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July 2, 2019

Amy Massey, P.E.
Kimley-Horn and Associates, Inc.
200 South Tryon Street, Suite 200
Charlotte, North Carolina 28202

RE: Chester Quarry Site Traffic Impact Analysis
Lancaster Highway (SC Highway 9) at Old Richburg Road (S-12-56)
Chester County

Dear Ms. Massey:

Thank you for allowing us to review the Traffic Impact Analysis (TIA) regarding the Chester Quarry Site development located on Lancaster Highway at its intersection with Old Richburg Road (S-12-56). We concur in principle with the document.

Please include this concurrence letter in the Final TIA and return a digital copy of the document to us, once comments from all reviewing parties have been addressed. We look forward to the project proceeding to the encroachment permit process. At that time, all geometrical features, pavement designs, sight distances, etc., will be reviewed by the appropriate office. If you have any additional questions or concerns, please contact the District 4 Permit Office at 803-377-4155.

Sincerely,

C. Jason Johnston, P.E.
District 4 Engineering Administrator

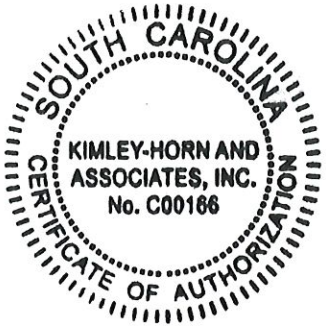
CJJ/mrg
ec: Mike Levister, Chester County Building & Zoning Director
Dennis Moore, Resident Maintenance Engineer, Chester County

File: D4/PO/ACL

District Four Engineering
Post Office Box 130
1232 JA Cochran Bypass
Chester, SC 29706
803-377-4155 | 803-581-0156 Fax

Kimley»Horn

TECHNICAL MEMORANDUM



To: Mr. David Gamble, PE
South Carolina Department of Transportation

AND

Mr. Mike Levister
Chester County Building & Zoning

From: Amy Massey, PE
Kimley-Horn and Associates, Inc.

Date: June 11, 2019

Subject: Traffic Analysis Technical Memorandum
Proposed Quarry Site

Kimley-Horn and Associates, Inc. was retained by Luck Stone Corporation to complete a Traffic Analysis to review the traffic impact of developing a proposed quarry operation along with 50,000 square feet (SF) of warehouse space on a site located along SC 9/Lancaster Hwy at Old Richburg Road (S-56). This Technical Memorandum presents the following:

- Executive Summary
- Introduction
- Traffic Volumes
- Analyses
- Conclusion

EXECUTIVE SUMMARY

Based on the capacity analyses, review of turn-lane warrants, queuing analysis, sight distance review, and ARMS Manual specifications, the following developer mitigation is recommended:

- Construct the proposed Luck Stone Drive site access as a three-lane section as follows:
  - Single northbound ingress lane
  - Two southbound egress lanes consisting of an exclusive left with 125 feet of storage and shared through-right lane aligned with the Old Richburg Road ingress lane
  - Large right-turn entry radius and wide entrance lane
  - Stop control on the southbound approach
- Confirm intersection sight distance standards for the proposed site access are met for both passenger vehicles and trucks, based on surveyed conditions.
- For Old Richburg Road, restripe the existing northbound right-turn lane to a shared through-right lane.

INTRODUCTION

The proposed development consists of a quarry operation and 50,000 SF of warehouse space located along SC 9 in Chester County. One full movement access point (Luck Stone Drive) is planned to be aligned with Old Richburg Road. **Figure 1** shows the site location, and **Figure 2** shows the proposed site plan. Full operation is expected within a 10-year horizon (2029), and maximum operating potential is expected thereafter. This study analyzes both full build and maximum operating potential in horizon year 2029. Based on coordination with Chester County and South Carolina Department of Transportation (SCDOT) staff, the study area for this Traffic Analysis consists of the SC 9 (Lancaster Hwy) intersection with Old Richburg Road/Proposed Luck Stone Drive. The scope and parameters contained here-in were coordinated with and approved by both SCDOT and Chester County staff.

SC 9 and Old Richburg Road are both SCDOT-maintained facilities. SC 9 is a four-lane divided principal arterial with a 2018 SCDOT average daily traffic (ADT) count of 11,400 vehicles per day (vpd) east of the site and 11,200 vpd west of the site, and a posted speed limit of 55 miles per hour (mph). Old Richburg Road is a two-lane undivided major collector with a 2018 SCDOT ADT of 1,000 vpd. For the purposes of this study, SC 9 is assumed to have an east-west orientation and Old Richburg Road is assumed to have a north-south orientation.

TRAFFIC VOLUMES

Existing 2019 Traffic

Intersection turning-movement, heavy-vehicle, and pedestrian counts were performed by National Data & Surveying Services on Wednesday, April 24, 2019 from 7:00-8:00 AM, 1:00-2:00 PM, and 4:00-5:00 PM at the intersection of SC 9 and Old Richburg Road.

The three count timeframes are based on anticipated peak hours of the quarry facility, combined with the warehouse, during typical peak hours of adjacent street traffic.

The 2019 existing peak-hour traffic volumes are shown in **Figure 3**, attached; raw count data is also attached.

2029 Background Traffic

Background traffic consists of existing, historical growth, and approved off-site development traffic. A 2% annual growth rate was applied to the 2019 existing peak-hour traffic volumes for 10 years to calculate 2029 background traffic volumes based on available SCDOT ADT counts on SC 9 shown in **Table 1**. Based on input from Chester County and SCDOT staff, no specific approved off-site developments were considered.

Table 1 - SCDOT AADT

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	Growth Rate
SC 9 (west of Old Richburg)	11,200	10,900	10,500	10,300	9,700	7,700	8,600	9,400	9,900	9,500	1.8%
SC 9 (east of Old Richburg)	11,400	11,100	9,400	10,100	8,600	8,800	10,200	9,200	9,700	9,300	2.3%
Average											***2.1%***

The 2029 peak-hour background traffic volumes are shown in **Figure 3**.

Site Traffic

Tables 2 and 3 below summarize the trip generation potential for the proposed site, showing the full operation and anticipated maximum operation scenarios, respectively. It is noted that the quarry full operation projections are based upon historical information provided by Luck Stone Corporation; and the maximum potential is based upon an expected factor of 1.45 on full operation trip generation, also provided by Luck Stone Corporation.

Trip generation for the warehouse was calculated using Institute of Transportation Engineers' (ITE) *Trip Generation*, 10th Edition.

Table 2 - Trip Generation - Full Operation

Land Use	Intensity	Daily	AM Peak Hour (7-8 am)			MID Peak Hour (1-2 pm)^			PM Peak Hour (4-5 pm)		
			Total	In	Out	Total	In	Out	Total	In	Out
Warehousing - Passenger Cars*	50,000 SF	100	25	19	6	20	10	10	27	7	20
Warehousing - Trucks (20%)*		25	6	5	1	5	3	2	7	2	5
Quarry - Trucks**		238	32	16	16	36	18	18	24	12	12
Quarry - Passenger Cars**		40	0	0	0	0	0	0	16	0	16
Net New External Trips		**403**	**63**	**40**	**23**	**61**	**31**	**30**	**74**	**21**	**53**

*Warehousing Trips from ITE Trip Generation, 10th Edition.
**Quarry trips provided by developer.
^Warehousing mid-day trips were calculated by factoring the PM peak-hour trips by the ratio of the 1:00-2:00 PM k-factor (6.6%) to the highest of the k-factors between 4:00 and 6:00 PM (9%). In/out splits were assumed to be 50%.

Table 3 - Trip Generation - Maximum Operation

Land Use	Intensity	Daily	AM Peak Hour (7-8 am)			MID Peak Hour (1-2 pm)^			PM Peak Hour (4-5 pm)		
			Total	In	Out	Total	In	Out	Total	In	Out
Warehousing - Passenger Cars*	50,000 SF	100	25	19	6	20	10	10	27	7	20
Warehousing - Trucks (20%)*		25	6	5	1	5	3	2	7	2	5
Quarry - Trucks**		345	46	23	23	52	26	26	35	18	17
Quarry - Passenger Cars**		58	0	0	0	0	0	0	23	0	23
Net New External Trips		**528**	**77**	**47**	**30**	**77**	**39**	**38**	**92**	**27**	**65**

*Warehousing Trips from ITE Trip Generation, 10th Edition.
**Quarry trips provided by developer.
^Warehousing mid-day trips were calculated by factoring the PM peak-hour trips by the ratio of the 1:00-2:00 PM k-factor (6.6%) to the highest of the k-factors between 4:00 and 6:00 PM (9%). In/out splits were assumed to be 50%.

The resulting trip generation analysis equates to the following impact levels under full operation conditions:

- 63 AM peak-hour trips
- 61 midday peak-hour trips
- 74 PM peak-hour trips

The resulting trip generation analysis equates to the following impact levels under potential maximum operation conditions:

- 77 AM peak-hour trips
- 77 midday peak-hour trips
- 92 PM peak-hour trips

These impacts support a determination of a minimal impact based on a comparison to SCDOT's trip generation threshold of 100 peak-hour trips.

The proposed development's peak-hour trips were assigned to the study intersection based on existing travel patterns along with input from Luck Stone on anticipated market area. The site traffic distribution and assignment for passenger cars and trucks are shown in **Figure 4**, which was reviewed and approved by SCDOT and County staff.

The resulting peak-hour site traffic projections are shown in **Figure 5,** attached.

2029 Total Build-Out Traffic

The 2029 total build-out peak-hour traffic volumes consist of 2029 background traffic and proposed site traffic. 2029 total build-out peak-hour traffic volumes for full and maximum operation are shown in **Figures 5, 6, and 7** for the AM, midday, and PM peak hours, respectively.

ANALYSES

Kimley-Horn performed analyses for study intersection under the following scenarios in the three peak hours:

- 2019 Existing Conditions
- 2029 Background Conditions
- 2029 Full Operation
- 2029 Maximum Operation

The following analyses were performed, as described below:

- Capacity Analysis
- SCDOT turn lane warrant review
- Intersection sight distance review

Capacity Analysis

Capacity analyses were performed using Synchro 10 software to determine the operating characteristics at the unsignalized study intersection and to evaluate the impacts of the proposed development. Capacity is defined as the maximum number of vehicles that can pass over a particular road segment, or through a particular intersection, within a specified period of time under prevailing operational, geometric and controlling conditions within a set time duration. Synchro 10 uses methodologies contained in the *Highway Capacity Manual* (HCM) to determine the operating characteristics of an intersection.

The *Highway Capacity Manual* (HCM) defines LOS as a "quantitative stratification of a performance measure or measures representing quality of service" and is used to "translate complex numerical performance results into a simple A-F system representative of travelers' perceptions of the quality of service provided by a facility or service". The HCM defines six levels of service, LOS A through LOS F, with A having the best operating conditions from the traveler's perspective and F having the worst. However, it must be understood that "the LOS letter result hides much of the complexity of facility performance", and that "the appropriate LOS for a given system element in the community is a decision for local policy makers". According to the HCM, "for cost, environmental impact, and other reasons, roadways are typically designed not to provide LOS A conditions during peak periods but instead to provide some lower LOS that balances individual travers' desires against society's desires and financial resources. Nevertheless, during low-volume periods of the day, a system element may operate at LOS A."

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay at the side-street approaches, typically during the highest volume periods of the day, the AM and PM peak periods. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. With respect to field measurements, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. It is typical for stop sign-controlled side streets and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay.

Table 4 lists the LOS control delay thresholds published in the *Highway Capacity Manual* for signalized intersections.

Table 4
Level-of-Service Control Delay Thresholds for Unsignalized Intersections

Level-of-Service	Average Control Delay per Vehicle [sec/veh]	
A	≤ 10	Short Delays
B	> 10 – 15	
C	> 15 – 25	
D	> 25 – 35	Moderate Delays
E	> 35 – 50	
F	> 50	Long Delays

A peak-hour factor (PHF) of 0.9 was assumed for all future year analyses. Heavy vehicle percentages were taken directly from field observations and weighted with projected site truck percentages, subject to a two-percent minimum. Synchro LOS results and 95th percentile queues are reported below.

Table 5 - Old Richburg Road and SC 9 (Lancaster Hwy)/Luck Stone Drive										
Condition	Measure	EB			WB		NB		SB	
		EBL	EBT	EBR	WBL	WBTR	NBL	NBTR	SBL	SBTR
AM Peak Hour										
2019 Existing	LOS (Delay)	A (0.0)			A (0.3)		B (14.0)		-	
	Synchro 95th Q	-	0'	0'	1'	0'	11'	0'	-	-
2029 Background	LOS (Delay)	A (0.0)			A (0.2)		C (15.7)		-	
	Synchro 95th Q	-	0'	0'	1'	0'	16'	0'	-	-
2091 Build-out FULL	LOS (Delay)	A (0.3)			A (0.2)		C (18.7)		C (19.2)	
	Synchro 95th Q	2'	0'	0'	1'	0'	21'	1'	6'	2'
2029 Build-out MAX	LOS (Delay)	A (0.3)			A (0.2)		C (19.0)		C (20.1)	
	Synchro 95th Q	2'	0'	0'	1'	0'	21'	1'	8'	2'
MD Peak Hour										
2019 Existing	LOS (Delay)	A (0.0)			A (0.3)		B (13.1)		-	
	Synchro 95th Q	-	0'	0'	1'	0'	11'	1'	-	-
2029 Background	LOS (Delay)	A (0.0)			A (0.2)		B (14.4)		-	
	Synchro 95th Q	-	0'	0'	1'	0'	14'	1'	-	-
2091 Build-out FULL	LOS (Delay)	A (0.2)			A (0.2)		C (16.2)		B (15.7)	
	Synchro 95th Q	1'	0'	0'	1'	0'	16'	2'	5'	2'
2029 Build-out MAX	LOS (Delay)	A (0.3)			A (0.2)		C (16.4)		C (16.6)	
	Synchro 95th Q	1'	0'	0'	1'	0'	17'	2'	8'	2'
PM Peak Hour										
2019 Existing	LOS (Delay)	A (0.0)			A (0.1)		B (13.4)		-	
	Synchro 95th Q	-	0'	0'	0'	0'	8'	0'	-	-
2029 Background	LOS (Delay)	A (0.0)			A (0.0)		B (14.1)		-	
	Synchro 95th Q	-	0'	0'	0'	0'	8'	0'	-	-
2091 Build-out FULL	LOS (Delay)	A (0.2)			A (0.0)		C (16.5)		C (15.9)	
	Synchro 95th Q	1'	0'	0'	0'	0'	10'	1'	9'	5'
2029 Build-out MAX	LOS (Delay)	A (0.2)			A (0.0)		C (16.8)		C (16.1)	
	Synchro 95th Q	1'	0'	0'	0'	0'	10'	1'	11'	6'
Existing Storage		225'		250'	300'		225'			

As shown in **Table 5,** short delays are expected on the stop-controlled northbound and southbound approaches during each peak hour under full and maximum operations. It is noted that a two-lane southbound approach was assumed exiting the proposed development. Therefore, the analysis includes an exclusive left-turn lane and shared through-right both northbound and southbound.

Based on review of the Synchro 95th percentile queues above and SimTraffic maximum queue lengths, the existing left- and right-turn lane lengths are not expected to be exceeded under either build-out scenario. Therefore, intersection capacity improvements would not be recommended with the construction of the proposed driveway. Note that based on the Synchro 95th percentile queues above

and SimTraffic maximum queue lengths, 125 feet of storage is recommended for the southbound left-turn lane along the proposed site driveway.

SCDOT Turn lane warrant review

Warrants for additional turn-lane improvements for unsignalized intersections beyond those necessary for capacity were determined based on a review of the figures 15.5A and 15.5F found on pages 15.5 (3) and 15.5 (8) in the *2003 SCDOT Highway Design Manual*. Based on the results of the warrants under 2029 full operation and maximum operation conditions, a westbound right-turn lane is not warranted for consideration. Additionally, based on the SCDOT Access and Roadside Management Standards (ARMS) manual, recommended right-turn storage lengths are not provided for right-turn movements with less than 50 vehicles. As shown in Figures 5-7, the highest westbound right-turn volume projected to enter the site under peak-hour conditions is 26 vehicles. Therefore, an exclusive westbound right-turn lane is not recommended. However, the construction of a large entry radius and wide entrance lane are recommended to facilitate westbound right-turning movements into the site. Note that an eastbound left-turn lane is already constructed at this intersection and therefore, was not considered in the review of auxiliary turn lanes.

Intersection sight distance (ISD) review

A field visit was performed on Monday, April 29, 2019 to review ISD availability for the proposed development's driveway compared to 2017 SCDOT Roadway Design Manual and American Association of State Highway Transportation Officials (AASHTO) standards. Results are shown in **Table 6**.

Table 6 - Intersection Sight Distance

Direction Turning	Direction Looking	Required Intersection Sight Distance		Intersection Sight Distance Met	
		Passenger Car (PC)	Truck	PC	Truck
Turning Left	Looking Left	662	1224	Yes	Yes
	Looking Right (from median for PC)	662			
Crossing	Looking Left	617	1410	Yes	Yes
	Looking Right (from median for PC)	662			
Turning Right	Looking Left	575	930	Yes	Yes

Note: Intersection sight distance calculations assume the approach grade will be less than 3%.

Based on the results in Table 6 and field observations shown below (photos taken from the approximate location of the proposed access across from Old Richburg Road), the required intersection sight distance standard is anticipated to be met for both passenger cars and trucks; however, it is noted that some signage may need to be relocated along SC 9 so as not to obscure drivers' view of oncoming vehicles.

It is also noted that the median width was measured to be approximately 34 feet, which is assumed to store one passenger car based on the design vehicle lengths included in the SCDOT ARMS manual (passenger cars are assumed to be 19 feet long). Therefore, the results shown in Table 6 and the field observation photos shown below assume that passenger car drivers will be looking right from the median rather than from the proposed site driveway.

Looking right from the site driveway from the approximate perspective of a truck driver

Looking right from the median from the approximate perspective of a passenger car driver

Looking left from the site driveway from the approximate perspective of a truck driver

Looking left from the driveway from the approximate perspective of a car driver

CONCLUSION

Based on the capacity analyses, review of turn-lane warrants, queuing analysis, sight distance review, and ARMS Manual specifications, the following developer mitigation is recommended:

- Construct the proposed Luck Stone Drive site access as a three-lane section as follows:
  - Single northbound ingress lane
  - Two southbound egress lanes consisting of an exclusive left with 125 feet of storage and shared through-right lane aligned with the Old Richburg Road ingress lane
  - Large right-turn entry radius and wide entrance lane
  - Stop control on the southbound approach
- Confirm intersection sight distance standards for the proposed site access are met for both passenger vehicles and trucks, based on surveyed conditions.
- For Old Richburg Road, restripe the existing northbound right-turn lane to a shared through-right lane.

The recommended developer mitigation is shown in Figure 8, attached.

Should you have any questions or comments please contact me at 704-954-7470.

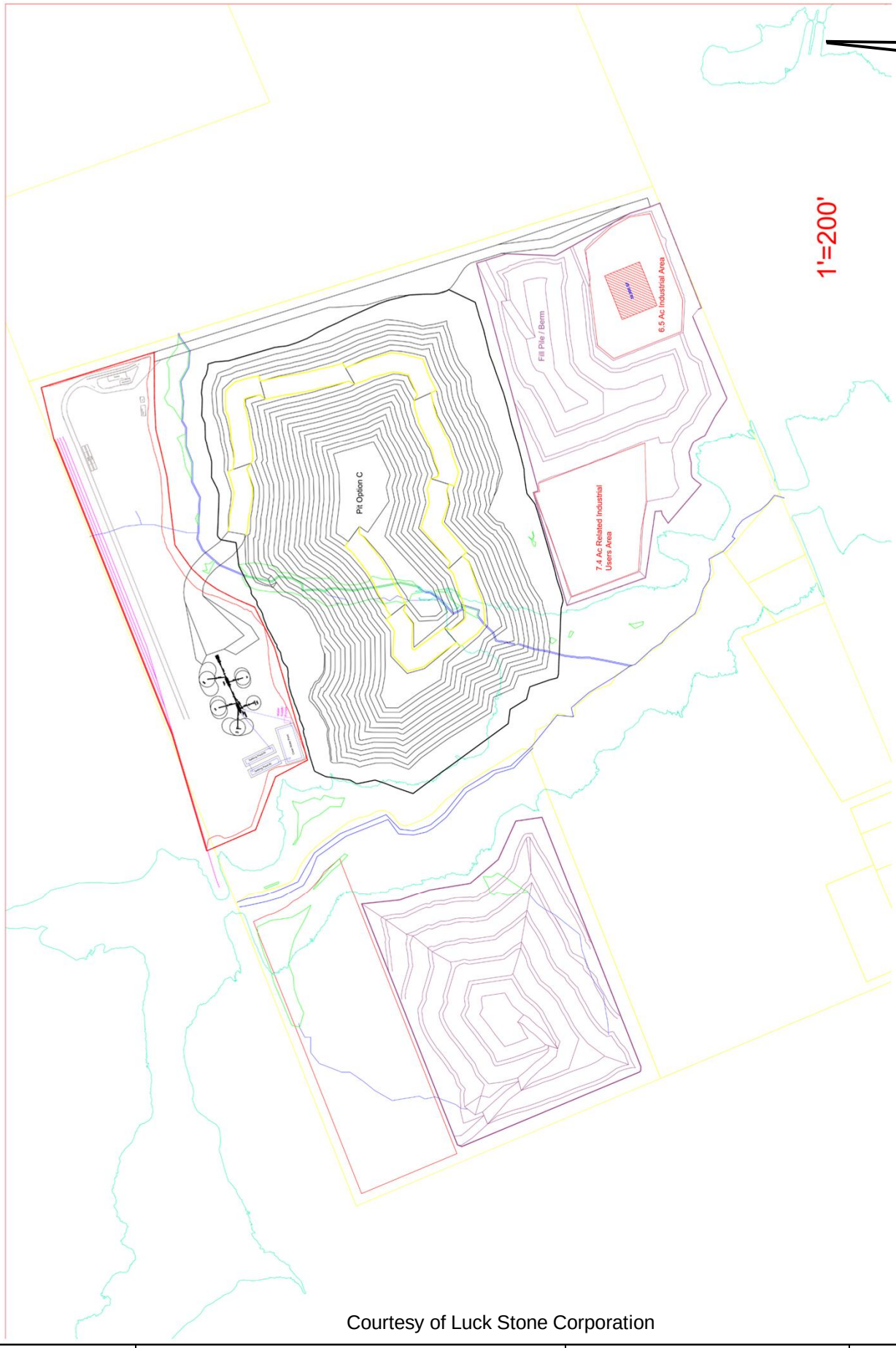
Attachments:

- Figures 1-8
- Raw turning movement counts
- Synchro and SimTraffic reports
- SCDOT turn lane warrant review results

Attachments

Figures

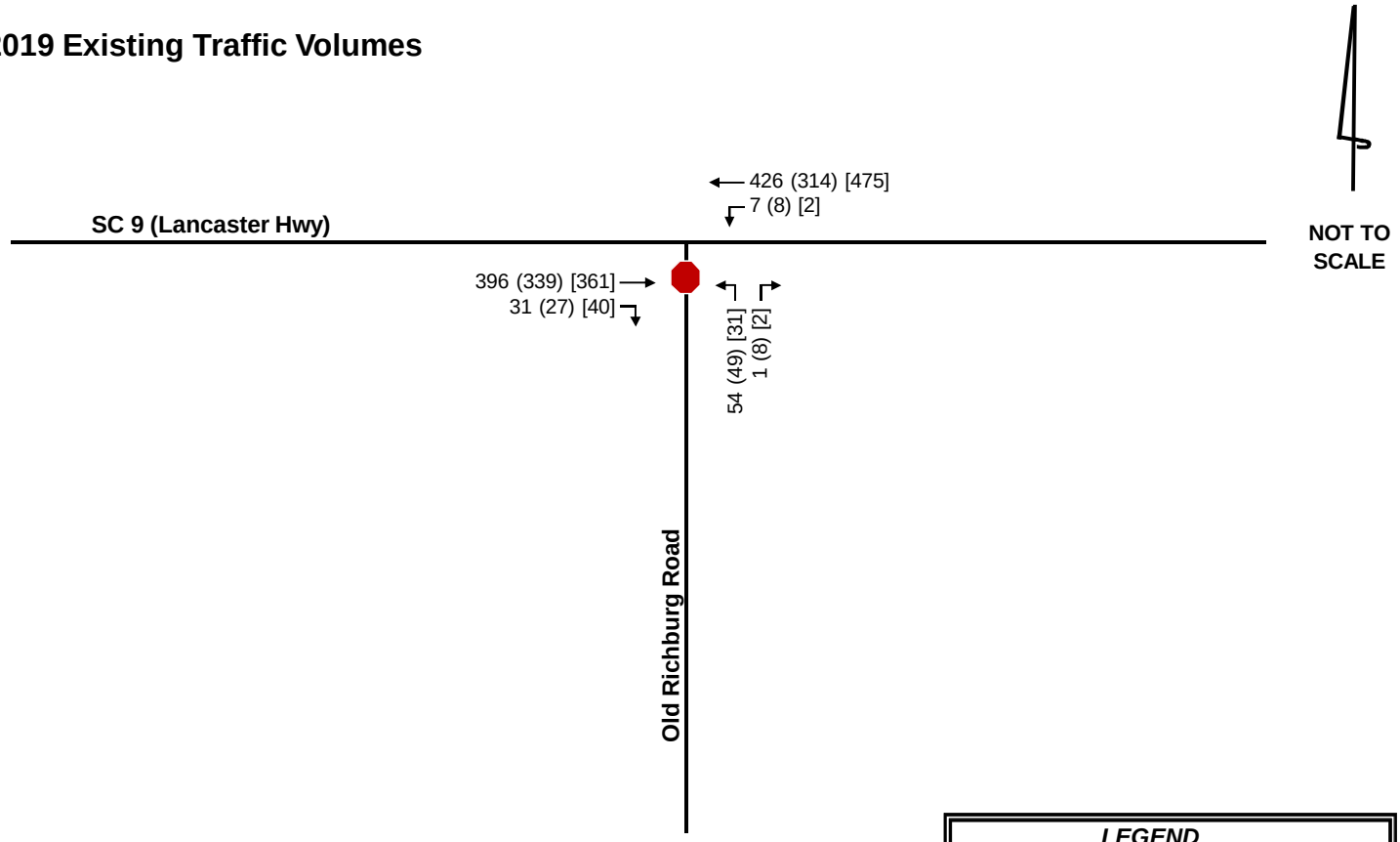
Kimley»Horn	**Proposed Quarry Site Traffic Analysis**	**Site Location**	**Figure 1**



Courtesy of Luck Stone Corporation

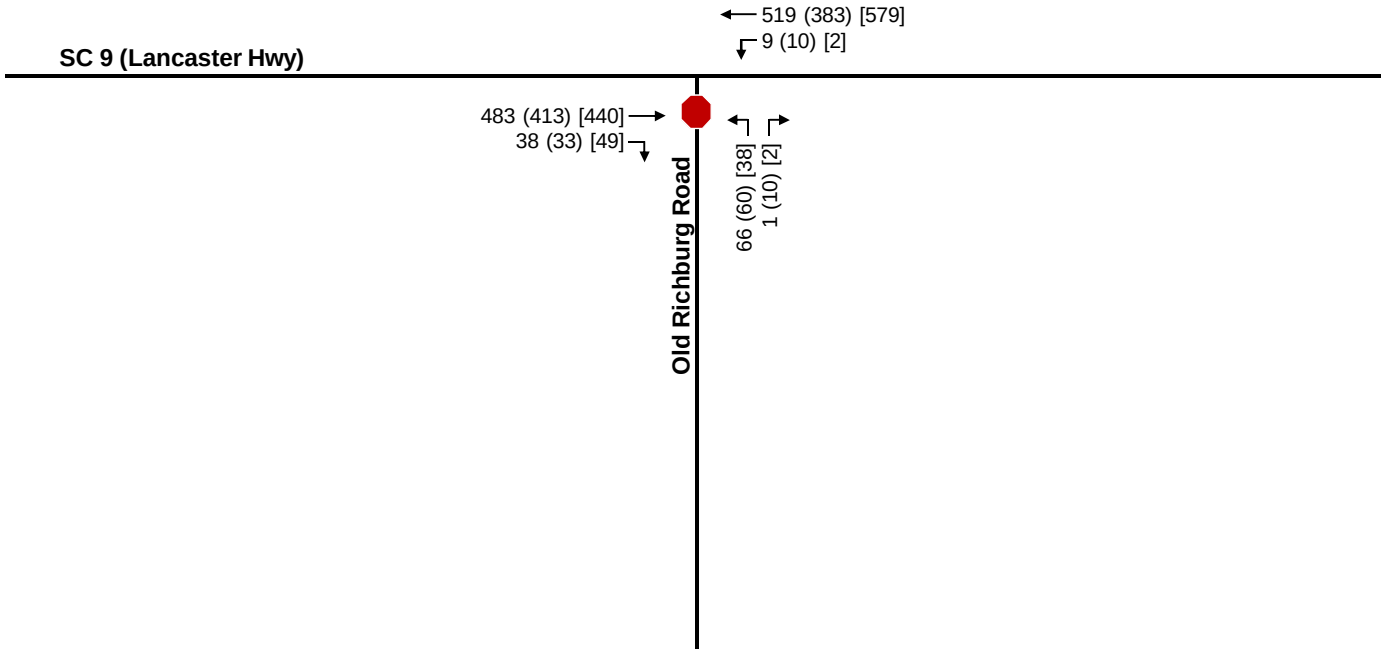
Kimley»Horn	**Proposed Quarry Site Traffic Analysis**	**Site Plan**	**Figure 2**

2019 Existing Traffic Volumes

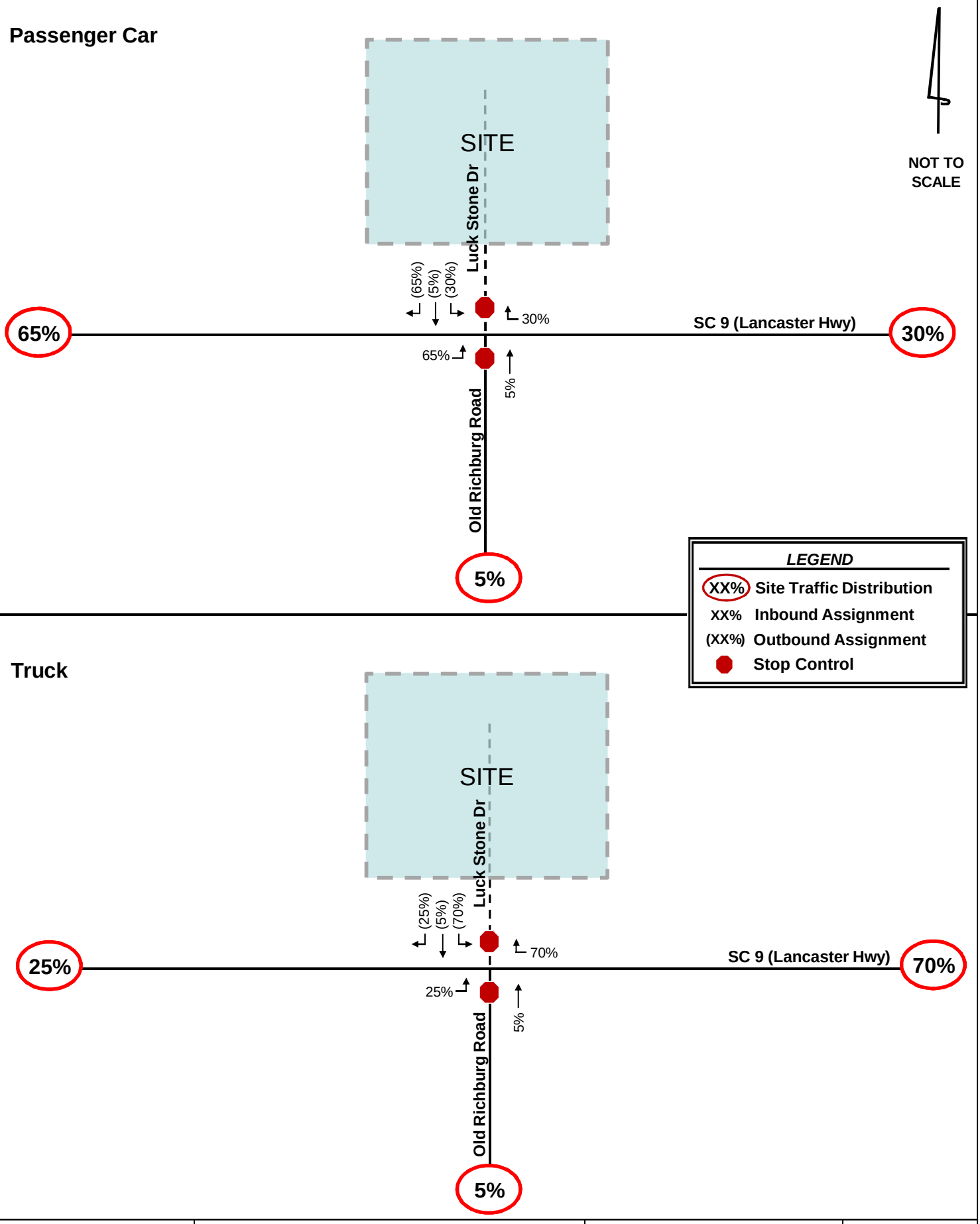


LEGEND	
XX	AM Peak Site Trips (7-8 AM)
(XX)	Midday Peak Site Trips (1-2 PM)
[XX]	PM Peak Site Trips (4-5 PM)
	Stop Control

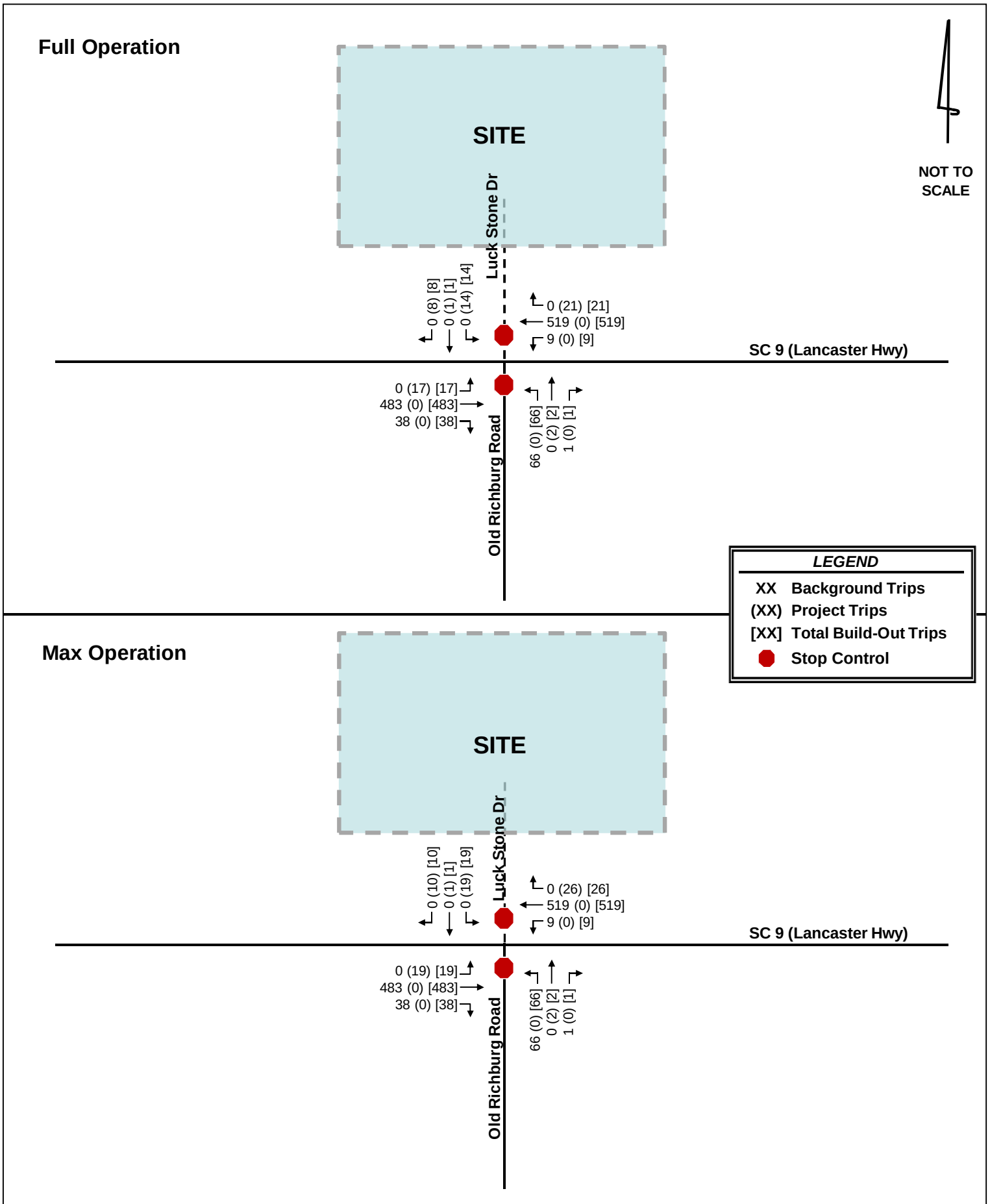
2029 Background Traffic Volumes



Kimley»Horn	Proposed Quarry Site Traffic Analysis	2019 Existing and 2029 Background Traffic Volumes	Figure 3

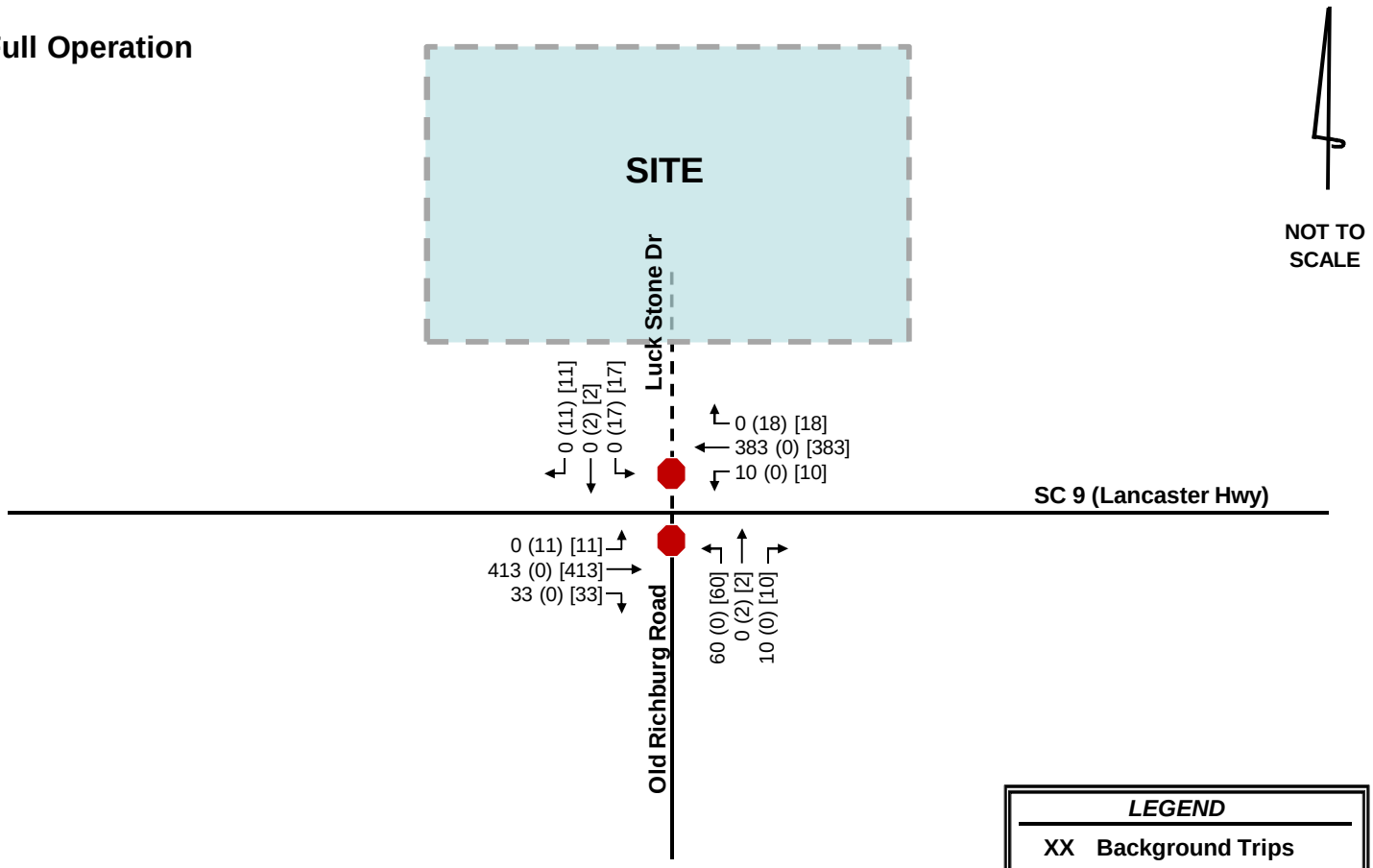


Kimley»Horn	**Proposed Quarry Site Traffic Analysis**	**Site Trip Distribution and Assignment**	**Figure 4**

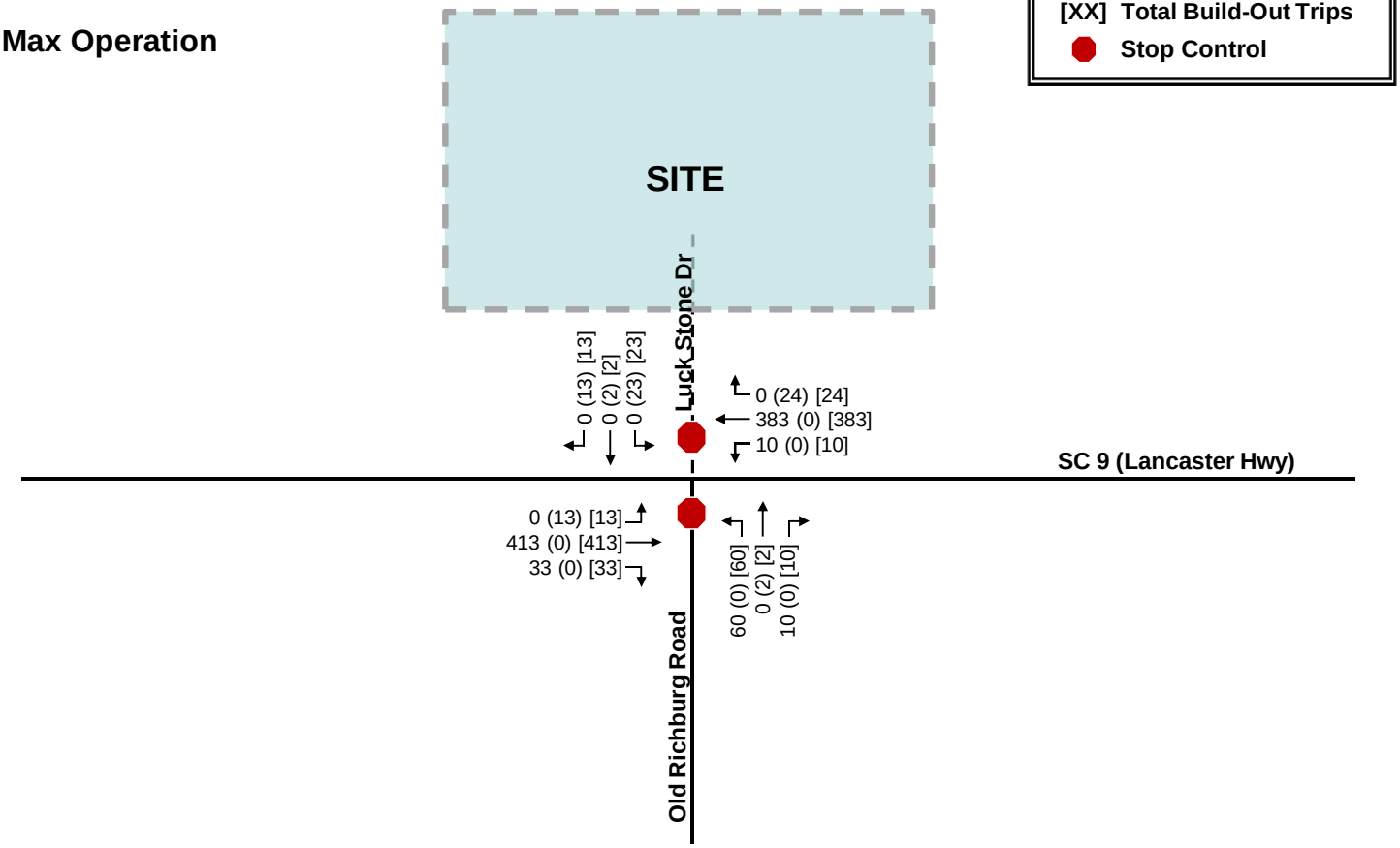


Kimley»Horn	**Proposed Quarry Site Traffic Analysis**	**2029 Build-Out AM Peak Hour Traffic Volumes**	**Figure 5**

Full Operation

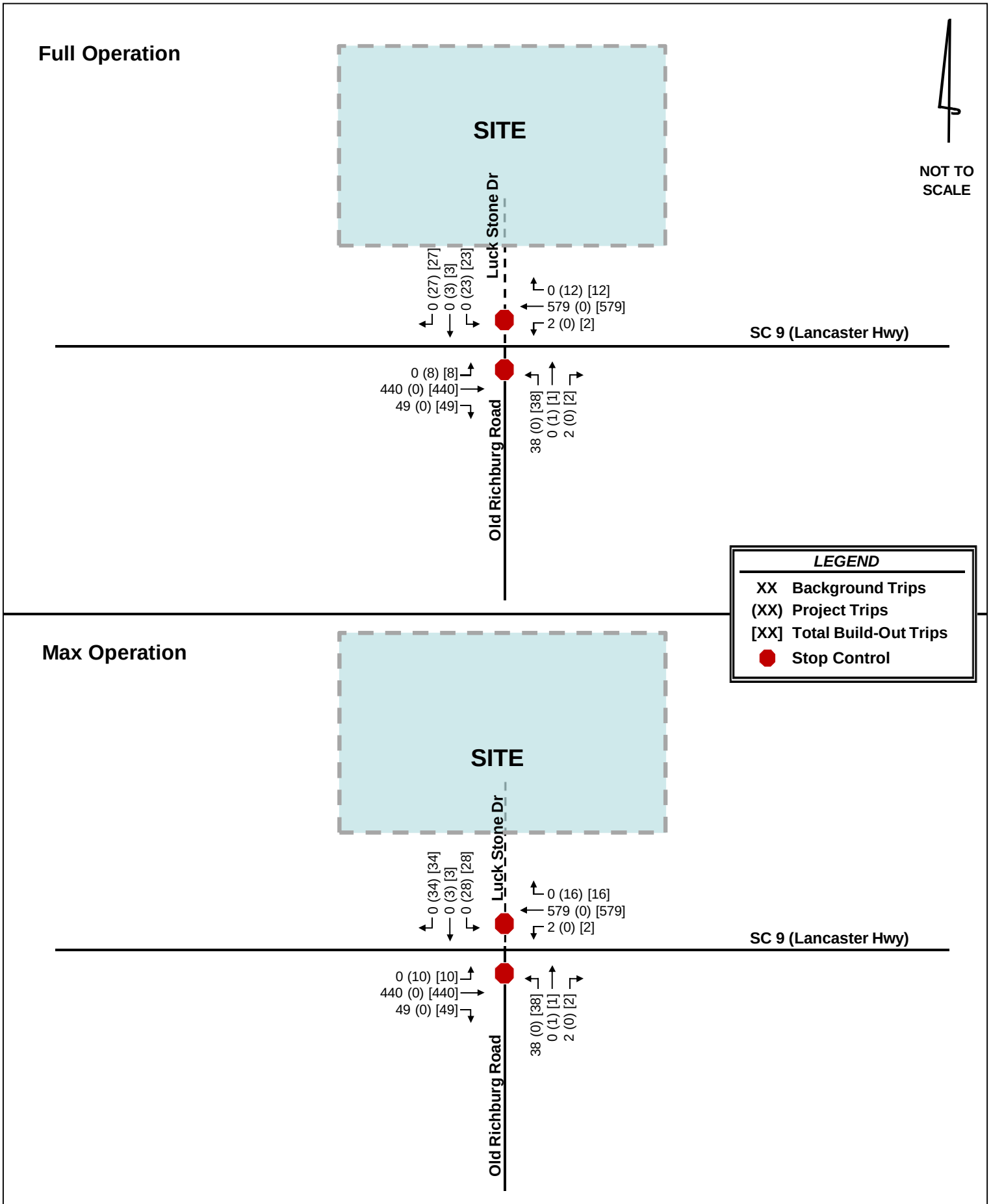


Max Operation

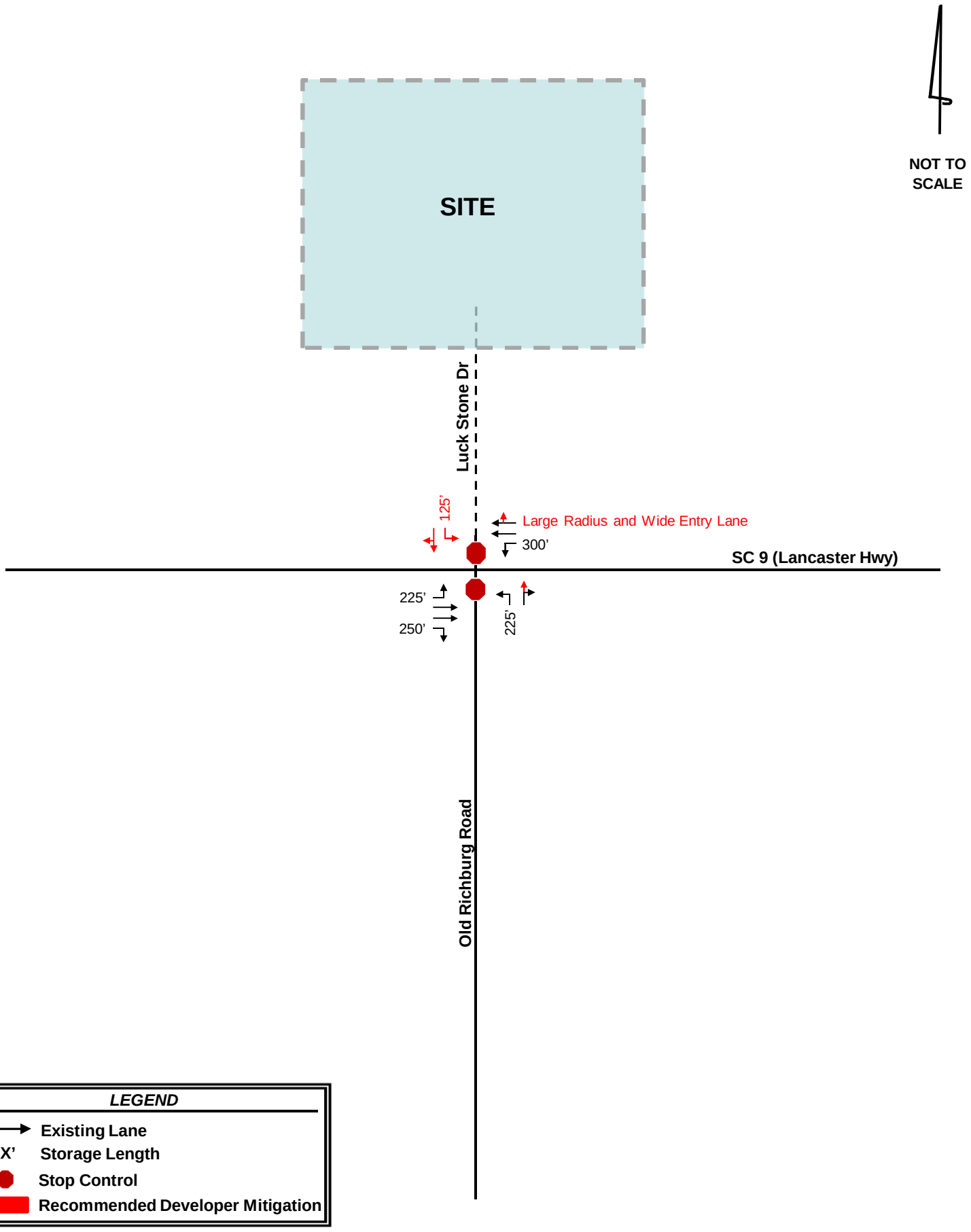


LEGEND	
XX	Background Trips
(XX)	Project Trips
[XX]	Total Build-Out Trips
	Stop Control

Kimley»Horn	**Proposed Quarry Site Traffic Analysis**	**2029 Build-Out Midday Peak Hour Traffic Volumes**	**Figure 6**



Kimley»Horn	**Proposed Quarry Site Traffic Analysis**	**2029 Build-Out PM Peak Hour Traffic Volumes**	**Figure 7**



Kimley»Horn	**Proposed Quarry Site Traffic Analysis**	**Recommended Roadway Laneage**	**Figure 8**

Turning Movement Counts

Project ID: 19-09307-001
Location: Old Richburg Rd/SC-56 & Lancaster Hwy/SC 9
City: Chester

Day: Wednesday
Date: 04/24/2019

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Old Richburg Rd/SC-56 Northbound						Old Richburg Rd/SC-56 Southbound						Lancaster Hwy/SC 9 Eastbound						Lancaster Hwy/SC 9 Westbound						
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Int. Total
7:00 AM	12	0	0	0	0	12	0	0	0	0	0	0	0	83	6	0	0	89	0	90	0	0	0	90	191
7:15 AM	13	0	0	0	0	13	0	0	0	0	0	0	0	104	5	0	0	109	1	129	0	0	0	130	252
7:30 AM	15	0	1	0	0	16	0	0	0	0	0	0	0	112	10	0	0	122	4	102	0	0	0	106	244
7:45 AM	14	0	0	0	0	14	0	0	0	0	0	0	0	97	10	0	0	107	2	105	0	0	0	107	228
Total	54	0	1	0	0	55	0	0	0	0	0	0	0	396	31	0	0	427	7	426	0	0	0	433	915
BREAK																									
1:00 PM	13	0	1	0	0	14	0	0	0	0	0	0	0	84	7	0	0	91	3	99	0	0	0	102	207
1:15 PM	12	0	3	0	0	15	0	0	0	0	0	0	0	83	5	0	0	88	2	67	0	0	0	69	172
1:30 PM	9	0	1	0	0	10	0	0	0	0	0	0	0	81	10	0	0	91	2	73	0	1	0	76	177
1:45 PM	15	0	3	0	0	18	0	0	0	0	0	0	0	91	5	0	0	96	0	75	0	0	0	75	189
Total	49	0	8	0	0	57	0	0	0	0	0	0	0	339	27	0	0	366	7	314	0	1	0	322	745
BREAK																									
4:00 PM	8	0	0	0	0	8	0	0	0	0	0	0	0	83	6	0	0	89	1	139	0	0	0	140	237
4:15 PM	6	0	1	0	0	7	0	0	0	0	0	0	0	73	12	0	0	85	0	129	0	0	0	129	221
4:30 PM	11	0	1	0	0	12	0	0	0	0	0	0	0	94	10	0	0	104	1	127	0	0	0	128	244
4:45 PM	6	0	0	0	0	6	0	0	0	0	0	0	0	111	12	0	0	123	0	80	0	0	0	80	209
Total	31	0	2	0	0	33	0	0	0	0	0	0	0	361	40	0	0	401	2	475	0	0	0	477	911
Grand Total	134	0	11	0	0	145	0	0	0	0	0	0	0	1096	98	0	0	1194	16	1215	0	1	0	1232	2571
Apprch %	92.4	0.0	7.6	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	91.8	8.2	0.0	0.0		1.3	98.6	0.0	0.1	0.0		
Total %	5.2	0.0	0.4	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.6	3.8	0.0	0.0	46.4	0.6	47.3	0.0	0.0	0.0	47.9	
Cars, PU, Vans	120	0	3	0	0	123	0	0	0		0	0	0	981	93	0		1074	10	1045	0		0	1056	2253
% Cars, PU, Vans	89.6	0.0	27.3	0.0	0.0	84.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	89.5	94.9	0.0	0.0	89.9	62.5	86.0	0.0	0.0	0.0	85.7	87.6
Heavy Trucks	14	0	8	0		22	0	0	0	0		0	0	115	5	0		120	6	170	0	0		176	318
%Heavy Trucks	10.4	0.0	72.7	0.0	0.0	15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	5.1	0.0	0.0	10.1	37.5	14.0	0.0	0.0	0.0	14.3	12.4

Project ID: 19-09307-001
Location: Old Richburg Rd/SC-56 & Lancaster Hwy/SC 9
City: Chester

PEAK HOURS

Day: Wednesday
Date: 04/24/2019

AM

	Old Richburg Rd/SC-56 Northbound					Old Richburg Rd/SC-56 Southbound					Lancaster Hwy/SC 9 Eastbound					Lancaster Hwy/SC 9 Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
7:00 AM	12	0	0	0	12	0	0	0	0	0	0	83	6	0	89	0	90	0	0	90	191
7:15 AM	13	0	0	0	13	0	0	0	0	0	0	104	5	0	109	1	129	0	0	130	252
7:30 AM	15	0	1	0	16	0	0	0	0	0	0	112	10	0	122	4	102	0	0	106	244
7:45 AM	14	0	0	0	14	0	0	0	0	0	0	97	10	0	107	2	105	0	0	107	228
Total Volume	54	0	1	0	55	0	0	0	0	0	0	396	31	0	427	7	426	0	0	433	915
% App. Total	98.2	0.0	1.8	0.0	100	0.0	0.0	0.0	0.0	0	0.0	92.7	7.3	0.0	100	1.6	98.4	0.0	0.0	100	
PHF					0.859										0.875					0.833	0.908
Cars, PU, Vans	51	0	1	0	52	0	0	0	0	0	0	365	29	0	394	5	381	0	0	386	832
% Cars, PU, Vans	94.4	0.0	100.0	0.0	94.5	0.0	0.0	0.0	0.0	0.0	0.0	92.2	93.5	0.0	92.3	71.4	89.4	0.0	0.0	89.1	90.9
Heavy Trucks	3	0	0	0	3	0	0	0	0	0	0	31	2	0	33	2	45	0	0	47	83
%Heavy Trucks	5.6	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	7.8	6.5	0.0	7.7	28.6	10.6	0.0	0.0	10.9	9.1

NOON

	Old Richburg Rd/SC-56 Northbound					Old Richburg Rd/SC-56 Southbound					Lancaster Hwy/SC 9 Eastbound					Lancaster Hwy/SC 9 Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 01:00 PM to 03:00 PM																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
1:00 PM	13	0	1	0	14	0	0	0	0	0	0	84	7	0	91	3	99	0	0	102	207
1:15 PM	12	0	3	0	15	0	0	0	0	0	0	83	5	0	88	2	67	0	0	69	172
1:30 PM	9	0	1	0	10	0	0	0	0	0	0	81	10	0	91	2	73	0	1	76	177
1:45 PM	15	0	3	0	18	0	0	0	0	0	0	91	5	0	96	0	75	0	0	75	189
Total Volume	49	0	8	0	57	0	0	0	0	0	0	339	27	0	366	7	314	0	1	322	745
% App. Total	86.0	0.0	14.0	0.0	100	0.0	0.0	0.0	0.0	0	0.0	92.6	7.4	0.0	100	2.2	97.5	0.0	0.3	100	
PHF					0.792										0.953					0.789	0.900
Cars, PU, Vans	39	0	1	0	40	0	0	0	0	0	0	279	24	0	303	3	238	0	1	242	585
% Cars, PU, Vans	79.6	0.0	12.5	0.0	70.2	0.0	0.0	0.0	0.0	0.0	0.0	82.3	88.9	0.0	82.8	42.9	75.8	0.0	100.0	75.2	78.5
Heavy Trucks	10	0	7	0	17	0	0	0	0	0	0	60	3	0	63	4	76	0	0	80	160
%Heavy Trucks	20.4	0.0	87.5	0.0	29.8	0.0	0.0	0.0	0.0	0.0	0.0	17.7	11.1	0.0	17.2	57.1	24.2	0.0	0.0	24.8	21.5

PM

	Old Richburg Rd/SC-56 Northbound					Old Richburg Rd/SC-56 Southbound					Lancaster Hwy/SC 9 Eastbound					Lancaster Hwy/SC 9 Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
4:00 PM	8	0	0	0	8	0	0	0	0	0	0	83	6	0	89	1	139	0	0	140	237
4:15 PM	6	0	1	0	7	0	0	0	0	0	0	73	12	0	85	0	129	0	0	129	221
4:30 PM	11	0	1	0	12	0	0	0	0	0	0	94	10	0	104	1	127	0	0	128	244
4:45 PM	6	0	0	0	6	0	0	0	0	0	0	111	12	0	123	0	80	0	0	80	209
Total Volume	31	0	2	0	33	0	0	0	0	0	0	361	40	0	401	2	475	0	0	477	911
% App. Total	93.9	0.0	6.1	0.0	100	0.0	0.0	0.0	0.0	0	0.0	90.0	10.0	0.0	100	0.4	99.6	0.0	0.0	100	
PHF					0.688										0.815					0.852	0.933
Cars, PU, Vans	30	0	1	0	31	0	0	0	0	0	0	337	40	0	377	2	426	0	0	428	836
% Cars, PU, Vans	96.8	0.0	50.0	0.0	93.9	0.0	0.0	0.0	0.0	0.0	0.0	93.4	100.0	0.0	94.0	100.0	89.7	0.0	0.0	89.7	91.8
Heavy Trucks	1	0	1	0	2	0	0	0	0	0	0	24	0	0	24	0	49	0	0	49	75
%Heavy Trucks	3.2	0.0	50.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0	6.0	0.0	10.3	0.0	0.0	10.3	8.2

Synchro and SimTraffic Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	396	31	7	426	54	1
Future Volume (vph)	396	31	7	426	54	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	300		225	0
Storage Lanes		1	1		1	1
Taper Length (ft)			250		100	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3343	1524	1399	3252	1703	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3343	1524	1399	3252	1703	1583
Link Speed (mph)	55			55	45	
Link Distance (ft)	2483			3026	1317	
Travel Time (s)	30.8			37.5	20.0	
Peak Hour Factor	0.88	0.78	0.44	0.83	0.90	0.25
Heavy Vehicles (%)	8%	6%	29%	11%	6%	2%
Adj. Flow (vph)	450	40	16	513	60	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	450	40	16	513	60	4
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	396	31	7	426	54	1
Future Volume (Veh/h)	396	31	7	426	54	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.78	0.44	0.83	0.90	0.25
Hourly flow rate (vph)	450	40	16	513	60	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			490		738	225
vC1, stage 1 conf vol					450	
vC2, stage 2 conf vol					288	
vCu, unblocked vol			490		738	225
tC, single (s)			4.7		6.9	6.9
tC, 2 stage (s)					5.9	
tF (s)			2.5		3.6	3.3
p0 queue free %			98		87	99
cM capacity (veh/h)			902		448	778

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	225	225	40	16	256	256	60	4
Volume Left	0	0	0	16	0	0	60	0
Volume Right	0	0	40	0	0	0	0	4
cSH	1700	1700	1700	902	1700	1700	448	778
Volume to Capacity	0.13	0.13	0.02	0.02	0.15	0.15	0.13	0.01
Queue Length 95th (ft)	0	0	0	1	0	0	11	0
Control Delay (s)	0.0	0.0	0.0	9.1	0.0	0.0	14.3	9.7
Lane LOS				A			B	A
Approach Delay (s)	0.0			0.3			14.0	
Approach LOS							B	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	339	27	8	314	49	8
Future Volume (vph)	339	27	8	314	49	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	300		225	0
Storage Lanes		1	1		1	1
Taper Length (ft)			250		100	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3059	1455	1203	2911	1504	859
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3059	1455	1203	2911	1504	859
Link Speed (mph)	55			55	45	
Link Distance (ft)	2483			3026	1317	
Travel Time (s)	30.8			37.5	20.0	
Peak Hour Factor	0.93	0.68	0.67	0.79	0.82	0.67
Heavy Vehicles (%)	18%	11%	50%	24%	20%	88%
Adj. Flow (vph)	365	40	12	397	60	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	365	40	12	397	60	12
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	339	27	8	314	49	8
Future Volume (Veh/h)	339	27	8	314	49	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.68	0.67	0.79	0.82	0.67
Hourly flow rate (vph)	365	40	12	397	60	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			405		588	182
vC1, stage 1 conf vol					365	
vC2, stage 2 conf vol					222	
vCu, unblocked vol			405		588	182
tC, single (s)			5.1		7.2	8.7
tC, 2 stage (s)					6.2	
tF (s)			2.7		3.7	4.2
p0 queue free %			99		88	98
cM capacity (veh/h)			871		484	616

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	182	182	40	12	198	198	60	12
Volume Left	0	0	0	12	0	0	60	0
Volume Right	0	0	40	0	0	0	0	12
cSH	1700	1700	1700	871	1700	1700	484	616
Volume to Capacity	0.11	0.11	0.02	0.01	0.12	0.12	0.12	0.02
Queue Length 95th (ft)	0	0	0	1	0	0	11	1
Control Delay (s)	0.0	0.0	0.0	9.2	0.0	0.0	13.5	11.0
Lane LOS				A			B	B
Approach Delay (s)	0.0			0.3			13.1	
Approach LOS							B	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	361	40	2	475	31	2
Future Volume (vph)	361	40	2	475	31	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	300		225	0
Storage Lanes		1	1		1	1
Taper Length (ft)			250		100	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3374	1583	1770	3282	1752	1077
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3374	1583	1770	3282	1752	1077
Link Speed (mph)	55			55	45	
Link Distance (ft)	2483			3026	1317	
Travel Time (s)	30.8			37.5	20.0	
Peak Hour Factor	0.81	0.83	0.50	0.85	0.71	0.50
Heavy Vehicles (%)	7%	2%	2%	10%	3%	50%
Adj. Flow (vph)	446	48	4	559	44	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	446	48	4	559	44	4
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	361	40	2	475	31	2
Future Volume (Veh/h)	361	40	2	475	31	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.83	0.50	0.85	0.71	0.50
Hourly flow rate (vph)	446	48	4	559	44	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			494		734	223
vC1, stage 1 conf vol					446	
vC2, stage 2 conf vol					288	
vCu, unblocked vol			494		734	223
tC, single (s)			4.1		6.9	7.9
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.8
p0 queue free %			100		90	99
cM capacity (veh/h)			1066		461	652

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	223	223	48	4	280	280	44	4
Volume Left	0	0	0	4	0	0	44	0
Volume Right	0	0	48	0	0	0	0	4
cSH	1700	1700	1700	1066	1700	1700	461	652
Volume to Capacity	0.13	0.13	0.03	0.00	0.16	0.16	0.10	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	8	0
Control Delay (s)	0.0	0.0	0.0	8.4	0.0	0.0	13.6	10.6
Lane LOS				A			B	B
Approach Delay (s)	0.0			0.1			13.4	
Approach LOS							B	

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	483	38	9	519	66	1
Future Volume (vph)	483	38	9	519	66	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	300		225	0
Storage Lanes		1	1		1	1
Taper Length (ft)			250		100	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3343	1524	1399	3252	1703	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3343	1524	1399	3252	1703	1583
Link Speed (mph)	55			55	45	
Link Distance (ft)	2483			3026	1317	
Travel Time (s)	30.8			37.5	20.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	8%	6%	29%	11%	6%	2%
Adj. Flow (vph)	537	42	10	577	73	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	537	42	10	577	73	1
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	483	38	9	519	66	1
Future Volume (Veh/h)	483	38	9	519	66	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	537	42	10	577	73	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			579		846	268
vC1, stage 1 conf vol					537	
vC2, stage 2 conf vol					308	
vCu, unblocked vol			579		846	268
tC, single (s)			4.7		6.9	6.9
tC, 2 stage (s)					5.9	
tF (s)			2.5		3.6	3.3
p0 queue free %			99		82	100
cM capacity (veh/h)			827		406	730

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	268	268	42	10	288	288	73	1
Volume Left	0	0	0	10	0	0	73	0
Volume Right	0	0	42	0	0	0	0	1
cSH	1700	1700	1700	827	1700	1700	406	730
Volume to Capacity	0.16	0.16	0.02	0.01	0.17	0.17	0.18	0.00
Queue Length 95th (ft)	0	0	0	1	0	0	16	0
Control Delay (s)	0.0	0.0	0.0	9.4	0.0	0.0	15.8	9.9
Lane LOS				A			C	A
Approach Delay (s)	0.0			0.2			15.7	
Approach LOS							C	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	413	33	10	383	60	10
Future Volume (vph)	413	33	10	383	60	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	300		225	0
Storage Lanes		1	1		1	1
Taper Length (ft)			250		100	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3059	1455	1203	2911	1504	859
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3059	1455	1203	2911	1504	859
Link Speed (mph)	55			55	45	
Link Distance (ft)	2483			3026	1317	
Travel Time (s)	30.8			37.5	20.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	18%	11%	50%	24%	20%	88%
Adj. Flow (vph)	459	37	11	426	67	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	459	37	11	426	67	11
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	413	33	10	383	60	10
Future Volume (Veh/h)	413	33	10	383	60	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	459	37	11	426	67	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			496		694	230
vC1, stage 1 conf vol					459	
vC2, stage 2 conf vol					235	
vCu, unblocked vol			496		694	230
tC, single (s)			5.1		7.2	8.7
tC, 2 stage (s)					6.2	
tF (s)			2.7		3.7	4.2
p0 queue free %			99		85	98
cM capacity (veh/h)			791		433	565

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	230	230	37	11	213	213	67	11
Volume Left	0	0	0	11	0	0	67	0
Volume Right	0	0	37	0	0	0	0	11
cSH	1700	1700	1700	791	1700	1700	433	565
Volume to Capacity	0.14	0.14	0.02	0.01	0.13	0.13	0.15	0.02
Queue Length 95th (ft)	0	0	0	1	0	0	14	1
Control Delay (s)	0.0	0.0	0.0	9.6	0.0	0.0	14.8	11.5
Lane LOS				A			B	B
Approach Delay (s)	0.0			0.2			14.4	
Approach LOS							B	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

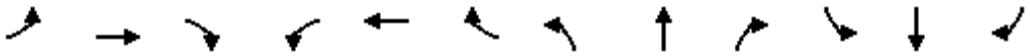
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	440	49	2	579	38	2
Future Volume (vph)	440	49	2	579	38	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	300		225	0
Storage Lanes		1	1		1	1
Taper Length (ft)			250		100	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3374	1583	1770	3282	1752	1077
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3374	1583	1770	3282	1752	1077
Link Speed (mph)	55			55	45	
Link Distance (ft)	2483			3026	1317	
Travel Time (s)	30.8			37.5	20.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	2%	10%	3%	50%
Adj. Flow (vph)	489	54	2	643	42	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	489	54	2	643	42	2
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	440	49	2	579	38	2
Future Volume (Veh/h)	440	49	2	579	38	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	489	54	2	643	42	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			543		814	244
vC1, stage 1 conf vol					489	
vC2, stage 2 conf vol					326	
vCu, unblocked vol			543		814	244
tC, single (s)			4.1		6.9	7.9
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.8
p0 queue free %			100		90	100
cM capacity (veh/h)			1022		430	629

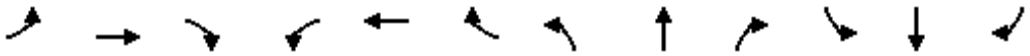
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	244	244	54	2	322	322	42	2
Volume Left	0	0	0	2	0	0	42	0
Volume Right	0	0	54	0	0	0	0	2
cSH	1700	1700	1700	1022	1700	1700	430	629
Volume to Capacity	0.14	0.14	0.03	0.00	0.19	0.19	0.10	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	8	0
Control Delay (s)	0.0	0.0	0.0	8.5	0.0	0.0	14.3	10.7
Lane LOS				A			B	B
Approach Delay (s)	0.0			0.0			14.1	
Approach LOS							B	

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	483	38	9	519	21	66	2	1	14	1	8
Future Volume (vph)	17	483	38	9	519	21	66	2	1	14	1	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		250	300		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	150			250			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.994			0.950			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1399	3343	1524	1399	3167	0	1703	1347	0	970	1060	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1399	3343	1524	1399	3167	0	1703	1347	0	970	1060	0
Link Speed (mph)		55			55			45			25	
Link Distance (ft)		2483			3026			1317			1048	
Travel Time (s)		30.8			37.5			20.0			28.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	29%	8%	6%	29%	11%	71%	6%	50%	2%	86%	100%	50%
Adj. Flow (vph)	19	537	42	10	577	23	73	2	1	16	1	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	537	42	10	600	0	73	3	0	16	10	0
Sign Control		Free			Free			Stop			Stop	

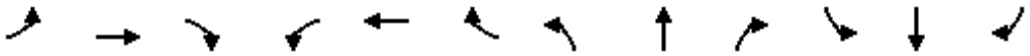
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.0%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	483	38	9	519	21	66	2	1	14	1	8
Future Volume (Veh/h)	17	483	38	9	519	21	66	2	1	14	1	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	537	42	10	577	23	73	2	1	16	1	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	600			579			893	1195	268	917	1226	300
vC1, stage 1 conf vol							575	575		608	608	
vC2, stage 2 conf vol							318	620		308	617	
vCu, unblocked vol	600			579			893	1195	268	917	1226	300
tC, single (s)	4.7			4.7			7.6	7.5	6.9	9.2	8.5	7.9
tC, 2 stage (s)							6.6	6.5		8.2	7.5	
tF (s)	2.5			2.5			3.6	4.5	3.3	4.4	5.0	3.8
p0 queue free %	98			99			78	99	100	93	99	98
cM capacity (veh/h)	810			827			333	224	730	215	168	572

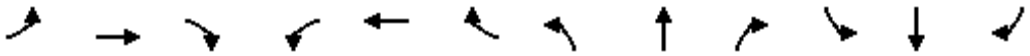
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	
Volume Total	19	268	268	42	10	385	215	73	3	16	10	
Volume Left	19	0	0	0	10	0	0	73	0	16	0	
Volume Right	0	0	0	42	0	0	23	0	1	0	9	
cSH	810	1700	1700	1700	827	1700	1700	333	292	215	461	
Volume to Capacity	0.02	0.16	0.16	0.02	0.01	0.23	0.13	0.22	0.01	0.07	0.02	
Queue Length 95th (ft)	2	0	0	0	1	0	0	21	1	6	2	
Control Delay (s)	9.6	0.0	0.0	0.0	9.4	0.0	0.0	18.8	17.5	23.1	13.0	
Lane LOS	A				A			C	C	C	B	
Approach Delay (s)	0.3				0.2			18.7		19.2		
Approach LOS								C		C		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	32.0%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	413	33	10	383	18	60	2	10	17	2	11
Future Volume (vph)	11	413	33	10	383	18	60	2	10	17	2	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		250	300		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	150			250			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.873			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1245	3059	1455	1203	2831	0	1504	911	0	992	1136	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1245	3059	1455	1203	2831	0	1504	911	0	992	1136	0
Link Speed (mph)		55			55			45			25	
Link Distance (ft)		2483			3026			1317			1048	
Travel Time (s)		30.8			37.5			20.0			28.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	45%	18%	11%	50%	24%	83%	20%	50%	88%	82%	50%	45%
Adj. Flow (vph)	12	459	37	11	426	20	67	2	11	19	2	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	459	37	11	446	0	67	13	0	19	14	0
Sign Control		Free			Free			Stop			Stop	

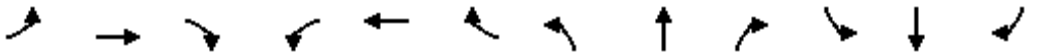
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	413	33	10	383	18	60	2	10	17	2	11
Future Volume (Veh/h)	11	413	33	10	383	18	60	2	10	17	2	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	459	37	11	426	20	67	2	11	19	2	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	446			496			731	951	230	724	978	223
vC1, stage 1 conf vol							483	483		458	458	
vC2, stage 2 conf vol							248	468		266	520	
vCu, unblocked vol	446			496			731	951	230	724	978	223
tC, single (s)	5.0			5.1			7.9	7.5	8.7	9.1	7.5	7.8
tC, 2 stage (s)							6.9	6.5		8.1	6.5	
tF (s)	2.7			2.7			3.7	4.5	4.2	4.3	4.5	3.8
p0 queue free %	99			99			82	99	98	93	99	98
cM capacity (veh/h)	858			791			369	283	565	281	276	664

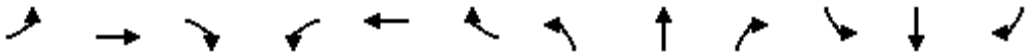
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	
Volume Total	12	230	230	37	11	284	162	67	13	19	14	
Volume Left	12	0	0	0	11	0	0	67	0	19	0	
Volume Right	0	0	0	37	0	0	20	0	11	0	12	
cSH	858	1700	1700	1700	791	1700	1700	369	490	281	553	
Volume to Capacity	0.01	0.14	0.14	0.02	0.01	0.17	0.10	0.18	0.03	0.07	0.03	
Queue Length 95th (ft)	1	0	0	0	1	0	0	16	2	5	2	
Control Delay (s)	9.3	0.0	0.0	0.0	9.6	0.0	0.0	16.9	12.5	18.7	11.7	
Lane LOS	A				A			C	B	C	B	
Approach Delay (s)	0.2				0.2			16.2		15.7		
Approach LOS								C		C		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	28.1%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	440	49	2	579	12	38	1	2	23	3	27
Future Volume (vph)	8	440	49	2	579	12	38	1	2	23	3	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		250	300		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	150			250			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.997			0.900			0.864	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1308	3374	1583	1770	3230	0	1752	1026	0	1188	1407	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1308	3374	1583	1770	3230	0	1752	1026	0	1188	1407	0
Link Speed (mph)		55			55			45			25	
Link Distance (ft)		2483			3026			1317			1048	
Travel Time (s)		30.8			37.5			20.0			28.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	38%	7%	2%	2%	10%	83%	3%	100%	50%	52%	33%	15%
Adj. Flow (vph)	9	489	54	2	643	13	42	1	2	26	3	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	489	54	2	656	0	42	3	0	26	33	0
Sign Control		Free			Free			Stop			Stop	

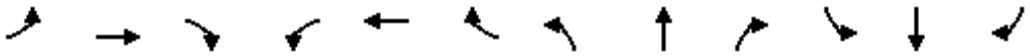
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	440	49	2	579	12	38	1	2	23	3	27
Future Volume (Veh/h)	8	440	49	2	579	12	38	1	2	23	3	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	489	54	2	643	13	42	1	2	26	3	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	656			543			864	1167	244	918	1214	328
vC1, stage 1 conf vol							507	507		654	654	
vC2, stage 2 conf vol							357	660		265	561	
vCu, unblocked vol	656			543			864	1167	244	918	1214	328
tC, single (s)	4.9			4.1			7.6	8.5	7.9	8.5	7.2	7.2
tC, 2 stage (s)							6.6	7.5		7.5	6.2	
tF (s)	2.6			2.2			3.5	5.0	3.8	4.0	4.3	3.4
p0 queue free %	99			100			88	99	100	90	99	95
cM capacity (veh/h)	721			1022			352	178	629	252	250	631

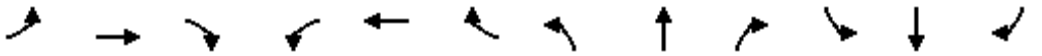
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	
Volume Total	9	244	244	54	2	429	227	42	3	26	33	
Volume Left	9	0	0	0	2	0	0	42	0	26	0	
Volume Right	0	0	0	54	0	0	13	0	2	0	30	
cSH	721	1700	1700	1700	1022	1700	1700	352	341	252	554	
Volume to Capacity	0.01	0.14	0.14	0.03	0.00	0.25	0.13	0.12	0.01	0.10	0.06	
Queue Length 95th (ft)	1	0	0	0	0	0	0	10	1	9	5	
Control Delay (s)	10.1	0.0	0.0	0.0	8.5	0.0	0.0	16.6	15.6	20.9	11.9	
Lane LOS	B				A			C	C	C	B	
Approach Delay (s)	0.2				0.0			16.5		15.9		
Approach LOS								C		C		

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	31.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	483	38	9	519	26	66	2	1	19	1	10
Future Volume (vph)	19	483	38	9	519	26	66	2	1	19	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		250	300		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	150			250			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.950			0.862	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1318	3343	1524	1399	3140	0	1703	1347	0	955	1003	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1318	3343	1524	1399	3140	0	1703	1347	0	955	1003	0
Link Speed (mph)		55			55			45			25	
Link Distance (ft)		2483			3026			1317			1048	
Travel Time (s)		30.8			37.5			20.0			28.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	37%	8%	6%	29%	11%	77%	6%	50%	2%	89%	100%	60%
Adj. Flow (vph)	21	537	42	10	577	29	73	2	1	21	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	537	42	10	606	0	73	3	0	21	12	0
Sign Control		Free			Free			Stop			Stop	

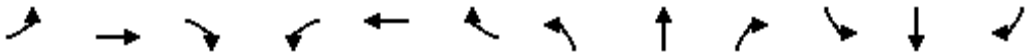
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	483	38	9	519	26	66	2	1	19	1	10
Future Volume (Veh/h)	19	483	38	9	519	26	66	2	1	19	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	537	42	10	577	29	73	2	1	21	1	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	606			579			899	1205	268	924	1232	303
vC1, stage 1 conf vol							579	579		612	612	
vC2, stage 2 conf vol							320	626		312	621	
vCu, unblocked vol	606			579			899	1205	268	924	1232	303
tC, single (s)	4.8			4.7			7.6	7.5	6.9	9.3	8.5	8.1
tC, 2 stage (s)							6.6	6.5		8.3	7.5	
tF (s)	2.6			2.5			3.6	4.5	3.3	4.4	5.0	3.9
p0 queue free %	97			99			78	99	100	90	99	98
cM capacity (veh/h)	764			827			329	221	730	210	166	548

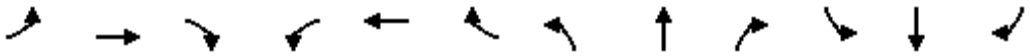
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	
Volume Total	21	268	268	42	10	385	221	73	3	21	12	
Volume Left	21	0	0	0	10	0	0	73	0	21	0	
Volume Right	0	0	0	42	0	0	29	0	1	0	11	
cSH	764	1700	1700	1700	827	1700	1700	329	288	210	460	
Volume to Capacity	0.03	0.16	0.16	0.02	0.01	0.23	0.13	0.22	0.01	0.10	0.03	
Queue Length 95th (ft)	2	0	0	0	1	0	0	21	1	8	2	
Control Delay (s)	9.8	0.0	0.0	0.0	9.4	0.0	0.0	19.0	17.6	24.1	13.0	
Lane LOS	A				A			C	C	C	B	
Approach Delay (s)	0.3				0.2			19.0		20.1		
Approach LOS								C		C		

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	32.8%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	413	33	10	383	24	60	2	10	23	2	13
Future Volume (vph)	13	413	33	10	383	24	60	2	10	23	2	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		250	300		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	150			250			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.991			0.873			0.869	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1172	3059	1455	1203	2799	0	1504	911	0	965	1076	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1172	3059	1455	1203	2799	0	1504	911	0	965	1076	0
Link Speed (mph)		55			55			45			25	
Link Distance (ft)		2483			3026			1317			1048	
Travel Time (s)		30.8			37.5			20.0			28.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	54%	18%	11%	50%	24%	88%	20%	50%	88%	87%	50%	54%
Adj. Flow (vph)	14	459	37	11	426	27	67	2	11	26	2	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	459	37	11	453	0	67	13	0	26	16	0
Sign Control		Free			Free			Stop			Stop	

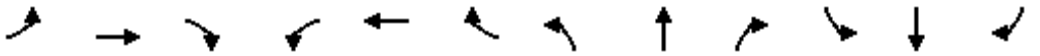
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	413	33	10	383	24	60	2	10	23	2	13
Future Volume (Veh/h)	13	413	33	10	383	24	60	2	10	23	2	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	459	37	11	426	27	67	2	11	26	2	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	453			496			737	962	230	731	986	226
vC1, stage 1 conf vol							487	487		462	462	
vC2, stage 2 conf vol							250	475		270	524	
vCu, unblocked vol	453			496			737	962	230	731	986	226
tC, single (s)	5.2			5.1			7.9	7.5	8.7	9.2	7.5	8.0
tC, 2 stage (s)							6.9	6.5		8.2	6.5	
tF (s)	2.7			2.7			3.7	4.5	4.2	4.4	4.5	3.8
p0 queue free %	98			99			82	99	98	90	99	98
cM capacity (veh/h)	809			791			365	279	565	272	273	639

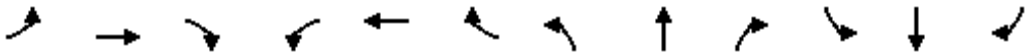
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	
Volume Total	14	230	230	37	11	284	169	67	13	26	16	
Volume Left	14	0	0	0	11	0	0	67	0	26	0	
Volume Right	0	0	0	37	0	0	27	0	11	0	14	
cSH	809	1700	1700	1700	791	1700	1700	365	488	272	547	
Volume to Capacity	0.02	0.14	0.14	0.02	0.01	0.17	0.10	0.18	0.03	0.10	0.03	
Queue Length 95th (ft)	1	0	0	0	1	0	0	17	2	8	2	
Control Delay (s)	9.5	0.0	0.0	0.0	9.6	0.0	0.0	17.1	12.6	19.6	11.8	
Lane LOS	A				A			C	B	C	B	
Approach Delay (s)	0.3				0.2			16.4		16.6		
Approach LOS								C		C		

Intersection Summary					
Average Delay	2.0				
Intersection Capacity Utilization	28.1%	ICU Level of Service		A	
Analysis Period (min)	15				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	440	49	2	579	16	38	1	2	28	3	34
Future Volume (vph)	10	440	49	2	579	16	38	1	2	28	3	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		250	300		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	150			250			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.900			0.861	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1203	3374	1583	1770	3207	0	1752	1026	0	1172	1374	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1203	3374	1583	1770	3207	0	1752	1026	0	1172	1374	0
Link Speed (mph)		55			55			45			25	
Link Distance (ft)		2483			3026			1317			1048	
Travel Time (s)		30.8			37.5			20.0			28.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	50%	7%	2%	2%	10%	88%	3%	100%	50%	54%	33%	18%
Adj. Flow (vph)	11	489	54	2	643	18	42	1	2	31	3	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	489	54	2	661	0	42	3	0	31	41	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.0%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	440	49	2	579	16	38	1	2	28	3	34
Future Volume (Veh/h)	10	440	49	2	579	16	38	1	2	28	3	34
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	489	54	2	643	18	42	1	2	31	3	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	661			543			876	1176	244	925	1221	330
vC1, stage 1 conf vol							511	511		656	656	
vC2, stage 2 conf vol							365	665		269	565	
vCu, unblocked vol	661			543			876	1176	244	925	1221	330
tC, single (s)	5.1			4.1			7.6	8.5	7.9	8.6	7.2	7.3
tC, 2 stage (s)							6.6	7.5		7.6	6.2	
tF (s)	2.7			2.2			3.5	5.0	3.8	4.0	4.3	3.5
p0 queue free %	98			100			88	99	100	87	99	94
cM capacity (veh/h)	663			1022			344	176	629	247	249	621

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	
Volume Total	11	244	244	54	2	429	232	42	3	31	41	
Volume Left	11	0	0	0	2	0	0	42	0	31	0	
Volume Right	0	0	0	54	0	0	18	0	2	0	38	
cSH	663	1700	1700	1700	1022	1700	1700	344	338	247	559	
Volume to Capacity	0.02	0.14	0.14	0.03	0.00	0.25	0.14	0.12	0.01	0.13	0.07	
Queue Length 95th (ft)	1	0	0	0	0	0	0	10	1	11	6	
Control Delay (s)	10.5	0.0	0.0	0.0	8.5	0.0	0.0	16.9	15.7	21.6	11.9	
Lane LOS	B				A			C	C	C	B	
Approach Delay (s)	0.2				0.0			16.8		16.1		
Approach LOS								C		C		

Intersection Summary					
Average Delay	1.5				
Intersection Capacity Utilization	32.0%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection: 1: Old Richburg Rd/Site Driveway & Lancaster Hwy

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	L	L	TR	L	TR
Maximum Queue (ft)	52	4	34	66	36	84	69
Average Queue (ft)	9	0	3	29	3	22	14
95th Queue (ft)	35	3	18	56	19	68	52
Link Distance (ft)		2463			1246	990	990
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225		300	225			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Old Richburg Rd/Site Driveway & Lancaster Hwy

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	L	TR	L	TR
Maximum Queue (ft)	48	35	96	50	101	75
Average Queue (ft)	4	5	32	13	24	16
95th Queue (ft)	24	26	73	43	75	55
Link Distance (ft)				1246	990	990
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	300	225			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Old Richburg Rd/Site Driveway & Lancaster Hwy

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	L	TR	L	TR
Maximum Queue (ft)	62	4	9	12	3	76	52	109	77
Average Queue (ft)	6	0	0	1	0	20	5	32	27
95th Queue (ft)	34	3	7	8	3	48	25	84	65
Link Distance (ft)		2447			2992		1246	990	990
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	225		250	300		225			
Storage Blk Time (%)									
Queuing Penalty (veh)									

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Old Richburg Rd/Site Driveway & Lancaster Hwy

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	TR	L	TR	L	TR
Maximum Queue (ft)	54	49	4	91	39	99	74
Average Queue (ft)	10	4	0	32	4	29	16
95th Queue (ft)	38	25	3	67	20	81	56
Link Distance (ft)			2992		1246	990	990
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225	300		225			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Old Richburg Rd/Site Driveway & Lancaster Hwy

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	57	46	10	12	98	54	107	74
Average Queue (ft)	7	3	0	0	32	13	33	21
95th Queue (ft)	33	21	6	9	72	45	85	62
Link Distance (ft)			2992	2992		1246	990	990
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225	300			225			
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Old Richburg Rd/Site Driveway & Lancaster Hwy

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	L	L	TR	L	TR
Maximum Queue (ft)	63	4	16	63	37	123	78
Average Queue (ft)	8	0	1	21	3	39	31
95th Queue (ft)	38	3	8	48	21	98	70
Link Distance (ft)		2447			1246	990	990
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225		300	225			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 0

SCDOT Turn Lane Warrants

Full Operations

AM Peak

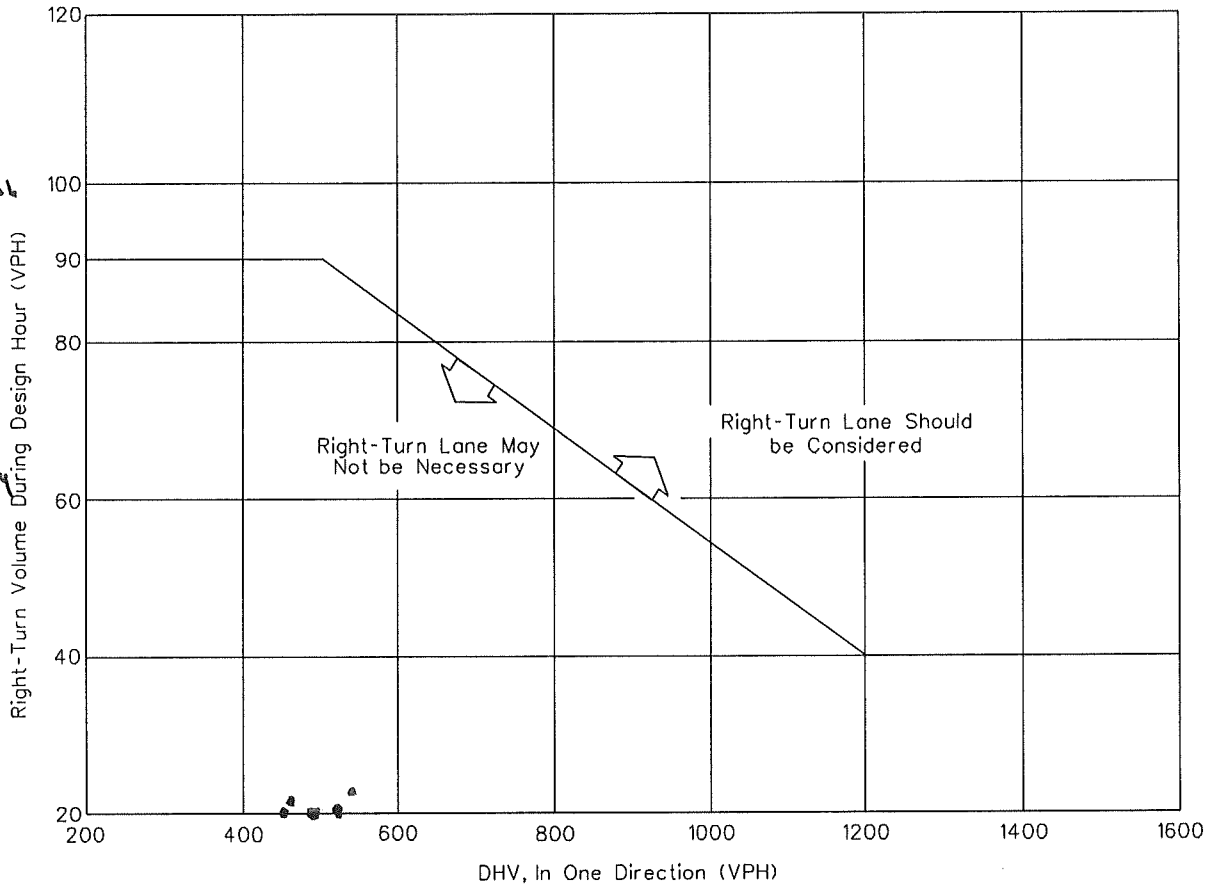
$V_{WBL} = 21$
$V_o = 538$
RT lane may not be necessary

MD

$V_{WBL} = 18$
$V_o = 457$
LT lane may not be necessary

PM

$V_{WBL} = 12$
$V_o = 497$
LT may not be necessary



Note: Figure is only applicable on highways with a design speed of 50 miles per hour or greater.

GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON FOUR-LANE HIGHWAYS

Figure 15.5B

Max Operations

AM $V_{WBL} = 26$ $V_o = 540$
RT may not be necessary

MD $V_{WBL} = 24$ $V_o = 459$
RT may not be necessary

PM $V_{WBL} = 16$ $V_o = 499$
RT may not be necessary