
TRAFFIC IMPACT ANALYSIS

BEAHM PROPERTY ROANOKE COUNTY AND BOTETOURT COUNTY, VIRGINIA

AUGUST 2024

Prepared By:

Kimley»Horn

2035 Maywill Street, Suite 200

Richmond, VA 23230

(804) 673-3882

Copyright © 2024, Kimley-Horn and Associates, Inc.

TABLE OF CONTENTS

1	Executive Summary.....	3
2	Introduction.....	4
	2.1 Purpose.....	4
	2.2 Methodology.....	4
	2.3 Project Area	4
	2.4 Development Information.....	6
3	Traffic Operational Analysis.....	6
	3.1 Methodology.....	6
	3.2 Key Assumptions.....	7
4	Existing Conditions	7
	4.1 Existing Roadway Characteristics	7
	4.2 Existing Traffic Volumes	7
	4.3 Existing Conditions Intersection Capacity Analysis.....	9
	4.4 Existing Conditions SimTraffic Queuing Analysis	9
5	Projected No-Build Conditions.....	9
	5.1 Traffic Growth Rate	9
	5.2 2028 No-Build Conditions Intersection Capacity Analysis.....	12
	5.3 2028 No-Build Conditions SimTraffic Queueing Analysis.....	12
	5.4 2030 No-Build Conditions Intersection Capacity Analyses.....	12
	5.5 2030 No-Build Conditions SimTraffic Queueing Analysis.....	12
6	Projected Build Conditions.....	12
	6.1 Site Trip Generation	12
	6.2 Site Trip Distribution and Assignment	13
	6.3 2028 Phase 1 Conditions Intersection Capacity Analysis	19
	6.4 2028 Phase 1 Conditions SimTraffic Queueing Analysis	19
	6.5 2030 Full-Build Conditions Intersection Capacity Analysis.....	19
	6.6 2030 Full-Build Conditions SimTraffic Queueing Analysis.....	19
7	Projected Build With Improvements Conditions	20
	7.1 2028 Phase 1 w/ Improvements Int. Capacity Analysis.....	20
	7.2 2028 Phase 1 w/ Improvements SimTraffic Queueing Analysis	20
	7.3 2030 Build w/ Improvements Intersection Capacity Analysis	20
	7.4 2030 Build w/ Improvements SimTraffic Queueing Analysis	20
8	Conclusion and Recommendations	25

TABLE OF FIGURES

Figure 1: Study Area	5
Figure 2: Existing 2023 Turning Movement Volumes	8
Figure 3: Projected 2028 No-Build Turning Movement Volumes	10
Figure 4: Projected 2030 No-Build Turning Movement Volumes	11
Figure 5: Trip Distribution	14
Figure 6: 2028 Trip Assignment	15
Figure 7: 2030 Trip Assignment	16
Figure 8: Projected 2028 Build Turning Movement Volumes	17
Figure 9: Projected 2030 Full-Build Turning Movement Volumes	18

TABLE OF TABLES

Table 1: Intersection Level of Service (LOS) Analysis Criteria.....	6
Table 2: Existing Roadway Characteristics	7
Table 3: Trip Generation Summary	13
Table 4: AM Peak Hour Control Delay and LOS Summary.....	21
Table 5: PM Peak Hour Control Delay and LOS Summary.....	22
Table 6: AM Peak Hour Queueing Analysis	23
Table 7: PM Peak Hour Queueing Analysis	24

APPENDICES

Appendix A: Conceptual Site Plan
Appendix B: Trip Generation
Appendix C: Traffic Count Data
Appendix D: Intersection Capacity Analysis
Appendix E: SimTraffic Queueing Analysis

1 EXECUTIVE SUMMARY

The traffic impact analysis (TIA) documented in this report evaluates the anticipated traffic impacts of the proposed development to be generally located in the northeast quadrant of the intersection of Shadwell Drive and Sanderson Drive within both Roanoke County and Botetourt County. Currently, the site proposed for development is occupied and used primarily as farmland. The proposed development consists of up to 125 townhomes and 100 single-family residential units with Phase 1 consisting of 50 townhomes and 100 single-family residential units. A site plan is included in **Appendix A**. Access to the proposed development will be provided via two full-access driveways along Sanderson Drive.

Traffic operations were analyzed at the intersections identified below during the AM and PM peak hours using *Synchro 12*TM software for the Existing 2023, projected 2028 No-Build, projected 2028 Phase 1 Build, projected 2028 Phase 1 Build with Improvements, projected 2030 No-Build, projected 2030 Full-Build, and projected 2030 Full-Build with Improvements conditions. Based on historic growth trends developed from VDOT Annual Average Daily Traffic (AADT) publications along Sanderson Drive, Shadwell Drive, and Hollins Road, a linear growth rate of 1.0% was established for Sanderson Drive and a linear growth rate of 1.5% was established for Shadwell Drive and Hollins Road to project future traffic volumes for the no-build and build conditions.

The following unsignalized intersections were analyzed in this traffic impact analysis:

1. Shadwell Drive & Hollins Road
2. Shadwell Drive & Sanderson Drive
3. Sanderson Drive and Southern Driveway
4. Sanderson Drive and Northern Driveway

The results of the traffic impact analysis indicate that while the project results in minor increases in delay at the study intersections the anticipated maximum queues will be accommodated and are not expected to spill back into adjacent intersections. It must be noted that project traffic is expected to increase delays at the southbound approach of Shadwell Drive and Sanderson Drive by 38 seconds during the 2028 Phase 1 PM peak hour and 80 seconds during the 2030 Full-Build PM peak hour. However, improving the approach to include exclusive southbound left and right-turn lanes improves the approach delays to better than no-build conditions.

The applicant agrees to participate in a cooperative effort with Roanoke County and other parties to seek a solution to construct a southbound left-turn lane along Sanderson Drive. The applicant would agree to deed adequate right-of-way for a turn-lane over their existing property.

2 INTRODUCTION

2.1 PURPOSE

Kimley-Horn has performed a traffic impact analysis (TIA) to evaluate the traffic impacts of the proposed Beahm Property development generally located in the northeast quadrant of the intersection of Shadwell Drive and Sanderson Drive within both Roanoke County and Botetourt County. The purpose of this study is to evaluate the future impacts of the proposed development traffic on the surrounding roadway network and to identify mitigation measures to accommodate the proposed development, if needed.

2.2 METHODOLOGY

In preparation of the TIA, Kimley-Horn coordinated with the Virginia Department of Transportation (VDOT) and Roanoke County to receive concurrence on the scope of the study, the limits of the study area, and the proposed analysis methodology. As determined through coordination, study area intersections included the following:

1. Shadwell Drive & Hollins Road
2. Shadwell Drive & Sanderson Drive
3. Sanderson Drive and Southern Driveway
4. Sanderson Drive and Northern Driveway

Intersection analyses were performed using *Synchro 12™* software which applied the Highway Capacity Manual (HCM), 6th Edition, methodology and included an evaluation of the Existing 2023, projected 2028 No-Build, projected 2028 Phase 1 Build, projected 2028 Phase 1 Build with Improvements, projected 2030 No-Build, projected 2030 Full-Build, and projected 2030 Full-Build with Improvements conditions. Existing conditions represent the roadway network geometry and traffic volumes at the time of this study. No-build conditions represent the future roadway network prior to the completion of the proposed project and include estimated traffic attributable to approved but unbuilt developments in the study area. Build conditions represent the future roadway network with the proposed project, and Build with Improvements Conditions include a southbound left-turn lane with 200 ft of storage at the Sanderson Drive and Shadwell Drive intersection.

2.3 PROJECT AREA

The proposed project is generally located in the northeast quadrant of the intersection of Shadwell Drive and Sanderson Drive within both Roanoke County and Botetourt County, as shown in **Figure 1**.

Figure 1: Study Area



2.4 DEVELOPMENT INFORMATION

The site proposed for development is currently occupied and generally used as farmland. The proposed development consists of up to 125 townhomes and 100 single-family residential units with Phase 1 consisting of 50 townhomes and 100-single family residential units.

3 TRAFFIC OPERATIONAL ANALYSIS

3.1 METHODOLOGY

The traffic operational analysis performed for this study using *Synchro 12™* was conducted in accordance with VDOT's *Traffic Operations Safety Analysis Manual (TOSAM)* for deterministic, intersection capacity analyses. Consistent with coordination with VDOT, SimTraffic maximum queue analyses were also performed.

The evaluation of traffic operations within the study area was comprised of an intersection capacity level of service (LOS) analysis and a queueing analysis for the AM and PM peak hours. As part of the traffic operational analysis, the projected future year no-build conditions served as the baseline for evaluating intersection delays and identifying mitigation measures under the build conditions.

Intersection capacity defines the volume of traffic that can be accommodated by an intersection at a specified LOS. Capacity is affected by various geometric factors including roadway type (e.g., divided or undivided), number of lanes, lane widths, and grades. LOS, which is a measure of the degree of congestion, ranges from LOS A (free flowing) to LOS F (a congested, forced flow condition). Delay, measured in seconds per vehicle, and the associated LOS thresholds for signalized and unsignalized intersections based on HCM methodologies are presented in **Table 1**.

Table 1: Intersection Level of Service (LOS) Analysis Criteria

Level of Service (LOS)	Average Control Delay per Vehicle (sec/veh)		Description of Traffic Conditions
	Signalized	Unsignalized	
A	≤ 10	≤ 10	No delays at intersections with continuous flow traffic. Uncongested operations; high frequency of long gaps available for all left and right-turning traffic; no observable queues.
B	> 10 and ≤ 20	> 10 and ≤ 15	
C	> 20 and ≤ 35	> 15 and ≤ 25	Moderate delays at intersections with satisfactory to good traffic flow. Light congestion; infrequent backups on critical approaches.
D	> 35 and ≤ 55	> 25 and ≤ 35	Increased probability of delays along every approach. Significant congestion on critical approaches, but intersection functional. No long-standing lines formed.
E	> 55 and ≤ 80	> 35 and ≤ 50	Heavy traffic flow condition. Heavy delays probable. No available gaps for cross-street traffic or main street turning traffic. Limit of stable flow.
F	> 80	> 50	Unstable traffic flow. Heavy congestion. Traffic moves in forced flow condition. Average delays greater than one minute highly probable. Total breakdown.

3.2 KEY ASSUMPTIONS

The following assumptions were made as part of the traffic operational analysis:

- All intersections used the collected peak hour factor (PHF) data for the existing condition. For the future year no-build and build conditions, all intersections, in accordance with TOSAM, used the higher of the measured PHF or 0.92.
- All intersections were analyzed with the collected heavy vehicle percentages at each individual movement for the existing, no-build, and build conditions.

4 EXISTING CONDITIONS

4.1 EXISTING ROADWAY CHARACTERISTICS

Roadway characteristics including geometry and posted speed limits for roadway facilities adjacent to the proposed development are summarized in **Table 2**.

Table 2: Existing Roadway Characteristics

Road	Lanes	Posted Speed (mph)	Functional Classification
Hollins Road	2 Lanes Undivided	40	Major Collector
Shadwell Drive (west of Sanderson Drive)	2 Lanes Undivided	40	Major Collector
Shadwell Drive (east of Sanderson Drive)	2 Lanes Undivided	45	Major Collector
Sanderson Drive	2 Lanes Undivided	40	Major Collector

4.2 EXISTING TRAFFIC VOLUMES

Existing AM and PM peak hour traffic volumes were collected on August 15, 2023 (Tuesday) at the following identified study area intersections:

1. Shadwell Drive & Hollins Road
2. Shadwell Drive & Sanderson Drive

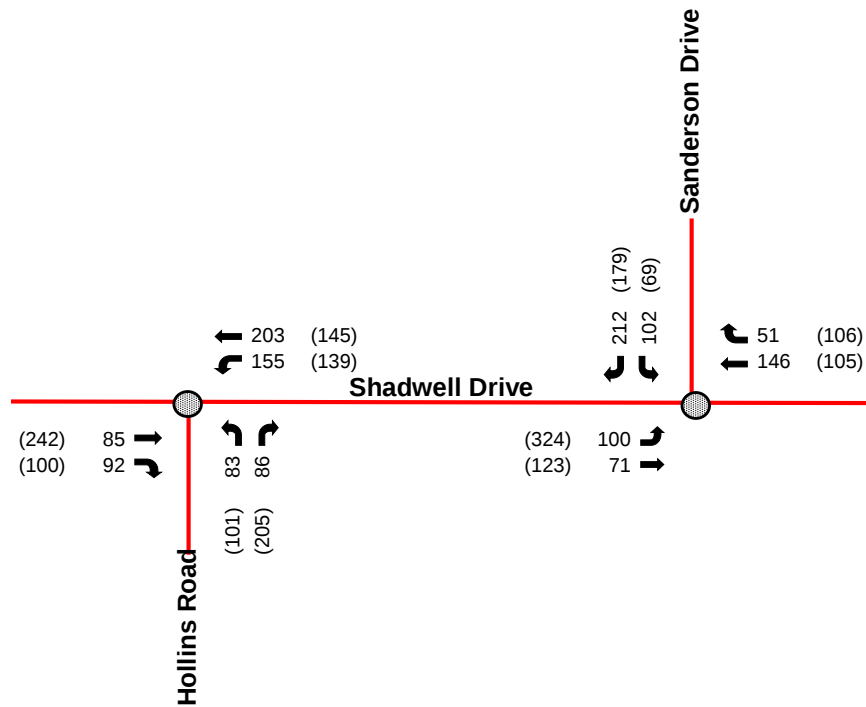
Existing turning movement counts are shown in **Figure 2**. The systemwide A.M. peak hour was determined to be 7:15 – 8:15 A.M. and the systemwide PM peak hour was determined to be 5:00 – 6:00 PM. Traffic count data is provided in **Appendix C**.



NOT TO SCALE

Legend

-  Study Roadway
-  Study Intersection
- XX A.M. Peak Hour Traffic
- (XX) P.M. Peak Hour Traffic



4.3 EXISTING CONDITIONS INTERSECTION CAPACITY ANALYSIS

During the AM and PM peak hours, all intersection approaches operate at LOS C or better. The control delay and LOS results are summarized in **Table 4** and **Table 5** following the analysis sections. The intersection capacity analysis results are included in **Appendix D**.

4.4 EXISTING CONDITIONS SIMTRAFFIC QUEUING ANALYSIS

Existing maximum queue lengths were reported for all intersection approaches at the study intersections. Based on the queue analysis results, all movement queues are expected to have adequate storage space between adjacent intersections.

The queue results are summarized in **Table 6** and **Table 7** following the analysis sections. The queueing analysis results are included in **Appendix E**.

5 PROJECTED NO-BUILD CONDITIONS

The projected no-build conditions represent the future roadway network and background traffic growth without the addition of the proposed development traffic. Stonegate Phase III was identified as a background development within the project area and was included in all future year analyses. This project is located along Shadwell Drive to the east of the proposed development and consists of 40 single-family residential units. Trip generation estimates for this development are located in **Appendix B**. Trip distribution and assignment followed the approved distribution for the proposed development.

5.1 TRAFFIC GROWTH RATE

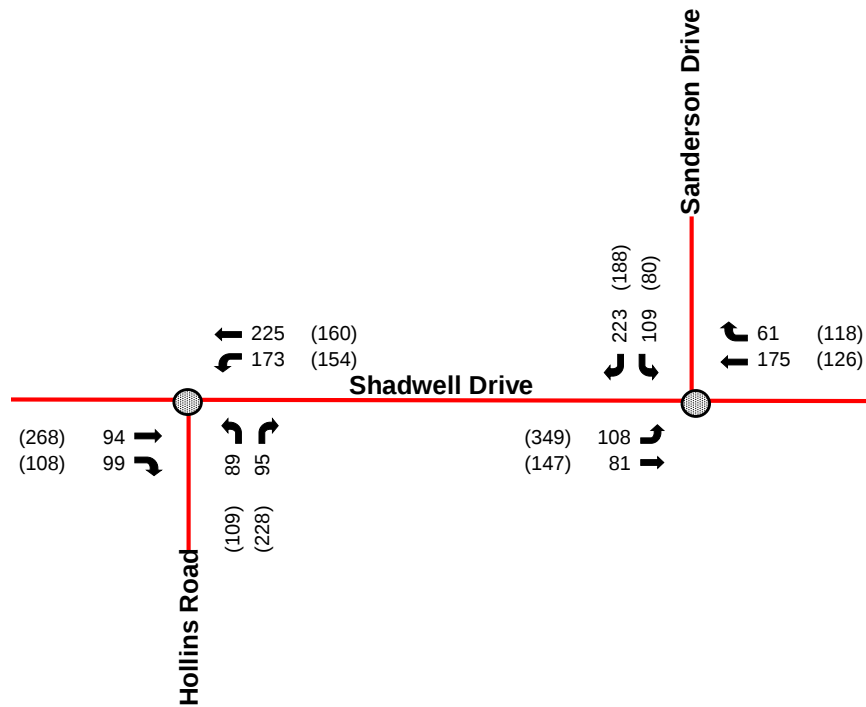
To project future traffic volumes for the Existing 2023, 2028 No-Build, 2028 Phase 1 Build, 2028 Phase 1 Build with Improvements, 2030 No-Build, 2030 Full-Build, and 2030 Full-Build with Improvements conditions, a linear growth rate of 1.0% was established for Sanderson Drive, and a linear growth rate of 1.50% was established for Shadwell Drive and Hollins Road to reflect historic growth trends from VDOT-published Annual Average Daily Traffic (AADT) data. No-Build 2028 and 2030 traffic volumes are presented in **Figure 3** and **Figure 4**.



NOT TO SCALE

Legend

-  Study Roadway
-  Study Intersection
- XX A.M. Peak Hour Traffic
- (XX) P.M. Peak Hour Traffic

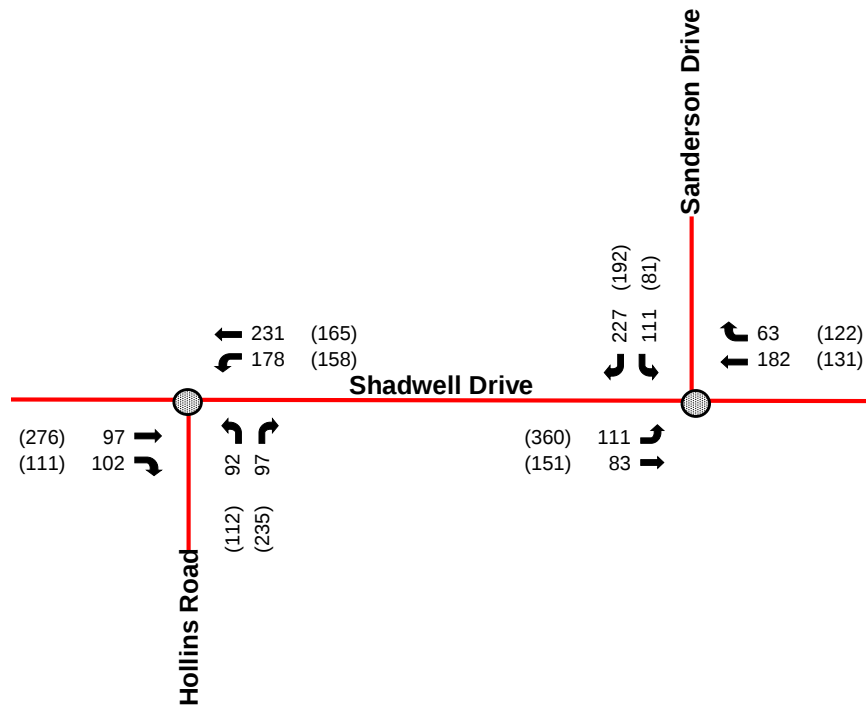




NOT TO SCALE

Legend

-  Study Roadway
-  Study Intersection
- XX A.M. Peak Hour Traffic
- (XX) P.M. Peak Hour Traffic



5.2 2028 NO-BUILD CONDITIONS INTERSECTION CAPACITY ANALYSIS

During the AM and PM peak hours, all intersection approaches operate at LOS E or better. The control delay and LOS results are summarized in **Table 4** and **Table 5** following the analysis sections. The intersection capacity analysis results are included in **Appendix D**.

5.3 2028 NO-BUILD CONDITIONS SIMTRAFFIC QUEUEING ANALYSIS

Future year No-Build maximum queue lengths were reported for all intersection approaches at the study intersections. Based on the queue analysis results, all movement queues are expected to have adequate storage space between adjacent intersections.

The queue results are summarized in **Table 6** and **Table 7** following the analysis sections. The queueing analysis results are included in **Appendix E**.

5.4 2030 NO-BUILD CONDITIONS INTERSECTION CAPACITY ANALYSES

During the AM and PM peak hours, all intersection approaches operate at LOS E or better. The control delay and LOS results are summarized in **Table 4** and **Table 5** following the analysis sections. The intersection capacity analysis results are included in **Appendix D**.

5.5 2030 NO-BUILD CONDITIONS SIMTRAFFIC QUEUEING ANALYSIS

Future year No-Build maximum queue lengths were reported for all intersection approaches at the study intersections. Based on the queue analysis results, all movement queues are expected to have adequate storage space between adjacent intersections.

The queue results are summarized in **Table 6** and **Table 7** following the analysis sections. The queueing analysis results are included in **Appendix E**.

6 PROJECTED BUILD CONDITIONS

The 2028 Phase 1 and 2030 Build conditions represent the future roadway network with the addition of background traffic growth, surrounding development traffic, and traffic attributable to the proposed project. Access to the proposed development will be provided along Sanderson Drive via two full-access driveways.

6.1 SITE TRIP GENERATION

Traffic projections were estimated for the proposed development based on the ITE *Trip Generation Manual*, 11th Edition. **Table 3** summarizes the expected project trip generation during the AM and PM peak hours. The total trips represent the estimated number of vehicles entering and exiting the proposed development to and from the adjacent roadway network. The expected net new project trips presented in **Table 3** represent the gross project trips attributable to the proposed land uses. Detailed trip generation calculations have been included in **Appendix C**.

Table 3: Trip Generation Summary

Description	ITE Code	Intensity	Weekday AM Peak Hour			Weekday PM Peak Hour		
			Total	In	Out	Total	In	Out
Phase 1								
Single-Family Attached Housing	215	50 units	20	5	15	26	15	11
Single-Family Detached Housing	210	100 units	74	19	55	99	62	37
Net New Trips			94	24	70	125	77	48
Full-Build								
Single-Family Attached Housing	215	125 units	59	15	44	71	42	29
Single-Family Detached Housing	210	100 units	74	19	55	99	62	37
Net New Trips			133	34	99	170	104	66

6.2 SITE TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of traffic at study area intersections, including proposed access locations, was established based on existing traffic patterns, and anticipated future traffic patterns, and was agreed upon by VDOT staff. The trip distribution is shown in **Figure 5**.

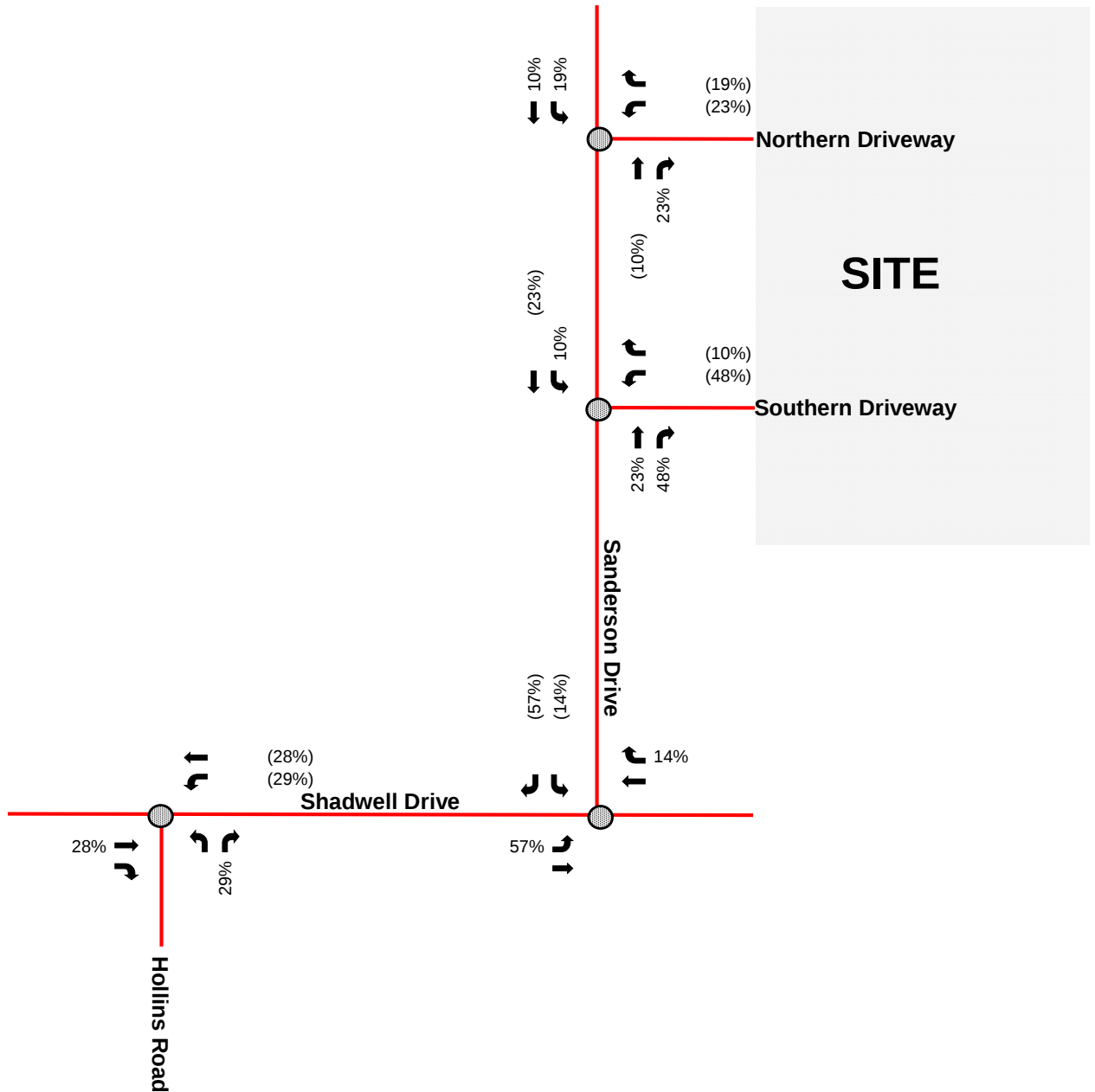
The assignment of traffic generated by the site was calculated by applying the distribution percentage for a specific turning movement to the total number of inbound or outbound trips generated to establish the turning movement volume at that location. 2028 trip assignment based on the trip distribution is shown in **Figure 6**. 2030 trip assignment based on the trip distribution is shown in **Figure 7**. The resulting 2028 Phase 1 Build volumes for the AM and PM peak hours are shown in **Figure 8** and the resulting 2030 Full-Build volumes for the AM and PM peak hours are shown in **Figure 9**. The 2028 Phase 1 Build and 2030 Full-Build condition traffic volumes were calculated by adding the site-generated trips to the projected No-Build 2028 traffic volumes.



NOT TO SCALE

Legend

- Study Roadway
- Study Intersection
- XX% Entering Distribution
- (XX%) Exiting Distribution

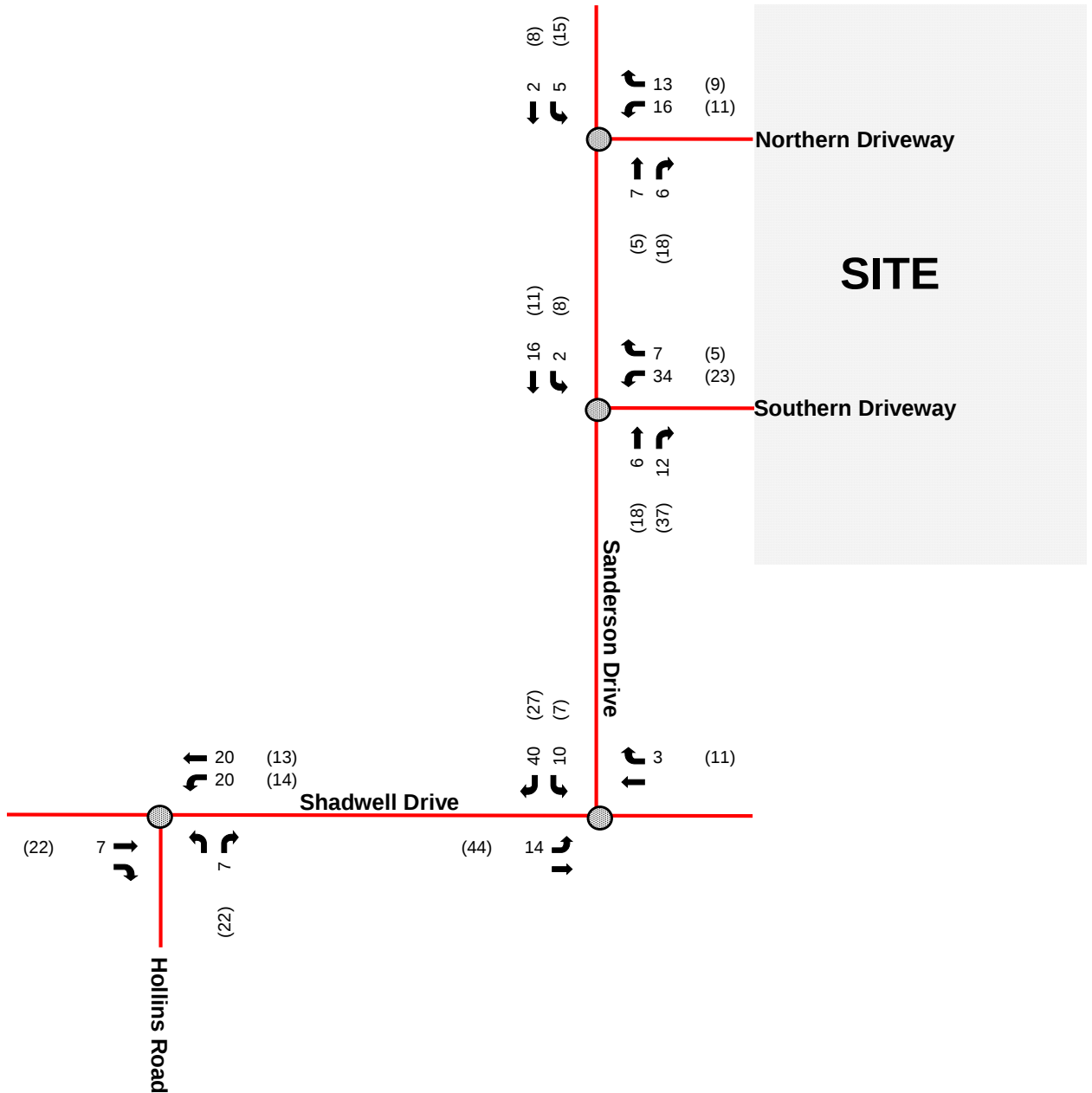




NOT TO SCALE

Legend

- Study Roadway
- Study Intersection
- XX A.M. Peak Hour Trip Assignment
- (XX) P.M. Peak Hour Trip Assignment

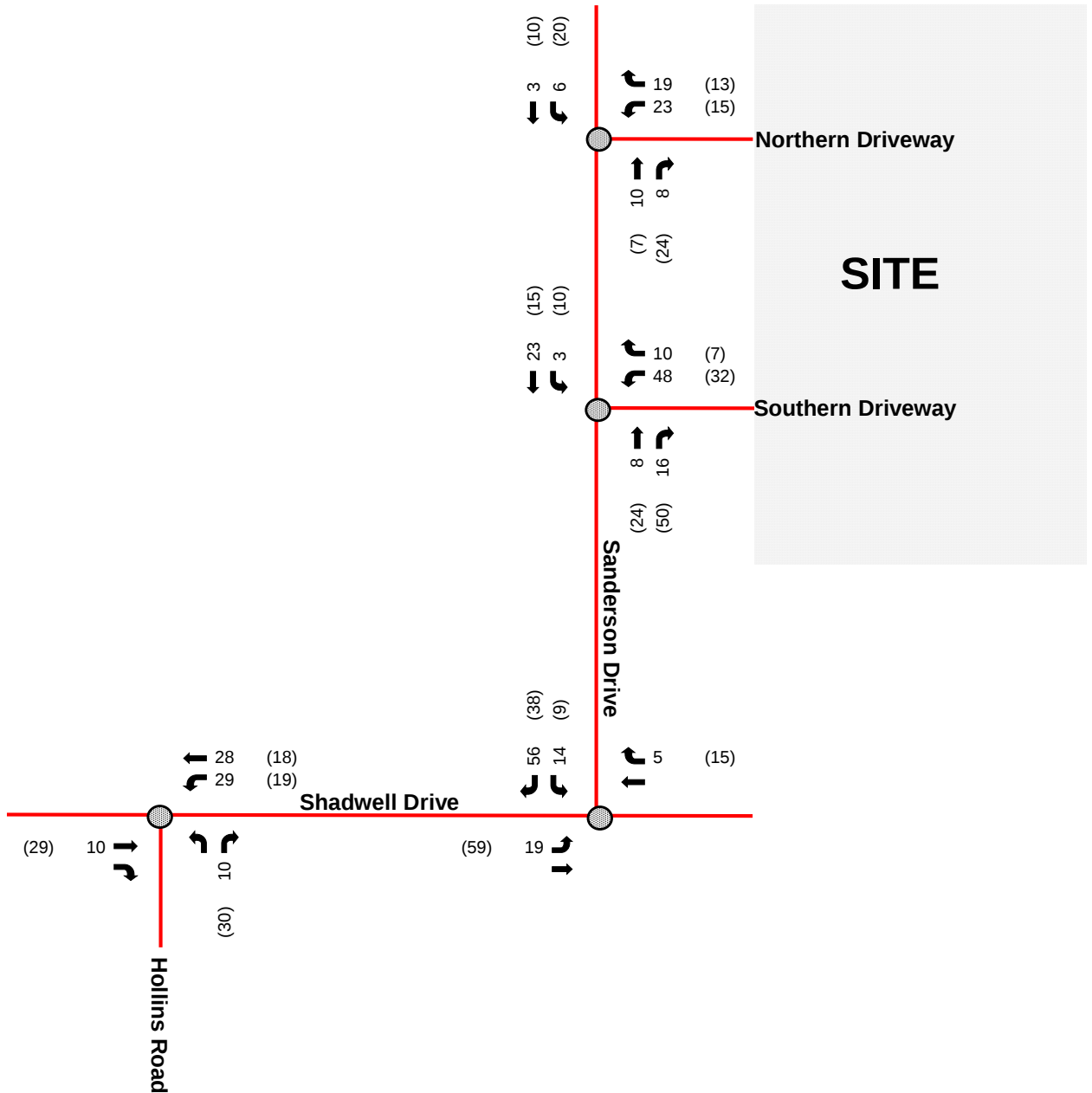




NOT TO SCALE

Legend

-  Study Roadway
-  Study Intersection
- XX A.M. Peak Hour Trip Assignment
- (XX) P.M. Peak Hour Trip Assignment

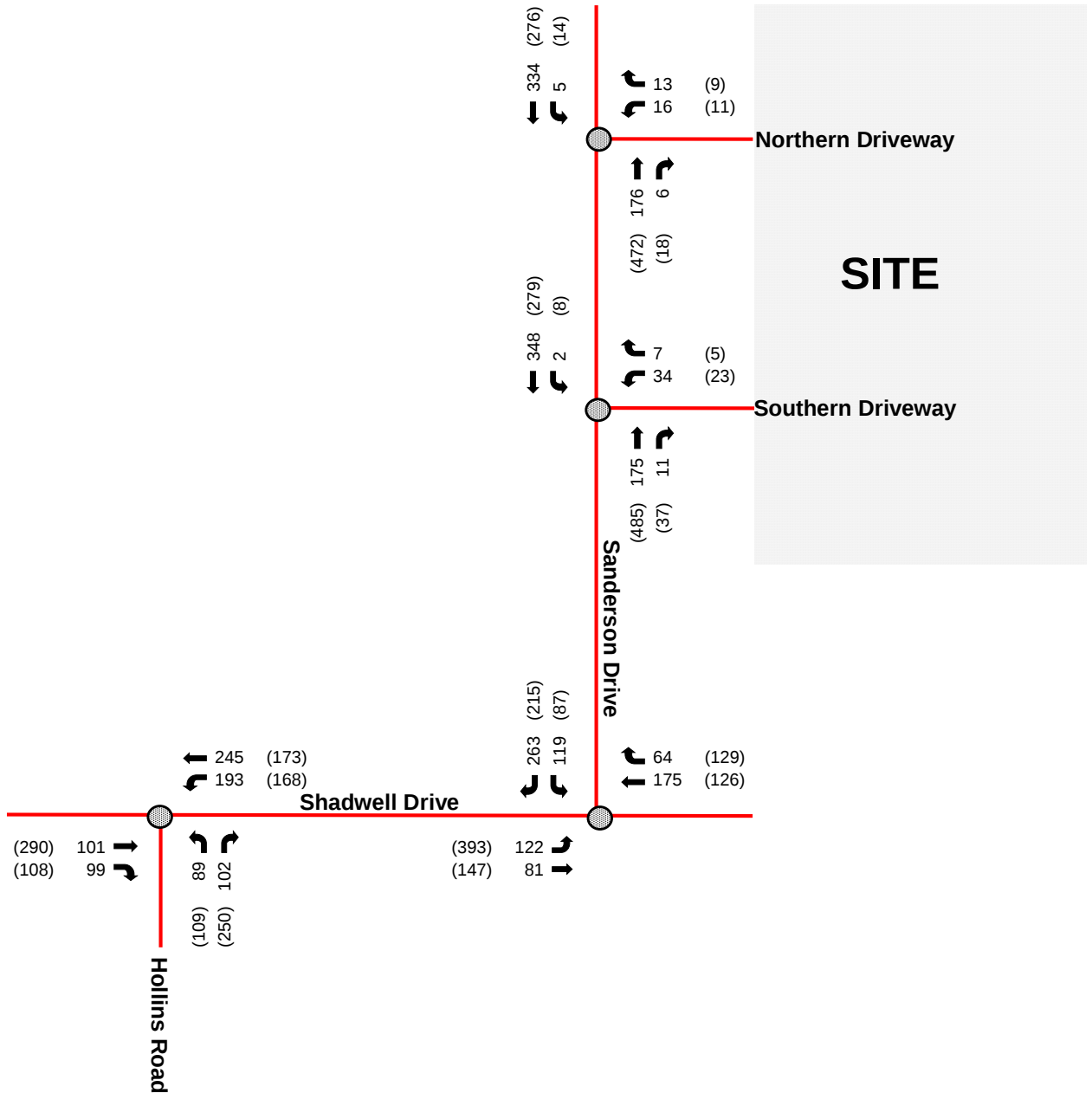




NOT TO SCALE

Legend

-  Study Roadway
-  Study Intersection
- XX A.M. Peak Hour Traffic
- (XX) P.M. Peak Hour Traffic



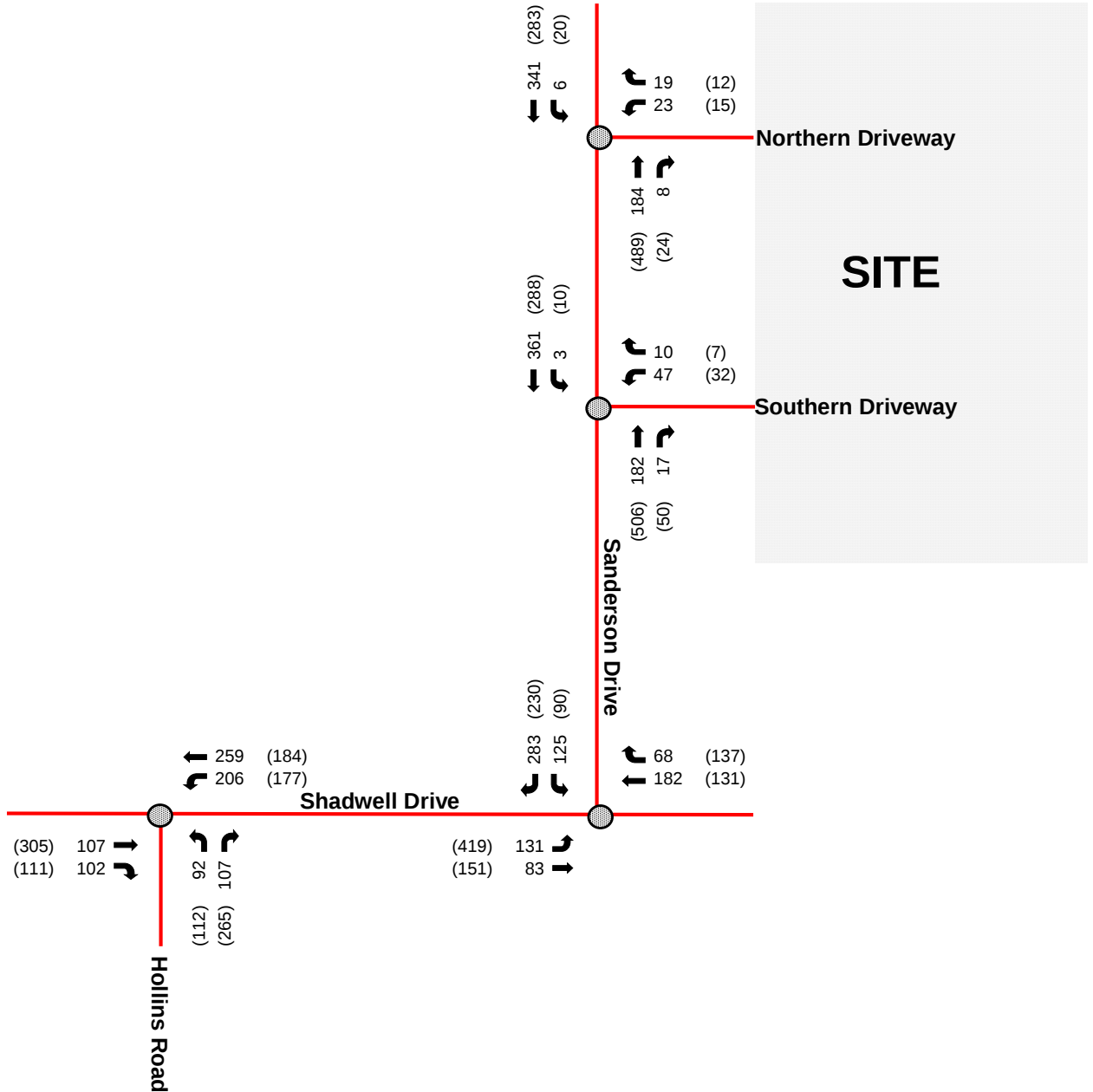
SITE



NOT TO SCALE

Legend

-  Study Roadway
-  Study Intersection
- XX A.M. Peak Hour Traffic
- (XX) P.M. Peak Hour Traffic



6.3 2028 PHASE 1 CONDITIONS INTERSECTION CAPACITY ANALYSIS

During the AM and PM peak hours, all intersection approaches operate at LOS E or better with the exception of the southbound approach at the intersection of Shadwell Drive and Sanderson Drive. It is anticipated that project traffic will increase delays at the southbound approach of Shadwell Drive and Sanderson Drive by 3 seconds during the AM peak hour and 38 seconds during the PM peak hour.

Note that these results are typical where a high volume, free-flow, roadway intersects a low volume, stop-controlled, roadway. Further note that the delay is driven by the southbound left-turning volumes which the project adds fewer than 10 trips to during the PM peak hour. The control delay and LOS results are summarized in **Table 4** and **Table 5** following the analysis sections. The intersection capacity analysis results are included in **Appendix D**.

6.4 2028 PHASE 1 CONDITIONS SIMTRAFFIC QUEUEING ANALYSIS

Phase 1 maximum queue lengths were reported for all intersection approaches at the study intersections. Based on the queue analysis results, all movement queues are expected to have adequate storage space between adjacent intersections.

The queue results are summarized in **Table 6** and **Table 7** following the analysis sections. The queueing analysis results are included in **Appendix E**.

6.5 2030 FULL-BUILD CONDITIONS INTERSECTION CAPACITY ANALYSIS

During the AM and PM peak hours, all intersection approaches operate at LOS E or better with the exception of the northbound approach at the intersection of Shadwell Drive and Hollins Road and the southbound approach at the intersection of Shadwell Drive and Sanderson Drive. It is anticipated that project traffic will increase delays at the northbound approach of Shadwell Drive and Hollins Road by 5 seconds during the AM peak hour and 21 seconds during the PM peak hour. Similarly, it is anticipated that project traffic will increase delays at the southbound approach of Shadwell Drive and Sanderson Drive by 6 seconds during the AM peak hour and 80 seconds during the PM peak hour.

Note that these results are typical where a high volume, free-flow, roadway intersects a low volume, stop-controlled, roadway. Further note that the delay is driven by the southbound left-turning volumes which the project adds fewer than 10 trips to during the PM peak hour. The control delay and LOS results are summarized in **Table 4** and **Table 5** following the analysis sections. The intersection capacity analysis results are included in **Appendix D**.

6.6 2030 FULL-BUILD CONDITIONS SIMTRAFFIC QUEUEING ANALYSIS

2030 Full-Build maximum queue lengths were reported for all intersection approaches at the study intersections. Based on the queue analysis results, all movement queues are expected to have adequate storage space between adjacent intersections.

The queue results are summarized in **Table 6** and **Table 7** following the analysis sections. The queueing analysis results are included in **Appendix E**.

7 PROJECTED BUILD WITH IMPROVEMENTS CONDITIONS

The 2028 Phase 1 and 2030 Build with Improvements conditions represent the project Build Conditions with the addition of a southbound left turn lane with 200 ft of storage at the intersection of Sanderson Drive and Shadwell Drive.

7.1 2028 PHASE 1 W/ IMPROVEMENTS CAPACITY ANALYSIS

During the AM and PM peak hours, all intersection approaches operate at LOS E or better. The control delay and LOS results are summarized in **Table 4** and **Table 5** following the analysis sections. The intersection capacity analysis results are included in **Appendix D**.

7.2 2028 PHASE 1 W/ IMPROVEMENTS SIMTRAFFIC QUEUEING ANALYSIS

Phase 1 maximum queue lengths were reported for all intersection approaches at the study intersections. Based on the queue analysis results, all movement queues are expected to have adequate storage space between adjacent intersections.

The queue results are summarized in **Table 6** and **Table 7** following the analysis sections. The queueing analysis results are included in **Appendix E**.

7.3 2030 BUILD W/ IMPROVEMENTS INTERSECTION CAPACITY ANALYSIS

During the AM and PM peak hours, all intersection approaches operate at LOS E or better with the exception of the northbound approach at the intersection of Shadwell Drive and Hollins Road. Note that these results are typical where a high volume, free-flow, roadway intersects a low volume, stop-controlled, roadway. It is anticipated that project traffic will increase delays at the northbound approach of Shadwell Drive and Hollins Road by 5 seconds during the AM peak hour and 21 seconds during the PM peak hour. The control delay and LOS results are summarized in **Table 4** and **Table 5** following the analysis sections. The intersection capacity analysis results are included in **Appendix D**.

7.4 2030 BUILD W/ IMPROVEMENTS SIMTRAFFIC QUEUEING ANALYSIS

2030 Full-Build maximum queue lengths were reported for all intersection approaches at the study intersections. Based on the queue analysis results, all movement queues are expected to have adequate storage space between adjacent intersections.

The queue results are summarized in **Table 6** and **Table 7** following the analysis sections. The queueing analysis results are included in **Appendix E**.

Table 4: AM Peak Hour Control Delay and LOS Summary

Intersection	Approach	Movement	AM Peak						
			2023 Existing	2028 No-Build	2028 Phase 1	2028 Phase 1 w/ Imp	2030 No-Build	2030 Build	2030 Build w/ Imp
			Delay (LOS)						
1. Shadwell Drive & Hollins Road	Eastbound	T	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		R							
		Approach							
	Westbound	L	8.0 (A)	8.1 (A)	8.2 (A)	8.2 (A)	8.1 (A)	8.2 (A)	8.2 (A)
		T							
		Approach							
	Northbound	L	17.6 (C)	19.1 (C)	21.8 (C)	21.8 (C)	20.3 (C)	25.1 (D)	25.1 (D)
		R							
Approach									
Overall Intersection			(2)	(2)	(2)	(2)	(2)	(2)	(2)
2. Shadwell Drive & Sanderson Drive	Eastbound	L	7.9 (A)	8.0 (A)	8.0 (A)	8.0 (A)	8.0 (A)	8.1 (A)	8.1 (A)
		T							
		Approach							
	Westbound	T	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		R							
		Approach							
	Southbound	L	14.9 (B)	17.1 (C)	20.2 (C)	16.9 (C)	17.8 (C)	23.4 (C)	18.1 (C)
		R				11.7 (B)			12.1 (B)
Approach		14.9 (B)				17.1 (C)			20.2 (C)
Overall Intersection			(2)	(2)	(2)	(2)	(2)	(2)	(2)
3. Sanderson Drive & Southern Driveway	Westbound	L	(3)	(3)	12.7 (B)	12.7 (B)	(3)	13.2 (B)	13.2 (B)
		R							
		Approach							
	Northbound	T	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		R							
		Approach							
	Southbound	L	(3)	(3)	7.6 (A)	7.6 (A)	(3)	7.7 (A)	7.7 (A)
		T							
Approach									
Overall Intersection			(3)	(3)	(1)	(1)	(3)	(1)	(1)
4. Sanderson Drive & Northern Driveway	Westbound	L	(3)	(3)	11.4 (B)	11.3 (B)	(3)	11.7 (B)	11.7 (B)
		R							
		Approach							
	Northbound	T	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		R							
		Approach							
	Southbound	L	(3)	(3)	7.6 (A)	7.6 (A)	(3)	7.7 (A)	7.7 (A)
		T							
Approach									
Overall Intersection			(3)	(3)	(1)	(1)	(3)	(1)	(1)

Notes: ⁽¹⁾ Approach/movement operates under free-flow conditions; therefore, no LOS is reported.
⁽²⁾ Intersection operates under two-way stop-control conditions; therefore, no LOS is reported.
⁽³⁾ Intersection does not exist; therefore, no LOS is reported.
⁽⁴⁾ For uncontrolled shared lane approaches, reported delays are for the interrupted movement.

Table 5: PM Peak Hour Control Delay and LOS Summary

Intersection	Approach	Movement	PM Peak						
			2023 Existing	2028 No-Build	2028 Phase 1	2028 Phase 1 w/ Imp	2030 No-Build	2030 Build	2030 Build w/ Imp
			Delay (LOS)						
1. Shadwell Drive & Hollins Road	Eastbound	T	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		R	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		Approach	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Westbound	L	8.4 (A)	8.6 (A)	8.7 (A)	8.7 (A)	8.6 (A)	8.8 (A)	8.8 (A)
		T	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		Approach	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Northbound	L	22.5 (C)	30.9 (D)	41.2 (E)	41.2 (E)	35.2 (D)	56.0 (F)	56.0 (F)
		R	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		Approach	22.5 (C)	30.9 (D)	41.2 (E)	41.2 (E)	35.2 (D)	56.0 (F)	56.0 (F)
	Overall Intersection		(2)	(2)	(2)	(2)	(2)	(2)	(2)
2. Shadwell Drive & Sanderson Drive	Eastbound	L	8.6 (A)	8.8 (A)	9.1 (A)	9.1 (A)	8.9 (A)	9.3 (A)	9.3 (A)
		T	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		Approach	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Westbound	T	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		R	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		Approach	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Southbound	L	23.8 (C)	38.5 (E)	76.0 (F)	77.1 (F)	45.8 (E)	125.6 (F)	111.1 (F)
		R	(1)	(1)	(1)	10.9 (B)	(1)	(1)	11.1 (B)
		Approach	23.8 (C)	38.5 (E)	76.0 (F)	30.0 (D)	45.8 (E)	125.6 (F)	39.2 (E)
	Overall Intersection		(2)	(2)	(2)	(2)	(2)	(2)	(2)
3. Sanderson Drive & Southern Driveway	Westbound	L	(3)	(3)	16.5 (C)	16.4 (C)	(3)	17.8 (C)	17.8 (C)
		R	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		Approach	(3)	(3)	16.5 (C)	16.4 (C)	(3)	17.8 (C)	17.8 (C)
	Northbound	T	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		R	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		Approach	(3)	(3)	(1)	(1)	(3)	(1)	(1)
	Southbound	L	(3)	(3)	8.6 (A)	8.6 (A)	(3)	8.7 (A)	8.7 (A)
		T	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		Approach	(3)	(3)	(1)	(1)	(3)	(1)	(1)
	Overall Intersection		(3)	(3)	(1)	(1)	(3)	(1)	(1)
4. Sanderson Drive & Northern Driveway	Westbound	L	(3)	(3)	14.6 (B)	14.6 (B)	(3)	15.4 (C)	15.4 (C)
		R	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		Approach	(3)	(3)	14.6 (B)	14.6 (B)	(3)	15.4 (C)	15.4 (C)
	Northbound	T	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		R	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		Approach	(3)	(3)	(1)	(1)	(3)	(1)	(1)
	Southbound	L	(3)	(3)	8.5 (A)	8.5 (A)	(3)	8.6 (A)	8.6 (A)
		T	(3)	(3)	(1)	(1)	(3)	(1)	(1)
		Approach	(3)	(3)	(1)	(1)	(3)	(1)	(1)
	Overall Intersection		(3)	(3)	(1)	(1)	(3)	(1)	(1)

Notes: ⁽¹⁾ Approach/movement operates under free-flow conditions; therefore, no LOS is reported.
⁽²⁾ Intersection operates under two-way stop-control conditions; therefore, no LOS is reported.
⁽³⁾ Intersection does not exist; therefore, no LOS is reported.
⁽⁴⁾ For uncontrolled shared lane approaches, reported delays are for the interrupted movement.

Table 6: AM Peak Hour Queueing Analysis

Intersection	Approach	Movement	Storage	AM Peak Hour						
				2023 Existing	2028 No-Build	2028 Phase 1	2028 Phase 1 w/ Improvements	2030 No-Build	2030 Build	2030 Build w/ Improvements
				Maximum Queue (ft)						
1. Shadwell Drive & Hollins Road	Eastbound	T	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Westbound	R	120 ⁽³⁾	92	93	98	96	90	106	97
		L								
2. Shadwell Drive & Sanderson Drive	Northbound	T	-	113	130	148	142	125	153	151
	Eastbound	R	105 ⁽³⁾	60	74	78	79	73	77	83
		L								
3. Sanderson Drive & Southern Driveway	Westbound	T	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Southbound	R	-	173	150	224	88	184	211	94
		L					104			133
4. Sanderson Drive & Northern Driveway	Westbound	T	-	(2)	(2)	62	62	(2)	58	59
	Northbound	R	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
		L								
5. Sanderson Drive & Northern Driveway	Southbound	T	-	(2)	(2)	<25	<25	(2)	<25	<25
	Westbound	R	-	(2)	(2)	40	43	(2)	51	51
		L								
6. Sanderson Drive & Northern Driveway	Northbound	T	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
	Southbound	R	-	(2)	(2)	<25	27	(2)	25	28
		L								

Notes: ⁽¹⁾ Intersection approach operates under free-flow conditions, no queue is reported.
⁽²⁾ Intersection/approach does not exist; therefore, no queue is reported.
⁽³⁾ Available storage distance accounts for location of railroad tracks.

Table 7: PM Peak Hour Queueing Analysis

Intersection	Approach	Movement	Storage	PM Peak Hour						
				2023 Existing	2028 No-Build	2028 Phase 1	2028 Phase 1 w/ Improvements	2030 No-Build	2030 Build	2030 Build w/ Improvements
				Maximum Queue (ft)						
1. Shadwell Drive & Hollins Road	Eastbound	T	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		R	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Westbound	L	120 ⁽³⁾	98	114	112	96	108	120	101
		T	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Northbound	L	-	227	350	414	408	381	523	505
		R	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
2. Shadwell Drive & Sanderson Drive	Eastbound	L	105 ⁽³⁾	110	117	119	103	116	119	103
		T	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Westbound	T	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
		R	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Southbound	L	-	173	254	360	118	238	527	155
		R	-	(1)	(1)	(1)	96	(1)	(1)	134
3. Sanderson Drive & Southern Driveway	Westbound	L	-	(2)	(2)	51	53	(2)	68	62
		R	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
	Northbound	T	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
		R	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
	Southbound	L	-	(2)	(2)	57	45	(2)	103	56
		T	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
4. Sanderson Drive & Northern Driveway	Westbound	L	-	(2)	(2)	42	42	(2)	42	44
		R	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
	Northbound	T	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
		R	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)
	Southbound	L	-	(2)	(2)	51	52	(2)	63	69
		T	-	(2)	(2)	(1)	(1)	(2)	(1)	(1)

Notes: ⁽¹⁾ Intersection approach operates under free-flow conditions, no queue is reported.
⁽²⁾ Intersection/approach does not exist; therefore, no queue is reported.
⁽³⁾ Available storage distance accounts for location of railroad tracks.

8 CONCLUSION AND RECOMMENDATIONS

The traffic impact analysis (TIA) documented in this report evaluates the anticipated traffic impacts of the proposed development to be generally located in the northeast quadrant of the intersection of Shadwell Drive and Sanderson Drive within both Roanoke County and Botetourt County. Currently, the site proposed for development is occupied and used primarily as farmland. The proposed development consists of up to 125 townhomes and 100 single-family residential units with Phase 1 consisting of 50 townhomes and 100 single-family residential units. Access to the proposed development will be provided via two full-access driveways along Sanderson Drive.

The results of the traffic impact analysis indicate that while the project results in minor increases in delay at the study intersections the anticipated maximum queues will be accommodated and are not expected to spill back into adjacent intersections. It must be noted that project traffic is expected to increase delays at the southbound approach of Shadwell Drive and Sanderson Drive by 38 seconds during the 2028 Phase 1 PM peak hour and 80 seconds during the 2030 Full-Build PM peak hour. However, improving the approach to include exclusive southbound left and right-turn lanes improves the approach delays to better than no-build conditions.

The applicant agrees to participate in a cooperative effort with Roanoke County and other parties to seek a solution to construct a southbound left-turn lane along Sanderson Drive. The applicant would agree to deed adequate right-of-way for a turn-lane over their existing property.

APPENDIX A

Conceptual Site Plan



APPENDIX B

Trip Generation

PROPOSED WEEKDAY AM PEAK HOUR TRIP GENERATION

		ITE TRIP GENERATION CHARACTERISTICS					DIRECTIONAL DISTRIBUTION		BASELINE TRIPS		
		Land Use	ITE Edition	ITE Code	Scale	ITE Units	Percent		In	Out	Total
							In	Out			
GROUP 1	1	Single-Family Detached Housing	11	210	100	du	25%	75%	19	55	74
	2	Single-Family Attached Housing	11	215	125	du	25%	75%	15	44	59
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
		ITE Land Use Code		Rate or Equation			Total:		34	99	133
		210		$LN(Y) = 0.91*LN(X)+0.12$							
		215		$Y=0.52*(X)+-5.7$							

PROPOSED WEEKDAY PM PEAK HOUR TRIP GENERATION

		ITE TRIP GENERATION CHARACTERISTICS					DIRECTIONAL DISTRIBUTION		BASELINE TRIPS		
		Land Use	ITE Edition	ITE Code	Scale	ITE Units	Percent		In	Out	Total
							In	Out			
GROUP 2	1	Single-Family Detached Housing	11	210	100	du	63%	37%	62	37	99
	2	Single-Family Attached Housing	11	215	125	du	59%	41%	42	29	71
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
		ITE Land Use Code		Rate or Equation			Total:		104	66	170
		210		$LN(Y) = 0.94*LN(X)+0.27$							
		215		$Y=0.6*(X)+-3.93$							

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 192

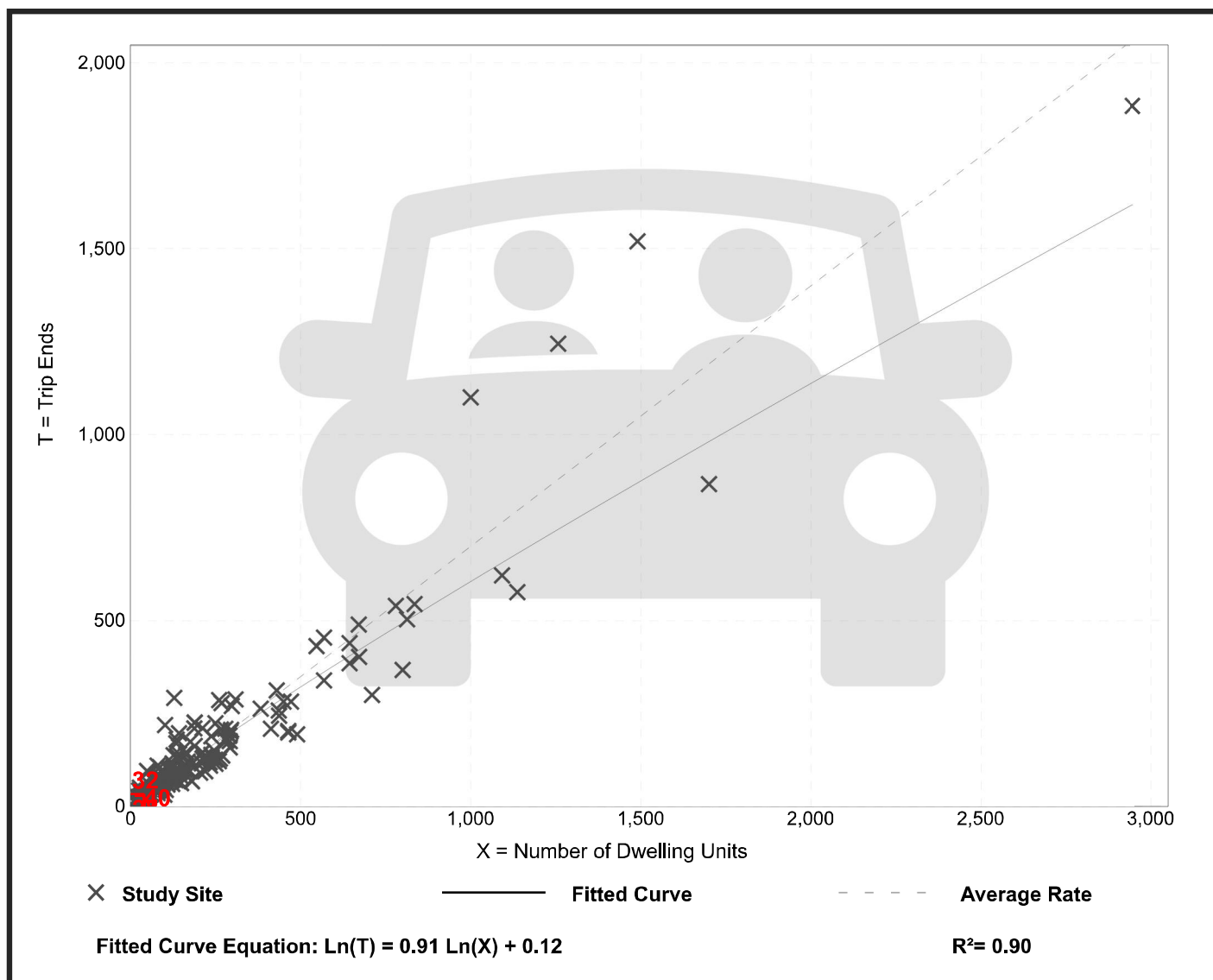
Avg. Num. of Dwelling Units: 226

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

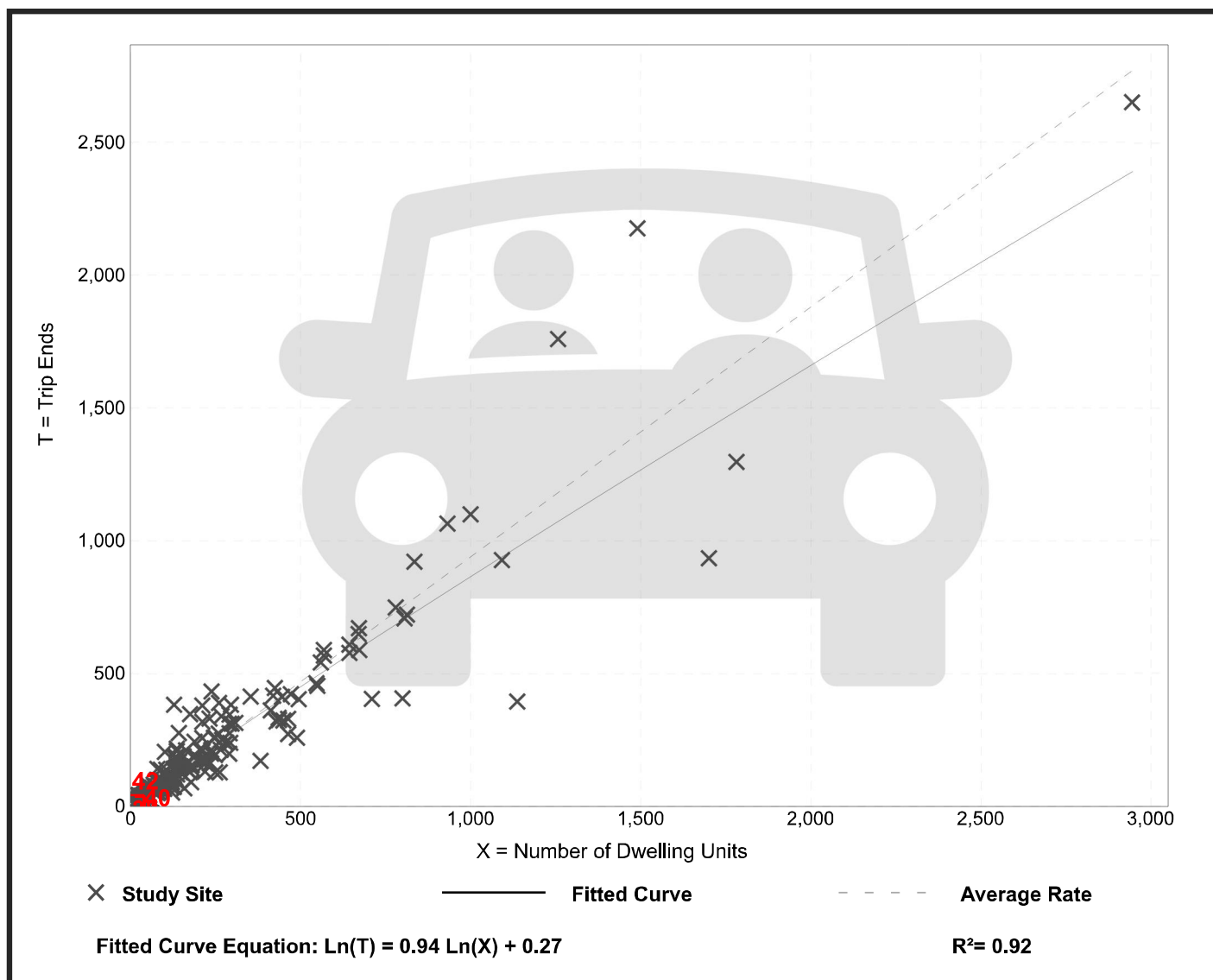
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 46

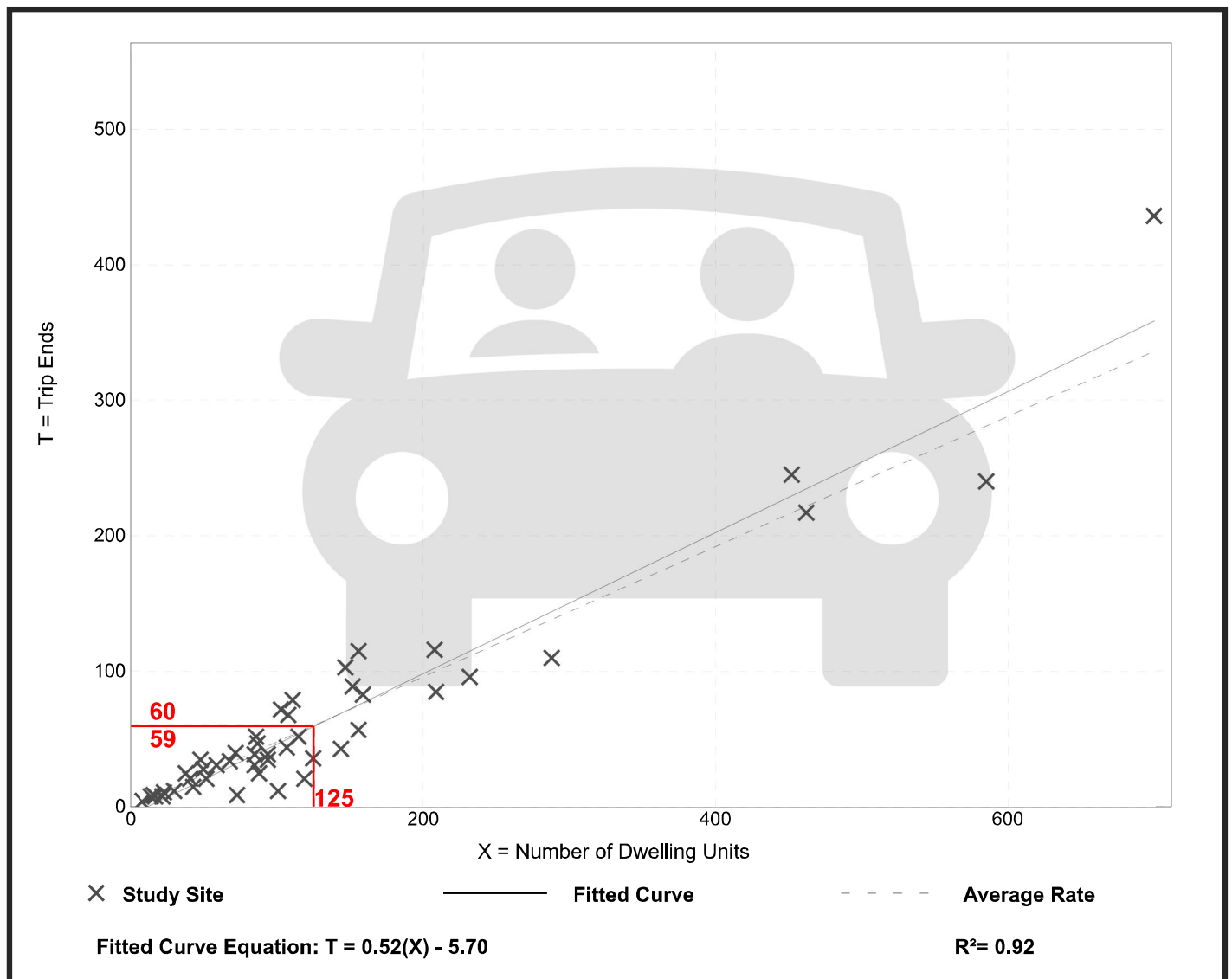
Avg. Num. of Dwelling Units: 135

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 51

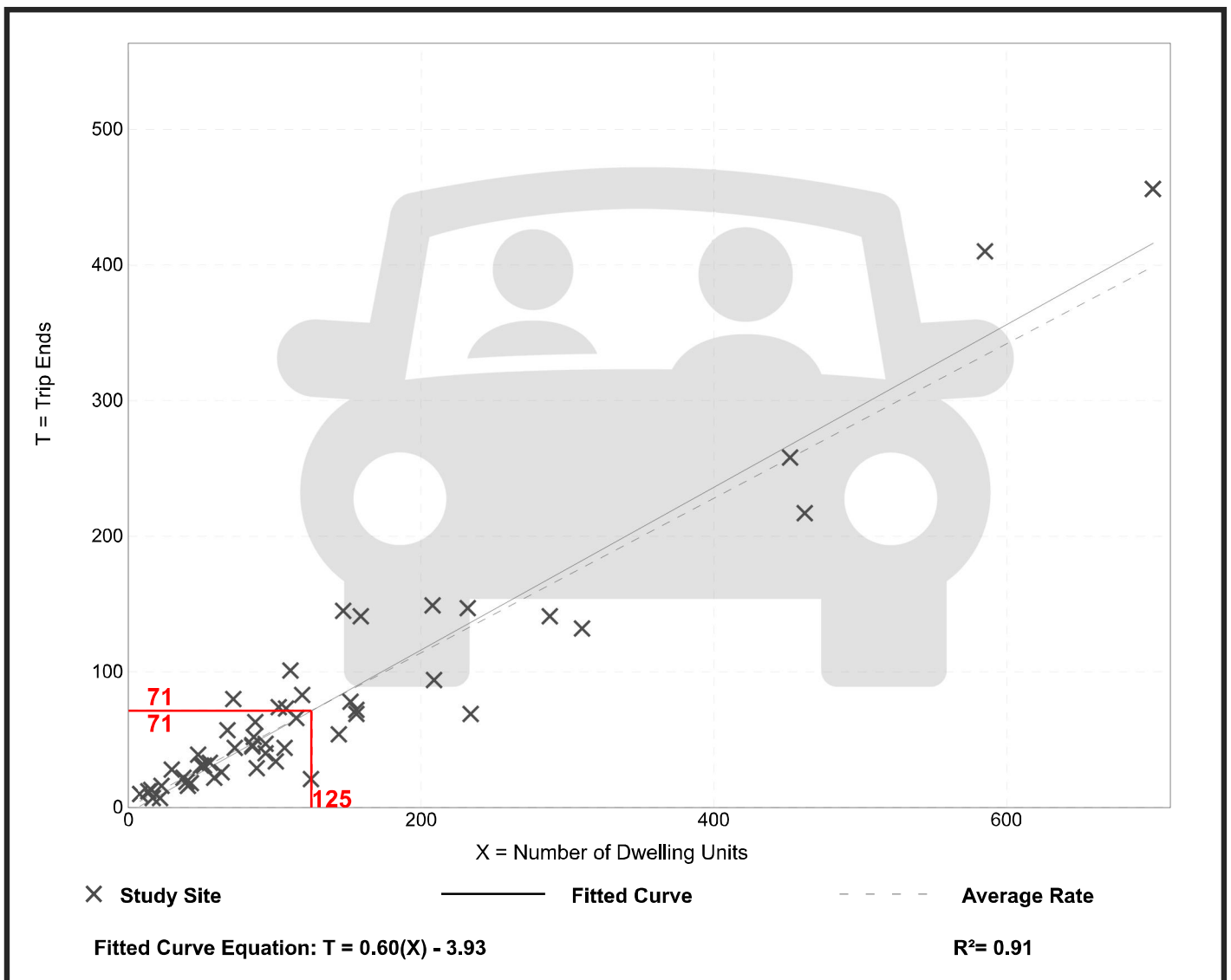
Avg. Num. of Dwelling Units: 136

Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 192

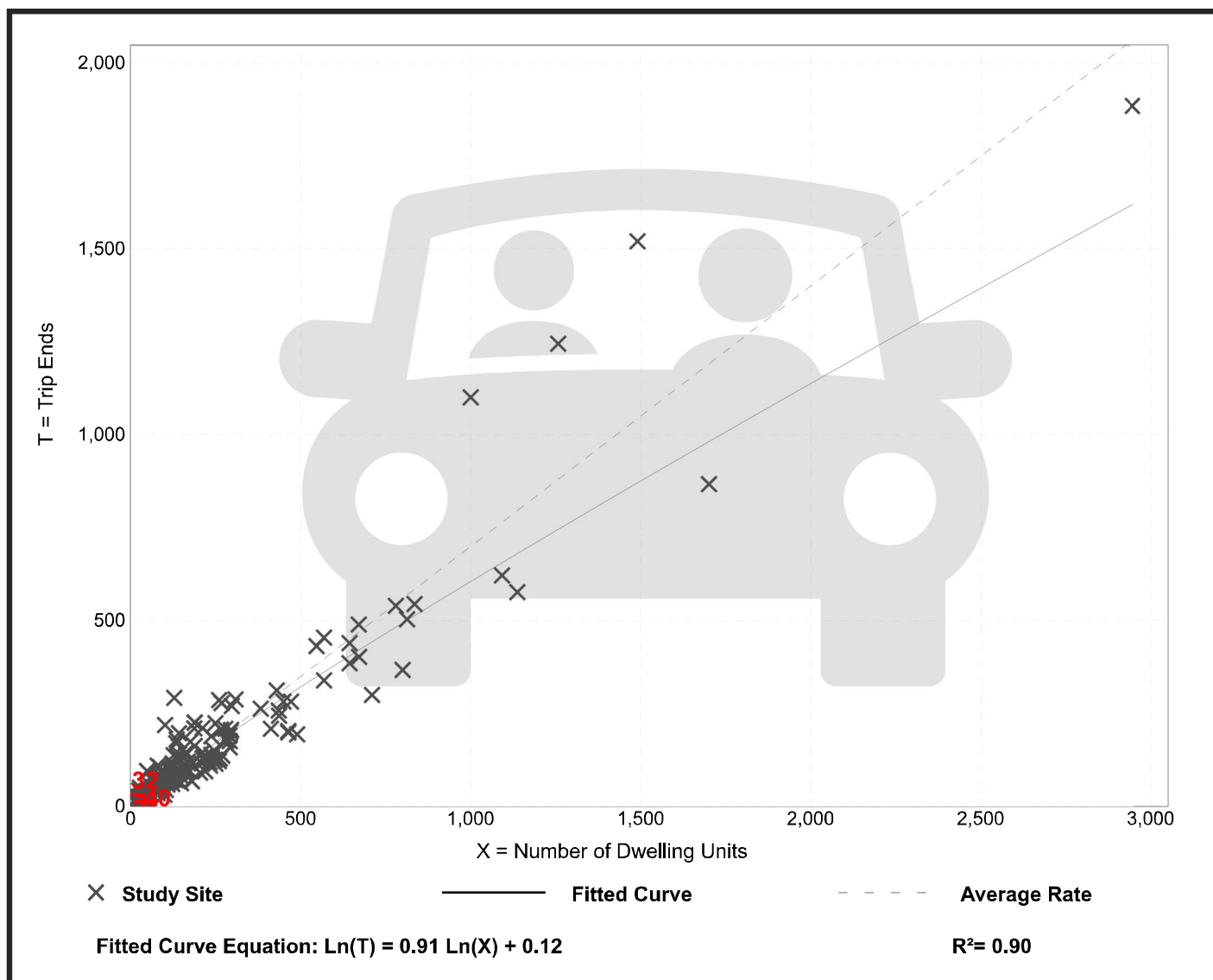
Avg. Num. of Dwelling Units: 226

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

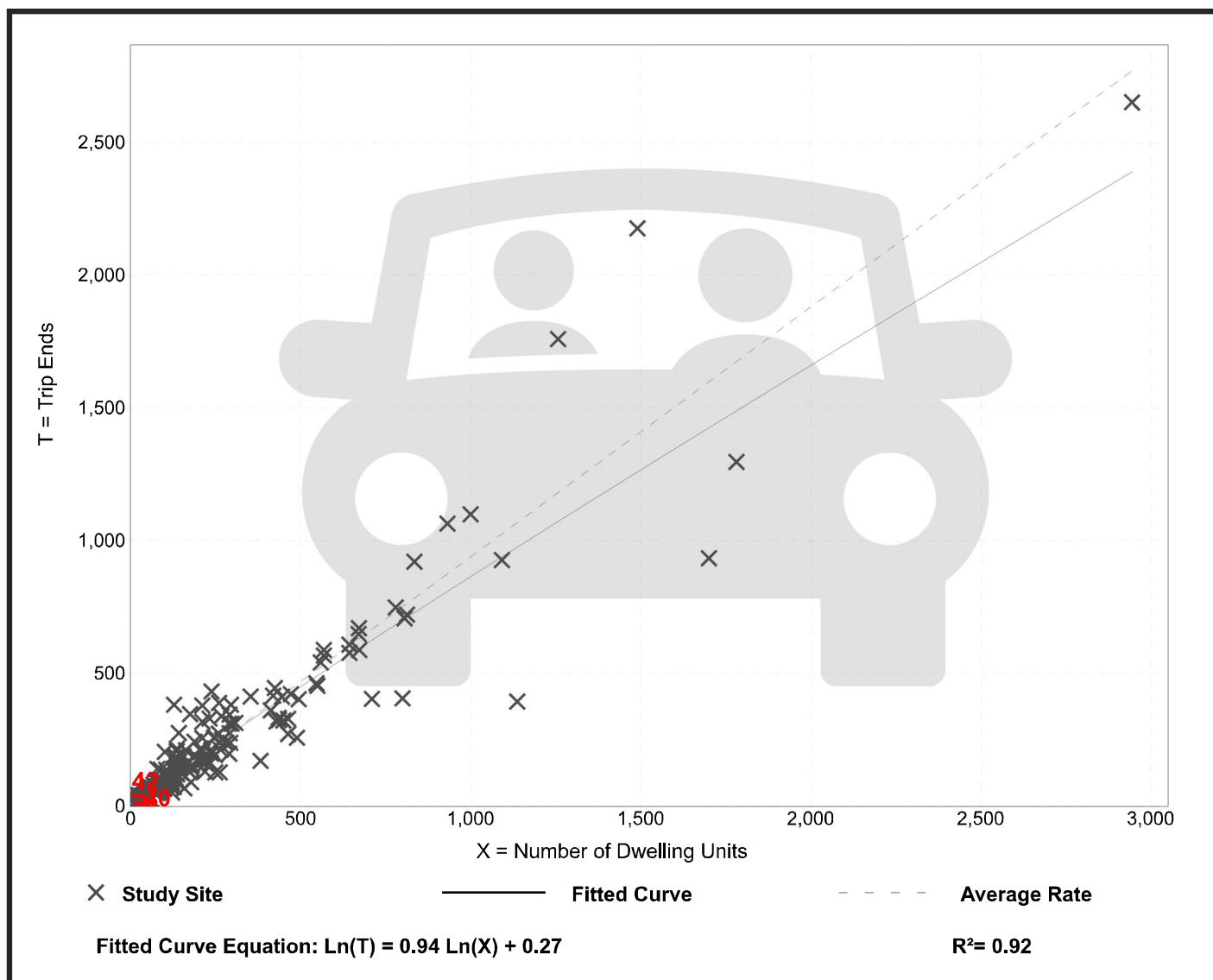
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



APPENDIX C

Traffic Count Data

1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shadwell Dr Westbound					Hollins Rd Northbound					Shadwell Dr Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2023-08-15 7:00AM	33	19	0	52	0	20	15	0	35	0	16	18	0	34	0	121
7:15AM	51	51	0	102	0	17	17	0	34	0	26	19	0	45	0	181
7:30AM	59	37	0	96	0	22	27	0	49	0	33	21	0	54	0	199
7:45AM	53	35	0	88	0	22	25	0	47	0	22	25	0	47	0	182
Hourly Total	196	142	0	338	0	81	84	0	165	0	97	83	0	180	0	683
8:00AM	40	32	0	72	0	25	14	0	39	0	11	19	0	30	0	141
8:15AM	37	33	0	70	0	24	22	0	46	0	17	24	0	41	0	157
8:30AM	27	27	0	54	0	15	10	0	25	0	17	22	0	39	0	118
8:45AM	36	27	0	63	0	18	15	0	33	0	10	22	0	32	0	128
Hourly Total	140	119	0	259	0	82	61	0	143	0	55	87	0	142	0	544
9:00AM	26	27	0	53	0	19	12	0	31	0	12	17	0	29	0	113
9:15AM	16	26	0	42	0	17	15	0	32	0	10	31	0	41	0	115
9:30AM	28	22	0	50	0	23	17	0	40	0	10	16	0	26	0	116
9:45AM	25	18	0	43	0	17	14	0	31	0	11	20	0	31	0	105
Hourly Total	95	93	0	188	0	76	58	0	134	0	43	84	0	127	0	449
10:00AM	22	23	0	45	0	20	19	0	39	0	13	17	0	30	0	114
10:15AM	28	18	0	46	0	19	11	0	30	0	14	19	0	33	0	109
10:30AM	22	34	0	56	0	15	13	0	28	0	7	22	0	29	0	113
10:45AM	25	24	0	49	0	25	15	0	40	0	18	14	0	32	0	121
Hourly Total	97	99	0	196	0	79	58	0	137	0	52	72	0	124	0	457
11:00AM	29	25	0	54	0	24	16	0	40	0	18	24	0	42	0	136
11:15AM	28	17	0	45	0	15	10	0	25	0	11	20	0	31	0	101
11:30AM	22	21	0	43	0	17	16	0	33	0	10	29	0	39	0	115
11:45AM	25	15	0	40	0	30	16	0	46	0	15	28	0	43	0	129
Hourly Total	104	78	0	182	0	86	58	0	144	0	54	101	0	155	0	481
12:00PM	23	18	0	41	0	23	19	0	42	0	14	34	0	48	0	131
12:15PM	25	32	0	57	0	27	13	0	40	0	16	24	0	40	0	137
12:30PM	26	17	0	43	0	21	16	0	37	0	15	20	0	35	0	115
12:45PM	21	23	0	44	0	32	12	0	44	0	12	36	0	48	0	136
Hourly Total	95	90	0	185	0	103	60	0	163	0	57	114	0	171	0	519
1:00PM	14	22	0	36	0	34	17	0	51	0	22	33	0	55	0	142
1:15PM	27	18	0	45	0	25	17	0	42	0	12	30	0	42	0	129
1:30PM	34	18	0	52	0	32	22	0	54	0	13	35	0	48	0	154
1:45PM	34	26	0	60	0	29	21	0	50	0	15	29	0	44	0	154
Hourly Total	109	84	0	193	0	120	77	0	197	0	62	127	0	189	0	579
2:00PM	34	34	0	68	0	38	8	0	46	0	18	29	0	47	0	161
2:15PM	27	30	0	57	0	33	20	0	53	0	14	36	0	50	0	160
2:30PM	23	34	0	57	0	28	15	0	43	0	17	39	0	56	2	156
2:45PM	21	17	0	38	0	42	22	0	64	0	24	23	0	47	0	149
Hourly Total	105	115	0	220	0	141	65	0	206	0	73	127	0	200	2	626
3:00PM	26	31	0	57	0	38	13	0	51	0	21	36	0	57	0	165
3:15PM	27	36	0	63	0	37	21	0	58	0	18	45	0	63	0	184
3:30PM	24	36	0	60	0	50	22	0	72	0	25	60	0	85	0	217
3:45PM	28	31	0	59	0	41	18	0	59	0	21	45	0	66	0	184
Hourly Total	105	134	0	239	0	166	74	0	240	0	85	186	0	271	0	750
4:00PM	31	37	0	68	0	33	22	0	55	1	22	51	0	73	0	196
4:15PM	23	38	0	61	0	51	20	0	71	0	24	41	0	65	0	197
4:30PM	26	25	0	51	0	57	32	0	89	0	20	55	0	75	0	215
4:45PM	35	29	0	64	0	50	14	0	64	0	26	55	0	81	0	209
Hourly Total	115	129	0	244	0	191	88	0	279	1	92	202	0	294	0	817
5:00PM	41	25	0	66	0	63	26	0	89	0	28	61	0	89	0	244
5:15PM	34	34	0	68	0	51	28	0	79	0	27	64	0	91	0	238
5:30PM	34	32	0	66	0	48	31	0	79	0	22	61	0	83	0	228

Leg Direction	Shadwell Dr Westbound					Hollins Rd Northbound					Shadwell Dr Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
5:45PM	32	48	0	80	0	43	16	0	59	0	23	56	0	79	0	218
Hourly Total	141	139	0	280	0	205	101	0	306	0	100	242	0	342	0	928
6:00PM	18	29	0	47	0	49	8	0	57	0	22	42	0	64	0	168
6:15PM	19	34	0	53	0	45	25	0	70	0	19	27	0	46	0	169
6:30PM	14	19	0	33	0	26	14	0	40	0	20	31	0	51	0	124
6:45PM	22	29	0	51	0	32	8	0	40	0	20	15	0	35	0	126
Hourly Total	73	111	0	184	0	152	55	0	207	0	81	115	0	196	0	587
Total	1375	1333	0	2708	0	1482	839	0	2321	1	851	1540	0	2391	2	7420
% Approach	50.8%	49.2%	0%	-	-	63.9%	36.1%	0%	-	-	35.6%	64.4%	0%	-	-	-
% Total	18.5%	18.0%	0%	36.5%	-	20.0%	11.3%	0%	31.3%	-	11.5%	20.8%	0%	32.2%	-	-
Lights and Motorcycles	1306	1306	0	2612	-	1458	762	0	2220	-	792	1479	0	2271	-	7103
% Lights and Motorcycles	95.0%	98.0%	0%	96.5%	-	98.4%	90.8%	0%	95.6%	-	93.1%	96.0%	0%	95.0%	-	95.7%
Heavy	69	27	0	96	-	24	77	0	101	-	59	61	0	120	-	317
% Heavy	5.0%	2.0%	0%	3.5%	-	1.6%	9.2%	0%	4.4%	-	6.9%	4.0%	0%	5.0%	-	4.3%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	2	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

Full Length (7 AM-7 PM)

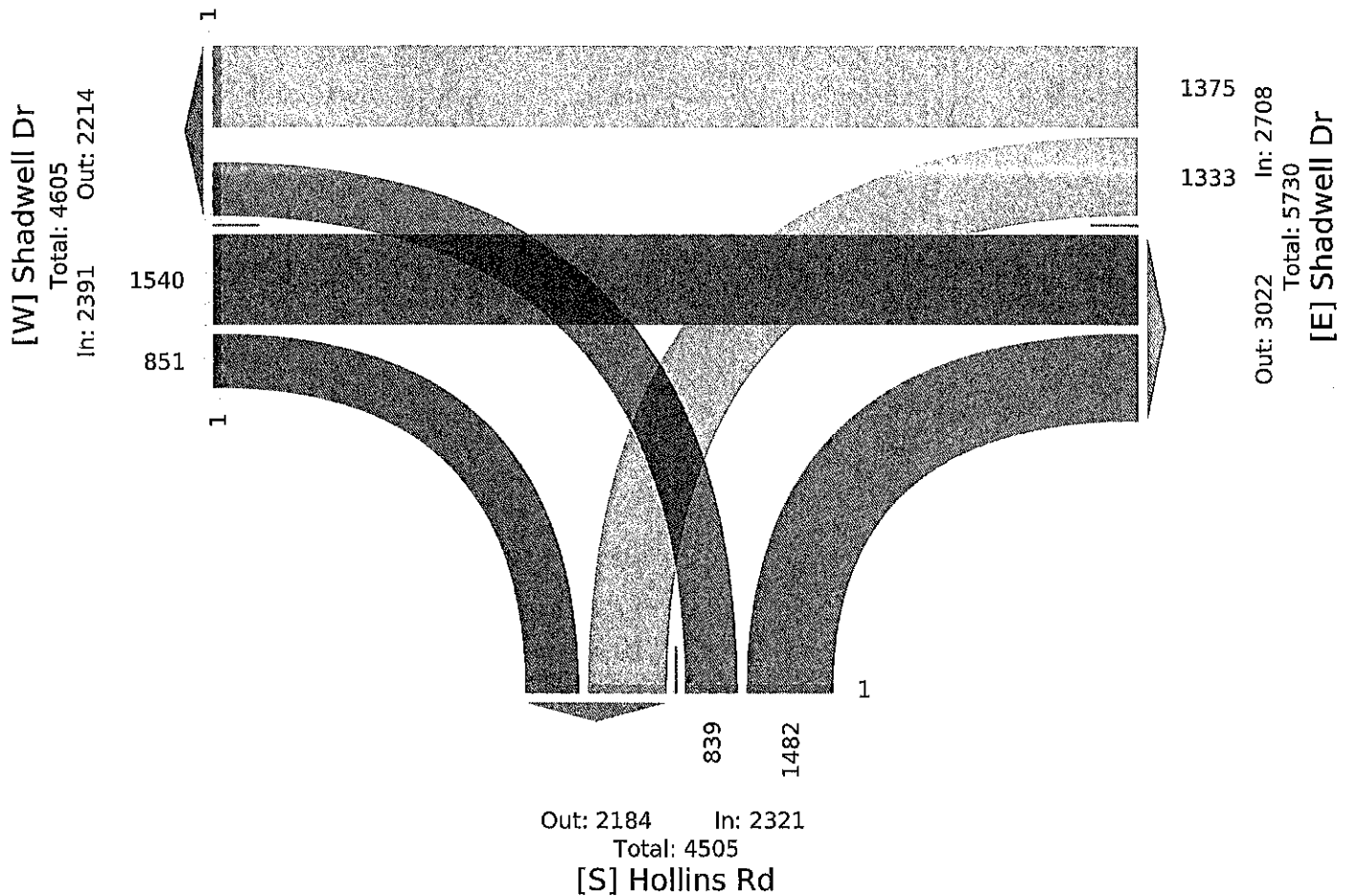
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shadwell Dr Westbound					Hollins Rd Northbound					Shadwell Dr Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2023-08-15 7:15AM	51	51	0	102	0	17	17	0	34	0	26	19	0	45	0	181
7:30AM	59	37	0	96	0	22	27	0	49	0	33	21	0	54	0	199
7:45AM	53	35	0	88	0	22	25	0	47	0	22	25	0	47	0	182
8:00AM	40	32	0	72	0	25	14	0	39	0	11	19	0	30	0	141
Total	203	155	0	358	0	86	83	0	169	0	92	84	0	176	0	703
% Approach	56.7%	43.3%	0%	-	-	50.9%	49.1%	0%	-	-	52.3%	47.7%	0%	-	-	-
% Total	28.9%	22.0%	0%	50.9%	-	12.2%	11.8%	0%	24.0%	-	13.1%	11.9%	0%	25.0%	-	-
PHF	0.860	0.760	-	0.877	-	0.860	0.769	-	0.862	-	0.697	0.840	-	0.815	-	0.883
Lights and Motorcycles	194	152	0	346	-	86	73	0	159	-	83	78	0	161	-	666
% Lights and Motorcycles	95.6%	98.1%	0%	96.6%	-	100%	88.0%	0%	94.1%	-	90.2%	92.9%	0%	91.5%	-	94.7%
Heavy	9	3	0	12	-	0	10	0	10	-	9	6	0	15	-	37
% Heavy	4.4%	1.9%	0%	3.4%	-	0%	12.0%	0%	5.9%	-	9.8%	7.1%	0%	8.5%	-	5.3%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

AM Peak (7:15 AM - 8:15 AM)

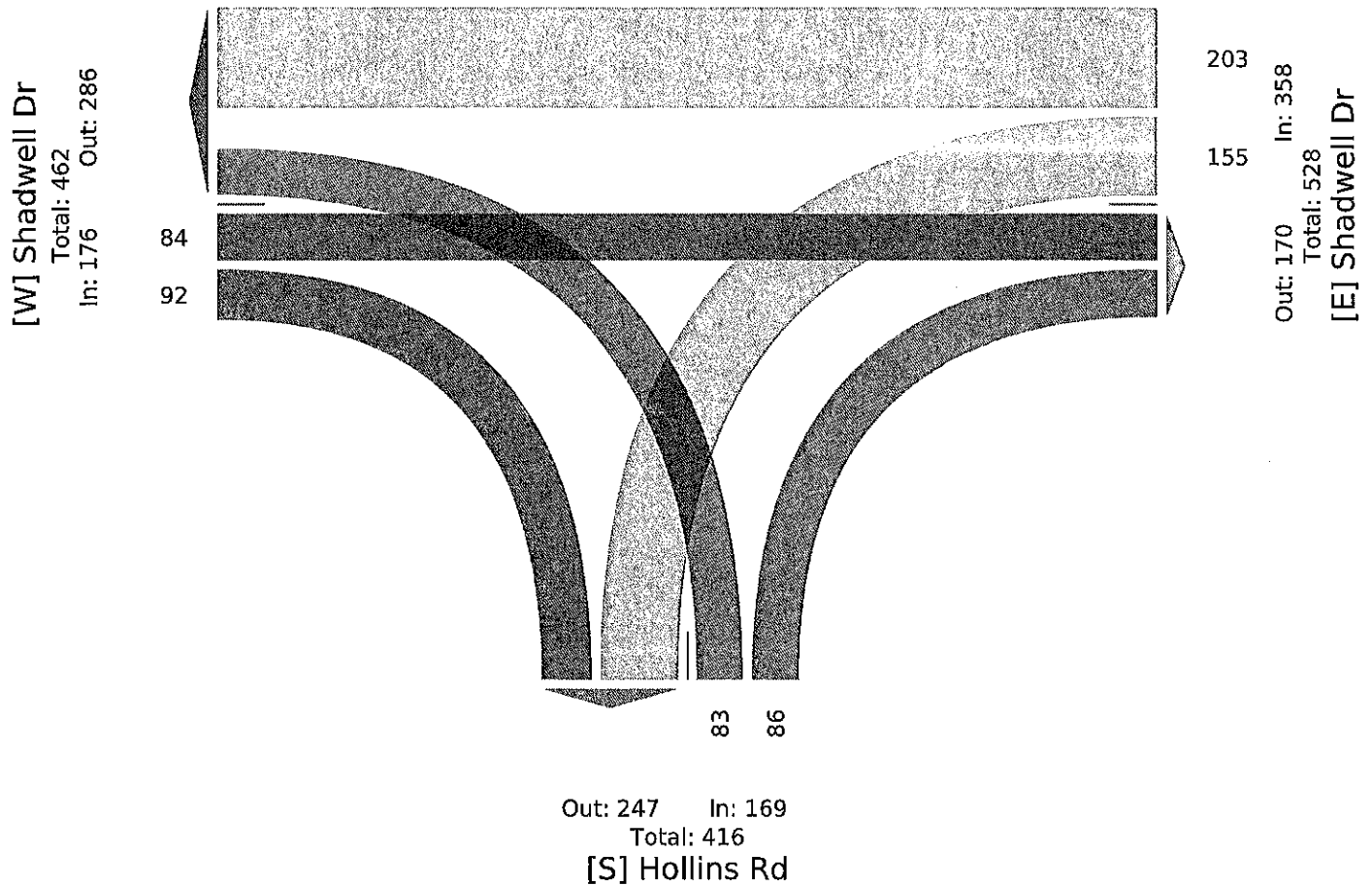
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

Midday Peak (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shadwell Dr Westbound					Hollins Rd Northbound					Shadwell Dr Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2023-08-15 1:00PM	14	22	0	36	0	34	17	0	51	0	22	33	0	55	0	142
1:15PM	27	18	0	45	0	25	17	0	42	0	12	30	0	42	0	129
1:30PM	34	18	0	52	0	32	22	0	54	0	13	35	0	48	0	154
1:45PM	34	26	0	60	0	29	21	0	50	0	15	29	0	44	0	154
Total	109	84	0	193	0	120	77	0	197	0	62	127	0	189	0	579
% Approach	56.5%	43.5%	0%	-	-	60.9%	39.1%	0%	-	-	32.8%	67.2%	0%	-	-	-
% Total	18.8%	14.5%	0%	33.3%	-	20.7%	13.3%	0%	34.0%	-	10.7%	21.9%	0%	32.6%	-	-
PHF	0.801	0.808	-	0.804	-	0.882	0.875	-	0.912	-	0.705	0.907	-	0.859	-	0.940
Lights and Motorcycles	101	82	0	183	-	117	68	0	185	-	60	122	0	182	-	550
% Lights and Motorcycles	92.7%	97.6%	0%	94.8%	-	97.5%	88.3%	0%	93.9%	-	96.8%	96.1%	0%	96.3%	-	95.0%
Heavy	8	2	0	10	-	3	9	0	12	-	2	5	0	7	-	29
% Heavy	7.3%	2.4%	0%	5.2%	-	2.5%	11.7%	0%	6.1%	-	3.2%	3.9%	0%	3.7%	-	5.0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

Midday Peak (1 PM - 2 PM)

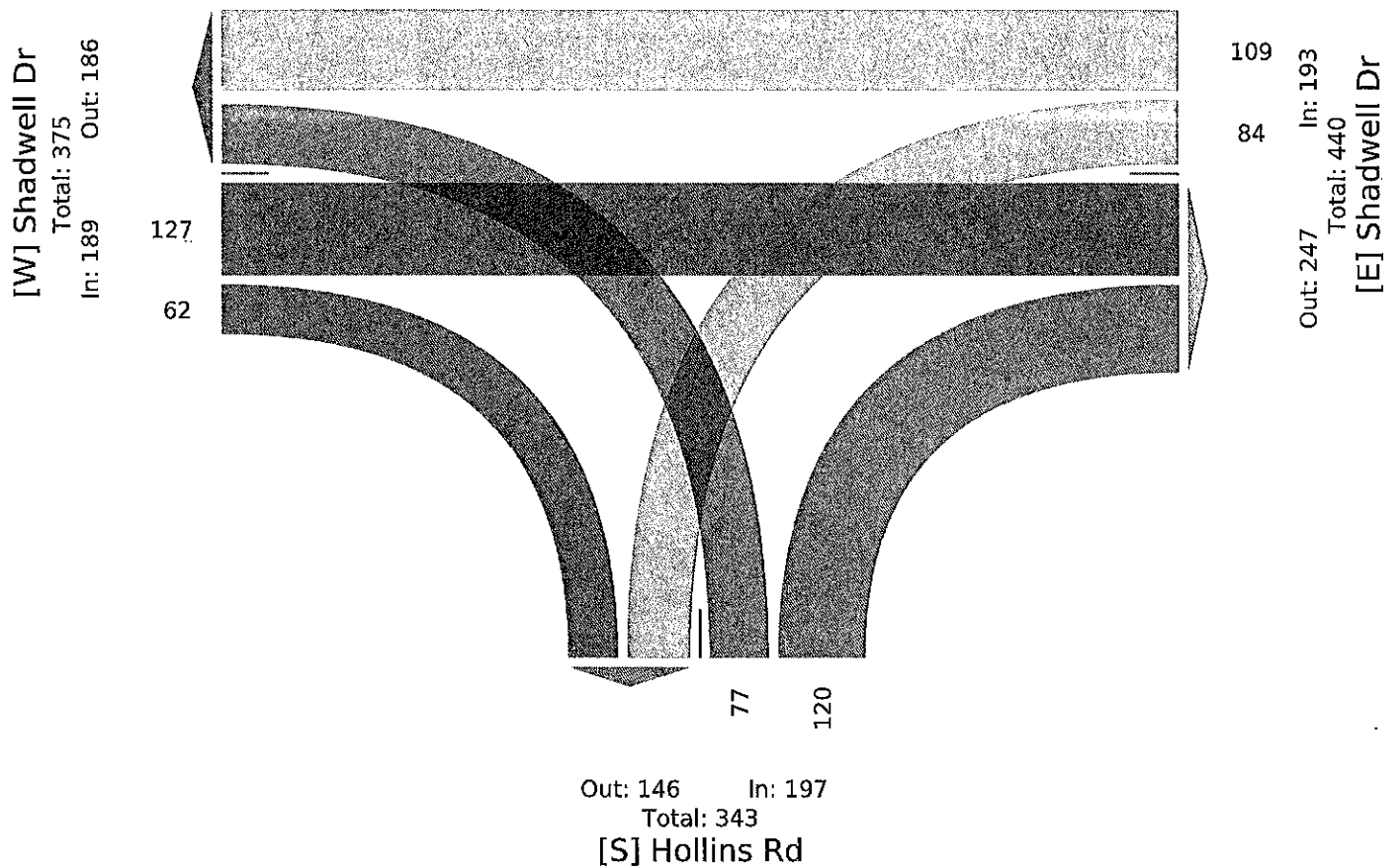
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shadwell Dr Westbound					Hollins Rd Northbound					Shadwell Dr Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2023-08-15 5:00PM	41	25	0	66	0	63	26	0	89	0	28	61	0	89	0	244
5:15PM	34	34	0	68	0	51	28	0	79	0	27	64	0	91	0	238
5:30PM	34	32	0	66	0	48	31	0	79	0	22	61	0	83	0	228
5:45PM	32	48	0	80	0	43	16	0	59	0	23	56	0	79	0	218
Total	141	139	0	280	0	205	101	0	306	0	100	242	0	342	0	928
% Approach	50.4%	49.6%	0%	-	-	67.0%	33.0%	0%	-	-	29.2%	70.8%	0%	-	-	-
% Total	15.2%	15.0%	0%	30.2%	-	22.1%	10.9%	0%	33.0%	-	10.8%	26.1%	0%	36.9%	-	-
PHF	0.860	0.724	-	0.875	-	0.813	0.815	-	0.860	-	0.893	0.945	-	0.940	-	0.951
Lights and Motorcycles	140	138	0	278	-	203	99	0	302	-	97	241	0	338	-	918
% Lights and Motorcycles	99.3%	99.3%	0%	99.3%	-	99.0%	98.0%	0%	98.7%	-	97.0%	99.6%	0%	98.8%	-	98.9%
Heavy	1	1	0	2	-	2	2	0	4	-	3	1	0	4	-	10
% Heavy	0.7%	0.7%	0%	0.7%	-	1.0%	2.0%	0%	1.3%	-	3.0%	0.4%	0%	1.2%	-	1.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Shadwell Dr & Hollins Rd (VA23-228) - TMC

Tue Aug 15, 2023

PM Peak (5 PM - 6 PM) - Overall Peak Hour

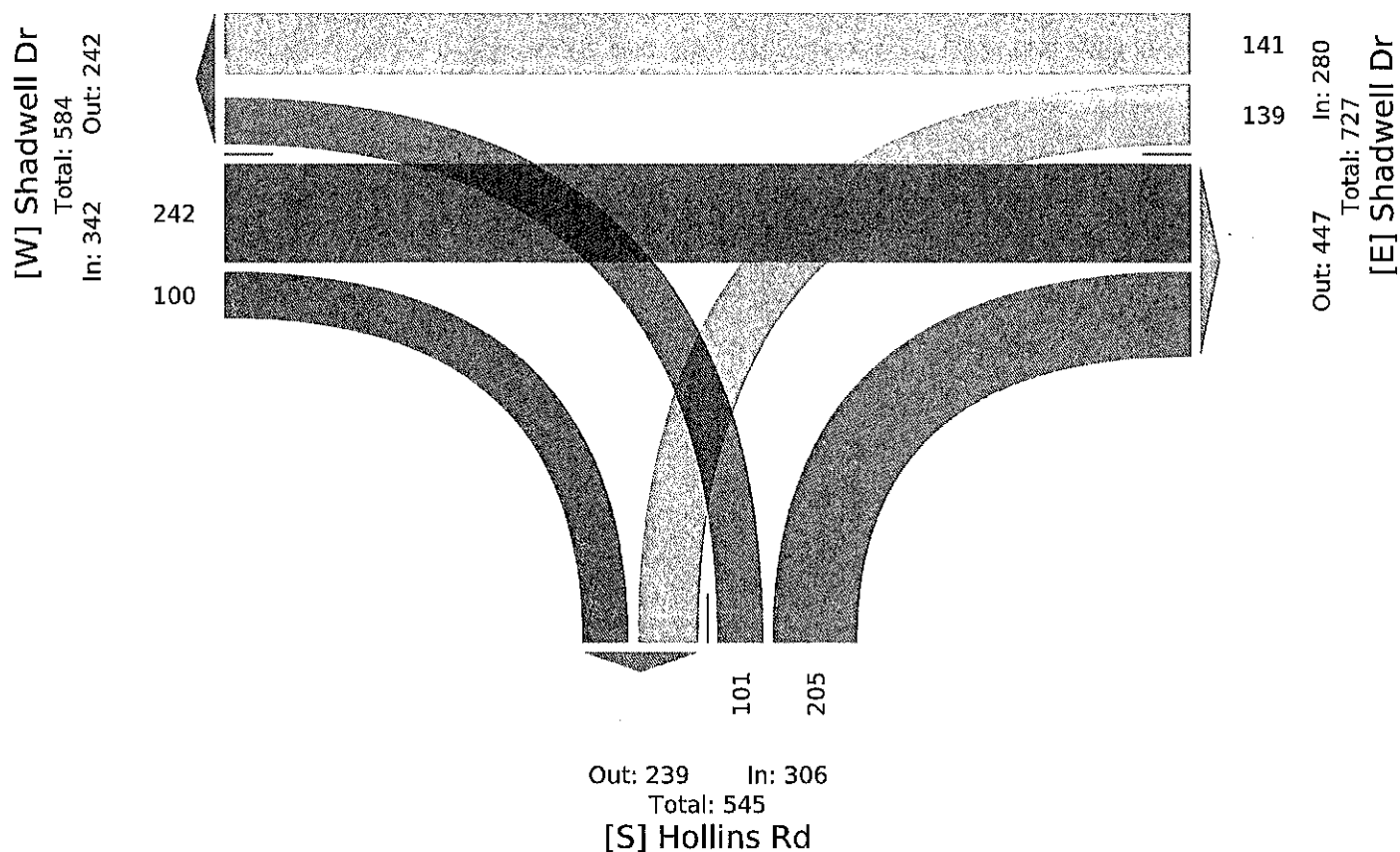
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098547, Location: 37.34949, -79.921974



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



2-Shadwell Dr & Sanderson Dr (VA23-228) - TMC

Tue Aug 15, 2023

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098549, Location: 37.349227, -79.921454



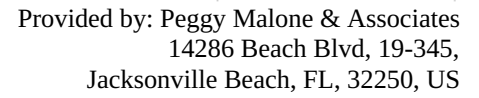
Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Sanderson Dr Southbound					Shadwell Dr Westbound					Shadwell Dr Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
2023-08-15 7:00AM	27	14	0	41	0	11	27	0	38	0	11	26	0	37	0	116
7:15AM	66	26	0	92	0	16	30	0	46	0	17	21	0	38	0	176
7:30AM	53	34	0	87	0	12	40	0	52	0	17	25	0	42	0	181
7:45AM	49	26	0	75	0	7	41	0	48	0	19	29	0	48	0	171
Hourly Total	195	100	0	295	0	46	138	0	184	0	64	101	0	165	0	644
8:00AM	44	16	0	60	0	16	28	0	44	0	18	25	0	43	0	147
8:15AM	54	15	0	69	0	15	16	0	31	0	20	29	0	49	0	149
8:30AM	39	13	0	52	0	10	18	0	28	0	20	15	0	35	0	115
8:45AM	43	10	0	53	0	11	19	0	30	0	10	28	0	38	0	121
Hourly Total	180	54	0	234	0	52	81	0	133	0	68	97	0	165	0	532
9:00AM	38	12	0	50	0	9	15	0	24	0	14	23	0	37	0	111
9:15AM	31	20	0	51	0	12	12	0	24	0	15	30	0	45	0	120
9:30AM	39	7	0	46	0	7	18	0	25	0	10	33	0	43	0	114
9:45AM	28	10	0	38	0	8	16	0	24	0	11	28	0	39	0	101
Hourly Total	136	49	0	185	0	36	61	0	97	0	50	114	0	164	0	446
10:00AM	28	8	0	36	0	8	16	0	24	0	10	28	0	38	0	98
10:15AM	32	8	0	40	0	13	16	0	29	0	16	20	0	36	0	105
10:30AM	37	11	0	48	0	5	15	0	20	0	14	25	0	39	0	107
10:45AM	28	10	0	38	0	8	23	0	31	0	11	31	0	42	0	111
Hourly Total	125	37	0	162	0	34	70	0	104	0	51	104	0	155	0	421
11:00AM	38	12	0	50	0	9	18	0	27	0	15	33	0	48	0	125
11:15AM	29	8	0	37	0	9	15	0	24	0	14	23	0	37	0	98
11:30AM	26	12	0	38	0	7	18	0	25	0	11	34	0	45	0	108
11:45AM	26	11	0	37	0	8	13	0	21	0	17	39	0	56	0	114
Hourly Total	119	43	0	162	0	33	64	0	97	0	57	129	0	186	0	445
12:00PM	29	6	0	35	0	10	17	0	27	0	23	34	0	57	0	119
12:15PM	37	12	0	49	0	11	19	0	30	0	11	38	0	49	0	128
12:30PM	31	14	0	45	0	7	12	0	19	0	13	26	1	40	0	104
12:45PM	35	13	0	48	0	10	11	0	21	0	25	41	1	67	0	136
Hourly Total	132	45	0	177	0	38	59	0	97	0	72	139	2	213	0	487
1:00PM	25	11	0	36	0	16	12	0	28	0	22	45	0	67	0	131
1:15PM	30	9	0	39	0	9	18	0	27	0	13	41	0	54	0	120
1:30PM	30	11	0	41	0	12	23	0	35	0	23	46	0	69	0	145
1:45PM	44	7	0	51	0	17	16	0	33	0	15	44	0	59	0	143
Hourly Total	129	38	0	167	0	54	69	0	123	0	73	176	0	249	0	539
2:00PM	28	12	0	40	0	12	39	0	51	0	20	44	0	64	0	155
2:15PM	38	10	0	48	0	12	23	0	35	0	17	53	0	70	0	153
2:30PM	39	15	0	54	0	12	19	0	31	0	20	51	0	71	0	156
2:45PM	17	22	0	39	0	16	20	0	36	0	17	46	0	63	0	138
Hourly Total	122	59	0	181	0	52	101	0	153	0	74	194	0	268	0	602
3:00PM	38	15	0	53	0	17	19	0	36	0	17	57	0	74	0	163
3:15PM	41	16	0	57	0	15	21	0	36	0	28	52	0	80	0	173
3:30PM	45	12	0	57	0	18	15	0	33	0	35	72	0	107	0	197
3:45PM	45	12	0	57	0	20	17	0	37	0	30	64	0	94	0	188
Hourly Total	169	55	0	224	0	70	72	0	142	0	110	245	0	355	0	721
4:00PM	40	22	0	62	0	28	27	0	55	0	24	63	0	87	0	204
4:15PM	43	10	0	53	0	20	22	0	42	0	23	64	0	87	0	182
4:30PM	31	10	0	41	0	21	20	0	41	0	32	75	0	107	0	189
4:45PM	44	12	0	56	0	30	22	0	52	0	32	79	0	111	0	219
Hourly Total	158	54	0	212	0	99	91	0	190	0	111	281	0	392	0	794
5:00PM	37	15	0	52	0	38	31	0	69	0	34	85	0	119	0	240
5:15PM	46	14	0	60	0	31	24	0	55	0	28	86	0	114	0	229
5:30PM	37	16	0	53	0	19	30	0	49	0	26	88	0	114	0	216

Leg Direction	Sanderson Dr Southbound					Shadwell Dr Westbound					Shadwell Dr Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
5:45PM	59	24	0	83	0	18	20	0	38	0	33	65	0	98	0	219
Hourly Total	179	69	0	248	0	106	105	0	211	0	121	324	0	445	0	904
6:00PM	35	17	0	52	0	18	12	0	30	0	33	61	0	94	0	176
6:15PM	42	12	0	54	0	20	14	0	34	0	17	55	0	72	0	160
6:30PM	24	17	0	41	0	9	11	0	20	0	20	38	0	58	0	119
6:45PM	34	5	0	39	0	6	17	0	23	1	11	36	0	47	0	109
Hourly Total	135	51	0	186	0	53	54	0	107	1	81	190	0	271	0	564
Total	1779	654	0	2433	0	673	965	0	1638	1	932	2094	2	3028	0	7099
% Approach	73.1%	26.9%	0%	-	-	41.1%	58.9%	0%	-	-	30.8%	69.2%	0.1%	-	-	-
% Total	25.1%	9.2%	0%	34.3%	-	9.5%	13.6%	0%	23.1%	-	13.1%	29.5%	0%	42.7%	-	-
Lights and Motorcycles	1759	636	0	2395	-	654	894	0	1548	-	861	2072	2	2935	-	6878
% Lights and Motorcycles	98.9%	97.2%	0%	98.4%	-	97.2%	92.6%	0%	94.5%	-	92.4%	98.9%	100%	96.9%	-	96.9%
Heavy	20	18	0	38	-	19	71	0	90	-	71	22	0	93	-	221
% Heavy	1.1%	2.8%	0%	1.6%	-	2.8%	7.4%	0%	5.5%	-	7.6%	1.1%	0%	3.1%	-	3.1%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

ID: 1098549, Location: 37.349227, -79.921454



2-Shadwell Dr & Sanderson Dr (VA23-228) - TMC

Tue Aug 15, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098549, Location: 37.349227, -79.921454



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Sanderson Dr Southbound					Shadwell Dr Westbound					Shadwell Dr Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
2023-08-15 7:15AM	66	26	0	92	0	16	30	0	46	0	17	21	0	38	0	176
7:30AM	53	34	0	87	0	12	40	0	52	0	17	25	0	42	0	181
7:45AM	49	26	0	75	0	7	41	0	48	0	19	29	0	48	0	171
8:00AM	44	16	0	60	0	16	28	0	44	0	18	25	0	43	0	147
Total	212	102	0	314	0	51	139	0	190	0	71	100	0	171	0	675
% Approach	67.5%	32.5%	0%	-	-	26.8%	73.2%	0%	-	-	41.5%	58.5%	0%	-	-	-
% Total	31.4%	15.1%	0%	46.5%	-	7.6%	20.6%	0%	28.1%	-	10.5%	14.8%	0%	25.3%	-	-
PHF	0.803	0.750	-	0.853	-	0.797	0.848	-	0.913	-	0.934	0.862	-	0.891	-	0.932
Lights and Motorcycles	211	99	0	310	-	49	129	0	178	-	63	100	0	163	-	651
% Lights and Motorcycles	99.5%	97.1%	0%	98.7%	-	96.1%	92.8%	0%	93.7%	-	88.7%	100%	0%	95.3%	-	96.4%
Heavy	1	3	0	4	-	2	10	0	12	-	8	0	0	8	-	24
% Heavy	0.5%	2.9%	0%	1.3%	-	3.9%	7.2%	0%	6.3%	-	11.3%	0%	0%	4.7%	-	3.6%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Shadwell Dr & Sanderson Dr (VA23-228) - TMC

Tue Aug 15, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098549, Location: 37.349227, -79.921454



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Sanderson Dr

Total: 465

In: 314

Out: 151

212

102

[W] Shadwell Dr

Total: 522

In: 171

Out: 351

100
71

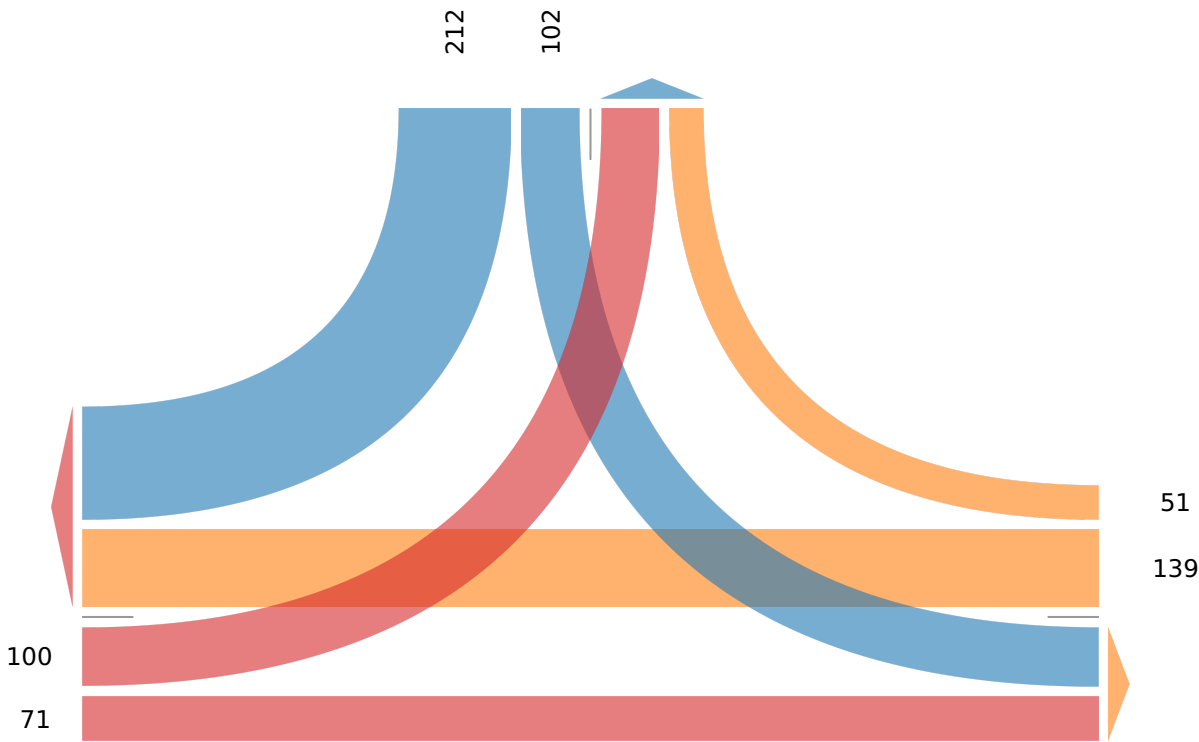
51
139

Out: 173

In: 190

Total: 363

[E] Shadwell Dr



2-Shadwell Dr & Sanderson Dr (VA23-228) - TMC

Tue Aug 15, 2023

Midday Peak (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098549, Location: 37.349227, -79.921454



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Sanderson Dr Southbound					Shadwell Dr Westbound					Shadwell Dr Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
2023-08-15 1:00PM	25	11	0	36	0	16	12	0	28	0	22	45	0	67	0	131
1:15PM	30	9	0	39	0	9	18	0	27	0	13	41	0	54	0	120
1:30PM	30	11	0	41	0	12	23	0	35	0	23	46	0	69	0	145
1:45PM	44	7	0	51	0	17	16	0	33	0	15	44	0	59	0	143
Total	129	38	0	167	0	54	69	0	123	0	73	176	0	249	0	539
% Approach	77.2%	22.8%	0%	-	-	43.9%	56.1%	0%	-	-	29.3%	70.7%	0%	-	-	-
% Total	23.9%	7.1%	0%	31.0%	-	10.0%	12.8%	0%	22.8%	-	13.5%	32.7%	0%	46.2%	-	-
PHF	0.733	0.864	-	0.819	-	0.794	0.750	-	0.879	-	0.793	0.957	-	0.902	-	0.929
Lights and Motorcycles	125	37	0	162	-	52	63	0	115	-	68	172	0	240	-	517
% Lights and Motorcycles	96.9%	97.4%	0%	97.0%	-	96.3%	91.3%	0%	93.5%	-	93.2%	97.7%	0%	96.4%	-	95.9%
Heavy	4	1	0	5	-	2	6	0	8	-	5	4	0	9	-	22
% Heavy	3.1%	2.6%	0%	3.0%	-	3.7%	8.7%	0%	6.5%	-	6.8%	2.3%	0%	3.6%	-	4.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Shadwell Dr & Sanderson Dr (VA23-228) - TMC

Tue Aug 15, 2023

Midday Peak (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098549, Location: 37.349227, -79.921454



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Sanderson Dr

Total: 397

In: 167

Out: 230

129

38

[W] Shadwell Dr

Total: 447

Out: 198

In: 249

176

73

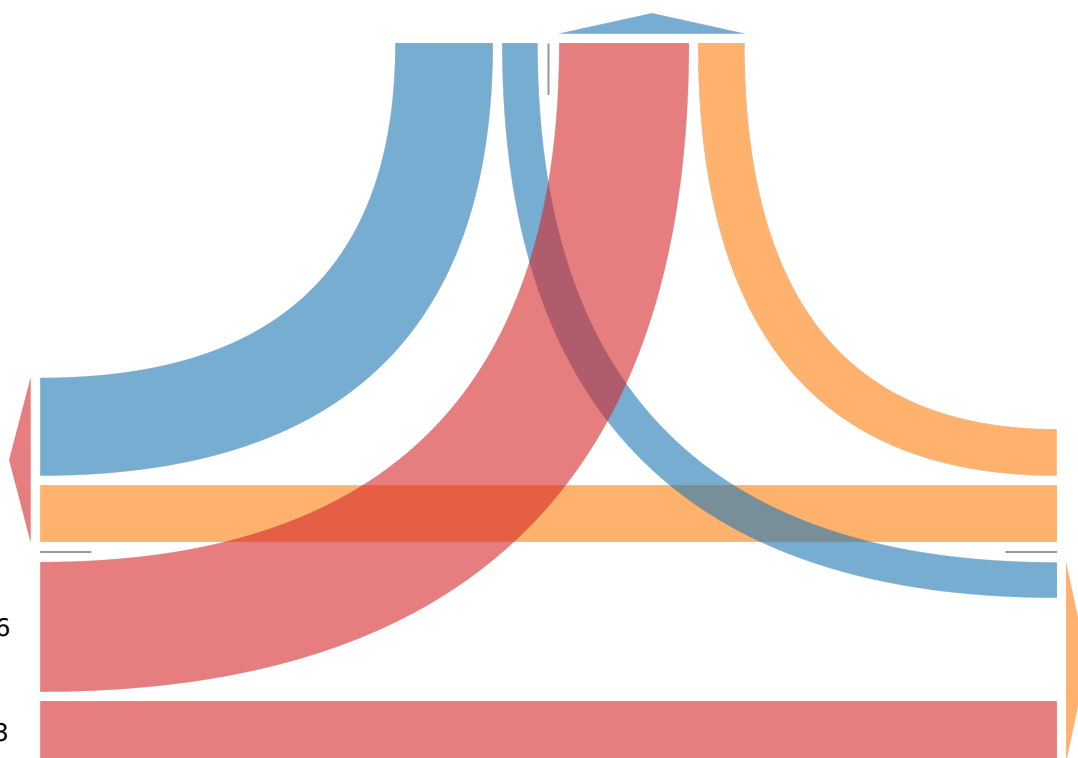
54

69

Out: 111 In: 123

Total: 234

[E] Shadwell Dr



2-Shadwell Dr & Sanderson Dr (VA23-228) - TMC

Tue Aug 15, 2023

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098549, Location: 37.349227, -79.921454



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Sanderson Dr Southbound					Shadwell Dr Westbound					Shadwell Dr Eastbound					
Time	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	Int
2023-08-15 4:45PM	44	12	0	56	0	30	22	0	52	0	32	79	0	111	0	219
5:00PM	37	15	0	52	0	38	31	0	69	0	34	85	0	119	0	240
5:15PM	46	14	0	60	0	31	24	0	55	0	28	86	0	114	0	229
5:30PM	37	16	0	53	0	19	30	0	49	0	26	88	0	114	0	216
Total	164	57	0	221	0	118	107	0	225	0	120	338	0	458	0	904
% Approach	74.2%	25.8%	0%	-	-	52.4%	47.6%	0%	-	-	26.2%	73.8%	0%	-	-	-
% Total	18.1%	6.3%	0%	24.4%	-	13.1%	11.8%	0%	24.9%	-	13.3%	37.4%	0%	50.7%	-	-
PHF	0.891	0.891	-	0.921	-	0.776	0.863	-	0.815	-	0.882	0.960	-	0.962	-	0.942
Lights and Motorcycles	161	56	0	217	-	117	107	0	224	-	117	335	0	452	-	893
% Lights and Motorcycles	98.2%	98.2%	0%	98.2%	-	99.2%	100%	0%	99.6%	-	97.5%	99.1%	0%	98.7%	-	98.8%
Heavy	3	1	0	4	-	1	0	0	1	-	3	3	0	6	-	11
% Heavy	1.8%	1.8%	0%	1.8%	-	0.8%	0%	0%	0.4%	-	2.5%	0.9%	0%	1.3%	-	1.2%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Shadwell Dr & Sanderson Dr (VA23-228) - TMC

Tue Aug 15, 2023

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1098549, Location: 37.349227, -79.921454



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Sanderson Dr

Total: 677

In: 221

Out: 456

164

57

[W] Shadwell Dr

Total: 729

Out: 271

In: 458

338

120

118

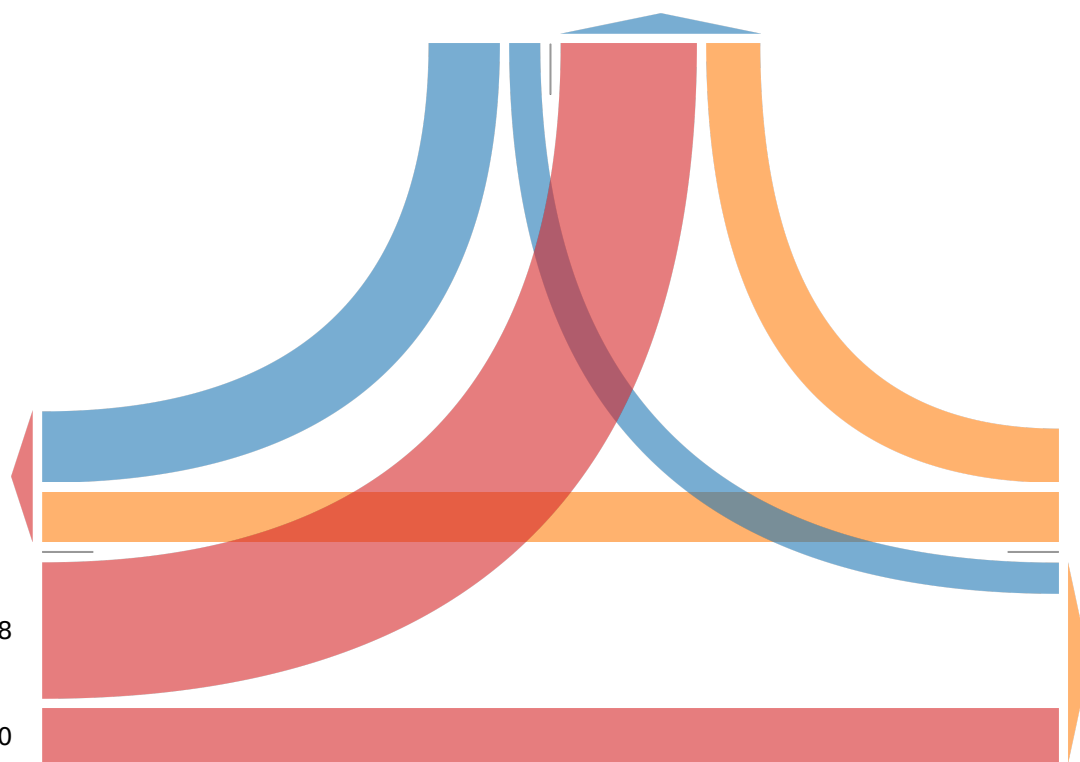
107

Out: 177

In: 225

Total: 402

[E] Shadwell Dr



APPENDIX D

Intersection Capacity Analysis

Existing 2023 A.M.

HCM 6th TWSC
1: Hollins Road & Shadwell Drive

Existing Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	92	155	203	83	86
Future Vol, veh/h	85	92	155	203	83	86
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	88	88	88	88	88	88
Heavy Vehicles, %	7	10	2	4	12	0
Mvmt Flow	97	105	176	231	94	98
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	202	0	733	150
Stage 1	-	-	-	-	150	-
Stage 2	-	-	-	-	583	-
Critical Hdwy	-	-	4.12	-	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	-	-	2.218	-	3.608	3.3
Pot Cap-1 Maneuver	-	-	1370	-	374	902
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	539	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1370	-	319	902
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	460	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.5		17.6	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	475	-	-	1370	-	
HCM Lane V/C Ratio	0.404	-	-	0.129	-	
HCM Control Delay (s)	17.6	-	-	8	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	1.9	-	-	0.4	-	

HCM 6th TWSC
2: Shadwell Drive & Sanderson Drive

Existing Conditions
AM Peak Hour

Intersection

Int Delay, s/veh 8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	71	146	51	102	212
Future Vol, veh/h	100	71	146	51	102	212
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	93	93	93	93	93	93
Heavy Vehicles, %	0	11	7	4	3	1
Mvmt Flow	108	76	157	55	110	228

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	212	0	0 477 185
Stage 1	-	-	- 185 -
Stage 2	-	-	- 292 -
Critical Hdwy	4.1	-	- 6.43 6.21
Critical Hdwy Stg 1	-	-	- 5.43 -
Critical Hdwy Stg 2	-	-	- 5.43 -
Follow-up Hdwy	2.2	-	- 3.527 3.309
Pot Cap-1 Maneuver	1370	-	- 545 860
Stage 1	-	-	- 844 -
Stage 2	-	-	- 756 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1370	-	- 500 860
Mov Cap-2 Maneuver	-	-	- 500 -
Stage 1	-	-	- 775 -
Stage 2	-	-	- 756 -

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1370	-	-	-	697
HCM Lane V/C Ratio	0.078	-	-	-	0.484
HCM Control Delay (s)	7.9	0	-	-	14.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	2.7

Existing 2023 P.M.

HCM 6th TWSC
1: Hollins Road & Shadwell Drive

Existing Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	8.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	242	100	139	145	101	205
Future Vol, veh/h	242	100	139	145	101	205
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	95	95	95	95	95	95
Heavy Vehicles, %	1	3	1	1	2	1
Mvmt Flow	255	105	146	153	106	216
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	360	0	753	308
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	-	-	4.11	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.309
Pot Cap-1 Maneuver	-	-	1204	-	377	734
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1204	-	327	734
Mov Cap-2 Maneuver	-	-	-	-	327	-
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	561	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.1		22.5	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	520	-	-	1204	-	
HCM Lane V/C Ratio	0.619	-	-	0.122	-	
HCM Control Delay (s)	22.5	-	-	8.4	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	4.2	-	-	0.4	-	

HCM 6th TWSC
2: Shadwell Drive & Sanderson Drive

Existing Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	9.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	324	123	105	106	69	179
Future Vol, veh/h	324	123	105	106	69	179
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	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	1	1	1
Mvmt Flow	345	131	112	113	73	190
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	225	0	-	0	990	169
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	821	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1350	-	-	-	274	878
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	434	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1350	-	-	-	198	878
Mov Cap-2 Maneuver	-	-	-	-	198	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	434	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.2	0		23.8		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1350	-	-	-	449	
HCM Lane V/C Ratio	0.255	-	-	-	0.588	
HCM Control Delay (s)	8.6	0	-	-	23.8	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	1	-	-	-	3.7	

2028 No-Build A.M.

Intersection						
Int Delay, s/veh	6.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	99	173	225	89	95
Future Vol, veh/h	94	99	173	225	89	95
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, %	7	10	2	4	12	0
Mvmt Flow	102	108	188	245	97	103
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	210	0	777	156
Stage 1	-	-	-	-	156	-
Stage 2	-	-	-	-	621	-
Critical Hdwy	-	-	4.12	-	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	-	-	2.218	-	3.608	3.3
Pot Cap-1 Maneuver	-	-	1361	-	352	895
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	517	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1361	-	296	895
Mov Cap-2 Maneuver	-	-	-	-	296	-
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	434	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.5		19.1	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	452	-	-	1361	-	
HCM Lane V/C Ratio	0.442	-	-	0.138	-	
HCM Control Delay (s)	19.1	-	-	8.1	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	2.2	-	-	0.5	-	

Intersection						
Int Delay, s/veh	8.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	108	81	175	61	109	223
Future Vol, veh/h	108	81	175	61	109	223
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	93	93	93	93	93	93
Heavy Vehicles, %	0	11	7	4	3	1
Mvmt Flow	116	87	188	66	117	240
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	254	0	-	0	540	221
Stage 1	-	-	-	-	221	-
Stage 2	-	-	-	-	319	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1323	-	-	-	501	821
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	735	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1323	-	-	-	455	821
Mov Cap-2 Maneuver	-	-	-	-	455	-
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	735	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.6	0		17.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1323	-	-	-	649	
HCM Lane V/C Ratio	0.088	-	-	-	0.55	
HCM Control Delay (s)	8	0	-	-	17.1	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.3	-	-	-	3.4	

2028 No-Build P.M.

Intersection						
Int Delay, s/veh	11.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	268	108	154	160	109	228
Future Vol, veh/h	268	108	154	160	109	228
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	95	95	95	95	95	95
Heavy Vehicles, %	1	3	1	1	2	1
Mvmt Flow	282	114	162	168	115	240
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	396	0	831	339
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	492	-
Critical Hdwy	-	-	4.11	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.309
Pot Cap-1 Maneuver	-	-	1168	-	340	706
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	615	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1168	-	288	706
Mov Cap-2 Maneuver	-	-	-	-	288	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	521	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.2		30.9	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	480	-	-	1168	-	
HCM Lane V/C Ratio	0.739	-	-	0.139	-	
HCM Control Delay (s)	30.9	-	-	8.6	0	
HCM Lane LOS	D	-	-	A	A	
HCM 95th %tile Q(veh)	6.1	-	-	0.5	-	

Intersection						
Int Delay, s/veh	13.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	349	147	126	118	80	188
Future Vol, veh/h	349	147	126	118	80	188
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	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	1	1	1
Mvmt Flow	371	156	134	126	85	200
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	260	0	-	0	1095	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	898	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1310	-	-	-	238	847
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	399	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1310	-	-	-	164	847
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	399	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.2	0		38.5		
HCM LOS				E		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1310	-	-	-	378	
HCM Lane V/C Ratio	0.283	-	-	-	0.754	
HCM Control Delay (s)	8.8	0	-	-	38.5	
HCM Lane LOS	A	A	-	-	E	
HCM 95th %tile Q(veh)	1.2	-	-	-	6.1	

2030 No-Build A.M.

Intersection						
Int Delay, s/veh	6.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	97	102	178	231	92	97
Future Vol, veh/h	97	102	178	231	92	97
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, %	7	10	2	4	12	0
Mvmt Flow	105	111	193	251	100	105

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	216
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1354
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1354
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	20.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	438	-	-	1354	-
HCM Lane V/C Ratio	0.469	-	-	0.143	-
HCM Control Delay (s)	20.3	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.4	-	-	0.5	-

Intersection						
Int Delay, s/veh	8.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	111	83	182	63	111	227
Future Vol, veh/h	111	83	182	63	111	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	11	7	4	3	1
Mvmt Flow	119	89	196	68	119	244
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	264	0	-	0	557	230
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	327	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1312	-	-	-	490	812
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1312	-	-	-	443	812
Mov Cap-2 Maneuver	-	-	-	-	443	-
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	728	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.6	0		17.8		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1312	-	-	-	638	
HCM Lane V/C Ratio	0.091	-	-	-	0.57	
HCM Control Delay (s)	8	0	-	-	17.8	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.3	-	-	-	3.6	

2030 No-Build P.M.

Intersection						
Int Delay, s/veh	12.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	276	111	158	165	112	235
Future Vol, veh/h	276	111	158	165	112	235
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	95	95	95	95	95	95
Heavy Vehicles, %	1	3	1	1	2	1
Mvmt Flow	291	117	166	174	118	247
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	408	0	856	350
Stage 1	-	-	-	-	350	-
Stage 2	-	-	-	-	506	-
Critical Hdwy	-	-	4.11	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.309
Pot Cap-1 Maneuver	-	-	1156	-	328	696
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1156	-	276	696
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	510	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.2		35.2	
HCM LOS					E	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	467	-	-	1156	-	
HCM Lane V/C Ratio	0.782	-	-	0.144	-	
HCM Control Delay (s)	35.2	-	-	8.6	0	
HCM Lane LOS	E	-	-	A	A	
HCM 95th %tile Q(veh)	7	-	-	0.5	-	

Intersection						
Int Delay, s/veh	15.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	360	151	131	122	81	192
Future Vol, veh/h	360	151	131	122	81	192
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	1	1	1
Mvmt Flow	383	161	139	130	86	204
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	269	0	-	0	1131	204
Stage 1	-	-	-	-	204	-
Stage 2	-	-	-	-	927	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1300	-	-	-	226	839
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	387	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1300	-	-	-	153	839
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	387	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.3	0		45.8		
HCM LOS	E					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1300	-	-	-	360	
HCM Lane V/C Ratio	0.295	-	-	-	0.807	
HCM Control Delay (s)	8.9	0	-	-	45.8	
HCM Lane LOS	A	A	-	-	E	
HCM 95th %tile Q(veh)	1.2	-	-	-	7	

2028 Phase 1 Build A.M.

Intersection						
Int Delay, s/veh	6.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	101	99	193	245	89	102
Future Vol, veh/h	101	99	193	245	89	102
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, %	7	10	2	4	12	0
Mvmt Flow	110	108	210	266	97	111
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	218	0	850	164
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	-	-	4.12	-	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	-	-	2.218	-	3.608	3.3
Pot Cap-1 Maneuver	-	-	1352	-	318	886
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1352	-	260	886
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	394	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.6		21.8	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	418	-	-	1352	-	
HCM Lane V/C Ratio	0.497	-	-	0.155	-	
HCM Control Delay (s)	21.8	-	-	8.2	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	2.7	-	-	0.5	-	

Intersection						
Int Delay, s/veh	10.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	122	81	175	64	119	263
Future Vol, veh/h	122	81	175	64	119	263
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	93	93	93	93	93	93
Heavy Vehicles, %	0	11	7	4	3	1
Mvmt Flow	131	87	188	69	128	283

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	257	0	0	572	223
Stage 1	-	-	-	223	-
Stage 2	-	-	-	349	-
Critical Hdwy	4.1	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	3.527	3.309
Pot Cap-1 Maneuver	1320	-	-	480	819
Stage 1	-	-	-	812	-
Stage 2	-	-	-	712	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1320	-	-	430	819
Mov Cap-2 Maneuver	-	-	-	430	-
Stage 1	-	-	-	728	-
Stage 2	-	-	-	712	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	20.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1320	-	-	-	639
HCM Lane V/C Ratio	0.099	-	-	-	0.643
HCM Control Delay (s)	8	0	-	-	20.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	4.6

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	7	175	11	2	348
Future Vol, veh/h	34	7	175	11	2	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	8	190	12	2	378
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	578	196	0	0	202	0
Stage 1	196	-	-	-	-	-
Stage 2	382	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	478	845	-	-	1370	-
Stage 1	837	-	-	-	-	-
Stage 2	690	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	477	845	-	-	1370	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.7	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	515	1370	-	
HCM Lane V/C Ratio	-	-	0.087	0.002	-	
HCM Control Delay (s)	-	-	12.7	7.6	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2028 Phase 1 Build Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	13	176	6	5	334
Future Vol, veh/h	16	13	176	6	5	334
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	14	191	7	5	363

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	568	195	0	0	198
Stage 1	195	-	-	-	-
Stage 2	373	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	484	846	-	-	1375
Stage 1	838	-	-	-	-
Stage 2	696	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	482	846	-	-	1375
Mov Cap-2 Maneuver	482	-	-	-	-
Stage 1	838	-	-	-	-
Stage 2	693	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	597	1375
HCM Lane V/C Ratio	-	-	0.053	0.004
HCM Control Delay (s)	-	-	11.4	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

2028 Phase 1 Build P.M.

Intersection						
Int Delay, s/veh	14.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	290	108	168	173	109	250
Future Vol, veh/h	290	108	168	173	109	250
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	95	95	95	95	95	95
Heavy Vehicles, %	1	3	1	1	2	1
Mvmt Flow	305	114	177	182	115	263
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	419	0	898	362
Stage 1	-	-	-	-	362	-
Stage 2	-	-	-	-	536	-
Critical Hdwy	-	-	4.11	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.309
Pot Cap-1 Maneuver	-	-	1145	-	310	685
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	587	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1145	-	257	685
Mov Cap-2 Maneuver	-	-	-	-	257	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	486	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.3		41.2	
HCM LOS					E	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	455	-	-	1145	-	
HCM Lane V/C Ratio	0.831	-	-	0.154	-	
HCM Control Delay (s)	41.2	-	-	8.7	0	
HCM Lane LOS	E	-	-	A	A	
HCM 95th %tile Q(veh)	8	-	-	0.5	-	

Intersection						
Int Delay, s/veh	24.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	393	147	126	129	87	215
Future Vol, veh/h	393	147	126	129	87	215
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	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	1	1	1
Mvmt Flow	418	156	134	137	93	229
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	271	0	-	0	1195	203
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	992	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1298	-	-	-	207	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	360	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1298	-	-	-	134	840
Mov Cap-2 Maneuver	-	-	-	-	134	-
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	360	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.6	0		76		
HCM LOS				F		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1298	-	-	-	334	
HCM Lane V/C Ratio	0.322	-	-	-	0.962	
HCM Control Delay (s)	9.1	0	-	-	76	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	1.4	-	-	-	10.2	

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	5	485	37	8	279
Future Vol, veh/h	23	5	485	37	8	279
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	5	527	40	9	303
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	868	547	0	0	567	0
Stage 1	547	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	323	537	-	-	1005	-
Stage 1	580	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	319	537	-	-	1005	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.5	0		0.2		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	344	1005	-	
HCM Lane V/C Ratio	-	-	0.088	0.009	-	
HCM Control Delay (s)	-	-	16.5	8.6	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2028 Phase 1 Build Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	9	472	18	14	276
Future Vol, veh/h	11	9	472	18	14	276
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	10	513	20	15	300
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	853	523	0	0	533	0
Stage 1	523	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	330	554	-	-	1035	-
Stage 1	595	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	324	554	-	-	1035	-
Mov Cap-2 Maneuver	324	-	-	-	-	-
Stage 1	595	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.6	0		0.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	398	1035	-	
HCM Lane V/C Ratio	-	-	0.055	0.015	-	
HCM Control Delay (s)	-	-	14.6	8.5	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

**2028 Phase 1 Build
with Improvements A.M.**

Intersection						
Int Delay, s/veh	6.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	101	99	193	245	89	102
Future Vol, veh/h	101	99	193	245	89	102
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, %	7	10	2	4	12	0
Mvmt Flow	110	108	210	266	97	111
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	218	0	850	164
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	-	-	4.12	-	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	-	-	2.218	-	3.608	3.3
Pot Cap-1 Maneuver	-	-	1352	-	318	886
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1352	-	260	886
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	394	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.6		21.8	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	418	-	-	1352	-	
HCM Lane V/C Ratio	0.497	-	-	0.155	-	
HCM Control Delay (s)	21.8	-	-	8.2	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	2.7	-	-	0.5	-	

Intersection						
Int Delay, s/veh	7.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	122	81	175	64	119	263
Future Vol, veh/h	122	81	175	64	119	263
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	11	7	4	3	1
Mvmt Flow	131	87	188	69	128	283
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	257	0	-	0	572	223
Stage 1	-	-	-	-	223	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1320	-	-	-	480	819
Stage 1	-	-	-	-	812	-
Stage 2	-	-	-	-	712	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1320	-	-	-	430	819
Mov Cap-2 Maneuver	-	-	-	-	430	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	712	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.8	0		13.3		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1320	-	-	-	430	819
HCM Lane V/C Ratio	0.099	-	-	-	0.298	0.345
HCM Control Delay (s)	8	0	-	-	16.9	11.7
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.2	1.5

HCM 6th TWSC
3: Sanderson Drive & Southern Driveway

2028 Phase 1 Build Conditions w/ Improvements
AM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	7	175	11	2	348
Future Vol, veh/h	34	7	175	11	2	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	8	190	12	2	378
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	578	196	0	0	202	0
Stage 1	196	-	-	-	-	-
Stage 2	382	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	478	845	-	-	1370	-
Stage 1	837	-	-	-	-	-
Stage 2	690	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	477	845	-	-	1370	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	515	1370	-	
HCM Lane V/C Ratio	-	-	0.087	0.002	-	
HCM Control Delay (s)	-	-	12.7	7.6	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2028 Phase 1 Build Conditions w/ Improvements
AM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	13	176	6	5	334
Future Vol, veh/h	16	13	176	6	5	334
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	14	191	7	5	363
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	568	195	0	0	198	0
Stage 1	195	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	484	846	-	-	1375	-
Stage 1	838	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	482	846	-	-	1375	-
Mov Cap-2 Maneuver	482	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.4	0		0.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		597	1375	
HCM Lane V/C Ratio	-	-		0.053	0.004	
HCM Control Delay (s)	-	-		11.4	7.6	
HCM Lane LOS	-	-		B	A	
HCM 95th %tile Q(veh)	-	-		0.2	0	

**2028 Phase 1 Build
with Improvements P.M.**

Intersection						
Int Delay, s/veh	14.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	290	108	168	173	109	250
Future Vol, veh/h	290	108	168	173	109	250
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	95	95	95	95	95	95
Heavy Vehicles, %	1	3	1	1	2	1
Mvmt Flow	305	114	177	182	115	263
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	419	0	898	362
Stage 1	-	-	-	-	362	-
Stage 2	-	-	-	-	536	-
Critical Hdwy	-	-	4.11	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.309
Pot Cap-1 Maneuver	-	-	1145	-	310	685
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	587	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1145	-	257	685
Mov Cap-2 Maneuver	-	-	-	-	257	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	486	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.3		41.2	
HCM LOS					E	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	455	-	-	1145	-	
HCM Lane V/C Ratio	0.831	-	-	0.154	-	
HCM Control Delay (s)	41.2	-	-	8.7	0	
HCM Lane LOS	E	-	-	A	A	
HCM 95th %tile Q(veh)	8	-	-	0.5	-	

Intersection						
Int Delay, s/veh	11.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	393	147	126	129	87	215
Future Vol, veh/h	393	147	126	129	87	215
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	1	1	1
Mvmt Flow	418	156	134	137	93	229
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	271	0	-	0	1195	203
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	992	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1298	-	-	-	207	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	360	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1298	-	-	-	134	840
Mov Cap-2 Maneuver	-	-	-	-	134	-
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	360	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.6	0		30		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1298	-	-	-	134	840
HCM Lane V/C Ratio	0.322	-	-	-	0.691	0.272
HCM Control Delay (s)	9.1	0	-	-	77.1	10.9
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	1.4	-	-	-	3.8	1.1

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	5	485	37	8	279
Future Vol, veh/h	23	5	485	37	8	279
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	5	527	40	9	303
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	868	547	0	0	567	0
Stage 1	547	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	323	537	-	-	1005	-
Stage 1	580	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	319	537	-	-	1005	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.5	0		0.2		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	344	1005	-	
HCM Lane V/C Ratio	-	-	0.088	0.009	-	
HCM Control Delay (s)	-	-	16.5	8.6	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2028 Phase 1 Build Conditions w/ Improvements
PM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	9	472	18	14	276
Future Vol, veh/h	11	9	472	18	14	276
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	10	513	20	15	300
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	853	523	0	0	533	0
Stage 1	523	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	330	554	-	-	1035	-
Stage 1	595	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	324	554	-	-	1035	-
Mov Cap-2 Maneuver	324	-	-	-	-	-
Stage 1	595	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	14.6	0	0.4			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	398	1035	-	
HCM Lane V/C Ratio	-	-	0.055	0.015	-	
HCM Control Delay (s)	-	-	14.6	8.5	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

2030 Full-Build A.M.

Intersection						
Int Delay, s/veh	7.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	107	102	206	259	92	107
Future Vol, veh/h	107	102	206	259	92	107
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, %	7	10	2	4	12	0
Mvmt Flow	116	111	224	282	100	116
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	227	0	902	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	730	-
Critical Hdwy	-	-	4.12	-	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	-	-	2.218	-	3.608	3.3
Pot Cap-1 Maneuver	-	-	1341	-	296	877
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	459	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1341	-	237	877
Mov Cap-2 Maneuver	-	-	-	-	237	-
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	368	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.6		25.1	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	390	-	-	1341	-	
HCM Lane V/C Ratio	0.555	-	-	0.167	-	
HCM Control Delay (s)	25.1	-	-	8.2	0	
HCM Lane LOS	D	-	-	A	A	
HCM 95th %tile Q(veh)	3.2	-	-	0.6	-	

Intersection

Int Delay, s/veh 12.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	131	83	182	68	125	283
Future Vol, veh/h	131	83	182	68	125	283
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	11	7	4	3	1
Mvmt Flow	141	89	196	73	134	304

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	269	0	0 604 233
Stage 1	-	-	- 233 -
Stage 2	-	-	- 371 -
Critical Hdwy	4.1	-	- 6.43 6.21
Critical Hdwy Stg 1	-	-	- 5.43 -
Critical Hdwy Stg 2	-	-	- 5.43 -
Follow-up Hdwy	2.2	-	- 3.527 3.309
Pot Cap-1 Maneuver	1306	-	- 460 809
Stage 1	-	-	- 803 -
Stage 2	-	-	- 696 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1306	-	- 408 809
Mov Cap-2 Maneuver	-	-	- 408 -
Stage 1	-	-	- 711 -
Stage 2	-	-	- 696 -

Approach	EB	WB	SB
HCM Control Delay, s	5	0	23.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1306	-	-	-	622
HCM Lane V/C Ratio	0.108	-	-	-	0.705
HCM Control Delay (s)	8.1	0	-	-	23.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	5.7

HCM 6th TWSC
3: Sanderson Drive & Southern Driveway

2030 Build Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	47	10	182	17	3	361
Future Vol, veh/h	47	10	182	17	3	361
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	11	198	18	3	392
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	605	207	0	0	216	0
Stage 1	207	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	461	833	-	-	1354	-
Stage 1	828	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	460	833	-	-	1354	-
Mov Cap-2 Maneuver	460	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.2	0		0.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		499	1354	-
HCM Lane V/C Ratio	-	-		0.124	0.002	-
HCM Control Delay (s)	-	-		13.2	7.7	0
HCM Lane LOS	-	-		B	A	A
HCM 95th %tile Q(veh)	-	-		0.4	0	-

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2030 Build Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	19	184	8	6	341
Future Vol, veh/h	23	19	184	8	6	341
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	21	200	9	7	371
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	590	205	0	0	209	0
Stage 1	205	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	470	836	-	-	1362	-
Stage 1	829	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	467	836	-	-	1362	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.7	0	0.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	584	1362	-	
HCM Lane V/C Ratio	-	-	0.078	0.005	-	
HCM Control Delay (s)	-	-	11.7	7.7	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

2030 Full-Build P.M.

Intersection						
Int Delay, s/veh	19.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	305	111	177	184	112	265
Future Vol, veh/h	305	111	177	184	112	265
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	95	95	95	95	95	95
Heavy Vehicles, %	1	3	1	1	2	1
Mvmt Flow	321	117	186	194	118	279
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	438	0	946	380
Stage 1	-	-	-	-	380	-
Stage 2	-	-	-	-	566	-
Critical Hdwy	-	-	4.11	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.309
Pot Cap-1 Maneuver	-	-	1127	-	290	669
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1127	-	236	669
Mov Cap-2 Maneuver	-	-	-	-	236	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	463	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.3		56	
HCM LOS					F	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	433	-	-	1127	-	
HCM Lane V/C Ratio	0.916	-	-	0.165	-	
HCM Control Delay (s)	56	-	-	8.8	0	
HCM Lane LOS	F	-	-	A	A	
HCM 95th %tile Q(veh)	10.1	-	-	0.6	-	

Intersection						
Int Delay, s/veh	38.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	419	151	131	137	90	230
Future Vol, veh/h	419	151	131	137	90	230
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	1	1	1
Mvmt Flow	446	161	139	146	96	245

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	285	0	0 1265 212
Stage 1	-	-	- - 212 -
Stage 2	-	-	- - 1053 -
Critical Hdwy	4.11	-	- - 6.41 6.21
Critical Hdwy Stg 1	-	-	- - 5.41 -
Critical Hdwy Stg 2	-	-	- - 5.41 -
Follow-up Hdwy	2.209	-	- - 3.509 3.309
Pot Cap-1 Maneuver	1283	-	- - 188 831
Stage 1	-	-	- - 826 -
Stage 2	-	-	- - 337 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1283	-	- - 116 831
Mov Cap-2 Maneuver	-	-	- - 116 -
Stage 1	-	-	- - 510 -
Stage 2	-	-	- - 337 -

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	125.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1283	-	-	-	304
HCM Lane V/C Ratio	0.347	-	-	-	1.12
HCM Control Delay (s)	9.3	0	-	-	125.6
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	1.6	-	-	-	13.8

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	7	506	50	10	288
Future Vol, veh/h	32	7	506	50	10	288
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	8	550	54	11	313

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	912	577	0
Stage 1	577	-	-
Stage 2	335	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	304	516	-
Stage 1	562	-	-
Stage 2	725	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	300	516	-
Mov Cap-2 Maneuver	300	-	-
Stage 1	562	-	-
Stage 2	715	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.8	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	324	974
HCM Lane V/C Ratio	-	-	0.131	0.011
HCM Control Delay (s)	-	-	17.8	8.7
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2030 Build Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	12	489	24	20	283
Future Vol, veh/h	15	12	489	24	20	283
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	13	532	26	22	308
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	897	545	0	0	558	0
Stage 1	545	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	310	538	-	-	1013	-
Stage 1	581	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	302	538	-	-	1013	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.4	0		0.6		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	375	1013	-	
HCM Lane V/C Ratio	-	-	0.078	0.021	-	
HCM Control Delay (s)	-	-	15.4	8.6	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

**2030 Full-Build
with Improvements A.M.**

Intersection						
Int Delay, s/veh	7.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	107	102	206	259	92	107
Future Vol, veh/h	107	102	206	259	92	107
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, %	7	10	2	4	12	0
Mvmt Flow	116	111	224	282	100	116
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	227	0	902	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	730	-
Critical Hdwy	-	-	4.12	-	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	-	-	2.218	-	3.608	3.3
Pot Cap-1 Maneuver	-	-	1341	-	296	877
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	459	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1341	-	237	877
Mov Cap-2 Maneuver	-	-	-	-	237	-
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	368	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.6		25.1	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	390	-	-	1341	-	
HCM Lane V/C Ratio	0.555	-	-	0.167	-	
HCM Control Delay (s)	25.1	-	-	8.2	0	
HCM Lane LOS	D	-	-	A	A	
HCM 95th %tile Q(veh)	3.2	-	-	0.6	-	

Intersection						
Int Delay, s/veh	7.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	131	83	182	68	125	283
Future Vol, veh/h	131	83	182	68	125	283
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	11	7	4	3	1
Mvmt Flow	141	89	196	73	134	304
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	269	0	-	0	604	233
Stage 1	-	-	-	-	233	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1306	-	-	-	460	809
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1306	-	-	-	408	809
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	711	-
Stage 2	-	-	-	-	696	-
Approach	EB	WB		SB		
HCM Control Delay, s	5	0		13.9		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1306	-	-	-	408	809
HCM Lane V/C Ratio	0.108	-	-	-	0.329	0.376
HCM Control Delay (s)	8.1	0	-	-	18.1	12.1
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1.4	1.8

HCM 6th TWSC
3: Sanderson Drive & Southern Driveway

2030 Build Conditions w/ Improvements
AM Peak Hour

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	47	10	182	17	3	361
Future Vol, veh/h	47	10	182	17	3	361
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	11	198	18	3	392
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	605	207	0	0	216	0
Stage 1	207	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	461	833	-	-	1354	-
Stage 1	828	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	460	833	-	-	1354	-
Mov Cap-2 Maneuver	460	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.2	0		0.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		499	1354	
HCM Lane V/C Ratio	-	-		0.124	0.002	
HCM Control Delay (s)	-	-		13.2	7.7	
HCM Lane LOS	-	-		B	A	
HCM 95th %tile Q(veh)	-	-		0.4	0	

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2030 Build Conditions w/ Improvements
AM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	19	184	8	6	341
Future Vol, veh/h	23	19	184	8	6	341
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	21	200	9	7	371
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	590	205	0	0	209	0
Stage 1	205	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	470	836	-	-	1362	-
Stage 1	829	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	467	836	-	-	1362	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.7	0		0.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	584	1362	-	
HCM Lane V/C Ratio	-	-	0.078	0.005	-	
HCM Control Delay (s)	-	-	11.7	7.7	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

**2030 Full-Build
with Improvements P.M.**

Intersection						
Int Delay, s/veh	19.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	305	111	177	184	112	265
Future Vol, veh/h	305	111	177	184	112	265
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	95	95	95	95	95	95
Heavy Vehicles, %	1	3	1	1	2	1
Mvmt Flow	321	117	186	194	118	279
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	438	0	946	380
Stage 1	-	-	-	-	380	-
Stage 2	-	-	-	-	566	-
Critical Hdwy	-	-	4.11	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.309
Pot Cap-1 Maneuver	-	-	1127	-	290	669
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1127	-	236	669
Mov Cap-2 Maneuver	-	-	-	-	236	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	463	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.3		56	
HCM LOS					F	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	433	-	-	1127	-	
HCM Lane V/C Ratio	0.916	-	-	0.165	-	
HCM Control Delay (s)	56	-	-	8.8	0	
HCM Lane LOS	F	-	-	A	A	
HCM 95th %tile Q(veh)	10.1	-	-	0.6	-	

Intersection						
Int Delay, s/veh	14.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	419	151	131	137	90	230
Future Vol, veh/h	419	151	131	137	90	230
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	1	1	1
Mvmt Flow	446	161	139	146	96	245

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	285	0	0 1265 212
Stage 1	-	-	- - 212 -
Stage 2	-	-	- - 1053 -
Critical Hdwy	4.11	-	- - 6.41 6.21
Critical Hdwy Stg 1	-	-	- - 5.41 -
Critical Hdwy Stg 2	-	-	- - 5.41 -
Follow-up Hdwy	2.209	-	- - 3.509 3.309
Pot Cap-1 Maneuver	1283	-	- - 188 831
Stage 1	-	-	- - 826 -
Stage 2	-	-	- - 337 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1283	-	- - 116 831
Mov Cap-2 Maneuver	-	-	- - 116 -
Stage 1	-	-	- - 510 -
Stage 2	-	-	- - 337 -

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	39.2
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1283	-	-	-	116	831
HCM Lane V/C Ratio	0.347	-	-	-	0.825	0.294
HCM Control Delay (s)	9.3	0	-	-	111.1	11.1
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	1.6	-	-	-	4.9	1.2

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	7	506	50	10	288
Future Vol, veh/h	32	7	506	50	10	288
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	8	550	54	11	313
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	912	577	0	0	604	0
Stage 1	577	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	304	516	-	-	974	-
Stage 1	562	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	300	516	-	-	974	-
Mov Cap-2 Maneuver	300	-	-	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	17.8	0	0.3			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	324	974	-	
HCM Lane V/C Ratio	-	-	0.131	0.011	-	
HCM Control Delay (s)	-	-	17.8	8.7	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.4	0	-	

HCM 6th TWSC
4: Sanderson Drive & Northern Driveway

2030 Build Conditions w/ Improvements
PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	12	489	24	20	283
Future Vol, veh/h	15	12	489	24	20	283
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	13	532	26	22	308
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	897	545	0	0	558	0
Stage 1	545	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	310	538	-	-	1013	-
Stage 1	581	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	302	538	-	-	1013	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	15.4	0	0.6			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	375	1013	-	
HCM Lane V/C Ratio	-	-	0.078	0.021	-	
HCM Control Delay (s)	-	-	15.4	8.6	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

APPENDIX E

SimTraffic Queueing Analysis

Existing 2023 A.M.

Queuing and Blocking Report

AM Peak Hour

08/06/2024

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	13	92	113
Average Queue (ft)	1	33	45
95th Queue (ft)	7	73	84
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	60	10	173
Average Queue (ft)	21	0	70
95th Queue (ft)	52	5	127
Link Distance (ft)	106	1591	938
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Existing 2023 P.M.

Queuing and Blocking Report

PM Peak Hour

08/06/2024

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	29	98	227
Average Queue (ft)	1	40	92
95th Queue (ft)	13	79	175
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	110	29	173
Average Queue (ft)	51	3	64
95th Queue (ft)	95	16	129
Link Distance (ft)	106	1591	938
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	1		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 2

2028 No-Build A.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	17	93	130
Average Queue (ft)	1	36	53
95th Queue (ft)	10	78	100
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	74	15	150
Average Queue (ft)	25	1	73
95th Queue (ft)	59	7	128
Link Distance (ft)	106	1591	938
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

2028 No-Build P.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	57	114	350
Average Queue (ft)	3	50	129
95th Queue (ft)	26	96	279
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		1	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	117	27	254
Average Queue (ft)	61	3	88
95th Queue (ft)	104	15	194
Link Distance (ft)	106	1591	938
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	3		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 5

2030 No-Build A.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	33	90	125
Average Queue (ft)	1	36	53
95th Queue (ft)	12	75	100
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	73	15	184
Average Queue (ft)	26	1	77
95th Queue (ft)	61	10	138
Link Distance (ft)	106	1591	938
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

2030 No-Build P.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	80	108	381
Average Queue (ft)	6	50	149
95th Queue (ft)	40	97	346
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		2	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	116	28	238
Average Queue (ft)	61	4	86
95th Queue (ft)	105	19	188
Link Distance (ft)	106	1591	938
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	4		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 5

2028 Phase 1 Build A.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	23	98	148
Average Queue (ft)	1	38	57
95th Queue (ft)	11	83	110
Link Distance (ft)	446	107	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		1	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	78	27	224
Average Queue (ft)	27	2	86
95th Queue (ft)	62	15	163
Link Distance (ft)	107	1591	694
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	62	8
Average Queue (ft)	24	0
95th Queue (ft)	50	6
Link Distance (ft)	475	594
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	40	22
Average Queue (ft)	21	1
95th Queue (ft)	46	13
Link Distance (ft)	226	605
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1

2028 Phase 1 Build P.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	64	112	414
Average Queue (ft)	6	57	156
95th Queue (ft)	36	106	344
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		3	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	119	38	360
Average Queue (ft)	71	5	126
95th Queue (ft)	114	23	303
Link Distance (ft)	106	1591	673
Upstream Blk Time (%)	1		0
Queuing Penalty (veh)	6		1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	51	57
Average Queue (ft)	21	6
95th Queue (ft)	48	34
Link Distance (ft)	537	596
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	42	51
Average Queue (ft)	17	8
95th Queue (ft)	44	33
Link Distance (ft)	222	566
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 11

**2028 Phase 1 Build
with Improvements A.M.**

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	27	96	142
Average Queue (ft)	1	39	56
95th Queue (ft)	11	83	107
Link Distance (ft)	446	94	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		1	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	79	51	88	104
Average Queue (ft)	28	3	37	51
95th Queue (ft)	65	21	69	85
Link Distance (ft)	94	1591		691
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			200	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	62	5
Average Queue (ft)	24	0
95th Queue (ft)	50	5
Link Distance (ft)	469	594
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	43	27
Average Queue (ft)	21	1
95th Queue (ft)	46	14
Link Distance (ft)	226	605
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1

**2028 Phase 1 Build
with Improvements P.M.**

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	82	96	408
Average Queue (ft)	10	53	159
95th Queue (ft)	48	93	340
Link Distance (ft)	446	94	665
Upstream Blk Time (%)		1	0
Queuing Penalty (veh)		3	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	103	43	118	96
Average Queue (ft)	69	7	43	42
95th Queue (ft)	107	27	90	73
Link Distance (ft)	94	1591		669
Upstream Blk Time (%)	2			
Queuing Penalty (veh)	11			
Storage Bay Dist (ft)			200	
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	53	45
Average Queue (ft)	21	4
95th Queue (ft)	48	23
Link Distance (ft)	531	596
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	42	52
Average Queue (ft)	17	7
95th Queue (ft)	44	31
Link Distance (ft)	222	566
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 14

2030 Full-Build A.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	24	106	153
Average Queue (ft)	1	43	64
95th Queue (ft)	11	88	120
Link Distance (ft)	446	107	665
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		1	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	77	36	211
Average Queue (ft)	30	1	92
95th Queue (ft)	64	19	175
Link Distance (ft)	107	1591	694
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	58	17
Average Queue (ft)	27	1
95th Queue (ft)	51	8
Link Distance (ft)	474	571
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	51	25
Average Queue (ft)	24	1
95th Queue (ft)	48	13
Link Distance (ft)	236	511
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1

2030 Full-Build P.M.

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	69	120	523
Average Queue (ft)	8	62	252
95th Queue (ft)	39	116	546
Link Distance (ft)	446	106	665
Upstream Blk Time (%)		2	5
Queuing Penalty (veh)		6	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	119	41	527
Average Queue (ft)	71	6	228
95th Queue (ft)	120	24	545
Link Distance (ft)	106	1591	673
Upstream Blk Time (%)	1		2
Queuing Penalty (veh)	9		6
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	68	103
Average Queue (ft)	26	12
95th Queue (ft)	56	80
Link Distance (ft)	536	575
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	42	63
Average Queue (ft)	18	10
95th Queue (ft)	42	39
Link Distance (ft)	216	476
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 20

**2030 Full-Build
with Improvements A.M.**

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	35	97	151
Average Queue (ft)	2	45	65
95th Queue (ft)	16	89	118
Link Distance (ft)	446	94	665
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		2	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	83	55	94	133
Average Queue (ft)	31	3	39	54
95th Queue (ft)	67	26	73	97
Link Distance (ft)	94	1591		691
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			200	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	59	19
Average Queue (ft)	28	1
95th Queue (ft)	51	9
Link Distance (ft)	469	572
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	51	28
Average Queue (ft)	24	2
95th Queue (ft)	48	15
Link Distance (ft)	236	511
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2

**2030 Full-Build
with Improvements P.M.**

Intersection: 1: Hollins Road & Shadwell Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	90	101	505
Average Queue (ft)	13	58	260
95th Queue (ft)	54	100	575
Link Distance (ft)	446	94	665
Upstream Blk Time (%)		2	6
Queuing Penalty (veh)		6	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Shadwell Drive & Sanderson Drive

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	103	52	155	134
Average Queue (ft)	71	9	53	48
95th Queue (ft)	107	32	115	93
Link Distance (ft)	94	1591		669
Upstream Blk Time (%)	2			
Queuing Penalty (veh)	13			
Storage Bay Dist (ft)			200	
Storage Blk Time (%)			0	0
Queuing Penalty (veh)			1	0

Intersection: 3: Sanderson Drive & Southern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	62	56
Average Queue (ft)	25	6
95th Queue (ft)	53	31
Link Distance (ft)	529	575
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sanderson Drive & Northern Driveway

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	44	69
Average Queue (ft)	18	11
95th Queue (ft)	43	43
Link Distance (ft)	216	476
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 19
