0		0	0	0		4	0	0		68	
Buses																		
Pedestrians		0				0				0				0				0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0			0
Scooters																		

Comments:

Type of report: Tube Count - Volume Data

LOCATION: RR 12 South of Brookside St SPECIFIC LOCATION: CITY/STATE: Dripping Springs, TX							QC JOB #: 15207107 DIRECTION: NB DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		18				18			18	
01:00 AM		9				9			9	
02:00 AM		3				3			3	
03:00 AM		7				7			7	
04:00 AM		9				9			9	
05:00 AM		38				38			38	
06:00 AM		247				247			247	
07:00 AM		606				606			606	
08:00 AM		562				562			562	
09:00 AM		459				459			459	
10:00 AM		451				451			451	
11:00 AM		460				460			460	
12:00 PM		422				422			422	
01:00 PM		467				467			467	
02:00 PM		524				524			524	
03:00 PM		553				553			553	
04:00 PM		666				666			666	
05:00 PM		721				721			721	
06:00 PM		602				602			602	
07:00 PM		480				480			480	
08:00 PM		395				395			395	
09:00 PM		160				160			160	
10:00 PM		83				83			83	
11:00 PM		44				44			44	
Day Total		7986				7986			7986	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		7:00 AM 606				7:00 AM 606			7:00 AM 606	
PM Peak Volume		5:00 PM 721				5:00 PM 721			5:00 PM 721	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: RR 12 South of Brookside St SPECIFIC LOCATION: CITY/STATE: Dripping Springs, TX							QC JOB #: 15207107 DIRECTION: NB, SB DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		42				42			42	
01:00 AM		20				20			20	
02:00 AM		6				6			6	
03:00 AM		18				18			18	
04:00 AM		40				40			40	
05:00 AM		131				131			131	
06:00 AM		506				506			506	
07:00 AM		1263				1263			1263	
08:00 AM		1237				1237			1237	
09:00 AM		882				882			882	
10:00 AM		936				936			936	
11:00 AM		984				984			984	
12:00 PM		892				892			892	
01:00 PM		910				910			910	
02:00 PM		1011				1011			1011	
03:00 PM		1220				1220			1220	
04:00 PM		1402				1402			1402	
05:00 PM		1471				1471			1471	
06:00 PM		1194				1194			1194	
07:00 PM		808				808			808	
08:00 PM		617				617			617	
09:00 PM		284				284			284	
10:00 PM		140				140			140	
11:00 PM		62				62			62	
Day Total		16076				16076			16076	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		7:00 AM 1263				7:00 AM 1263			7:00 AM 1263	
PM Peak Volume		5:00 PM 1471				5:00 PM 1471			5:00 PM 1471	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: RR 12 North of Brookside St SPECIFIC LOCATION: CITY/STATE: Dripping Springs, TX							QC JOB #: 15207108 DIRECTION: NB DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		18				18			18	
01:00 AM		10				10			10	
02:00 AM		3				3			3	
03:00 AM		7				7			7	
04:00 AM		9				9			9	
05:00 AM		40				40			40	
06:00 AM		247				247			247	
07:00 AM		622				622			622	
08:00 AM		595				595			595	
09:00 AM		454				454			454	
10:00 AM		453				453			453	
11:00 AM		482				482			482	
12:00 PM		443				443			443	
01:00 PM		492				492			492	
02:00 PM		547				547			547	
03:00 PM		576				576			576	
04:00 PM		692				692			692	
05:00 PM		727				727			727	
06:00 PM		596				596			596	
07:00 PM		474				474			474	
08:00 PM		392				392			392	
09:00 PM		156				156			156	
10:00 PM		77				77			77	
11:00 PM		39				39			39	
Day Total		8151				8151			8151	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		7:00 AM 622				7:00 AM 622			7:00 AM 622	
PM Peak Volume		5:00 PM 727				5:00 PM 727			5:00 PM 727	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: RR 12 North of Brookside St SPECIFIC LOCATION: CITY/STATE: Dripping Springs, TX							QC JOB #: 15207108 DIRECTION: NB DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		18				18			18	
01:00 AM		10				10			10	
02:00 AM		3				3			3	
03:00 AM		7				7			7	
04:00 AM		9				9			9	
05:00 AM		40				40			40	
06:00 AM		247				247			247	
07:00 AM		622				622			622	
08:00 AM		595				595			595	
09:00 AM		454				454			454	
10:00 AM		453				453			453	
11:00 AM		482				482			482	
12:00 PM		443				443			443	
01:00 PM		492				492			492	
02:00 PM		547				547			547	
03:00 PM		576				576			576	
04:00 PM		692				692			692	
05:00 PM		727				727			727	
06:00 PM		596				596			596	
07:00 PM		474				474			474	
08:00 PM		392				392			392	
09:00 PM		156				156			156	
10:00 PM		77				77			77	
11:00 PM		39				39			39	
Day Total		8151				8151			8151	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		7:00 AM 622				7:00 AM 622			7:00 AM 622	
PM Peak Volume		5:00 PM 727				5:00 PM 727			5:00 PM 727	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: RR 12 North of Brookside St SPECIFIC LOCATION: CITY/STATE: Dripping Springs, TX							QC JOB #: 15207108 DIRECTION: NB, SB DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		40				40			40	
01:00 AM		21				21			21	
02:00 AM		6				6			6	
03:00 AM		20				20			20	
04:00 AM		41				41			41	
05:00 AM		131				131			131	
06:00 AM		489				489			489	
07:00 AM		1260				1260			1260	
08:00 AM		1262				1262			1262	
09:00 AM		880				880			880	
10:00 AM		941				941			941	
11:00 AM		999				999			999	
12:00 PM		916				916			916	
01:00 PM		929				929			929	
02:00 PM		1033				1033			1033	
03:00 PM		1226				1226			1226	
04:00 PM		1441				1441			1441	
05:00 PM		1463				1463			1463	
06:00 PM		1198				1198			1198	
07:00 PM		790				790			790	
08:00 PM		599				599			599	
09:00 PM		269				269			269	
10:00 PM		124				124			124	
11:00 PM		55				55			55	
Day Total		16133				16133			16133	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		8:00 AM 1262				8:00 AM 1262			8:00 AM 1262	
PM Peak Volume		5:00 PM 1463				5:00 PM 1463			5:00 PM 1463	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: RR 12 North of Brookside St							QC JOB #: 15207108			
SPECIFIC LOCATION:							DIRECTION: SB			
CITY/STATE: Dripping Springs, TX							DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		22				22			22	
01:00 AM		11				11			11	
02:00 AM		3				3			3	
03:00 AM		13				13			13	
04:00 AM		32				32			32	
05:00 AM		91				91			91	
06:00 AM		242				242			242	
07:00 AM		638				638			638	
08:00 AM		667				667			667	
09:00 AM		426				426			426	
10:00 AM		488				488			488	
11:00 AM		517				517			517	
12:00 PM		473				473			473	
01:00 PM		437				437			437	
02:00 PM		486				486			486	
03:00 PM		650				650			650	
04:00 PM		749				749			749	
05:00 PM		736				736			736	
06:00 PM		602				602			602	
07:00 PM		316				316			316	
08:00 PM		207				207			207	
09:00 PM		113				113			113	
10:00 PM		47				47			47	
11:00 PM		16				16			16	
Day Total		7982				7982			7982	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		8:00 AM 667				8:00 AM 667			8:00 AM 667	
PM Peak Volume		4:00 PM 749				4:00 PM 749			4:00 PM 749	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: Brookside St East of RR 12							QC JOB #: 15207109			
SPECIFIC LOCATION:							DIRECTION: EB			
CITY/STATE: Dripping Springs, TX							DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		1				1			1	
01:00 AM		0				0			0	
02:00 AM		0				0			0	
03:00 AM		0				0			0	
04:00 AM		0				0			0	
05:00 AM		0				0			0	
06:00 AM		3				3			3	
07:00 AM		10				10			10	
08:00 AM		10				10			10	
09:00 AM		7				7			7	
10:00 AM		10				10			10	
11:00 AM		5				5			5	
12:00 PM		7				7			7	
01:00 PM		9				9			9	
02:00 PM		4				4			4	
03:00 PM		15				15			15	
04:00 PM		7				7			7	
05:00 PM		24				24			24	
06:00 PM		20				20			20	
07:00 PM		12				12			12	
08:00 PM		13				13			13	
09:00 PM		6				6			6	
10:00 PM		5				5			5	
11:00 PM		6				6			6	
Day Total		174				174			174	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		7:00 AM 10				7:00 AM 10			7:00 AM 10	
PM Peak Volume		5:00 PM 24				5:00 PM 24			5:00 PM 24	

Comments:

Report generated on 3/12/2020 11:20 AM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>)

Type of report: Tube Count - Volume Data

LOCATION: Brookside St East of RR 12							QC JOB #: 15207109			
SPECIFIC LOCATION:							DIRECTION: EB, WB			
CITY/STATE: Dripping Springs, TX							DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		3				3			3	
01:00 AM		0				0			0	
02:00 AM		0				0			0	
03:00 AM		0				0			0	
04:00 AM		0				0			0	
05:00 AM		3				3			3	
06:00 AM		18				18			18	
07:00 AM		35				35			35	
08:00 AM		24				24			24	
09:00 AM		19				19			19	
10:00 AM		18				18			18	
11:00 AM		9				9			9	
12:00 PM		13				13			13	
01:00 PM		15				15			15	
02:00 PM		11				11			11	
03:00 PM		24				24			24	
04:00 PM		15				15			15	
05:00 PM		40				40			40	
06:00 PM		34				34			34	
07:00 PM		24				24			24	
08:00 PM		22				22			22	
09:00 PM		12				12			12	
10:00 PM		13				13			13	
11:00 PM		6				6			6	
Day Total		358				358			358	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		7:00 AM 35				7:00 AM 35			7:00 AM 35	
PM Peak Volume		5:00 PM 40				5:00 PM 40			5:00 PM 40	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: Brookside St East of RR 12 SPECIFIC LOCATION: CITY/STATE: Dripping Springs, TX							QC JOB #: 15207109 DIRECTION: WB DATE: Mar 10 2020 - Mar 10 2020			
Start Time	Mon 10 Mar 20	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		2				2			2	
01:00 AM		0				0			0	
02:00 AM		0				0			0	
03:00 AM		0				0			0	
04:00 AM		0				0			0	
05:00 AM		3				3			3	
06:00 AM		15				15			15	
07:00 AM		25				25			25	
08:00 AM		14				14			14	
09:00 AM		12				12			12	
10:00 AM		8				8			8	
11:00 AM		4				4			4	
12:00 PM		6				6			6	
01:00 PM		6				6			6	
02:00 PM		7				7			7	
03:00 PM		9				9			9	
04:00 PM		8				8			8	
05:00 PM		16				16			16	
06:00 PM		14				14			14	
07:00 PM		12				12			12	
08:00 PM		9				9			9	
09:00 PM		6				6			6	
10:00 PM		8				8			8	
11:00 PM		0				0			0	
Day Total		184				184			184	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		7:00 AM 25				7:00 AM 25			7:00 AM 25	
PM Peak Volume		5:00 PM 16				5:00 PM 16			5:00 PM 16	

Comments:

Appendix C: Site Trip Generation

Trip Generation Planner (ITE 10th Edition) - Summary Report



Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name
Project Number

ITE Code	Internal Capture Land Use	Land Use Description	Independent Variable	Setting/Location	No. of Units	Daily Avg or Eq	AM Avg or Eq	PM Avg or Eq	Rates			Total Trips				Net Trips after Internal Capture				Net Trips after Internal Capture & Pass-By												
									Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out							
210		Single-Family Detached Housing	Dwelling Unit(s)	General Urban/Suburban	595	Eq	Eq	Eq	N/A	N/A	N/A	5,366	427	563	107	320	355	208	5,366	427	563	107	320	355	208	3,382	158	563	40	119	355	208
220		Multifamily Housing (Low-Rise)	Dwelling Unit(s)	General Urban/Suburban	105	Eq	Eq	Eq	N/A	N/A	N/A	754	50	62	11	39	39	23	754	50	62	11	39	39	23	11	39	39	23	754	50	62
									Grand Total			6,120	477	625	118	359	394	231	6,120	477	625	118	359	394	231	3,393	197	602	62	873	405	270

- Notes:
 (1) AM and/or PM rates correspond to peak hour of generator
 (2) Land use was removed in *Trip Generation, 10 Edition*, trip generation data from the ITE *Trip Generation, 9th Edition*

- A Trip Generation data from ITE *Trip Generation, 10th Edition*
- B AM/PM rates correspond to peak of adjacent street traffic (if data available)
- C Includes weekday rates only
- D Total trips include pass-by trips w/ no internal capture
- E Pass-by rates from ITE *Trip Generation Handbook, 3rd Edition*
- F Internal capture rates from ITE *Trip Generation Handbook, 3rd Edition*
- G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation 9th Edition*
- H Enter data in shaded cells of column A
- I ITE Codes entered on first 8 rows of table are assumed to be part of mixed use and will be used in calculation of internal capture.

Appendix D: 2015 Approved Bury Report

BURY

FINAL TRAFFIC STUDY

*Heritage Dripping Springs
Dripping Springs, Hays County, Texas*

March 25, 2016

TBPE F-1048



LET'S SOLVE IT.

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CERTIFICATION STATEMENT

I hereby certify that this report complies with Ordinance requirements and applicable technical requirements of the City of Dripping Springs and the Texas Department of Transportation and is complete and accurate to the best of my knowledge.

Nicola Gheno 117180
(Signature of Responsible Engineer) Texas P.E. No.

03/25/2016
Date

Nicola Gheno
Signature of Submitter

03/25/2016
Date

Nicola Gheno, P.E., PTOE
Printed Name of Submitter

03/25/2016
Date

INTRODUCTION

STUDY PURPOSE AND OBJECTIVE

The purpose of this report is to summarize the findings of the Traffic Study performed by Bury, Inc. (Bury) for the proposed Heritage Dripping Springs development. The proposed development is a residential development located west of Ranch Road (RM) 12 and north of US Highway (US) 290 within the City of Dripping Springs, Hays County, Texas. A site location map of the proposed development is included as *Exhibit 1*. For the purposes of this analysis, this report documents the estimated traffic volumes to be generated by the development in two (2) phases described below and understand the impact of the site on the roadway network. The site is currently undeveloped. The scope of this study includes the following:

- Data collection of the existing roadway system;
- Estimate the number of trips to be generated by the development in two (2) phases. Phase I will analyze Parcels B, C and E to be included with the 2018 build-out year and Phase II will analyze Parcels A, D and F to be included with the 2022 build-out year;
- Distributing new trips to the proposed build-out at year 2018 for Phase I and year 2022 for Phase II;
- Evaluating capacity of the study area intersections using the latest version of Synchro and SimTraffic software for the 2015 Existing , 2018 Forecasted (future, no-build), 2018 Phase I Site+Forecasted (future-build) conditions, 2022 Forecasted (future, build with Phase 1) and 2022 Phase II Site+Forecasted (future-build) conditions;
- Evaluating the segment capacity with and without future connections (to be made by others) tying into Mercer Street, Old Fitzhugh Road, and Springlake Drive. The following roadway segments for each condition will be analyzed utilizing HCS 2010;
- Brookside Street Extension between RM 12 and US 290 (two (2) locations at RM 12 and US 290)
- Baird Lane between Sportsplex Drive and Brookside Street
- Proposed N/S Road between Brookside Street and Springlake Drive
- Proposed N/S Road between Mercer Street and Baird Lane
- Proposed E/W Road between Old Fitzhugh Road and Baird Lane
- Suggest roadway or intersection improvements to mitigate significant impacts, if any, due to the proposed development.

As mentioned above the proposed development has been analyzed as a 2-phase single-family residential development including the following land uses:

- Phase I (2018 Build-Out) will include a total of 458 single-family dwelling units associated with Parcel B (213 dwelling units), Parcel C (111 dwelling units) and Parcel E (134 dwelling units)
- Phase II (2022 Build-Out) will include a total of 243 single-family dwelling units associated with Parcel A (115 dwelling units), Parcel D (72 dwelling units) and Parcel F (56 dwelling units)

The conceptual site plan for the proposed development has been included within the Appendix of this report as **Exhibit 2**. The Traffic Study scoping documents with the City of Dripping Springs, Hays County, and Texas Department of Transportation (TxDOT) defining the parameters of this report is contained within the Appendix as **Exhibit 3**.

STUDY METHODOLOGY

This study consists of five (5) major components listed below.

- Data Collection of the existing roadway system;
- Trip Generation – An estimation of new trips generated by the proposed development was determined using the Institute of Transportation Engineers Trip Generation Handbook, 9th Edition;
- Trip Distribution – The origins and destinations of site-related trips were determined by comparing existing traffic patterns on the study area roadways, and by observing the existing land use in the area;
- Trip Assignment – New trips were assigned to the completion of the development in 2018 as well as 2022; and
- Analysis – An operational and capacity analysis of the surrounding roadway network was completed for the 2015 Existing, 2018 Forecasted, 2018 Phase I Site + Forecasted, 2022 Forecasted and 2022 Phase II Site+Forecasted conditions.

DATA COLLECTION OF ROADWAY SYSTEM

Manual TMC's for the peak periods were performed between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. on May 14, 2015. All independent schools districts were in session at the time counts were captured. All TMC data is included within the Appendix of this report as **Exhibit 4** and represent current traffic conditions within the study area roadway network.

A site investigation was performed to understand the existing conditions of the roadway network within the analysis. Intersection geometries, traffic behavior, and unique characteristics were noted during the investigation. The following provides a description of the roadway system within the study area based upon the data obtained in the field:

- US 290 is a 4-lane roadway with a 14 feet Two-Way-Left-Turn-Lane (TWLTL) in the center located south of the proposed development. The posted speed limit along the US 290 is 55 miles per hour (mph). Based on HDR's Average Daily Traffic (ADT) counts taken on May 4, 2015, US 290 experienced 32,085 vehicles per day.
- RM 12 is a 2-lane roadway located east of the proposed development. The posted speed limit along RM 12 is 45 mph. Based on HDR's Average Daily Traffic (ADT) counts taken on May 4, 2015, RM 12 experienced 11,272 vehicles per day. RM 12 will be widened to a 3-lane section in the vicinity of Old Fitzhugh Road by TxDOT was considered for all future conditions.
- Brookside Street is an existing 2-lane local residential roadway located east of the proposed development with a posted speed limit of 25 mph. Brookside Street forms a three-leg stop controlled intersection with RM 12 with stop control along Brookside Street. Brookside Street is proposed to be extended through the proposed development from RM 12 to the western property limits and serve as the primary internal collector roadway for the proposed development. Further extension on Brookside Street will be completed by others and is expected to align and tie-into US 290 at existing intersection of US 290 with Roger Hanks Parkway. The proposed cross section for Brookside Street internal to the development will be a 2-lane roadway with bike lanes on either side. Additional, slip streets adjacent to Brookside Street within the development are being utilized to promote ease of access to and from the collector.
- Springlake Drive is an existing 2-lane local roadway located north of the proposed development with a posted speed limit of 30 mph. Springlake Drive forms a Two-Way Stop Control intersection (TWSC) with RM 12 with stop control along Springlake Drive. An internal roadway connection is expected to be built by others and tie-into Springlake Drive from the proposed development.
- Sportsplex Drive is an existing 3-lane roadway with a 12 foot center Fire Lane that can only be utilized by emergency vehicles. Sportsplex Drive is located southwest of the proposed development with a posted speed limit of 30 mph. Sportsplex Drive primarily serves the Dripping Springs High School.
- Baird Lane is an existing 2-lane local roadway located west of the proposed development with a posted speed limit of 25 mph. Baird Lane is expected to tie into the proposed Brookside Street extension and will serve as an internal residential roadway for the proposed development. Baird Lane forms a Two-Way Stop Control intersection (TWSC) with stop control along Baird Lane and Library Driveway. The proposed cross section for Baird Lane internal to the development will be a two-way shared drive.

ASSUMPTIONS

As part of the proposed Dripping Springs development, various improvements have been assumed to occur based on the Development Agreements between Developers and the City of Dripping Springs. These improvements have been assumed in the 2018 Phase I Site+Forecasted conditions and 2022 Phase II Site + Forecasted conditions. The following improvements have been assumed as part of the proposed Dripping Springs development:

By Heritage Development:

- Extension of Brookside Street from RM 12 to western property limits
- Extension of Baird Lane to Brookside Street

By Others:

- Extension of Brookside Street/Roger Hanks from US 290 to western property limits

The extension of Brookside Street will be completed in multiple phases, however for the purposes of this analysis, it is assumed that Brookside Street will be extended from RM 12 Road to tie-into and align with US 290 at existing intersection of US 290/Roger Hanks Parkway. Brookside Street is proposed to be extended through the proposed development from RM 12 to the western property limits and serve as the primary internal collector roadway for the proposed development. Further extension of Brookside Street will be completed by others and is expected to align and tie into US 290 at existing intersection of US 290 with Roger Hanks Parkway. It was assumed that when the Brookside extension to US 290 occurs, a signal will be installed by others and has been included within the Phase I and Phase II Site + Forecasted conditions.

The extension of Baird Lane will be completed in multiple phases, however for the purposes of this analysis, it is assumed that Baird Lane will be extended to tie-into the proposed extension of Brookside Street.

TRIP GENERATION

SITE TRAFFIC

The Dripping Springs development consists of 2-phase single family residential development. The proposed development will be 2-phase single-family residential development including the following land uses:

- Phase I (2018 Build-Out) will include a total of 458 single-family dwelling units associated with Parcel B (213 dwelling units), Parcel C (111 dwelling units) and Parcel E (134 dwelling units)
- Phase II (2022 Build-Out) will include a total of 243 single-family dwelling units associated with Parcel A (115 dwelling units), Parcel D (72 dwelling units) and Parcel F (56 dwelling units)

A summary of the proposed land use and intensity can be seen within **Table 1** below. The conceptual site plan for the proposed development has been included within the Appendix of this report as **Exhibit 2**.

Based on the proposed site plan, site generated trips were estimated using rates or equations per the recommendations and data contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. The proposed development will generate approximately 4,637 unadjusted daily trips by Phase I full-build out in 2018 and 2,586 unadjusted daily trips by Phase II full-build out in 2022. **Table 1** provides a detailed summary of unadjusted traffic production for each land use, which is directly related to the site plan. The trip generation outputs with associated rates or equations have been included as **Exhibit 3** within the Appendix of this report.

TABLE 1 - SUMMARY OF UNADJUSTED DAILY AND PEAK HOUR TRIP GENERATION

ITE Code	Land Use	Size	Units	24-Hour Two-Way Volume	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Phase I - 2018										
210	Parcel B: Single Family	213	DU	2,106	40	119	160	131	77	208
210	Parcel C: Single Family	111	DU	1,156	22	65	87	72	43	115
210	Parcel E: Single Family	134	DU	1,375	26	78	104	86	51	137
Phase I Subtotal		458	DU	4,637	88	262	351	289	171	460
Phase II - 2022										
210	Parcel A: Single Family	115	DU	1,194	23	67	90	75	44	119
210	Parcel D: Single Family	72	DU	776	15	45	60	49	29	78
210	Parcel F: Single Family	56	DU	616	12	37	49	39	23	62
Phase II Subtotal		243	DU	2,586	50	149	199	163	96	259
Total Proposed Development		701	DU	7,223	138	411	550	452	267	719

Pass-by and internal trips can account for a significant portion of site generated traffic. Internal trips use only internal roadways within the site traveling from one land use to another. Given the land uses for this development, no pass-by or internal trip reductions have been applied for the purposes of this study.

TRIP DISTRIBUTION

The trip distribution for the site was evaluated utilizing the existing turning movement counts as well evaluating the area, locations of potential patrons of the development, and the location of similar developments within the vicinity. Phase I and II of this development will be residential land uses; therefore, trips will be primarily traveling to and from work during the peak hours. **Table 2** provides a summary of the directional trip distribution to and from the development as a whole. The traffic distribution map can also be seen in the Appendix of this report as **Exhibit 5**.

TABLE 2 - DIRECTIONAL DISTRIBUTION OF SITE TRAFFIC

Direction	% of Site Traffic
East US 290	55%
West US 290	15%
North RM 12	15%
South RM 12	15%

TRIP ASSIGNMENT

New site generated trips were assigned to the roadway network in accordance with the trip distribution patterns determined in the **Table 2** above. Trips to and from the site were assigned to each study area roadway and intersection. Additionally, the proposed extension of Brookside Street was also taken into consideration when determining the appropriate trip assignments.

The existing 2015 traffic volumes were increased using a conservative growth factor determined and agreed upon during the scoping agreement dated January 22, 2016. A 10% growth rate for the first five (5) years and a 5% growth rate for following two (2) years has been assumed for the roadway network. All traffic generated by the proposed Heritage Dripping Springs development was distributed throughout the study area and added to the forecasted condition AM and PM Peak Hour volumes, which are shown in **Exhibit 6**. No background developments were provided by the City of Dripping Springs to be evaluated as background traffic.

INTERSECTION ANALYSIS

INTERSECTION OPERATIONAL ANALYSIS

Following the assignment of projected traffic volumes onto the study area roadways, a Detailed Operational Analysis was undertaken using techniques outlined in the Highway Capacity Manual 2010 (HCM 2010). For the purposes of Traffic Operational Analyses, geometric conditions within the study area were input into the microcomputer based traffic model, Synchro, Version 9.0 (by David Husch in Trafficware, Synchro 9.0). Synchro follows procedures developed in the HCM 2010 and analyzes the study area in its entirety, rather than as a series of isolated intersections and driveways. All of the various scenarios, including Existing, Forecasted, and Site+Forecasted conditions for this study area were analyzed using Synchro. Traffic signal timing plans were obtained from TxDOT and these timing plans have been included with the Synchro Outputs for each scenario within the Appendix as *Exhibit 7*.

For the evaluation of existing and proposed conditions, measures of effectiveness were utilized such as intersection LOS and delay associated with these LOS. The intersection delay is the average control delay for the signalized intersection and is calculated by taking a volumes-weighted average of all the delays occurring at the intersection. The intersection delay for an unsignalized intersection was calculated by reporting the maximum delay for the stop controlled approaches. Control delay is defined as 'the component of delay that results when a traffic control device such as signal, stop etc. causes a lane group to reduce speed or brings traffic to a complete stop'. Control delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS refers to the operational conditions within a traffic stream and their perception by motorists in terms of delay, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. There are six (6) LOS capacity conditions for each roadway facility. These are designated from "A" to "F," with "A" representing a free-flow optimal best condition and "F" representing a congested forced flow worst condition. The LOS criteria for signalized and un-signalized intersections are different and is mainly because how the drivers function at a signalized versus un-signalized intersections. The general criteria associated with each LOS reported for signalized and un-signalized intersections are presented in **Table 3** below.

TABLE 3 - LEVEL OF SERVICE MEASUREMENT AND QUALITATIVE DESCRIPTIONS

Level of Service	Control Delay for Signalized Intersection (sec/veh)	Control Delay for Unsignalized Intersection (sec/veh)	Description
A	≤ 10	≤ 10	Good progression and short cycle lengths
B	> 10 and ≤ 20	> 10 and ≤ 15	Good progression or short cycle lengths, more vehicle stops
C	> 20 and ≤ 35	> 15 and ≤ 25	Fair progression and/or longer cycle lengths, some cycle failures
D	> 35 and ≤ 55	> 25 and ≤ 35	Congestion becomes noticeable, high volume-to-capacity ratio
E	> 55 and ≤ 80	> 35 and ≤ 50	Limit of acceptable delay, poor progression, long cycles, and/or high volume
F	> 80	> 50	Unacceptable to drivers, volume greater than capacity

Table 4, shown below summarizes the operations at each intersection under the Existing, Forecasted (no-build), and Site+Forecasted (build) conditions.

TABLE 4 - SUMMARY OF INTERSECTION LEVEL OF SERVICE

Intersection	2015		2018		2018		2022		2022	
	Existing LOS		Forecasted LOS		Site + Forecasted LOS		Forecasted LOS		Site + Forecasted LOS	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 290 & RR 12	D	E	F	D	F	F	F	F	F	F
US 290 & Sportsplex Drive	B	C	D	E	F	F	F	F	F	F
RR 12 and Old Fitzhugh Road/Timberline Road	F	F	F	F	F	F	F	F	F	F
Brookside Street & RR 12	D	C	F	E	F	F	F	F	F	F
Brookside Street & N/S Extension	-	-	-	-	A	A	A	A	A	A
Brookside Street Roundabout	-	-	-	-	A	A	A	A	A	A
Baird Lane & Sportsplex Trail	-	-	-	-	D	C	F	E	F	F
US 290 & Roger Hanks Pkwy	C	D	B	B	A	A	B	E	A	E

The corresponding intersection delays associated with the levels of service have also been included in **Table 5**, below.

TABLE 5 – SUMMARY OF INTERSECTION DELAY IN SECONDS

Intersection	2015		2018		2018		2022		2022	
	Existing Delay (s)		Forecasted Delay (s)		Site + Forecasted LOS		Forecasted LOS		Site + Forecasted Delay (s)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 290 & RR 12	43.1	71.6	119.8	180.9	148.1	219.6	294.2	391.5	313.2	415.0
US 290 & Sportsplex Drive	12.2	20.4	51.5	64.9	72.2	126.2	193.6	288.3	221.5	315.3
RR 12 and Old Fitzhugh Road/Timberline Road	51.4	162.3	305.2	859.1	609.4	1515.0	1542.0	6458.0	9854.5	8099.1
Brookside Street & RR 12	26.0	23.2	50.7	44.5	636.3	450.8	1007.1	3758.3	4802.2	28643.7
Brookside Street & N/S Extension	-	-	-	-	8.9	8.9	8.9	8.9	9.5	9.7
Brookside Street Roundabout	-	-	-	-	3.7	3.6	4.3	4.1	4.3	4.1
Baird Lane & Sportsplex Trail	-	-	-	-	31.1	24.9	64.7	42.5	228.0	84.2
US 290 & Roger Hanks Pkwy	19.7	34.7	17.5	19.0	7.9	8.5	11.4	55.6	11.5	58.1

A detailed table providing the level of service and delay for each approach has been included in the Appendix of this report as **Exhibit 8**. In order to mitigate the impacts to the intersections which are failing, improvements have been evaluated for the failing intersections. Additionally, a discussion of these improvements can be found in the Findings and Recommendations. The Synchro files associated with proposed improvements has been included within the Appendix of this report as **Exhibit 9**.

Table 6, shown below summarizes the operations at each intersection under the Forecasted, Site+Forecasted, and Site+Forecasted with Improvement conditions.

TABLE 6 - SUMMARY OF INTERSECTION LEVEL OF SERVICE WITH IMPROVEMENTS

Intersection	2018		2018		2018		2022		2022	
	Forecasted		Site +		S+F w/ Imps		Site +		S+F w/ Imps	
	LOS		LOS		LOS		LOS		LOS	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 290 & RR 12	F	F	F	F	E	F	F	F	F	F
US 290 & Sportsplex Trail	D	E	F	F	D	F	F	F	F	F
RM 12 and Old Fitzhugh Road/Timberline Road	F	F	F	F	F	F	F	F	F	F
Brookside Street & RR 12	F	E	F	F	B	B	F	F	D	B
Brookside Street & N/S Extension	-	-	A	A	A	A	A	A	A	A
Brookside Street Roundabout	-	-	A	A	A	A	A	A	A	A
Baird Lane & Sportsplex Trail	-	-	D	C	D	C	F	F	F	F
US 290 & Roger Hanks Pkwy	B	B	A	A	A	A	A	E	B	D

The corresponding intersection delays associated with the levels of service have also been included in **Table 7**, below.

TABLE 7 - SUMMARY OF INTERSECTION LEVEL OF SERVICE WITH IMPROVEMENTS

Intersection	2018		2018		2018		2022		2022	
	Forecasted		Site +		S+F w/ Imps		Site +		S+F w/ Imps	
	Delay (s)		LOS		LOS		LOS		Delay (s)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 290 & RR 12	119.8	180.9	148.1	219.6	78.6	82.6	313.2	415.0	732.6	212.2
US 290 & Sportsplex Trail	51.5	64.9	72.2	126.2	53.3	89.7	221.5	315.3	173.9	226.2
RM 12 and Old Fitzhugh Road/Timberline Road	305.2	859.1	609.4	1515	609.4	1231.1	9854.5	8099.1	9854.5	8099.1
Brookside Street & RR 12	50.7	44.5	636.3	450.8	14.5	10.6	4802.2	28643.7	41.9	19.3
Brookside Street & N/S Extension	-	-	8.9	8.9	8.9	8.9	9.5	9.7	9.3	9.3
Brookside Street Roundabout	-	-	3.74	3.58	3.7	3.6	4.3	4.1	4.3	4.1
Baird Lane & Sportsplex Trail	-	-	31.1	24.9	29.6	22.9	228.0	84.2	203.6	61.3
US 290 & Roger Hanks Pkwy	17.5	19	7.9	8.5	5.3	8.5	11.5	58.1	12.3	54.5

SEGMENT CAPACITY ANALYSIS

Per scoping agreement, Segment Capacity Analysis was completed with and without future connections (to be made by others) tying into Mercer Street, Old Fitzhugh Road, and Springlake Drive for the following proposed extensions:

- Brookside Street Extension between RM 12 and US 290 (two (2) locations – at RM 12 and US 290)
- Baird Lane between Sportsplex Drive and Brookside Street
- Proposed N/S Road between Brookside Street and Springlake Drive
- Proposed N/S Road between Mercer Street and Baird Lane
- Proposed E/W Road between Old Fitzhugh Road and Baird Lane

With regards to the traffic associate with the Dripping Springs Development, the traffic generated from the development has been split between the US 290, RM 12 and the future extension of Brookside Street. The distributions are based upon an understanding of the percentage of patrons who will travel in each directions, primarily in the direction of Austin.

Following the assignment of projected traffic volumes onto the study area roadway, a detailed operational analysis was undertaken using techniques outlined in the Highway Capacity Manual 2010 (HCM 2010). Due to the limitations or the Highway Capacity Manual and modeling the capacity of signalized and unsignalized intersections, Chapter 15 (Two-Lane Highways) of the HCM 2010 was utilized to model the street segments discussed in this report that are most closely operating as a suburban section by limiting the speed limit to 45 mph which is the lowest range of acceptable speed and providing the maximum range of acceptable access points of 40 per mile. The multiple roadway extensions providing internal circulation as well as connection points to the existing roadway facilities and adjoin the proposed development is intended to be an urban street that provides for vehicular, bicycle, and pedestrian facilities. The HCS 2010 outputs on the Segment Analyses has been included for each scenario within the Appendix as *Exhibit 11*.

There are six (6) LOS capacity conditions for each roadway facility. These are designated from "A" to "F," with "A" representing a free-flow optimal best condition and "F" representing a congested forced flow worst condition. The LOS criteria for a Roadway Facility as defined by Chapter 15 of the HCM 2010 evaluates the LOS by the flow rate, average travel speed, and percent time spend flowing (Exhibit 15-2, Page 15.6 of HCM 2010).

The capacity analysis was performed by using the 2022 Site+Forecasted traffic for the PM peak hour trip generated volumes (see *Exhibit 6*). The roadway segment for all internal roadways is proposed to be a 2-lane cross-section. The volume, free flow speed, demand flow rate, density, and LOS were provided for each roadway segment with and without future connections. All the calculated values are summarized in **Table 8** and **9**, below. Please refer to *Exhibit 11* for full calculations.

TABLE 8– SUMMARY OF ROADWAY CAPACITY FOR WITHOUT CONNECTIONS (PM PEAK)

Roadway Segment	Analysis Direction Volume (vph)	Opposing Direction Volumes (vph)	Volume to Capacity Ratio (v/c)	LOS
Brookside Street from RM 12 to Roundabout	266	165	0.17	B
Brookside Street from Roundabout to US 290	90	101	0.06	A
Baird Lane between Sportsplex Drive and Brookside Street	169	92	0.11	A
Proposed N/S Road between Brookside Street and Springlake Drive	51	81	0.03	A
Proposed N/S Road between Mercer Street and Baird Lane	25	58	0.02	A
Proposed E/W Road between Old Fitzhugh Road and Baird Lane	14	11	0.01	A

TABLE 9– SUMMARY OF ROADWAY CAPACITY FOR WITH CONNECTIONS (PM PEAK)

Roadway Segment	Analysis Direction Volume (vph)	Opposing Direction Volume (vph)	Volume to Capacity Ratio (v/c)	LOS
Brookside Street from RM 12 to Roundabout	198	151	0.13	B
Brookside Street from Roundabout to US 290	93	94	0.06	A
Baird Lane between Sportsplex Drive and Brookside Street	169	40	0.11	A
Proposed N/S Road between Brookside Street and Springlake Drive	73	55	0.05	A
Proposed N/S Road between Mercer Street and Baird Lane	8	53	0.01	A
Proposed E/W Road between Old Fitzhugh Road Baird Lane	12	11	0.01	A

For each condition with and without future connections, the capacity analysis resulted in all internal roadway segments performing above an acceptable LOS. The remaining additional capacity after considering the site traffic along this new roadway is approximately 1,150 vehicles per hour prior to this roadway performing at an unacceptable level of service. It is anticipated that bypass traffic may occur to travel northbound to westbound or vice versa. Currently there are 165 and 135 vehicles during the existing AM and PM peak hour, respectively performing an eastbound left turn to travel north on RM 12. Similarly there are 225 and 111 vehicles during the existing AM and PM peak hour, respectively performing a southbound right turn to travel west on US 290. Should this bypass traffic occur with higher projected volumes, further evaluation at the internal roadway intersections along Brookside Street shall be evaluated.

FINDINGS AND RECOMMENDATIONS

Upon completing the analysis for the roadway network, it became evident that with the anticipated future growth of the area and the proposed development, improvements will be needed in order to mitigate the degradation of intersections. All existing intersections analyzed will require some sort of traffic improvement to improve the level of service. While Bury has evaluated mitigation to improve the LOS for the overall intersections, some of the proposed improvements do not benefit the proposed development but were still considered to accommodate the excessive delay experienced at these intersections. A summary of pro-rata share and estimated construction cost for each improvement are summarized within the Appendix as *Exhibit 10*.

US 290 and Brookside Street/Roger Hanks Parkway

The intersection of US 290 and Roger Hanks Parkway performs at an acceptable level of service at the 2015 Existing and 2018 Forecasted condition and continues to perform at an acceptable level of service through the Phase I and II Site + Forecasted condition. It was assumed that when the Brookside extension to US 290 occurs, a signal will be installed by others and has been included within the 2018 Forecasted condition and subsequent phasing.

US 290 and RM 12

The intersection of US 290 and RM 12 performs at an unacceptable level of service E at the 2015 Existing condition and continues to degrade to a level of service F at the 2018 Forecasted AM and PM peak hour condition and continues to degrade further with the Phase I and Phase II Site + Forecasted conditions. In order to mitigate the failing condition of this intersection, dual left turn bays shall be constructed for all approaches. While the north and south bound left turn bays are utilized by the development, the eastbound and westbound left turn bays will not be utilized by the development. In addition, the split phase signal timing may be removed to provide a protected left turn for the major and minor and longer shared green time for thru movements. The pro-rata for the northbound and southbound dual left turns and signal modification is calculated to be 15%. The pro-rata for the eastbound and westbound dual left turn is calculated to be 0%.

RM 12 and Brookside Street

RM 12 and Brookside Street is currently a T-intersection with stop controlled on Brookside Street. The intersection of RM 12 and Brookside Street performs at an acceptable level of service at the 2015 Existing condition but degrades to a level of service F and E at the 2018 Forecasted AM and PM peak hour condition, respectively and continues to degrade with the 2018 Site + Forecasted conditions and subsequent phasing. In order to mitigate the failing condition of this intersection, signalization is recommended at the 2018 Site + Forecasted condition. It is also recommended to provide left turn bays at the northbound, southbound, and eastbound approaches and a south bound right turn deceleration lane. The pro-rata for the eastbound, northbound, and southbound left turn bay is calculated to be 100%. The pro-rata share for the signalization is calculated to be 100%.

RM 12 and Old Fitzhugh Road/Timberline Road

RM 12 and Brookside Street is currently a two-way-stop-controlled (TWSC) intersection with stop controlled along Old Fitzhugh Road and Timberline Road. The intersection of RM 12 and Brookside Street performs at an unacceptable level of service at the 2015 Existing condition and continues to degrade with subsequent phasing. Further discussions with the City of Dripping Springs are currently in progress to determine the future roadway alignment along Old Fitzhugh Road which will impact the performance of this intersection.

Sportsplex Drive and Baird Lane

Sportsplex Drive and Baird Lane is currently a two-way stop controlled (TWSC) intersection with stop controlled on Baird Lane. Sportsplex Drive currently serves as one of the primary access points for Dripping Springs High School. The intersection of Sportsplex Drive and Baird Lane performs at an acceptable level of service at the 2018 Site+Forecasted but degrades to a LOS F and E at the 2022 Forecasted AM and PM peak hour condition, respectively. It is recommended to provide an eastbound left turn bay, westbound right turn bay, and southbound right turn bay. These improvements will remove turning vehicles from the travel path and promote progression along the free flowing movements. The pro-rata for the eastbound and westbound left turn bay is calculated to be 100%. It is assumed that the southbound right turn bay will be built out with the reconstruction of Baird Lane.

US 290 and Sportsplex Drive

The intersection of US 290 and Sportsplex Drive performs at an acceptable level of service at the 2015 Existing condition but degrades to a level of service E at the 2018 Forecasted PM peak hour condition and continues for degrade with the 2018 and 2022 Site + Forecasted conditions. In order to mitigate the failing condition of this intersection, dual left turn bays is recommended to be constructed for the southbound approach with the final roadway geometry on the southbound approach to be a left, left, and shared thru-right. The pro-rata for the southbound dual left turn and signal modification is calculated to be 40%.

Internal Intersections/Driveways

The following recommendations are recommended to be taken into consideration during the design of the internal roadways and intersections:

Brookside Street and N/S Residential Street

- Southbound left turn bay
- Westbound right turn bay

Parcel B/C Brookside Driveway*

- Westbound left turn bay
- Westbound right turn bay

Parcel C Brookside Eastern Driveway*

- Westbound left turn bay

*Parcels locations have been noted in the conceptual site plan in *Exhibit 2*.

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Appendix E: Background Projects

Big Sky Ranch

TRAFFIC IMPACT ANALYSIS

August 2018



Bethany James
8-15-2018

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INTRODUCTION

The Big Sky Ranch development is proposed to be located in the northeast quadrant of the intersection of US 290 with Ranch Road 12 (east of the existing Founders Memorial Park) within the extraterritorial jurisdiction near Dripping Springs, Texas. The development is proposed to be comprised of single family homes.

PURPOSE

The purpose of this study is to evaluate the traffic impacts of the site on the adjacent roadway network. This Traffic Impact Analysis (TIA) includes an evaluation of existing conditions (2018), future build-out conditions (2025), and a planning level analysis of the future build-out conditions of the surrounding area (2028). Based on analysis results, recommendations will be identified to ensure that the intersections within the study area operate at an adequate level of service (LOS) and that future planned roadways are constructed to provide adequate capacity for the anticipated traffic demand in the area.

METHODOLOGY

The following information provides a summary of the technical analysis used for this TIA. The methodology is based upon a thorough analysis of existing and projected site generated traffic on area roadways. The study methodology is as follows:

1. Conduct turning movement counts during the weekday AM (7-9) and PM (3:30-6) peak periods at the following intersections:
 - a. US 290 and Ranch Road 12
 - b. US 290 and Rob Shelton Boulevard
 - c. Ranch Road 12 and Mercer Street
 - d. Founders Park Road and Ranch Road 12
 - e. Ranch Road 12 and Springlake Drive/Goodnight Trail
2. Inventory the study intersections and note their respective intersection geometry, number of travel lanes, pavement markings, and intersection traffic control.
3. Evaluate AM and PM peak LOS (based on 2010 Highway Capacity Manual) at all intersections identified in Task 1.
4. Determine background traffic within the study area using existing volume counts and traffic growth rates determined from historical traffic counts obtained from the City and/or TxDOT.
5. Calculate the site-generated traffic for the proposed development using ITE Trip Generation Rates from the 9th Edition.
6. Determine trip distribution percentages for site generated traffic based on existing count data, site access locations and roadway geometries.
7. Assign total (background + site) traffic onto the roadway network located within the study area based on trip distribution percentages determined in Task 6.
8. Perform intersection analyses for the study peak period to determine intersection level-of-service (LOS) for the intersections identified in Task 1 and future intersections.
9. Analyze the results of Task 8 to determine the impacts of the development and accompanying traffic on surrounding study area roadways. Identify appropriate mitigation measures (geometric and/or operational improvements), which would be required in order to accommodate site generated traffic.
10. Determine probable cost of anticipated improvements from Task 9.
11. Analyze the future roadway demand related to planned background projects in the study area.

AREA CONDITIONS

The Big Sky Ranch development is proposed to be built in the northeast quadrant of the intersection of US 290 with Ranch Road 12 (east of the existing Founders Memorial Park) within the extraterritorial jurisdiction near Dripping Springs, Texas. The development is anticipated to be completed by 2025. The location of the proposed development with respect to the area roadway network is shown in **Figure 1**, and the current proposed site plan for the development is shown in **Figure 2**. The proposed land uses are shown in **Table 1**.

Table 1. Proposed Land Use and Density

ITE Code	Description	Quantity
210	Single Family Detached Housing	772 DU

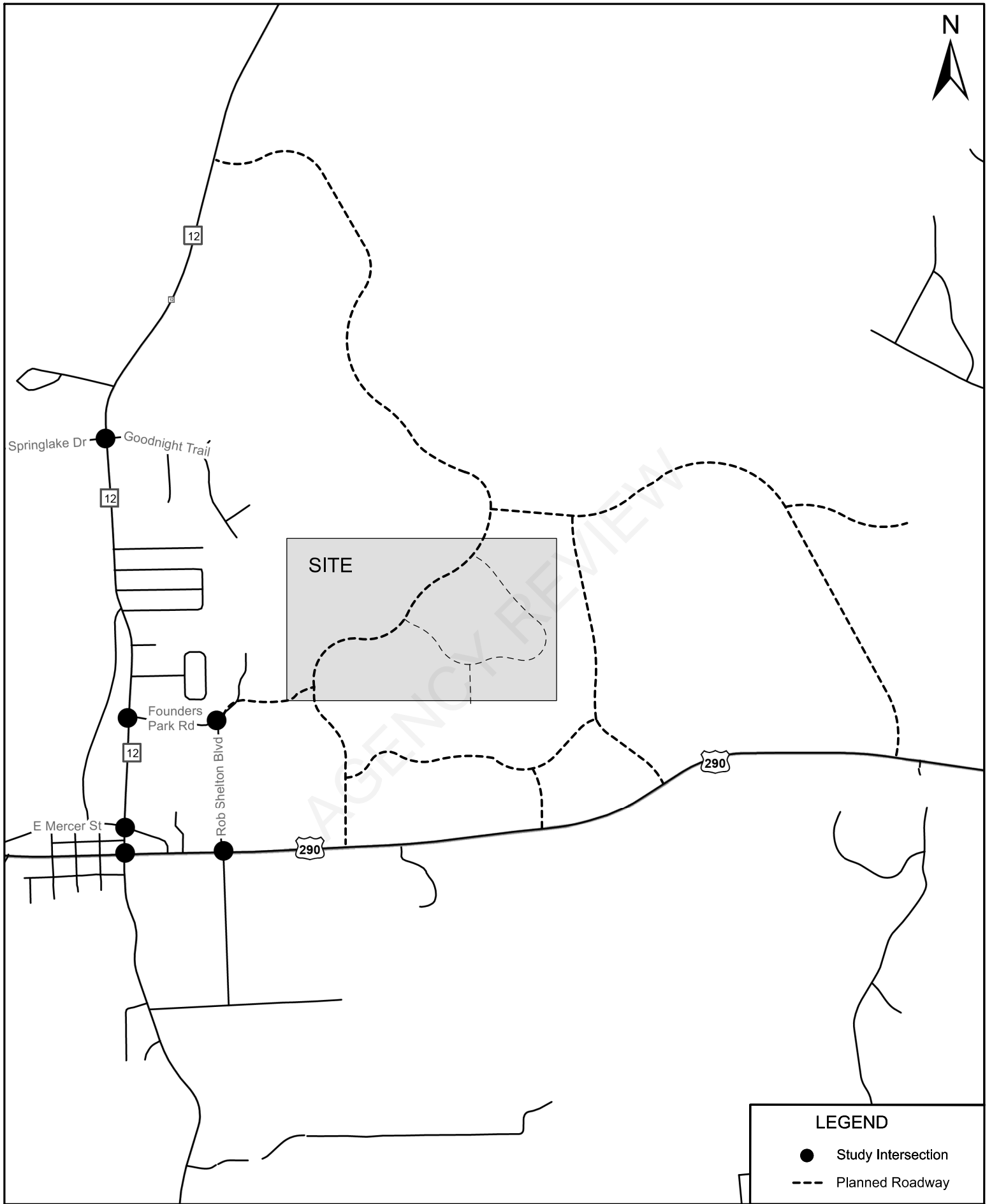
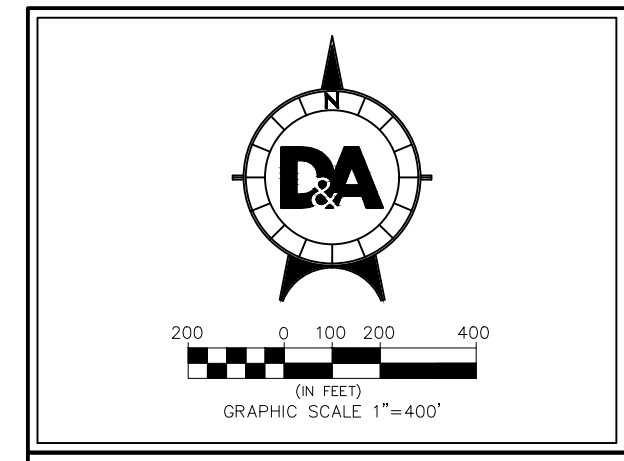
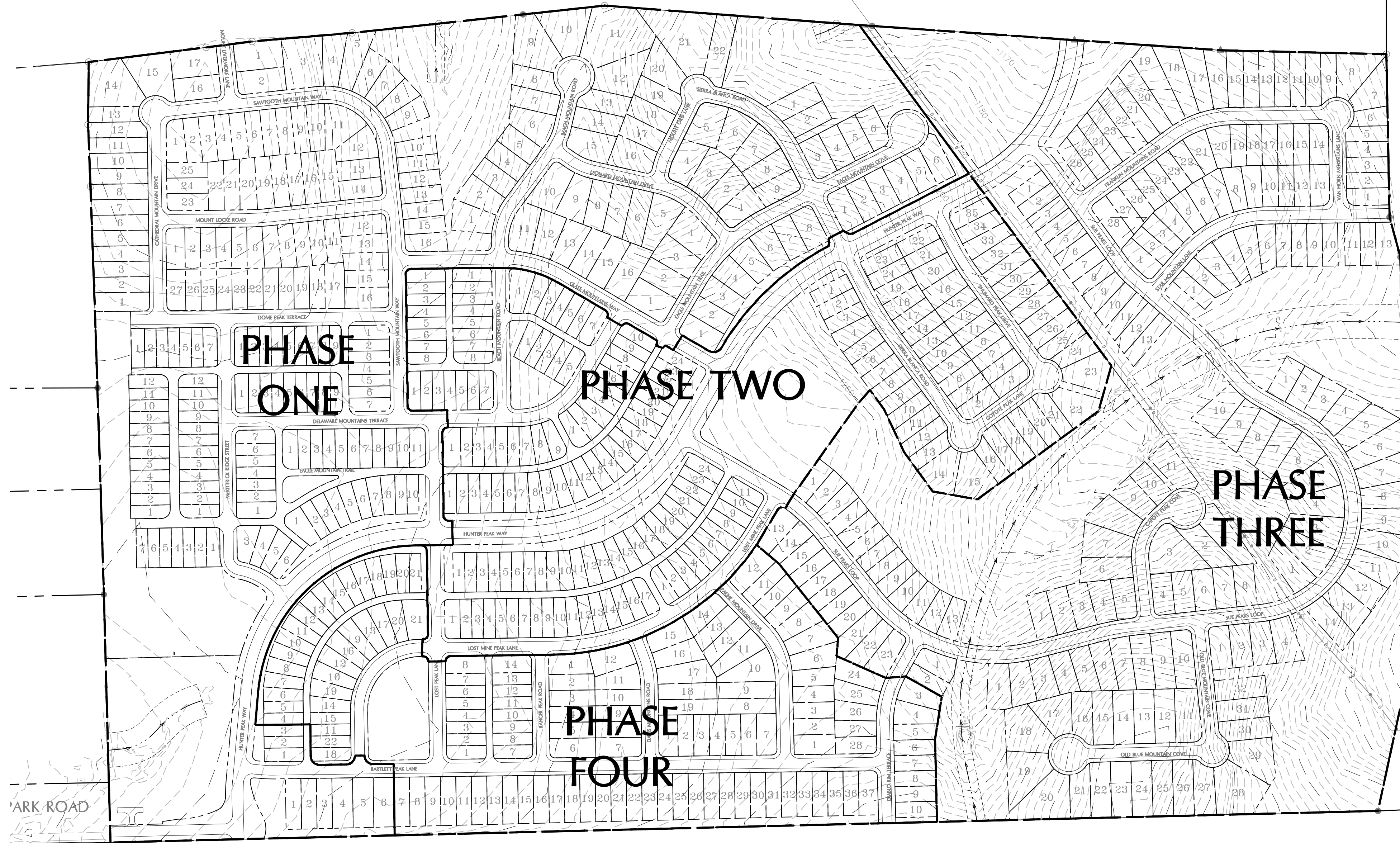


Figure 1: Study Area



LEGEND

- SUBDIVISION BOUNDARY
- LOT LINES
- EASEMENTS
- PROPOSED RIGHT OF WAY
- PROPOSED FACE OF CURB
- PROPOSED SIDEWALK



RESIDENTIAL LOTS BY PHASE	
PHASE ONE	
RESIDENTIAL LOTS A (34' X 115')	98
RESIDENTIAL LOTS B (45' X 120')	88
RESIDENTIAL LOTS C (60' X 120')	70
TOTAL PHASE ONE	256
PHASE TWO	
RESIDENTIAL LOTS A (34' X 115')	130
RESIDENTIAL LOTS B (45' X 120')	58
RESIDENTIAL LOTS C (60' X 120')	0
TOTAL PHASE TWO	188
PHASE THREE	
RESIDENTIAL LOTS A (34' X 115')	0
RESIDENTIAL LOTS B (45' X 120')	106
RESIDENTIAL LOTS C (60' X 120')	79
TOTAL PHASE THREE	185
PHASE FOUR	
RESIDENTIAL LOTS A (34' X 115')	48
RESIDENTIAL LOTS B (45' X 120')	87
RESIDENTIAL LOTS C (60' X 120')	0
TOTAL PHASE FOUR	135
TOTAL	
RESIDENTIAL LOTS A (34' X 115')	276
RESIDENTIAL LOTS B (45' X 120')	339
RESIDENTIAL LOTS C (60' X 120')	149
TOTAL RESIDENTIAL LOTS	764

D&A DOUCET & ASSOCIATES
 Civil Engineering - Easements - Surveying/Mapping
 7401 B. Highway 71 W, Suite 160
 Austin, Texas 78735, Phone: (512)-583-2600
 www.doucetengineers.com
 Firm Registration Number: 3937

PHASING PLAN

**BIG SKY RANCH
 PRELIMINARY PLAT
 DRIPPINGS SPRINGS, TX**

EXHIBIT

Scale: AS SHOWN
 Designed: JP
 Drawn: AD
 Reviewed: JP
 Date: 8/6/2018

SHEET

1

OF 1

Project No:
1691-002

Figure 2: Site Plan

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 User: @ANISTER Aug. 06, 18 - 15:21
 Last Modified: Aug. 06, 18 - 15:29:34
 Plot Date/Time: Aug. 06, 18 - 15:29:34

STUDY AREA ROADWAY NETWORK

EXISTING THOROUGHFARE SYSTEM

The following provides a description of the major transportation facilities within the study area:

US 290

US 290 is an east/west roadway that runs through the state of Texas. Within the study area, US 290 is defined as a principal arterial with two lanes in each direction, a two-way left-turn lane, and a posted speed limit of 45 mph. For the purposes of this study, the cross section is expected to remain unchanged for the foreseeable future.

Rob Shelton Boulevard

Rob Shelton Boulevard is a north/south roadway that begins at Sports Park road and terminates at Founders Park Road. Rob Shelton Boulevard is an undivided roadway in the northern section and a two-way divided roadway in the southern section with a posted speed of 25 mph. For the purposes of this study, the cross section is expected to remain unchanged for the foreseeable future.

Ranch Road 12

Ranch Road 12 is a north/south roadway that begins at I-35 and terminates at Hamilton Pool Road and runs through Dripping Springs, Texas. South of US 290, Ranch Road 12 is a principal arterial, and north of US 290 it is a minor arterial. Within the study area, Ranch Road 12 is a two-lane roadway with a posted speed limit of 45 mph through the majority of the study area and transitions to 55 mph 755 feet south of Goodnight Trail. For the purposes of this study, the cross section is expected to remain unchanged for the foreseeable future.

Mercer Road

Mercer Road is a local road within Dripping Springs that serves commercial land uses, beginning and terminating at US 290. Mercer Road is a two-lane roadway with a posted speed limit of 30 mph. For the purposes of this study, the cross section is expected to remain unchanged for the foreseeable future.

Founders Park Road

Founders Park Road is a local road within Dripping Springs that serves a small residential community and a recreational land use, beginning at Ranch Road 12 and terminating at Founders Park. Founders Park Road is a two-lane roadway with a posted speed limit of 20 mph. The roadway is anticipated to be extended to serve as an access point to the Big Sky Ranch development.

Springlake Drive/Goodnight Trail

Springlake Drive and Goodnight Trail are local roads within Dripping Springs that serve residential communities. They are both two-lane roadways with a posted speed limit of 35 mph. West of US 290 the roadway is called Springlake Drive and east of US 290 the roadway is called Goodnight Trail. For the purposes of this study, the cross sections are expected to remain unchanged for the foreseeable future.

EXISTING INTERSECTIONS

The existing roadway network within the study area includes three un-signalized intersections and three signalized intersections. AM and PM peak period (7-9 AM and 3:30-6 PM) turning movement counts were obtained in February 2018, at the following intersections and are included in **Appendix A**.

Ranch Road 12 and Springlake Drive/Goodnight Trail

This four-legged intersection is unsignalized. Springlake Drive and Goodnight Trail are stop-controlled, while the Ranch Road 12 is uncontrolled. The northbound approach has a two-way left-turn lane and a shared through-right lane. The southbound approach has a left-turn bay and a shared through-right lane. The eastbound and westbound approaches each have one shared lane for all movements.

Ranch Road 12 and Founders Park Road

This three-legged intersection is unsignalized. Founders Park road is stop controlled, while Ranch Road 12 is uncontrolled. All approaches have one shared lane for all movements.

Ranch Road 12 and Mercer Road

This four-legged intersection is signalized. The eastbound approach has a shared left-through lane and a right-turn bay. All other approaches have one shared lane for all movements.

Ranch Road 12 and US 290

This four-legged intersection is signalized. The northbound approach has a left-turn bay, a shared left-through lane, and a right-turn bay. The southbound approach has a left-turn bay, a shared left-through, and a right-turn bay. The eastbound and westbound approaches each have a left-turn bay (within a two-way left-turn lane), a through lane, and a shared through-right lane.

Founders Park Road and Rob Shelton Boulevard

This three-legged intersection is unsignalized. The northbound approach on Rob Shelton Boulevard is stop-controlled, while Founders Park Road is uncontrolled. All approaches have one shared lane for all movements.

Rob Shelton Boulevard and US 290

This four-legged intersection is signalized. The northbound approach has a left-turn bay and a shared through-right lane. The southbound approach has a left-turn bay and a shared through-right lane. The eastbound and westbound approaches each have a left-turn bay (within a two-way left-turn lane), a through lane, and a shared through-right lane.

LEVEL OF SERVICE

The 2010 HCM⁽²⁾ uses LOS as the method by which the quality of traffic flow is described. LOS describes operational conditions in six levels based upon speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. These six levels are given the letters ‘A’ through ‘F’ and are given different descriptions and defining criteria depending on the roadway element analyzed.

LOS criteria for traffic signals are based on the average control delay per vehicle. Control delay includes deceleration and acceleration delay, queue move-up time, and stopped delay. These criteria are shown in **Table 2**. Thus, if the average control delay for vehicles at an intersection is fifty-five seconds or less, the intersection is defined as operating at a LOS ‘D’ or better. Control delay of fifty-five through eighty seconds represents LOS ‘E’, and values greater than eighty seconds define LOS ‘F’. For signalized intersection operation, LOS ‘A’ represents very low delay; most vehicles do not stop at all. With LOS ‘B’, more vehicles stop than LOS ‘A’, increasing the average delay. Under LOS ‘C’, the number of vehicles stopping is significant; however, many still pass through the intersection without stopping. LOS ‘D’ describes conditions where congestion is readily apparent with many vehicles stopping and individual cycle failures are noticeable. LOS ‘E’ generally describes operations with poor progression, long cycle lengths and frequent cycle failures. LOS ‘F’ describes unacceptable operations which include many cycle failures caused by arrival flow rates exceeding intersection capacity.

Stop controlled intersections are analyzed in a similar manner; however, LOS is based on total delay per vehicle. The values that define LOS for stop controlled intersections are more restrictive than those for signalized intersections. Total delay includes both stopped delay and time spent in the queue waiting to enter the intersection. Two-way stop controlled intersections with the minor street average total delay greater than thirty-five seconds identifies LOS ‘E’ or worse.

Table 2: LOS Criteria for Signalized and Stop-Controlled Intersections

LOS	Average Control Delay – Signalized Intersections (sec/veh)	Average Total Delay – Stop Controlled Intersections (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

For this study, the criterion for minimum acceptable LOS for future conditions is a LOS ‘D’ or better.

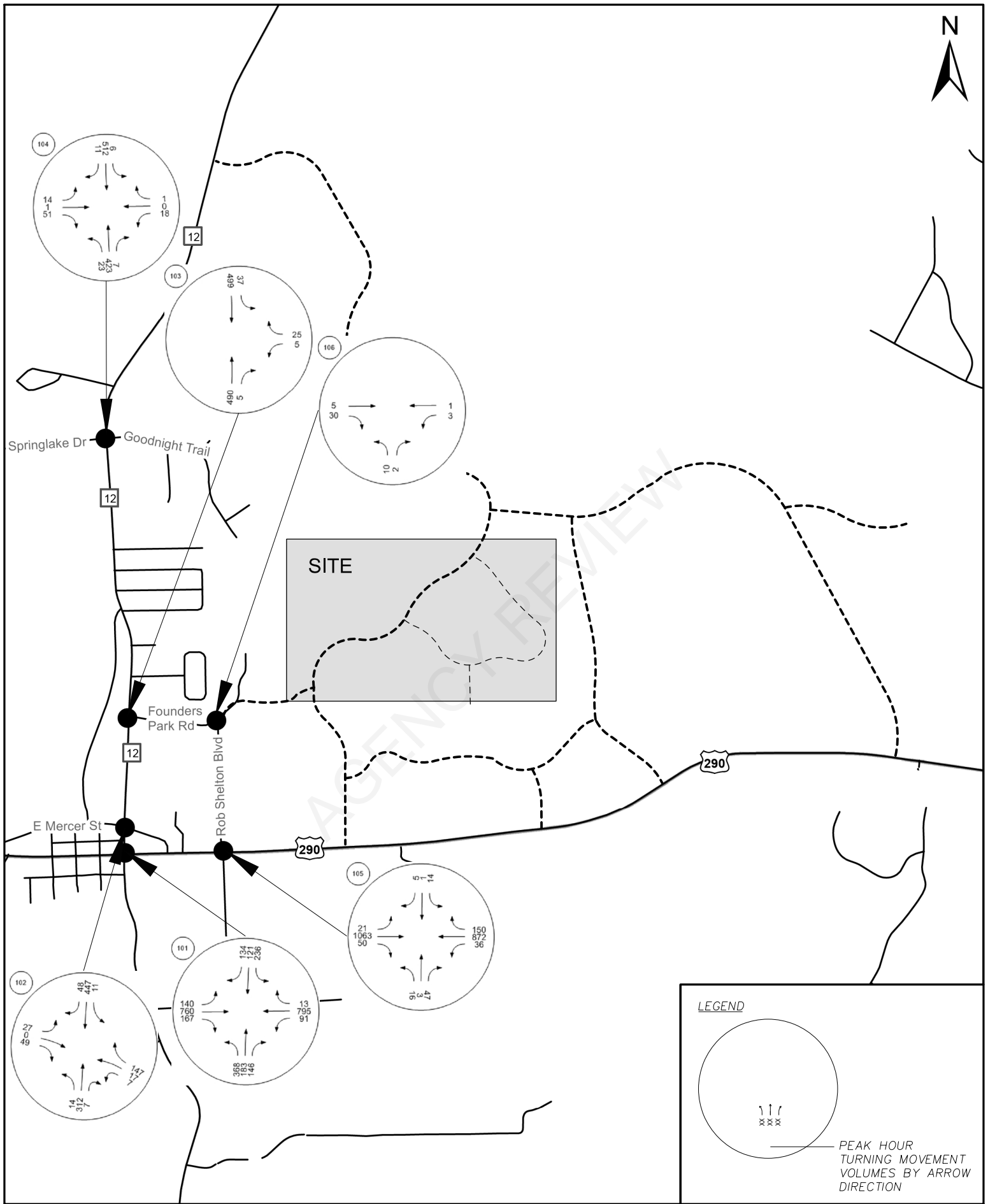


Figure 3: AM Existing Traffic (2018)

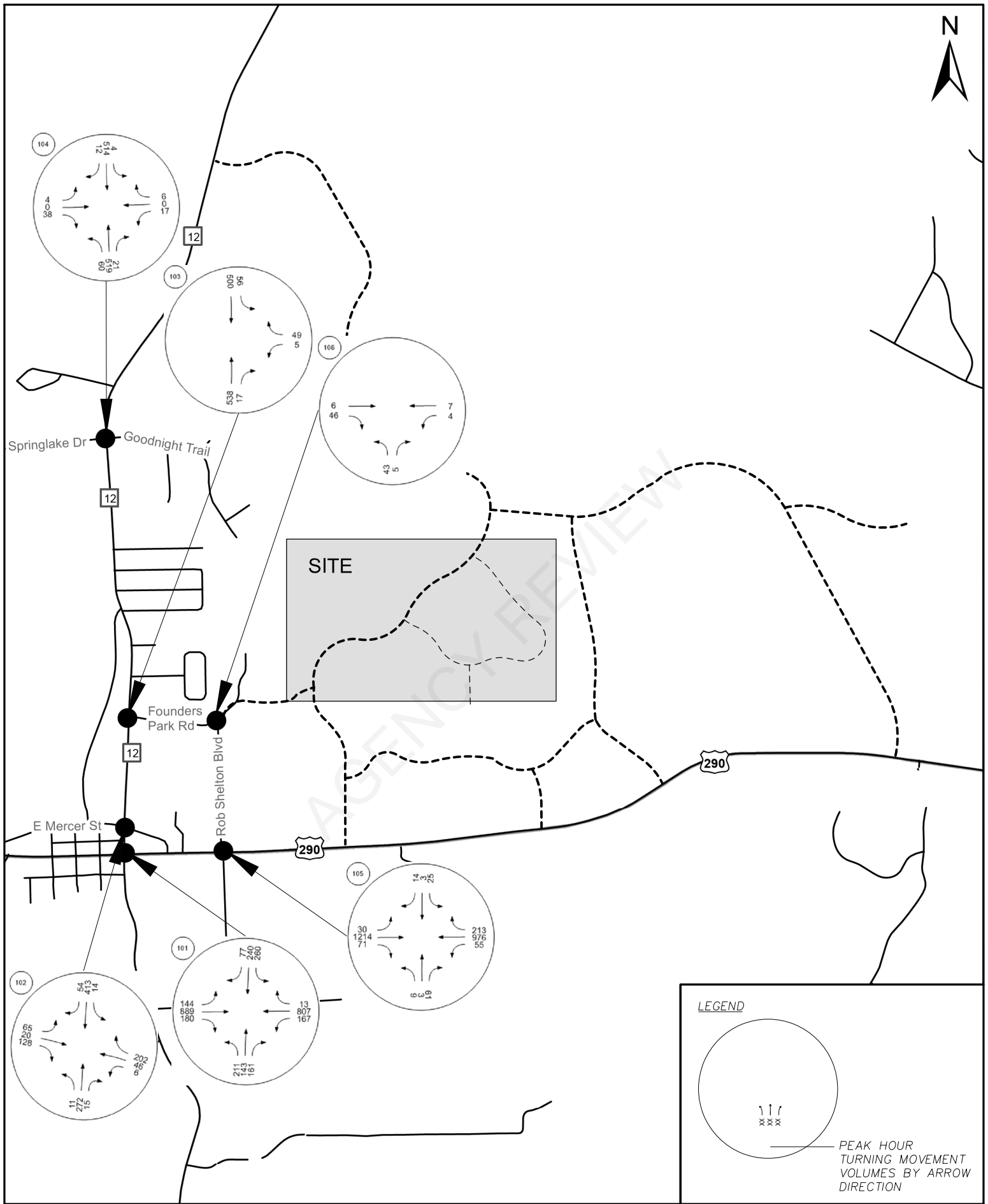


Figure 4: PM Existing Traffic (2018)

ANALYSIS OF FUTURE CONDITIONS

A technical approach for estimating future travel demand was utilized in evaluating the roadway system in and around the proposed development. Information used to develop the projection of future traffic for this area is documented in the following sections of the report.

BACKGROUND TRAFFIC

Existing and projected traffic volumes using the roadway system without the proposed project are commonly called background traffic. For the proposed Big Sky Ranch development, background traffic was based upon traffic counts collected in February of 2018. A 3% growth rate was then applied to existing traffic. The growth rate was determined using Texas Department of Transportation count maps from 2011 to 2016. The anticipated build out year is 2025. Thus, existing traffic was grown over a seven-year period.

When computing background traffic, consideration must be taken to include projected traffic from sites that have not yet been completed but are estimated to be completed by the build-out date. The City of Dripping Springs has identified seven background projects located north of US 290 between Ranch Road 12 and East Creek Drive to be included in the background analysis. A map detailing the background project locations can be found in **Appendix I**. It was determined by the City of Dripping Springs that the following projects be included:

- Cynosure Ranch: a residential development consisting of single family housing. This development is expected to be complete by 2028, with development anticipated to occur starting in 2022; therefore, the traffic anticipated to be generated from the site will be included in background and future condition (2025 and 2028) scenarios.
- Cannon Tract: a mixed-use development consisting of commercial property, single family housing, and multi-family housing. This development is expected to be complete by 2026, with development anticipated to occur starting in 2022; therefore, the traffic anticipated to be generated from the site will be included in background and future condition (2025 and 2028) scenarios.
- Blue Blazes: a mixed-use development consisting of commercial property and single family housing. This development is expected to be complete by 2026, with development anticipated to occur in 2026; therefore, the traffic anticipated to be generated from the site will be included in the future year planning analysis (2028) conditions only.
- Bordie Tract: a mixed-use development consisting of commercial property, single family housing, and multi-family housing. This development is expected to be complete by 2028 with development anticipated to occur starting in 2026; therefore, the traffic anticipated to be generated from the site will be included in the future year planning analysis (2028) conditions only.
- Legacy Trails: a residential development consisting of single family housing. This development is already partially built out and is expected to be complete by 2019; therefore, the traffic anticipated to be generated from the unbuilt portion of the site will be included in background and future condition (2025 and 2028) scenarios.
- Founders Ridge: a residential development consisting of single family housing. This development is already partially built out and is expected to be complete by 2023; therefore, the traffic anticipated to be generated from the unbuilt portion of the site will be included in background and future condition (2025 and 2028) scenarios.
- Headwaters: a residential development consisting of single family housing. This development is expected to be complete by 2025; therefore, the traffic anticipated to be generated from the site will be included in background and future condition (2025 and 2028) scenarios.

A summary of the build-out timelines and trips generated by the background projects can be found in **Appendix J**. Peak hour turning volumes for the background project traffic can be found in **Appendix K**.

SITE TRAFFIC

Entering and exiting volumes were calculated using information from ITE’s Trip Generation Manual, 10th Edition⁽¹⁾ and are shown in **Table 4**. The trips shown in **Table 4** are the unadjusted generated trips for the attributed site developments for the AM and PM peak hour(s).

Table 4: Unadjusted ITE Trip Generation

ITE Code	Description	Quantity	ADT	AM Peak		PM Peak	
				Enter	Exit	Enter	Exit
210	Single Family Detached Housing	772 DU	7,914	144	436	491	288
		Total	7,914	144	436	491	288

Trips generated by the site are different from total site trips that add to the adjacent roadway. Pass-by and internal capture trips can account for a significant portion of a site’s generated traffic and are removed from site traffic per ITE methodology. Internal capture trips are trips that use only internal roadways traveling from one land use to another within the site. Pass-by trips are attracted to the site from traffic passing on the adjacent street. Primary trips, made for the specific purpose of visiting the development, are considered new traffic added to the street system. The net primary trips are determined by subtracting internal and pass-by trips from unadjusted trips for each land use. Because this development is completely residential, there are no anticipated internal capture or pass-by trips associated directly with the Big Sky Ranch development. However, internal capture trips between Big Sky Ranch and adjacent future commercial land uses planned within the analyzed background projects are expected. **Table 5** shows these internal capture trips anticipated to travel between the proposed Big Sky Ranch development and the adjacent background project commercial land uses. Per ITE methodology 8% of trips were assumed to be internal trips to and from the nearby background project. These internal trips were removed from the unadjusted trips shown in **Table 4** to analyze the proposed study intersections.

Table 5: Internal Capture Trips

ITE Code	Description	Quantity	ADT	AM Peak		PM Peak	
				Enter	Exit	Enter	Exit
210	Single Family Detached Housing	772	535	0	0	34	22
		Total		0	0	34	22

Table 6 shows the adjusted trips, or primary trips, for the full build-out of the development. The reported volumes are for the peak generation during the peak hour of the adjacent street.

Table 6: Adjusted ITE Trip Generation

ITE Code	Description	Quantity	ADT	AM Peak		PM Peak	
				Enter	Exit	Enter	Exit
210	Single Family Detached Housing	772	7,379	144	436	457	266
		Total	7,379	144	436	457	266

TRIP DISTRIBUTION

Trip distribution takes into account where vehicles generated by the site are going to or coming from based on the roadway network. As primary site trips are those trips which leave an origin, travel to the site, and then return to the origin, site trips were distributed based on probable origins of the site trips. For this development, the distribution percentages were estimated based on existing count data, land use, and roadway geometries. Next, future site traffic was distributed using these percentages. The trip distribution percentages shown in **Figure 5** were applied to the site generated traffic for the phases studied.

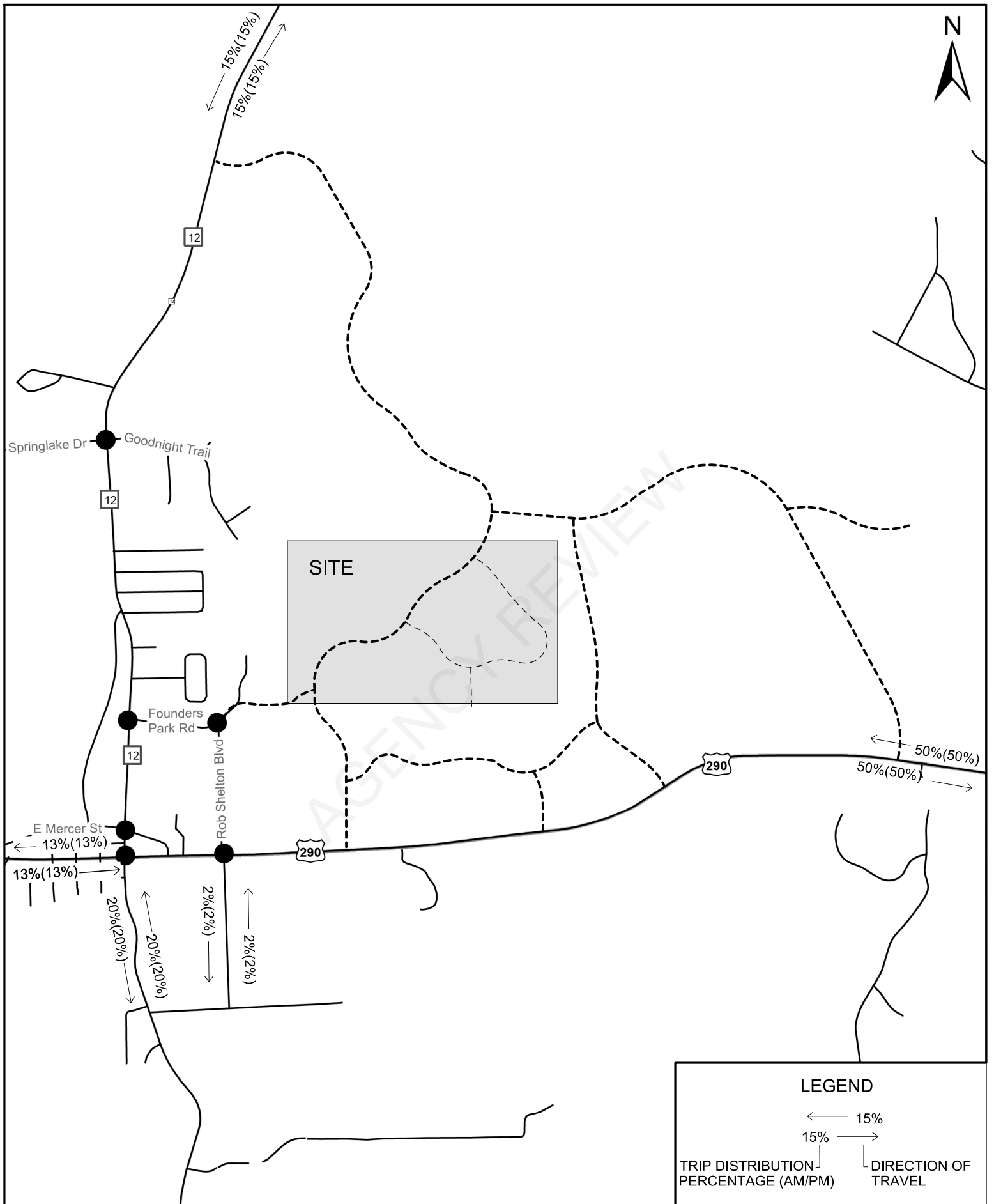


Figure 5: Trip Distribution

SITE ACCESS

Primary access for the development will be from a proposed roadway that will extend as the east leg of the Founders Park Road with Rob Shelton Boulevard intersection, providing access to Ranch Road 12 via Founders Park Road and to US 290 via Rob Shelton Boulevard. Big Sky Ranch is also anticipated to take access from a proposed north/south roadway that is planned to run through the Cannon Tract to US 290. Because it is unknown when this proposed north/south roadway through the Cannon tract will be build out, two access point scenarios were analyzed:

- **Access Scenario 1.** Access for the development is provided via Founders Park Road to Ranch Road 12 and via Rob Shelton Boulevard to US 290
- **Access Scenario 2.** Access for the development is provided via Founders Park Road to Ranch Road 12, via Rob Shelton Boulevard to US 290, as well as via the proposed north/south street which runs through the Cannon Tract to US 290.

Additionally, eight internal access points were analyzed to project the need for turn bays.

Once all background projects are built-out, access for the Big Sky Ranch development will also be provided via the planned roadways through the analyzed background projects as shown in **Figure 1**. However, these access points are not expected to come online until after the build-out of Big Sky Ranch, serving to alleviate the access points analyzed in this study. As such, the analysis of access points presented in this study represent the worst-case scenario for traffic operations, and recommended mitigation measures should be sufficient for future year scenarios once these other roadways are constructed and provide access to Big Sky Ranch.

PROJECTED CONDITIONS

The projected background traffic was combined with the proposed site generated traffic to perform the intersection analyses for the build-out year conditions (2025). Intersection analyses have been performed based on HCM⁽²⁾ Chapter 18 and Chapter 19 procedures using Synchro version 10.

Access Scenario 1 (2025) – Founders Park Road and Rob Shelton Boulevard

In this scenario, access for the development is assumed to be provided via Founders Park Road to Ranch Road 12 and via Rob Shelton Boulevard to US 290. Projected peak hour turning volumes for Background, Site, and Background + Site are illustrated in **Figure 6** through **Figure 11**. The results from this analysis are presented in **Table 7**. Analysis worksheets are provided in **Appendix C** and **Appendix E**.

Table 7: Scenario 1 Build-Out (2025) Projected Levels of Service

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements	
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
101	US 290 and Ranch Road 12	Signalized	Intersection	-	LOS	F	F	F	F	D	D
					Delay (s)	87.7	152.1	97.9	164.5	40.3	54.8
102	Ranch Road 12 and Mercer Street	Signalized	Intersection	-	LOS	B	C	C	C	-	-
					Delay (s)	18.7	21.8	22.5	23.8	-	-

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements	
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
103	Founders Park Road and Ranch Road 12	Un-signalized/ Signalized	Intersection	-	LOS	E	F	F	D	C	B
					Delay (s)	1.1	1.3	122	35.7	30.2	19.8
			Westbound	Left/Right	LOS	D	C	F	F	-	-
					Delay (s)	29.2	22.4	1006	391.3	-	-
			Northbound	Through/ Right	LOS	A	A	A	A	-	-
					Delay(s)	0.0	0.0	0.0	0.0	-	-
			Southbound	Left/Through	LOS	A	A	B	B	-	-
					Delay(s)	10.1	10.0	10.4	11.0	-	-
104	Ranch Road 12 and Springlake Drive/Goodnight Trail	Un-signalized/ Signalized	Intersection	-	LOS	F	C	F	B	B	B
					Delay(s)	87.3	10.1	109.7	13	18.8	11.4
			Eastbound	Left/Through/ Right	LOS	F	C	F	C	-	-
					Delay (s)	84.4	20.6	117.7	22.4	-	-
			Westbound	Left/Through/ Right	LOS	F	F	F	F	-	-
					Delay (s)	1255.5	209.5	1658.7	291.3	-	-
			Northbound	Left	LOS	B	A	B	A	-	-
					Delay(s)	10.2	9.5	10.3	9.7	-	-
				Through/ Right	LOS	A	A	A	A	-	-
					Delay(s)	0.0	0.0	0.0	0.0	-	-
			Southbound	Left	LOS	A	A	A	A	-	-
					Delay(s)	9.6	9.5	10.0	9.6	-	-
Through/ Right	LOS	A		A	A	A	-	-			
	Delay(s)	0.0		0.0	0.0	0.0	-	-			
105	US 290 and Rob Shelton Boulevard	Signalized	Intersection	-	LOS	C	D	D	E	C	D
					Delay (s)	21.9	46.1	51.7	66.9	27.7	35.6
106	Rob Shelton Boulevard and Founders Park Road	Un-signalized	Intersection (stop)	-	LOS	A	A	A	B	-	-
					Delay(s)	3.4	5.3	5.6	19.1	-	-
			Intersection (roundabout)	-	LOS	-	-	A	A	-	-
					Delay(s)	-	-	7.3	7.8	-	-
			Eastbound	Left/Through/ Right	LOS	A	A	A	A	-	-
					Delay (s)	7.2	7.2	7.6	7.5	-	-
			Westbound	Left/Through/ Right	LOS	A	A	A	A	-	-
					Delay(s)	0.0	0.0	8.1	8.4	-	-
Northbound	Left/Through/ Right	LOS	A	A	B	E	-	-			
		Delay(s)	8.9	9.5	11.8	40.7	-	-			
Southbound	Left/Through/ Right	LOS	A	A	C	B	-	-			
		Delay (s)	9.2	8.9	20.7	13.7	-	-			
201	Founders Park Road and Internal Site Roadway/Driveway 1	Un-signalized	Intersection	-	LOS	-	-	-	-	-	-
					Delay(s)	-	-	-	-	-	-
			Eastbound	Left/Through	LOS	-	-	-	-	-	-
					Delay(s)	-	-	-	-	-	-
			Westbound	Through/Right	LOS	-	-	-	-	-	-
					Delay(s)	-	-	-	-	-	-
			Southwest bound	Left/Through	LOS	-	-	-	-	-	-
					Delay(s)	-	-	-	-	-	-

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements	
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
202	Driveway 2 & Proposed Roadway	Un-signalized	Intersection	-	LOS	-	-	A	A	-	-
					Delay(s)	-	-	1.2	1.1	-	-
			Southeast bound	Left/Right	LOS	-	-	B	A	-	-
					Delay (s)	-	-	10.9	9.7	-	-
			Northeast bound	Left/Right	LOS	-	-	A	A	-	-
					Delay(s)	-	-	8.1	7.8	-	-
Southwest bound	Through/right	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	0.0	0.0	-	-			
203	Driveway 3 & Proposed Roadway	Un-signalized	Intersection	-	LOS	-	-	A	A	-	-
					Delay (s)	-	-	3.0	2.4	-	-
			Southeast bound	Left/Through/Right	LOS	-	-	B	A	-	-
					Delay (s)	-	-	10.2	9.3	-	-
			Northwest bound	Left/Through/Right	LOS	-	-	B	C	-	-
					Delay (s)	-	-	13.5	15.8	-	-
Northeast bound	Left/Through/Right	LOS	-	-	A	A	-	-			
		Delay (s)	-	-	7.8	7.7	-	-			
Southwest bound	Left/Through/Right	LOS	-	-	A	A	-	-			
		Delay (s)	-	-	0.0	0.0	-	-			
204	Driveway 4 & Proposed Roadway	Un-signalized	Intersection	-	LOS	-	-	A	A	-	-
					Delay(s)	-	-	2.9	1.5	-	-
			Northwest bound	Left/Right	LOS	-	-	B	B	-	-
					Delay(s)	-	-	10.5	10.8	-	-
			Northeast bound	Through/Right	LOS	-	-	A	A	-	-
					Delay(s)	-	-	0.0	0.0	-	-
Southwest bound	Left/Through	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	0.0	0.0	-	-			
205	Driveway 5 & Proposed Roadway	Un-signalized	Intersection	-	LOS	-	-	A	A	-	-
					Delay (s)	-	-	1.3	1.2	-	-
			Southeast bound	Left/Through	LOS	-	-	A	A	-	-
					Delay (s)	-	-	9.1	8.8	-	-
			Northeast bound	Left/Through	Los	-	-	A	A	-	-
					Delay(s)	-	-	7.5	7.7	-	-
Southwest bound	Through/Right	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	0.0	0.0	-	-			
206	Driveway 6 & Proposed Roadway	Un-signalized	Intersection	-	LOS	-	-	A	A	-	-
					Delay (s)	-	-	3.2	2.8	-	-
			Southeast bound	Left/Through/Right	LOS	-	-	A	A	-	-
					Delay (s)	-	-	8.9	8.7	-	-
			Northwest bound	Left/Through/Right	LOS	-	-	A	B	-	-
					Delay(s)	-	-	9.9	10.4	-	-
Northeast bound	Left/Through/Right	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	7.4	7.4	-	-			
Southwest bound	North/Through/Right	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	0.0	0.0	-	-			

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements		
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	
207	Driveway 7 & Proposed Roadway	Un-signalized	Intersection	-		-	-	A	A	-	-	
						-	-	1.4	0.7	-	-	
			Northwest Bound	Left/Right	LOS	-	-	A	A	-	-	
					Delay (s)	-	-	9.1	9.2	-	-	
			Northeast bound	Through/Right	LOS	-	-	A	A	-	-	
					Delay(s)	-	-	0.0	0.0	-	-	
			Southwest bound	Left/Through	LOS	-	-	A	A	-	-	
					Delay(s)	-	-	0.0	0.0	-	-	
208	Driveway 8 & Proposed Roadway	Un-signalized	Intersection	-		LOS	-	-	A	A	-	-
						Delay(s)	-	-	6.6	3.3	-	-
			Northwest bound	Left/Right	LOS	-	-	A	A	-	-	
					Delay (s)	-	-	8.9	8.9	-	-	
			Northeast bound	Through/Right	LOS	-	-	A	A	-	-	
					Delay(s)	-	-	0.0	0.0	-	-	
			Southwest bound	Left/Through	LOS	-	-	A	A	-	-	
					Delay(s)	-	-	0.0	0.0	-	-	

As indicated in **Table 7**, four intersections are anticipated to operate with an unacceptable LOS in at least one of the peak hours under 2025 build-out conditions, while two of those intersections are anticipated to operate with an unacceptable LOS under background conditions without the site.

The proposed access points were evaluated against the criteria in the TxDOT Access Management Manual to determine the need for right-turn deceleration and/or acceleration lane(s) to accommodate the full build-out of the development. Per the Access Management Manual, the minimum threshold volumes are 200 vehicles per hour (vph) for egress (acceleration lane) and 50 vph for ingress (deceleration lane). The volumes are shown in **Table 8**.

Table 8: Auxiliary Lane Threshold Evaluation

TxDOT Volume Threshold Criteria* (vph)		Right Turn Projected Volumes to or from Property	
		Acceleration	Deceleration
		Right-turn egress >200 vph	For speed limit >45 mph where right-turn ingress volumes is >50 vph
		Exiting	Entering
Ranch Road 12 and Founders Park Road	AM	95	34
	PM	101	110

**TxDOT Criteria obtained from TxDOT Access Management Manual. Table 2-3 (Auxiliary Lane Threshold)⁽⁴⁾*

As indicated in **Table 8**, the access roadway exceeds the threshold for the PM egress volumes. Therefore, a deceleration lane should be considered for this development.

The projected opposing volumes, advancing volumes, and percentage of left-turns from the advancing volumes at the study driveway were evaluated using the criteria contained in Table 3-11 of the TxDOT Roadway Design Manual(5). The criteria contained in Table 3-11 that pertains to the proposed driveway is shown in **Table 9**. The criteria for a 60 mph design speed was used to provide a conservative analysis.

Table 9: Guide for Left-Turn Lane on Two-Lane Highways

60 mph Design Speed				
Opposing Volume (vph)	Advancing Volume (vph)			
	5% Left Turns	10% Left Turns	15% Left Turns	20% Left Turns
800	230	170	125	115
600	290	210	160	140
400	365	270	200	175
200	450	330	250	215
100	505	370	275	240

The projected opposing volumes, advancing volumes, and percentage of left-turns from the advancing volumes for the study driveway are shown in **Table 10**.

Table 10: Left-Turn Lane Threshold Evaluation

Intersection	AM Peak			PM Peak		
	Opposing Volume	% Left-Turn	Advancing Volume	Opposing Volume	% Left-Turn	Advancing Volume
Ranch Road 12 and Founders Park Road	699	8%	763	889	14%	831

As indicated in **Table 10**, the study driveway exceeds the minimum advancing volume required for the consideration of a left-turn lane during both the AM and PM peak periods.

The following improvements are recommended in order to achieve acceptable LOS and improve operations under 2025 build-out conditions:

- US 290 and Ranch Road 12
 - Add Left-Turn Bay to create dual lefts (175 feet) – Northbound
 - Add Left-Turn Bay (55 feet) – Northbound
 - Add Left-Turn Bay (185 feet) – Southbound
 - Add Left-Turn Bay (135 feet) – Southbound
 - Add Right-Turn Bay to create dual lefts (100 feet) – Eastbound
 - Modify Signal Timing - Intersection



- Ranch Road 12 and Founders Park Road
 - Install 3 Approach Traffic Signal
 - Add Right-Turn Bay (345 feet) – Northbound
 - Add Left-Turn Bay (270 feet) – Westbound
 - Add Left-Turn Bay (475 feet) – Southbound
- Ranch Road 12 and Springlake Drive/Goodnight Trail
 - Install 4 Approach Traffic Signal
- US 290 and Rob Shelton Boulevard
 - Modify Signal Timing
- Proposed Roadway and Driveway 3
 - Add Left-Turn Bay (50 feet) - Northbound
- Proposed Roadway and Driveway 4
 - Add Left-Turn Bay (50 feet) – Westbound*

* These improvements are included based on developer plans to facilitate entry into the Amenity center for the development. This intersection is anticipated to operate at an acceptable LOS without these improvements.

An engineer’s opinion of probable cost for the recommended improvements for the build-out year analysis as well as the developer’s pro-rata share cost are shown in **Table 11**.

Table 11: Scenario 1 - Probable Cost for Recommended Improvements (2025)

ID	Location	Improvement	Construction Subtotal	Developer’s Pro Rata Share %	Developer’s Construction Cost
101	US 290 and Ranch Road 12	Add Left-Turn Bay (175 feet) – Northbound	\$240,800.00	4.1%	\$9,900.00
		Add Left-Turn Bay (55 feet) – Northbound*			
		Add Left-Turn Bay (185 feet) – Southbound	\$207,800.00		\$8,500.00
		Add Left-Turn Bay (135 feet) – Southbound*			
		Add Right-Turn Bay (100 feet) – Eastbound	\$204,900.00		\$8,400.00
		Modify Signal Timing – Intersection	\$5,000.00		\$200.00
103	Ranch Road 12 and Founders Park Road	Install 3 Approach Traffic Signal	\$250,000.00	12.6%	\$31,500.00
		Add Right-Turn Bay (345 feet) – Northbound	\$131,000.00		\$16,500.00
		Add Left-Turn Bay (270 feet) - Westbound	\$73,400.00		\$9,200.00
		Add Left-Turn Bay (475 feet) - Southbound	\$146,400.00		\$18,400.00
104	Ranch Road 12 and Springlake Drive/Goodnight Trail	Install 4 Approach Traffic Signal	\$250,000.00	5.1%	\$12,800.00
105	US 290 and Rob Shelton Blvd	Modify Signal Timing - Intersection	\$5,000.00	9.4%	\$500.00
Subtotal			\$1,514,300.00		\$115,900.00
Developer Funded Site Improvements					
203	Proposed Roadway and Driveway 3	Add Left-Turn Bay (50 feet) – Northbound	\$38,000.00	100%	\$38,000.00
204	Proposed Roadway and Driveway 4	Add Left-Turn Bay (50 feet) – Westbound**	\$38,000.00	100%	\$38,000.00
Subtotal			\$76,000.00		\$76,000.00
Total			\$1,590,300.00		\$191,900.00

*The length of this turn-bay represents the difference in the existing turn-bay length and the total turn-bay length required to meet 95th queue lengths.

**These improvements are included based on developer plans to facilitate entry into the Amenity center for the development. This intersection is anticipated to operate at an acceptable LOS without these improvements.



At the request of the City of Dripping Springs, a roundabout was also analyzed at the intersections of Founders Park Road with Rob Shelton Boulevard. Results are presented in **Table 7**. The intersection is anticipated to operate at an acceptable level of service as a two-way stop-controlled intersection under Access Scenario 1- Build-out (2025) conditions. Therefore, the implementation of a roundabout should be reevaluated at a future date and should be contingent on receiving the appropriate funding.

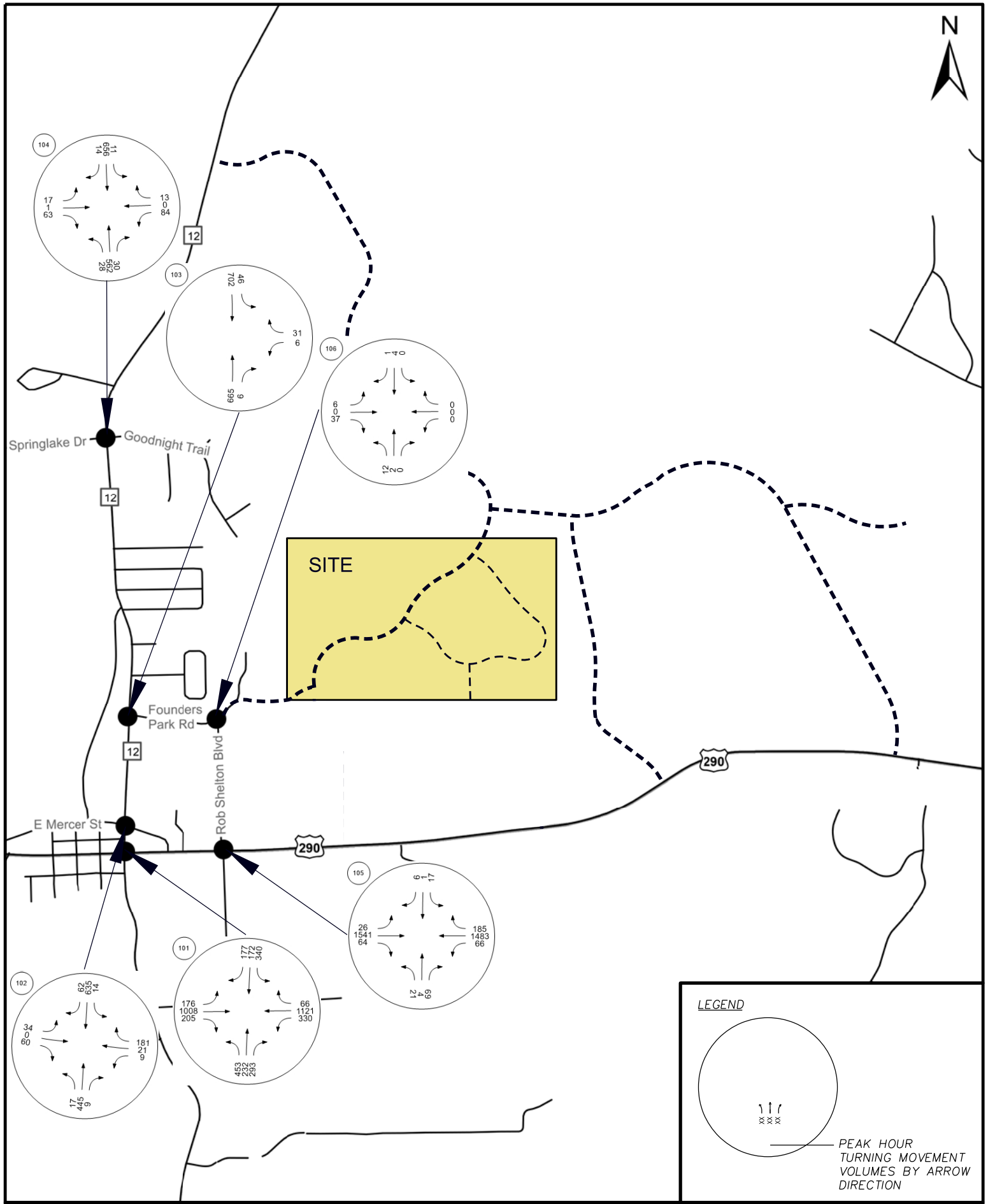


Figure 6: Access Scenario 1 - AM Background Traffic (2025)

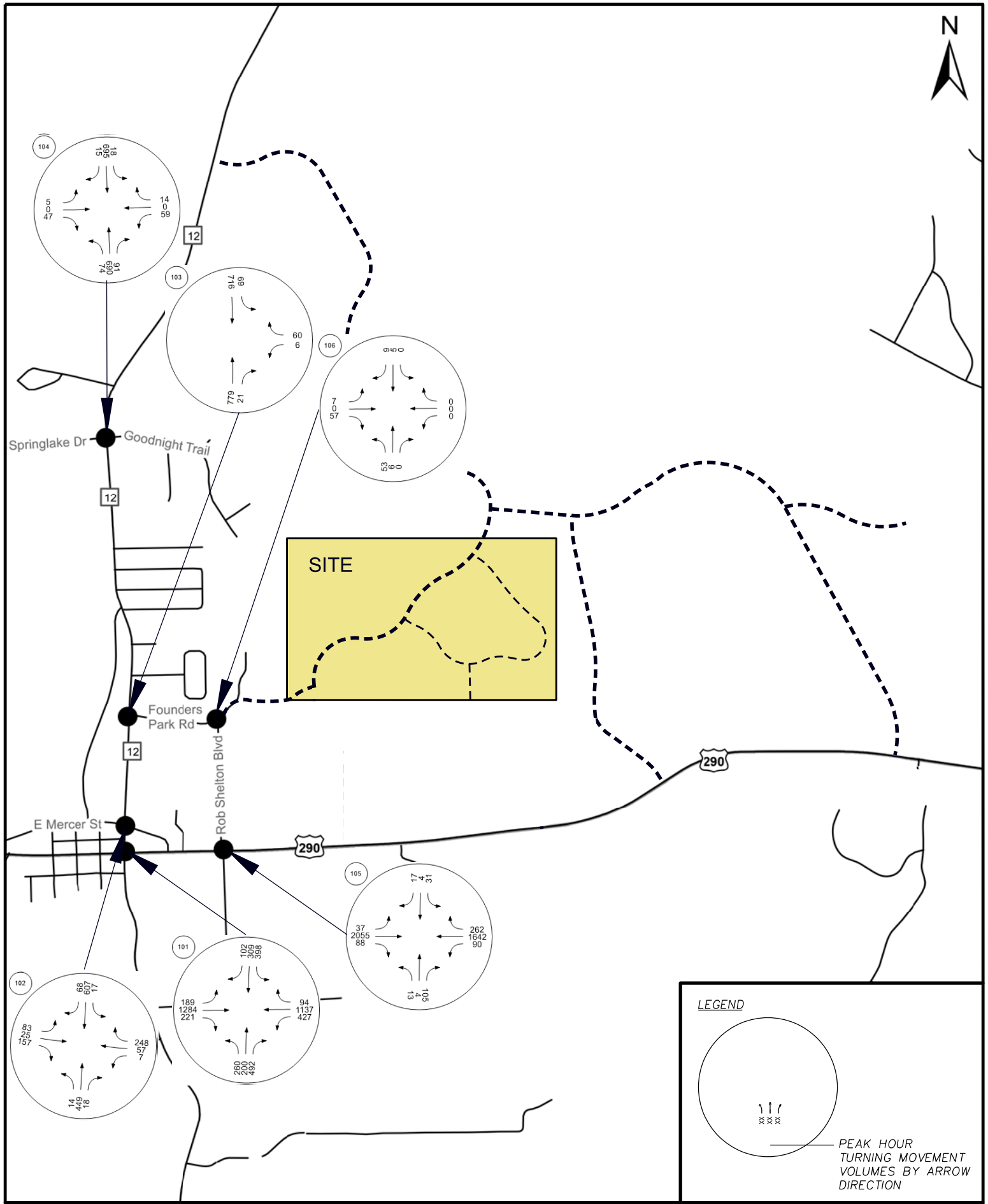


Figure 7: Access Scenario 1 - PM Background Traffic (2025)

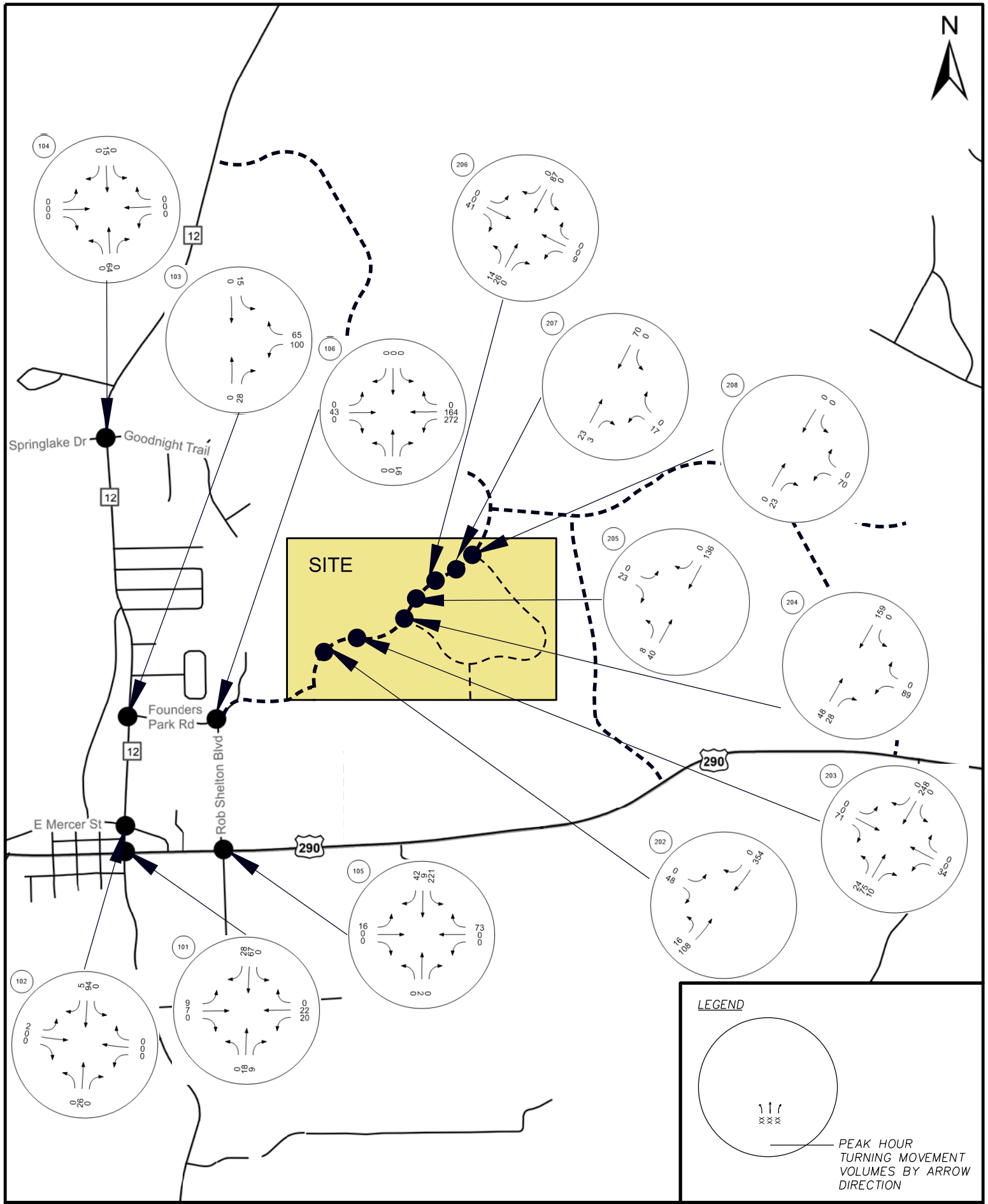


Figure 8: Access Scenario 1 - AM Peak Site Traffic (2025)

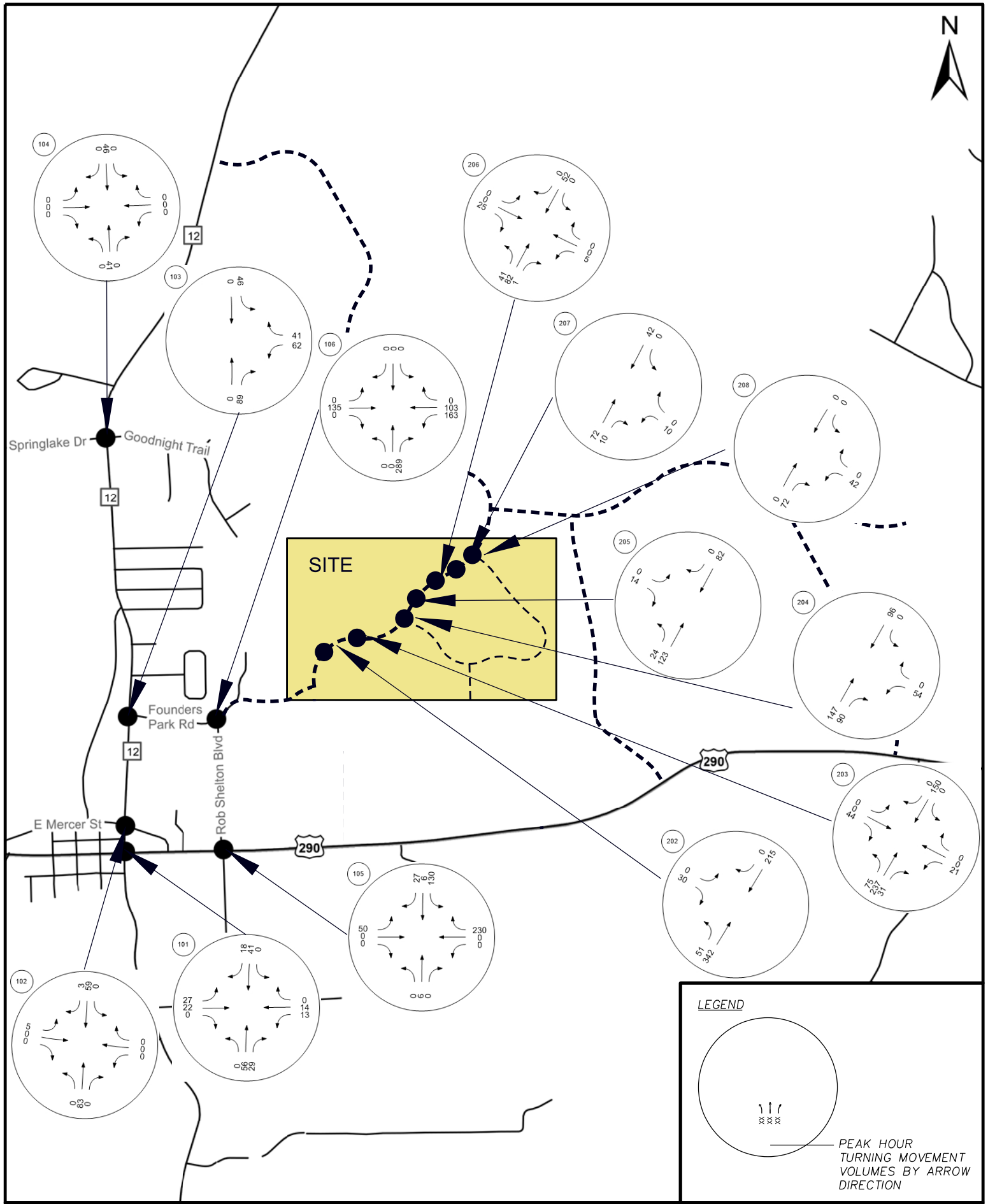


Figure 9: Access Scenario 1 - PM Peak Site Traffic (2025)

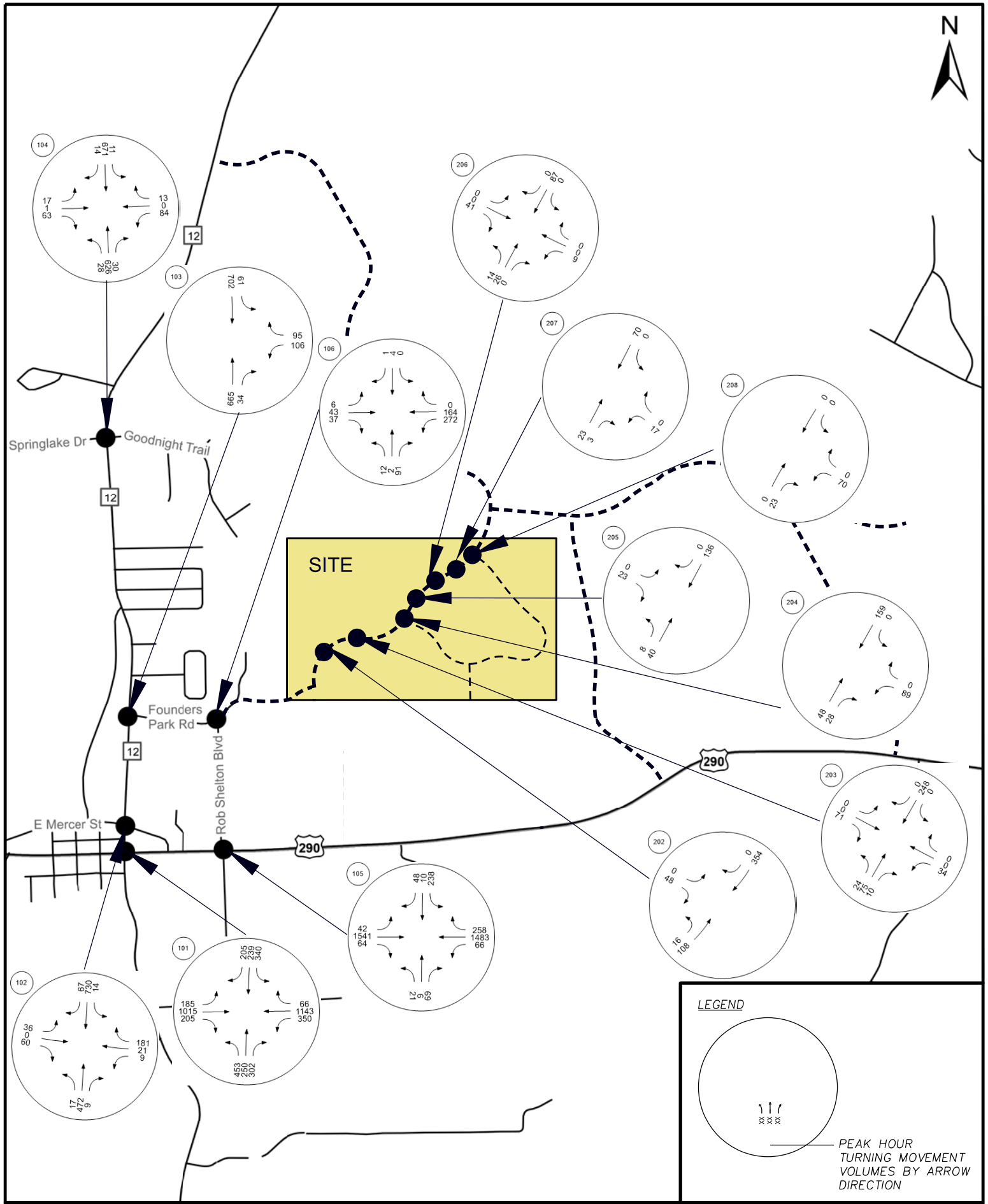


Figure 10: Access Scenario 1 - AM Peak B+S Traffic (2025)

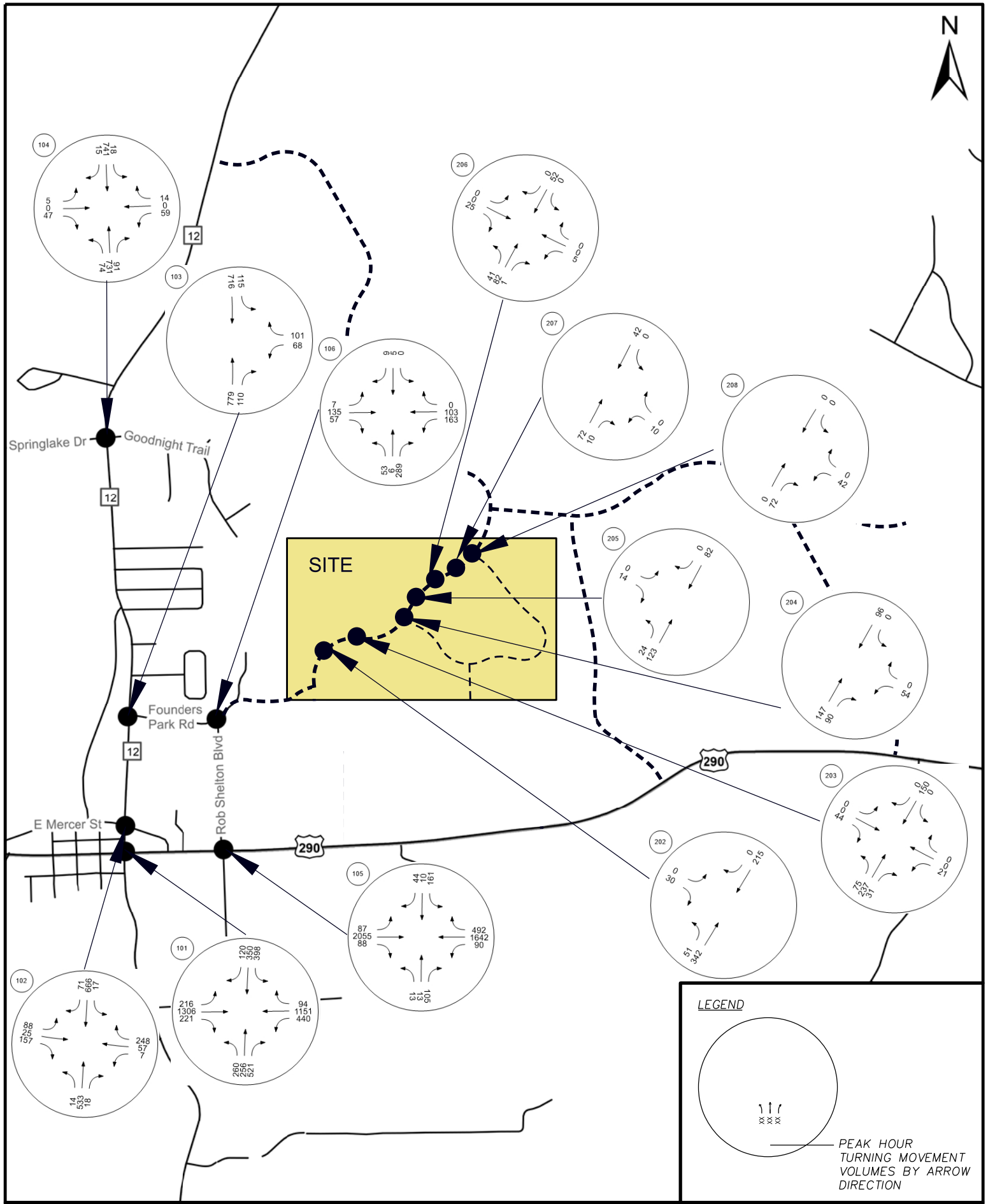


Figure 11: Access Scenario 1 - PM Peak B+S Traffic (2025)

Access Scenario 2 (2025) – Founders Park Road, Rob Shelton Boulevard, and Proposed Cannon Tract Roadway

In this scenario, the proposed north/south street which runs through the Cannon Tract to US 290 is assumed to be constructed by full build-out of Big Sky Ranch (2025). Accordingly, this scenario reflects access for the development provided via Founders Park Road to Ranch Road 12, via Rob Shelton Boulevard to US 290, as well as via the proposed north/south street which runs through the Cannon Tract to US 290.

Projected peak hour turning volumes for Background, Site, and Background + Site are illustrated in **Figure 12** through **Figure 17**. The results from this analysis are presented in **Table 12**. Analysis worksheets are provided in **Appendix F** and **Appendix H**.

Table 12: Scenario 2 Build-Out (2025) Projected Levels of Service

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements	
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
101	US 290 and Ranch Road 12	Signalized	Intersection	LOS	LOS	F	F	F	F	D	D
				Delay(s)	Delay (s)	89.3	151.1	104.0	168.0	40.1	54.2
102	Ranch Road 12 & Mercer Street	Signalized	Intersection	-	LOS	B	C	C	C	-	-
				Delay (s)	Delay (s)	18.1	21.4	22.7	23.2	-	-
103	Founders Park Road and Ranch Road 12	Un-signalized	Intersection	-	LOS	A	A	F	B	B	B
				Delay (s)	Delay (s)	1.0	1.3	47.6	11.9	20.9	4.6
			Westbound	Left/Right	LOS	D	C	F	F	F	F
					Delay (s)	Delay (s)	27.8	21.3	538.7	150.5	391.0
			Northbound	Through/ Right	LOS	A	A	A	A	A	B
					Delay(s)	Delay(s)	0.0	0.0	0.0	0.0	0.0
Southbound	Left/Through	LOS	B	A	B	A	B	B			
		Delay(s)	Delay(s)	10.1	9.9	10.3	10.5	10.3	10.5		
104	Ranch Road 12 and Springlake Drive/Goodnight Trail	Un-signalized/ Signalized	Intersection	-	LOS	A	A	A	C	B	B
				Delay(s)	Delay(s)	17.4	5.3	53.7	6.3	16.7	13.6
			Eastbound	Left/Through/ Right	LOS	D	C	F	C	-	-
					Delay (s)	Delay (s)	34.9	19.7	88.6	20.8	-
			Westbound	Left/Through/ Right	LOS	F	F	F	F	-	-
					Delay (s)	Delay (s)	218.4	118.3	957.4	147.6	-
			Northbound	Left	LOS	B	A	B	A	-	-
					Delay(s)	Delay(s)	10.2	9.4	10.2	9.5	-
				Through/ Right	LOS	A	A	A	A	-	-
					Delay(s)	Delay(s)	0.0	0.0	0.0	0.0	-
Southbound	Left	LOS	A	A	A	A	-	-			
		Delay(s)	Delay(s)	8.0	9.4	9.7	9.4	-	-		
	Through/ Right	LOS	A	A	A	A	-	-			
		Delay(s)	Delay(s)	0.0	0.0	0.0	0.0	-	-		
105	US 290 and Rob Shelton Boulevard	Signalized	Intersection	-	LOS	C	D	C	E	C	C
				Delay (s)	Delay (s)	21.9	44.5	33.0	72.0	30.8	33.5

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements	
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
106	Rob Shelton Boulevard and Founders Park Road	Un-signalized	Intersection (stop)	-	LOS	A	A	A	A	-	-
					Delay(s)	3.4	5.3	4.2	6.4	-	-
			Intersection (roundabout)	-	LOS	-	-	A	A	-	-
					Delay(s)	-	-	6.7	6.8	-	-
			Eastbound	Left/Through/Right	LOS	A	A	A	A	-	-
					Delay (s)	7.2	7.2	7.5	7.4	-	-
			Westbound	Left/Through/Right	LOS	A	A	A	A	-	-
Delay(s)	0.0	0.0			7.6	7.9	-	-			
Northbound	Left/Through/Right	LOS	A	A	B	B	-	-			
		Delay(s)	8.9	9.5	10.1	13.8	-	-			
Southbound	Left/Through/Right	LOS	A	A	B	B	-	-			
		Delay (s)	9.2	8.9	12.2	10.6	-	-			
107	US 290 & Proposed Cannon Tract Road	Un-signalized/ Signalized	Intersection	-	LOS	-	-	F	E	B	D
					Delay(s)	-	-	177.6	43.4	18.2	35.2
			Eastbound	Left Through	LOS	-	-	C	F	-	-
					Delay(s)	-	-	21.1	145.9	-	-
			Westbound	Through/ Right	LOS	-	-	A	B	-	-
					Delay (s)	-	-	0.0	0.0	-	-
			Southbound	Left/Right	LOS	-	-	F	F	-	-
Delay(s)	-	-			1857.7	502.6	-	-			
201	Founders Park Road and Internal Site Roadway/Driveway 1	Un-signalized	Intersection	-	LOS	-	-	B	A	-	-
					Delay(s)	-	-	11.0	4.8	-	-
			Northbound	Through/Right	LOS	-	-	A	A	-	-
					Delay(s)	-	-	0.0	0.0	-	-
			Eastbound	Left/Right	LOS	-	-	B	B	-	-
Delay(s)	-	-			12.6	15.0	-	-			
Southbound	Left/Through	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	0.0	0.0	-	-			
202	Driveway 2 & Proposed Roadway	Un-signalized	Intersection	-	LOS	-	-	A	A	-	-
					Delay(s)	-	-	1.3	1.2	-	-
			Eastbound	Left/Right	LOS	-	-	B	B	-	-
					Delay (s)	-	-	12.6	10.2	-	-
			Northbound	Left/Right	LOS	-	-	A	A	-	-
Delay(s)	-	-			0.0	1.2	-	-			
Southbound	Through/right	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	0.0	0.0	-	-			

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements	
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
203	Driveway 3 & Proposed Roadway	Un-signalized	Intersection	-		-	-	A	A	-	-
			SE bound	Left/Through/Right	LOS	-	-	B	A	-	-
			SE bound	Left/Through/Right	Delay (s)	-	-	10.4	9.5	-	-
			NW bound	Left/Through/Right	LOS	-	-	B	B	-	-
			NW bound	Left/Through/Right	Delay (s)	-	-	12.1	12.5	-	-
			NE bound	Left/Through/Right	LOS	-	-	A	A	-	-
NE bound	Left/Through/Right	Delay (s)	-	-	7.8	1.6	-	-			
SW bound	Left/Through/Right	LOS	-	-	A	A	-	-			
SW bound	Left/Through/Right	Delay (s)	-	-	7.4	0.2	-	-			
204	Driveway 4 & Proposed Roadway	Un-signalized	Intersection	-		-	-	A	A	-	-
			SW bound	Left/Through	LOS	-	-	A	A	-	-
			SW bound	Left/Through	Delay(s)	-	-	1.9	1.1	-	-
			NW bound	Left/Right	LOS	-	-	B	B	-	-
			NW bound	Left/Right	Delay(s)	-	-	10.8	11.8	-	-
			NE bound	Through/Right	LOS	-	-	A	A	-	-
NE bound	Through/Right	Delay(s)	-	-	0.0	0.0	-	-			
SW bound	Left/Through	LOS	-	-	A	A	-	-			
SW bound	Left/Through	Delay(s)	-	-	0.0	0.3	-	-			
205	Driveway 5 & Proposed Roadway	Un-signalized	Intersection	-		-	-	A	A	-	-
			SE bound	Left/Through	LOS	-	-	A	A	-	-
			SE bound	Left/Through	Delay (s)	-	-	9.5	9.4	-	-
			NE bound	Left/Through	Los	-	-	A	A	-	-
			NE bound	Left/Through	Delay(s)	-	-	7.6	0.7	-	-
			SW bound	Through/Right	LOS	-	-	A	A	-	-
SW bound	Through/Right	Delay(s)	-	-	0.0	0.0	-	-			
206	Driveway 6 & Proposed Roadway	Un-signalized	Intersection	-		-	-	A	A	-	-
			SE bound	Left/Through/Right	LOS	-	-	A	A	-	-
			SE bound	Left/Through/Right	Delay (s)	-	-	9.1	9.1	-	-
			NW bound	Left/Through/Right	LOS	-	-	B	B	-	-
			NW bound	Left/Through/Right	Delay(s)	-	-	10.6	11.9	-	-
			NE bound	Left/Through/Right	LOS	-	-	A	A	-	-
NE bound	Left/Through/Right	Delay(s)	-	-	7.5	1.6	-	-			
SW bound	North/Through/Right	LOS	-	-	A	A	-	-			
SW bound	North/Through/Right	Delay(s)	-	-	0.0	0.0	-	-			
207	Driveway 7 & Proposed Roadway	Un-signalized	Intersection	-		-	-	A	A	-	-
			SW bound	Left/Through	LOS	-	-	0.9	0.4	-	-
			NW bound	Left/Right	LOS	-	-	A	A	-	-
			NW bound	Left/Right	Delay (s)	-	-	9.5	10.0	-	-
			NE bound	Through/Right	LOS	-	-	A	A	-	-
NE bound	Through/Right	Delay(s)	-	-	0.0	0.0	-	-			
SW bound	Left/Through	LOS	-	-	A	A	-	-			
SW bound	Left/Through	Delay(s)	-	-	7.4	0.1	-	-			

ID	Intersection	Type of Control	Approach	Movement	MOE	Background		Background + Site		Background + Site w/ Improvements	
						AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
208	Driveway 8 & Proposed Roadway	Un-signalized	Intersection	-	LOS	-	-	A	A	-	-
					Delay(s)	-	-	3.3	1.7	-	-
			Northwest bound	Left/Right	LOS	-	-	A	A	-	-
					Delay (s)	-	-	9.4	9.9	-	-
			Northeast bound	Through/Right	LOS	-	-	A	A	-	-
					Delay(s)	-	-	0.0	0.0	-	-
Southwest bound	Left/Through	LOS	-	-	A	A	-	-			
		Delay(s)	-	-	7.3	0.8	-	-			
209	Driveway 1 & Proposed Roadway	Un-signalized	Intersection	-		-	-	A	A	-	-
						-	-	1.9	1.2	-	-
			Northbound	Through/Right		-	-	A	A	-	-
						-	-	0.0	0.0	-	-
			Westbound	Left/Right		-	-	B	B	-	-
						-	-	14.1	14.3	-	-
Southbound	Through/Left		-	-	A	A	-	-			
			-	-	7.6	0.1	-	-			

As indicated in **Table 12**, four intersections are anticipated to operate with an unacceptable LOS in at least one of the peak hours under 2025 build-out conditions, while two of those intersections are anticipated to operate with an unacceptable LOS under background conditions without the site.

The proposed access points were evaluated against the criteria in the TxDOT Access Management Manual to determine the need for right-turn deceleration and/or acceleration lane(s) to accommodate the full build-out of the development. Per the Access Management Manual, the minimum threshold volumes are 200 vehicles per hour (vph) for egress (acceleration lane) and 50 vph for ingress (deceleration lane). The volumes are shown in **Table 13**.

Table 13: Auxiliary Lane Threshold Evaluation

TxDOT Volume Threshold Criteria* (vph)	Right Turn Projected Volumes to or from Property		
		Acceleration	Deceleration
		Right-turn egress >200 vph	For speed limit >45 mph where right-turn ingress volumes is >50 vph
		Exiting	Entering
Ranch Road 12 and Founders Park Road	AM	57	29
	PM	79	94

**TxDOT Criteria obtained from TxDOT Access Management Manual. Table 2-3 (Auxiliary Lane Threshold)⁽⁴⁾*

As indicated in **Table 13**, the access roadway exceeds the threshold for PM ingress volumes. Therefore, a deceleration lane must be considered for this development.

The projected opposing volumes, advancing volumes, and percentage of left-turns from the advancing volumes at the study driveway were evaluated using the criteria contained in Table 3-11 of the TxDOT Roadway Design

Manual(5). The criteria contained in Table 3-11 that pertains to the proposed driveway is shown in **Table 14**. Although the speed limits differ in the northbound and southbound directions, the criteria for a 60 mph design speed was used to provide a conservative analysis.

Table 14: Guide for Left-Turn Lane on Two-Lane Highways

60 mph Design Speed				
Opposing Volume (vph)	Advancing Volume (vph)			
	5% Left Turns	10% Left Turns	15% Left Turns	20% Left Turns
800	230	170	125	115
600	290	210	160	140
400	365	270	200	175
200	450	330	250	215
100	505	370	275	240

The projected opposing volumes, advancing volumes, and percentage of left-turns from the advancing volumes for the study driveway are shown in **Table 14**.

Table 15: Left-Turn Lane Threshold Evaluation

Intersection	AM Peak			PM Peak		
	Opposing Volume	% Left-Turn	Advancing Volume	Opposing Volume	% Left-Turn	Advancing Volume
Ranch Road 12 and Founders Park Road	692	8%	724	846	13%	778

As indicated in **Table 15**, the study driveway exceeds the minimum advancing volume required for the consideration of a left-turn lane during both the AM and PM peak periods.

The following improvements are recommended in order to achieve acceptable LOS or improve operations under 2025 build-out conditions:

- US 290 and Ranch Road 12
 - Add Left-Turn Bay (155 feet) – Northbound
 - Add Left-Turn Bay (35 feet) – Northbound
 - Add Left-Turn Bay (185 feet) – Southbound
 - Add Left-Turn Bay (135 feet)- Southbound
 - Add Right-Turn Bay (100 feet)- Eastbound
 - Modify Signal Timing- Intersection

- Ranch Road 12 and Founders Park Road
 - Add Right-Turn Bay (345 feet) – Northbound
 - Add Left-Turn Bay (180 feet)- Westbound
 - Add Left-Turn Bay (475 feet)- Southbound
- Ranch Road 12 and Springlake Drive/Goodnight Trail
 - Install 4 Approach Traffic Signal
- US 290 and Rob Shelton Boulevard
 - Modify Signal Timing - Intersection
- US 290 and Proposed Cannon Tract Road
 - Add Right-Turn Bay (150 feet) – Westbound
 - Install 3 Approach Traffic Signal
- Proposed Roadway and Driveway 3
 - Add Left-Turn Bay (50 feet) - Northbound
- Proposed Roadway and Driveway 4
 - Add Left-Turn Bay (50 feet) – Eastbound*

*These improvements are recommended based only on comments received from the City of Dripping Springs. The intersections associated with these improvements are anticipated to operate at an acceptable LOS without these recommended improvements.

An engineer's opinion of probable cost for the recommended improvements for the build-out year analysis as well as the developer's pro-rata share cost are shown in **Table 16**.

Table 16: Scenario 2 - Probable Cost for Recommended Improvements (2025)

ID	Location	Improvement	Construction Subtotal	Developer's Pro Rata Share %	Developer's Construction Cost
Existing Intersections:					
101	US 290 and Ranch Road 12	Add Left-Turn Bay (155 feet) – Northbound	\$237,400.00	4.3%	\$10,200.00
		Add Left-Turn Bay (35 feet) – Northbound*			
		Add Left-Turn Bay (185 feet) – Southbound	\$207,800.00		\$8,900.00
		Add Left-Turn Bay (135 feet) – Southbound*			
		Add Right-Turn Bay (100 feet) – Eastbound	\$204,900.00		\$8,800.00
Modify Signal Timing – Intersection	\$5,000.00	\$200.00			
103	Ranch Road 12 and Founders Park Road	Add Right-Turn Bay (345 feet) – Northbound	\$131,100.00	9.6%	\$12,600.00
		Add Left-Turn Bay (180 feet) - Westbound	\$66,300.00		\$6,400.00
		Add Left-Turn Bay (345 feet) - Southbound	\$146,400.00		\$14,000.00
104	Ranch Road 12 and Springlake Drive/Goodnight Trail	Install 4 Approach Traffic Signal	\$250,000.00	3.0%	\$7,500.00
105	US 290 and Rob Shelton Blvd	Modify Signal Timing - Intersection	\$5,000.00	5.8%	\$300.00
Subtotal			\$1,253,900.00	-	\$68,900.00
Future Intersections:					
107	Proposed Cannon Access and US 290	Add Right-Turn Bay (150 feet) – Westbound	\$138,400.00	9.5%	\$13,100.00
		Install 3 Approach Traffic Signal	\$250,000.00		\$23,800.00
Subtotal			\$388,400.00	-	\$36,900.00
Developer Funded Site Improvements					
203	Proposed Roadway and Driveway 3	Add Left-Turn Bay (50 feet) – Northbound	\$38,000.00	100%	\$38,000.00
204	Proposed Roadway and Driveway 4	Add Left-Turn Bay (50 feet) – Eastbound**	\$38,000.00	100%	\$38,000.00
Subtotal			\$76,000.00	-	\$76,000.00
Total			\$1,718,300.00	-	\$181,800.00

*The length of this turn-bay represents the difference in the existing turn-bay length and the total turn-bay length required to meet 95th queue lengths.
 ** These improvements are included based on developer plans to facilitate entry into the Amenity center for the development. This intersection is anticipated to operate at an acceptable LOS without these improvements.

At the request of the City of Dripping Springs, a roundabout was also analyzed at the intersections of Founders Park Road and Rob Shelton Boulevard. Results are presented in **Table 16**. The intersection is anticipated to operate at an acceptable level of service as a two-way stop-controlled intersection under Access Scenario 2- Build-out (2025) conditions. Therefore, the implementation of a roundabout should be reevaluated at a future date and should be contingent on receiving the appropriate funding.

As indicated by **Table 11** and **Table 16**, Access Scenario 2 is anticipated to have similar results and improvements when compared to Access Scenario 1. This is largely due to the high background volumes that can be observed on Ranch Road 12 and US 290 in both access scenarios. The type of improvements that are anticipated to be needed are primarily dictated by background traffic and do not change significantly between the two access scenarios.

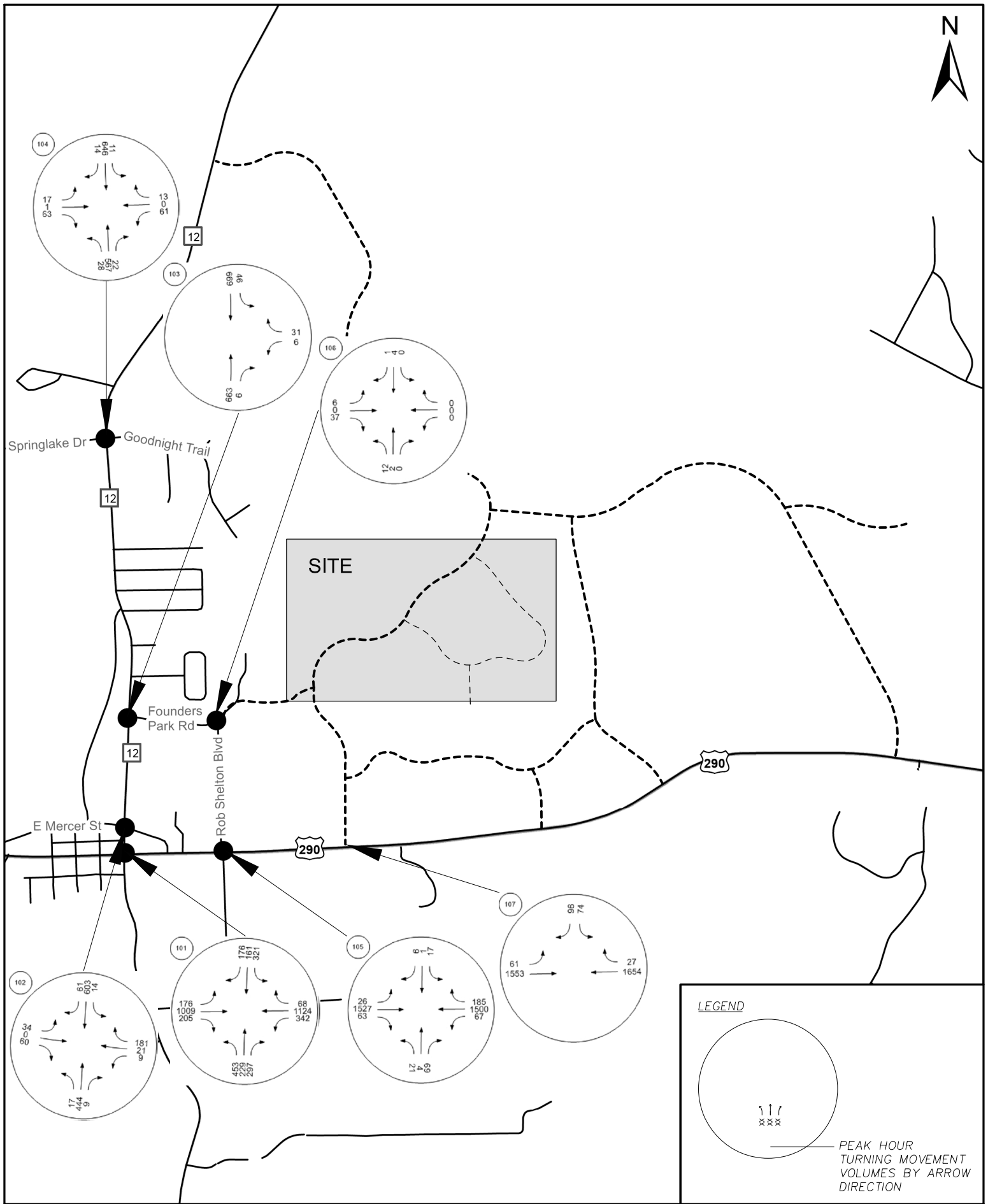


Figure 12: Access Scenario 2 - AM Background Traffic (2025)

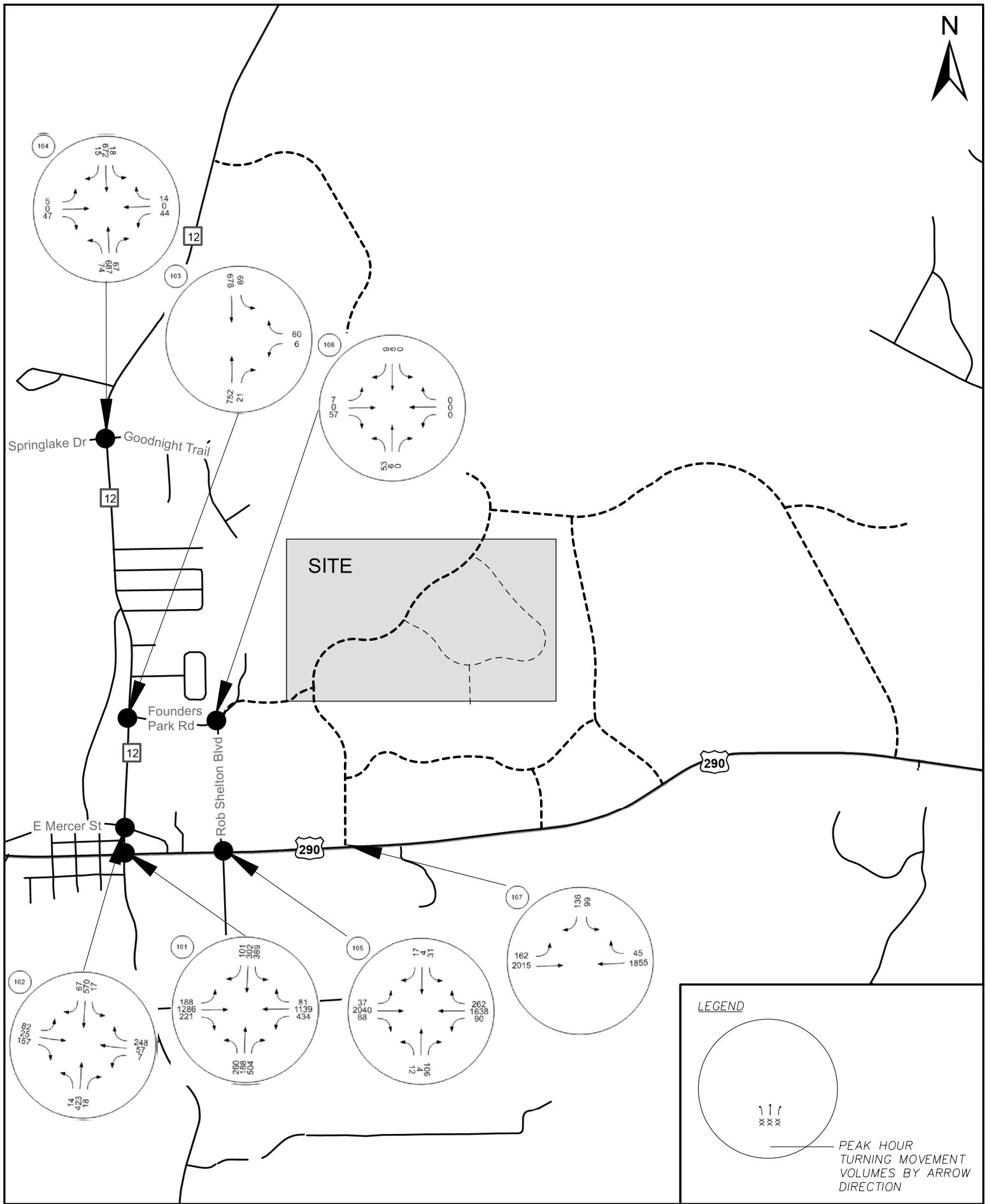


Figure 13: Access Scenario 2 - PM Background Traffic (2025)

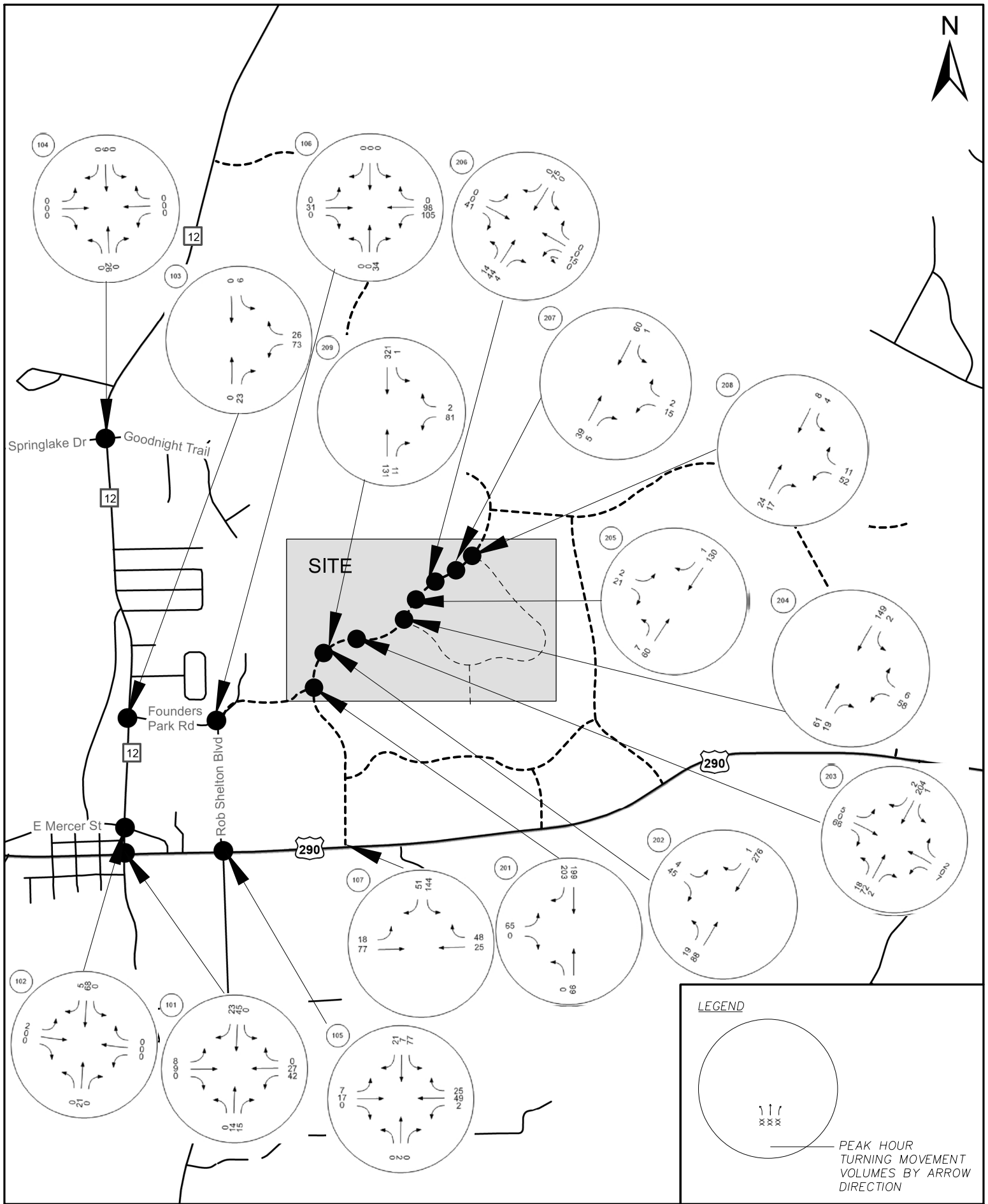


Figure 14: Access Scenario 2 - AM Peak Site Traffic (2025)

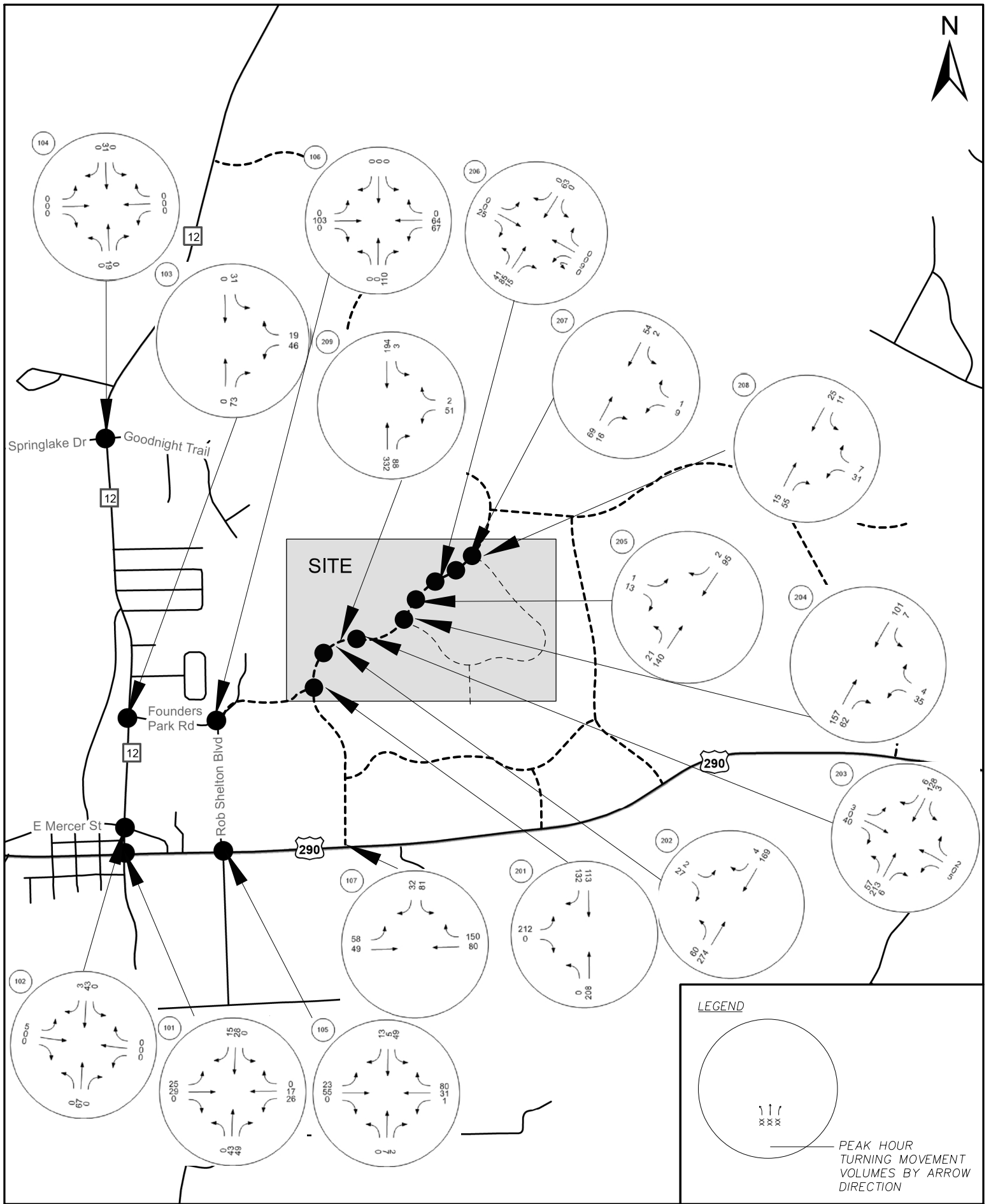


Figure 15: Access Scenario 2 - PM Peak Site Traffic (2025)

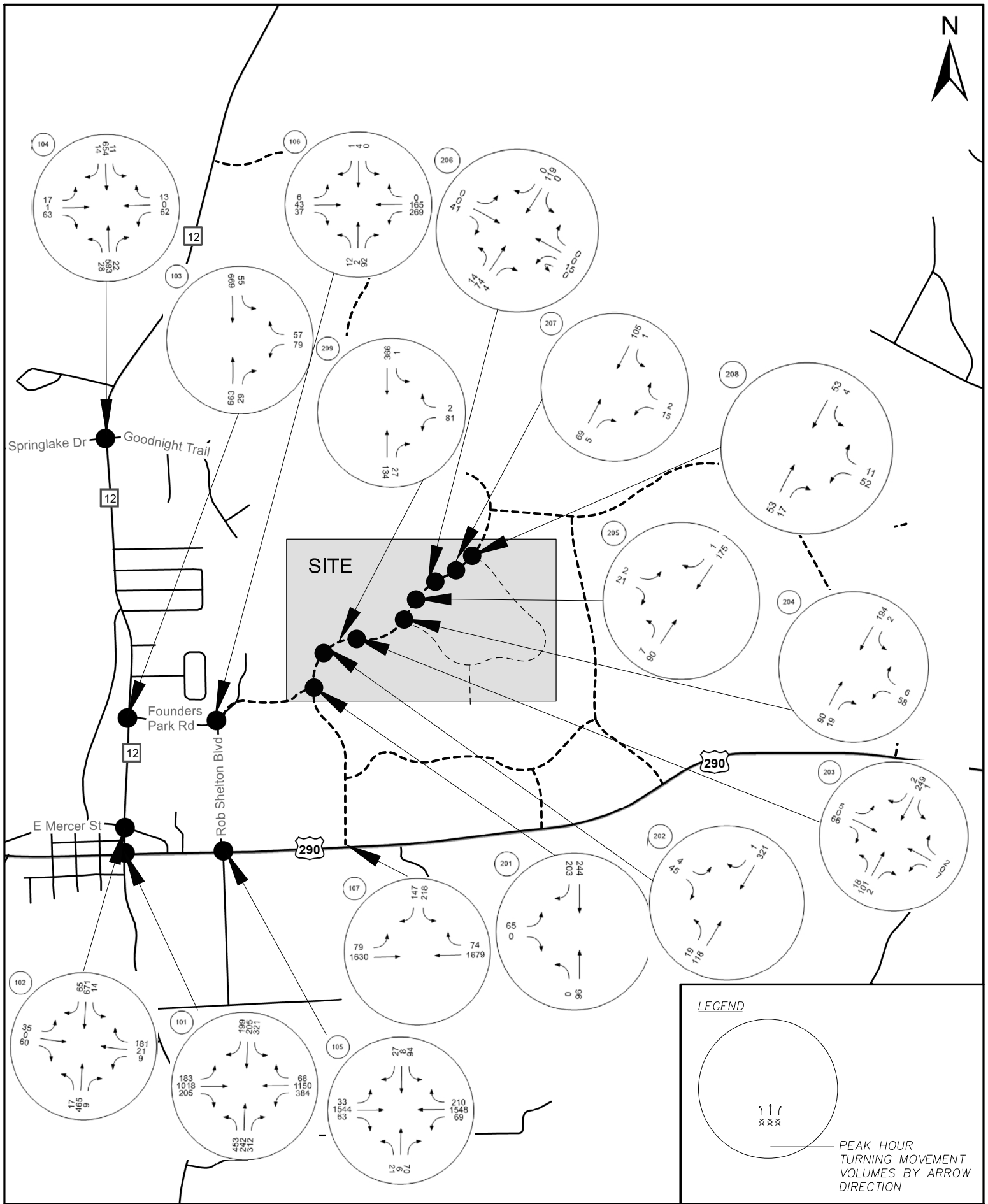


Figure 16: Access Scenario 2 - AM Peak B+S Traffic (2025)

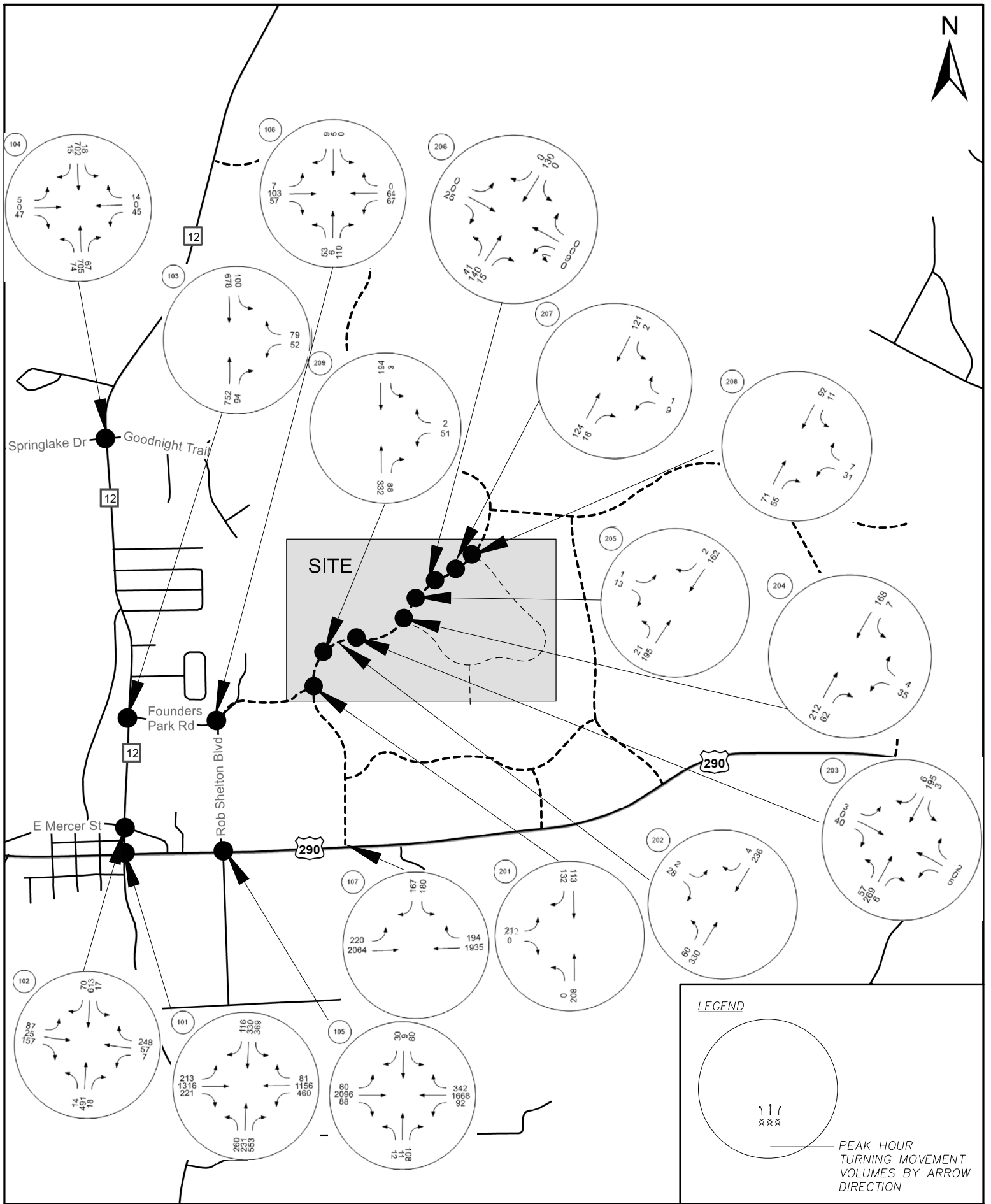


Figure 17: Access Scenario 2 - PM Peak B+S Traffic (2025)

Proposed Roadway Evaluation (2028)

New roadways are proposed with the development of Big Sky Ranch and the adjacent background projects. An evaluation of the roadways’ anticipated capacity was performed using projected future year planning phase (2028) peak hour volumes.

The 1994 HCM⁽⁶⁾ provides estimates for service flow rates in passenger cars per hour (pcph), total both directions, for two-lane roadways as they relate to LOS. In addition, the 1994 HCM⁽⁶⁾ provides estimates for service flow rates in passenger cars per hour per lane (pcphpl) for multi-lane roadways as they relate to LOS. **Table 17 and 18** describe traffic flow rates in relation to LOS for two lane roadways and multi-lane roadways, respectively.

The projected peak hour volumes for the proposed roadways are illustrated in **Figure 18**. A summary of the proposed roadways’ peak hour volumes and their anticipated required capacity can be found in **Table 19**.

Table 17: Two-Lane Roadways LOS vs. Traffic Flow Rates

LOS	Bi-Directional Flow Rate (pcph)
A	< 112
B	>112 and < 448
C	> 448 and < 896
D	> 896 and < 1,596
E	> 1,596 and < 2,800
F	>2,800

Table 18: Multi-Lane Roadways LOS vs. Traffic Flow Rates

LOS	Bi-Directional Flow Rate (pcphpl)
A	< 540
B	> 660 and < 900
C	> 900 and < 1,260
D	> 1,260 and < 1,500
E	>1,500 and < 1,900
F	>1,900

Table 19: Projected Volume and Capacity

Proposed Roadway ID	Projected Volume			Anticipated Capacity Needed (# of Lanes)*	LOS with Anticipated # of Lanes*	Anticipated Functional Classification**
	AM Peak	PM Peak	Daily Volume			
1	380	815	6,653	Two Lanes	C	Minor Arterial
2	See Figure 19			Two Lanes	C	Major Collector
3	384	675	6,537	Two Lanes	C	Minor Arterial
4	328	612	4,857	Two Lanes	C	Major Collector
5	224	576	4,437	Two Lanes	C	Major Collector
6	437	728	5,618	Two Lanes	C	Minor Arterial

*Anticipated number of lanes and LOS are based on HCM data presented in **Table 17** and **Table 18**.

**Anticipated functional classification are based on Table 2-1 from the Hays County Transportation Plan. The projected daily volumes represent a conservative analysis and should be reevaluated in the future when more detailed land use plans are available.

As indicated by **Table 19**, the proposed roadways are anticipated to perform at an acceptable LOS with two lanes under build-out (2028) conditions.

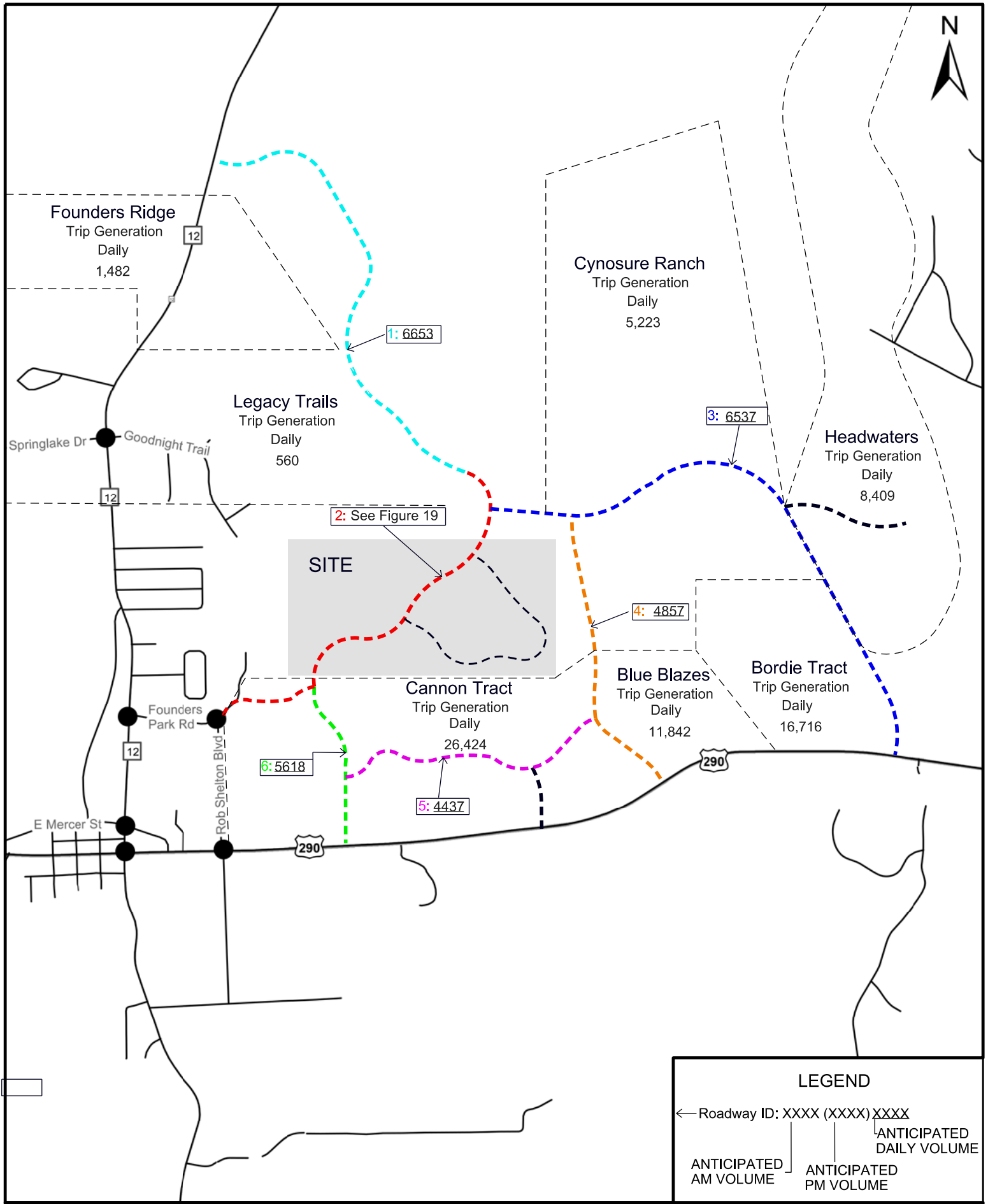
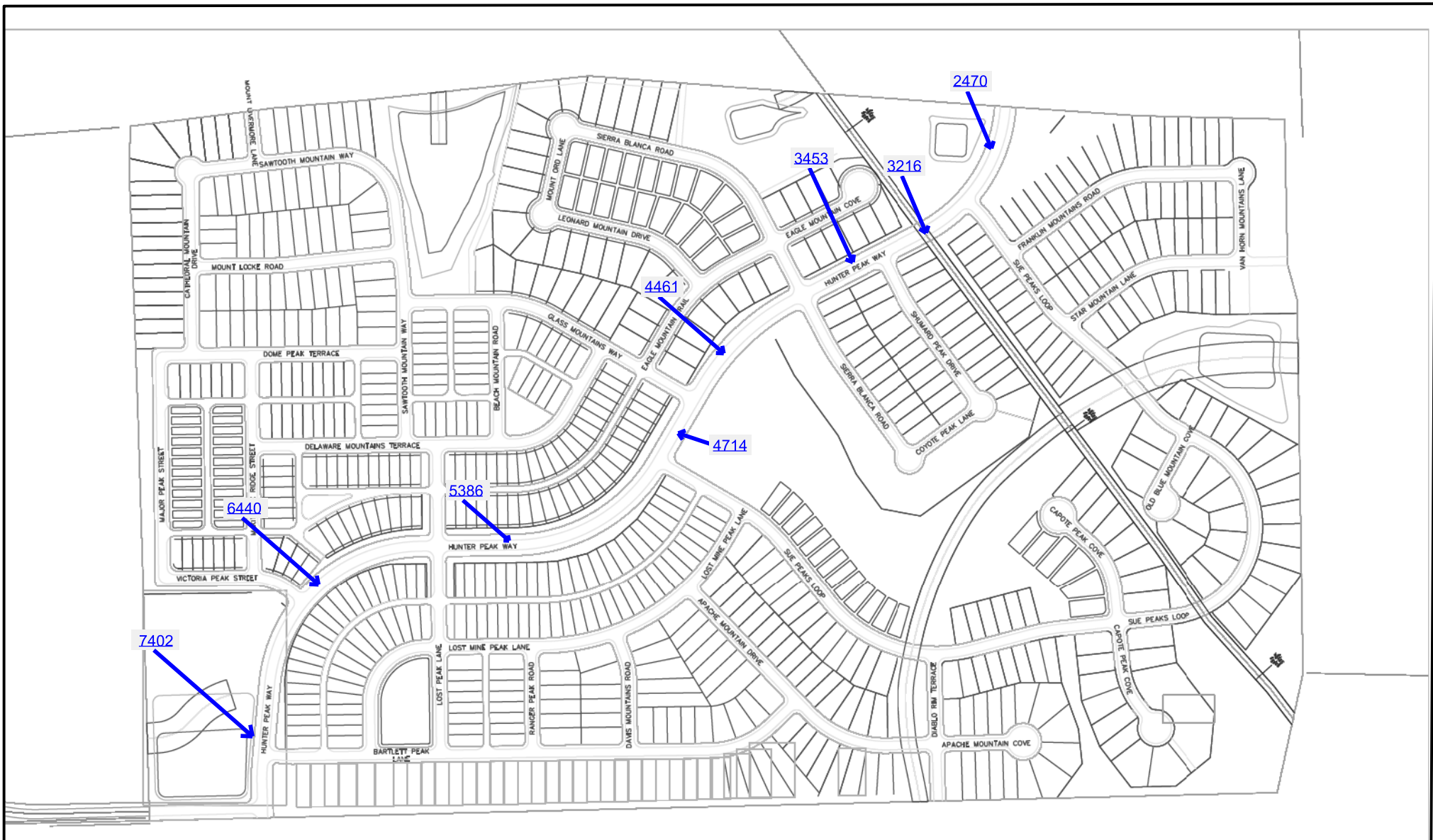


Figure 18: Anticipated Peak Volumes on Proposed Roadways (2028)



LEGEND

← XXXX
ANTICIPATED
DAILY VOLUME

**Figure 19: Hunter Peak Way Projected 2028 Daily Traffic Volumes
(with background projects included)**

CONCLUSIONS

The proposed Big Sky Ranch development and its interaction with the surrounding roadway have been analyzed for build-out (2025) conditions. Improvements to accommodate background and site traffic were made to satisfy LOS criteria and TxDOT access management guidelines. Based on these analyses, the development should be approved as planned in accordance with the recommendations shown in **Table 20**. If the Cannon Tract roadway is not anticipated to be constructed at the time of build-out of Big Sky Ranch, the pro-rata share of costs for Scenario 1 should be utilized. If the Cannon Tract roadway is anticipated to provide access to Big Sky Ranch at the time of full build-out for Big Sky Ranch, then the pro-rata share of costs for Scenario 2 should be utilized.

Table 20: Recommended Improvements

Location	Access Scenario 1 (2025) Improvements	Scenario 1 Developer's Pro Rata Cost	Access Scenario 2 (2025) Improvements	Scenario 2 Developer's Pro Rata Cost		
Existing Intersections:						
US 290 and Ranch Road 12	<ul style="list-style-type: none"> • Add Left-Turn Bay (175 feet) – Northbound • Add Left-Turn Bay (55 feet) – Northbound* • Add Left-Turn Bay (185 feet) – Southbound • Add Left-Turn Bay (135 feet) – Southbound* • Add Right-Turn Bay (100 feet) – Eastbound • Modify Signal Timing – Intersection 	\$27,000.00	<ul style="list-style-type: none"> • Add Left-Turn Bay (155 feet) – Northbound • Add Left-Turn Bay (35 feet) – Northbound* • Add Left-Turn Bay (185 feet) – Southbound • Add Left-Turn Bay (135 feet) – Southbound* • Add Right-Turn Bay (100 feet) – Eastbound • Modify Signal Timing – Intersection 	\$28,100.00		
Ranch Road 12 and Founders Park Road	<ul style="list-style-type: none"> • Install 3 Approach Traffic Signal • Add Right-Turn Bay (345 feet) – Northbound • Add Left-Turn Bay (270 feet) – Westbound • Add Left-Turn Bay (475 feet) – Southbound 	\$75,600.00	<ul style="list-style-type: none"> • Add Right-Turn Bay (345 feet) – Northbound • Add Left-Turn Bay (180 feet) – Westbound • Add Left-Turn Bay (345 feet) – Southbound 	\$33,000.00		
Ranch Road 12 and Springlake Drive/ Goodnight Trail	<ul style="list-style-type: none"> • Install 4 Approach Traffic Signal 	\$12,800.00	<ul style="list-style-type: none"> • Install 4 Approach Traffic Signal 	\$7,500.00		
US 290 and Rob Shelton Blvd	<ul style="list-style-type: none"> • Modify Signal Timing – Intersection 	\$500.00	<ul style="list-style-type: none"> • Modify Signal Timing – Intersection 	\$300.00		
Subtotal			\$115,900.00	Subtotal		\$68,900.00
Future Intersections:						
Proposed Cannon Access and US 290	N/A	N/A	<ul style="list-style-type: none"> • Add Right-Turn Bay (150 feet) – Westbound • Install 3 Approach Traffic Signal 	\$36,900.00		
Subtotal			N/A	Subtotal		\$36,900.00
Developer Funded Improvements						
Proposed Roadway and Driveway 3	Add Left-Turn Bay (50 feet) – Northbound	\$38,000.00		\$38,000.00		
Proposed Roadway and Driveway 4	Add Left-Turn Bay (50 feet) – Eastbound**	\$38,000.00		\$38,000.00		
Subtotal			\$76,000.00	Subtotal		\$76,000.00
Total			\$191,900.00	Total		\$181,800.00

*The length of this turn-bay represents the difference in the existing turn-bay length and the total turn-bay length required to meet 95th queue lengths.

** These improvements are included based on developer plans to facilitate entry into the Amenity center for the development. This intersection is anticipated to operate at an acceptable LOS without these improvements.

CERTIFICATION STATEMENT

I hereby certify that this report complies with applicable technical requirements of the Dripping Springs and is complete and accurate to the best of my knowledge.

Alliance Transportation Group, Inc.

A handwritten signature in black ink that reads "Bethany James".

Bethany James, P.E.

Transportation Engineer























REFERENCES

- 1) Trip Generation, an Informal Report. 8th Edition, Institute of Transportation Engineers, Washington D.C., 2008.
- 2) Highway Capacity Manual, Transportation Research Board, Washington D.C., 2014.
- 3) “Synchro”, Trafficware Corporation, Sugarland, Texas 2005.
- 4) Access Management Manual, Texas Department of Transportation, Austin, Texas, 2009.
- 5) Roadway Design Manual, Texas Department of Transportation, Austin, Texas, 2010.
- 6) Highway Capacity Manual, Transportation Research Board, Washington D.C., 1994.

Appendix F: Synchro Reports – Existing Conditions

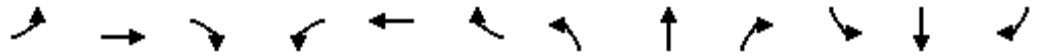
Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Existing AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	919	163	92	1016	17	392	186	147	215	138	158
Future Volume (vph)	124	919	163	92	1016	17	392	186	147	215	138	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	250		0	130		130	70		130
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Frt		0.973			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.983		0.950	0.991	
Satd. Flow (prot)	1671	3438	0	1671	3460	0	1633	1690	1553	1665	1765	1482
Flt Permitted	0.070			0.072			0.950	0.983		0.950	0.991	
Satd. Flow (perm)	123	3438	0	127	3460	0	1633	1690	1553	1665	1765	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			2				70			70
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3012			2872			679			2594	
Travel Time (s)		45.6			43.5			10.3			39.3	
Peak Hour Factor	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	3%	1%	9%
Adj. Flow (vph)	146	1069	233	108	1254	30	436	221	181	250	182	182
Shared Lane Traffic (%)							26%			15%		
Lane Group Flow (vph)	146	1302	0	108	1284	0	323	334	181	212	220	182
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5

Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Existing AM

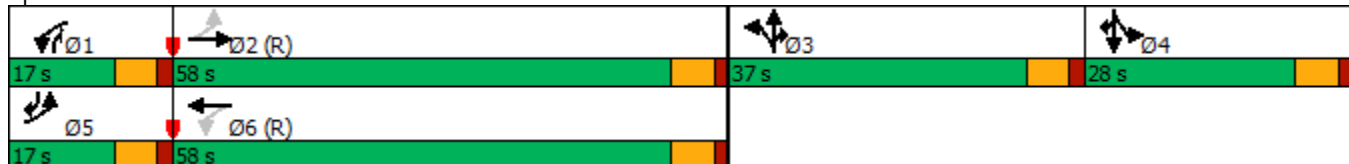


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6							
Detector Phase	5	2		1	6		3	3	3 1	4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		28.0	28.0		28.0	28.0	
Total Split (s)	17.0	58.0		17.0	58.0		37.0	37.0		28.0	28.0	
Total Split (%)	12.1%	41.4%		12.1%	41.4%		26.4%	26.4%		20.0%	20.0%	
Maximum Green (s)	11.0	52.0		11.0	52.0		31.0	31.0		22.0	22.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		13.0			13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	67.5	57.2		64.9	55.9		29.6	29.6	38.6	20.2	20.2	36.6
Actuated g/C Ratio	0.48	0.41		0.46	0.40		0.21	0.21	0.28	0.14	0.14	0.26
v/c Ratio	0.84	0.92		0.68	0.93		0.94	0.94	0.38	0.88	0.87	0.42
Control Delay	61.5	55.6		48.1	53.3		89.0	88.0	15.5	93.0	88.6	28.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	55.6		48.1	53.3		89.0	88.0	15.5	93.0	88.6	28.2
LOS	E	E		D	D		F	F	B	F	F	C
Approach Delay		56.2			52.9			72.7			72.2	
Approach LOS		E			D			E			E	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 60.7
 Intersection LOS: E
 Intersection Capacity Utilization 81.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: RR 12 & US 290





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	146	1302	108	1284	323	334	181	212	220	182
v/c Ratio	0.84	0.92	0.68	0.93	0.94	0.94	0.38	0.88	0.87	0.42
Control Delay	61.5	55.6	48.1	53.3	89.0	88.0	15.5	93.0	88.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	55.6	48.1	53.3	89.0	88.0	15.5	93.0	88.6	28.2
Queue Length 50th (ft)	94	658	52	611	303	313	50	198	206	81
Queue Length 95th (ft)	#180	#743	107	609	#487	#438	76	#308	250	146
Internal Link Dist (ft)		2932		2792		599			2514	
Turn Bay Length (ft)	300		250		130		130	70		130
Base Capacity (vph)	181	1416	182	1381	361	374	514	261	277	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.92	0.59	0.93	0.89	0.89	0.35	0.81	0.79	0.42

Intersection Summary

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

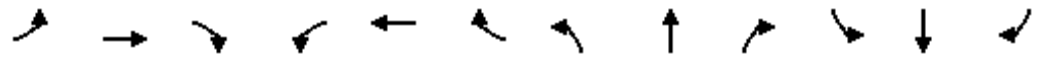
HCM Signalized Intersection Capacity Analysis
1: RR 12 & US 290

Heritage TIA
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	919	163	92	1016	17	392	186	147	215	138	158
Future Volume (vph)	124	919	163	92	1016	17	392	186	147	215	138	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1671	3438		1671	3462		1633	1690	1553	1665	1766	1482
Flt Permitted	0.07	1.00		0.07	1.00		0.95	0.98	1.00	0.95	0.99	1.00
Satd. Flow (perm)	123	3438		126	3462		1633	1690	1553	1665	1766	1482
Peak-hour factor, PHF	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Adj. Flow (vph)	146	1069	233	108	1254	30	436	221	181	250	182	182
RTOR Reduction (vph)	0	12	0	0	1	0	0	0	51	0	0	52
Lane Group Flow (vph)	146	1290	0	108	1283	0	323	334	130	212	220	130
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	3%	1%	9%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5
Permitted Phases	2			6								
Actuated Green, G (s)	67.6	57.2		64.8	55.8		29.6	29.6	38.6	20.2	20.2	36.6
Effective Green, g (s)	67.6	57.2		64.8	55.8		29.6	29.6	38.6	20.2	20.2	36.6
Actuated g/C Ratio	0.48	0.41		0.46	0.40		0.21	0.21	0.28	0.14	0.14	0.26
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	174	1404		157	1379		345	357	428	240	254	387
v/s Ratio Prot	c0.06	c0.38		0.04	0.37		c0.20	0.20	0.08	c0.13	0.12	0.09
v/s Ratio Perm	0.34			0.27								
v/c Ratio	0.84	0.92		0.69	0.93		0.94	0.94	0.30	0.88	0.87	0.34
Uniform Delay, d1	35.4	39.2		29.9	40.2		54.3	54.3	40.1	58.7	58.6	41.9
Progression Factor	0.83	1.16		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.9	10.1		9.6	12.5		31.8	31.0	0.1	28.8	24.4	0.2
Delay (s)	54.5	55.8		39.5	52.7		86.0	85.2	40.2	87.5	83.0	42.1
Level of Service	D	E		D	D		F	F	D	F	F	D
Approach Delay (s)		55.6			51.7			75.8			72.4	
Approach LOS		E			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			60.7				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			81.0%			ICU Level of Service		D				
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Sportsplex & US 290

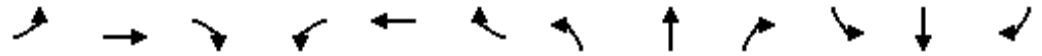
Heritage TIA
Existing AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1240	0	0	1141	480	0	0	0	131	0	47
Future Volume (vph)	30	1240	0	0	1141	480	0	0	0	131	0	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	1000		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt					0.951							0.883
Flt Protected	0.950									0.950	0.989	
Satd. Flow (prot)	1805	3505	0	1900	3279	0	0	1900	0	1715	1517	0
Flt Permitted	0.087									0.950	0.989	
Satd. Flow (perm)	165	3505	0	1900	3279	0	0	1900	0	1715	1517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					70							160
Link Speed (mph)		45			45			30				30
Link Distance (ft)		3195			3012			166				1615
Travel Time (s)		48.4			45.6			3.8				36.7
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Adj. Flow (vph)	34	1409	0	0	1189	578	0	0	0	147	0	87
Shared Lane Traffic (%)										17%		
Lane Group Flow (vph)	34	1409	0	0	1767	0	0	0	0	122	112	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA					Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Existing AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6							
Detector Phase	5	2			1	6	3		3	4	4	
Switch Phase												
Minimum Initial (s)	5.0	12.0			5.0	12.0	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	18.0			11.0	25.0	30.5		30.5	30.5	30.5	30.5
Total Split (s)	28.0	79.0			11.0	62.0	12.0		12.0	38.0	38.0	
Total Split (%)	20.0%	56.4%			7.9%	44.3%	8.6%		8.6%	27.1%	27.1%	
Maximum Green (s)	22.0	73.0			5.0	56.0	6.5		6.5	32.5	32.5	
Yellow Time (s)	4.5	4.5			4.5	4.5	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.5	1.5			1.5	1.5	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0			5.5	5.5	5.5	
Lead/Lag	Lead	Lag			Lead	Lag	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0	2.0	
Recall Mode	None	C-Max			None	C-Max	None		None	None	None	
Walk Time (s)					7.0		7.0		7.0	7.0	7.0	
Flash Dont Walk (s)					12.0		18.0		18.0	18.0	18.0	
Pedestrian Calls (#/hr)					0		0		0	0	0	
Act Effct Green (s)	114.1	114.1			107.3					14.4	14.4	
Actuated g/C Ratio	0.82	0.82			0.77					0.10	0.10	
v/c Ratio	0.17	0.49			0.70					0.69	0.37	
Control Delay	4.1	3.1			5.3					80.0	5.5	
Queue Delay	0.0	0.0			0.0					0.0	0.0	
Total Delay	4.1	3.1			5.3					80.0	5.5	
LOS	A	A			A					E	A	
Approach Delay	3.1				5.3					44.3		
Approach LOS	A				A					D		

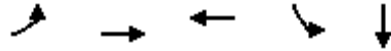
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 7.0
 Intersection LOS: A
 Intersection Capacity Utilization 61.5%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290



Lane Group	EBL	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	34	1409	1767	122	112
v/c Ratio	0.17	0.49	0.70	0.69	0.37
Control Delay	4.1	3.1	5.3	80.0	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	3.1	5.3	80.0	5.5
Queue Length 50th (ft)	4	102	126	114	0
Queue Length 95th (ft)	m9	114	m164	177	16
Internal Link Dist (ft)		3115	2932		1535
Turn Bay Length (ft)	100			1000	
Base Capacity (vph)	392	2856	2529	398	475
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.49	0.70	0.31	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Sportsplex & US 290

Heritage TIA
Existing AM



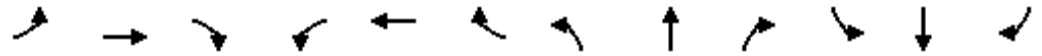
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕		↖	↗	
Traffic Volume (vph)	30	1240	0	0	1141	480	0	0	0	131	0	47
Future Volume (vph)	30	1240	0	0	1141	480	0	0	0	131	0	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0					5.5	5.5	
Lane Util. Factor	1.00	0.95			0.95					0.95	0.95	
Frt	1.00	1.00			0.95					1.00	0.88	
Flt Protected	0.95	1.00			1.00					0.95	0.99	
Satd. Flow (prot)	1805	3505			3278					1715	1518	
Flt Permitted	0.09	1.00			1.00					0.95	0.99	
Satd. Flow (perm)	166	3505			3278					1715	1518	
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Adj. Flow (vph)	34	1409	0	0	1189	578	0	0	0	147	0	87
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	0	0	100	0
Lane Group Flow (vph)	34	1409	0	0	1749	0	0	0	0	122	12	0
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA					Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6								
Actuated Green, G (s)	114.1	114.1			104.9					14.4	14.4	
Effective Green, g (s)	114.1	114.1			104.9					14.4	14.4	
Actuated g/C Ratio	0.81	0.81			0.75					0.10	0.10	
Clearance Time (s)	6.0	6.0			6.0					5.5	5.5	
Vehicle Extension (s)	2.0	2.0			2.0					2.0	2.0	
Lane Grp Cap (vph)	172	2856			2456					176	156	
v/s Ratio Prot	0.00	c0.40			c0.53					c0.07	0.01	
v/s Ratio Perm	0.16											
v/c Ratio	0.20	0.49			0.71					0.69	0.07	
Uniform Delay, d1	8.3	4.0			9.4					60.7	56.8	
Progression Factor	0.74	0.58			0.47					1.00	1.00	
Incremental Delay, d2	0.2	0.6			0.8					9.1	0.1	
Delay (s)	6.3	2.9			5.2					69.8	56.8	
Level of Service	A	A			A					E	E	
Approach Delay (s)		2.9			5.2			0.0			63.6	
Approach LOS		A			A			A			E	

Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
Existing AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	42	1	1	17	4	3	2	572	13	5	572	115
Future Volume (vph)	42	1	1	17	4	3	2	572	13	5	572	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.964			0.996			0.976	
Flt Protected		0.959			0.973		0.950			0.950		
Satd. Flow (prot)	0	1804	0	0	1782	0	1805	1801	0	1805	1789	0
Flt Permitted		0.959			0.973		0.950			0.950		
Satd. Flow (perm)	0	1804	0	0	1782	0	1805	1801	0	1805	1789	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			1015			342	
Travel Time (s)		14.1			35.6			15.4			5.2	
Peak Hour Factor	0.89	0.25	0.25	0.67	0.50	0.25	0.50	0.80	0.60	0.63	0.77	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	8%	0%	4%	2%
Adj. Flow (vph)	47	4	4	25	8	12	4	715	22	8	743	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	45	0	4	737	0	8	887	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	47.1%						ICU Level of Service A					
Analysis Period (min)	15											











Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	42	1	1	17	4	3	2	572	13	5	572	115
Future Vol, veh/h	42	1	1	17	4	3	2	572	13	5	572	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	25	25	67	50	25	50	80	60	63	77	80
Heavy Vehicles, %	0	0	0	0	0	0	0	5	8	0	4	2
Mvmt Flow	47	4	4	25	8	12	4	715	22	8	743	144

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1575	1576	815	1495	1493	726	743	0	0	737	0	0
Stage 1	831	831	-	734	734	-	-	-	-	-	-	-
Stage 2	744	745	-	761	759	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	90	111	381	102	124	428	873	-	-	878	-	-
Stage 1	367	387	-	415	429	-	-	-	-	-	-	-
Stage 2	410	424	-	401	418	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	82	109	381	97	122	428	873	-	-	878	-	-
Mov Cap-2 Maneuver	82	109	-	97	122	-	-	-	-	-	-	-
Stage 1	365	384	-	413	427	-	-	-	-	-	-	-
Stage 2	389	422	-	389	414	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	94.4		47.8		0		0.1	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	873	-	-	90	128	878	-
HCM Lane V/C Ratio	0.005	-	-	0.613	0.354	0.009	-
HCM Control Delay (s)	9.1	-	-	94.4	47.8	9.1	-
HCM Lane LOS	A	-	-	F	E	A	-
HCM 95th %tile Q(veh)	0	-	-	2.9	1.4	0	-

Lanes, Volumes, Timings
4: RR 12 & Brookside

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	5	606	5	5	688
Future Volume (vph)	19	5	606	5	5	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	50	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.966		0.999			
Flt Protected	0.964				0.950	
Satd. Flow (prot)	1580	0	1775	0	1805	1776
Flt Permitted	0.964				0.950	
Satd. Flow (perm)	1580	0	1775	0	1805	1776
Link Speed (mph)	25		45			45
Link Distance (ft)	1288		342			958
Travel Time (s)	35.1		5.2			14.5
Peak Hour Factor	0.53	0.42	0.77	0.63	0.42	0.91
Heavy Vehicles (%)	16%	0%	7%	0%	0%	7%
Adj. Flow (vph)	36	12	787	8	12	756
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	795	0	12	756
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	46.2%		ICU Level of Service A			
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑		↘↗	↑
Traffic Vol, veh/h	19	5	606	5	5	688
Future Vol, veh/h	19	5	606	5	5	688
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	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	42	77	63	42	91
Heavy Vehicles, %	16	0	7	0	0	7
Mvmt Flow	36	12	787	8	12	756

















Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1571	791	0	0	795
Stage 1	791	-	-	-	-
Stage 2	780	-	-	-	-
Critical Hdwy	6.56	6.2	-	-	4.1
Critical Hdwy Stg 1	5.56	-	-	-	-
Critical Hdwy Stg 2	5.56	-	-	-	-
Follow-up Hdwy	3.644	3.3	-	-	2.2
Pot Cap-1 Maneuver	113	393	-	-	835
Stage 1	423	-	-	-	-
Stage 2	428	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	111	393	-	-	835
Mov Cap-2 Maneuver	243	-	-	-	-
Stage 1	423	-	-	-	-
Stage 2	422	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	835
HCM Lane V/C Ratio	-	-	0.178	0.014
HCM Control Delay (s)	-	-	21.2	9.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.6	0

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
Existing AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	123	1	6	514	8	1	0	1	4	0	3
Future Volume (vph)	9	123	1	6	514	8	1	0	1	4	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.997			0.932			0.932	
Flt Protected		0.995			0.999			0.976			0.976	
Satd. Flow (prot)	0	1808	0	0	1841	0	0	1728	0	0	1536	0
Flt Permitted		0.995			0.999			0.976			0.976	
Satd. Flow (perm)	0	1808	0	0	1841	0	0	1728	0	0	1536	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		229			479			221			1309	
Travel Time (s)		5.2			10.9			5.0			29.8	
Peak Hour Factor	0.45	0.72	0.25	0.50	0.83	0.50	0.25	0.92	0.25	0.50	0.92	0.38
Heavy Vehicles (%)	33%	1%	0%	0%	1%	75%	0%	0%	0%	25%	0%	0%
Adj. Flow (vph)	20	171	4	12	619	16	4	0	4	8	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	195	0	0	647	0	0	8	0	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.1%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	123	1	6	514	8	1	0	1	4	0	3
Future Vol, veh/h	9	123	1	6	514	8	1	0	1	4	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	72	25	50	83	50	25	92	25	50	92	38
Heavy Vehicles, %	33	1	0	0	1	75	0	0	0	25	0	0
Mvmt Flow	20	171	4	12	619	16	4	0	4	8	0	8

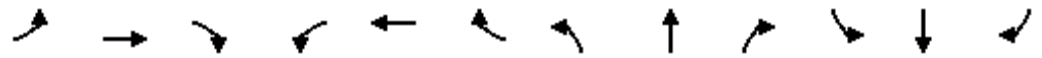
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	635	0	0	175	0	0	868	872	173	866	866	627
Stage 1	-	-	-	-	-	-	213	213	-	651	651	-
Stage 2	-	-	-	-	-	-	655	659	-	215	215	-
Critical Hdwy	4.43	-	-	4.1	-	-	7.1	6.5	6.2	7.35	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Follow-up Hdwy	2.497	-	-	2.2	-	-	3.5	4	3.3	3.725	4	3.3
Pot Cap-1 Maneuver	816	-	-	1414	-	-	275	291	876	250	293	487
Stage 1	-	-	-	-	-	-	794	730	-	421	468	-
Stage 2	-	-	-	-	-	-	458	464	-	738	729	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	816	-	-	1414	-	-	262	279	876	241	281	487
Mov Cap-2 Maneuver	-	-	-	-	-	-	262	279	-	241	281	-
Stage 1	-	-	-	-	-	-	773	710	-	410	462	-
Stage 2	-	-	-	-	-	-	445	458	-	715	709	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1			0.1			14.1			16.8		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	403	816	-	-	1414	-	-	322
HCM Lane V/C Ratio	0.02	0.025	-	-	0.008	-	-	0.049
HCM Control Delay (s)	14.1	9.5	0	-	7.6	0	-	16.8
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.2

Lanes, Volumes, Timings
6: Roger Hanks & US 290

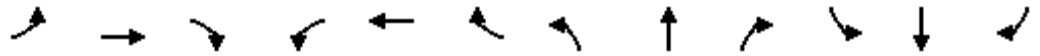
Heritage TIA
Existing AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1076	22	19	938	56	24	9	32	78	2	36
Future Volume (vph)	30	1076	22	19	938	56	24	9	32	78	2	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.990				0.850		0.858	
Flt Protected	0.950			0.950				0.964		0.950		
Satd. Flow (prot)	1752	3299	0	1719	3265	0	0	1684	1429	1703	986	0
Flt Permitted	0.195			0.188				0.964		0.950		
Satd. Flow (perm)	360	3299	0	340	3265	0	0	1684	1429	1703	986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			6				168		72	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Adj. Flow (vph)	48	1170	28	28	1066	76	36	12	56	88	4	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	1198	0	28	1142	0	0	48	56	88	76	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
Existing AM

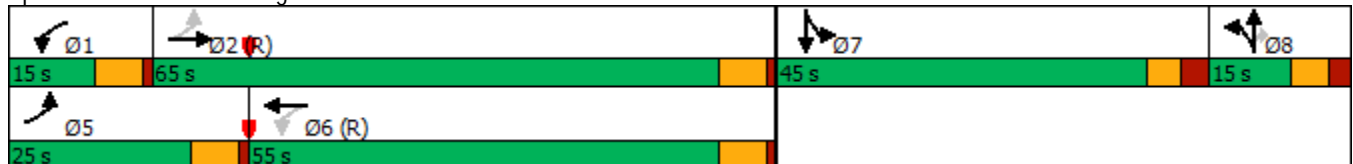


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6				8				
Detector Phase	5	2		1	6		8	8	8	7	7	
Switch Phase												
Minimum Initial (s)	5.0	12.0		5.0	12.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	31.0		11.0	24.0		33.5	33.5	33.5	24.5	24.5	
Total Split (s)	25.0	65.0		15.0	55.0		15.0	15.0	15.0	45.0	45.0	
Total Split (%)	17.9%	46.4%		10.7%	39.3%		10.7%	10.7%	10.7%	32.1%	32.1%	
Maximum Green (s)	19.0	59.0		9.0	49.0		8.5	8.5	8.5	38.5	38.5	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.5	2.5	2.5	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Walk Time (s)		7.0					7.0	7.0	7.0			
Flash Dont Walk (s)		18.0					20.0	20.0	20.0			
Pedestrian Calls (#/hr)		0					0	0	0			
Act Effct Green (s)	100.0	96.2		98.0	93.6			8.5	8.5	11.7	11.7	
Actuated g/C Ratio	0.71	0.69		0.70	0.67			0.06	0.06	0.08	0.08	
v/c Ratio	0.15	0.53		0.10	0.52			0.48	0.23	0.62	0.51	
Control Delay	8.0	14.3		8.9	23.7			77.8	2.2	80.1	26.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	8.0	14.3		8.9	23.7			77.8	2.2	80.1	26.3	
LOS	A	B		A	C			E	A	F	C	
Approach Delay		14.0			23.3			37.1			55.2	
Approach LOS		B			C			D			E	

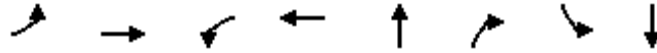
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 33 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 21.5
 Intersection LOS: C
 Intersection Capacity Utilization 54.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290



Queues
6: Roger Hanks & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1198	28	1142	48	56	88	76
v/c Ratio	0.15	0.53	0.10	0.52	0.48	0.23	0.62	0.51
Control Delay	8.0	14.3	8.9	23.7	77.8	2.2	80.1	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	14.3	8.9	23.7	77.8	2.2	80.1	26.3
Queue Length 50th (ft)	11	303	8	462	43	0	79	3
Queue Length 95th (ft)	20	443	m16	563	71	0	132	2
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	454	2267	333	2184	114	253	468	323
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.53	0.08	0.52	0.42	0.22	0.19	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Roger Hanks & US 290























Heritage TIA
Existing AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1076	22	19	938	56	24	9	32	78	2	36
Future Volume (vph)	30	1076	22	19	938	56	24	9	32	78	2	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3300		1719	3265			1684	1429	1703	986	
Flt Permitted	0.20	1.00		0.19	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (perm)	360	3300		340	3265			1684	1429	1703	986	
Peak-hour factor, PHF	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Adj. Flow (vph)	48	1170	28	28	1066	76	36	12	56	88	4	72
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	53	0	66	0
Lane Group Flow (vph)	48	1197	0	28	1140	0	0	48	3	88	10	0
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases	2			6					8			
Actuated Green, G (s)	97.2	92.4		94.4	91.0			7.5	7.5	11.7	11.7	
Effective Green, g (s)	97.2	92.4		94.4	91.0			7.5	7.5	11.7	11.7	
Actuated g/C Ratio	0.69	0.66		0.67	0.65			0.05	0.05	0.08	0.08	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	297	2178		262	2122			90	76	142	82	
v/s Ratio Prot	c0.01	c0.36		0.00	0.35			c0.03		c0.05	0.01	
v/s Ratio Perm	0.11			0.07					0.00			
v/c Ratio	0.16	0.55		0.11	0.54			0.53	0.04	0.62	0.12	
Uniform Delay, d1	8.3	12.7		8.8	13.2			64.5	62.8	62.0	59.4	
Progression Factor	1.00	1.00		1.18	1.61			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.0		0.0	0.7			3.0	0.1	5.6	0.2	
Delay (s)	8.4	13.7		10.4	22.0			67.6	62.9	67.6	59.6	
Level of Service	A	B		B	C			E	E	E	E	
Approach Delay (s)		13.5			21.7			65.1			63.9	
Approach LOS		B			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			22.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			25.0			
Intersection Capacity Utilization			54.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

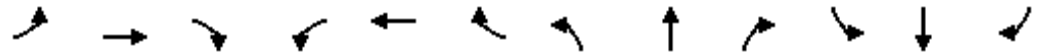
Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Existing PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	927	181	183	844	22	228	162	167	308	268	95
Future Volume (vph)	151	927	181	183	844	22	228	162	167	308	268	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	250		0	130		130	70		130
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Frt		0.969			0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.990		0.950	0.994	
Satd. Flow (prot)	1719	3332	0	1787	3449	0	1665	1749	1583	1698	1761	1495
Flt Permitted	0.119			0.073			0.950	0.990		0.950	0.994	
Satd. Flow (perm)	215	3332	0	137	3449	0	1665	1749	1583	1698	1761	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			4				70			70
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3012			2872			679			2605	
Travel Time (s)		45.6			43.5			10.3			39.5	
Peak Hour Factor	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Heavy Vehicles (%)	5%	5%	5%	1%	4%	5%	3%	2%	2%	1%	2%	8%
Adj. Flow (vph)	199	997	259	215	1005	44	259	178	223	358	288	117
Shared Lane Traffic (%)							17%			12%		
Lane Group Flow (vph)	199	1256	0	215	1049	0	215	222	223	315	331	117
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5

Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Existing PM

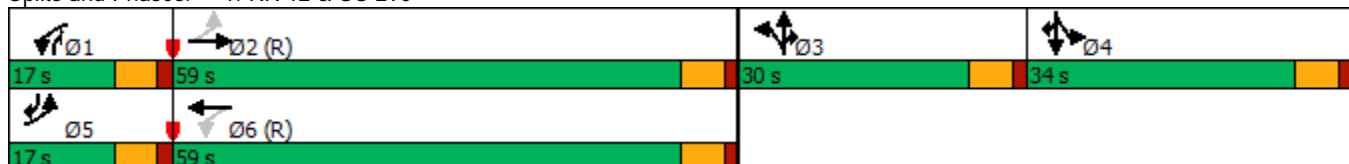


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6									
Detector Phase	5	2	1		6	3		3	3 1	4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0		15.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.0	26.0	11.0		26.0	28.0		28.0	28.0		28.0	28.0
Total Split (s)	17.0	59.0	17.0		59.0	30.0		30.0	34.0		34.0	
Total Split (%)	12.1%	42.1%	12.1%		42.1%	21.4%		21.4%	24.3%		24.3%	
Maximum Green (s)	11.0	53.0	11.0		53.0	24.0		24.0	28.0		28.0	
Yellow Time (s)	4.5	4.5	4.5		4.5	4.5		4.5	4.5		4.5	
All-Red Time (s)	1.5	1.5	1.5		1.5	1.5		1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0		6.0	6.0		6.0	
Lead/Lag	Lead	Lag	Lead		Lag	Lead		Lead	Lag		Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	2.0		2.0	
Recall Mode	None	C-Max	None		C-Max	None		None	None		None	
Walk Time (s)	7.0		7.0		7.0		7.0		7.0		7.0	
Flash Dont Walk (s)	13.0		13.0		15.0		15.0		15.0		15.0	
Pedestrian Calls (#/hr)	0		0		0		0		0		0	
Act Effct Green (s)	64.9	53.0	67.9		54.8	21.1		21.1	34.8	28.2	28.2	46.1
Actuated g/C Ratio	0.46	0.38	0.48		0.39	0.15		0.15	0.25	0.20	0.20	0.33
v/c Ratio	0.88	0.98	0.94		0.78	0.86		0.84	0.50	0.92	0.93	0.22
Control Delay	51.8	60.6	84.8		42.4	87.3		84.5	20.3	86.9	88.2	15.9
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	60.6	84.8		42.4	87.3		84.5	20.3	86.9	88.2	15.9
LOS	D	E	F		D	F		F	C	F	F	B
Approach Delay	59.4		49.6		63.7		76.6					
Approach LOS	E		D		E		E					

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 60.3
 Intersection LOS: E
 Intersection Capacity Utilization 87.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: RR 12 & US 290

































Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	199	1256	215	1049	215	222	223	315	331	117
v/c Ratio	0.88	0.98	0.94	0.78	0.86	0.84	0.50	0.92	0.93	0.22
Control Delay	51.8	60.6	84.8	42.4	87.3	84.5	20.3	86.9	88.2	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	60.6	84.8	42.4	87.3	84.5	20.3	86.9	88.2	15.9
Queue Length 50th (ft)	140	572	~175	444	201	206	70	295	312	30
Queue Length 95th (ft)	m#164	#741	#311	481	#307	#320	90	#453	#514	65
Internal Link Dist (ft)		2932		2792		599			2525	
Turn Bay Length (ft)	300		250		130		130	70		130
Base Capacity (vph)	227	1278	228	1353	285	299	477	348	361	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.98	0.94	0.78	0.75	0.74	0.47	0.91	0.92	0.22

Intersection Summary

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

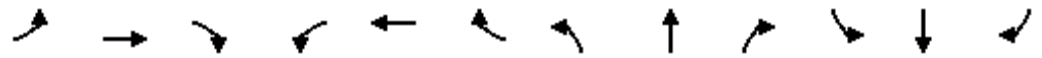
HCM Signalized Intersection Capacity Analysis
1: RR 12 & US 290

Heritage TIA
Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 		 	 	 
Traffic Volume (vph)	151	927	181	183	844	22	228	162	167	308	268	95
Future Volume (vph)	151	927	181	183	844	22	228	162	167	308	268	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1719	3332		1787	3448		1665	1749	1583	1698	1760	1495
Flt Permitted	0.12	1.00		0.07	1.00		0.95	0.99	1.00	0.95	0.99	1.00
Satd. Flow (perm)	215	3332		137	3448		1665	1749	1583	1698	1760	1495
Peak-hour factor, PHF	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Adj. Flow (vph)	199	997	259	215	1005	44	259	178	223	358	288	117
RTOR Reduction (vph)	0	17	0	0	2	0	0	0	53	0	0	47
Lane Group Flow (vph)	199	1239	0	215	1047	0	215	222	170	315	331	70
Heavy Vehicles (%)	5%	5%	5%	1%	4%	5%	3%	2%	2%	1%	2%	8%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5
Permitted Phases	2			6								
Actuated Green, G (s)	64.9	53.0		68.5	54.8		21.1	21.1	34.8	28.2	28.2	46.1
Effective Green, g (s)	64.9	53.0		68.5	54.8		21.1	21.1	34.8	28.2	28.2	46.1
Actuated g/C Ratio	0.46	0.38		0.49	0.39		0.15	0.15	0.25	0.20	0.20	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	227	1261		228	1349		250	263	393	342	354	492
v/s Ratio Prot	0.07	c0.37		c0.09	0.30		c0.13	0.13	0.11	0.19	c0.19	0.05
v/s Ratio Perm	0.33			0.37								
v/c Ratio	0.88	0.98		0.94	0.78		0.86	0.84	0.43	0.92	0.94	0.14
Uniform Delay, d1	28.1	43.0		42.1	37.2		58.0	57.8	44.3	54.8	55.0	33.0
Progression Factor	1.01	1.05		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.6	16.8		43.3	4.4		23.5	20.4	0.3	29.0	31.0	0.0
Delay (s)	48.9	61.9		85.4	41.7		81.5	78.3	44.6	83.8	86.0	33.1
Level of Service	D	E		F	D		F	E	D	F	F	C
Approach Delay (s)		60.1			49.1			68.0			77.0	
Approach LOS		E			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			61.1				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			87.7%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Sportsplex & US 290

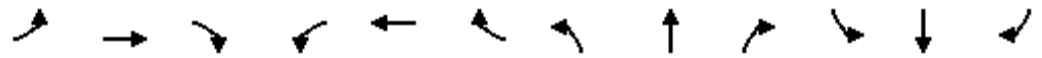
Heritage TIA
Existing PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1171	6	6	1113	161	1	0	1	402	0	30
Future Volume (vph)	27	1171	6	6	1113	161	1	0	1	402	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	1000		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999			0.972			0.932			0.976	
Flt Protected	0.950			0.950				0.976		0.950	0.960	
Satd. Flow (prot)	1805	3422	0	1203	3453	0	0	1728	0	1649	1636	0
Flt Permitted	0.050			0.077				0.976		0.950	0.960	
Satd. Flow (perm)	95	3422	0	98	3453	0	0	1728	0	1649	1636	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			30			160			160	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		3195			3012			166			1615	
Travel Time (s)		48.4			45.6			3.8			36.7	
Peak Hour Factor	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Heavy Vehicles (%)	0%	5%	83%	50%	2%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	52	1541	8	16	1357	310	4	0	4	648	0	56
Shared Lane Traffic (%)										45%		
Lane Group Flow (vph)	52	1549	0	16	1667	0	0	8	0	356	348	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Existing PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6							
Detector Phase	5	2			1	6	3		3	4		4
Switch Phase												
Minimum Initial (s)	5.0	12.0			5.0	12.0	5.0		5.0	5.0		5.0
Minimum Split (s)	11.0	18.0			11.0	25.0	30.5		30.5	30.5		30.5
Total Split (s)	18.0	87.0			11.0	80.0	12.0		12.0	30.0		30.0
Total Split (%)	12.9%	62.1%			7.9%	57.1%	8.6%		8.6%	21.4%		21.4%
Maximum Green (s)	12.0	81.0			5.0	74.0	6.5		6.5	24.5		24.5
Yellow Time (s)	4.5	4.5			4.5	4.5	4.0		4.0	4.0		4.0
All-Red Time (s)	1.5	1.5			1.5	1.5	1.5		1.5	1.5		1.5
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0			6.0	6.0			5.5	5.5		5.5
Lead/Lag	Lead	Lag			Lead	Lag	Lead		Lead	Lag		Lag
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	C-Max			None	C-Max	None		None	None		None
Walk Time (s)						7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)						12.0	18.0		18.0	18.0		18.0
Pedestrian Calls (#/hr)						0	0		0	0		0
Act Effct Green (s)	90.4	87.6			86.1	82.1	5.0		5.0	34.4		34.4
Actuated g/C Ratio	0.65	0.63			0.62	0.59	0.04		0.04	0.25		0.25
v/c Ratio	0.39	0.72			0.16	0.82	0.04		0.04	0.88		0.67
Control Delay	21.5	36.6			7.5	13.1	0.5		0.5	73.8		32.6
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	21.5	36.6			7.5	13.1	0.5		0.5	73.8		32.6
LOS	C	D			A	B	A		A	E		C
Approach Delay	36.1				13.0		0.5				53.5	
Approach LOS	D				B		A				D	

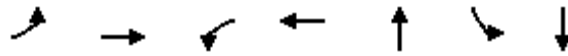
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 46 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 29.4
 Intersection LOS: C
 Intersection Capacity Utilization 64.2%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	52	1549	16	1667	8	356	348
v/c Ratio	0.39	0.72	0.16	0.82	0.04	0.88	0.67
Control Delay	21.5	36.6	7.5	13.1	0.5	73.8	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	36.6	7.5	13.1	0.5	73.8	32.6
Queue Length 50th (ft)	29	707	2	632	0	323	161
Queue Length 95th (ft)	27	707	2	406	0	#328	#338
Internal Link Dist (ft)		3115		2932	86		1535
Turn Bay Length (ft)	100		100			1000	
Base Capacity (vph)	209	2141	99	2037	232	404	522
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.72	0.16	0.82	0.03	0.88	0.67

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Sportsplex & US 290

Heritage TIA
Existing PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1171	6	6	1113	161	1	0	1	402	0	30
Future Volume (vph)	27	1171	6	6	1113	161	1	0	1	402	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		0.95	0.95	
Frt	1.00	1.00		1.00	0.97			0.93		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	0.96	
Satd. Flow (prot)	1805	3422		1203	3453			1729		1649	1636	
Flt Permitted	0.05	1.00		0.08	1.00			0.98		0.95	0.96	
Satd. Flow (perm)	95	3422		97	3453			1729		1649	1636	
Peak-hour factor, PHF	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Adj. Flow (vph)	52	1541	8	16	1357	310	4	0	4	648	0	56
RTOR Reduction (vph)	0	0	0	0	14	0	0	8	0	0	121	0
Lane Group Flow (vph)	52	1549	0	16	1653	0	0	0	0	356	227	0
Heavy Vehicles (%)	0%	5%	83%	50%	2%	0%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6								
Actuated Green, G (s)	84.7	79.6		78.5	76.5			1.0		34.4	34.4	
Effective Green, g (s)	84.7	79.6		78.5	76.5			1.0		34.4	34.4	
Actuated g/C Ratio	0.61	0.57		0.56	0.55			0.01		0.25	0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	119	1945		70	1886			12		405	401	
v/s Ratio Prot	c0.02	c0.45		0.00	c0.48			c0.00		c0.22	0.14	
v/s Ratio Perm	0.25			0.12								
v/c Ratio	0.44	0.80		0.23	0.88			0.00		0.88	0.57	
Uniform Delay, d1	25.2	23.8		20.2	27.6			69.0		50.8	46.3	
Progression Factor	1.40	1.82		0.54	0.42			1.00		1.00	1.00	
Incremental Delay, d2	0.8	2.9		0.5	5.0			0.1		18.5	1.1	
Delay (s)	35.9	46.2		11.3	16.6			69.1		69.3	47.4	
Level of Service	D	D		B	B			E		E	D	
Approach Delay (s)		45.9			16.6			69.1			58.4	
Approach LOS		D			B			E			E	

Intersection Summary

HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
Existing PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	79	3	4	11	3	4	5	581	22	6	605	97
Future Volume (vph)	79	3	4	11	3	4	5	581	22	6	605	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.951			0.990			0.978	
Flt Protected		0.960			0.975		0.950			0.950		
Satd. Flow (prot)	0	1800	0	0	1762	0	1805	1847	0	1805	1837	0
Flt Permitted		0.960			0.975		0.950			0.950		
Satd. Flow (perm)	0	1800	0	0	1762	0	1805	1847	0	1805	1837	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			1002			342	
Travel Time (s)		14.1			35.6			15.2			5.2	
Peak Hour Factor	0.73	0.38	0.33	0.63	0.75	0.33	0.42	0.94	0.50	0.50	0.86	0.78
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	2%
Adj. Flow (vph)	108	8	12	17	4	12	12	618	44	12	703	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	128	0	0	33	0	12	662	0	12	827	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.2%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Int Delay, s/veh	16.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	79	3	4	11	3	4	5	581	22	6	605	97
Future Vol, veh/h	79	3	4	11	3	4	5	581	22	6	605	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	38	33	63	75	33	42	94	50	50	86	78
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	2
Mvmt Flow	108	8	12	17	4	12	12	618	44	12	703	124











Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1461	1475	765	1395	1391	640	703	0	0	662	0	0
Stage 1	789	789	-	664	664	-	-	-	-	-	-	-
Stage 2	672	686	-	731	727	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 108	128	406	120	143	479	904	-	-	936	-	-
Stage 1	387	405	-	453	461	-	-	-	-	-	-	-
Stage 2	449	451	-	416	432	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 101	125	406	109	139	479	904	-	-	936	-	-
Mov Cap-2 Maneuver	~ 101	125	-	109	139	-	-	-	-	-	-	-
Stage 1	382	400	-	447	455	-	-	-	-	-	-	-
Stage 2	428	445	-	391	426	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	206.8		34.1		0.2		0.1	
HCM LOS	F		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	904	-	-	111	157	936	-
HCM Lane V/C Ratio	0.013	-	-	1.155	0.214	0.013	-
HCM Control Delay (s)	9	-	-	206.8	34.1	8.9	-
HCM Lane LOS	A	-	-	F	D	A	-
HCM 95th %tile Q(veh)	0	-	-	8.1	0.8	0	-

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

Lanes, Volumes, Timings
4: RR 12 & Brookside

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	695	19	3	740
Future Volume (vph)	9	6	695	19	3	740
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	50	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932		0.995			
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1638	0	1813	0	1805	1827
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1638	0	1813	0	1805	1827
Link Speed (mph)	25		45			45
Link Distance (ft)	1288		342			958
Travel Time (s)	35.1		5.2			14.5
Peak Hour Factor	0.75	0.50	0.93	0.68	0.38	0.89
Heavy Vehicles (%)	11%	0%	4%	11%	0%	4%
Adj. Flow (vph)	12	12	747	28	8	831
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	775	0	8	831
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.9%			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	9	6	695	19	3	740
Future Vol, veh/h	9	6	695	19	3	740
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	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	50	93	68	38	89
Heavy Vehicles, %	11	0	4	11	0	4
Mvmt Flow	12	12	747	28	8	831

















Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1608	761	0	0	775
Stage 1	761	-	-	-	-
Stage 2	847	-	-	-	-
Critical Hdwy	6.51	6.2	-	-	4.1
Critical Hdwy Stg 1	5.51	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-
Follow-up Hdwy	3.599	3.3	-	-	2.2
Pot Cap-1 Maneuver	110	409	-	-	850
Stage 1	446	-	-	-	-
Stage 2	406	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	109	409	-	-	850
Mov Cap-2 Maneuver	243	-	-	-	-
Stage 1	446	-	-	-	-
Stage 2	402	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	305	850
HCM Lane V/C Ratio	-	-	0.079	0.009
HCM Control Delay (s)	-	-	17.8	9.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
Existing PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	347	9	16	196	68	5	2	18	3	1	2
Future Volume (vph)	13	347	9	16	196	68	5	2	18	3	1	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.953			0.905			0.955	
Flt Protected		0.998			0.998			0.990			0.984	
Satd. Flow (prot)	0	1822	0	0	1767	0	0	1702	0	0	1785	0
Flt Permitted		0.998			0.998			0.990			0.984	
Satd. Flow (perm)	0	1822	0	0	1767	0	0	1702	0	0	1785	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		229			479			221			1309	
Travel Time (s)		5.2			10.9			5.0			29.8	
Peak Hour Factor	0.54	0.59	0.75	0.80	0.65	0.40	0.63	0.50	0.64	0.75	0.25	0.50
Heavy Vehicles (%)	0%	4%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	24	588	12	20	302	170	8	4	28	4	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	624	0	0	492	0	0	40	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.8%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	347	9	16	196	68	5	2	18	3	1	2
Future Vol, veh/h	13	347	9	16	196	68	5	2	18	3	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	59	75	80	65	40	63	50	64	75	25	50
Heavy Vehicles, %	0	4	0	0	2	3	0	0	0	0	0	0
Mvmt Flow	24	588	12	20	302	170	8	4	28	4	4	4

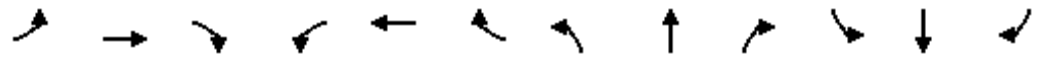
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	472	0	0	600	0	0	1073	1154	594	1085	1075	387
Stage 1	-	-	-	-	-	-	642	642	-	427	427	-
Stage 2	-	-	-	-	-	-	431	512	-	658	648	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1100	-	-	987	-	-	200	199	509	196	221	665
Stage 1	-	-	-	-	-	-	466	472	-	610	589	-
Stage 2	-	-	-	-	-	-	607	540	-	457	469	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1100	-	-	987	-	-	187	187	509	174	208	665
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	187	-	174	208	-
Stage 1	-	-	-	-	-	-	451	456	-	590	573	-
Stage 2	-	-	-	-	-	-	582	525	-	414	454	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.4			17.2			20.2		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	336	1100	-	-	987	-	-	249
HCM Lane V/C Ratio	0.119	0.022	-	-	0.02	-	-	0.048
HCM Control Delay (s)	17.2	8.3	0	-	8.7	0	-	20.2
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	0.2

Lanes, Volumes, Timings
6: Roger Hanks & US 290

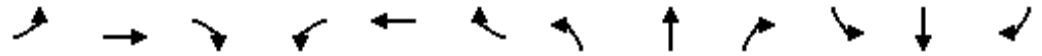
Heritage TIA
Existing PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	980	62	38	1102	53	20	0	24	91	20	27
Future Volume (vph)	29	980	62	38	1102	53	20	0	24	91	20	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.992				0.850		0.916	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1805	3268	0	1805	3386	0	0	1805	1553	1597	1605	0
Flt Permitted	0.156			0.141				0.950		0.950		
Satd. Flow (perm)	296	3268	0	268	3386	0	0	1805	1553	1597	1605	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			7				121		36	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Heavy Vehicles (%)	0%	10%	0%	0%	6%	2%	0%	0%	4%	13%	0%	15%
Adj. Flow (vph)	60	1241	103	56	1211	72	32	0	32	157	28	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	1344	0	56	1283	0	0	32	32	157	64	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
Existing PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6				8					
Detector Phase	5	2	1		6	8		8	8	7	7	
Switch Phase												
Minimum Initial (s)	5.0	12.0	5.0		12.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	31.0	11.0		18.0	33.5		33.5	33.5	11.5	11.5	
Total Split (s)	16.0	80.0	16.0		80.0	22.0		22.0	22.0	22.0	22.0	22.0
Total Split (%)	11.4%	57.1%	11.4%		57.1%	15.7%		15.7%	15.7%	15.7%	15.7%	15.7%
Maximum Green (s)	10.0	74.0	10.0		74.0	15.5		15.5	15.5	15.5	15.5	15.5
Yellow Time (s)	5.0	5.0	5.0		5.0	4.0		4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	2.5		2.5	2.5	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.5		6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	None		C-Max	None		None	None	None	None	None
Walk Time (s)	7.0						7.0	7.0	7.0			
Flash Dont Walk (s)	18.0						20.0	20.0	20.0			
Pedestrian Calls (#/hr)	0						0	0	0			
Act Effct Green (s)	96.4	91.4	96.2		91.3	7.1		7.1	15.1	15.1		
Actuated g/C Ratio	0.69	0.65	0.69		0.65	0.05		0.05	0.11	0.11		
v/c Ratio	0.22	0.63	0.22		0.58	0.35		0.17	0.92	0.31		
Control Delay	8.8	17.6	5.0		5.5	74.0		1.8	110.8	33.4		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		
Total Delay	8.8	17.6	5.0		5.5	74.0		1.8	110.8	33.4		
LOS	A	B	A		A	E		A	F	C		
Approach Delay	17.3						37.9		88.4			
Approach LOS	B						D		F			

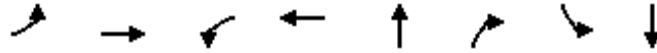
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 86 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 17.7
 Intersection LOS: B
 Intersection Capacity Utilization 54.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290



Queues
6: Roger Hanks & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	1344	56	1283	32	32	157	64
v/c Ratio	0.22	0.63	0.22	0.58	0.35	0.17	0.92	0.31
Control Delay	8.8	17.6	5.0	5.5	74.0	1.8	110.8	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	17.6	5.0	5.5	74.0	1.8	110.8	33.4
Queue Length 50th (ft)	15	391	6	75	29	0	143	23
Queue Length 95th (ft)	17	404	m8	97	64	0	138	49
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	317	2136	299	2210	199	279	176	209
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.63	0.19	0.58	0.16	0.11	0.89	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Roger Hanks & US 290

Heritage TIA
Existing PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↑	↗	↖	↗	
Traffic Volume (vph)	29	980	62	38	1102	53	20	0	24	91	20	27
Future Volume (vph)	29	980	62	38	1102	53	20	0	24	91	20	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3267		1805	3384			1805	1553	1597	1604	
Flt Permitted	0.16	1.00		0.14	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (perm)	296	3267		269	3384			1805	1553	1597	1604	
Peak-hour factor, PHF	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Adj. Flow (vph)	60	1241	103	56	1211	72	32	0	32	157	28	36
RTOR Reduction (vph)	0	3	0	0	3	0	0	0	31	0	32	0
Lane Group Flow (vph)	60	1341	0	56	1280	0	0	32	1	157	32	0
Heavy Vehicles (%)	0%	10%	0%	0%	6%	2%	0%	0%	4%	13%	0%	15%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases	2			6					8			
Actuated Green, G (s)	93.9	88.9		93.7	88.8			6.1	6.1	15.1	15.1	
Effective Green, g (s)	93.9	88.9		93.7	88.8			6.1	6.1	15.1	15.1	
Actuated g/C Ratio	0.67	0.64		0.67	0.63			0.04	0.04	0.11	0.11	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	252	2074		233	2146			78	67	172	173	
v/s Ratio Prot	c0.01	c0.41		0.01	0.38			c0.02		c0.10	0.02	
v/s Ratio Perm	0.15			0.15					0.00			
v/c Ratio	0.24	0.65		0.24	0.60			0.41	0.02	0.91	0.18	
Uniform Delay, d1	10.4	15.8		10.9	15.1			65.2	64.1	61.8	56.8	
Progression Factor	1.00	1.00		0.56	0.32			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.6		0.1	0.7			1.3	0.0	43.5	0.2	
Delay (s)	10.6	17.4		6.2	5.5			66.5	64.1	105.3	57.0	
Level of Service	B	B		A	A			E	E	F	E	
Approach Delay (s)		17.1			5.5			65.3			91.3	
Approach LOS		B			A			E			F	























Intersection Summary

HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix G: Synchro Reports – 2026 No-Build Conditions

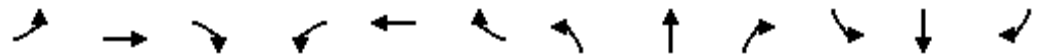
Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
No Build AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	1170	207	136	1307	22	495	250	195	272	242	228
Future Volume (vph)	166	1170	207	136	1307	22	495	250	195	272	242	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	250		0	130		130	70		130
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Frt		0.973			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.985		0.950	0.995	
Satd. Flow (prot)	1671	3438	0	1671	3460	0	1633	1693	1553	1665	1775	1482
Flt Permitted	0.077			0.077			0.950	0.985		0.950	0.995	
Satd. Flow (perm)	135	3438	0	135	3460	0	1633	1693	1553	1665	1775	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			2				70			70
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3012			2872			679			2623	
Travel Time (s)		45.6			43.5			10.3			39.7	
Peak Hour Factor	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	3%	1%	9%
Adj. Flow (vph)	195	1360	296	160	1614	39	550	298	241	316	318	262
Shared Lane Traffic (%)							24%			10%		
Lane Group Flow (vph)	195	1656	0	160	1653	0	418	430	241	284	350	262
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5

Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
No Build AM

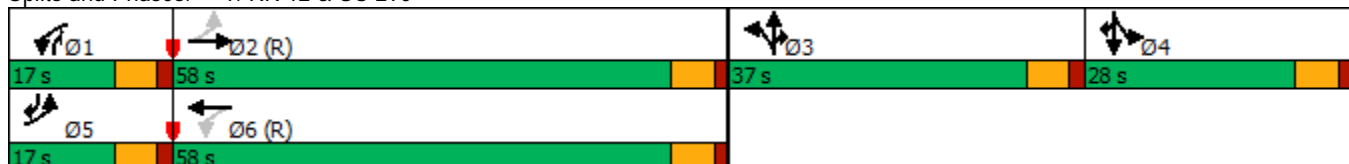


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6							
Detector Phase	5	2		1	6		3	3	3 1	4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		28.0	28.0		28.0	28.0	
Total Split (s)	17.0	58.0		17.0	58.0		37.0	37.0		28.0	28.0	
Total Split (%)	12.1%	41.4%		12.1%	41.4%		26.4%	26.4%		20.0%	20.0%	
Maximum Green (s)	11.0	52.0		11.0	52.0		31.0	31.0		22.0	22.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		13.0			13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	63.1	52.1		62.9	52.0		31.0	31.0	41.9	22.0	22.0	39.0
Actuated g/C Ratio	0.45	0.37		0.45	0.37		0.22	0.22	0.30	0.16	0.16	0.28
v/c Ratio	1.08	1.28		0.89	1.29		1.16	1.15	0.47	1.09	1.26	0.57
Control Delay	112.5	169.9		77.3	171.4		145.2	141.7	18.5	135.0	189.1	36.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.5	169.9		77.3	171.4		145.2	141.7	18.5	135.0	189.1	36.6
LOS	F	F		E	F		F	F	B	F	F	D
Approach Delay		163.9			163.1			115.8				127.4
Approach LOS		F			F			F				F

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.29
 Intersection Signal Delay: 148.6 Intersection LOS: F
 Intersection Capacity Utilization 100.6% ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 1: RR 12 & US 290





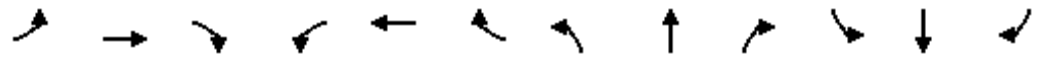
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	195	1656	160	1653	418	430	241	284	350	262
v/c Ratio	1.08	1.28	0.89	1.29	1.16	1.15	0.47	1.09	1.26	0.57
Control Delay	112.5	169.9	77.3	171.4	145.2	141.7	18.5	135.0	189.1	36.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.5	169.9	77.3	171.4	145.2	141.7	18.5	135.0	189.1	36.6
Queue Length 50th (ft)	~145	~1028	97	~1008	~471	~482	78	~304	~418	150
Queue Length 95th (ft)	#277	#1078	#208	#969	#694	#635	111	#467	#488	233
Internal Link Dist (ft)		2932		2792		599			2543	
Turn Bay Length (ft)	300		250		130		130	70		130
Base Capacity (vph)	181	1293	181	1286	361	374	514	261	278	463
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.28	0.88	1.29	1.16	1.15	0.47	1.09	1.26	0.57

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: RR 12 & US 290

Heritage TIA
No Build AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	1170	207	136	1307	22	495	250	195	272	242	228
Future Volume (vph)	166	1170	207	136	1307	22	495	250	195	272	242	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1671	3438		1671	3462		1633	1693	1553	1665	1776	1482
Flt Permitted	0.08	1.00		0.08	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	135	3438		135	3462		1633	1693	1553	1665	1776	1482
Peak-hour factor, PHF	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Adj. Flow (vph)	195	1360	296	160	1614	39	550	298	241	316	318	262
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	49	0	0	51
Lane Group Flow (vph)	195	1643	0	160	1652	0	418	430	192	284	350	212
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	3%	1%	9%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5
Permitted Phases	2			6								
Actuated Green, G (s)	63.1	52.1		62.9	52.0		31.0	31.0	41.9	22.0	22.0	39.0
Effective Green, g (s)	63.1	52.1		62.9	52.0		31.0	31.0	41.9	22.0	22.0	39.0
Actuated g/C Ratio	0.45	0.37		0.45	0.37		0.22	0.22	0.30	0.16	0.16	0.28
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	181	1279		180	1285		361	374	464	261	279	412
v/s Ratio Prot	c0.08	c0.48		0.07	0.48		c0.26	0.25	0.12	0.17	c0.20	0.14
v/s Ratio Perm	0.40			0.33								
v/c Ratio	1.08	1.28		0.89	1.29		1.16	1.15	0.41	1.09	1.25	0.51
Uniform Delay, d1	41.0	44.0		37.4	44.0		54.5	54.5	39.2	59.0	59.0	42.5
Progression Factor	0.87	1.09		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.3	132.8		36.3	134.5		97.7	93.9	0.2	81.2	140.4	0.5
Delay (s)	116.9	180.7		73.7	178.5		152.2	148.4	39.4	140.2	199.4	43.0
Level of Service	F	F		E	F		F	F	D	F	F	D
Approach Delay (s)		174.0			169.2			125.7			134.9	
Approach LOS		F			F			F			F	

Intersection Summary		
HCM 2000 Control Delay	157.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.23	F
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	100.6%	ICU Level of Service
Analysis Period (min)	15	G
c Critical Lane Group		

Lanes, Volumes, Timings
2: Sportsplex & US 290

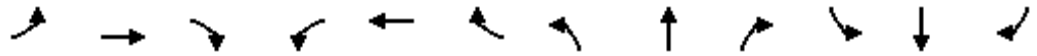
Heritage TIA
No Build AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	1584	0	0	1494	608	0	0	0	166	0	59
Future Volume (vph)	38	1584	0	0	1494	608	0	0	0	166	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	1000		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt					0.952							0.884
Flt Protected	0.950									0.950	0.989	
Satd. Flow (prot)	1805	3505	0	1900	3281	0	0	1900	0	1715	1519	0
Flt Permitted	0.037									0.950	0.989	
Satd. Flow (perm)	70	3505	0	1900	3281	0	0	1900	0	1715	1519	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					67							160
Link Speed (mph)		45			45			30				30
Link Distance (ft)		3195			3012			166				1615
Travel Time (s)		48.4			45.6			3.8				36.7
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Adj. Flow (vph)	43	1800	0	0	1556	733	0	0	0	187	0	109
Shared Lane Traffic (%)										17%		
Lane Group Flow (vph)	43	1800	0	0	2289	0	0	0	0	155	141	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA					Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
No Build AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6							
Detector Phase	5	2			1	6	3		3	4		4
Switch Phase												
Minimum Initial (s)	5.0	12.0			5.0	12.0	5.0		5.0	5.0		5.0
Minimum Split (s)	11.0	18.0			11.0	25.0	30.5		30.5	30.5		30.5
Total Split (s)	28.0	79.0			11.0	62.0	12.0		12.0	38.0		38.0
Total Split (%)	20.0%	56.4%			7.9%	44.3%	8.6%		8.6%	27.1%		27.1%
Maximum Green (s)	22.0	73.0			5.0	56.0	6.5		6.5	32.5		32.5
Yellow Time (s)	4.5	4.5			4.5	4.5	4.0		4.0	4.0		4.0
All-Red Time (s)	1.5	1.5			1.5	1.5	1.5		1.5	1.5		1.5
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0			6.0	6.0			5.5	5.5		5.5
Lead/Lag	Lead	Lag			Lead	Lag	Lead		Lead	Lag		Lag
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	C-Max			None	C-Max	None		None	None		None
Walk Time (s)					7.0		7.0		7.0	7.0		7.0
Flash Dont Walk (s)					12.0		18.0		18.0	18.0		18.0
Pedestrian Calls (#/hr)					0		0		0	0		0
Act Effct Green (s)	111.4	111.4			102.2					17.1		17.1
Actuated g/C Ratio	0.80	0.80			0.73					0.12		0.12
v/c Ratio	0.35	0.65			0.95					0.74		0.43
Control Delay	25.9	4.4			13.8					79.4		9.3
Queue Delay	0.0	0.0			0.0					0.0		0.0
Total Delay	25.9	4.4			13.8					79.4		9.3
LOS	C	A			B					E		A
Approach Delay	4.9				13.8							46.0
Approach LOS	A				B							D

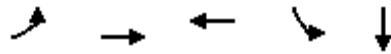
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 12.3
 Intersection LOS: B
 Intersection Capacity Utilization 76.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290



Lane Group	EBL	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	43	1800	2289	155	141
v/c Ratio	0.35	0.65	0.95	0.74	0.43
Control Delay	25.9	4.4	13.8	79.4	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	4.4	13.8	79.4	9.3
Queue Length 50th (ft)	5	134	253	145	0
Queue Length 95th (ft)	m27	195	m176	215	47
Internal Link Dist (ft)		3115	2932		1535
Turn Bay Length (ft)	100			1000	
Base Capacity (vph)	328	2788	2413	398	475
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.65	0.95	0.39	0.30

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Sportsplex & US 290

Heritage TIA
No Build AM



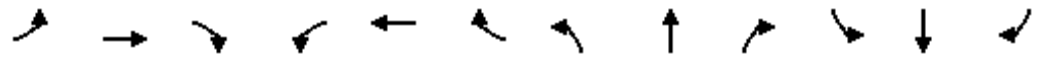
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕		↖	↗	
Traffic Volume (vph)	38	1584	0	0	1494	608	0	0	0	166	0	59
Future Volume (vph)	38	1584	0	0	1494	608	0	0	0	166	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0					5.5	5.5	
Lane Util. Factor	1.00	0.95			0.95					0.95	0.95	
Frt	1.00	1.00			0.95					1.00	0.88	
Flt Protected	0.95	1.00			1.00					0.95	0.99	
Satd. Flow (prot)	1805	3505			3280					1715	1519	
Flt Permitted	0.04	1.00			1.00					0.95	0.99	
Satd. Flow (perm)	71	3505			3280					1715	1519	
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Adj. Flow (vph)	43	1800	0	0	1556	733	0	0	0	187	0	109
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	0	0	124	0
Lane Group Flow (vph)	43	1800	0	0	2270	0	0	0	0	155	17	0
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA					Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6								
Actuated Green, G (s)	111.4	111.4			101.0					17.1	17.1	
Effective Green, g (s)	111.4	111.4			101.0					17.1	17.1	
Actuated g/C Ratio	0.80	0.80			0.72					0.12	0.12	
Clearance Time (s)	6.0	6.0			6.0					5.5	5.5	
Vehicle Extension (s)	2.0	2.0			2.0					2.0	2.0	
Lane Grp Cap (vph)	110	2788			2366					209	185	
v/s Ratio Prot	0.01	c0.51			c0.69					c0.09	0.01	
v/s Ratio Perm	0.30											
v/c Ratio	0.39	0.65			0.96					0.74	0.09	
Uniform Delay, d1	29.4	6.0			17.7					59.3	54.6	
Progression Factor	2.37	0.53			0.64					1.00	1.00	
Incremental Delay, d2	0.7	0.9			1.5					11.7	0.1	
Delay (s)	70.5	4.1			12.8					71.0	54.6	
Level of Service	E	A			B					E	D	
Approach Delay (s)		5.6			12.8			0.0			63.2	
Approach LOS		A			B			A			E	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
No Build AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	53	1	1	22	5	4	3	789	16	7	739	145
Future Volume (vph)	53	1	1	22	5	4	3	789	16	7	739	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.963			0.996			0.976	
Flt Protected		0.958			0.973		0.950			0.950		
Satd. Flow (prot)	0	1806	0	0	1780	0	1805	1801	0	1805	1789	0
Flt Permitted		0.958			0.973		0.950			0.950		
Satd. Flow (perm)	0	1806	0	0	1780	0	1805	1801	0	1805	1789	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			990			342	
Travel Time (s)		14.1			35.6			15.0			5.2	
Peak Hour Factor	0.89	0.25	0.25	0.67	0.50	0.25	0.50	0.80	0.60	0.63	0.77	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	8%	0%	4%	2%
Adj. Flow (vph)	60	4	4	33	10	16	6	986	27	11	960	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	0	59	0	6	1013	0	11	1141	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.2%
ICU Level of Service	B
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	27.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	53	1	1	22	5	4	3	789	16	7	739	145
Future Vol, veh/h	53	1	1	22	5	4	3	789	16	7	739	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	25	25	67	50	25	50	80	60	63	77	80
Heavy Vehicles, %	0	0	0	0	0	0	0	5	8	0	4	2
Mvmt Flow	60	4	4	33	10	16	6	986	27	11	960	181

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2098	2098	1051	1996	1994	1000	960	0	0	1013	0	0
Stage 1	1073	1073	-	1012	1012	-	-	-	-	-	-	-
Stage 2	1025	1025	-	984	982	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 38	53	278	45	61	298	725	-	-	692	-	-
Stage 1	269	299	-	291	319	-	-	-	-	-	-	-
Stage 2	286	315	-	302	330	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 31	52	278	41	60	298	725	-	-	692	-	-
Mov Cap-2 Maneuver	~ 31	52	-	41	60	-	-	-	-	-	-	-
Stage 1	267	294	-	289	316	-	-	-	-	-	-	-
Stage 2	260	312	-	289	325	-	-	-	-	-	-	-











Approach	EB	WB	NB	SB
HCM Control Delay, s	712.3	238.7	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	725	-	-	34	58	692	-
HCM Lane V/C Ratio	0.008	-	-	1.987	1.014	0.016	-
HCM Control Delay (s)	10	-	-	712.3	238.7	10.3	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0	-	-	7.5	4.8	0	-

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

Lanes, Volumes, Timings
4: RR 12 & Brookside

Heritage TIA
No Build AM

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	6	832	6	6	886
Future Volume (vph)	24	6	832	6	6	886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	50	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.968		0.999			
Flt Protected	0.963				0.950	
Satd. Flow (prot)	1579	0	1775	0	1805	1776
Flt Permitted	0.963				0.950	
Satd. Flow (perm)	1579	0	1775	0	1805	1776
Link Speed (mph)	25		45			45
Link Distance (ft)	1288		342			958
Travel Time (s)	35.1		5.2			14.5
Peak Hour Factor	0.53	0.42	0.77	0.63	0.42	0.91
Heavy Vehicles (%)	16%	0%	7%	0%	0%	7%
Adj. Flow (vph)	45	14	1081	10	14	974
Shared Lane Traffic (%)						
Lane Group Flow (vph)	59	0	1091	0	14	974
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	56.6%		ICU Level of Service B			
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑		↔	↑
Traffic Vol, veh/h	24	6	832	6	6	886
Future Vol, veh/h	24	6	832	6	6	886
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	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	42	77	63	42	91
Heavy Vehicles, %	16	0	7	0	0	7
Mvmt Flow	45	14	1081	10	14	974

















Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2088	1086	0	0	1091
Stage 1	1086	-	-	-	-
Stage 2	1002	-	-	-	-
Critical Hdwy	6.56	6.2	-	-	4.1
Critical Hdwy Stg 1	5.56	-	-	-	-
Critical Hdwy Stg 2	5.56	-	-	-	-
Follow-up Hdwy	3.644	3.3	-	-	2.2
Pot Cap-1 Maneuver	53	265	-	-	647
Stage 1	304	-	-	-	-
Stage 2	335	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	52	265	-	-	647
Mov Cap-2 Maneuver	168	-	-	-	-
Stage 1	304	-	-	-	-
Stage 2	328	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.7	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	184	647
HCM Lane V/C Ratio	-	-	0.324	0.022
HCM Control Delay (s)	-	-	33.7	10.7
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	1.3	0.1

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
No Build AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	156	1	8	650	10	1	0	1	5	0	4
Future Volume (vph)	11	156	1	8	650	10	1	0	1	5	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.997			0.932			0.929	
Flt Protected		0.995			0.999			0.976			0.977	
Satd. Flow (prot)	0	1828	0	0	1841	0	0	1728	0	0	1541	0
Flt Permitted		0.995			0.999			0.976			0.977	
Satd. Flow (perm)	0	1828	0	0	1841	0	0	1728	0	0	1541	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		229			479			221			1309	
Travel Time (s)		5.2			10.9			5.0			29.8	
Peak Hour Factor	0.45	0.72	0.25	0.50	0.83	0.50	0.25	0.92	0.25	0.50	0.92	0.38
Heavy Vehicles (%)	33%	0%	0%	0%	1%	75%	0%	0%	0%	25%	0%	0%
Adj. Flow (vph)	24	217	4	16	783	20	4	0	4	10	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	245	0	0	819	0	0	8	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.0%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	156	1	8	650	10	1	0	1	5	0	4
Future Vol, veh/h	11	156	1	8	650	10	1	0	1	5	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	72	25	50	83	50	25	92	25	50	92	38
Heavy Vehicles, %	33	0	0	0	1	75	0	0	0	25	0	0
Mvmt Flow	24	217	4	16	783	20	4	0	4	10	0	11

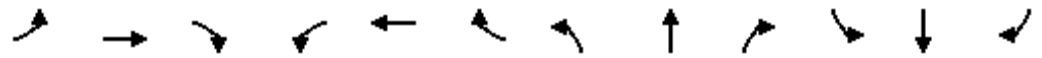
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	803	0	0	221	0	0	1098	1102	219	1094	1094	793
Stage 1	-	-	-	-	-	-	267	267	-	825	825	-
Stage 2	-	-	-	-	-	-	831	835	-	269	269	-
Critical Hdwy	4.43	-	-	4.1	-	-	7.1	6.5	6.2	7.35	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Follow-up Hdwy	2.497	-	-	2.2	-	-	3.5	4	3.3	3.725	4	3.3
Pot Cap-1 Maneuver	700	-	-	1360	-	-	192	213	826	173	216	392
Stage 1	-	-	-	-	-	-	743	692	-	335	390	-
Stage 2	-	-	-	-	-	-	367	386	-	689	690	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	700	-	-	1360	-	-	178	200	826	164	203	392
Mov Cap-2 Maneuver	-	-	-	-	-	-	178	200	-	164	203	-
Stage 1	-	-	-	-	-	-	714	665	-	322	382	-
Stage 2	-	-	-	-	-	-	350	378	-	659	663	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1			0.1			17.6			21.9		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	293	700	-	-	1360	-	-	234
HCM Lane V/C Ratio	0.027	0.035	-	-	0.012	-	-	0.088
HCM Control Delay (s)	17.6	10.3	0	-	7.7	0	-	21.9
HCM Lane LOS	C	B	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.3

Lanes, Volumes, Timings
6: Roger Hanks & US 290

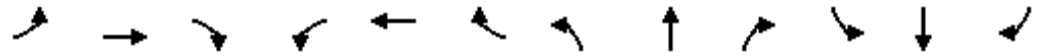
Heritage TIA
No Build AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	1377	28	24	1237	71	30	11	40	99	3	46
Future Volume (vph)	38	1377	28	24	1237	71	30	11	40	99	3	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.990				0.850		0.859	
Flt Protected	0.950			0.950				0.964		0.950		
Satd. Flow (prot)	1752	3302	0	1719	3264	0	0	1684	1429	1703	990	0
Flt Permitted	0.101			0.098				0.964		0.950		
Satd. Flow (perm)	186	3302	0	177	3264	0	0	1684	1429	1703	990	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			5				168		92	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Adj. Flow (vph)	60	1497	35	35	1406	96	45	15	70	111	6	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	1532	0	35	1502	0	0	60	70	111	98	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
No Build AM

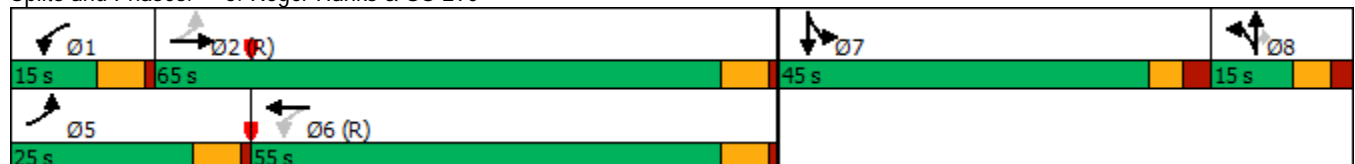


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6				8					
Detector Phase	5	2	1		6	8		8	8	7	7	
Switch Phase												
Minimum Initial (s)	5.0	12.0	5.0		12.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	31.0	11.0		24.0	33.5		33.5	33.5	24.5	24.5	
Total Split (s)	25.0	65.0	15.0		55.0	15.0		15.0	15.0	45.0	45.0	
Total Split (%)	17.9%	46.4%	10.7%		39.3%	10.7%		10.7%	10.7%	32.1%	32.1%	
Maximum Green (s)	19.0	59.0	9.0		49.0	8.5		8.5	8.5	38.5	38.5	
Yellow Time (s)	5.0	5.0	5.0		5.0	4.0		4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	2.5		2.5	2.5	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.5		6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	None		C-Max	None		None	None	None	None	None
Walk Time (s)	7.0						7.0	7.0	7.0			
Flash Dont Walk (s)	18.0						20.0	20.0	20.0			
Pedestrian Calls (#/hr)	0						0	0	0			
Act Effct Green (s)	93.7	88.6	92.6		88.0	9.5		9.5	13.6	13.6		
Actuated g/C Ratio	0.67	0.63	0.66		0.63	0.07		0.07	0.10	0.10		
v/c Ratio	0.31	0.73	0.20		0.73	0.53		0.28	0.67	0.55		
Control Delay	12.3	22.5	12.9		32.5	79.0		2.7	80.1	24.1		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		
Total Delay	12.3	22.5	12.9		32.5	79.0		2.7	80.1	24.1		
LOS	B	C	B		C	E		A	F	C		
Approach Delay	22.1		32.0				37.9		53.8			
Approach LOS	C		C				D		D			

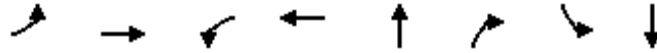
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 33 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 29.0
 Intersection LOS: C
 Intersection Capacity Utilization 64.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290



Queues
6: Roger Hanks & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	1532	35	1502	60	70	111	98
v/c Ratio	0.31	0.73	0.20	0.73	0.53	0.28	0.67	0.55
Control Delay	12.3	22.5	12.9	32.5	79.0	2.7	80.1	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	22.5	12.9	32.5	79.0	2.7	80.1	24.1
Queue Length 50th (ft)	16	494	11	655	54	0	99	5
Queue Length 95th (ft)	26	721	m18	m762	83	0	158	0
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	342	2090	219	2053	123	259	468	338
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.73	0.16	0.73	0.49	0.27	0.24	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Roger Hanks & US 290























Heritage TIA
No Build AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	1377	28	24	1237	71	30	11	40	99	3	46
Future Volume (vph)	38	1377	28	24	1237	71	30	11	40	99	3	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3301		1719	3266			1684	1429	1703	991	
Flt Permitted	0.10	1.00		0.10	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (perm)	186	3301		177	3266			1684	1429	1703	991	
Peak-hour factor, PHF	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Adj. Flow (vph)	60	1497	35	35	1406	96	45	15	70	111	6	92
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	65	0	83	0
Lane Group Flow (vph)	60	1531	0	35	1500	0	0	60	5	111	15	0
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases	2			6					8			
Actuated Green, G (s)	92.5	87.3		91.3	86.7			9.5	9.5	13.6	13.6	
Effective Green, g (s)	92.5	87.3		91.3	86.7			9.5	9.5	13.6	13.6	
Actuated g/C Ratio	0.66	0.62		0.65	0.62			0.07	0.07	0.10	0.10	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	181	2058		166	2022			114	96	165	96	
v/s Ratio Prot	c0.01	c0.46		0.01	0.46			c0.04		c0.07	0.02	
v/s Ratio Perm	0.21			0.13					0.00			
v/c Ratio	0.33	0.74		0.21	0.74			0.53	0.05	0.67	0.16	
Uniform Delay, d1	14.2	18.5		13.9	18.8			63.1	61.0	61.1	57.9	
Progression Factor	1.00	1.00		1.42	1.54			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	2.5		0.1	1.0			2.0	0.1	8.2	0.3	
Delay (s)	14.5	21.0		19.8	29.9			65.1	61.1	69.2	58.2	
Level of Service	B	C		B	C			E	E	E	E	
Approach Delay (s)		20.7			29.7			62.9			64.1	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			28.9	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			140.0	Sum of lost time (s)				25.0				
Intersection Capacity Utilization			64.4%	ICU Level of Service				C				
Analysis Period (min)			15									
c Critical Lane Group												

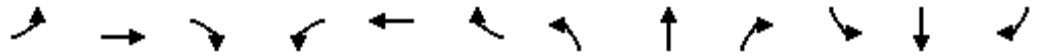
Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
No Build PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	1195	229	244	1081	27	289	261	240	390	380	138
Future Volume (vph)	219	1195	229	244	1081	27	289	261	240	390	380	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	250		0	130		130	70		130
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Frt		0.970			0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.995		0.950	0.995	
Satd. Flow (prot)	1719	3335	0	1787	3449	0	1665	1759	1583	1698	1762	1495
Flt Permitted	0.075			0.075			0.950	0.995		0.950	0.995	
Satd. Flow (perm)	136	3335	0	141	3449	0	1665	1759	1583	1698	1762	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			3				70			70
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3012			2872			679			2607	
Travel Time (s)		45.6			43.5			10.3			39.5	
Peak Hour Factor	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Heavy Vehicles (%)	5%	5%	5%	1%	4%	5%	3%	2%	2%	1%	2%	8%
Adj. Flow (vph)	288	1285	327	287	1287	54	328	287	320	453	409	170
Shared Lane Traffic (%)							10%			10%		
Lane Group Flow (vph)	288	1612	0	287	1341	0	295	320	320	408	454	170
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5

Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
No Build PM

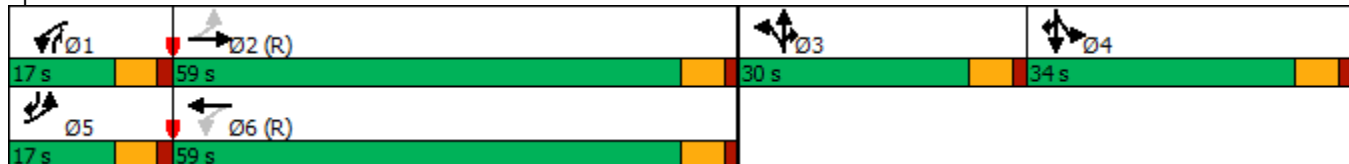


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6		3		3		3 1		4 4	
Detector Phase	5	2		1	6		3	3	3 1	4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		28.0	28.0		28.0	28.0	
Total Split (s)	17.0	59.0		17.0	59.0		30.0	30.0		34.0	34.0	
Total Split (%)	12.1%	42.1%		12.1%	42.1%		21.4%	21.4%		24.3%	24.3%	
Maximum Green (s)	11.0	53.0		11.0	53.0		24.0	24.0		28.0	28.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		13.0			13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	64.0	53.0		64.0	53.0		24.0	24.0	35.0	28.0	28.0	45.0
Actuated g/C Ratio	0.46	0.38		0.46	0.38		0.17	0.17	0.25	0.20	0.20	0.32
v/c Ratio	1.55	1.26		1.49	1.03		1.04	1.06	0.71	1.20	1.29	0.32
Control Delay	281.8	154.7		274.2	74.2		118.2	123.7	30.1	163.2	194.2	22.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	281.8	154.7		274.2	74.2		118.2	123.7	30.1	163.2	194.2	22.6
LOS	F	F		F	E		F	F	C	F	F	C
Approach Delay		173.9			109.5			89.9				153.6
Approach LOS		F			F			F				F

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.55
 Intersection Signal Delay: 136.7
 Intersection LOS: F
 Intersection Capacity Utilization 109.5%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 1: RR 12 & US 290





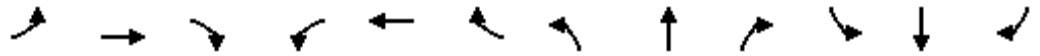
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	1612	287	1341	295	320	320	408	454	170
v/c Ratio	1.55	1.26	1.49	1.03	1.04	1.06	0.71	1.20	1.29	0.32
Control Delay	281.8	154.7	274.2	74.2	118.2	123.7	30.1	163.2	194.2	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	281.8	154.7	274.2	74.2	118.2	123.7	30.1	163.2	194.2	22.6
Queue Length 50th (ft)	~318	~963	~310	~683	~303	~336	125	~473	~552	66
Queue Length 95th (ft)	m#331	m#982	#458	#725	#482	#540	145	#647	#781	110
Internal Link Dist (ft)		2932		2792		599			2527	
Turn Bay Length (ft)	300		250		130		130	70		130
Base Capacity (vph)	186	1278	193	1307	285	301	448	339	352	528
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.55	1.26	1.49	1.03	1.04	1.06	0.71	1.20	1.29	0.32

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: RR 12 & US 290

Heritage TIA
No Build PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	↖
Traffic Volume (vph)	219	1195	229	244	1081	27	289	261	240	390	380	138
Future Volume (vph)	219	1195	229	244	1081	27	289	261	240	390	380	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3333		1787	3449		1665	1759	1583	1698	1763	1495
Flt Permitted	0.08	1.00		0.08	1.00		0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	137	3333		142	3449		1665	1759	1583	1698	1763	1495
Peak-hour factor, PHF	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Adj. Flow (vph)	288	1285	327	287	1287	54	328	287	320	453	409	170
RTOR Reduction (vph)	0	16	0	0	2	0	0	0	53	0	0	48
Lane Group Flow (vph)	288	1596	0	287	1339	0	295	320	268	408	454	123
Heavy Vehicles (%)	5%	5%	5%	1%	4%	5%	3%	2%	2%	1%	2%	8%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5
Permitted Phases	2			6								
Actuated Green, G (s)	64.0	53.0		64.0	53.0		24.0	24.0	35.0	28.0	28.0	45.0
Effective Green, g (s)	64.0	53.0		64.0	53.0		24.0	24.0	35.0	28.0	28.0	45.0
Actuated g/C Ratio	0.46	0.38		0.46	0.38		0.17	0.17	0.25	0.20	0.20	0.32
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	186	1261		194	1305		285	301	395	339	352	480
v/s Ratio Prot	c0.12	0.48		0.12	0.39		0.18	c0.18	0.17	0.24	c0.26	0.08
v/s Ratio Perm	c0.59			0.56								
v/c Ratio	1.55	1.27		1.48	1.03		1.04	1.06	0.68	1.20	1.29	0.26
Uniform Delay, d1	41.3	43.5		41.4	43.5		58.0	58.0	47.4	56.0	56.0	35.1
Progression Factor	0.93	0.95		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	254.0	121.3		241.3	31.8		62.7	69.5	3.6	116.3	150.2	0.1
Delay (s)	292.4	162.5		282.7	75.3		120.7	127.5	51.0	172.3	206.2	35.2
Level of Service	F	F		F	E		F	F	D	F	F	D
Approach Delay (s)		182.2			111.9			99.2			164.6	
Approach LOS		F			F			F			F	

Intersection Summary

HCM 2000 Control Delay	143.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
No Build PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	1531	8	8	1440	204	1	0	1	509	0	38
Future Volume (vph)	34	1531	8	8	1440	204	1	0	1	509	0	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	1000		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999			0.973			0.932			0.976	
Flt Protected	0.950			0.950				0.976		0.950	0.960	
Satd. Flow (prot)	1805	3421	0	1203	3456	0	0	1728	0	1649	1636	0
Flt Permitted	0.051			0.053				0.976		0.950	0.960	
Satd. Flow (perm)	97	3421	0	67	3456	0	0	1728	0	1649	1636	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			29			160			160	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		3195			3012			166			1615	
Travel Time (s)		48.4			45.6			3.8			36.7	
Peak Hour Factor	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Heavy Vehicles (%)	0%	5%	83%	50%	2%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	65	2014	11	21	1756	392	4	0	4	821	0	70
Shared Lane Traffic (%)										45%		
Lane Group Flow (vph)	65	2025	0	21	2148	0	0	8	0	452	439	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
No Build PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6							
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	12.0		5.0	12.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	18.0		11.0	25.0		30.5	30.5		30.5	30.5	
Total Split (s)	18.0	87.0		11.0	80.0		12.0	12.0		30.0	30.0	
Total Split (%)	12.9%	62.1%		7.9%	57.1%		8.6%	8.6%		21.4%	21.4%	
Maximum Green (s)	12.0	81.0		5.0	74.0		6.5	6.5		24.5	24.5	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)					7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)					12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)					0		0	0		0	0	
Act Effct Green (s)	89.9	85.4		85.6	81.6		5.0	5.0		34.4	34.4	
Actuated g/C Ratio	0.64	0.61		0.61	0.58		0.04	0.04		0.25	0.25	
v/c Ratio	0.46	0.97		0.26	1.06		0.04	0.04		1.12	0.84	
Control Delay	21.3	49.8		15.2	51.8		0.5	0.5		128.1	46.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.3	49.8		15.2	51.8		0.5	0.5		128.1	46.9	
LOS	C	D		B	D		A	A		F	D	
Approach Delay		48.9			51.4		0.5	0.5			88.1	
Approach LOS		D			D		A	A			F	

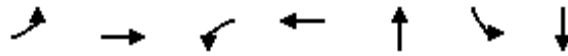
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 46 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 56.7
 Intersection LOS: E
 Intersection Capacity Utilization 77.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	65	2025	21	2148	8	452	439
v/c Ratio	0.46	0.97	0.26	1.06	0.04	1.12	0.84
Control Delay	21.3	49.8	15.2	51.8	0.5	128.1	46.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	49.8	15.2	51.8	0.5	128.1	46.9
Queue Length 50th (ft)	30	~1056	3	~1145	0	~471	262
Queue Length 95th (ft)	m25	m922	m3	m#1112	0	#471	#537
Internal Link Dist (ft)		3115		2932	86		1535
Turn Bay Length (ft)	100		100			1000	
Base Capacity (vph)	210	2087	81	2027	232	404	522
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.97	0.26	1.06	0.03	1.12	0.84

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Sportsplex & US 290

Heritage TIA
No Build PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	1531	8	8	1440	204	1	0	1	509	0	38
Future Volume (vph)	34	1531	8	8	1440	204	1	0	1	509	0	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		0.95	0.95	
Frt	1.00	1.00		1.00	0.97			0.93		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	0.96	
Satd. Flow (prot)	1805	3421		1203	3455			1729		1649	1636	
Flt Permitted	0.05	1.00		0.05	1.00			0.98		0.95	0.96	
Satd. Flow (perm)	97	3421		67	3455			1729		1649	1636	
Peak-hour factor, PHF	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Adj. Flow (vph)	65	2014	11	21	1756	392	4	0	4	821	0	70
RTOR Reduction (vph)	0	0	0	0	13	0	0	8	0	0	121	0
Lane Group Flow (vph)	65	2025	0	21	2135	0	0	0	0	452	318	0
Heavy Vehicles (%)	0%	5%	83%	50%	2%	0%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6								
Actuated Green, G (s)	84.2	78.6		79.0	76.0			1.0		34.4	34.4	
Effective Green, g (s)	84.2	78.6		79.0	76.0			1.0		34.4	34.4	
Actuated g/C Ratio	0.60	0.56		0.56	0.54			0.01		0.25	0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	126	1920		62	1875			12		405	401	
v/s Ratio Prot	c0.02	c0.59		0.01	c0.62			c0.00		c0.27	0.19	
v/s Ratio Perm	0.29			0.18								
v/c Ratio	0.52	1.05		0.34	1.14			0.00		1.12	0.79	
Uniform Delay, d1	32.1	30.7		32.4	32.0			69.0		52.8	49.5	
Progression Factor	1.17	1.55		1.15	0.51			1.00		1.00	1.00	
Incremental Delay, d2	0.9	32.9		0.7	66.7			0.1		80.1	9.7	
Delay (s)	38.4	80.4		38.1	83.1			69.1		132.9	59.2	
Level of Service	D	F		D	F			E		F	E	
Approach Delay (s)		79.1			82.6			69.1			96.6	
Approach LOS		E			F			E			F	

Intersection Summary

HCM 2000 Control Delay	83.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
No Build PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	100	4	5	14	4	5	7	776	27	8	811	123
Future Volume (vph)	100	4	5	14	4	5	7	776	27	8	811	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.952			0.991			0.978	
Flt Protected		0.960			0.974		0.950			0.950		
Satd. Flow (prot)	0	1802	0	0	1762	0	1805	1848	0	1805	1837	0
Flt Permitted		0.960			0.974		0.950			0.950		
Satd. Flow (perm)	0	1802	0	0	1762	0	1805	1848	0	1805	1837	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			1000			342	
Travel Time (s)		14.1			35.6			15.2			5.2	
Peak Hour Factor	0.73	0.38	0.33	0.63	0.75	0.33	0.42	0.94	0.50	0.50	0.86	0.78
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	2%
Adj. Flow (vph)	137	11	15	22	5	15	17	826	54	16	943	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	163	0	0	42	0	17	880	0	16	1101	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.4%
ICU Level of Service	C
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	94.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	100	4	5	14	4	5	7	776	27	8	811	123
Future Vol, veh/h	100	4	5	14	4	5	7	776	27	8	811	123
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	38	33	63	75	33	42	94	50	50	86	78
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	2
Mvmt Flow	137	11	15	22	5	15	17	826	54	16	943	158

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1951	1968	1022	1868	1862	853	943	0	0	880	0	0
Stage 1	1054	1054	-	887	887	-	-	-	-	-	-	-
Stage 2	897	914	-	981	975	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 49	63	289	56	74	362	736	-	-	777	-	-
Stage 1	276	305	-	341	365	-	-	-	-	-	-	-
Stage 2	337	355	-	303	332	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 43	60	289	44	71	362	736	-	-	777	-	-
Mov Cap-2 Maneuver	~ 43	60	-	44	71	-	-	-	-	-	-	-
Stage 1	270	299	-	333	357	-	-	-	-	-	-	-
Stage 2	311	347	-	271	325	-	-	-	-	-	-	-











Approach	EB		WB		NB			SB		
HCM Control Delay, \$	1252.5		119.4		0.2			0.1		
HCM LOS	F		F							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	736	-	-	48	69	777	-	-
HCM Lane V/C Ratio	0.023	-	-	3.389	0.619	0.021	-	-
HCM Control Delay (s)	10	-	-	\$ 1252.5	119.4	9.7	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	17.8	2.7	0.1	-	-

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

Lanes, Volumes, Timings
4: RR 12 & Brookside

Heritage TIA
No Build PM

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	8	920	24	4	982
Future Volume (vph)	11	8	920	24	4	982
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	50	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.930		0.995			
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1637	0	1814	0	1805	1827
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1637	0	1814	0	1805	1827
Link Speed (mph)	25		45			45
Link Distance (ft)	1288		342			958
Travel Time (s)	35.1		5.2			14.5
Peak Hour Factor	0.75	0.50	0.93	0.68	0.38	0.89
Heavy Vehicles (%)	11%	0%	4%	10%	0%	4%
Adj. Flow (vph)	15	16	989	35	11	1103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	0	1024	0	11	1103
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	61.7%		ICU Level of Service B			
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↙		↑		↘↙	↑
Traffic Vol, veh/h	11	8	920	24	4	982
Future Vol, veh/h	11	8	920	24	4	982
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	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	50	93	68	38	89
Heavy Vehicles, %	11	0	4	10	0	4
Mvmt Flow	15	16	989	35	11	1103

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2132	1007	0	0	1024	0
Stage 1	1007	-	-	-	-	-
Stage 2	1125	-	-	-	-	-
Critical Hdwy	6.51	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	51	295	-	-	686	-
Stage 1	340	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	50	295	-	-	686	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	340	-	-	-	-	-
Stage 2	293	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.5	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	215	686
HCM Lane V/C Ratio	-	-	0.143	0.015
HCM Control Delay (s)	-	-	24.5	10.3
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.5	0

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
No Build PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	16	439	11	20	248	86	6	3	23	4	1	3
Future Volume (vph)	16	439	11	20	248	86	6	3	23	4	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.953			0.907			0.946	
Flt Protected		0.998			0.998			0.990			0.984	
Satd. Flow (prot)	0	1822	0	0	1767	0	0	1706	0	0	1769	0
Flt Permitted		0.998			0.998			0.990			0.984	
Satd. Flow (perm)	0	1822	0	0	1767	0	0	1706	0	0	1769	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		229			479			221			1309	
Travel Time (s)		5.2			10.9			5.0			29.8	
Peak Hour Factor	0.54	0.59	0.75	0.80	0.65	0.40	0.63	0.50	0.64	0.75	0.25	0.50
Heavy Vehicles (%)	0%	4%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	744	15	25	382	215	10	6	36	5	4	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	789	0	0	622	0	0	52	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	439	11	20	248	86	6	3	23	4	1	3
Future Vol, veh/h	16	439	11	20	248	86	6	3	23	4	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	59	75	80	65	40	63	50	64	75	25	50
Heavy Vehicles, %	0	4	0	0	2	3	0	0	0	0	0	0
Mvmt Flow	30	744	15	25	382	215	10	6	36	5	4	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	597	0	0	759	0	0	1357	1459	752	1373	1359	490
Stage 1	-	-	-	-	-	-	812	812	-	540	540	-
Stage 2	-	-	-	-	-	-	545	647	-	833	819	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	989	-	-	862	-	-	127	131	413	124	150	582
Stage 1	-	-	-	-	-	-	376	395	-	530	524	-
Stage 2	-	-	-	-	-	-	526	470	-	366	392	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	989	-	-	862	-	-	114	118	413	101	136	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	114	118	-	101	136	-
Stage 1	-	-	-	-	-	-	356	374	-	502	500	-
Stage 2	-	-	-	-	-	-	493	449	-	311	371	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.4			24.9			28.9		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	232	989	-	-	862	-	-	166
HCM Lane V/C Ratio	0.222	0.03	-	-	0.029	-	-	0.092
HCM Control Delay (s)	24.9	8.8	0	-	9.3	0	-	28.9
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0.1	-	-	0.3

Lanes, Volumes, Timings
6: Roger Hanks & US 290

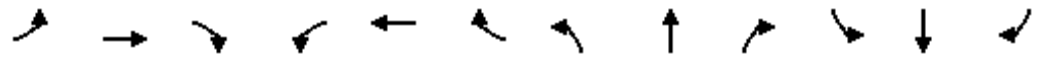
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1289	78	48	1426	67	25	0	30	115	25	34
Future Volume (vph)	37	1289	78	48	1426	67	25	0	30	115	25	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.992				0.850		0.916	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1805	3268	0	1805	3385	0	0	1805	1553	1597	1605	0
Flt Permitted	0.070			0.057				0.950		0.950		
Satd. Flow (perm)	133	3268	0	108	3385	0	0	1805	1553	1597	1605	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			6				121		37	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Heavy Vehicles (%)	0%	10%	0%	0%	6%	2%	0%	0%	4%	13%	0%	15%
Adj. Flow (vph)	77	1632	130	71	1567	91	40	0	40	198	35	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	1762	0	71	1658	0	0	40	40	198	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
No Build PM



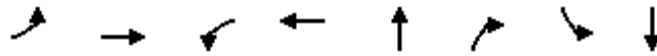
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6				8					
Detector Phase	5	2	1		6	8		8	8	7	7	
Switch Phase												
Minimum Initial (s)	5.0	12.0	5.0		12.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	31.0	11.0		18.0	33.5		33.5	33.5	11.5	11.5	
Total Split (s)	16.0	80.0	16.0		80.0	22.0		22.0	22.0	22.0	22.0	22.0
Total Split (%)	11.4%	57.1%	11.4%		57.1%	15.7%		15.7%	15.7%	15.7%	15.7%	15.7%
Maximum Green (s)	10.0	74.0	10.0		74.0	15.5		15.5	15.5	15.5	15.5	15.5
Yellow Time (s)	5.0	5.0	5.0		5.0	4.0		4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	2.5		2.5	2.5	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.5		6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	None		C-Max	None		None	None	None	None	None
Walk Time (s)	7.0						7.0	7.0	7.0			
Flash Dont Walk (s)	18.0						20.0	20.0	20.0			
Pedestrian Calls (#/hr)	0						0	0	0			
Act Effct Green (s)	95.5	89.6	94.1		87.3	7.6		7.6	15.5	15.5		
Actuated g/C Ratio	0.68	0.64	0.67		0.62	0.05		0.05	0.11	0.11		
v/c Ratio	0.45	0.84	0.46		0.79	0.41		0.20	1.12	0.38		
Control Delay	17.2	26.7	25.5		6.8	75.5		2.3	159.9	38.6		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		
Total Delay	17.2	26.7	25.5		6.8	75.5		2.3	159.9	38.6		
LOS	B	C	C		A	E		A	F	D		
Approach Delay	26.3						38.9		125.0			
Approach LOS	C						D		F			

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 86 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 25.3 Intersection LOS: C
 Intersection Capacity Utilization 65.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290


























Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	77	1762	71	1658	40	40	198	80
v/c Ratio	0.45	0.84	0.46	0.79	0.41	0.20	1.12	0.38
Control Delay	17.2	26.7	25.5	6.8	75.5	2.3	159.9	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	26.7	25.5	6.8	75.5	2.3	159.9	38.6
Queue Length 50th (ft)	20	669	15	114	36	0	-207	36
Queue Length 95th (ft)	20	682	m13	m112	75	0	#179	63
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	212	2093	196	2112	199	279	176	210
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.84	0.36	0.79	0.20	0.14	1.13	0.38

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
6: Roger Hanks & US 290

Heritage TIA
No Build PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1289	78	48	1426	67	25	0	30	115	25	34
Future Volume (vph)	37	1289	78	48	1426	67	25	0	30	115	25	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3267		1805	3385			1805	1553	1597	1604	
Flt Permitted	0.07	1.00		0.06	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (perm)	133	3267		108	3385			1805	1553	1597	1604	
Peak-hour factor, PHF	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Adj. Flow (vph)	77	1632	130	71	1567	91	40	0	40	198	35	45
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	38	0	33	0
Lane Group Flow (vph)	77	1759	0	71	1656	0	0	40	2	198	47	0
Heavy Vehicles (%)	0%	10%	0%	0%	6%	2%	0%	0%	4%	13%	0%	15%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases	2			6					8			
Actuated Green, G (s)	94.0	87.1		91.8	86.0			6.6	6.6	15.5	15.5	
Effective Green, g (s)	94.0	87.1		91.8	86.0			6.6	6.6	15.5	15.5	
Actuated g/C Ratio	0.67	0.62		0.66	0.61			0.05	0.05	0.11	0.11	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	171	2032		141	2079			85	73	176	177	
v/s Ratio Prot	c0.02	c0.54		0.02	0.49			c0.02		c0.12	0.03	
v/s Ratio Perm	0.28			0.31					0.00			
v/c Ratio	0.45	0.87		0.50	0.80			0.47	0.03	1.12	0.27	
Uniform Delay, d1	18.3	21.7		20.6	20.4			65.0	63.6	62.2	57.0	
Progression Factor	1.00	1.00		2.07	0.30			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	5.2		0.1	0.3			1.5	0.1	105.4	0.3	
Delay (s)	19.0	26.9		42.9	6.5			66.5	63.7	167.6	57.3	
Level of Service	B	C		D	A			E	E	F	E	
Approach Delay (s)		26.6			8.0			65.1			135.9	
Approach LOS		C			A			E			F	
Intersection Summary												
HCM 2000 Control Delay			26.9	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			140.0	Sum of lost time (s)				25.0				
Intersection Capacity Utilization			65.0%	ICU Level of Service				C				
Analysis Period (min)			15									
c Critical Lane Group												

Appendix H: Synchro Reports – 2026 Build-Out Conditions

Lanes, Volumes, Timings
1: RR 12 & US 290

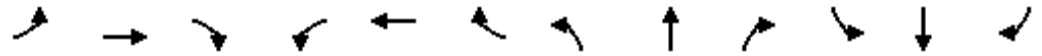
Heritage TIA
Build Out AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Future Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	250		0	130		130	70		130
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Frt		0.973			0.991				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.986		0.950	0.995	
Satd. Flow (prot)	1671	3438	0	1671	3447	0	1633	1695	1553	1681	1776	1482
Flt Permitted	0.077			0.077			0.950	0.986		0.950	0.995	
Satd. Flow (perm)	135	3438	0	135	3447	0	1633	1695	1553	1681	1776	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			5				70			70
Link Speed (mph)		45			45			45				45
Link Distance (ft)		3012			2872			679				2620
Travel Time (s)		45.6			43.5			10.3				39.7
Peak Hour Factor	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	2%	1%	9%
Adj. Flow (vph)	195	1462	320	160	1649	100	557	312	241	438	364	262
Shared Lane Traffic (%)							23%			10%		
Lane Group Flow (vph)	195	1782	0	160	1749	0	429	440	241	394	408	262
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5

Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Build Out AM

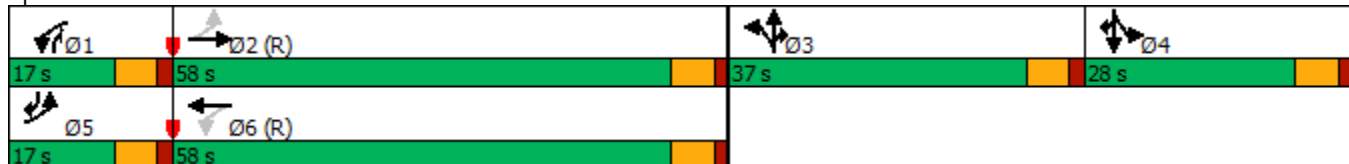


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6		3		3		3 1		4 4	
Detector Phase	5	2		1	6		3	3	3 1	4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		28.0	28.0		28.0	28.0	
Total Split (s)	17.0	58.0		17.0	58.0		37.0	37.0		28.0	28.0	
Total Split (%)	12.1%	41.4%		12.1%	41.4%		26.4%	26.4%		20.0%	20.0%	
Maximum Green (s)	11.0	52.0		11.0	52.0		31.0	31.0		22.0	22.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		13.0			13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	63.1	52.1		62.9	52.0		31.0	31.0	41.9	22.0	22.0	39.0
Actuated g/C Ratio	0.45	0.37		0.45	0.37		0.22	0.22	0.30	0.16	0.16	0.28
v/c Ratio	1.08	1.38		0.89	1.36		1.19	1.17	0.47	1.49	1.46	0.57
Control Delay	110.7	209.7		77.3	203.8		155.6	149.6	18.5	280.4	267.3	36.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.7	209.7		77.3	203.8		155.6	149.6	18.5	280.4	267.3	36.6
LOS	F	F		E	F		F	F	B	F	F	D
Approach Delay		200.0			193.2			123.5				215.3
Approach LOS		F			F			F				F

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	145
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.49
Intersection Signal Delay:	186.5
Intersection LOS:	F
Intersection Capacity Utilization	107.9%
ICU Level of Service	G
Analysis Period (min)	15

Splits and Phases: 1: RR 12 & US 290



























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	195	1782	160	1749	429	440	241	394	408	262
v/c Ratio	1.08	1.38	0.89	1.36	1.19	1.17	0.47	1.49	1.46	0.57
Control Delay	110.7	209.7	77.3	203.8	155.6	149.6	18.5	280.4	267.3	36.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.7	209.7	77.3	203.8	155.6	149.6	18.5	280.4	267.3	36.6
Queue Length 50th (ft)	~145	~1141	97	~1106	~493	~502	78	~521	~533	150
Queue Length 95th (ft)	#279	#1196	#208	#1055	#718	#654	111	#695	#593	233
Internal Link Dist (ft)		2932		2792		599			2540	
Turn Bay Length (ft)	300		250		130		130	70		130
Base Capacity (vph)	181	1293	181	1283	361	375	514	264	279	463
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.38	0.88	1.36	1.19	1.17	0.47	1.49	1.46	0.57

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: RR 12 & US 290

Heritage TIA
Build Out AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Future Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1671	3438		1671	3449		1633	1694	1553	1681	1776	1482
Flt Permitted	0.08	1.00		0.08	1.00		0.95	0.99	1.00	0.95	0.99	1.00
Satd. Flow (perm)	135	3438		135	3449		1633	1694	1553	1681	1776	1482
Peak-hour factor, PHF	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Adj. Flow (vph)	195	1462	320	160	1649	100	557	312	241	438	364	262
RTOR Reduction (vph)	0	13	0	0	3	0	0	0	49	0	0	51
Lane Group Flow (vph)	195	1769	0	160	1746	0	429	440	192	394	408	212
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	2%	1%	9%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5
Permitted Phases	2			6								
Actuated Green, G (s)	63.1	52.1		62.9	52.0		31.0	31.0	41.9	22.0	22.0	39.0
Effective Green, g (s)	63.1	52.1		62.9	52.0		31.0	31.0	41.9	22.0	22.0	39.0
Actuated g/C Ratio	0.45	0.37		0.45	0.37		0.22	0.22	0.30	0.16	0.16	0.28
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	181	1279		180	1281		361	375	464	264	279	412
v/s Ratio Prot	c0.08	c0.51		0.07	0.51		c0.26	0.26	0.12	c0.23	0.23	0.14
v/s Ratio Perm	0.40			0.33								
v/c Ratio	1.08	1.38		0.89	1.36		1.19	1.17	0.41	1.49	1.46	0.51
Uniform Delay, d1	41.0	44.0		37.4	44.0		54.5	54.5	39.2	59.0	59.0	42.5
Progression Factor	0.86	1.06		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	79.7	176.0		36.3	168.4		109.2	102.7	0.2	240.6	226.8	0.5
Delay (s)	115.0	222.6		73.7	212.4		163.7	157.2	39.4	299.6	285.8	43.0
Level of Service	F	F		E	F		F	F	D	F	F	D
Approach Delay (s)		212.0			200.8			134.1			231.1	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			197.6				HCM 2000 Level of Service		F			
HCM 2000 Volume to Capacity ratio			1.32									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		24.0			
Intersection Capacity Utilization			107.9%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Sportsplex & US 290

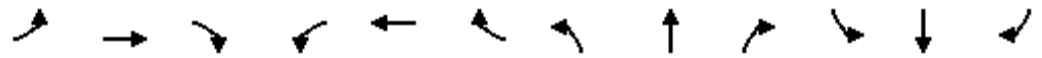
Heritage TIA
Build Out AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Future Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	1000		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt					0.950							0.901
Flt Protected	0.950									0.950	0.983	
Satd. Flow (prot)	1805	3505	0	1900	3276	0	0	1900	0	1715	1548	0
Flt Permitted	0.040									0.950	0.983	
Satd. Flow (perm)	76	3505	0	1900	3276	0	0	1900	0	1715	1548	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					73							160
Link Speed (mph)		45			45			30				30
Link Distance (ft)		3195			3012			166				1615
Travel Time (s)		48.4			45.6			3.8				36.7
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Adj. Flow (vph)	50	1800	0	0	1556	775	0	0	0	303	0	141
Shared Lane Traffic (%)										24%		
Lane Group Flow (vph)	50	1800	0	0	2331	0	0	0	0	230	214	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA					Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Build Out AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6		3		3		4		4	
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	12.0		5.0	12.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	18.0		11.0	25.0		30.5	30.5		30.5	30.5	
Total Split (s)	28.0	79.0		11.0	62.0		12.0	12.0		38.0	38.0	
Total Split (%)	20.0%	56.4%		7.9%	44.3%		8.6%	8.6%		27.1%	27.1%	
Maximum Green (s)	22.0	73.0		5.0	56.0		6.5	6.5		32.5	32.5	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)					7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)					12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)					0		0	0		0	0	
Act Effct Green (s)	105.2	105.2		95.8						23.3	23.3	
Actuated g/C Ratio	0.75	0.75		0.68						0.17	0.17	
v/c Ratio	0.40	0.68		1.03						0.81	0.55	
Control Delay	30.8	5.8		30.8						76.7	19.5	
Queue Delay	0.0	0.0		0.0						0.0	0.0	
Total Delay	30.8	5.8		30.8						76.7	19.5	
LOS	C	A		C						E	B	
Approach Delay		6.4		30.8							49.1	
Approach LOS		A		C							D	

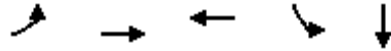
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 22.8
 Intersection Capacity Utilization 81.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290



Lane Group	EBL	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	50	1800	2331	230	214
v/c Ratio	0.40	0.68	1.03	0.81	0.55
Control Delay	30.8	5.8	30.8	76.7	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	5.8	30.8	76.7	19.5
Queue Length 50th (ft)	7	139	~1203	214	45
Queue Length 95th (ft)	m36	204	m808	291	123
Internal Link Dist (ft)		3115	2932		1535
Turn Bay Length (ft)	100			1000	
Base Capacity (vph)	328	2634	2263	398	482
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.68	1.03	0.58	0.44

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Sportsplex & US 290

Heritage TIA
Build Out AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Future Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0					5.5	5.5	
Lane Util. Factor	1.00	0.95			0.95					0.95	0.95	
Frt	1.00	1.00			0.95					1.00	0.90	
Flt Protected	0.95	1.00			1.00					0.95	0.98	
Satd. Flow (prot)	1805	3505			3277					1715	1548	
Flt Permitted	0.04	1.00			1.00					0.95	0.98	
Satd. Flow (perm)	76	3505			3277					1715	1548	
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Adj. Flow (vph)	50	1800	0	0	1556	775	0	0	0	303	0	141
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	0	0	133	0
Lane Group Flow (vph)	50	1800	0	0	2307	0	0	0	0	230	81	0
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA					Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6								
Actuated Green, G (s)	105.2	105.2			94.5					23.3	23.3	
Effective Green, g (s)	105.2	105.2			94.5					23.3	23.3	
Actuated g/C Ratio	0.75	0.75			0.68					0.17	0.17	
Clearance Time (s)	6.0	6.0			6.0					5.5	5.5	
Vehicle Extension (s)	2.0	2.0			2.0					2.0	2.0	
Lane Grp Cap (vph)	115	2633			2211					285	257	
v/s Ratio Prot	0.01	c0.51			c0.70					c0.13	0.05	
v/s Ratio Perm	0.31											
v/c Ratio	0.43	0.68			1.04					0.81	0.31	
Uniform Delay, d1	38.6	8.9			22.8					56.2	51.3	
Progression Factor	2.32	0.46			0.56					1.00	1.00	
Incremental Delay, d2	0.8	1.1			21.2					14.5	0.3	
Delay (s)	90.4	5.3			34.0					70.7	51.6	
Level of Service	F	A			C					E	D	
Approach Delay (s)		7.6			34.0			0.0			61.5	
Approach LOS		A			C			A			E	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
Build Out AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	53	1	1	22	5	4	3	836	16	7	878	145
Future Volume (vph)	53	1	1	22	5	4	3	836	16	7	878	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.963			0.996			0.979	
Flt Protected		0.958			0.973		0.950			0.950		
Satd. Flow (prot)	0	1806	0	0	1780	0	1805	1801	0	1805	1793	0
Flt Permitted		0.958			0.973		0.950			0.950		
Satd. Flow (perm)	0	1806	0	0	1780	0	1805	1801	0	1805	1793	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			994			342	
Travel Time (s)		14.1			35.6			15.1			5.2	
Peak Hour Factor	0.89	0.25	0.25	0.67	0.50	0.25	0.50	0.80	0.60	0.63	0.77	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	8%	0%	4%	2%
Adj. Flow (vph)	60	4	4	33	10	16	6	1045	27	11	1140	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	0	59	0	6	1072	0	11	1321	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.6%
Analysis Period (min)	15
	ICU Level of Service C

Intersection												
Int Delay, s/veh	46											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	53	1	1	22	5	4	3	836	16	7	878	145
Future Vol, veh/h	53	1	1	22	5	4	3	836	16	7	878	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	25	25	67	50	25	50	80	60	63	77	80
Heavy Vehicles, %	0	0	0	0	0	0	0	5	8	0	4	2
Mvmt Flow	60	4	4	33	10	16	6	1045	27	11	1140	181

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2337	2337	1231	2235	2233	1059	1140	0	0	1072	0	0
Stage 1	1253	1253	-	1071	1071	-	-	-	-	-	-	-
Stage 2	1084	1084	-	1164	1162	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 26	37	218	~ 31	43	275	620	-	-	658	-	-
Stage 1	213	246	-	270	300	-	-	-	-	-	-	-
Stage 2	265	296	-	239	272	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 20	36	218	~ 27	42	275	620	-	-	658	-	-
Mov Cap-2 Maneuver	~ 20	36	-	~ 27	42	-	-	-	-	-	-	-
Stage 1	211	242	-	267	297	-	-	-	-	-	-	-
Stage 2	239	293	-	227	267	-	-	-	-	-	-	-



















Approach	EB		WB		NB		SB	
HCM Control Delay, \$1300.2			\$ 487		0.1		0.1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	620	-	-	22	39	658	-
HCM Lane V/C Ratio	0.01	-	-	3.07	1.509	0.017	-
HCM Control Delay (s)	10.9	-	-	\$ 1300.2	\$ 487	10.6	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0	-	-	8.6	6.1	0.1	-

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

Lanes, Volumes, Timings
4: RR 12 & Brookside

Heritage TIA
Build Out AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	0	139	24	0	6	47	832	6	6	886	18
Future Volume (vph)	52	0	139	24	0	6	47	832	6	6	886	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.902			0.968			0.999				0.997
Flt Protected		0.986			0.963		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1579	0	1805	1775	0	1805	1773	0
Flt Permitted		0.986			0.963		0.950			0.950		
Satd. Flow (perm)	0	1690	0	0	1579	0	1805	1775	0	1805	1773	0
Link Speed (mph)		30			25			45				45
Link Distance (ft)		1986			1288			342				958
Travel Time (s)		45.1			35.1			5.2				14.5
Peak Hour Factor	0.92	0.92	0.92	0.53	0.92	0.42	0.92	0.77	0.63	0.42	0.91	0.92
Heavy Vehicles (%)	0%	0%	0%	16%	0%	0%	0%	7%	0%	0%	7%	0%
Adj. Flow (vph)	57	0	151	45	0	14	51	1081	10	14	974	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	208	0	0	59	0	51	1091	0	14	994	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane								Yes				Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free				Free
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	65.3%						ICU Level of Service C					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	110.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	52	0	139	24	0	6	47	832	6	6	886	18
Future Vol, veh/h	52	0	139	24	0	6	47	832	6	6	886	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	53	92	42	92	77	63	42	91	92
Heavy Vehicles, %	0	0	0	16	0	0	0	7	0	0	7	0
Mvmt Flow	57	0	151	45	0	14	51	1081	10	14	974	20

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	2207	2205	984	2276	2210	1086	994	0	0	1091	0	0
Stage 1	1012	1012	-	1188	1188	-	-	-	-	-	-	-
Stage 2	1195	1193	-	1088	1022	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.26	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.26	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.26	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.644	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 32	45	304	~ 26	45	265	704	-	-	647	-	-
Stage 1	291	319	-	215	264	-	-	-	-	-	-	-
Stage 2	230	263	-	246	316	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 28	41	304	~ 12	41	265	704	-	-	647	-	-
Mov Cap-2 Maneuver	~ 28	41	-	~ 12	41	-	-	-	-	-	-	-
Stage 1	270	312	-	200	245	-	-	-	-	-	-	-
Stage 2	202	244	-	121	309	-	-	-	-	-	-	-

















Approach	EB	WB	NB	SB
HCM Control Delay, s	789.8	1710.1	0.5	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	704	-	-	83	16	647	-
HCM Lane V/C Ratio	0.073	-	-	2.501	3.723	0.022	-
HCM Control Delay (s)	10.5	-	-	789.8	1710.1	10.7	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0.2	-	-	19.6	8.2	0.1	-

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

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
Build Out AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	156	1	8	650	51	1	0	1	127	0	4
Future Volume (vph)	11	156	1	8	650	51	1	0	1	127	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.985			0.932			0.994	
Flt Protected		0.995			0.999			0.976			0.954	
Satd. Flow (prot)	0	1812	0	0	1710	0	0	1728	0	0	1453	0
Flt Permitted		0.995			0.999			0.976			0.954	
Satd. Flow (perm)	0	1812	0	0	1710	0	0	1728	0	0	1453	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		229			479			221			2634	
Travel Time (s)		5.2			10.9			5.0			59.9	
Peak Hour Factor	0.45	0.72	0.25	0.50	0.83	0.50	0.25	0.92	0.25	0.50	0.92	0.38
Heavy Vehicles (%)	33%	1%	0%	0%	1%	75%	0%	0%	0%	25%	0%	0%
Adj. Flow (vph)	24	217	4	16	783	102	4	0	4	254	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	245	0	0	901	0	0	8	0	0	265	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.8%
ICU Level of Service	B
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	72.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	156	1	8	650	51	1	0	1	127	0	4
Future Vol, veh/h	11	156	1	8	650	51	1	0	1	127	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	72	25	50	83	50	25	92	25	50	92	38
Heavy Vehicles, %	33	1	0	0	1	75	0	0	0	25	0	0
Mvmt Flow	24	217	4	16	783	102	4	0	4	254	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	885	0	0	221	0	0	1139	1184	219	1135	1135	834
Stage 1	-	-	-	-	-	-	267	267	-	866	866	-
Stage 2	-	-	-	-	-	-	872	917	-	269	269	-
Critical Hdwy	4.43	-	-	4.1	-	-	7.1	6.5	6.2	7.35	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Follow-up Hdwy	2.497	-	-	2.2	-	-	3.5	4	3.3	3.725	4	3.3
Pot Cap-1 Maneuver	649	-	-	1360	-	-	180	191	826	~ 162	204	371
Stage 1	-	-	-	-	-	-	743	692	-	318	373	-
Stage 2	-	-	-	-	-	-	348	354	-	689	690	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	649	-	-	1360	-	-	166	179	826	~ 153	191	371
Mov Cap-2 Maneuver	-	-	-	-	-	-	166	179	-	~ 153	191	-
Stage 1	-	-	-	-	-	-	712	663	-	305	364	-
Stage 2	-	-	-	-	-	-	330	346	-	657	661	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.1			0.1			18.4			\$ 384.8		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	276	649	-	-	1360	-	-	157
HCM Lane V/C Ratio	0.029	0.038	-	-	0.012	-	-	1.685
HCM Control Delay (s)	18.4	10.8	0	-	7.7	0	-	\$ 384.8
HCM Lane LOS	C	B	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	18.7

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

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
Build Out AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Future Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.991				0.850		0.855	
Flt Protected	0.950			0.950				0.964		0.950		
Satd. Flow (prot)	1752	3302	0	1719	3267	0	0	1684	1429	1703	976	0
Flt Permitted	0.091			0.098				0.964		0.950		
Satd. Flow (perm)	168	3302	0	177	3267	0	0	1684	1429	1703	976	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			5				168		160	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Adj. Flow (vph)	79	1503	35	35	1425	96	45	15	70	111	6	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	1538	0	35	1521	0	0	60	70	111	166	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
Build Out AM

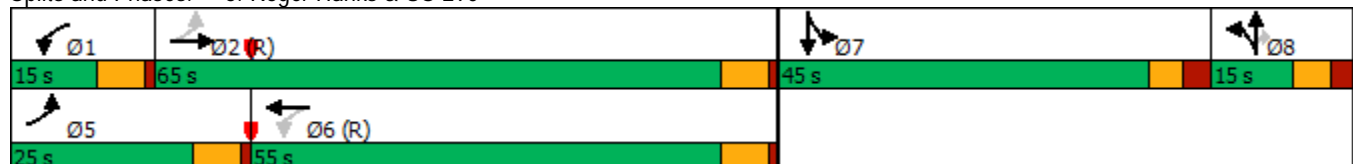


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6				8			7		7
Detector Phase	5	2	1		6	8		8	8	7	7	
Switch Phase												
Minimum Initial (s)	5.0	12.0	5.0		12.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	31.0	11.0		24.0	33.5		33.5	33.5	24.5	24.5	
Total Split (s)	25.0	65.0	15.0		55.0	15.0		15.0	15.0	45.0	45.0	
Total Split (%)	17.9%	46.4%	10.7%		39.3%	10.7%		10.7%	10.7%	32.1%	32.1%	
Maximum Green (s)	19.0	59.0	9.0		49.0	8.5		8.5	8.5	38.5	38.5	
Yellow Time (s)	5.0	5.0	5.0		5.0	4.0		4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	2.5		2.5	2.5	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.5		6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	None		C-Max	None		None	None	None	None	None
Walk Time (s)	7.0					7.0		7.0	7.0			
Flash Dont Walk (s)	18.0					20.0		20.0	20.0			
Pedestrian Calls (#/hr)	0					0		0	0			
Act Effct Green (s)	94.2	88.4	90.6		85.0	9.5		9.5	13.7	13.7		
Actuated g/C Ratio	0.67	0.63	0.65		0.61	0.07		0.07	0.10	0.10		
v/c Ratio	0.42	0.74	0.20		0.77	0.53		0.28	0.66	0.69		
Control Delay	14.9	22.8	13.2		37.4	79.0		2.7	79.0	24.7		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		
Total Delay	14.9	22.8	13.2		37.4	79.0		2.7	79.0	24.7		
LOS	B	C	B		D	E		A	E	C		
Approach Delay	22.4		36.8		37.9		46.5					
Approach LOS	C		D		D		D					

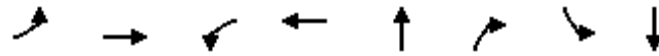
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 33 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 31.1
 Intersection LOS: C
 Intersection Capacity Utilization 64.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290



Queues
6: Roger Hanks & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	79	1538	35	1521	60	70	111	166
v/c Ratio	0.42	0.74	0.20	0.77	0.53	0.28	0.66	0.69
Control Delay	14.9	22.8	13.2	37.4	79.0	2.7	79.0	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	22.8	13.2	37.4	79.0	2.7	79.0	24.7
Queue Length 50th (ft)	21	498	13	712	54	0	99	5
Queue Length 95th (ft)	33	738	m17	m754	83	0	156	0
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	332	2085	217	1986	123	259	468	384
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.74	0.16	0.77	0.49	0.27	0.24	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Roger Hanks & US 290

Heritage TIA
Build Out AM

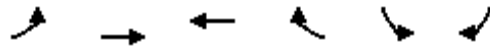


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Future Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3301		1719	3266			1684	1429	1703	976	
Flt Permitted	0.09	1.00		0.10	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (perm)	169	3301		178	3266			1684	1429	1703	976	
Peak-hour factor, PHF	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Adj. Flow (vph)	79	1503	35	35	1425	96	45	15	70	111	6	160
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	65	0	144	0
Lane Group Flow (vph)	79	1537	0	35	1519	0	0	60	5	111	22	0
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases	2			6					8			
Actuated Green, G (s)	94.0	87.2		89.6	85.0			9.5	9.5	13.7	13.7	
Effective Green, g (s)	94.0	87.2		89.6	85.0			9.5	9.5	13.7	13.7	
Actuated g/C Ratio	0.67	0.62		0.64	0.61			0.07	0.07	0.10	0.10	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	190	2056		164	1982			114	96	166	95	
v/s Ratio Prot	c0.02	c0.47		0.01	0.47			c0.04		c0.07	0.02	
v/s Ratio Perm	0.26			0.13					0.00			
v/c Ratio	0.42	0.75		0.21	0.77			0.53	0.05	0.67	0.23	
Uniform Delay, d1	15.7	18.6		14.2	20.2			63.1	61.0	61.0	58.3	
Progression Factor	1.00	1.00		1.46	1.67			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	2.5		0.1	0.8			2.0	0.1	7.7	0.4	
Delay (s)	16.2	21.2		20.8	34.6			65.1	61.1	68.6	58.7	
Level of Service	B	C		C	C			E	E	E	E	
Approach Delay (s)		20.9			34.2			62.9			62.7	
Approach LOS		C			C			E			E	

Intersection Summary

HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Brookside



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	35	12	12	35	0
Future Volume (vph)	0	35	12	12	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.932					
Fl _t Protected					0.950	
Satd. Flow (prot)	0	1863	1736	0	1770	0
Fl _t Permitted					0.950	
Satd. Flow (perm)	0	1863	1736	0	1770	0
Link Speed (mph)	30		30	30		
Link Distance (ft)	2535		225	1819		
Travel Time (s)	57.6		5.1	41.3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	38	13	13	38	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	38	26	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)	0		0	12		
Link Offset(ft)	0		0	0		
Crosswalk Width(ft)	16		16	16		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control	Free		Free	Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.3%
Analysis Period (min)	15
	ICU Level of Service A

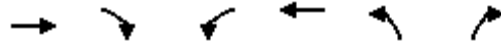
Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	35	12	12	35	0
Future Vol, veh/h	0	35	12	12	35	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	13	13	38	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	26	0	-	0	58
Stage 1	-	-	-	-	20
Stage 2	-	-	-	-	38
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1588	-	-	-	949
Stage 1	-	-	-	-	1003
Stage 2	-	-	-	-	984
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1588	-	-	-	949
Mov Cap-2 Maneuver		-	-	-	949
Stage 1		-	-	-	1003
Stage 2		-	-	-	984

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1588	-	-	-	949
HCM Lane V/C Ratio	-	-	-	-	0.04
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings
8: Brookside



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	35	35	41	12	12	47
Future Volume (vph)	35	35	41	12	12	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932			0.892		
Flt Protected				0.963	0.990	
Satd. Flow (prot)	1736	0	0	1794	1645	0
Flt Permitted				0.963	0.990	
Satd. Flow (perm)	1736	0	0	1794	1645	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	225			1986	2634	
Travel Time (s)	5.1			45.1	59.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	38	45	13	13	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	0	0	58	64	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Yield			Yield	Yield	























Intersection Summary

Area Type:	Other
Control Type:	Roundabout
Intersection Capacity Utilization	19.8% ICU Level of Service A
Analysis Period (min)	15

Intersection			
Intersection Delay, s/veh	3.2		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	76	58	64
Demand Flow Rate, veh/h	78	59	65
Vehicles Circulating, veh/h	46	13	39
Vehicles Exiting, veh/h	26	91	85
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.0	3.1
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	78	59	65
Cap Entry Lane, veh/h	1317	1362	1326
Entry HV Adj Factor	0.977	0.979	0.985
Flow Entry, veh/h	76	58	64
Cap Entry, veh/h	1287	1333	1306
V/C Ratio	0.059	0.043	0.049
Control Delay, s/veh	3.3	3.0	3.1
LOS	A	A	A
95th %tile Queue, veh	0	0	0

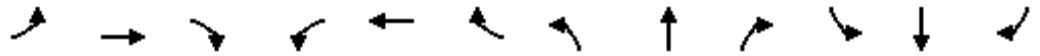
Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Build Out PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	1251	240	244	1177	142	308	300	240	458	403	138
Future Volume (vph)	219	1251	240	244	1177	142	308	300	240	458	403	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	250		0	130		130	70		130
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Frt		0.970			0.975				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.995		0.950	0.994	
Satd. Flow (prot)	1719	3335	0	1787	3379	0	1665	1759	1583	1698	1761	1495
Flt Permitted	0.075			0.075			0.950	0.995		0.950	0.994	
Satd. Flow (perm)	136	3335	0	141	3379	0	1665	1759	1583	1698	1761	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			19				70			70
Link Speed (mph)		45			45			45				45
Link Distance (ft)		3012			2872			679			2642	
Travel Time (s)		45.6			43.5			10.3			40.0	
Peak Hour Factor	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Heavy Vehicles (%)	5%	5%	5%	1%	4%	5%	3%	2%	2%	1%	2%	8%
Adj. Flow (vph)	288	1345	343	287	1401	284	350	330	320	533	433	170
Shared Lane Traffic (%)							10%			11%		
Lane Group Flow (vph)	288	1688	0	287	1685	0	315	365	320	474	492	170
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5

Lanes, Volumes, Timings
1: RR 12 & US 290

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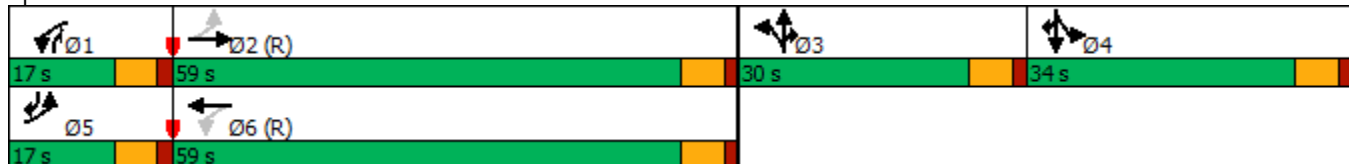


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6									
Detector Phase	5	2	1		6	3		3	3 1	4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0		15.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.0	26.0	11.0		26.0	28.0		28.0	28.0		28.0	28.0
Total Split (s)	17.0	59.0	17.0		59.0	30.0		30.0	34.0		34.0	
Total Split (%)	12.1%	42.1%	12.1%		42.1%	21.4%		21.4%	24.3%		24.3%	
Maximum Green (s)	11.0	53.0	11.0		53.0	24.0		24.0	28.0		28.0	
Yellow Time (s)	4.5	4.5	4.5		4.5	4.5		4.5	4.5		4.5	
All-Red Time (s)	1.5	1.5	1.5		1.5	1.5		1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0		6.0	6.0		6.0	
Lead/Lag	Lead	Lag	Lead		Lag	Lead		Lead	Lag		Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	2.0		2.0	
Recall Mode	None	C-Max	None		C-Max	None		None	None		None	
Walk Time (s)	7.0		7.0		7.0		7.0		7.0		7.0	
Flash Dont Walk (s)	13.0		13.0		15.0		15.0		15.0		15.0	
Pedestrian Calls (#/hr)	0		0		0		0		0		0	
Act Effct Green (s)	64.0	53.0	64.0		53.0	24.0		24.0	35.0	28.0	28.0	45.0
Actuated g/C Ratio	0.46	0.38	0.46		0.38	0.17		0.17	0.25	0.20	0.20	0.32
v/c Ratio	1.55	1.32	1.49		1.31	1.11		1.21	0.71	1.40	1.40	0.32
Control Delay	277.1	179.5	274.2		179.0	136.8		170.3	30.1	237.1	236.3	22.6
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	277.1	179.5	274.2		179.0	136.8		170.3	30.1	237.1	236.3	22.6
LOS	F	F	F		F	F		F	C	F	F	C
Approach Delay	193.8		192.8		114.8		204.6					
Approach LOS	F		F		F		F					

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.55
 Intersection Signal Delay: 182.5
 Intersection LOS: F
 Intersection Capacity Utilization 115.4%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 1: RR 12 & US 290





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	1688	287	1685	315	365	320	474	492	170
v/c Ratio	1.55	1.32	1.49	1.31	1.11	1.21	0.71	1.40	1.40	0.32
Control Delay	277.1	179.5	274.2	179.0	136.8	170.3	30.1	237.1	236.3	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	277.1	179.5	274.2	179.0	136.8	170.3	30.1	237.1	236.3	22.6
Queue Length 50th (ft)	~319	~1038	~310	~1033	~343	~426	125	~605	~628	66
Queue Length 95th (ft)	m#313	m#1007	#458	#1051	#525	#638	145	#784	#861	110
Internal Link Dist (ft)		2932		2792		599			2562	
Turn Bay Length (ft)	300		250		130		130	70		130
Base Capacity (vph)	186	1278	193	1291	285	301	448	339	352	528
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.55	1.32	1.49	1.31	1.11	1.21	0.71	1.40	1.40	0.32

Intersection Summary

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

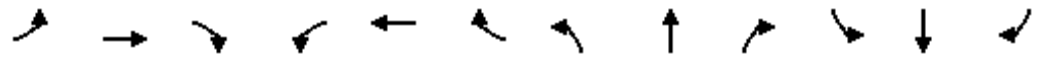
HCM Signalized Intersection Capacity Analysis
1: RR 12 & US 290

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	1251	240	244	1177	142	308	300	240	458	403	138
Future Volume (vph)	219	1251	240	244	1177	142	308	300	240	458	403	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1719	3333		1787	3378		1665	1760	1583	1698	1761	1495
Flt Permitted	0.08	1.00		0.08	1.00		0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)	137	3333		142	3378		1665	1760	1583	1698	1761	1495
Peak-hour factor, PHF	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Adj. Flow (vph)	288	1345	343	287	1401	284	350	330	320	533	433	170
RTOR Reduction (vph)	0	16	0	0	12	0	0	0	53	0	0	48
Lane Group Flow (vph)	288	1672	0	287	1673	0	315	365	268	474	492	123
Heavy Vehicles (%)	5%	5%	5%	1%	4%	5%	3%	2%	2%	1%	2%	8%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3	3 1	4	4	4 5
Permitted Phases	2			6								
Actuated Green, G (s)	64.0	53.0		64.0	53.0		24.0	24.0	35.0	28.0	28.0	45.0
Effective Green, g (s)	64.0	53.0		64.0	53.0		24.0	24.0	35.0	28.0	28.0	45.0
Actuated g/C Ratio	0.46	0.38		0.46	0.38		0.17	0.17	0.25	0.20	0.20	0.32
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	186	1261		194	1278		285	301	395	339	352	480
v/s Ratio Prot	c0.12	0.50		0.12	0.50		0.19	c0.21	0.17	0.28	c0.28	0.08
v/s Ratio Perm	c0.59			0.56								
v/c Ratio	1.55	1.33		1.48	1.31		1.11	1.21	0.68	1.40	1.40	0.26
Uniform Delay, d1	41.3	43.5		41.4	43.5		58.0	58.0	47.4	56.0	56.0	35.1
Progression Factor	0.94	0.97		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	249.2	147.1		241.3	144.9		84.5	122.4	3.6	196.2	195.4	0.1
Delay (s)	287.9	189.2		282.7	188.4		142.5	180.4	51.0	252.2	251.4	35.2
Level of Service	F	F		F	F		F	F	D	F	F	D
Approach Delay (s)		203.6			202.1			127.0			219.4	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			193.5				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.44									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			115.4%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Sportsplex & US 290

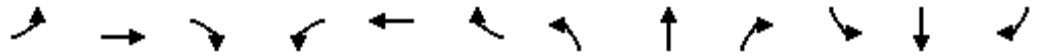
Heritage TIA
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	1531	8	8	1440	319	1	0	1	577	0	50
Future Volume (vph)	53	1531	8	8	1440	319	1	0	1	577	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	1000		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999			0.961			0.932			0.972	
Flt Protected	0.950			0.950				0.976		0.950	0.961	
Satd. Flow (prot)	1805	3421	0	1203	3419	0	0	1728	0	1649	1633	0
Flt Permitted	0.051			0.055				0.976		0.950	0.961	
Satd. Flow (perm)	97	3421	0	70	3419	0	0	1728	0	1649	1633	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			53			160			160	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		3195			3012			166			1615	
Travel Time (s)		48.4			45.6			3.8			36.7	
Peak Hour Factor	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Heavy Vehicles (%)	0%	5%	83%	50%	2%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	102	2014	11	21	1756	613	4	0	4	931	0	93
Shared Lane Traffic (%)										44%		
Lane Group Flow (vph)	102	2025	0	21	2369	0	0	8	0	521	503	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Build Out PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6							
Detector Phase	5	2			1	6	3		3	4		4
Switch Phase												
Minimum Initial (s)	5.0	12.0			5.0	12.0	5.0		5.0	5.0		5.0
Minimum Split (s)	11.0	18.0			11.0	25.0	30.5		30.5	30.5		30.5
Total Split (s)	18.0	87.0			11.0	80.0	12.0		12.0	30.0		30.0
Total Split (%)	12.9%	62.1%			7.9%	57.1%	8.6%		8.6%	21.4%		21.4%
Maximum Green (s)	12.0	81.0			5.0	74.0	6.5		6.5	24.5		24.5
Yellow Time (s)	4.5	4.5			4.5	4.5	4.0		4.0	4.0		4.0
All-Red Time (s)	1.5	1.5			1.5	1.5	1.5		1.5	1.5		1.5
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0			6.0	6.0			5.5	5.5		5.5
Lead/Lag	Lead	Lag			Lead	Lag	Lead		Lead	Lag		Lag
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	C-Max			None	C-Max	None		None	None		None
Walk Time (s)					7.0		7.0		7.0	7.0		7.0
Flash Dont Walk (s)					12.0		18.0		18.0	18.0		18.0
Pedestrian Calls (#/hr)					0		0		0	0		0
Act Effct Green (s)	91.2	85.4			82.6	77.6	5.0		5.0	34.4		34.4
Actuated g/C Ratio	0.65	0.61			0.59	0.55	0.04		0.04	0.25		0.25
v/c Ratio	0.62	0.97			0.26	1.24	0.04		0.04	1.29		0.96
Control Delay	29.7	49.6			13.1	126.8	0.5		0.5	189.2		66.7
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	29.7	49.6			13.1	126.8	0.5		0.5	189.2		66.7
LOS	C	D			B	F	A		A	F		E
Approach Delay	48.6				125.8		0.5		0.5	129.0		129.0
Approach LOS	D				F		A		A	F		F

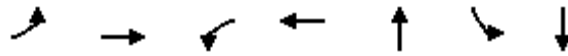
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 46 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.29
 Intersection Signal Delay: 96.6
 Intersection Capacity Utilization 83.7%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service E

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	102	2025	21	2369	8	521	503
v/c Ratio	0.62	0.97	0.26	1.24	0.04	1.29	0.96
Control Delay	29.7	49.6	13.1	126.8	0.5	189.2	66.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	49.6	13.1	126.8	0.5	189.2	66.7
Queue Length 50th (ft)	48	~1057	3	~1388	0	~608	343
Queue Length 95th (ft)	m37	m921	m3	m#1049	0	#572	#675
Internal Link Dist (ft)		3115		2932	86		1535
Turn Bay Length (ft)	100		100			1000	
Base Capacity (vph)	210	2087	81	1918	232	404	522
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.97	0.26	1.24	0.03	1.29	0.96

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Sportsplex & US 290

Heritage TIA
Build Out PM



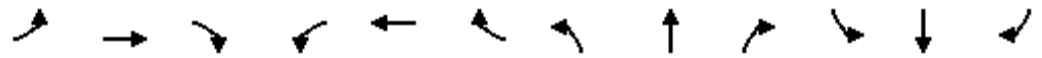
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	1531	8	8	1440	319	1	0	1	577	0	50
Future Volume (vph)	53	1531	8	8	1440	319	1	0	1	577	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		0.95	0.95	
Frt	1.00	1.00		1.00	0.96			0.93		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	0.96	
Satd. Flow (prot)	1805	3421		1203	3419			1729		1649	1633	
Flt Permitted	0.05	1.00		0.05	1.00			0.98		0.95	0.96	
Satd. Flow (perm)	97	3421		69	3419			1729		1649	1633	
Peak-hour factor, PHF	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Adj. Flow (vph)	102	2014	11	21	1756	613	4	0	4	931	0	93
RTOR Reduction (vph)	0	0	0	0	25	0	0	8	0	0	121	0
Lane Group Flow (vph)	102	2025	0	21	2344	0	0	0	0	521	382	0
Heavy Vehicles (%)	0%	5%	83%	50%	2%	0%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2			6								
Actuated Green, G (s)	87.0	78.6		76.2	73.2			1.0		34.4	34.4	
Effective Green, g (s)	87.0	78.6		76.2	73.2			1.0		34.4	34.4	
Actuated g/C Ratio	0.62	0.56		0.54	0.52			0.01		0.25	0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	162	1920		61	1787			12		405	401	
v/s Ratio Prot	c0.04	c0.59		0.01	c0.69			c0.00		c0.32	0.23	
v/s Ratio Perm	0.35			0.18								
v/c Ratio	0.63	1.05		0.34	1.31			0.00		1.29	0.95	
Uniform Delay, d1	33.3	30.7		32.2	33.4			69.0		52.8	52.0	
Progression Factor	0.93	1.54		1.09	0.52			1.00		1.00	1.00	
Incremental Delay, d2	3.4	32.8		0.4	141.5			0.1		146.5	32.7	
Delay (s)	34.3	80.1		35.4	158.8			69.1		199.3	84.7	
Level of Service	C	F		D	F			E		F	F	
Approach Delay (s)		77.9			157.7			69.1			143.0	
Approach LOS		E			F			E			F	

Intersection Summary

HCM 2000 Control Delay	124.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
Build Out PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	100	4	5	14	4	5	7	929	27	8	901	123
Future Volume (vph)	100	4	5	14	4	5	7	929	27	8	901	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.952			0.992			0.980	
Flt Protected		0.960			0.974		0.950			0.950		
Satd. Flow (prot)	0	1802	0	0	1762	0	1805	1850	0	1805	1841	0
Flt Permitted		0.960			0.974		0.950			0.950		
Satd. Flow (perm)	0	1802	0	0	1762	0	1805	1850	0	1805	1841	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			967			342	
Travel Time (s)		14.1			35.6			14.7			5.2	
Peak Hour Factor	0.73	0.38	0.33	0.63	0.75	0.33	0.42	0.94	0.50	0.50	0.86	0.78
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	2%
Adj. Flow (vph)	137	11	15	22	5	15	17	988	54	16	1048	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	163	0	0	42	0	17	1042	0	16	1206	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	70.2%						ICU Level of Service C					
Analysis Period (min)	15											

Intersection

Int Delay, s/veh 152.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	100	4	5	14	4	5	7	929	27	8	901	123
Future Vol, veh/h	100	4	5	14	4	5	7	929	27	8	901	123
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	38	33	63	75	33	42	94	50	50	86	78
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	2
Mvmt Flow	137	11	15	22	5	15	17	988	54	16	1048	158

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2218	2235	1127	2135	2129	1015	1048	0	0	1042	0	0
Stage 1	1159	1159	-	1049	1049	-	-	-	-	-	-	-
Stage 2	1059	1076	-	1086	1080	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 32	43	251	36	50	292	672	-	-	675	-	-
Stage 1	241	272	-	277	307	-	-	-	-	-	-	-
Stage 2	274	298	-	264	297	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 27	41	251	26	48	292	672	-	-	675	-	-
Mov Cap-2 Maneuver	~ 27	41	-	26	48	-	-	-	-	-	-	-
Stage 1	235	265	-	270	299	-	-	-	-	-	-	-
Stage 2	249	291	-	233	290	-	-	-	-	-	-	-



















Approach	EB	WB	NB	SB
HCM Control Delay, \$2252.6		292.6	0.2	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	672	-	-	30	42	675	-
HCM Lane V/C Ratio	0.025	-	-	5.422	1.017	0.024	-
HCM Control Delay (s)	10.5	-	-	\$ 2252.6	292.6	10.5	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0.1	-	-	19.7	4	0.1	-

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

Lanes, Volumes, Timings
4: RR 12 & Brookside

Heritage TIA
Build Out PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	0	90	11	0	8	153	920	24	4	982	57
Future Volume (vph)	34	0	90	11	0	8	153	920	24	4	982	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.902			0.930			0.995			0.992	
Flt Protected		0.986			0.976		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1637	0	1805	1814	0	1805	1816	0
Flt Permitted		0.986			0.976		0.950			0.950		
Satd. Flow (perm)	0	1690	0	0	1637	0	1805	1814	0	1805	1816	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		1986			1288			342			958	
Travel Time (s)		45.1			35.1			5.2			14.5	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.92	0.50	0.92	0.93	0.68	0.38	0.89	0.92
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	0%	4%	10%	0%	4%	0%
Adj. Flow (vph)	37	0	98	15	0	16	166	989	35	11	1103	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	0	0	31	0	166	1024	0	11	1165	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	81.3%						ICU Level of Service D					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	66.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	34	0	90	11	0	8	153	920	24	4	982	57
Future Vol, veh/h	34	0	90	11	0	8	153	920	24	4	982	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	75	92	50	92	93	68	38	89	92
Heavy Vehicles, %	0	0	0	11	0	0	0	4	10	0	4	0
Mvmt Flow	37	0	98	15	0	16	166	989	35	11	1103	62

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2503	2512	1134	2544	2526	1007	1165	0	0	1024	0	0
Stage 1	1156	1156	-	1339	1339	-	-	-	-	-	-	-
Stage 2	1347	1356	-	1205	1187	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.21	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.599	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 20	29	249	17	28	295	607	-	-	686	-	-
Stage 1	242	273	-	180	224	-	-	-	-	-	-	-
Stage 2	188	219	-	215	264	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 15	21	249	~ 8	20	295	607	-	-	686	-	-
Mov Cap-2 Maneuver	~ 15	21	-	~ 8	20	-	-	-	-	-	-	-
Stage 1	176	269	-	131	163	-	-	-	-	-	-	-
Stage 2	129	159	-	128	260	-	-	-	-	-	-	-

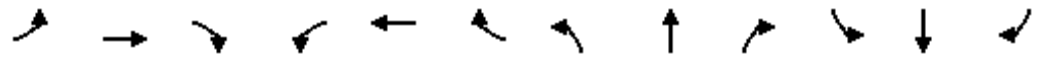
Approach	EB	WB	NB	SB
HCM Control Delay, \$1026.7		\$ 922.7	1.8	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	607	-	-	47	16	686	-
HCM Lane V/C Ratio	0.274	-	-	2.868	1.917	0.015	-
HCM Control Delay (s)	13.2	-	-	\$ 1026.7	\$ 922.7	10.3	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	1.1	-	-	14.5	4.4	0	-

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

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
Build Out PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	16	439	11	20	248	220	6	3	23	83	1	3
Future Volume (vph)	16	439	11	20	248	220	6	3	23	83	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.922			0.907			0.993	
Flt Protected		0.998			0.999			0.990			0.956	
Satd. Flow (prot)	0	1822	0	0	1707	0	0	1706	0	0	1804	0
Flt Permitted		0.998			0.999			0.990			0.956	
Satd. Flow (perm)	0	1822	0	0	1707	0	0	1706	0	0	1804	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		229			479			221			2634	
Travel Time (s)		5.2			10.9			5.0			59.9	
Peak Hour Factor	0.54	0.59	0.75	0.80	0.65	0.40	0.63	0.50	0.64	0.75	0.25	0.50
Heavy Vehicles (%)	0%	4%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	744	15	25	382	550	10	6	36	111	4	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	789	0	0	957	0	0	52	0	0	121	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.4%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Int Delay, s/veh	26.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	439	11	20	248	220	6	3	23	83	1	3
Future Vol, veh/h	16	439	11	20	248	220	6	3	23	83	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	59	75	80	65	40	63	50	64	75	25	50
Heavy Vehicles, %	0	4	0	0	2	3	0	0	0	0	0	0
Mvmt Flow	30	744	15	25	382	550	10	6	36	111	4	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	932	0	0	759	0	0	1524	1794	752	1540	1526	657
Stage 1	-	-	-	-	-	-	812	812	-	707	707	-
Stage 2	-	-	-	-	-	-	712	982	-	833	819	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	743	-	-	862	-	-	98	81	413	~ 95	119	468
Stage 1	-	-	-	-	-	-	376	395	-	429	441	-
Stage 2	-	-	-	-	-	-	427	330	-	366	392	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	743	-	-	862	-	-	84	70	413	~ 73	103	468
Mov Cap-2 Maneuver	-	-	-	-	-	-	84	70	-	~ 73	103	-
Stage 1	-	-	-	-	-	-	350	367	-	399	411	-
Stage 2	-	-	-	-	-	-	389	307	-	306	365	-

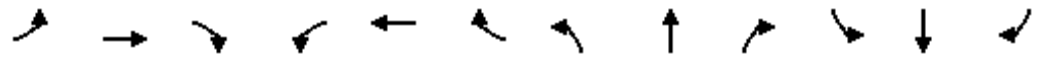
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.2			32.8			\$ 401.3		
HCM LOS							D			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	180	743	-	-	862	-	-	77
HCM Lane V/C Ratio	0.286	0.04	-	-	0.029	-	-	1.567
HCM Control Delay (s)	32.8	10	0	-	9.3	0	-	\$ 401.3
HCM Lane LOS	D	B	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	10

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

Lanes, Volumes, Timings
6: Roger Hanks & US 290

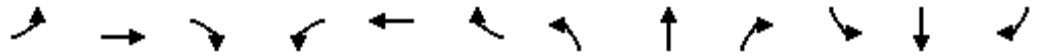
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	1308	78	48	1438	67	25	0	30	115	25	57
Future Volume (vph)	75	1308	78	48	1438	67	25	0	30	115	25	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.992				0.850		0.897	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1805	3267	0	1805	3385	0	0	1805	1553	1597	1546	0
Flt Permitted	0.051			0.057				0.950		0.950		
Satd. Flow (perm)	97	3267	0	108	3385	0	0	1805	1553	1597	1546	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			6				121		63	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Heavy Vehicles (%)	0%	10%	0%	0%	6%	2%	0%	0%	4%	13%	0%	15%
Adj. Flow (vph)	156	1656	130	71	1580	91	40	0	40	198	35	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	1786	0	71	1671	0	0	40	40	198	111	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

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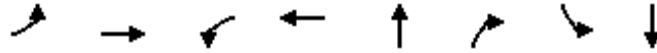
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6				8					
Detector Phase	5	2	1		6	8		8	8	7	7	
Switch Phase												
Minimum Initial (s)	5.0	12.0	5.0		12.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	31.0	11.0		18.0	33.5		33.5	33.5	11.5	11.5	
Total Split (s)	16.0	80.0	16.0		80.0	22.0		22.0	22.0	22.0	22.0	22.0
Total Split (%)	11.4%	57.1%	11.4%		57.1%	15.7%		15.7%	15.7%	15.7%	15.7%	15.7%
Maximum Green (s)	10.0	74.0	10.0		74.0	15.5		15.5	15.5	15.5	15.5	15.5
Yellow Time (s)	5.0	5.0	5.0		5.0	4.0		4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	2.5		2.5	2.5	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.5		6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	None		C-Max	None		None	None	None	None	None
Walk Time (s)	7.0						7.0	7.0	7.0			
Flash Dont Walk (s)	18.0						20.0	20.0	20.0			
Pedestrian Calls (#/hr)	0						0	0	0			
Act Effct Green (s)	99.7	89.6	88.9		82.1	7.6		7.6	15.5	15.5		
Actuated g/C Ratio	0.71	0.64	0.64		0.59	0.05		0.05	0.11	0.11		
v/c Ratio	0.72	0.85	0.47		0.84	0.41		0.20	1.12	0.49		
Control Delay	48.3	27.4	25.6		9.6	75.5		2.3	159.9	34.9		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		
Total Delay	48.3	27.4	25.6		9.6	75.5		2.3	159.9	34.9		
LOS	D	C	C		A	E		A	F	C		
Approach Delay	29.0		10.2				38.9		115.0			
Approach LOS	C		B				D		F			

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 86 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 27.7
 Intersection LOS: C
 Intersection Capacity Utilization 74.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290


























Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	156	1786	71	1671	40	40	198	111
v/c Ratio	0.72	0.85	0.47	0.84	0.41	0.20	1.12	0.49
Control Delay	48.3	27.4	25.6	9.6	75.5	2.3	159.9	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	27.4	25.6	9.6	75.5	2.3	159.9	34.9
Queue Length 50th (ft)	81	690	15	130	36	0	-207	41
Queue Length 95th (ft)	54	701	m8	m111	75	0	#179	68
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	223	2093	192	1987	199	279	176	227
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.85	0.37	0.84	0.20	0.14	1.13	0.49

Intersection Summary

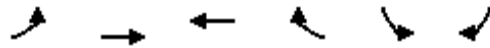
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Roger Hanks & US 290

Heritage TIA
Build Out PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	1308	78	48	1438	67	25	0	30	115	25	57
Future Volume (vph)	75	1308	78	48	1438	67	25	0	30	115	25	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3268		1805	3385			1805	1553	1597	1546	
Flt Permitted	0.05	1.00		0.06	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (perm)	96	3268		107	3385			1805	1553	1597	1546	
Peak-hour factor, PHF	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Adj. Flow (vph)	156	1656	130	71	1580	91	40	0	40	198	35	76
RTOR Reduction (vph)	0	3	0	0	3	0	0	0	38	0	56	0
Lane Group Flow (vph)	156	1783	0	71	1668	0	0	40	2	198	55	0
Heavy Vehicles (%)	0%	10%	0%	0%	6%	2%	0%	0%	4%	13%	0%	15%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases	2			6					8			
Actuated Green, G (s)	98.9	87.1		86.6	80.8			6.6	6.6	15.5	15.5	
Effective Green, g (s)	98.9	87.1		86.6	80.8			6.6	6.6	15.5	15.5	
Actuated g/C Ratio	0.71	0.62		0.62	0.58			0.05	0.05	0.11	0.11	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	215	2033		136	1953			85	73	176	171	
v/s Ratio Prot	c0.06	c0.55		0.02	0.49			c0.02		c0.12	0.04	
v/s Ratio Perm	0.45			0.30					0.00			
v/c Ratio	0.73	0.88		0.52	0.85			0.47	0.03	1.12	0.32	
Uniform Delay, d1	38.7	22.0		21.0	24.7			65.0	63.6	62.2	57.4	
Progression Factor	1.00	1.00		1.68	0.33			1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.8	5.7		0.2	0.5			1.5	0.1	105.4	0.4	
Delay (s)	48.6	27.7		35.5	8.6			66.5	63.7	167.6	57.8	
Level of Service	D	C		D	A			E	E	F	E	
Approach Delay (s)		29.4			9.7			65.1			128.2	
Approach LOS		C			A			E			F	
Intersection Summary												
HCM 2000 Control Delay			29.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			25.0			
Intersection Capacity Utilization			74.5%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Brookside












Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↷	
Traffic Volume (vph)	0	23	38	38	23	0
Future Volume (vph)	0	23	38	38	23	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.932				
Fl _t Protected					0.950	
Satd. Flow (prot)	0	1863	1736	0	1770	0
Fl _t Permitted					0.950	
Satd. Flow (perm)	0	1863	1736	0	1770	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		2535	225		1819	
Travel Time (s)		57.6	5.1		41.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	25	41	41	25	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	25	82	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.3%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	0	23	38	38	23	0
Future Vol, veh/h	0	23	38	38	23	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	25	41	41	25	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	82	0	-	0	87	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	25	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1515	-	-	-	914	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	998	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1515	-	-	-	914	1003
Mov Cap-2 Maneuver	-	-	-	-	914	-
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	998	-
Approach	EB	WB	SB			
HCM Control Delay, s	0	0	9			
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1515	-	-	-	914	
HCM Lane V/C Ratio	-	-	-	-	0.027	
HCM Control Delay (s)	0	-	-	-	9	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Lanes, Volumes, Timings
8: Brookside























						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	23	23	88	38	38	61
Future Volume (vph)	23	23	88	38	38	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932			0.917		
Flt Protected				0.966	0.981	
Satd. Flow (prot)	1736	0	0	1799	1676	0
Flt Permitted				0.966	0.981	
Satd. Flow (perm)	1736	0	0	1799	1676	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	225			1986	2634	
Travel Time (s)	5.1			45.1	59.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	25	96	41	41	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	137	107	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Yield			Yield	Yield	
Intersection Summary						
Area Type:	Other					
Control Type:	Roundabout					
Intersection Capacity Utilization	26.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection			
Intersection Delay, s/veh	3.5		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	50	137	107
Demand Flow Rate, veh/h	52	140	109
Vehicles Circulating, veh/h	98	42	25
Vehicles Exiting, veh/h	84	92	123
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.6	3.4
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	52	140	109
Cap Entry Lane, veh/h	1249	1322	1345
Entry HV Adj Factor	0.971	0.980	0.982
Flow Entry, veh/h	50	137	107
Cap Entry, veh/h	1212	1295	1320
V/C Ratio	0.042	0.106	0.081
Control Delay, s/veh	3.3	3.6	3.4
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Appendix I: Synchro Reports – 2026 Build-Out Conditions With Mitigation

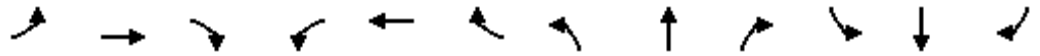
Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Mitigated AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Future Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		275	150		275	150		150	130		130
Storage Lanes	2		0	2		0	2		1	2		1
Taper Length (ft)	25			25			100			100		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	0.91	0.91	1.00	0.91	0.91	1.00
Frt		0.973			0.991				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.992		0.950	0.995	
Satd. Flow (prot)	3242	3438	0	3242	3447	0	3129	1633	1553	3221	1702	1482
Flt Permitted	0.950			0.950			0.950	0.890		0.950	0.933	
Satd. Flow (perm)	3242	3438	0	3242	3447	0	3129	1466	1553	3221	1595	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			6				82			82
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3012			2872			679			376	
Travel Time (s)		45.6			43.5			10.3			5.7	
Peak Hour Factor	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	2%	1%	9%
Adj. Flow (vph)	195	1462	320	160	1649	100	557	312	241	438	364	262
Shared Lane Traffic (%)							10%			10%		
Lane Group Flow (vph)	195	1782	0	160	1749	0	501	368	241	394	408	262
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5

Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Mitigated AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases									8			4
Detector Phase	5	2		1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	26.0		11.0	26.0		28.0	28.0	11.0	9.5	28.0	11.0
Total Split (s)	11.0	56.0		11.0	56.0		28.0	25.0	11.0	28.0	25.0	11.0
Total Split (%)	9.2%	46.7%		9.2%	46.7%		23.3%	20.8%	9.2%	23.3%	20.8%	9.2%
Maximum Green (s)	5.0	50.0		5.0	50.0		22.0	19.0	5.0	23.5	19.0	5.0
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	4.5	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	3.0	2.0	2.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)		13.0			13.0		15.0	15.0			15.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	5.0	50.0		5.0	50.0		21.3	21.3	33.9	19.6	18.1	30.7
Actuated g/C Ratio	0.04	0.42		0.04	0.42		0.18	0.18	0.28	0.16	0.15	0.26
v/c Ratio	1.44	1.23		1.19	1.22		0.90	1.27	0.48	0.75	1.59	0.60
Control Delay	277.0	141.9		184.6	135.9		69.1	187.4	27.7	57.1	319.4	33.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	277.0	141.9		184.6	135.9		69.1	187.4	27.7	57.1	319.4	33.1
LOS	F	F		F	F		E	F	C	E	F	C
Approach Delay		155.2			140.0			99.4			151.8	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.59
 Intersection Signal Delay: 139.6 Intersection LOS: F
 Intersection Capacity Utilization 94.5% ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 1: RR 12 & US 290





































Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	195	1782	160	1749	501	368	241	394	408	262
v/c Ratio	1.44	1.23	1.19	1.22	0.90	1.27	0.48	0.75	1.59	0.60
Control Delay	277.0	141.9	184.6	135.9	69.1	187.4	27.7	57.1	319.4	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	277.0	141.9	184.6	135.9	69.1	187.4	27.7	57.1	319.4	33.1
Queue Length 50th (ft)	~105	~895	~76	~875	209	~386	101	161	~492	123
Queue Length 95th (ft)	#170	#961	#137	#852	#306	#539	161	201	#517	205
Internal Link Dist (ft)		2932		2792		599			296	
Turn Bay Length (ft)	150		150		150		150	130		130
Base Capacity (vph)	135	1448	135	1439	573	289	498	630	256	440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.44	1.23	1.19	1.22	0.87	1.27	0.48	0.63	1.59	0.60

Intersection Summary

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

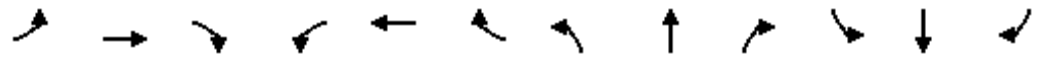
HCM Signalized Intersection Capacity Analysis
1: RR 12 & US 290

Heritage TIA
Mitigated AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 	 	 	 	 
Traffic Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Future Volume (vph)	166	1257	224	136	1336	57	501	262	195	377	277	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	0.99	1.00
Satd. Flow (prot)	3242	3438		3242	3449		3129	1634	1553	3221	1701	1482
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.89	1.00	0.95	0.93	1.00
Satd. Flow (perm)	3242	3438		3242	3449		3129	1465	1553	3221	1595	1482
Peak-hour factor, PHF	0.85	0.86	0.70	0.85	0.81	0.57	0.90	0.84	0.81	0.86	0.76	0.87
Adj. Flow (vph)	195	1462	320	160	1649	100	557	312	241	438	364	262
RTOR Reduction (vph)	0	16	0	0	4	0	0	0	63	0	0	65
Lane Group Flow (vph)	195	1766	0	160	1746	0	501	368	178	394	408	197
Heavy Vehicles (%)	8%	2%	3%	8%	4%	0%	5%	5%	4%	2%	1%	9%
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	5.0	50.0		5.0	50.0		21.3	44.2	27.9	19.6	39.3	24.7
Effective Green, g (s)	5.0	50.0		5.0	50.0		21.3	44.2	27.9	19.6	39.3	24.7
Actuated g/C Ratio	0.04	0.42		0.04	0.42		0.18	0.37	0.23	0.16	0.33	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	135	1432		135	1437		555	569	438	526	539	379
v/s Ratio Prot	c0.06	c0.51		0.05	0.51		c0.16	0.11	0.02	0.12	0.12	0.02
v/s Ratio Perm								c0.12	0.10		c0.12	0.11
v/c Ratio	1.44	1.23		1.19	1.21		0.90	0.65	0.41	0.75	0.76	0.52
Uniform Delay, d1	57.5	35.0		57.5	35.0		48.3	31.4	39.0	47.9	36.1	42.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	236.6	111.3		135.7	103.2		17.6	1.9	0.2	5.8	5.4	0.5
Delay (s)	294.1	146.3		193.2	138.2		65.9	33.3	39.3	53.6	41.4	42.9
Level of Service	F	F		F	F		E	C	D	D	D	D
Approach Delay (s)		160.9			142.8			49.3			46.3	
Approach LOS		F			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			114.7			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			94.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Mitigated AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Future Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		275	0		0	250		0
Storage Lanes	1		0	1		1	0		0	2		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1805	3505	0	1900	3374	1615	0	1900	0	3502	1538	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1805	3505	0	1900	3374	1615	0	1900	0	3502	1538	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						576						412
Link Speed (mph)		45			45			30				30
Link Distance (ft)		3195			3012			166				1615
Travel Time (s)		48.4			45.6			3.8				36.7
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Adj. Flow (vph)	50	1800	0	0	1556	775	0	0	0	303	0	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	1800	0	0	1556	775	0	0	0	303	141	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA		Perm	NA	Perm				Split	NA	
Protected Phases	1	6			2			4		8		8

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Mitigated AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				2		2	4					
Detector Phase	1	6		2	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0	12.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	25.0		25.0	25.0	25.0	30.5	30.5		30.5	30.5	
Total Split (s)	25.0	70.0		45.0	45.0	45.0	10.0	10.0		30.0	30.0	
Total Split (%)	22.7%	63.6%		40.9%	40.9%	40.9%	9.1%	9.1%		27.3%	27.3%	
Maximum Green (s)	19.0	64.0		39.0	39.0	39.0	4.5	4.5		24.5	24.5	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	7.6	84.4			73.0	73.0				14.1	14.1	
Actuated g/C Ratio	0.07	0.77			0.66	0.66				0.13	0.13	
v/c Ratio	0.40	0.67			0.69	0.61				0.68	0.25	
Control Delay	57.8	8.1			15.4	5.3				53.3	1.1	
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	
Total Delay	57.8	8.1			15.4	5.3				53.3	1.1	
LOS	E	A			B	A				D	A	
Approach Delay		9.4			12.0							36.8
Approach LOS		A			B							D

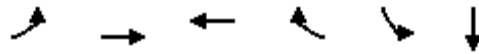
Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 13.4
 Intersection LOS: B
 Intersection Capacity Utilization 61.1%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290
























Lane Group	EBL	EBT	WBT	WBR	SBL	SBT
Lane Group Flow (vph)	50	1800	1556	775	303	141
v/c Ratio	0.40	0.67	0.69	0.61	0.68	0.25
Control Delay	57.8	8.1	15.4	5.3	53.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	8.1	15.4	5.3	53.3	1.1
Queue Length 50th (ft)	35	262	347	52	107	0
Queue Length 95th (ft)	71	382	532	122	144	0
Internal Link Dist (ft)		3115	2932			1535
Turn Bay Length (ft)	100			275	250	
Base Capacity (vph)	311	2690	2240	1265	779	662
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.67	0.69	0.61	0.39	0.21

Intersection Summary

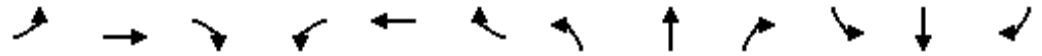
HCM Signalized Intersection Capacity Analysis
2: Sportsplex & US 290

Heritage TIA
Mitigated AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Future Volume (vph)	44	1584	0	0	1494	643	0	0	0	270	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0				5.5	5.5	
Lane Util. Factor	1.00	0.95			0.95	1.00				0.97	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)	1805	3505			3374	1615				3502	1538	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1805	3505			3374	1615				3502	1538	
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.83	0.92	0.92	0.92	0.89	0.92	0.54
Adj. Flow (vph)	50	1800	0	0	1556	775	0	0	0	303	0	141
RTOR Reduction (vph)	0	0	0	0	0	200	0	0	0	0	123	0
Lane Group Flow (vph)	50	1800	0	0	1556	575	0	0	0	303	18	0
Heavy Vehicles (%)	0%	3%	100%	0%	7%	0%	0%	0%	0%	0%	0%	5%
Turn Type	Prot	NA		Perm	NA	Perm				Split	NA	
Protected Phases	1	6			2			4		8	8	
Permitted Phases				2		2	4					
Actuated Green, G (s)	6.6	84.4			71.8	71.8				14.1	14.1	
Effective Green, g (s)	6.6	84.4			71.8	71.8				14.1	14.1	
Actuated g/C Ratio	0.06	0.77			0.65	0.65				0.13	0.13	
Clearance Time (s)	6.0	6.0			6.0	6.0				5.5	5.5	
Vehicle Extension (s)	2.0	2.0			2.0	2.0				2.0	2.0	
Lane Grp Cap (vph)	108	2689			2202	1054				448	197	
v/s Ratio Prot	0.03	c0.51			c0.46					c0.09	0.01	
v/s Ratio Perm						0.36						
v/c Ratio	0.46	0.67			0.71	0.55				0.68	0.09	
Uniform Delay, d1	50.0	6.1			12.3	10.3				45.8	42.3	
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.1	1.3			1.9	2.0				3.2	0.1	
Delay (s)	51.1	7.5			14.3	12.3				48.9	42.4	
Level of Service	D	A			B	B				D	D	
Approach Delay (s)		8.6			13.6			0.0			46.9	
Approach LOS		A			B			A			D	
Intersection Summary												
HCM 2000 Control Delay			14.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		23.0			
Intersection Capacity Utilization			61.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
Mitigated AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	53	1	1	22	5	4	3	836	16	7	878	145
Future Volume (vph)	53	1	1	22	5	4	3	836	16	7	878	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.963			0.996			0.979	
Flt Protected		0.958			0.973		0.950			0.950		
Satd. Flow (prot)	0	1806	0	0	1780	0	1805	1801	0	1805	1793	0
Flt Permitted		0.958			0.973		0.950			0.950		
Satd. Flow (perm)	0	1806	0	0	1780	0	1805	1801	0	1805	1793	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			982			342	
Travel Time (s)		14.1			35.6			14.9			5.2	
Peak Hour Factor	0.89	0.25	0.25	0.67	0.50	0.25	0.50	0.80	0.60	0.63	0.77	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	8%	0%	4%	2%
Adj. Flow (vph)	60	4	4	33	10	16	6	1045	27	11	1140	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	0	59	0	6	1072	0	11	1321	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.6%
ICU Level of Service	C
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	46											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	53	1	1	22	5	4	3	836	16	7	878	145
Future Vol, veh/h	53	1	1	22	5	4	3	836	16	7	878	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	25	25	67	50	25	50	80	60	63	77	80
Heavy Vehicles, %	0	0	0	0	0	0	0	5	8	0	4	2
Mvmt Flow	60	4	4	33	10	16	6	1045	27	11	1140	181

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2337	2337	1231	2235	2233	1059	1140	0	0	1072	0	0
Stage 1	1253	1253	-	1071	1071	-	-	-	-	-	-	-
Stage 2	1084	1084	-	1164	1162	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 26	37	218	~ 31	43	275	620	-	-	658	-	-
Stage 1	213	246	-	270	300	-	-	-	-	-	-	-
Stage 2	265	296	-	239	272	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 20	36	218	~ 27	42	275	620	-	-	658	-	-
Mov Cap-2 Maneuver	~ 20	36	-	~ 27	42	-	-	-	-	-	-	-
Stage 1	211	242	-	267	297	-	-	-	-	-	-	-
Stage 2	239	293	-	227	267	-	-	-	-	-	-	-




















Approach	EB		WB		NB		SB	
HCM Control Delay, \$1300.2			\$ 487		0.1		0.1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	620	-	-	22	39	658	-	-
HCM Lane V/C Ratio	0.01	-	-	3.07	1.509	0.017	-	-
HCM Control Delay (s)	10.9	-	-	\$ 1300.2	\$ 487	10.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	8.6	6.1	0.1	-	-

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

Lanes, Volumes, Timings
4: RR 12 & Brookside

Heritage TIA
Mitigated AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	0	139	24	0	6	47	832	6	6	886	18
Future Volume (vph)	52	0	139	24	0	6	47	832	6	6	886	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		100	100		0	50		0	50		400
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.902			0.968			0.999				0.850
Flt Protected		0.986			0.963		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1579	0	1805	1775	0	1805	1776	1615
Flt Permitted		0.887			0.458		0.139			0.109		
Satd. Flow (perm)	0	1520	0	0	751	0	264	1775	0	207	1776	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		132			97			1				97
Link Speed (mph)		30			25			45				45
Link Distance (ft)		1986			1288			342				958
Travel Time (s)		45.1			35.1			5.2				14.5
Peak Hour Factor	0.92	0.92	0.92	0.53	0.92	0.42	0.92	0.77	0.63	0.42	0.91	0.92
Heavy Vehicles (%)	0%	0%	0%	16%	0%	0%	0%	7%	0%	0%	7%	0%
Adj. Flow (vph)	57	0	151	45	0	14	51	1081	10	14	974	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	208	0	0	59	0	51	1091	0	14	974	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane								Yes				Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6

Lanes, Volumes, Timings
4: RR 12 & Brookside

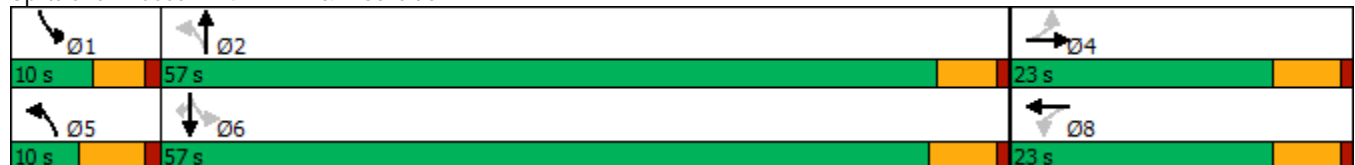
Heritage TIA
Mitigated AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		4.0	15.0		5.0	15.0	15.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	23.0		9.5	23.5	23.5
Total Split (s)	23.0	23.0		23.0	23.0		10.0	57.0		10.0	57.0	57.0
Total Split (%)	25.6%	25.6%		25.6%	25.6%		11.1%	63.3%		11.1%	63.3%	63.3%
Maximum Green (s)	17.5	17.5		17.5	17.5		4.5	52.0		5.5	51.5	51.5
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.0		3.5	4.5	4.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		5.5			5.5		5.5	5.0		4.5	5.5	5.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	16.0	16.0		16.0	16.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effct Green (s)		10.2			10.2		57.6	57.3		57.1	53.0	53.0
Actuated g/C Ratio		0.13			0.13		0.72	0.72		0.71	0.66	0.66
v/c Ratio		0.67			0.33		0.18	0.86		0.05	0.83	0.02
Control Delay		24.9			7.3		5.3	19.7		4.2	21.0	0.1
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		24.9			7.3		5.3	19.7		4.2	21.0	0.1
LOS		C			A		A	B		A	C	A
Approach Delay		24.9			7.3			19.0			20.4	
Approach LOS		C			A			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 79.9
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 19.8
 Intersection LOS: B
 Intersection Capacity Utilization 66.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: RR 12 & Brookside



Queues
4: RR 12 & Brookside



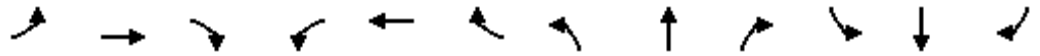
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	208	59	51	1091	14	974	20
v/c Ratio	0.67	0.33	0.18	0.86	0.05	0.83	0.02
Control Delay	24.9	7.3	5.3	19.7	4.2	21.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	7.3	5.3	19.7	4.2	21.0	0.1
Queue Length 50th (ft)	37	0	5	281	1	372	0
Queue Length 95th (ft)	104	13	19	#709	3	#790	0
Internal Link Dist (ft)	1906	1208		262		878	
Turn Bay Length (ft)			50		50		400
Base Capacity (vph)	439	242	278	1273	259	1178	1104
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.24	0.18	0.86	0.05	0.83	0.02

Intersection Summary

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

HCM 6th Signalized Intersection Summary
4: RR 12 & Brookside

Heritage TIA
Mitigated AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Volume (veh/h)	52	0	139	24	0	6	47	832	6	6	886	18
Future Volume (veh/h)	52	0	139	24	0	6	47	832	6	6	886	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1796	1796	1900	1796	1900
Adj Flow Rate, veh/h	57	0	151	45	0	14	51	1081	10	14	974	20
Peak Hour Factor	0.92	0.92	0.92	0.53	0.92	0.42	0.92	0.77	0.63	0.42	0.91	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	7	7	0	7	0
Cap, veh/h	111	15	182	205	11	42	228	1124	10	153	1083	971
Arrive On Green	0.16	0.00	0.16	0.16	0.00	0.16	0.03	0.63	0.63	0.02	0.60	0.60
Sat Flow, veh/h	343	96	1164	805	70	272	1810	1777	16	1810	1796	1610
Grp Volume(v), veh/h	208	0	0	59	0	0	51	0	1091	14	974	20
Grp Sat Flow(s),veh/h/ln	1604	0	0	1146	0	0	1810	0	1793	1810	1796	1610
Q Serve(g_s), s	6.4	0.0	0.0	0.0	0.0	0.0	0.8	0.0	45.5	0.2	37.5	0.4
Cycle Q Clear(g_c), s	9.9	0.0	0.0	3.5	0.0	0.0	0.8	0.0	45.5	0.2	37.5	0.4
Prop In Lane	0.27		0.73	0.76		0.24	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	308	0	0	258	0	0	228	0	1135	153	1083	971
V/C Ratio(X)	0.68	0.00	0.00	0.23	0.00	0.00	0.22	0.00	0.96	0.09	0.90	0.02
Avail Cap(c_a), veh/h	407	0	0	343	0	0	269	0	1171	248	1161	1041
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	0.0	29.7	0.0	0.0	15.1	0.0	13.7	17.8	13.7	6.4
Incr Delay (d2), s/veh	2.8	0.0	0.0	0.4	0.0	0.0	0.5	0.0	17.6	0.3	9.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.0	1.0	0.0	0.0	0.4	0.0	18.3	0.1	13.9	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.3	0.0	0.0	30.2	0.0	0.0	15.6	0.0	31.3	18.0	22.9	6.4
LnGrp LOS	D	A	A	C	A	A	B	A	C	B	C	A
Approach Vol, veh/h		208			59			1142			1008	
Approach Delay, s/veh		35.3			30.2			30.6			22.5	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	55.9		17.9	8.2	53.5		17.9				
Change Period (Y+Rc), s	4.5	* 5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.5	* 52		17.5	4.5	51.5		17.5				
Max Q Clear Time (g_c+I1), s	2.2	47.5		11.9	2.8	39.5		5.5				
Green Ext Time (p_c), s	0.0	3.0		0.5	0.0	5.5		0.2				

Intersection Summary





















HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
Mitigated AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	156	1	8	650	51	1	0	1	127	0	4
Future Volume (vph)	11	156	1	8	650	51	1	0	1	127	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		0	175		100
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	50			25			25			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.932				0.850
Flt Protected	0.950				0.999			0.976		0.950		
Satd. Flow (prot)	1357	1879	0	0	1880	923	0	1728	0	1444	1900	1615
Flt Permitted	0.950				0.999			0.976		0.950		
Satd. Flow (perm)	1357	1879	0	0	1880	923	0	1728	0	1444	1900	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		229			479			221			2634	
Travel Time (s)		5.2			10.9			5.0			59.9	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	33%	1%	0%	0%	1%	75%	0%	0%	0%	25%	0%	0%
Adj. Flow (vph)	14	195	1	10	813	64	1	0	1	159	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	196	0	0	823	64	0	2	0	159	0	5
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.7%					ICU Level of Service B						
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	11.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↔		↖	↗	↖
Traffic Vol, veh/h	11	156	1	8	650	51	1	0	1	127	0	4
Future Vol, veh/h	11	156	1	8	650	51	1	0	1	127	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	100	-	-	-	175	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	33	1	0	0	1	75	0	0	0	25	0	0
Mvmt Flow	14	195	1	10	813	64	1	0	1	159	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	877	0	0	196	0	0	1092	1121	196	1057	1057	813
Stage 1	-	-	-	-	-	-	224	224	-	833	833	-
Stage 2	-	-	-	-	-	-	868	897	-	224	224	-
Critical Hdwy	4.43	-	-	4.1	-	-	7.1	6.5	6.2	7.35	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.35	5.5	-
Follow-up Hdwy	2.497	-	-	2.2	-	-	3.5	4	3.3	3.725	4	3.3
Pot Cap-1 Maneuver	654	-	-	1389	-	-	194	208	850	184	227	382
Stage 1	-	-	-	-	-	-	783	722	-	332	386	-
Stage 2	-	-	-	-	-	-	350	361	-	729	722	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	654	-	-	1389	-	-	186	201	850	179	219	382
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	201	-	179	219	-
Stage 1	-	-	-	-	-	-	767	707	-	325	381	-
Stage 2	-	-	-	-	-	-	341	356	-	712	707	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.1			16.9			90.4		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3	
Capacity (veh/h)	305	654	-	-	1389	-	-	179	-	382	
HCM Lane V/C Ratio	0.008	0.021	-	-	0.007	-	-	0.887	-	0.013	
HCM Control Delay (s)	16.9	10.6	-	-	7.6	0	-	92.8	0	14.5	
HCM Lane LOS		C	B	-	-	A	A	-	F	A	B
HCM 95th %tile Q(veh)		0	0.1	-	-	0	-	-	6.6	-	0

Lanes, Volumes, Timings
6: Roger Hanks & US 290

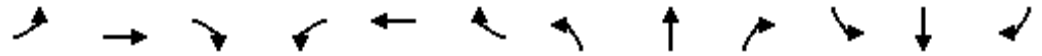
Heritage TIA
Mitigated AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Future Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.991				0.850		0.855	
Flt Protected	0.950			0.950				0.964		0.950		
Satd. Flow (prot)	1752	3302	0	1719	3267	0	0	1684	1429	1703	976	0
Flt Permitted	0.091			0.098				0.964		0.950		
Satd. Flow (perm)	168	3302	0	177	3267	0	0	1684	1429	1703	976	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			5				168		160	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Adj. Flow (vph)	79	1503	35	35	1425	96	45	15	70	111	6	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	1538	0	35	1521	0	0	60	70	111	166	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
Mitigated AM

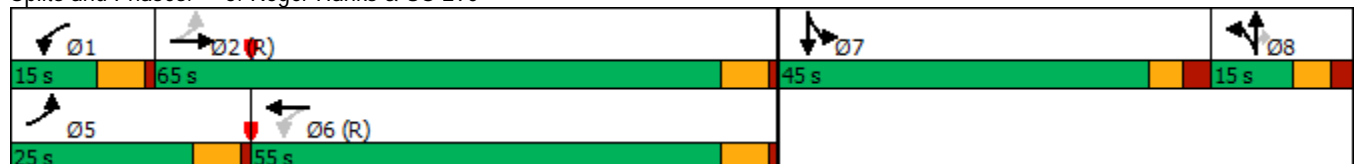


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6				8				
Detector Phase	5	2		1	6		8	8	8	7	7	
Switch Phase												
Minimum Initial (s)	5.0	12.0		5.0	12.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	31.0		11.0	24.0		33.5	33.5	33.5	24.5	24.5	
Total Split (s)	25.0	65.0		15.0	55.0		15.0	15.0	15.0	45.0	45.0	
Total Split (%)	17.9%	46.4%		10.7%	39.3%		10.7%	10.7%	10.7%	32.1%	32.1%	
Maximum Green (s)	19.0	59.0		9.0	49.0		8.5	8.5	8.5	38.5	38.5	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.5	2.5	2.5	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Walk Time (s)		7.0					7.0	7.0	7.0			
Flash Dont Walk (s)		18.0					20.0	20.0	20.0			
Pedestrian Calls (#/hr)		0					0	0	0			
Act Effct Green (s)	94.2	88.4		90.6	85.0			9.5	9.5	13.7	13.7	
Actuated g/C Ratio	0.67	0.63		0.65	0.61			0.07	0.07	0.10	0.10	
v/c Ratio	0.42	0.74		0.20	0.77			0.53	0.28	0.66	0.69	
Control Delay	14.9	22.8		11.1	25.1			79.0	2.7	79.0	24.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	14.9	22.8		11.1	25.1			79.0	2.7	79.0	24.7	
LOS	B	C		B	C			E	A	E	C	
Approach Delay		22.4			24.7			37.9			46.5	
Approach LOS		C			C			D			D	

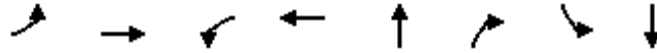
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 33 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 25.9
 Intersection LOS: C
 Intersection Capacity Utilization 64.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290



Queues
6: Roger Hanks & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	79	1538	35	1521	60	70	111	166
v/c Ratio	0.42	0.74	0.20	0.77	0.53	0.28	0.66	0.69
Control Delay	14.9	22.8	11.1	25.1	79.0	2.7	79.0	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	22.8	11.1	25.1	79.0	2.7	79.0	24.7
Queue Length 50th (ft)	21	498	9	503	54	0	99	5
Queue Length 95th (ft)	33	738	19	727	83	0	156	0
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	332	2085	217	1986	123	259	468	384
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.74	0.16	0.77	0.49	0.27	0.24	0.43

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Roger Hanks & US 290

Heritage TIA
Mitigated AM

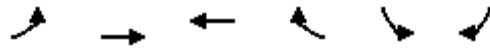


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Future Volume (vph)	50	1383	28	24	1254	71	30	11	40	99	3	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3301		1719	3266			1684	1429	1703	976	
Flt Permitted	0.09	1.00		0.10	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (perm)	169	3301		178	3266			1684	1429	1703	976	
Peak-hour factor, PHF	0.63	0.92	0.79	0.68	0.88	0.74	0.67	0.75	0.57	0.89	0.50	0.50
Adj. Flow (vph)	79	1503	35	35	1425	96	45	15	70	111	6	160
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	65	0	144	0
Lane Group Flow (vph)	79	1537	0	35	1519	0	0	60	5	111	22	0
Heavy Vehicles (%)	3%	9%	9%	5%	10%	2%	8%	11%	13%	6%	0%	69%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases	2			6					8			
Actuated Green, G (s)	94.0	87.2		89.6	85.0			9.5	9.5	13.7	13.7	
Effective Green, g (s)	94.0	87.2		89.6	85.0			9.5	9.5	13.7	13.7	
Actuated g/C Ratio	0.67	0.62		0.64	0.61			0.07	0.07	0.10	0.10	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	190	2056		164	1982			114	96	166	95	
v/s Ratio Prot	c0.02	c0.47		0.01	0.47			c0.04		c0.07	0.02	
v/s Ratio Perm	0.26			0.13					0.00			
v/c Ratio	0.42	0.75		0.21	0.77			0.53	0.05	0.67	0.23	
Uniform Delay, d1	15.7	18.6		14.2	20.2			63.1	61.0	61.0	58.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	2.5		0.2	2.9			2.0	0.1	7.7	0.4	
Delay (s)	16.2	21.2		14.4	23.1			65.1	61.1	68.6	58.7	
Level of Service	B	C		B	C			E	E	E	E	
Approach Delay (s)		20.9			22.9			62.9			62.7	
Approach LOS		C			C			E			E	

Intersection Summary

HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Brookside



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Volume (vph)	0	35	12	12	35	0
Future Volume (vph)	0	35	12	12	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.932					
Fl _t Protected					0.950	
Satd. Flow (prot)	0	1863	1736	0	1770	0
Fl _t Permitted					0.950	
Satd. Flow (perm)	0	1863	1736	0	1770	0
Link Speed (mph)	30		30	30		
Link Distance (ft)	2535		225	1819		
Travel Time (s)	57.6		5.1	41.3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	38	13	13	38	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	38	26	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)	0		0	12		
Link Offset(ft)	0		0	0		
Crosswalk Width(ft)	16		16	16		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control	Free		Free	Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.3%
Analysis Period (min)	15
	ICU Level of Service A

Intersection

Int Delay, s/veh 3.4

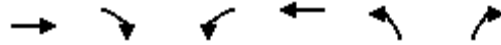
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	0	35	12	12	35	0
Future Vol, veh/h	0	35	12	12	35	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	13	13	38	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	26	0	58
Stage 1	-	-	20
Stage 2	-	-	38
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1588	-	949
Stage 1	-	-	1003
Stage 2	-	-	984
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1588	-	949
Mov Cap-2 Maneuver	-	-	949
Stage 1	-	-	1003
Stage 2	-	-	984

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1588	-	-	-	949
HCM Lane V/C Ratio	-	-	-	-	0.04
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings
8: Brookside



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	35	35	41	12	12	47
Future Volume (vph)	35	35	41	12	12	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932			0.892		
Flt Protected				0.963	0.990	
Satd. Flow (prot)	1736	0	0	1794	1645	0
Flt Permitted				0.963	0.990	
Satd. Flow (perm)	1736	0	0	1794	1645	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	225			1986	2634	
Travel Time (s)	5.1			45.1	59.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	38	45	13	13	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	0	0	58	64	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Yield			Yield	Yield	























Intersection Summary

Area Type:	Other
Control Type:	Roundabout
Intersection Capacity Utilization	19.8%
Analysis Period (min)	15
	ICU Level of Service A

Intersection			
Intersection Delay, s/veh	3.2		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	76	58	64
Demand Flow Rate, veh/h	78	59	65
Vehicles Circulating, veh/h	46	13	39
Vehicles Exiting, veh/h	26	91	85
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.0	3.1
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	78	59	65
Cap Entry Lane, veh/h	1317	1362	1326
Entry HV Adj Factor	0.977	0.979	0.985
Flow Entry, veh/h	76	58	64
Cap Entry, veh/h	1287	1333	1306
V/C Ratio	0.059	0.043	0.049
Control Delay, s/veh	3.3	3.0	3.1
LOS	A	A	A
95th %tile Queue, veh	0	0	0

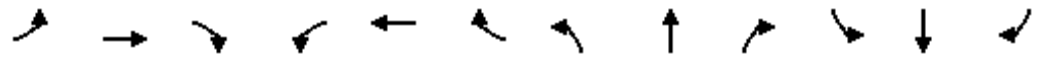
Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Mitigated PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	1251	240	244	1177	142	308	300	240	458	403	138
Future Volume (vph)	219	1251	240	244	1177	142	308	300	240	458	403	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		275	150		275	150		150	130		130
Storage Lanes	2		0	2		0	2		1	2		1
Taper Length (ft)	25			25			100			100		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	0.91	0.91	1.00	0.91	0.91	1.00
Frt		0.970			0.975				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.995		0.950	0.995	
Satd. Flow (prot)	3335	3335	0	3467	3379	0	3189	1685	1583	3253	1688	1495
Flt Permitted	0.950			0.950			0.950	0.926		0.950	0.921	
Satd. Flow (perm)	3335	3335	0	3467	3379	0	3189	1568	1583	3253	1563	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			22				70			70
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3012			2872			679			386	
Travel Time (s)		45.6			43.5			10.3			5.8	
Peak Hour Factor	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Heavy Vehicles (%)	5%	5%	5%	1%	4%	5%	3%	2%	2%	1%	2%	8%
Adj. Flow (vph)	288	1345	343	287	1401	284	350	330	320	533	433	170
Shared Lane Traffic (%)							10%			10%		
Lane Group Flow (vph)	288	1688	0	287	1685	0	315	365	320	480	486	170
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5

Lanes, Volumes, Timings
1: RR 12 & US 290

Heritage TIA
Mitigated PM

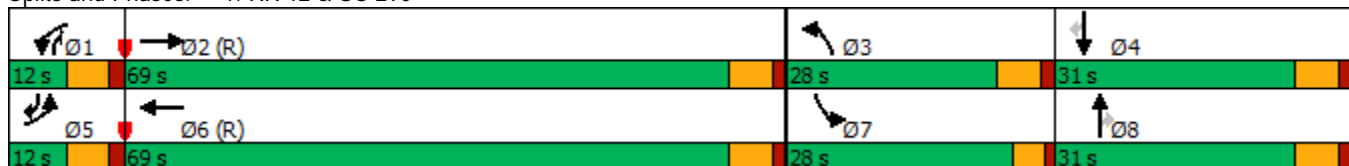


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases									8			4
Detector Phase	5	2		1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	26.0		11.0	26.0		28.0	28.0	11.0	9.5	28.0	11.0
Total Split (s)	12.0	69.0		12.0	69.0		28.0	31.0	12.0	28.0	31.0	12.0
Total Split (%)	8.6%	49.3%		8.6%	49.3%		20.0%	22.1%	8.6%	20.0%	22.1%	8.6%
Maximum Green (s)	6.0	63.0		6.0	63.0		22.0	25.0	6.0	23.5	25.0	6.0
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	4.5	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	3.0	2.0	2.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)		13.0			13.0		15.0	15.0			15.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	6.0	63.0		6.0	63.0		17.9	17.9	37.6	22.9	21.4	41.1
Actuated g/C Ratio	0.04	0.45		0.04	0.45		0.13	0.13	0.27	0.16	0.15	0.29
v/c Ratio	2.03	1.11		1.94	1.10		0.77	1.71	0.67	0.90	1.88	0.35
Control Delay	517.7	96.7		479.2	91.7		72.1	370.8	43.5	78.2	443.0	25.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	517.7	96.7		479.2	91.7		72.1	370.8	43.5	78.2	443.0	25.5
LOS	F	F		F	F		E	F	D	E	F	C
Approach Delay		158.1			148.1			172.0			226.4	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.03
 Intersection Signal Delay: 169.9 Intersection LOS: F
 Intersection Capacity Utilization 106.2% ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 1: RR 12 & US 290





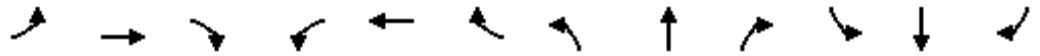
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	1688	287	1685	315	365	320	480	486	170
v/c Ratio	2.03	1.11	1.94	1.10	0.77	1.71	0.67	0.90	1.88	0.35
Control Delay	517.7	96.7	479.2	91.7	72.1	370.8	43.5	78.2	443.0	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	517.7	96.7	479.2	91.7	72.1	370.8	43.5	78.2	443.0	25.5
Queue Length 50th (ft)	~210	~918	~207	~909	154	~531	207	237	~734	70
Queue Length 95th (ft)	#248	#1060	#281	#927	199	#705	240	#308	#976	120
Internal Link Dist (ft)		2932		2792		599			306	
Turn Bay Length (ft)	150		150		150		150	130		130
Base Capacity (vph)	142	1516	148	1532	501	214	475	546	258	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.03	1.11	1.94	1.10	0.63	1.71	0.67	0.88	1.88	0.35

Intersection Summary

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

HCM 6th Signalized Intersection Summary
1: RR 12 & US 290

Heritage TIA
Mitigated PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔↔	↕↔		↔↔	↕	↔	↔↔	↕	↔
Traffic Volume (veh/h)	219	1251	240	244	1177	142	308	300	240	458	403	138
Future Volume (veh/h)	219	1251	240	244	1177	142	308	300	240	458	403	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1841	1841	1856	1870	1870	1885	1870	1781
Adj Flow Rate, veh/h	288	1345	343	287	1401	284	350	330	320	533	433	170
Peak Hour Factor	0.76	0.93	0.70	0.85	0.84	0.50	0.88	0.91	0.75	0.86	0.93	0.81
Percent Heavy Veh, %	5	5	5	1	4	4	3	2	2	1	2	8
Cap, veh/h	145	1254	312	149	1325	264	404	334	351	582	403	390
Arrive On Green	0.04	0.46	0.46	0.04	0.46	0.46	0.11	0.18	0.18	0.16	0.22	0.22
Sat Flow, veh/h	3374	2752	686	3483	2907	579	3534	1870	1585	3591	1870	1510
Grp Volume(v), veh/h	288	836	852	287	832	853	350	330	320	533	433	170
Grp Sat Flow(s),veh/h/ln	1687	1735	1703	1742	1749	1737	1767	1870	1585	1795	1870	1510
Q Serve(g_s), s	6.0	63.8	63.8	6.0	63.8	63.8	13.6	24.6	25.0	20.4	30.2	13.2
Cycle Q Clear(g_c), s	6.0	63.8	63.8	6.0	63.8	63.8	13.6	24.6	25.0	20.4	30.2	13.2
Prop In Lane	1.00		0.40	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	791	776	149	797	791	404	334	351	582	403	390
V/C Ratio(X)	1.99	1.06	1.10	1.92	1.04	1.08	0.87	0.99	0.91	0.92	1.07	0.44
Avail Cap(c_a), veh/h	145	791	776	149	797	791	555	334	351	603	403	390
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.19	0.19	0.19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.0	38.1	38.1	67.0	38.1	38.1	60.9	57.4	53.2	57.7	54.9	43.4
Incr Delay (d2), s/veh	451.1	32.4	48.5	438.9	44.1	54.9	8.1	45.8	26.6	18.5	65.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	32.7	35.5	11.7	35.5	37.6	6.4	15.6	13.3	10.6	21.2	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	518.1	70.5	86.6	505.9	82.2	93.0	69.1	103.1	79.8	76.2	120.7	43.7
LnGrp LOS	F	F	F	F	F	F	E	F	E	E	F	D
Approach Vol, veh/h		1976			1972			1000			1136	
Approach Delay, s/veh		142.7			148.5			83.7			88.3	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	69.8	22.0	36.2	12.0	69.8	27.2	31.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0				
Max Green Setting (Gmax), s	6.0	63.0	22.0	25.0	6.0	63.0	23.5	25.0				
Max Q Clear Time (g_c+I1), s	8.0	65.8	15.6	32.2	8.0	65.8	22.4	27.0				
Green Ext Time (p_c), s	0.0	0.0	0.4	0.0	0.0	0.0	0.3	0.0				

Intersection Summary






















HCM 6th Ctrl Delay	124.7
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

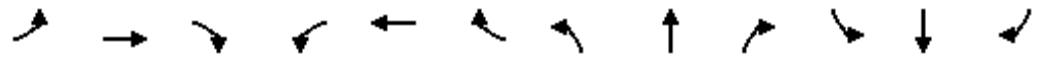
Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Mitigated PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	1531	8	8	1440	319	1	0	1	577	0	50
Future Volume (vph)	53	1531	8	8	1440	319	1	0	1	577	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		275	0		0	250		0
Storage Lanes	1		0	1		1	0		0	2		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt		0.999				0.850		0.932			0.850	
Flt Protected	0.950			0.950				0.976		0.950		
Satd. Flow (prot)	1805	3421	0	1203	3539	1615	0	1728	0	3367	1615	0
Flt Permitted	0.950			0.060						0.950		
Satd. Flow (perm)	1805	3421	0	76	3539	1615	0	1771	0	3367	1615	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				354		105			315	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		3195			3012			166			1615	
Travel Time (s)		48.4			45.6			3.8			36.7	
Peak Hour Factor	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Heavy Vehicles (%)	0%	5%	83%	50%	2%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	102	2014	11	21	1756	613	4	0	4	931	0	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	2025	0	21	1756	613	0	8	0	931	93	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	Perm	NA		Split	NA	
Protected Phases	1	6			2			4		8	8	

Lanes, Volumes, Timings
2: Sportsplex & US 290

Heritage TIA
Mitigated PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				2		2	4					
Detector Phase	1	6		2	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0	12.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	25.0		25.0	25.0	25.0	30.5	30.5		30.5	30.5	
Total Split (s)	20.0	95.0		75.0	75.0	75.0	20.0	20.0		35.0	35.0	
Total Split (%)	13.3%	63.3%		50.0%	50.0%	50.0%	13.3%	13.3%		23.3%	23.3%	
Maximum Green (s)	14.0	89.0		69.0	69.0	69.0	14.5	14.5		29.5	29.5	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	11.8	89.0		71.2	71.2	71.2		5.0		47.4	47.4	
Actuated g/C Ratio	0.08	0.59		0.47	0.47	0.47		0.03		0.32	0.32	
v/c Ratio	0.72	1.00		0.60	1.05	0.64		0.05		0.88	0.13	
Control Delay	93.9	49.6		95.6	73.5	15.3		0.5		58.5	0.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	93.9	49.6		95.6	73.5	15.3		0.5		58.5	0.4	
LOS	F	D		F	E	B		A		E	A	
Approach Delay		51.7			58.7			0.5			53.2	
Approach LOS		D			E			A			D	

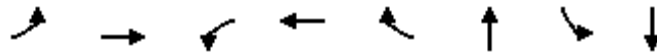
Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.05
 Intersection Signal Delay: 55.0
 Intersection Capacity Utilization 76.8%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 2: Sportsplex & US 290



Queues
2: Sportsplex & US 290



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	102	2025	21	1756	613	8	931	93
v/c Ratio	0.72	1.00	0.60	1.05	0.64	0.05	0.88	0.13
Control Delay	93.9	49.6	95.6	73.5	15.3	0.5	58.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.9	49.6	95.6	73.5	15.3	0.5	58.5	0.4
Queue Length 50th (ft)	99	997	15	~990	190	0	435	0
Queue Length 95th (ft)	91	777	16	#964	38	0	350	0
Internal Link Dist (ft)		3115		2932		86		1535
Turn Bay Length (ft)	100		100		275		250	
Base Capacity (vph)	168	2030	35	1678	952	266	1064	726
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.00	0.60	1.05	0.64	0.03	0.88	0.13

Intersection Summary

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

HCM 6th Signalized Intersection Summary

2: Sportsplex & US 290

Heritage TIA
Mitigated PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗		↕		↖	↗	↗
Traffic Volume (veh/h)	53	1531	8	8	1440	319	1	0	1	577	0	50
Future Volume (veh/h)	53	1531	8	8	1440	319	1	0	1	577	0	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1159	1870	1900	1900	1900	1900	1841	1900	1900
Adj Flow Rate, veh/h	102	2014	11	21	1756	613	4	0	4	931	0	93
Peak Hour Factor	0.52	0.76	0.75	0.38	0.82	0.52	0.25	0.92	0.25	0.62	0.92	0.54
Percent Heavy Veh, %	0	5	5	50	2	0	0	0	0	4	0	0
Cap, veh/h	123	2408	13	82	2034	922	8	0	8	669	0	317
Arrive On Green	0.07	0.68	0.68	0.57	0.57	0.57	0.01	0.00	0.01	0.20	0.00	0.20
Sat Flow, veh/h	1810	3538	19	130	3554	1610	852	0	852	3401	0	1610
Grp Volume(v), veh/h	102	987	1038	21	1756	613	8	0	0	931	0	93
Grp Sat Flow(s),veh/h/ln	1810	1735	1822	130	1777	1610	1704	0	0	1700	0	1610
Q Serve(g_s), s	8.3	63.2	63.5	21.4	62.7	39.4	0.7	0.0	0.0	29.5	0.0	7.4
Cycle Q Clear(g_c), s	8.3	63.2	63.5	68.7	62.7	39.4	0.7	0.0	0.0	29.5	0.0	7.4
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	123	1180	1240	82	2034	922	16	0	0	669	0	317
V/C Ratio(X)	0.83	0.84	0.84	0.26	0.86	0.67	0.50	0.00	0.00	1.39	0.00	0.29
Avail Cap(c_a), veh/h	169	1180	1240	82	2034	922	165	0	0	669	0	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.48	0.48	0.48	0.11	0.11	0.11	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	69.0	17.7	17.8	49.3	27.1	22.2	73.9	0.0	0.0	60.3	0.0	51.4
Incr Delay (d2), s/veh	8.2	3.6	3.4	0.8	0.6	0.4	8.5	0.0	0.0	185.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	23.5	24.8	0.7	25.0	14.2	0.3	0.0	0.0	30.0	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.2	21.3	21.2	50.2	27.7	22.6	82.5	0.0	0.0	245.7	0.0	51.6
LnGrp LOS	E	C	C	D	C	C	F	A	A	F	A	D
Approach Vol, veh/h		2127			2390			8			1024	
Approach Delay, s/veh		23.9			26.6			82.5			228.1	
Approach LOS		C			C			F			F	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	16.2	91.8		6.9		108.1		35.0				
Change Period (Y+Rc), s	6.0	6.0		5.5		6.0		5.5				
Max Green Setting (Gmax), s	14.0	69.0		14.5		89.0		29.5				
Max Q Clear Time (g_c+l1), s	10.3	70.7		2.7		65.5		31.5				
Green Ext Time (p_c), s	0.0	0.0		0.0		11.1		0.0				

Intersection Summary

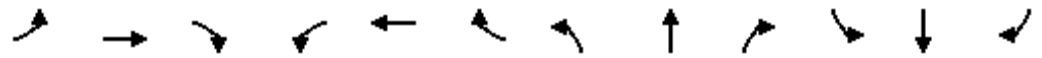
HCM 6th Ctrl Delay	62.8
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
3: RR 12 & Old Fitzhugh/Timberline

Heritage TIA
Mitigated PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	100	4	5	14	4	5	7	929	27	8	901	123
Future Volume (vph)	100	4	5	14	4	5	7	929	27	8	901	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.952			0.992			0.980	
Flt Protected		0.960			0.974		0.950			0.950		
Satd. Flow (prot)	0	1802	0	0	1762	0	1805	1850	0	1805	1841	0
Flt Permitted		0.960			0.974		0.950			0.950		
Satd. Flow (perm)	0	1802	0	0	1762	0	1805	1850	0	1805	1841	0
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		621			1305			982			342	
Travel Time (s)		14.1			35.6			14.9			5.2	
Peak Hour Factor	0.73	0.38	0.33	0.63	0.75	0.33	0.42	0.94	0.50	0.50	0.86	0.78
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	2%
Adj. Flow (vph)	137	11	15	22	5	15	17	988	54	16	1048	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	163	0	0	42	0	17	1042	0	16	1206	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	70.2%
Analysis Period (min)	15
	ICU Level of Service C

Intersection												
Int Delay, s/veh	152.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	100	4	5	14	4	5	7	929	27	8	901	123
Future Vol, veh/h	100	4	5	14	4	5	7	929	27	8	901	123
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	38	33	63	75	33	42	94	50	50	86	78
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	2
Mvmt Flow	137	11	15	22	5	15	17	988	54	16	1048	158

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2218	2235	1127	2135	2129	1015	1048	0	0	1042	0	0
Stage 1	1159	1159	-	1049	1049	-	-	-	-	-	-	-
Stage 2	1059	1076	-	1086	1080	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 32	43	251	36	50	292	672	-	-	675	-	-
Stage 1	241	272	-	277	307	-	-	-	-	-	-	-
Stage 2	274	298	-	264	297	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 27	41	251	26	48	292	672	-	-	675	-	-
Mov Cap-2 Maneuver	~ 27	41	-	26	48	-	-	-	-	-	-	-
Stage 1	235	265	-	270	299	-	-	-	-	-	-	-
Stage 2	249	291	-	233	290	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$2252.6		292.6	0.2	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	672	-	-	30	42	675	-
HCM Lane V/C Ratio	0.025	-	-	5.422	1.017	0.024	-
HCM Control Delay (s)	10.5	-	-	\$ 2252.6	292.6	10.5	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0.1	-	-	19.7	4	0.1	-

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

Lanes, Volumes, Timings
4: RR 12 & Brookside

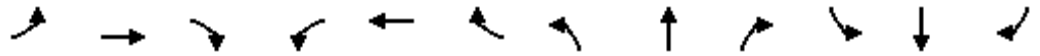
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	↗
Traffic Volume (vph)	34	0	90	11	0	8	153	920	24	4	982	57
Future Volume (vph)	34	0	90	11	0	8	153	920	24	4	982	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		100	100		0	50		0	50		400
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.902			0.930			0.995				0.850
Flt Protected		0.986			0.976		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1637	0	1805	1814	0	1805	1827	1615
Flt Permitted		0.896			0.674		0.091			0.185		
Satd. Flow (perm)	0	1536	0	0	1131	0	173	1814	0	352	1827	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		98			87			3				87
Link Speed (mph)		30			25			45				45
Link Distance (ft)		1986			1288			342				958
Travel Time (s)		45.1			35.1			5.2				14.5
Peak Hour Factor	0.92	0.92	0.92	0.75	0.92	0.50	0.92	0.93	0.68	0.38	0.89	0.92
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	0%	4%	10%	0%	4%	0%
Adj. Flow (vph)	37	0	98	15	0	16	166	989	35	11	1103	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	0	0	31	0	166	1024	0	11	1103	62
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane								Yes				Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6

Lanes, Volumes, Timings
4: RR 12 & Brookside

Heritage TIA
Mitigated PM

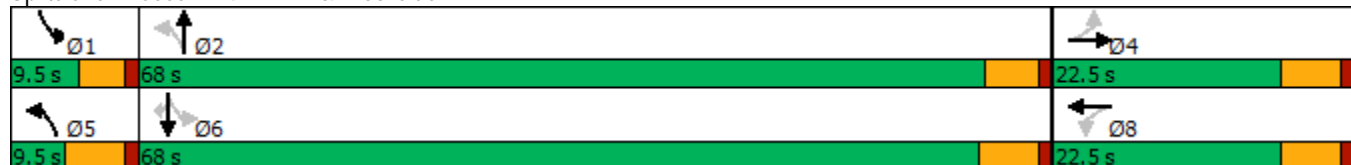


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		4.0	15.0		5.0	15.0	15.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	23.0		9.5	68.0	68.0
Total Split (s)	22.5	22.5		22.5	22.5		9.5	68.0		9.5	68.0	68.0
Total Split (%)	22.5%	22.5%		22.5%	22.5%		9.5%	68.0%		9.5%	68.0%	68.0%
Maximum Green (s)	17.0	17.0		17.0	17.0		4.0	63.0		5.0	62.5	62.5
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.0		3.5	4.5	4.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		5.5			5.5		5.5	5.0		4.5	5.5	5.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	16.0	16.0		16.0	16.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effect Green (s)		8.3			8.3		66.5	66.3		63.9	57.9	57.9
Actuated g/C Ratio		0.10			0.10		0.77	0.76		0.74	0.67	0.67
v/c Ratio		0.57			0.17		0.80	0.74		0.03	0.91	0.06
Control Delay		24.1			1.9		38.6	11.7		2.8	25.4	0.9
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		24.1			1.9		38.6	11.7		2.8	25.4	0.9
LOS		C			A		D	B		A	C	A
Approach Delay		24.1			1.9			15.5			23.9	
Approach LOS		C			A			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 86.9
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 19.7
 Intersection LOS: B
 Intersection Capacity Utilization 81.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: RR 12 & Brookside



Queues
4: RR 12 & Brookside



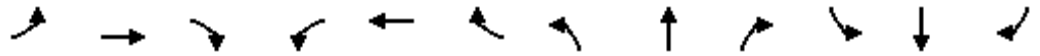
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	135	31	166	1024	11	1103	62
v/c Ratio	0.57	0.17	0.80	0.74	0.03	0.91	0.06
Control Delay	24.1	1.9	38.6	11.7	2.8	25.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	1.9	38.6	11.7	2.8	25.4	0.9
Queue Length 50th (ft)	20	0	16	199	1	430	0
Queue Length 95th (ft)	76	0	#104	#797	2	#885	8
Internal Link Dist (ft)	1906	1208		262		878	
Turn Bay Length (ft)			50		50		400
Base Capacity (vph)	382	293	208	1426	343	1329	1199
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.11	0.80	0.72	0.03	0.83	0.05

Intersection Summary

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

HCM 6th Signalized Intersection Summary
4: RR 12 & Brookside

Heritage TIA
Mitigated PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	↗
Traffic Volume (veh/h)	34	0	90	11	0	8	153	920	24	4	982	57
Future Volume (veh/h)	34	0	90	11	0	8	153	920	24	4	982	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1841	1841	1900	1841	1900
Adj Flow Rate, veh/h	37	0	98	15	0	16	166	989	35	11	1103	62
Peak Hour Factor	0.92	0.92	0.92	0.75	0.92	0.50	0.92	0.93	0.68	0.38	0.89	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	4	4	0	4	0
Cap, veh/h	90	12	125	129	20	92	230	1225	43	280	1191	1042
Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11	0.05	0.69	0.69	0.01	0.65	0.65
Sat Flow, veh/h	325	109	1149	602	187	842	1810	1767	63	1810	1841	1610
Grp Volume(v), veh/h	135	0	0	31	0	0	166	0	1024	11	1103	62
Grp Sat Flow(s),veh/h/ln	1583	0	0	1632	0	0	1810	0	1829	1810	1841	1610
Q Serve(g_s), s	4.8	0.0	0.0	0.0	0.0	0.0	2.6	0.0	32.7	0.2	44.3	1.2
Cycle Q Clear(g_c), s	6.9	0.0	0.0	1.4	0.0	0.0	2.6	0.0	32.7	0.2	44.3	1.2
Prop In Lane	0.27		0.73	0.48		0.52	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	227	0	0	241	0	0	230	0	1268	280	1191	1042
V/C Ratio(X)	0.60	0.00	0.00	0.13	0.00	0.00	0.72	0.00	0.81	0.04	0.93	0.06
Avail Cap(c_a), veh/h	373	0	0	378	0	0	230	0	1374	363	1372	1200
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	0.0	0.0	33.9	0.0	0.0	20.2	0.0	9.0	9.9	13.0	5.4
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.2	0.0	0.0	10.4	0.0	3.4	0.1	10.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.0	0.6	0.0	0.0	2.6	0.0	9.6	0.1	16.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	0.0	0.0	34.2	0.0	0.0	30.7	0.0	12.4	10.0	23.1	5.5
LnGrp LOS	D	A	A	C	A	A	C	A	B	A	C	A
Approach Vol, veh/h		135			31			1190			1176	
Approach Delay, s/veh		38.8			34.2			15.0			22.1	
Approach LOS		D			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	63.6		14.6	9.5	59.8		14.6				
Change Period (Y+Rc), s	4.5	* 5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.0	* 63		17.0	4.0	62.5		17.0				
Max Q Clear Time (g_c+I1), s	2.2	34.7		8.9	4.6	46.3		3.4				
Green Ext Time (p_c), s	0.0	9.0		0.4	0.0	8.0		0.1				

Intersection Summary






















HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
5: Baird & Sportsplex

Heritage TIA
Mitigated PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	439	11	20	248	220	6	3	23	83	1	3
Future Volume (vph)	16	439	11	20	248	220	6	3	23	83	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		0	175		100
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	50			25			25			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850		0.902				0.850
Flt Protected	0.950				0.996			0.991		0.950		
Satd. Flow (prot)	1805	1821	0	0	1858	1568	0	1698	0	1805	1900	1615
Flt Permitted	0.950				0.996			0.991		0.950		
Satd. Flow (perm)	1805	1821	0	0	1858	1568	0	1698	0	1805	1900	1615
Link Speed (mph)		30			30			30				30
Link Distance (ft)		229			479			221				2634
Travel Time (s)		5.2			10.9			5.0				59.9
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	0%	4%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	22	610	15	28	344	306	8	4	32	115	1	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	625	0	0	372	306	0	44	0	115	1	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	50.7%					ICU Level of Service A						
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↔		↖	↗	↖
Traffic Vol, veh/h	16	439	11	20	248	220	6	3	23	83	1	3
Future Vol, veh/h	16	439	11	20	248	220	6	3	23	83	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	100	-	-	-	175	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	72	72	72	72	72	72	72	72	72
Heavy Vehicles, %	0	4	0	0	2	3	0	0	0	0	0	0
Mvmt Flow	22	610	15	28	344	306	8	4	32	115	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	650	0	0	625	0	0	1218	1368	618	1080	1069	344
Stage 1	-	-	-	-	-	-	662	662	-	400	400	-
Stage 2	-	-	-	-	-	-	556	706	-	680	669	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	946	-	-	966	-	-	159	148	493	197	223	703
Stage 1	-	-	-	-	-	-	454	462	-	630	605	-
Stage 2	-	-	-	-	-	-	519	442	-	444	459	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	946	-	-	966	-	-	149	138	493	170	207	703
Mov Cap-2 Maneuver	-	-	-	-	-	-	149	138	-	170	207	-
Stage 1	-	-	-	-	-	-	444	451	-	616	576	-
Stage 2	-	-	-	-	-	-	490	421	-	402	448	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.4			19.4			59.8		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3	
Capacity (veh/h)	294	946	-	-	966	-	-	170	207	703	
HCM Lane V/C Ratio	0.151	0.023	-	-	0.029	-	-	0.678	0.007	0.006	
HCM Control Delay (s)	19.4	8.9	-	-	8.8	0	-	62	22.5	10.2	
HCM Lane LOS		C	A	-	-	A	A	-	F	C	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	4	0	0	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

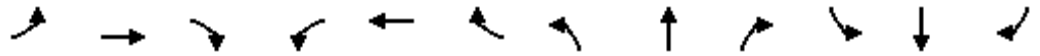
Heritage TIA
Mitigated PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	1308	78	48	1438	67	25	0	30	115	25	57
Future Volume (vph)	75	1308	78	48	1438	67	25	0	30	115	25	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	90		0	150		0	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.992				0.850		0.897	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1805	3267	0	1805	3385	0	0	1805	1553	1597	1546	0
Flt Permitted	0.095			0.051				0.685		0.464		
Satd. Flow (perm)	180	3267	0	97	3385	0	0	1302	1553	780	1546	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			6				152		76	
Link Speed (mph)		45			45			35			30	
Link Distance (ft)		866			3195			957			1336	
Travel Time (s)		13.1			48.4			18.6			30.4	
Peak Hour Factor	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Heavy Vehicles (%)	0%	10%	0%	0%	6%	2%	0%	0%	4%	13%	0%	15%
Adj. Flow (vph)	156	1656	130	71	1580	91	40	0	40	198	35	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	1786	0	71	1671	0	0	40	40	198	111	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6			8		7	4	

Lanes, Volumes, Timings
6: Roger Hanks & US 290

Heritage TIA
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	12.0		5.0	12.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	31.0		11.0	24.0		33.5	33.5	33.5	9.5	24.5	
Total Split (s)	13.0	80.0		11.0	78.0		34.0	34.0	34.0	15.0	49.0	
Total Split (%)	9.3%	57.1%		7.9%	55.7%		24.3%	24.3%	24.3%	10.7%	35.0%	
Maximum Green (s)	7.0	74.0		5.0	72.0		27.5	27.5	27.5	10.5	42.5	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.5	2.5	2.5	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.5	6.5	4.5	6.5	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	3.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Walk Time (s)		7.0					7.0	7.0	7.0			
Flash Dont Walk (s)		18.0					20.0	20.0	20.0			
Pedestrian Calls (#/hr)		0					0	0	0			
Act Effct Green (s)	95.3	95.3		93.0	93.0			8.8	8.8	23.5	21.5	
Actuated g/C Ratio	0.68	0.68		0.66	0.66			0.06	0.06	0.17	0.15	
v/c Ratio	0.77	0.80		0.48	0.74			0.49	0.17	1.03	0.37	
Control Delay	59.3	21.9		24.7	19.3			82.0	1.5	127.2	21.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	59.3	21.9		24.7	19.3			82.0	1.5	127.2	21.7	
LOS	E	C		C	B			F	A	F	C	
Approach Delay		24.9			19.5			41.8			89.3	
Approach LOS		C			B			D			F	

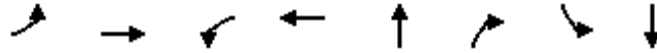
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 27.8
 Intersection LOS: C
 Intersection Capacity Utilization 74.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: Roger Hanks & US 290



Queues
6: Roger Hanks & US 290



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	156	1786	71	1671	40	40	198	111
v/c Ratio	0.77	0.80	0.48	0.74	0.49	0.17	1.03	0.37
Control Delay	59.3	21.9	24.7	19.3	82.0	1.5	127.2	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	21.9	24.7	19.3	82.0	1.5	127.2	21.7
Queue Length 50th (ft)	51	613	22	518	36	0	170	27
Queue Length 95th (ft)	47	637	34	674	75	0	149	50
Internal Link Dist (ft)		786		3115	877			1256
Turn Bay Length (ft)	150		90				150	
Base Capacity (vph)	203	2226	148	2249	255	427	192	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.80	0.48	0.74	0.16	0.09	1.03	0.21

Intersection Summary

HCM 6th Signalized Intersection Summary
6: Roger Hanks & US 290

Heritage TIA
Mitigated PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↑	↗	↖	↗	
Traffic Volume (veh/h)	75	1308	78	48	1438	67	25	0	30	115	25	57
Future Volume (veh/h)	75	1308	78	48	1438	67	25	0	30	115	25	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1752	1752	1900	1811	1811	1900	1900	1841	1707	1900	1900
Adj Flow Rate, veh/h	156	1656	130	71	1580	91	40	0	40	198	35	76
Peak Hour Factor	0.48	0.79	0.60	0.68	0.91	0.74	0.63	0.92	0.75	0.58	0.71	0.75
Percent Heavy Veh, %	0	10	10	0	6	6	0	0	4	13	0	0
Cap, veh/h	430	2133	166	132	1701	97	111	0	71	193	81	177
Arrive On Green	0.20	0.68	0.68	0.03	0.51	0.51	0.05	0.00	0.05	0.08	0.15	0.15
Sat Flow, veh/h	1810	3129	243	1810	3308	190	1302	0	1560	1626	533	1158
Grp Volume(v), veh/h	156	874	912	71	818	853	40	0	40	198	0	111
Grp Sat Flow(s),veh/h/ln	1810	1664	1708	1810	1721	1777	1302	0	1560	1626	0	1692
Q Serve(g_s), s	4.9	49.2	51.1	2.9	61.6	62.8	4.2	0.0	3.5	10.5	0.0	8.3
Cycle Q Clear(g_c), s	4.9	49.2	51.1	2.9	61.6	62.8	4.2	0.0	3.5	10.5	0.0	8.3
Prop In Lane	1.00		0.14	1.00		0.11	1.00		1.00	1.00		0.68
Lane Grp Cap(c), veh/h	430	1134	1164	132	885	914	111	0	71	193	0	258
V/C Ratio(X)	0.36	0.77	0.78	0.54	0.92	0.93	0.36	0.00	0.56	1.03	0.00	0.43
Avail Cap(c_a), veh/h	430	1134	1164	136	885	914	307	0	306	193	0	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.3	14.9	15.2	32.2	31.5	31.8	65.8	0.0	65.4	61.3	0.0	53.8
Incr Delay (d2), s/veh	0.2	5.1	5.3	0.2	2.1	2.3	0.7	0.0	2.6	72.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	17.8	19.0	1.2	24.4	25.7	1.4	0.0	1.4	6.1	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	20.0	20.5	32.4	33.6	34.1	66.5	0.0	68.0	133.7	0.0	54.2
LnGrp LOS	D	B	C	C	C	C	E	A	E	F	A	D
Approach Vol, veh/h		1942			1742			80			309	
Approach Delay, s/veh		22.3			33.8			67.3			105.1	
Approach LOS		C			C			E			F	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	101.4		27.9	34.1	78.0	15.0	12.9				
Change Period (Y+Rc), s	6.0	6.0		6.5	6.0	6.0	4.5	6.5				
Max Green Setting (Gmax), s	5.0	74.0		42.5	7.0	72.0	10.5	27.5				
Max Q Clear Time (g_c+l1), s	4.9	53.1		10.3	6.9	64.8	12.5	6.2				
Green Ext Time (p_c), s	0.0	8.6		0.4	0.0	4.2	0.0	0.2				

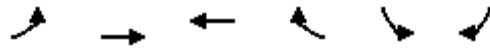
Intersection Summary

HCM 6th Ctrl Delay			34.4									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
7: Brookside



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Volume (vph)	0	23	38	38	23	0
Future Volume (vph)	0	23	38	38	23	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.932				
Fl _t Protected					0.950	
Satd. Flow (prot)	0	1863	1736	0	1770	0
Fl _t Permitted					0.950	
Satd. Flow (perm)	0	1863	1736	0	1770	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		2535	225		1819	
Travel Time (s)		57.6	5.1		41.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	25	41	41	25	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	25	82	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.3%
Analysis Period (min)	15
	ICU Level of Service A










Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	0	23	38	38	23	0
Future Vol, veh/h	0	23	38	38	23	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	25	41	41	25	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	82	0	-	0	87 62
Stage 1	-	-	-	-	62 -
Stage 2	-	-	-	-	25 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1515	-	-	-	914 1003
Stage 1	-	-	-	-	961 -
Stage 2	-	-	-	-	998 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1515	-	-	-	914 1003
Mov Cap-2 Maneuver	-	-	-	-	914 -
Stage 1	-	-	-	-	961 -
Stage 2	-	-	-	-	998 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1515	-	-	-	914
HCM Lane V/C Ratio	-	-	-	-	0.027
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

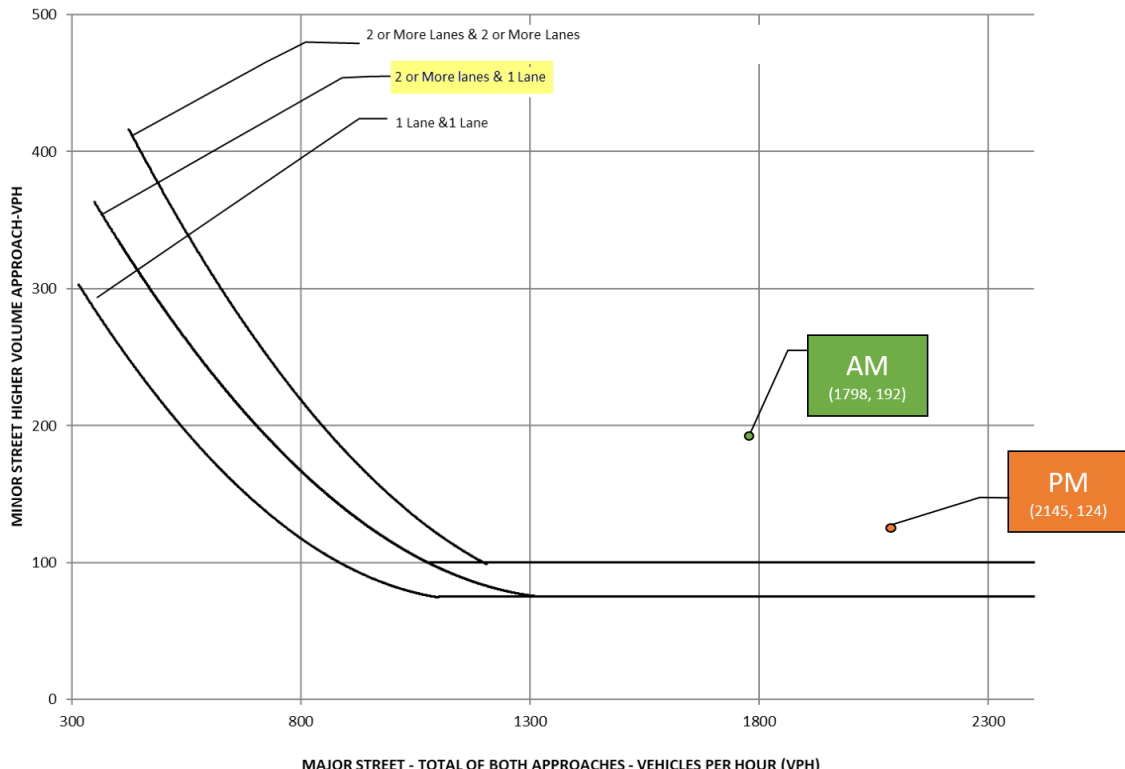
Lanes, Volumes, Timings
8: Brookside

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	23	23	88	38	38	61
Future Volume (vph)	23	23	88	38	38	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932			0.917		
Flt Protected				0.966	0.981	
Satd. Flow (prot)	1736	0	0	1799	1676	0
Flt Permitted				0.966	0.981	
Satd. Flow (perm)	1736	0	0	1799	1676	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	225			1986	2634	
Travel Time (s)	5.1			45.1	59.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	25	96	41	41	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	137	107	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Yield			Yield	Yield	
Intersection Summary						
Area Type:	Other					
Control Type:	Roundabout					
Intersection Capacity Utilization	26.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection			
Intersection Delay, s/veh	3.5		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	50	137	107
Demand Flow Rate, veh/h	52	140	109
Vehicles Circulating, veh/h	98	42	25
Vehicles Exiting, veh/h	84	92	123
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.6	3.4
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	52	140	109
Cap Entry Lane, veh/h	1249	1322	1345
Entry HV Adj Factor	0.971	0.980	0.982
Flow Entry, veh/h	50	137	107
Cap Entry, veh/h	1212	1295	1320
V/C Ratio	0.042	0.106	0.081
Control Delay, s/veh	3.3	3.6	3.4
LOS	A	A	A
95th %tile Queue, veh	0	0	0

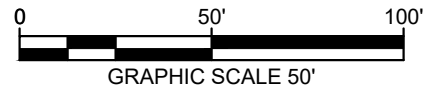
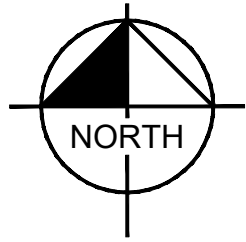
Appendix J: Peak Hour Signal Warrant Analysis

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
 (Community Less than 10,000 Population or Above 40 MPH on Major Street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one

Appendix K: Sportsplex Drive and Baird Lane Concept Figure



WET POND

FG 18" CMP
FL 18" RCP

FL 18" CMP

WMMH

Turn Lane Request-TIA
Heritage
OCTOBER, 2020

Kimley»Horn
10814 Jollyville Road
Building 4, Suite 200
Austin, Texas 78759
512-418-1771
State of Texas Registration No. F-928

NOTE: THIS PLAN IS CONCEPTUAL IN NATURE AND HAS BEEN PRODUCED WITHOUT THE BENEFIT OF A SURVEY, TOPOGRAPHY, UTILITIES, CONTACT WITH THE CITY, ETC.