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December 12, 2018

Mr. Kurtis Jones  
Starwood Land Ventures  
385 Inverness Parkway, Suite 310  
Englewood, CO 80112

Re: Sunstone Village  
PA 47, 51 & 52  
Traffic Impact Analysis  
Castle Rock, CO  
LSC #170081

Dear Mr. Jones:

In response to your request, LSC Transportation Consultants, Inc. has prepared this updated traffic impact analysis for the proposed Sunstone Village PA 47, 51 & 52 portion of the overall Terrain master planned development to address Town comments. As shown on Figure 1, the site is located south of State Highway (SH) 86 on the east side of Castle Rock, Colorado.

## **REPORT CONTENTS**

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site including the lane geometries, traffic controls, posted speed limits, etc.; the existing weekday peak-hour traffic volumes; the existing daily traffic volumes in the area; the typical weekday site-generated traffic volume projections for the site; the assignment of the projected traffic volumes to the area roadways; the projected site buildout and long-term background and resulting total traffic volumes on the area roadways; the site's projected traffic impacts; and any recommended roadway improvements to mitigate the growth in background traffic and from trips generated by the site.

## **LAND USE AND ACCESS**

The site is proposed to include 74 duplex or paired dwelling units and 187 single-family detached dwelling units. Access is proposed to Ridge Road and Enderud Boulevard as shown in the conceptual site plan in Figure 2.

## **ROADWAY AND TRAFFIC CONDITIONS**

### **Area Roadways**

The major roadways in the site's vicinity are shown on Figure 1 and are described below.

- **State Highway (SH) 86** is an east-west, two-lane arterial roadway north of the site. The intersection with Founders Parkway is signalized with auxiliary turn lanes. The posted speed limit is 55 mph in the vicinity of the site. It is classified by CDOT as NR-A (Non-Rural Principal Highway). The section adjacent to the site is planned as a four-lane cross-section by 2040. The Town of Castle Rock plans to replace the traffic signal with a modern two-lane roundabout by 2022.
- **N. Ridge Road** is a north-south, two-lane arterial roadway southwest of the site. The intersection with SH 86/5<sup>th</sup> Street is signalized with auxiliary lanes and the intersection with E. Enderud Boulevard is controlled by a roundabout. The posted speed limit in the vicinity of the site is 45 mph. The Town of Castle Rock has a CIP project under design to widen to a four-lane section south to Plum Creek Parkway by 2022.
- **E. Enderud Boulevard** is a four-lane collector roadway south of the site. The intersection with N. Ridge Road is controlled by a roundabout. The posted speed limit in the vicinity of the site is 35 mph.

### Existing Traffic Conditions

Figure 3 shows the existing traffic volumes, lane geometry, posted speed limits, and traffic control in the site's vicinity on a typical weekday. The weekday peak-hour traffic volumes and average daily traffic volumes are from the attached traffic counts conducted by Counter Measures in January and September, 2017 and October, 2018.

### 2023 and 2040 Background Traffic

Figure 4 shows the estimated 2023 background traffic and Figure 5 shows the estimated 2040 background traffic. The 2023 background traffic is based on the projections in the *Castle Rock Transportation Master Plan* (TMP). The projections in Figure 5 are based on the 2040 total traffic volume from Figure 9 of the 2016 *Founders Crossing TIA* by LSC less the trips from the originally assumed land use for the Sunstone Village site which is about a third more dense than what is currently being proposed. This was done at the direction of Town staff and results in a long-term projection above those estimated in the Town's *Transportation Master Plan* (TMP).

### Existing, 2023, and 2040 Background Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay and LOS F is indicative of a high level of congestion or delay. Attached are specific level of service definitions for signalized and unsignalized intersections.

The intersections in Figures 3, 4 and 5 were analyzed to determine the existing, 2023, and 2040 background levels of service using Synchro, HCS, and/or Rodel. Table 1 shows the level of service analysis results. The level of service reports are attached.

- **SH 86/Ridge Road/5<sup>th</sup> Street/Founders Parkway:** This signalized intersection currently operates at an overall LOS "C" during both morning and afternoon peak-hours. By 2023,

it is expected to be converted to a two-lane roundabout and as such is expected to operate at LOS “A” during both peak-hours through 2023. In 2040, it is expected to operate at LOS “C” or better during both peak-hours, but the southbound approach is expected to operate at LOS “F” in the afternoon peak-hour.

- **Ridge Road/E. Enderud Boulevard:** This roundabout controlled intersection currently operates at an overall LOS “B” during the morning peak-hour and LOS “A” during the afternoon peak-hour and is expected to operate at LOS “A” during both peak-hours through 2040.

## **TRIP GENERATION**

Table 2 shows the estimated average weekday, morning peak-hour, and afternoon peak-hour trip generation for the proposed site based on the rates from *Trip Generation*, 10<sup>th</sup> Edition, 2017 by the Institute of Transportation Engineers (ITE).

The site is projected to generate about 2,307 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 43 vehicles would enter and about 130 vehicles would exit the site. During the afternoon peak-hour, which generally occurs for one hour between 4:00 and 6:00 p.m., about 143 vehicles would enter and about 75 vehicles would exit.

## **TRIP DISTRIBUTION**

Figure 6 shows the estimated directional distribution of site-generated traffic volumes on the area roadways. The estimates were based on the location of the site with respect to the regional population, employment, activity centers, and the site’s proposed land use.

## **TRIP ASSIGNMENT**

Figure 7 shows the estimated site-generated traffic volumes based on the directional distribution percentages (from Figure 6) and the trip generation estimate (from Table 2).

## **2023 AND 2040 TOTAL TRAFFIC**

Figure 8a shows the 2023 total traffic which is the sum of the 2023 background traffic volumes (from Figure 4) and the site-generated traffic volumes (from Figure 7). Figure 8b shows the recommended 2023 lane geometry and traffic control.

Figure 9a shows the 2040 total traffic which is the sum of the 2040 background traffic volumes (from Figure 5) and the site-generated traffic volumes (from Figure 7). Figure 9b shows the recommended 2040 lane geometry and traffic control.

## **PROJECTED LEVELS OF SERVICE**

The intersections in Figures 8a through 9b were analyzed to determine the 2023 and 2040 total traffic levels of service. Table 1 shows the level of service analysis results.

- **Ridge Road/Site Access:** All movements at this stop-sign controlled three-quarter movement intersection are expected to operate at “B” or better through 2040 with CIP improvements planned by the Town.
- **Enderud Boulevard/Site Access:** All movements at this full movement stop-controlled intersection are expected to operate at “C” or better through 2040.
- **SH 86/Ridge Road/5<sup>th</sup> Street/Founders Parkway:** Based on the conservative traffic projections required to be used, this roundabout controlled intersection is expected to operate at an overall LOS “C” or better during the morning peak-hour through 2040 with CIP improvements planned by the Town. The southbound approach is expected to operate at LOS “F” during the afternoon peak-hour by 2040 with or without development of the site. This movement is expected to operate at LOS “D” or better if the 2040 traffic volumes end up being more consistent with the Town’s TMP.
- **Ridge Road/E. Enderud Boulevard:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040 with CIP improvements planned by the Town.

## CONCLUSIONS AND RECOMMENDATIONS

### Trip Generation

1. The site is projected to generate about 2,307 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, about 43 vehicles would enter and about 130 vehicles would exit the site. During the afternoon peak-hour, about 143 vehicles would enter and about 75 vehicles would exit.

### Projected Levels of Service

2. All signalized intersections and all movements at the unsignalized intersections analyzed are expected to operate at LOS “D” or better during both peak-hours through 2040 with the following exception: The southbound approach at the SH 86/Ridge Road/5<sup>th</sup> Street/Founders Parkway intersection is expected to operate at LOS “F” in the 2040 afternoon peak-hour if the future 2040 traffic volumes shown in Figures 5 and 9a are realized over time. The recent projections in the Town’s TMP suggest the projections in Figures 5 and 9a are overly conservative. The southbound approach delay is expected to be LOS “D” or better if the future 2040 traffic volumes end up being consistent with the Town’s TMP.

### Conclusions

3. The impact of the Sunstone Village PA 47, 51 & 52 development can be accommodated by the existing roadway network with implementation of the recommendations below.
4. The Town of Castle Rock has a CIP project to convert the SH 86/Ridge Road/5<sup>th</sup> Street/Founders Parkway intersection from a traffic signal to a roundabout by 2022.

**Recommendations**

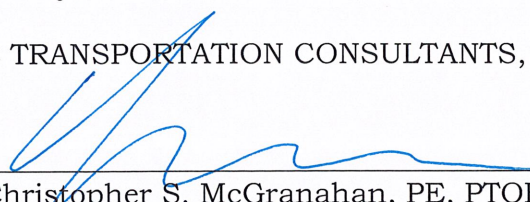
5. The Town of Castle Rock has a CIP project to widen N. Ridge Road south to Plum Creek Parkway by 2022 including improvements to the existing intersections along the corridor. The southbound left-turn lane on N. Ridge Road approaching the proposed site access should be 350 feet (275 feet for deceleration from 45 mph and 75 feet for vehicle storage) plus a 160-foot transition taper.
6. The existing eastbound left-turn lane on Enderud Boulevard approaching the proposed site access is about 140 feet long with a 175-foot transition taper. This length is appropriate because all vehicles approaching this movement will have just exited the existing roundabout at N. Ridge Road/Enderud Boulevard.
7. The proposed site access approach to Enderud Boulevard should have separate left-turn and right-turn lanes. The left-turn lane should be about 100 feet long.
8. A southbound right-turn bypass or turn lane may be needed by 2040 at the planned two-lane roundabout at the SH 86/Ridge Road/5<sup>th</sup> Street/Founders Parkway intersection if the 2040 traffic volumes exceed the projections in the Town's TMP and approach the volumes shown in Figures 5 and 9a. The conservative volumes in Figures 5 and 9a were required to be used by Town staff to test the sensitivity of the proposed roundabout to accommodate future growth.

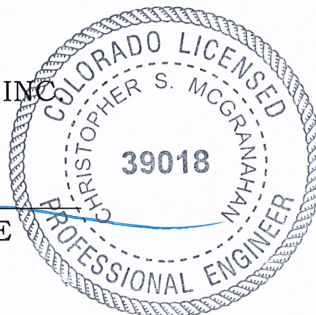
\* \* \* \* \*

We trust our findings will assist you in gaining approval of the Sunstone Village PA 47, 51 & 52 development. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC

By   
Christopher S. McGranahan, PE, PTOE  
Principal



CSM/wc

12-12-18

Enclosures: Tables 1 and 2  
Figures 1 - 9b  
Traffic Counts  
Level of Service Definitions  
Level of Service Reports



**Table 1**  
**Intersection Levels of Service Analysis**  
**Sunstone Village PA 47, 51 & 52**  
**Castle Rock, CO**  
**LSC #170081; December, 2018**

Intersection Location	Traffic Control	Existing Traffic		2023 Background Traffic		2023 Total Traffic		2040 Background Traffic		2040 Total Traffic	
		Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM
<u>Ridge Road/Site Access</u>	TWSC										
WB Right	Three-	--	--	--	--	B	B	--	--	B	B
SB Left	Quarter	--	--	--	--	B	A	--	--	B	A
Critical Movement Delay		--	--	--	--	12.6	10.5	--	--	13.4	11.3
<u>Enderud Blvd./Site Access</u>	TWSC										
NEB Left	Full	--	--	--	--	A	A	--	--	A	A
SEB Left	Movement	--	--	--	--	C	C	--	--	C	C
SEB Right		--	--	--	--	B	A	--	--	B	A
Critical Movement Delay		--	--	--	--	16.7	16.3	--	--	16.6	16.3
<u>SH 86/Ridge Road/5th Street/Founders Parkway</u>	Signalized										
EB Left		C	C	--	--	--	--	--	--	--	--
EB Through		C	C	--	--	--	--	--	--	--	--
WB Left		C	C	--	--	--	--	--	--	--	--
WB Through		D	C	--	--	--	--	--	--	--	--
NB Left		C	B	--	--	--	--	--	--	--	--
NB Through		C	C	--	--	--	--	--	--	--	--
SB Left		B	D	--	--	--	--	--	--	--	--
SB Through		B	C	--	--	--	--	--	--	--	--
Entire Intersection Delay (sec /veh)		27.8	29.6	--	--	--	--	--	--	--	--
Entire Intersection LOS		C	C	--	--	--	--	--	--	--	--
	Roundabout										
EB Approach		--	--	A	A	A	A	A	A	A	A
WB Approach		--	--	A	A	A	A	A	A	A	A
NB Approach		--	--	A	B	B	B	B	A	B	A
SB Approach		--	--	B	B	B	B	A	F	A	F
Entire Intersection Delay (sec /veh)		--	--	7.3	8.8	8.1	9.9	5.6	20.1	6.1	32.7
Entire Intersection LOS		--	--	A	A	A	A	A	C	A	D
<u>Ridge Road/E. Enderud Blvd.</u>	Roundabout										
WB Approach		C	A	A	A	A	A	A	A	A	A
NB Approach		A	A	A	A	A	A	A	A	A	A
SB Approach		A	A	A	A	A	A	A	A	A	A
Entire Intersection Delay (sec /veh)		10.4	6.8	5.9	6.0	6.2	6.3	6.4	7.2	6.7	7.5
Entire Intersection LOS		B	A	A	A	A	A	A	A	A	A

(1) Highway Capacity Software (HCS) was used to evaluate all roundabouts with the exception of the 2040 scenarios for the SH 86/Ridge Road/5th Street/Founders Parkway intersection which was analyzed using RODEL because it is more effective evaluating roundabouts that are at or near capacity.

**Table 2**  
**ESTIMATED TRAFFIC GENERATION**  
**Sunstone Village PA 47, 51 & 52**  
**Castle Rock, CO**  
**LSC #170081; December, 2018**

Trip Generating Category	Quantity	Trip Generation Rates <sup>(1)</sup>					Vehicle-Trips Generated				
		Average Weekday	AM Peak Hour		PM Peak Hour		Average Weekday	AM Peak Hour		PM Peak - Hour	
			In	Out	In	Out		In	Out	In	Out
Single-Family <sup>(2)</sup>	187 DU <sup>(3)</sup>	9.44	0.185	0.555	0.624	0.366	1,765	35	104	117	68
Duplex <sup>(4)</sup>	74 DU	7.32	0.106	0.354	0.353	0.096	542	8	26	26	7
<b>Total =</b>							<b>2,307</b>	<b>43</b>	<b>130</b>	<b>143</b>	<b>75</b>

**Notes:**

- (1) Source: *Trip Generation*, Institute of Transportation Engineers, 10th Edition, 2017.
- (2) ITE Land Use No. 210 - Single-Family Detached Housing
- (3) DU - Dwelling Units
- (4) ITE Land Use No. 220 - Multifamily Housing (Low Rise)



Figure 1

## Vicinity Map

Sunstone Village PA 47, 51 & 52 (LSC #170081)



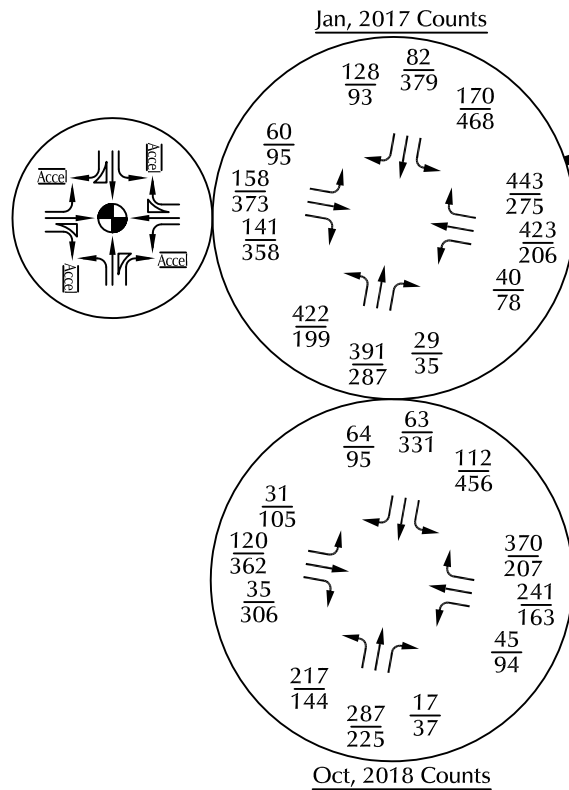


Approximate Scale  
Scale: NTS

Figure 2  
**Site Plan**

Sunstone Village PA 47, 51 & 52 (LSC #170081)





Note: The October, 2018 counts generally show lower overall traffic volumes than the January, 2017 counts so the earlier counts were used to maintain a conservative analysis.

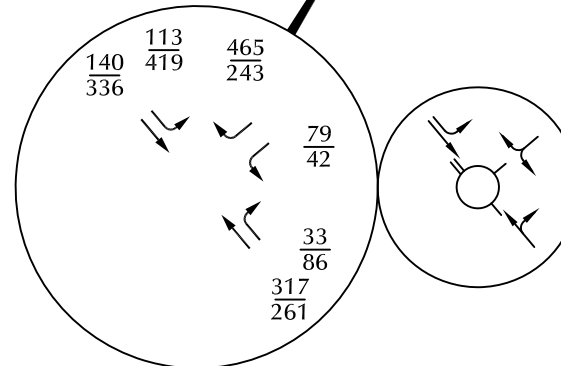
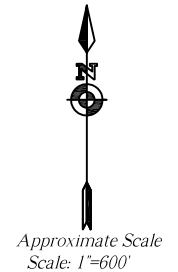
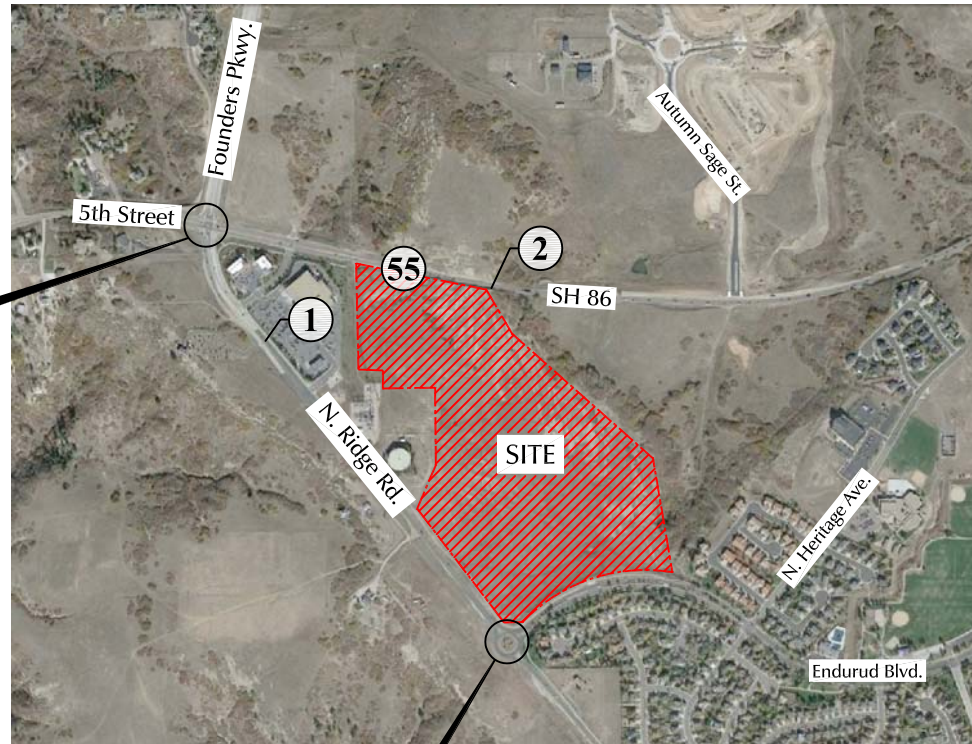
**LEGEND:**

⊥ = Stop Sign

(55) = Speed Limit

$\frac{26}{35}$  = AM Peak Hour Traffic  
PM Peak Hour Traffic

2,500 = Average Daily Traffic



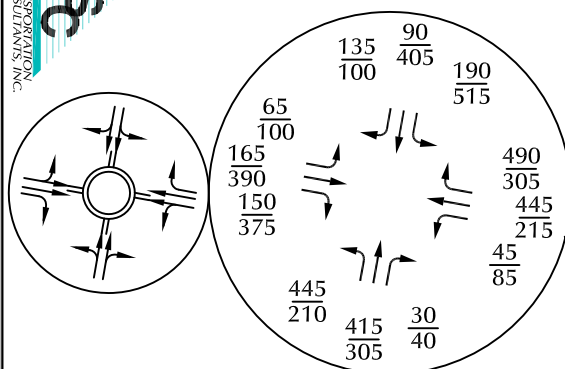
**1** Ridge Road south of SH 86  
Wednesday 1/25/2017 13,095vpd  
Thursday 1/26/2017 12,840vpd  
Average = 12,970vpd

**2** SH 86 west of Autumn Sage Street  
Wednesday 1/25/2017 15,245vpd  
Thursday 1/26/2017 15,360vpd  
Average = 15,300vpd

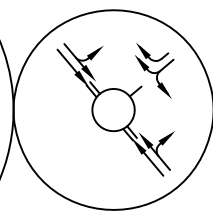
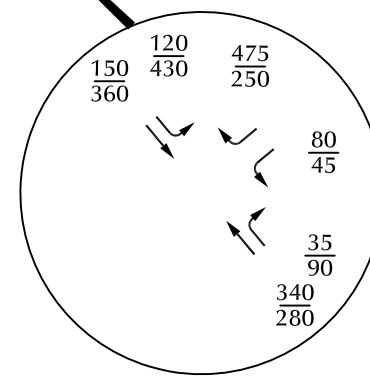
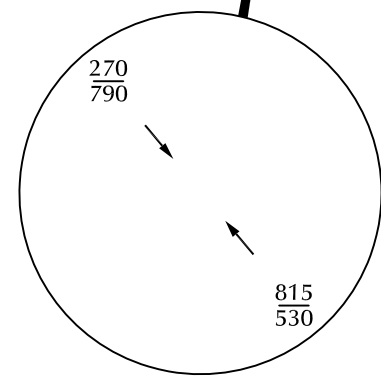
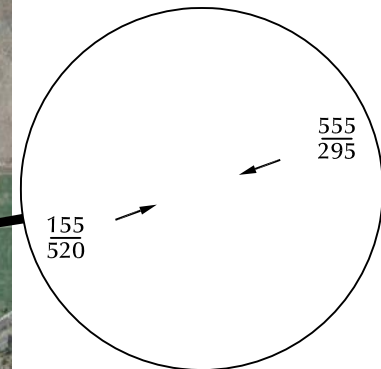
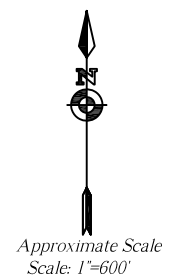
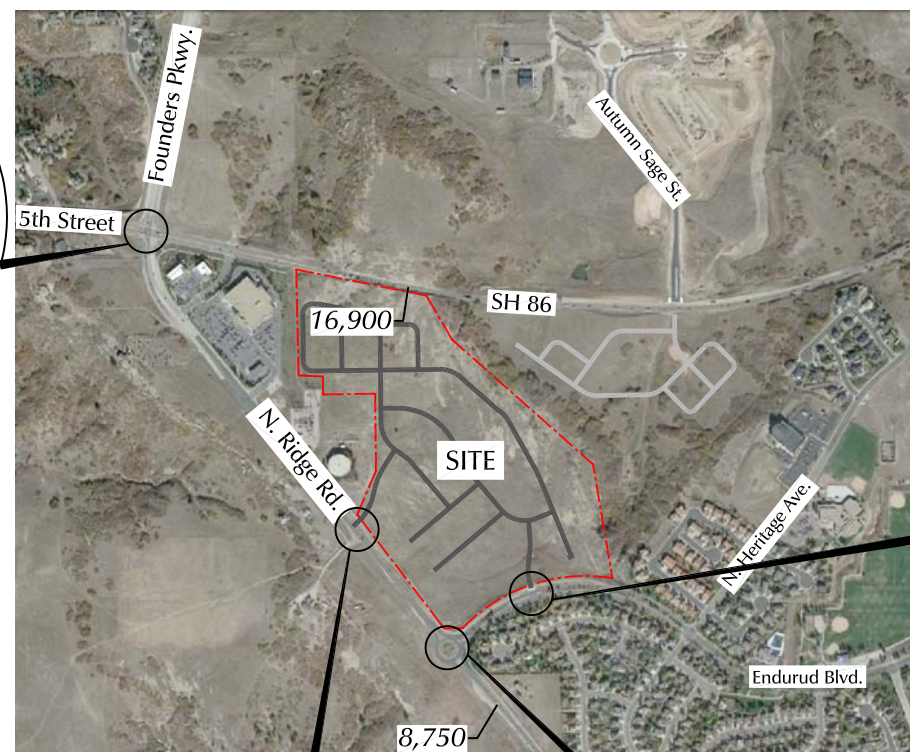
Figure 3

# Existing Traffic, Lane Geometry and Traffic Control

Sunstone Village PA 47, 51 & 52 (LSC #170081)

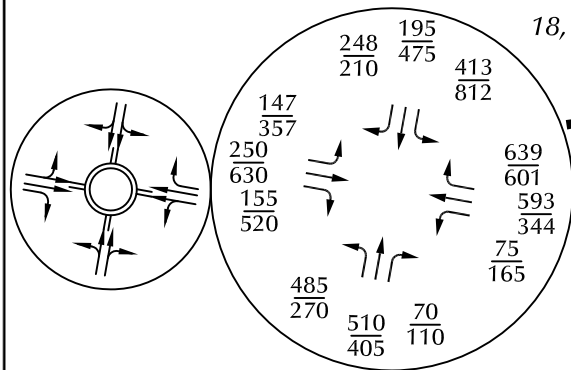


Note: An annual growth rate of two percent was assumed on SH 86 and Founders Parkway, one percent on 5th Street, 1.3 percent on Ridge Road and 0.5 percent on Enderud Boulevard based on the projections in the Castle Rock TMP.

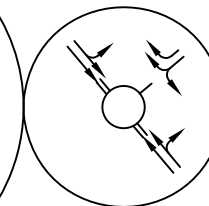
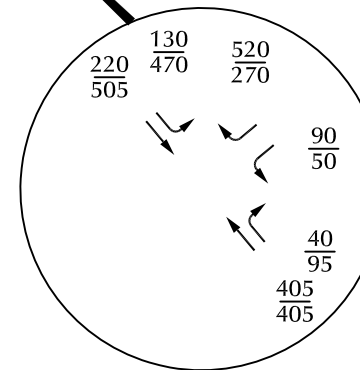
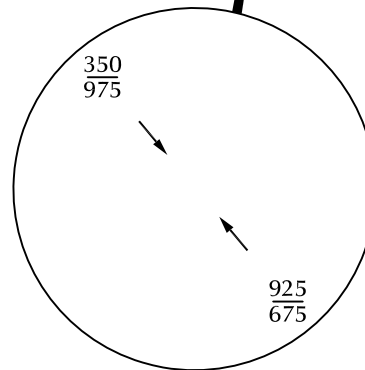
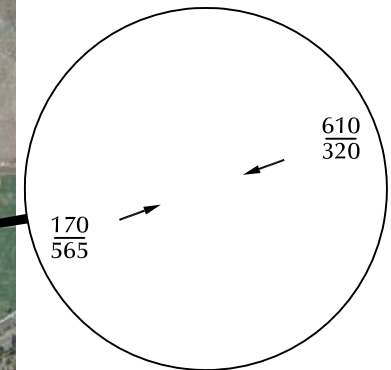
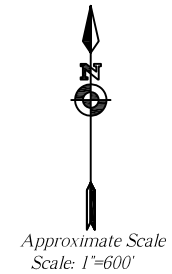
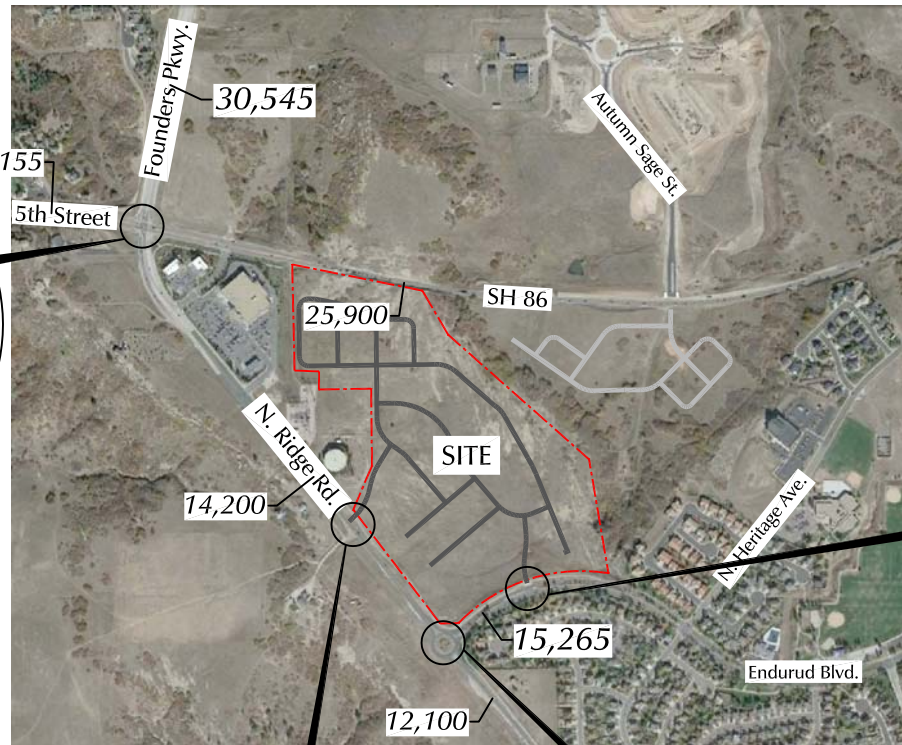


- LEGEND:
- = Stop Sign
  - = Traffic Signal
  - = Modern Roundabout
  - $\frac{26}{35}$  = AM Peak Hour Traffic / PM Peak Hour Traffic
  - 2,500 = Average Daily Traffic

Figure 4  
**Year 2023 Background Traffic,  
Lane Geometry and Traffic Control**  
Sunstone Village PA 47, 51 & 52 (LSC #170081)



Note: The 2040 background traffic volumes are based on the 2040 total traffic volumes from Figure 9 of the 2016 Founders Crossing TIA by LSC less the trips from the originally assumed land use for the Sunstone Village site which are about a third more dense than what is currently being proposed. This was done at the direction of town staff and results in long-term projections above those estimated in the Towns Transportation Master Plan (TMP).



#### LEGEND:

- = Stop Sign
- = Traffic Signal
- = Modern Roundabout
- $\frac{26}{35}$  = AM Peak Hour Traffic / PM Peak Hour Traffic
- 2,500 = Average Daily Traffic

Figure 5

## Year 2040 Background Traffic, Lane Geometry and Traffic Control

Sunstone Village PA 47, 51 & 52 (LSC #170081)





Approximate Scale  
Scale: 1"=600'

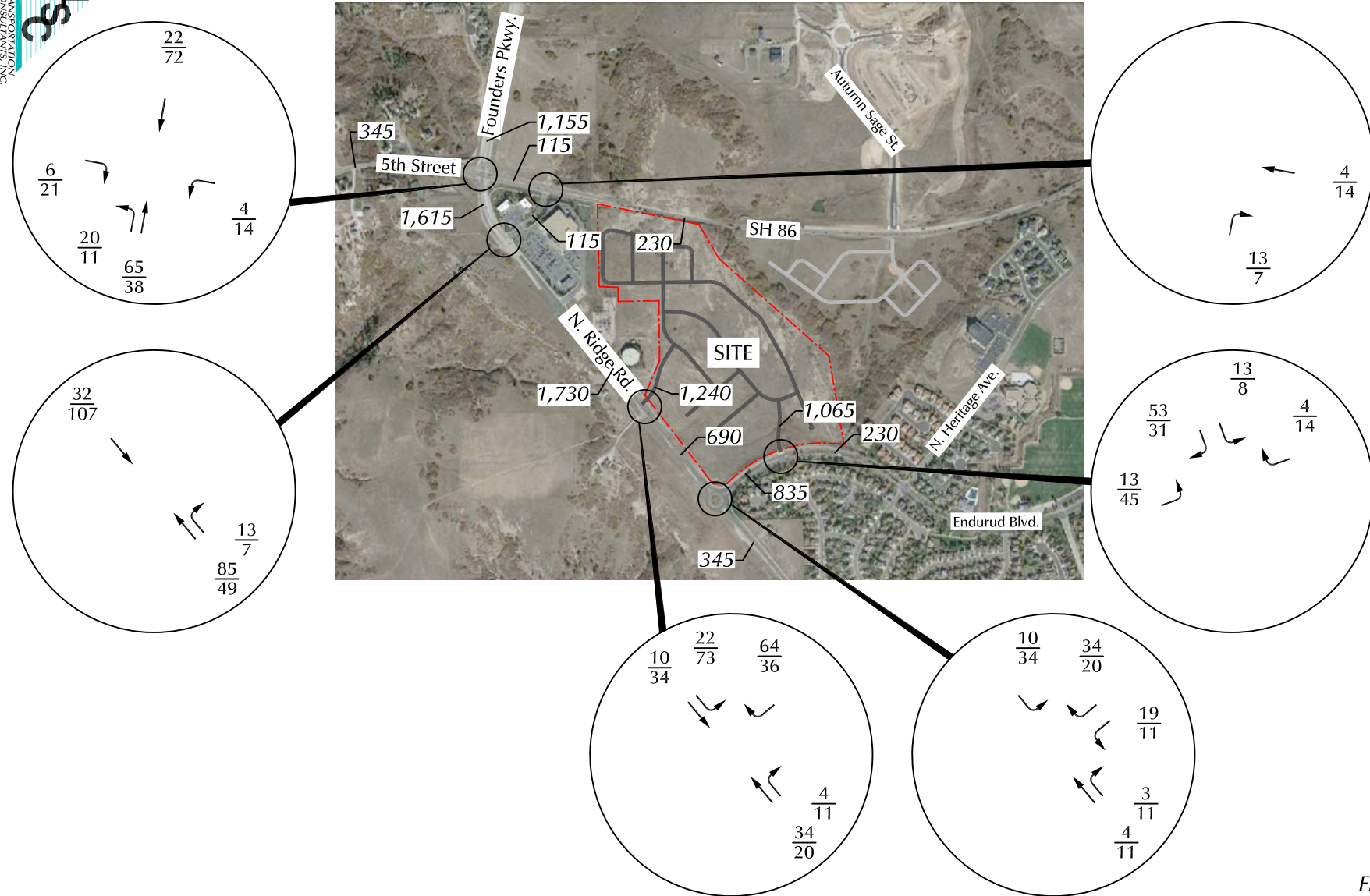
LEGEND:

65% = Percent Directional  
Distribution

Figure 6

## Directional Distribution of Site-Generated Traffic

Sunstone Village PA 47, 51 & 52 (LSC #170081)



LEGEND:

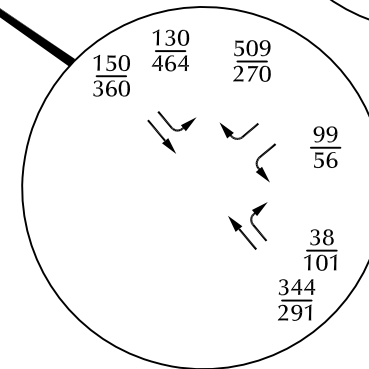
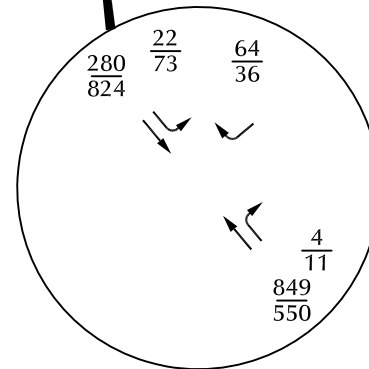
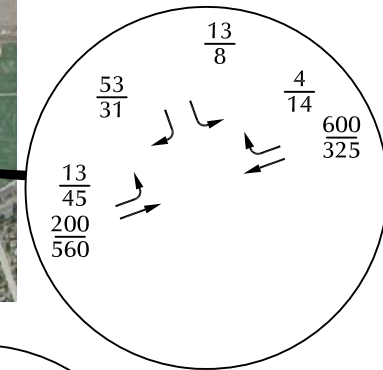
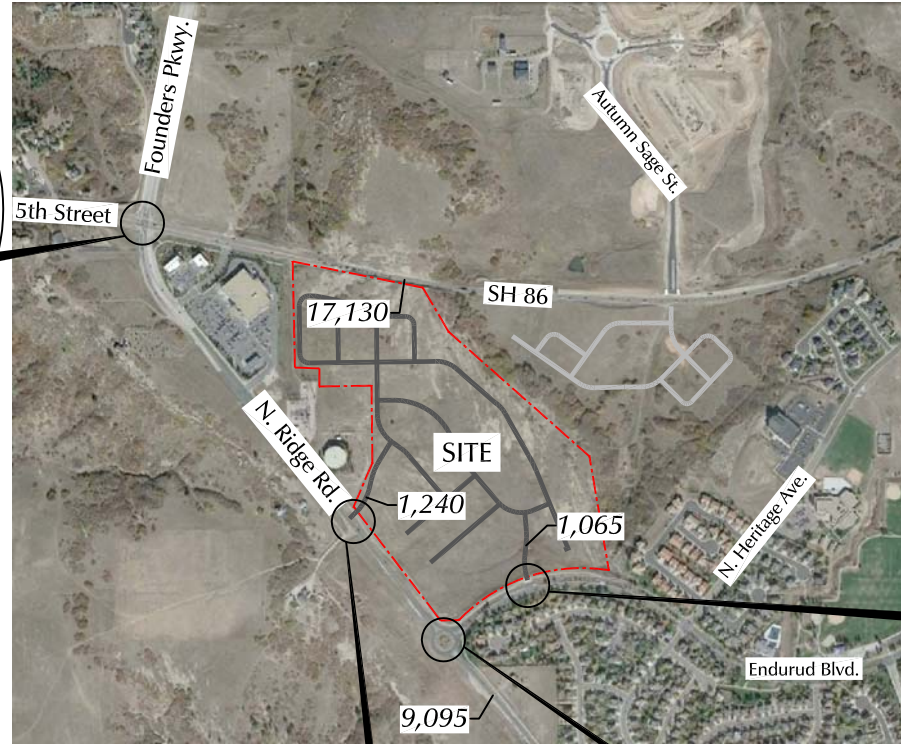
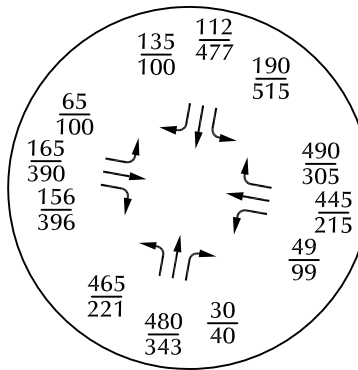
$\frac{26}{35}$  = AM Peak Hour Traffic  
PM Peak Hour Traffic

2,500 = Average Daily Traffic

Figure 7

# Assignment of Site-Generated Traffic

Sunstone Village PA 47, 51 & 52 (LSC #170081)



LEGEND:

$\frac{26}{35}$  = AM Peak Hour Traffic  
PM Peak Hour Traffic

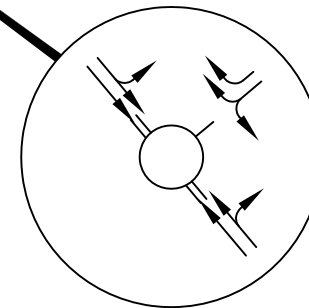
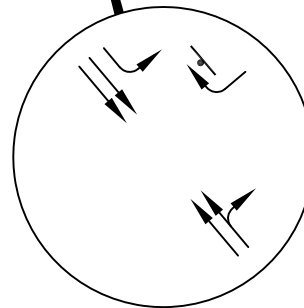
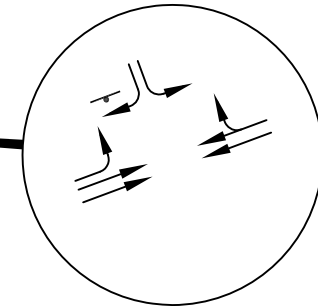
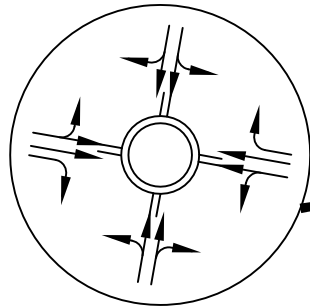
2,500 = Average Daily Traffic

Figure 8a

**Year 2023  
Total Traffic**

Sunstone Village PA 47, 51 & 52 (LSC #170081)





LEGEND:




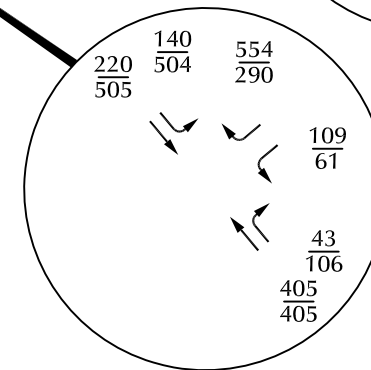
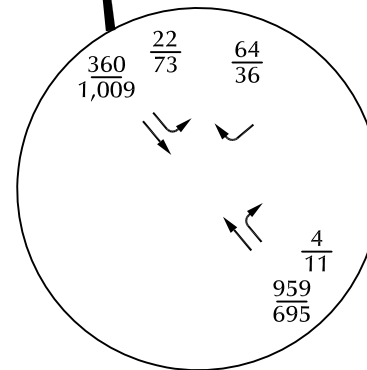
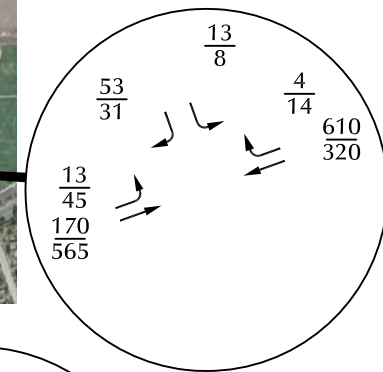
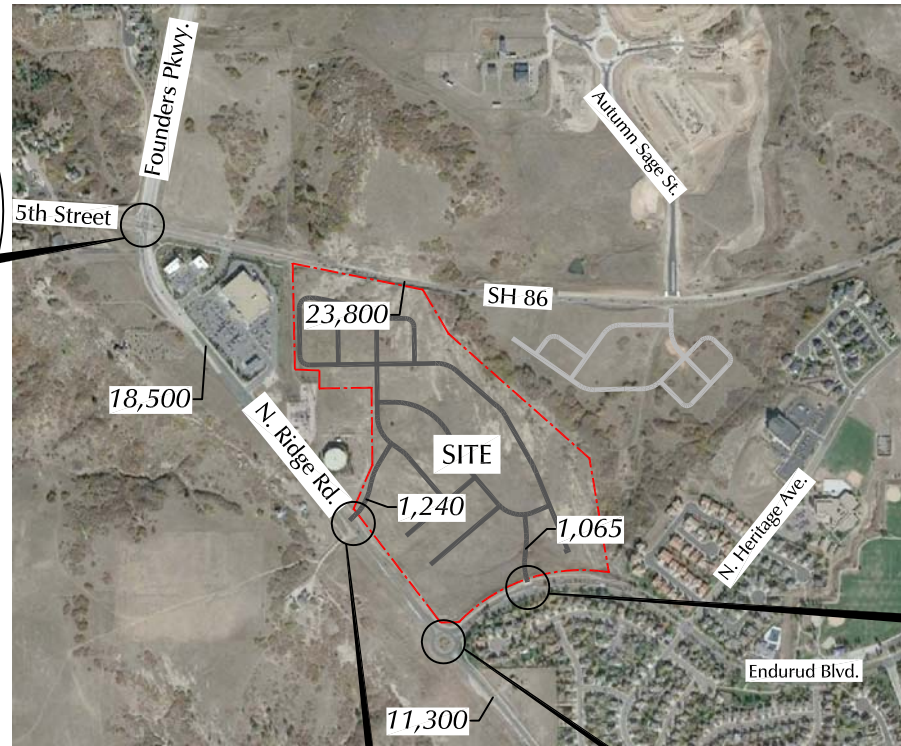
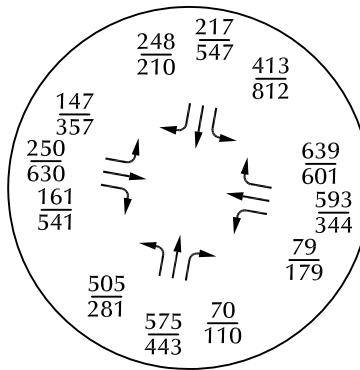
-  = Stop Sign
-  = Traffic Signal
-  = Modern Roundabout

Figure 8b

# *Year 2023 Total Lane Geometry and Traffic Control*

Sunstone Village PA 47, 51 & 52 (LSC #170081)





LEGEND:

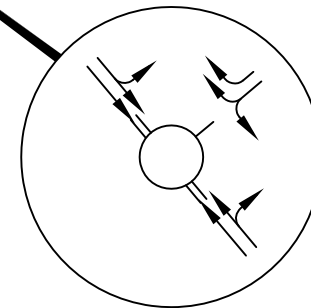
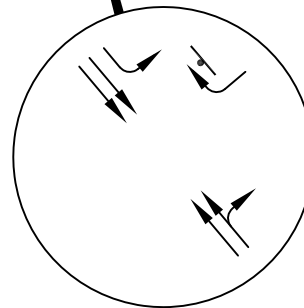
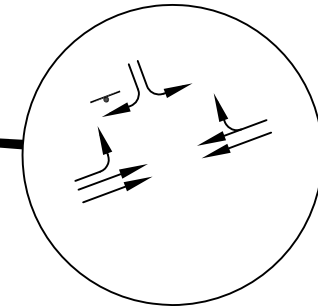
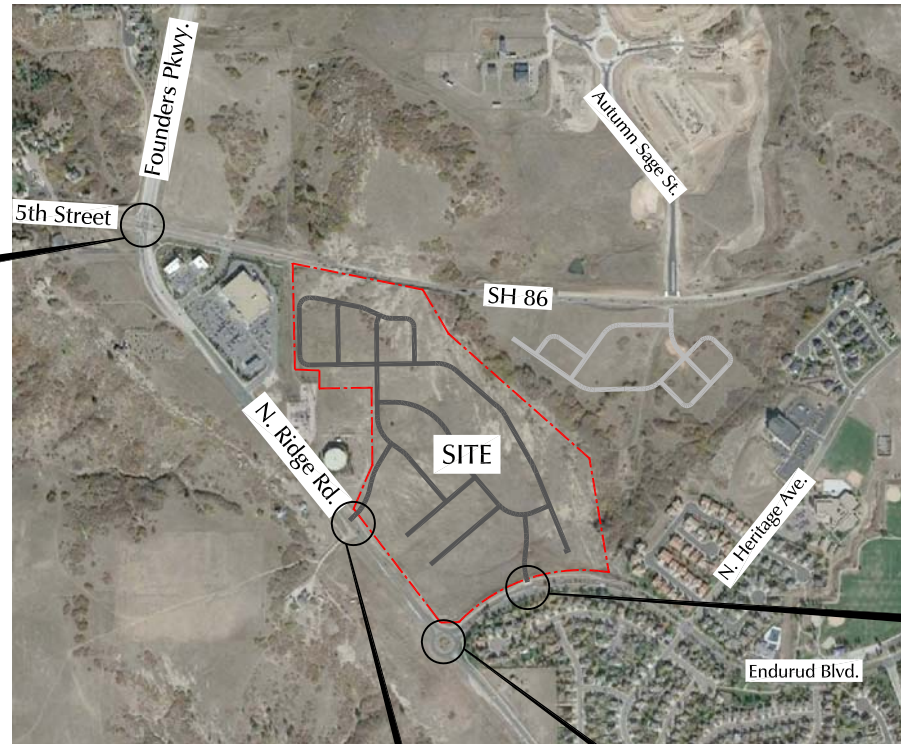
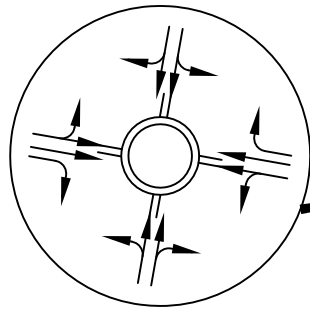
$\frac{26}{35}$  = AM Peak Hour Traffic  
PM Peak Hour Traffic

2,500 = Average Daily Traffic

Figure 9a

**Year 2040  
Total Traffic**

Sunstone Village PA 47, 51 & 52 (LSC #170081)



LEGEND:




-  = Stop Sign
-  = Traffic Signal
-  = Modern Roundabout

Figure 9b

## Year 2040 Total Lane Geometry and Traffic Control

Sunstone Village PA 47, 51 & 52 (LSC #170081)

## LEVEL OF SERVICE DEFINITIONS

From *Highway Capacity Manual*, Transportation Research Board, 2010

### SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

<b>LOS</b>	<b><u>Average Vehicle Delay</u> sec/vehicle</b>	<b><u>Operational Characteristics</u></b>
<b>A</b>	<10 seconds	Describes operations with low control delay, up to 10 sec/veh. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
<b>B</b>	10 to 20 seconds	Describes operations with control delay greater than 10 seconds and up to 20 sec/veh. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.
<b>C</b>	20 to 35 seconds	Describes operations with control delay greater than 20 and up to 35 sec/veh. These higher delays may result from only fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
<b>D</b>	35 to 55 seconds	Describes operations with control delay greater than 35 and up to 55 sec/veh. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
<b>E</b>	55 to 80 seconds	Describes operations with control delay greater than 55 and up to 80 sec/veh. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.
<b>F</b>	>80 seconds	Describes operations with control delay in excess of 80 sec/veh. This level, considered unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

## LEVEL OF SERVICE DEFINITIONS

From *Highway Capacity Manual*, Transportation Research Board, 2010

### UNSIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

Applicable to Two-Way Stop Control, All-Way Stop Control, and Roundabouts

LOS	Average Vehicle Control Delay	Operational Characteristics
A	<10 seconds	Normally, vehicles on the stop-controlled approach only have to wait up to 10 seconds before being able to clear the intersection. Left-turning vehicles on the uncontrolled street do not have to wait to make their turn.
B	10 to 15 seconds	Vehicles on the stop-controlled approach will experience delays before being able to clear the intersection. <u>The delay could be up to 15 seconds.</u> Left-turning vehicles on the uncontrolled street may have to wait to make their turn.
C	15 to 25 seconds	Vehicles on the stop-controlled approach can expect delays in the range of 15 to 25 seconds before clearing the intersection. Motorists may begin to take chances due to the long delays, thereby posing a safety risk to through traffic. <u>Left-turning vehicles on the uncontrolled street will now be required to wait to make their turn causing a queue to be created in the turn lane.</u>
D	25 to 35 seconds	<u>This is the point at which a traffic signal may be warranted for this intersection.</u> The delays for the stop-controlled intersection are not considered to be excessive. The length of the queue may begin to block other public and private access points.
E	35 to 50 seconds	The delays for all critical traffic movements are considered to be unacceptable. The length of the queues for the stop-controlled approaches as well as the left-turn movements are extremely long. <u>There is a high probability that this intersection will meet traffic signal warrants.</u> The ability to install a traffic signal is affected by the location of other existing traffic signals. Consideration may be given to restricting the accesses by eliminating the left-turn movements from and to the stop-controlled approach.
F	>50 seconds	The delay for the critical traffic movements are probably in excess of 100 seconds. The length of the queues are extremely long. Motorists are selecting alternative routes due to the long delays. <u>The only remedy for these long delays is installing a traffic signal or restricting the accesses.</u> The potential for accidents at this intersection are extremely high due to motorist taking more risky chances. If the median permits, motorists begin making two-stage left-turns.



# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER, COLORADO  
303-333-7409

N/S STREET: FOUNDERS PKWY  
E/W STREET: SH-86 / 5TH ST  
CITY: CASTLE ROCK  
COUNTY: DOUGLAS

File Name : FOUNSH-86  
Site Code : 00000015  
Start Date : 10/10/2018  
Page No : 1

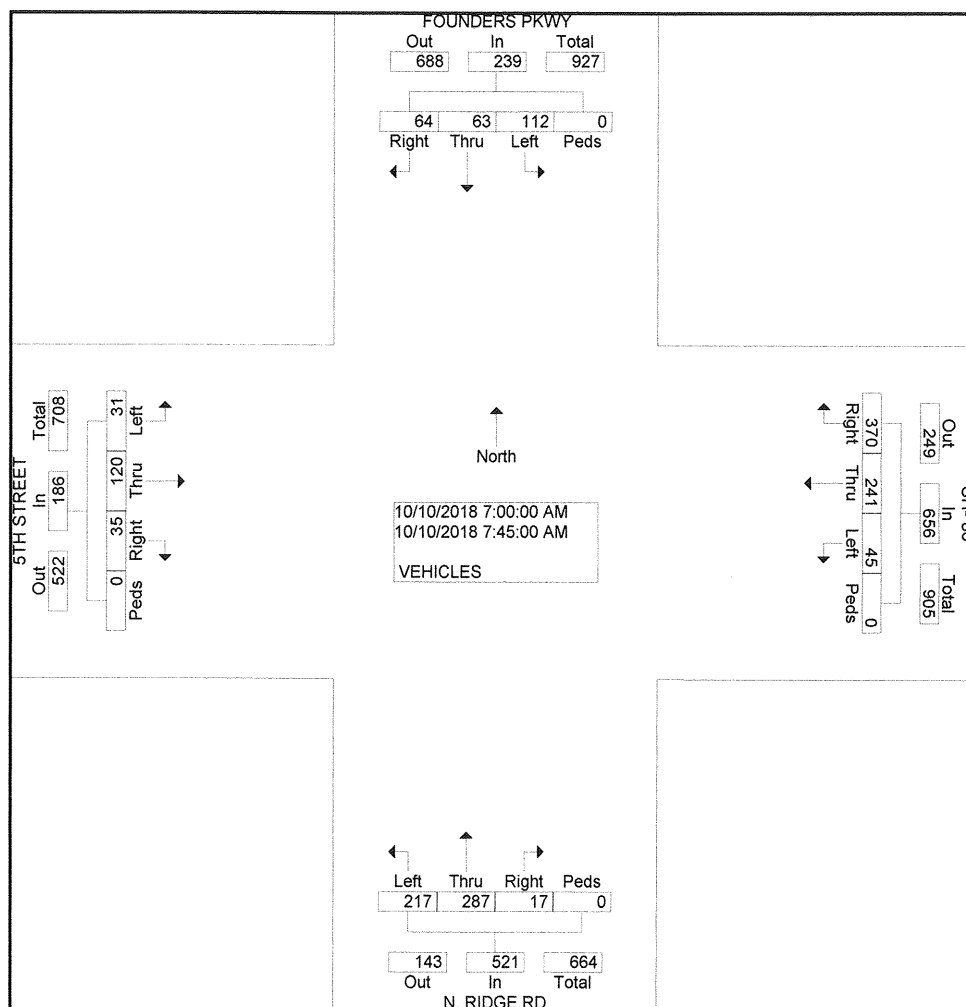
## Groups Printed- VEHICLES

	FOUNDERS PKWY Southbound				SH- 86 Westbound				N. RIDGE RD Northbound				5TH STREET Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	19	6	9	0	3	38	96	0	40	72	6	0	6	22	7	0	324
06:45 AM	27	16	12	0	7	60	99	0	39	72	5	0	12	8	10	0	367
Total	46	22	21	0	10	98	195	0	79	144	11	0	18	30	17	0	691
07:00 AM	28	12	10	0	13	52	85	0	51	81	4	0	11	32	6	0	385
07:15 AM	25	21	16	0	7	57	99	0	39	69	4	0	7	37	10	0	391
07:30 AM	25	7	14	0	15	52	94	0	57	64	4	0	6	27	10	0	375
07:45 AM	34	23	24	0	10	80	92	0	70	73	5	0	7	24	9	0	451
Total	112	63	64	0	45	241	370	0	217	287	17	0	31	120	35	0	1602
08:00 AM	30	23	19	0	18	65	70	0	24	63	6	0	4	27	13	0	362
08:15 AM	27	16	27	0	13	57	107	0	44	61	7	0	8	24	22	0	413
Total	57	39	46	0	31	122	177	0	68	124	13	0	12	51	35	0	775
04:00 PM	84	52	18	0	15	25	63	0	39	46	6	0	7	58	57	0	470
04:15 PM	107	64	23	0	16	37	61	0	33	51	6	0	20	70	69	0	557
04:30 PM	108	89	15	0	18	44	54	0	35	53	14	0	27	61	72	0	590
04:45 PM	115	78	23	0	25	44	65	0	39	32	14	0	21	84	58	0	598
Total	414	283	79	0	74	150	243	0	146	182	40	0	75	273	256	0	2215
05:00 PM	95	74	32	0	17	41	44	0	31	58	6	0	26	105	90	0	619
05:15 PM	122	99	24	0	24	48	45	0	41	69	12	0	23	87	78	0	672
05:30 PM	124	80	16	0	28	30	53	0	33	66	5	0	35	86	80	0	636
05:45 PM	84	98	19	0	18	26	58	0	28	46	13	0	19	62	74	0	545
Total	425	351	91	0	87	145	200	0	133	239	36	0	103	340	322	0	2472
Grand Total	1054	758	301	0	247	756	1185	0	643	976	117	0	239	814	665	0	7755
Apprch %	49.9	35.9	14.2	0.0	11.3	34.6	54.2	0.0	37.0	56.2	6.7	0.0	13.9	47.4	38.7	0.0	
Total %	13.6	9.8	3.9	0.0	3.2	9.7	15.3	0.0	8.3	12.6	1.5	0.0	3.1	10.5	8.6	0.0	

1889 YORK STREET  
DENVER, COLORADO  
303-333-7409

File Name : FOUNSH-86  
Site Code : 00000015  
Start Date : 10/10/2018  
Page No : 2

	FOUNDERS PKWY Southbound					SH- 86 Westbound					N. RIDGE RD Northbound					5TH STREET Eastbound														
Start Time	Left	Thr u	Rig ht	Ped s	App. Total	Left	Thr u	Rig ht	Ped s	App. Total	Left	Thr u	Rig ht	Ped s	App. Total	Left	Thr u	Rig ht	Ped s	App. Total	Int. Total									
Peak Hour	From 06:30 AM to 08:30 AM - Peak 1 of 1																													
Intersection	07:00 AM																													
Volume	112	63	64	0	239	45	241	370	0	656	217	287	17	0	521	31	120	35	0	186	1602									
Percent	46.9	26.4	26.8	0.0		6.9	36.7	56.4	0.0		41.7	55.1	3.3	0.0		16.7	64.5	18.8	0.0											
07:45 Volume	34	23	24	0	81	10	80	92	0	182	70	73	5	0	148	7	24	9	0	40	451									
Peak Factor																					0.888									
High Int.	07:45 AM										07:45 AM										07:15 AM									
Volume	34	23	24	0	81	10	80	92	0	182	70	73	5	0	148	7	37	10	0	54										
Peak	0.73										0.90										0.88									
Factor	8										1										0									



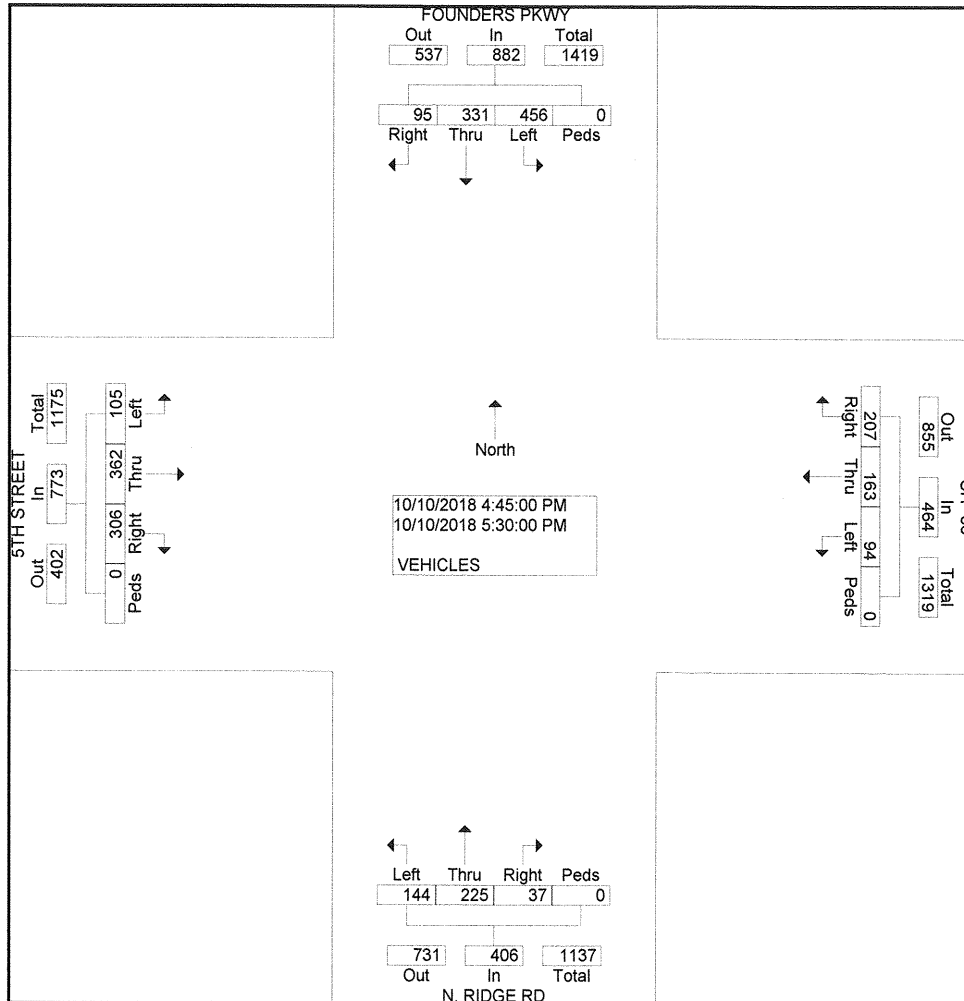
# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER, COLORADO  
303-333-7409

N/S STREET: FOUNDERS PKWY  
E/W STREET: SH-86 / 5TH ST  
CITY: CASTLE ROCK  
COUNTY: DOUGLAS

File Name : FOUNSH-86  
Site Code : 00000015  
Start Date : 10/10/2018  
Page No : 2

	FOUNDERS PKWY Southbound					SH- 86 Westbound					N. RIDGE RD Northbound					5TH STREET Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	456	331	95	0	882	94	163	207	0	464	144	225	37	0	406	105	362	306	0	773	2525
Percent	51.7	37.5	10.8	0.0		20.3	35.1	44.6	0.0		35.5	55.4	9.1	0.0		13.6	46.8	39.6	0.0		
05:15 Volume	122	99	24	0	245	24	48	45	0	117	41	69	12	0	122	23	87	78	0	188	672
Peak Factor																					0.939
High Int.	05:15 PM					04:45 PM					05:15 PM					05:00 PM					
Volume	122	99	24	0	245	25	44	65	0	134	41	69	12	0	122	26	105	90	0	221	
Peak Factor	0.90					0.86					0.83					0.87					4
	0					6					2					4					



# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER, COLORADO  
303-333-7409

N/S STREET: RIDGE RD  
E/W STREET: ENDERUD BLVD  
CITY: CASTLE ROCK  
COUNTY: DOUGLAS

File Name : RIDGENDE  
Site Code : 00000015  
Start Date : 1/25/2017  
Page No : 1

## Groups Printed- VEHICLES

Start Time	RIDGE RD Southbound				ENDERUD BLVD Westbound				RIDGE RD Northbound				Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	7	14	0	0	10	0	97	0	0	53	3	0	0	0	0	0	184
06:45 AM	12	8	0	0	11	0	87	0	0	60	4	0	0	0	0	0	182
Total	19	22	0	0	21	0	184	0	0	113	7	0	0	0	0	0	366
07:00 AM	21	31	0	0	16	0	133	0	0	79	7	0	0	0	0	0	287
07:15 AM	28	30	0	0	25	0	144	0	0	106	9	0	0	0	0	0	342
07:30 AM	30	38	0	0	20	0	103	0	0	85	9	0	0	0	0	0	285
07:45 AM	34	41	0	0	18	0	85	0	0	47	8	0	0	0	0	0	233
Total	113	140	0	0	79	0	465	0	0	317	33	0	0	0	0	0	1147
08:00 AM	35	33	0	0	10	0	85	0	0	67	20	0	0	0	0	0	250
08:15 AM	28	31	0	0	29	0	96	0	0	55	13	0	0	0	0	0	252
Total	63	64	0	0	39	0	181	0	0	122	33	0	0	0	0	0	502
04:00 PM	76	69	0	0	12	0	53	0	0	40	17	0	0	0	0	0	267
04:15 PM	93	82	0	0	15	0	73	0	0	54	18	0	0	0	0	0	335
04:30 PM	87	95	0	0	9	0	57	0	0	66	16	0	0	0	0	0	330
04:45 PM	103	85	0	0	12	0	68	0	0	61	30	0	0	0	0	0	359
Total	359	331	0	0	48	0	251	0	0	221	81	0	0	0	0	0	1291
05:00 PM	116	70	0	0	12	0	59	0	0	74	17	0	0	0	0	0	348
05:15 PM	113	86	0	0	9	0	59	0	0	60	23	0	0	0	0	0	350
05:30 PM	111	80	0	0	7	0	64	0	0	70	16	0	0	0	0	0	348
05:45 PM	117	100	0	0	11	0	65	0	0	45	19	0	0	0	0	0	357
Total	457	336	0	0	39	0	247	0	0	249	75	0	0	0	0	0	1403
Grand Total	1011	893	0	0	226	0	1328	0	0	1022	229	0	0	0	0	0	4709
Apprch %	53.1	46.9	0.0	0.0	14.5	0.0	85.5	0.0	0.0	81.7	18.3	0.0	0.0	0.0	0.0	0.0	
Total %	21.5	19.0	0.0	0.0	4.8	0.0	28.2	0.0	0.0	21.7	4.9	0.0	0.0	0.0	0.0	0.0	



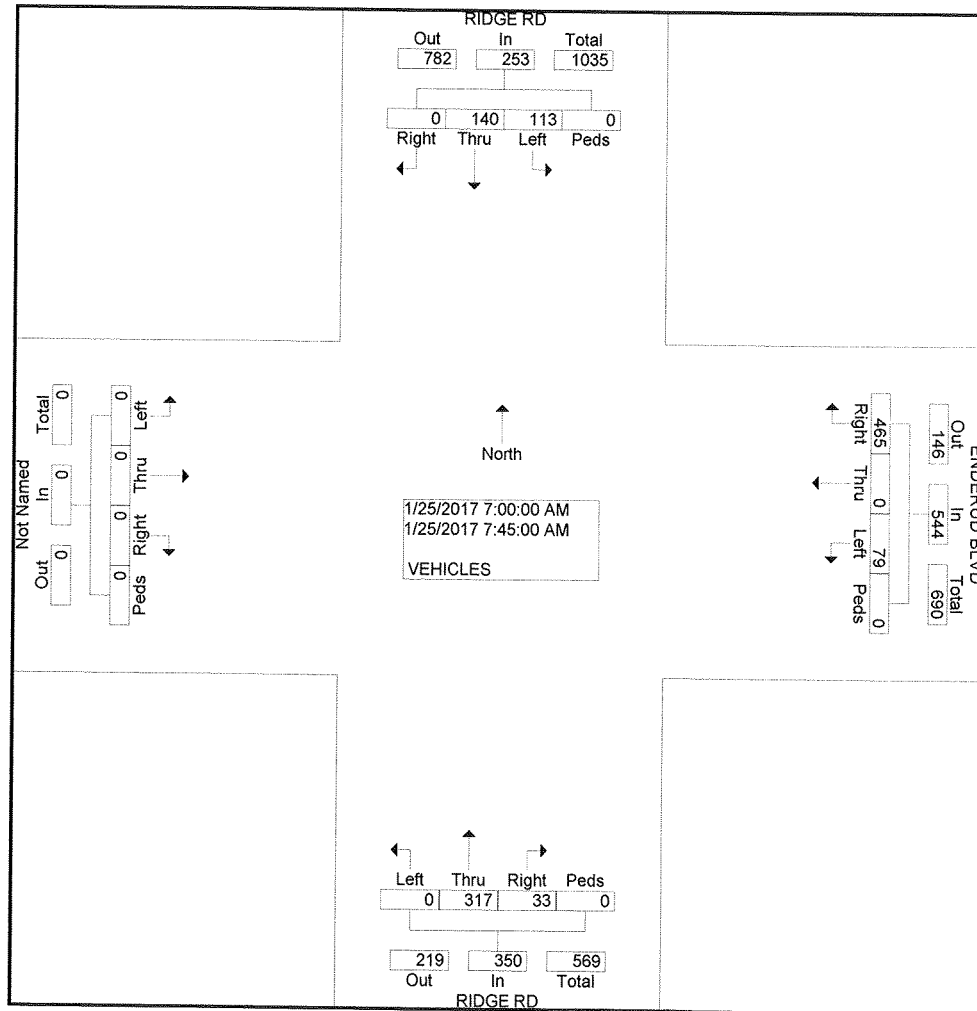
# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER, COLORADO  
303-333-7409

N/S STREET: RIDGE RD  
E/W STREET: ENDERUD BLVD  
CITY: CASTLE ROCK  
COUNTY: DOUGLAS

File Name : RIDGENDE  
Site Code : 00000015  
Start Date : 1/25/2017  
Page No : 2

	RIDGE RD Southbound					ENDERUD BLVD Westbound					RIDGE RD Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour	From 06:30 AM to 08:30 AM - Peak 1 of 1																				
Intersection	07:00 AM																				
Volume	113	140	0	0	253	79	0	465	0	544	0	317	33	0	350	0	0	0	0	0	1147
Percent	44.7	55.3	0.0	0.0		14.5	0.0	85.5	0.0		0.0	90.6	9.4	0.0		0.0	0.0	0.0	0.0		
07:15 Volume	28	30	0	0	58	25	0	144	0	169	0	106	9	0	115	0	0	0	0	0	342
Peak Factor																					0.838
High Int. Volume	07:45 AM					07:15 AM					07:15 AM					6:15:00 AM					
Peak Factor	34	41	0	0	75	25	0	144	0	169	0	106	9	0	115						
	0.843										0.805					0.761					



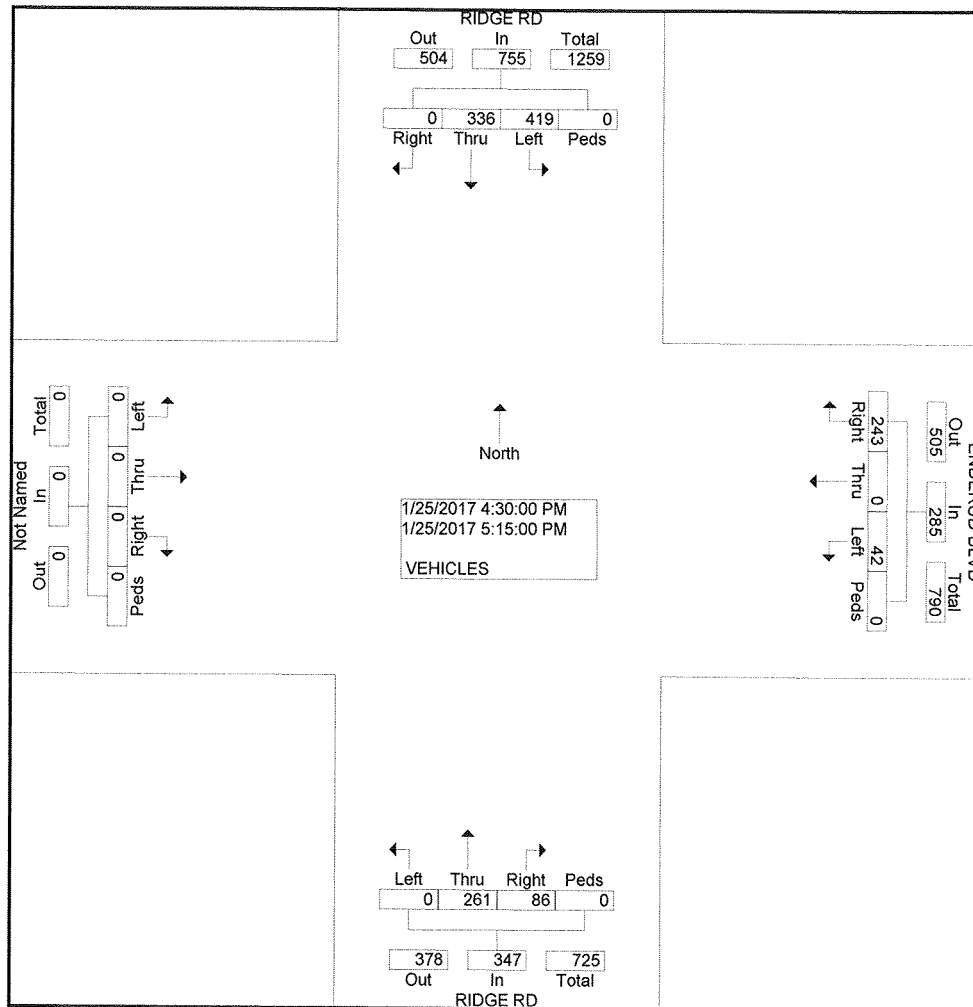
# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER, COLORADO  
303-333-7409

N/S STREET: RIDGE RD  
E/W STREET: ENDERUD BLVD  
CITY: CASTLE ROCK  
COUNTY: DOUGLAS

File Name : RIDGENDE  
Site Code : 00000015  
Start Date : 1/25/2017  
Page No : 2

	RIDGE RD Southbound					ENDERUD BLVD Westbound					RIDGE RD Northbound					Eastbound					
Start Time	Left	Thr u	Rig ht	Ped s	App. Total	Left	Thr u	Rig ht	Ped s	App. Total	Left	Thr u	Rig ht	Ped s	App. Total	Left	Thr u	Rig ht	Ped s	App. Total	Int. Total
Peak Hour From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	419	336	0	0	755	42	0	243	0	285	0	261	86	0	347	0	0	0	0	0	1387
Percent	55.5	44.5	0.0	0.0		14.7	0.0	85.3	0.0		0.0	75.2	24.8	0.0		0.0	0.0	0.0	0.0		
04:45 Volume	103	85	0	0	188	12	0	68	0	80	0	61	30	0	91	0	0	0	0	0	359
Peak Factor																					0.966
High Int.	05:15 PM					04:45 PM					04:45 PM										
Volume	113	86	0	0	199	12	0	68	0	80	0	61	30	0	91						
Peak Factor	0.948					0.891					0.953										



## COUNTER MEASURES INC.

Location: RIDGE RD S/O SH-86  
City: CASTLE ROCK  
County: DOUGLAS  
Direction: NORTHBOUND-SOUTHBOUND

1889 YORK STREET  
DENVER, COLORADO 80206  
303-333-7409

Site Code: 012307  
Station ID: 012307

Start Time	23-Jan-17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	*	*	4	25	5	27	*	*	*	*	*	*	4	26
01:00	*	*	*	*	5	18	6	17	*	*	*	*	*	*	6	18
02:00	*	*	*	*	4	15	3	12	*	*	*	*	*	*	4	14
03:00	*	*	*	*	16	9	14	6	*	*	*	*	*	*	15	8
04:00	*	*	*	*	66	15	63	14	*	*	*	*	*	*	64	14
05:00	*	*	*	*	222	33	218	30	*	*	*	*	*	*	220	32
06:00	*	*	*	*	501	109	510	106	*	*	*	*	*	*	506	108
07:00	*	*	*	*	719	281	714	276	*	*	*	*	*	*	716	278
08:00	*	*	*	*	514	299	509	287	*	*	*	*	*	*	512	293
09:00	*	*	*	*	386	339	373	298	*	*	*	*	*	*	380	318
10:00	*	*	*	*	291	254	288	298	*	*	*	*	*	*	290	276
11:00	*	*	*	*	366	336	292	316	*	*	*	*	*	*	329	326
12:00 PM	*	*	*	*	375	370	333	360	*	*	*	*	*	*	354	365
01:00	*	*	*	*	292	341	298	390	*	*	*	*	*	*	295	366
02:00	*	*	*	*	334	339	324	409	*	*	*	*	*	*	329	374
03:00	*	*	*	*	464	679	477	630	*	*	*	*	*	*	470	654
04:00	*	*	*	*	464	736	482	733	*	*	*	*	*	*	473	734
05:00	*	*	*	*	490	782	486	782	*	*	*	*	*	*	488	782
06:00	*	*	*	*	413	624	358	590	*	*	*	*	*	*	386	607
07:00	*	*	*	*	216	388	201	356	*	*	*	*	*	*	208	372
08:00	*	*	*	*	142	348	150	335	*	*	*	*	*	*	146	342
09:00	*	*	*	*	73	223	82	194	*	*	*	*	*	*	78	208
10:00	*	*	*	*	28	86	29	96	*	*	*	*	*	*	28	91
11:00	*	*	*	*	16	45	23	41	*	*	*	*	*	*	20	43
Lane	0	0	0	0	6401	6694	6238	6603	0	0	0	0	0	0	6321	6649
Day	0		0		13095		12841		0		0		0		12970	
AM Peak	-	-	-	-	07:00	09:00	07:00	11:00	-	-	-	-	-	-	07:00	11:00
Vol.	-	-	-	-	719	339	714	316	-	-	-	-	-	-	716	326
PM Peak	-	-	-	-	17:00	17:00	17:00	17:00	-	-	-	-	-	-	17:00	17:00
Vol.	-	-	-	-	490	782	486	782	-	-	-	-	-	-	488	782

Comb. Total	0	0	13095	12841	0	0	0	12970
ADT	ADT 12,968	AADT 12,968						

**COUNTER MEASURES INC.**

Location: SH-86 W/O AUTUMN SAGE ST  
 City: CASTLE ROCK  
 County: DOUGLAS  
 Direction: WESTBOUND-EASTBOUND

1889 YORK STREET  
 DENVER, COLORADO 80206  
 303-333-7409

Site Code: 012512  
 Station ID: 012512

Start Time	23-Jan-17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	*	*	10	33	13	34	*	*	*	*	*	*	12	34
01:00	*	*	*	*	9	12	8	11	*	*	*	*	*	*	8	12
02:00	*	*	*	*	9	12	8	10	*	*	*	*	*	*	8	11
03:00	*	*	*	*	33	10	35	8	*	*	*	*	*	*	34	9
04:00	*	*	*	*	77	19	70	18	*	*	*	*	*	*	74	18
05:00	*	*	*	*	271	57	278	53	*	*	*	*	*	*	274	55
06:00	*	*	*	*	699	188	700	186	*	*	*	*	*	*	700	187
07:00	*	*	*	*	934	399	920	384	*	*	*	*	*	*	927	392
08:00	*	*	*	*	651	366	644	358	*	*	*	*	*	*	648	362
09:00	*	*	*	*	534	332	578	377	*	*	*	*	*	*	556	354
10:00	*	*	*	*	414	310	482	314	*	*	*	*	*	*	448	312
11:00	*	*	*	*	452	322	476	348	*	*	*	*	*	*	464	335
12:00 PM	*	*	*	*	439	384	444	448	*	*	*	*	*	*	442	416
01:00	*	*	*	*	362	424	430	440	*	*	*	*	*	*	396	432
02:00	*	*	*	*	464	538	450	540	*	*	*	*	*	*	457	539
03:00	*	*	*	*	535	718	536	724	*	*	*	*	*	*	536	721
04:00	*	*	*	*	588	810	531	843	*	*	*	*	*	*	560	826
05:00	*	*	*	*	528	842	476	760	*	*	*	*	*	*	502	801
06:00	*	*	*	*	306	576	276	646	*	*	*	*	*	*	291	611
07:00	*	*	*	*	164	429	180	404	*	*	*	*	*	*	172	416
08:00	*	*	*	*	150	338	130	311	*	*	*	*	*	*	140	324
09:00	*	*	*	*	64	222	83	182	*	*	*	*	*	*	74	202
10:00	*	*	*	*	38	104	33	96	*	*	*	*	*	*	36	100
11:00	*	*	*	*	25	45	24	60	*	*	*	*	*	*	24	52
Lane	0	0	0	0	7756	7490	7805	7555	0	0	0	0	0	0	7783	7521
Day	0		0		15246		15360		0		0		0		15304	
AM Peak	-	-	-	-	07:00	07:00	07:00	07:00	-	-	-	-	-	-	07:00	07:00
Vol.	-	-	-	-	934	399	920	384	-	-	-	-	-	-	927	392
PM Peak	-	-	-	-	16:00	17:00	15:00	16:00	-	-	-	-	-	-	16:00	16:00
Vol.	-	-	-	-	588	842	536	843	-	-	-	-	-	-	560	826

























Comb. Total	0	0	15246	15360	0	0	0	15304
ADT	ADT 15,303	AADT 15,303						



# HCM 6th Signalized Intersection Summary

## 11: Ridge Road & 5th Street/State Highway 86

Existing  
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	158	141	40	423	443	422	391	29	170	82	128
Future Volume (veh/h)	60	158	141	40	423	443	422	391	29	170	82	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	178	0	45	475	0	474	439	0	191	92	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	551		416	536		670	677		398	672	
Arrive On Green	0.05	0.29	0.00	0.04	0.29	0.00	0.09	0.36	0.00	0.09	0.36	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	67	178	0	45	475	0	474	439	0	191	92	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.3	6.5	0.0	1.5	21.3	0.0	8.0	17.1	0.0	5.8	2.9	0.0
Cycle Q Clear(g_c), s	2.3	6.5	0.0	1.5	21.3	0.0	8.0	17.1	0.0	5.8	2.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	204	551		416	536		670	677		398	672	
V/C Ratio(X)	0.33	0.32		0.11	0.89		0.71	0.65		0.48	0.14	
Avail Cap(c_a), veh/h	275	725		501	725		670	677		403	672	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.1	24.1	0.0	20.7	29.9	0.0	20.3	23.3	0.0	17.0	18.9	0.0
Incr Delay (d2), s/veh	0.9	0.3	0.0	0.1	10.0	0.0	3.4	4.7	0.0	0.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.7	0.0	0.6	10.0	0.0	4.0	7.8	0.0	2.2	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	24.4	0.0	20.8	39.9	0.0	23.7	28.0	0.0	17.9	19.3	0.0
LnGrp LOS	C	C		C	D		C	C		B	B	
Approach Vol, veh/h		245	A		520	A		913	A		283	A
Approach Delay, s/veh		24.3			38.2			25.8			18.4	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	38.3	7.8	29.8	12.0	38.0	8.5	29.1				
Change Period (Y+Rc), s	4.0	6.5	4.5	4.0	4.0	6.5	4.5	4.0				
Max Green Setting (Gmax), s	8.0	31.5	7.5	34.0	8.0	31.5	7.5	34.0				
Max Q Clear Time (g_c+I1), s	7.8	19.1	3.5	8.5	10.0	4.9	4.3	23.3				
Green Ext Time (p_c), s	0.0	1.9	0.0	0.8	0.0	0.4	0.0	1.9				

### Intersection Summary

HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

























### Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

ROUNABOUT REPORT																
<b>General Information</b>								<b>Site Information</b>								
Analyst	CSM							Intersection	Ridge Road/ E. Enderud Blvd							
Agency or Co.	LSC							E/W Street Name	Enderud Blvd							
Date Performed	4/20/2017							N/S Street Name	Ridge Road							
Time Period	AM Peak							Analysis Year	Existing							
Peak Hour Factor	0.84							Project ID	#170081							
Project Description:																
<b>Volume Adjustment and Site Characteristics</b>																
	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	0	0	0		0	0	0		0	1	0		1	1	0	
Lane Assignment					LR				TR				L T			
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h				0	79		465	0		317	33	0	113	140		0
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			
<b>Critical and Follow-Up Headway Adjustment</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Critical Headway (sec)	5.1929	4.0000	5.1929	4.2000	4.2000	5.1929	4.0000	4.0000	5.1929	4.2000	4.2000	5.1929				
Follow-Up Headway (sec)	3.1858	2.8000	3.1858	2.8000	2.8000	3.1858	2.8000	2.8000	3.1858	2.8000	2.8000	3.1858				
<b>Flow Computations</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Circulating Flow ( $V_c$ ), pc/h	403			385			137			96						
Exiting Flow ( $V_{ex}$ ), pc/h	177			0			950			266						
Entry Flow ( $V_e$ ), pc/h		167			661			425		137	170					
Entry Volume veh/h					648			417		134	167					
<b>Capacity and v/c Ratios</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Capacity ( $c_{PCE}$ ), pc/h		0			953			1164		1193	1193					
Capacity (c), veh/h		0			934			1142		1170	1170					
v/c Ratio (X)					0.69			0.36		0.11	0.14					
<b>Delay and Level of Service</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Lane Control Delay (d), s/veh					15.6			6.8		4.0	4.3					
Lane LOS		F			C			A		A	A					
Lane 95% Queue					5.8			1.7		0.4	0.5					
Approach Delay, s/veh				15.57			6.78			4.19						
Approach LOS, s/veh				C			A			A						
Intersection Delay, s/veh	10.38															
Intersection LOS	B															

# HCM 6th Signalized Intersection Summary 11: Ridge Road & 5th Street/State Highway 86

Existing  
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	373	358	78	206	275	199	287	35	468	379	93
Future Volume (veh/h)	95	373	358	78	206	275	199	287	35	468	379	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	100	393	0	82	217	0	209	302	0	493	399	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	353	461		223	445		463	707		536	712	
Arrive On Green	0.06	0.25	0.00	0.05	0.24	0.00	0.09	0.38	0.00	0.10	0.38	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	100	393	0	82	217	0	209	302	0	493	399	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	3.5	16.7	0.0	2.9	8.3	0.0	5.8	10.0	0.0	8.0	14.0	0.0
Cycle Q Clear(g_c), s	3.5	16.7	0.0	2.9	8.3	0.0	5.8	10.0	0.0	8.0	14.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	461		223	445		463	707		536	712	
V/C Ratio(X)	0.28	0.85		0.37	0.49		0.45	0.43		0.92	0.56	
Avail Cap(c_a), veh/h	407	763		293	763		467	707		536	712	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.2	29.9	0.0	23.7	27.4	0.0	14.6	19.2	0.0	23.2	20.3	0.0
Incr Delay (d2), s/veh	0.4	5.0	0.0	1.0	0.8	0.0	0.7	1.9	0.0	21.2	3.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	7.5	0.0	1.1	3.4	0.0	2.1	4.3	0.0	8.0	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	34.9	0.0	24.7	28.2	0.0	15.3	21.1	0.0	44.5	23.5	0.0
LnGrp LOS	C	C		C	C		B	C		D	C	
Approach Vol, veh/h	493		A	299		A	511		A	892		A
Approach Delay, s/veh	32.4			27.2			18.7			35.1		
Approach LOS	C			C			B			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	38.0	8.8	24.5	11.8	38.2	9.5	23.8				
Change Period (Y+Rc), s	4.0	6.5	4.5	4.0	4.0	6.5	4.5	4.0				
Max Green Setting (Gmax), s	8.0	31.5	7.5	34.0	8.0	31.5	7.5	34.0				
Max Q Clear Time (g_c+I1), s	10.0	12.0	4.9	18.7	7.8	16.0	5.5	10.3				
Green Ext Time (p_c), s	0.0	1.5	0.0	1.9	0.0	1.8	0.0	1.0				

## Intersection Summary

HCM 6th Ctrl Delay	29.6
HCM 6th LOS	C

## Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

ROUNABOUT REPORT																
<b>General Information</b>								<b>Site Information</b>								
Analyst	CSM							Intersection	Ridge Road/ E. Enderud Blvd							
Agency or Co.	LSC							E/W Street Name	Enderud Blvd							
Date Performed	9/26/2017							N/S Street Name	Ridge Road							
Time Period	PM Peak							Analysis Year	Existing							
Peak Hour Factor	0.95							Project ID	#170081							
Project Description:																
<b>Volume Adjustment and Site Characteristics</b>																
	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	0	0	0		0	0	0		0	1	0		1	1	0	
Lane Assignment					LR				TR				L T			
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h				0	42		243	0		261	86	0	419	336		0
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			
<b>Critical and Follow-Up Headway Adjustment</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Critical Headway (sec)	5.1929	4.0000	5.1929	4.2000	4.2000	5.1929	4.0000	4.0000	5.1929	4.2000	4.2000	5.1929				
Follow-Up Headway (sec)	3.1858	2.8000	3.1858	2.8000	2.8000	3.1858	2.8000	2.8000	3.1858	2.8000	2.8000	3.1858				
<b>Flow Computations</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Circulating Flow ( $V_c$ ), pc/h	856			280			450			45						
Exiting Flow ( $V_{ex}$ ), pc/h	542			0			541			406						
Entry Flow ( $V_e$ ), pc/h		354			306			373		450	361					
Entry Volume veh/h					300			366		441	354					
<b>Capacity and v/c Ratios</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Capacity ( $c_{PCE}$ ), pc/h		0			1034			929		1241	1241					
Capacity (c), veh/h		0			1014			911		1217	1217					
v/c Ratio (X)					0.30			0.40		0.36	0.29					
<b>Delay and Level of Service</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Lane Control Delay (d), s/veh					6.5			8.6		6.4	5.6					
Lane LOS		F			A			A		A	A					
Lane 95% Queue					1.2			2.0		1.7	1.2					
Approach Delay, s/veh				6.51			8.58			6.08						
Approach LOS, s/veh				A			A			A						
Intersection Delay, s/veh	6.79															
Intersection LOS	A															

ROUNABOUT REPORT																
<b>General Information</b>								<b>Site Information</b>								
Analyst	KMK							Intersection	Ridge Road/ 5th Street							
Agency or Co.	LSC							E/W Street Name	5th Street/ SH 86							
Date Performed	10/16/2018							N/S Street Name	Ridge Road/Founders Pkwy							
Time Period	AM Peak							Analysis Year	2023 Background							
Peak Hour Factor	0.92							Project ID	#170081							
Project Description:																
<b>Volume Adjustment and Site Characteristics</b>																
	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	0	2	0		0	2	0		0	2	0		0	2	0	
Lane Assignment	LT		T		LT		T		LT		TR		LT		TR	
Right-Turn Bypass	Non-Yielding				Non-Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	65	165		0	45	445		0	445	415	30	0	190	90	135	0
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			
<b>Critical and Follow-Up Headway Adjustment</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Critical Headway (sec)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.1929	4.0000	4.0000	5.1929				
Follow-Up Headway (sec)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	3.1858	2.5000	2.5000	3.1858				
<b>Flow Computations</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Circulating Flow ( $V_c$ ), pc/h	361			1025			466			1036						
Exiting Flow ( $V_{ex}$ ), pc/h	427			1136			532			150						
Entry Flow ( $V_e$ ), pc/h	120	135	166	255	288	543	493	493		216	244					
Entry Volume veh/h	118	132	163	250	282	532	483	483		212	239					
<b>Capacity and v/c Ratios</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Capacity ( $c_{PCE}$ ), pc/h	1094	1094		658	658		1009	1009		652	652					
Capacity (c), veh/h	1072	1072		645	645		989	989		640	640					
v/c Ratio (X)	0.11	0.12		0.39	0.44		0.49	0.49		0.33	0.37					
<b>Delay and Level of Service</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Lane Control Delay (d), s/veh	4.3	4.4	0.0	11.0	12.0	0.0	9.5	9.5		10.0	10.8					
Lane LOS	A	A		B	B		A	A		B	B					
Lane 95% Queue	0.4	0.4		1.8	2.2		2.7	2.7		1.4	1.7					
Approach Delay, s/veh	2.66			5.78			9.51			10.45						
Approach LOS, s/veh	A			A			A			B						
Intersection Delay, s/veh	7.31															
Intersection LOS	A															



ROUNABOUT REPORT																				
<b>General Information</b>								<b>Site Information</b>												
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd											
Agency or Co.	LSC							E/W Street Name	Enderud Blvd											
Date Performed	10/16/2018							N/S Street Name	Ridge Road											
Time Period	AM Peak							Analysis Year	2023 Background											
Peak Hour Factor	0.92							Project ID	#170081											
Project Description:																				
<b>Volume Adjustment and Site Characteristics</b>																				
	EB				WB				NB				SB							
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U				
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0					
Lane Assignment					LTR				R				T				TR			
Right-Turn Bypass	None				None				None				None							
Conflicting Lanes	1				1				1				1							
Volume (V), veh/h				0	80	0	475	0		340	35	0	120			0				
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				
Pedestrians Crossing	0				0				0				0							
<b>Critical and Follow-Up Headway Adjustment</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929					
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858					
<b>Flow Computations</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Circulating Flow ( $V_c$ ), pc/h	638				377				133				89							
Exiting Flow ( $V_{ex}$ ), pc/h	172				0				904				504							
Entry Flow ( $V_e$ ), pc/h		286			289	326			195	220			258	291						
Entry Volume veh/h					283	320			191	216			253	285						
<b>Capacity and v/c Ratios</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Capacity ( $c_{PCE}$ ), pc/h		0			959	959			1159	1159			1200	1200						
Capacity (c), veh/h		0			940	940			1137	1137			1176	1176						
v/c Ratio (X)					0.30	0.34			0.17	0.19			0.22	0.24						
<b>Delay and Level of Service</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Lane Control Delay (d), s/veh					7.0	7.5			4.6	4.9			5.0	5.3						
Lane LOS		F			A	A			A	A			A	A						
Lane 95% Queue					1.3	1.5			0.6	0.7			0.8	1.0						
Approach Delay, s/veh					7.25				4.76				5.12							
Approach LOS, s/veh					A				A				A							
Intersection Delay, s/veh	5.85																			
Intersection LOS	A																			

ROUNABOUT REPORT																
<b>General Information</b>								<b>Site Information</b>								
Analyst	KMK							Intersection	Ridge Road/ 5th Street							
Agency or Co.	LSC							E/W Street Name	5th Street/ SH 86							
Date Performed	10/16/2018							N/S Street Name	Ridge Road/Founders Pkwy							
Time Period	PM Peak							Analysis Year	2023 Background							
Peak Hour Factor	0.96							Project ID	#170081							
Project Description:																
<b>Volume Adjustment and Site Characteristics</b>																
	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	0	2	0		0	2	0		0	2	0		0	2	0	
Lane Assignment	LT		T		LT		T		LT		TR		LT		TR	
Right-Turn Bypass	Non-Yielding				Non-Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	100	390		0	85	215		0	210	305	40	0	515	405	100	0
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			
<b>Critical and Follow-Up Headway Adjustment</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Critical Headway (sec)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.1929	4.0000	4.0000	5.1929				
Follow-Up Headway (sec)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	3.1858	2.5000	2.5000	3.1858				
<b>Flow Computations</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Circulating Flow ( $V_c$ ), pc/h	1067			653			1067			541						
Exiting Flow ( $V_{ex}$ ), pc/h	1004			558			430			521						
Entry Flow ( $V_e$ ), pc/h	245	276	398	150	169	324	277	313		547	537					
Entry Volume veh/h	240	271	390	147	166	318	272	307		536	526					
<b>Capacity and v/c Ratios</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Capacity ( $c_{PCE}$ ), pc/h	637	637		874	874		637	637		952	952					
Capacity (c), veh/h	624	624		857	857		624	624		933	933					
v/c Ratio (X)	0.38	0.43		0.17	0.19		0.44	0.49		0.57	0.56					
<b>Delay and Level of Service</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Lane Control Delay (d), s/veh	11.3	12.3	0.0	5.9	6.2	0.0	12.3	13.7		11.8	11.6					
Lane LOS	B	B		A	A		B	B		B	B					
Lane 95% Queue	1.8	2.2		0.6	0.7		2.2	2.7		3.8	3.6					
Approach Delay, s/veh	6.69			3.00			13.04			11.69						
Approach LOS, s/veh	A			A			B			B						
Intersection Delay, s/veh	8.79															
Intersection LOS	A															





ROUNABOUT REPORT																				
<b>General Information</b>								<b>Site Information</b>												
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd											
Agency or Co.	LSC							E/W Street Name	Enderud Blvd											
Date Performed	10/16/2018							N/S Street Name	Ridge Road											
Time Period	PM Peak							Analysis Year	2023 Background											
Peak Hour Factor	0.95							Project ID	#170081											
Project Description:																				
<b>Volume Adjustment and Site Characteristics</b>																				
	EB				WB				NB				SB							
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U				
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0					
Lane Assignment					LTR				R				T				TR			
Right-Turn Bypass	None				None				None				None							
Conflicting Lanes	1				1				1				1							
Volume (V), veh/h				0	45	0	250	0		280	90	0	430	360		0				
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				
Pedestrians Crossing	0				0				0				0							
<b>Critical and Follow-Up Headway Adjustment</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929					
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858					
<b>Flow Computations</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Circulating Flow ( $V_c$ ), pc/h	897				301				462				48							
Exiting Flow ( $V_{ex}$ ), pc/h	558				0				569				435							
Entry Flow ( $V_e$ ), pc/h		503			149	168			187	211			462	387						
Entry Volume veh/h					146	165			183	207			453	379						
<b>Capacity and v/c Ratios</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Capacity ( $c_{PCE}$ ), pc/h		0			1018	1018			898	898			1238	1238						
Capacity (c), veh/h		0			998	998			880	880			1214	1214						
v/c Ratio (X)					0.15	0.17			0.21	0.24			0.37	0.31						
<b>Delay and Level of Service</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Lane Control Delay (d), s/veh					5.0	5.1			6.2	6.5			6.6	5.9						
Lane LOS		F			A	A			A	A			A	A						
Lane 95% Queue					0.5	0.6			0.8	0.9			1.8	1.3						
Approach Delay, s/veh					5.06				6.37				6.26							
Approach LOS, s/veh					A				A				A							
Intersection Delay, s/veh	6.04																			
Intersection LOS	A																			

HCM 6th TWSC  
4: Ridge Road & Site Access

2023 Total  
AM Peak

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	64	849	4	22	280
Future Vol, veh/h	0	64	849	4	22	280
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	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	70	923	4	24	304

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	464	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	545	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	-	545	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	0.7
HCM LOS	B		







Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	545	733
HCM Lane V/C Ratio	-	-	0.128	0.033
HCM Control Delay (s)	-	-	12.6	10.1
HCM Lane LOS	-	-	B	B
HCM 95th %tile Q(veh)	-	-	0.4	0.1

HCM 6th TWSC  
8: Enderud Blvd & Site Access

2023 Total  
AM Peak

Intersection

Int Delay, s/veh 1

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	13	53	13	200	600	4
Future Vol, veh/h	13	53	13	200	600	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	1000	0	200	-	-	-
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	14	58	14	217	652	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	791	328	656
Stage 1	654	-	-
Stage 2	137	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	327	668	927
Stage 1	479	-	-
Stage 2	875	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	322	668	927
Mov Cap-2 Maneuver	322	-	-
Stage 1	472	-	-
Stage 2	875	-	-

Approach	SE	NE	SW
HCM Control Delay, s	12	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	927	-	322	668	-	-
HCM Lane V/C Ratio	0.015	-	0.044	0.086	-	-
HCM Control Delay (s)	8.9	-	16.7	10.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.3	-	-







ROUNABOUT REPORT																
<b>General Information</b>								<b>Site Information</b>								
Analyst	KMK							Intersection	Ridge Road/ 5th Street							
Agency or Co.	LSC							E/W Street Name	5th Street/ SH 86							
Date Performed	10/16/2018							N/S Street Name	Ridge Road/ Founders Pkwy							
Time Period	AM Peak							Analysis Year	2023 Total							
Peak Hour Factor	0.92							Project ID	#170081							
Project Description:																
<b>Volume Adjustment and Site Characteristics</b>																
	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	0	2	0		0	2	0		0	2	0		0	2	0	
Lane Assignment	LT		T		LT		T		LT		TR		LT		TR	
Right-Turn Bypass	Non-Yielding				Non-Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	65	165		0	49	445		0	465	480	30	0	190	112	135	0
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			
<b>Critical and Follow-Up Headway Adjustment</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Critical Headway (sec)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.1929	4.0000	4.0000	5.1929				
Follow-Up Headway (sec)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	3.1858	2.5000	2.5000	3.1858				
<b>Flow Computations</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Circulating Flow ( $V_c$ ), pc/h	389			1120			466			1063						
Exiting Flow ( $V_{ex}$ ), pc/h	427			1159			604			179						
Entry Flow ( $V_e$ ), pc/h	120	135	173	257	290	543	508	573		228	257					
Entry Volume veh/h	118	132	170	252	284	532	498	562		224	252					
<b>Capacity and v/c Ratios</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Capacity ( $c_{PCE}$ ), pc/h	1070	1070		612	612		1009	1009		639	639					
Capacity (c), veh/h	1049	1049		600	600		989	989		627	627					
v/c Ratio (X)	0.11	0.13		0.42	0.47		0.50	0.57		0.36	0.40					
<b>Delay and Level of Service</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Lane Control Delay (d), s/veh	4.4	4.6	0.0	12.4	13.7	0.0	9.8	11.2		10.7	11.6					
Lane LOS	A	A		B	B		A	B		B	B					
Lane 95% Queue	0.4	0.4		2.1	2.5		2.9	3.7		1.6	1.9					
Approach Delay, s/veh	2.68			6.55			10.51			11.14						
Approach LOS, s/veh	A			A			B			B						
Intersection Delay, s/veh	8.12															
Intersection LOS	A															

ROUNABOUT REPORT																				
<b>General Information</b>								<b>Site Information</b>												
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd											
Agency or Co.	LSC							E/W Street Name	Enderud Blvd											
Date Performed	10/16/2018							N/S Street Name	Ridge Road											
Time Period	AM Peak							Analysis Year	2023 Total											
Peak Hour Factor	0.92							Project ID	#170081											
Project Description:																				
<b>Volume Adjustment and Site Characteristics</b>																				
	EB				WB				NB				SB							
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U				
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0					
Lane Assignment					LTR				R				T				TR			
Right-Turn Bypass	None				None				None				None							
Conflicting Lanes	1				1				1				1							
Volume (V), veh/h				0	99	0	509	0		344	38	0	130			0				
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				
Pedestrians Crossing	0				0				0				0							
<b>Critical and Follow-Up Headway Adjustment</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929					
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858					
<b>Flow Computations</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Circulating Flow ( $V_c$ ), pc/h	692				381				144				110							
Exiting Flow ( $V_{ex}$ ), pc/h	186				0				946				548							
Entry Flow ( $V_e$ ), pc/h		302			317	357			199	224			274	308						
Entry Volume veh/h					311	350			195	220			269	302						
<b>Capacity and v/c Ratios</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Capacity ( $c_{PCE}$ ), pc/h		0			956	956			1149	1149			1181	1181						
Capacity (c), veh/h		0			937	937			1127	1127			1157	1157						
v/c Ratio (X)					0.33	0.37			0.17	0.19			0.23	0.26						
<b>Delay and Level of Service</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Lane Control Delay (d), s/veh					7.4	8.0			4.7	4.9			5.2	5.5						
Lane LOS		F			A	A			A	A			A	A						
Lane 95% Queue					1.5	1.7			0.6	0.7			0.9	1.0						
Approach Delay, s/veh					7.71				4.84				5.37							
Approach LOS, s/veh					A				A				A							
Intersection Delay, s/veh	6.17																			
Intersection LOS	A																			

HCM 6th TWSC  
4: Ridge Road & Site Access

2023 Total  
PM Peak







Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	36	550	11	73	824
Future Vol, veh/h	0	36	550	11	73	824
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	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	39	598	12	79	896
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	305	0	0	610	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	691	-	-	965	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	691	-	-	965	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.5	0		0.7		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	691	965	-	
HCM Lane V/C Ratio	-	-	0.057	0.082	-	
HCM Control Delay (s)	-	-	10.5	9.1	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.3	-	

HCM 6th TWSC  
8: Enderud Blvd & Site Access

2023 Total  
PM Peak

Intersection

Int Delay, s/veh 0.8

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	8	31	45	560	325	14
Future Vol, veh/h	8	31	45	560	325	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	1000	0	200	-	-	-
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	9	34	49	609	353	15

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	764	184	368
Stage 1	361	-	-
Stage 2	403	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	340	827	1187
Stage 1	676	-	-
Stage 2	644	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	326	827	1187
Mov Cap-2 Maneuver	326	-	-
Stage 1	648	-	-
Stage 2	644	-	-

Approach	SE	NE	SW
HCM Control Delay, s	10.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	1187	-	326	827	-	-
HCM Lane V/C Ratio	0.041	-	0.027	0.041	-	-
HCM Control Delay (s)	8.2	-	16.3	9.5	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-



ROUNABOUT REPORT																
<b>General Information</b>								<b>Site Information</b>								
Analyst	KMK							Intersection	Ridge Road/ 5th Street							
Agency or Co.	LSC							E/W Street Name	5th Street/ SH 86							
Date Performed	10/16/2018							N/S Street Name	Ridge Road/ Founders Pkwy							
Time Period	PM Peak							Analysis Year	2023 Total							
Peak Hour Factor	0.96							Project ID	#170081							
Project Description:																
<b>Volume Adjustment and Site Characteristics</b>																
	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	0	2	0		0	2	0		0	2	0		0	2	0	
Lane Assignment	LT		T		LT		T		LT		TR		LT		TR	
Right-Turn Bypass	Non-Yielding				Non-Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	100	390		0	99	215		0	221	343	40	0	515	477	100	0
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			
<b>Critical and Follow-Up Headway Adjustment</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Critical Headway (sec)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.1929	4.0000	4.0000	5.1929				
Follow-Up Headway (sec)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	3.1858	2.5000	2.5000	3.1858				
<b>Flow Computations</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Circulating Flow ( $V_c$ ), pc/h	1159			705			1067			568						
Exiting Flow ( $V_{ex}$ ), pc/h	1004			570			471			612						
Entry Flow ( $V_e$ ), pc/h	245	276	421	157	177	324	302	340		545	615					
Entry Volume veh/h	240	271	413	154	174	318	296	333		534	603					
<b>Capacity and v/c Ratios</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Capacity ( $c_{PCE}$ ), pc/h	594	594		840	840		637	637		933	933					
Capacity (c), veh/h	582	582		824	824		624	624		914	914					
v/c Ratio (X)	0.41	0.46		0.19	0.21		0.47	0.53		0.58	0.66					
<b>Delay and Level of Service</b>																
	EB			WB			NB			SB						
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass				
Lane Control Delay (d), s/veh	12.5	13.8	0.0	6.3	6.6	0.0	13.2	14.9		12.2	14.5					
Lane LOS	B	B		A	A		B	B		B	B					
Lane 95% Queue	2.0	2.5		0.7	0.8		2.6	3.2		3.9	5.1					
Approach Delay, s/veh	7.29			3.28			14.10			13.46						
Approach LOS, s/veh	A			A			B			B						
Intersection Delay, s/veh	9.90															
Intersection LOS	A															

ROUNABOUT REPORT																												
<b>General Information</b>								<b>Site Information</b>																				
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd																			
Agency or Co.	LSC							E/W Street Name	Enderud Blvd																			
Date Performed	10/16/2018							N/S Street Name	Ridge Road																			
Time Period	PM Peak							Analysis Year	2023 Total																			
Peak Hour Factor	0.95							Project ID	#170081																			
Project Description:																												
<b>Volume Adjustment and Site Characteristics</b>																												
	EB				WB				NB				SB															
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U												
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0													
Lane Assignment					LTR				R				T				TR				LT				T			
Right-Turn Bypass	None				None				None				None				None				None							
Conflicting Lanes	1				1				1				1				1				1							
Volume (V), veh/h				0	56	0	270	0		291	101	0	464	360		0												
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2												
Pedestrians Crossing	0				0				0				0				0											
<b>Critical and Follow-Up Headway Adjustment</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929													
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858													
<b>Flow Computations</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Circulating Flow ( $V_c$ ), pc/h	945				312				498				60															
Exiting Flow ( $V_{ex}$ ), pc/h	607				0				602				447															
Entry Flow ( $V_e$ ), pc/h		495			165	186			198	223			498	387														
Entry Volume veh/h					162	182			194	219			488	379														
<b>Capacity and v/c Ratios</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Capacity ( $c_{PCE}$ ), pc/h		0			1008	1008			873	873			1227	1227														
Capacity (c), veh/h		0			989	989			856	856			1203	1203														
v/c Ratio (X)					0.16	0.18			0.23	0.26			0.41	0.32														
<b>Delay and Level of Service</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Lane Control Delay (d), s/veh					5.2	5.4			6.6	6.9			7.1	5.9														
Lane LOS		F			A	A			A	A			A	A														
Lane 95% Queue					0.6	0.7			0.9	1.0			2.0	1.4														
Approach Delay, s/veh					5.28				6.75				6.57															
Approach LOS, s/veh					A				A				A															
Intersection Delay, s/veh	6.34																											
Intersection LOS	A																											

## Operational Data

### Main Geometry (ft)

#### Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Founders Parkway	10	0	24.00	2	28.00	2	150.00	75.00	20.00
2	SH 86	100	0	24.00	2	28.00	2	150.00	75.00	20.00
3	Ridge Road	170	0	24.00	2	28.00	2	150.00	75.00	20.00
4	Fifth Street	280	0	24.00	2	28.00	2	150.00	75.00	20.00

#### Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Founders Parkway	193.00	29.00	2	28.00	2	24.00	2
2	SH 86	193.00	29.00	2	28.00	2	24.00	2
3	Ridge Road	193.00	29.00	2	28.00	2	24.00	2
4	Fifth Street	193.00	29.00	2	28.00	2	24.00	2

## Bypass Geometry

### Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	SH 86	Free	639	24	2	12	1	24	2
4	Fifth Street	Merge	155	24	2	12	1	24	2

### Bypass Entry and Exit Geometry (ft)

Leg	Leg Names	Entry Geometry						Leg	Leg Names	Exit Lanes	
		Eb	neb	Lb	Lt	Rb	Phib			nex	Nmx
2	SH 86	13	1	0	130	75.000096	30	3	Ridge Road	2	2
4	Fifth Street	13	1	0	130	75.000096	30	1	Founders Parkway	2	2



## Operational Results

### 2040 AM Peak - 60 minutes

#### Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Founders Parkway	None	856		881		739	1838		0.4749	
2	SH 86	Free	668	639	755	0	982	1928	1325	0.3503	0.4835
3	Ridge Road	None	1065		1081		981	1697		0.6451	
4	Fifth Street	Merge	397	155	1069	584	1076	1705	1146	0.2363	0.1368

#### Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Founders Parkway	None	6.87		6.87	5.05		A		A
2	SH 86	Free	3.14	0.00	1.61	1.79	0.00	A	A	A
3	Ridge Road	None	10.13		10.13	9.84		B		B
4	Fifth Street	Merge	4.28	3.60	4.09	1.45	0.46	A	A	A

## Global Results

### Performance and Accidents

#### 2040 AM Peak Global Performance

Parameter	Units	Entries	Bypasses	Total
Arrive Flows	veh/hr	2986	794	3780
Capacity	veh/hr	7167	2471	9638
Average Delay	sec/veh	6.86	0.70	5.56
L.O.S. (Signal)	A – F	A	A	A
L.O.S. (Unsig)	A – F	A	A	A
Total Delay	veh.hrs	5.69	0.16	5.84

ROUNABOUT REPORT																												
<b>General Information</b>								<b>Site Information</b>																				
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd																			
Agency or Co.	LSC							E/W Street Name	Enderud Blvd																			
Date Performed	12/03/2018							N/S Street Name	Ridge Road																			
Time Period	AM Peak							Analysis Year	2040 Background																			
Peak Hour Factor	0.92							Project ID	#170081																			
Project Description:																												
<b>Volume Adjustment and Site Characteristics</b>																												
	EB				WB				NB				SB															
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U												
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0													
Lane Assignment					LTR				R				T				TR				LT				T			
Right-Turn Bypass	None				None				None				None				None				None							
Conflicting Lanes	1				1				1				1				1				1							
Volume (V), veh/h				0	90	0	520	0		405	40	0		130			0											
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2											
Pedestrians Crossing	0				0				0				0				0											
<b>Critical and Follow-Up Headway Adjustment</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929													
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858													
<b>Flow Computations</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Circulating Flow ( $V_c$ ), pc/h	455				449				144				100															
Exiting Flow ( $V_{ex}$ ), pc/h	188				0				1026				310															
Entry Flow ( $V_e$ ), pc/h		184			318	358			232	261			167	188														
Entry Volume veh/h					312	351			227	256			164	184														
<b>Capacity and v/c Ratios</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Capacity ( $c_{PCE}$ ), pc/h		0			907	907			1149	1149			1190	1190														
Capacity (c), veh/h		0			889	889			1127	1127			1166	1166														
v/c Ratio (X)					0.35	0.39			0.20	0.23			0.14	0.16														
<b>Delay and Level of Service</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Lane Control Delay (d), s/veh					8.0	8.6			5.0	5.3			4.3	4.5														
Lane LOS		F			A	A			A	A			A	A														
Lane 95% Queue					1.6	1.9			0.8	0.9			0.5	0.6														
Approach Delay, s/veh					8.33				5.15				4.38															
Approach LOS, s/veh					A				A				A															
Intersection Delay, s/veh	6.38																											
Intersection LOS	A																											

## Operational Data

### Main Geometry (ft)

#### Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Founders Parkway	10	0	24.00	2	28.00	2	150.00	75.00	20.00
2	SH 86	100	0	24.00	2	28.00	2	150.00	75.00	20.00
3	Ridge Road	170	0	24.00	2	28.00	2	150.00	75.00	20.00
4	Fifth Street	280	0	24.00	2	28.00	2	150.00	75.00	20.00

#### Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Founders Parkway	193.00	29.00	2	28.00	2	24.00	2
2	SH 86	193.00	29.00	2	28.00	2	24.00	2
3	Ridge Road	193.00	29.00	2	28.00	2	24.00	2
4	Fifth Street	193.00	29.00	2	28.00	2	24.00	2

## Bypass Geometry

### Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	SH 86	Free	601	24	2	12	1	24	2
4	Fifth Street	Merge	520	24	2	12	1	24	2

### Bypass Entry and Exit Geometry (ft)

Leg	Leg Names	Entry Geometry						Leg	Leg Names	Exit Lanes	
		Eb	neb	Lb	Lt	Rb	Phib			nex	Nmx
2	SH 86	13	1	0	130	75.0001 032	30	3	Ridge Road	2	2
4	Fifth Street	13	1	0	130	75.0001 032	30	1	Founders Parkway	2	2



## Operational Results

### 2040 PM Peak - 60 minutes

#### Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Founders Parkway	None	1497		1257		1090	1572		1.0628	
2	SH 86	Free	509	601	1629	0	1107	1307	1325	0.3956	0.4540
3	Ridge Road	None	785		1311		1427	1533		0.5210	
4	Fifth Street	Merge	987	520	840	570	1256	1868	1150	0.5365	0.4583

#### Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Founders Parkway	None	53.77		53.77	70.64		F		F
2	SH 86	Free	6.48	0.00	2.97	2.65	0.00	A	A	A
3	Ridge Road	None	7.09		7.09	4.47		A		A
4	Fifth Street	Merge	6.20	5.65	6.01	4.91	2.35	A	A	A

## Global Results

### Performance and Accidents

#### 2040 PM Peak Global Performance

Parameter	Units	Entries	Bypasses	Total
Arrive Flows	veh/hr	3778	1121	4899
Capacity	veh/hr	6279	2475	8754
Average Delay	sec/veh	25.27	2.62	20.09
L.O.S. (Signal)	A – F	C	A	C
L.O.S. (Unsig)	A – F	D	A	C
Total Delay	veh.hrs	26.52	0.82	27.34





ROUNABOUT REPORT																				
<b>General Information</b>								<b>Site Information</b>												
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd											
Agency or Co.	LSC							E/W Street Name	Enderud Blvd											
Date Performed	12/03/2018							N/S Street Name	Ridge Road											
Time Period	PM Peak							Analysis Year	2040 Background											
Peak Hour Factor	0.95							Project ID	#170081											
Project Description:																				
<b>Volume Adjustment and Site Characteristics</b>																				
	EB				WB				NB				SB							
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U				
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0					
Lane Assignment					LTR				R				T				TR			
Right-Turn Bypass	None				None				None				None							
Conflicting Lanes	1				1				1				1							
Volume (V), veh/h				0	50	0	270	0		405	95	0	470	505		0				
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				
Pedestrians Crossing	0				0				0				0							
<b>Critical and Follow-Up Headway Adjustment</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929					
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858					
<b>Flow Computations</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Circulating Flow ( $V_c$ ), pc/h	1101				435				505				54							
Exiting Flow ( $V_{ex}$ ), pc/h	607				0				725				596							
Entry Flow ( $V_e$ ), pc/h		469			161	182			252	285			492	555						
Entry Volume veh/h					158	178			247	279			482	544						
<b>Capacity and v/c Ratios</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Capacity ( $c_{PCE}$ ), pc/h		0			917	917			868	868			1233	1233						
Capacity (c), veh/h		0			899	899			851	851			1209	1209						
v/c Ratio (X)					0.18	0.20			0.29	0.33			0.40	0.45						
<b>Delay and Level of Service</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Lane Control Delay (d), s/veh					5.7	6.0			7.4	7.9			6.9	7.6						
Lane LOS		F			A	A			A	A			A	A						
Lane 95% Queue					0.6	0.7			1.2	1.4			1.9	2.4						
Approach Delay, s/veh					5.87				7.68				7.31							
Approach LOS, s/veh					A				A				A							
Intersection Delay, s/veh	7.16																			
Intersection LOS	A																			

HCM 6th TWSC  
4: Ridge Road & Site Access

2040 Total  
AM Peak

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	64	959	4	22	360
Future Vol, veh/h	0	64	959	4	22	360
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	70	1042	4	24	391







Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	523	0 0 1046 0
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -
Critical Hdwy	-	6.94	- - 4.14 -
Critical Hdwy Stg 1	-	-	- - - -
Critical Hdwy Stg 2	-	-	- - - -
Follow-up Hdwy	-	3.32	- - 2.22 -
Pot Cap-1 Maneuver	0	499	- - 661 -
Stage 1	0	-	- - - -
Stage 2	0	-	- - - -
Platoon blocked, %		-	- - -
Mov Cap-1 Maneuver	-	499	- - 661 -
Mov Cap-2 Maneuver	-	-	- - - -
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 499	661	-
HCM Lane V/C Ratio	-	- 0.139	0.036	-
HCM Control Delay (s)	-	- 13.4	10.7	-
HCM Lane LOS	-	- B	B	-
HCM 95th %tile Q(veh)	-	- 0.5	0.1	-

HCM 6th TWSC  
8: Enderud Blvd & Site Access

2040 Total  
AM Peak

Intersection						
Int Delay, s/veh	1.1					
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	13	53	13	170	610	4
Future Vol, veh/h	13	53	13	170	610	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	1000	0	200	-	-	-
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	14	58	14	185	663	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	786	334	667	0	-	0
Stage 1	665	-	-	-	-	-
Stage 2	121	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	329	662	919	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	324	662	919	-	-	-
Mov Cap-2 Maneuver	324	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Approach	SE	NE		SW		
HCM Control Delay, s	12.1	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	919	-	324	662	-	-
HCM Lane V/C Ratio	0.015	-	0.044	0.087	-	-
HCM Control Delay (s)	9	-	16.6	11	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.3	-	-

## Operational Data

### Main Geometry (ft)

#### Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Founders Parkway	10	0	24.00	2	28.00	2	150.00	75.00	20.00
2	SH 86	100	0	24.00	2	28.00	2	150.00	75.00	20.00
3	Ridge Road	170	0	24.00	2	28.00	2	150.00	75.00	20.00
4	Fifth Street	280	0	24.00	2	28.00	2	150.00	75.00	20.00

#### Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Founders Parkway	193.00	29.00	2	28.00	2	24.00	2
2	SH 86	193.00	29.00	2	28.00	2	24.00	2
3	Ridge Road	193.00	29.00	2	28.00	2	24.00	2
4	Fifth Street	193.00	29.00	2	28.00	2	24.00	2



## Bypass Geometry

### Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	SH 86	Free	639	24	2	12	1	24	2
4	Fifth Street	Merge	161	24	2	12	1	24	2

### Bypass Entry and Exit Geometry (ft)

Leg	Leg Names	Entry Geometry						Leg	Leg Names	Exit Lanes	
		Eb	neb	Lb	Lt	Rb	Phib			nex	Nmx
2	SH 86	13	1	0	130	75.0000 792	30	3	Ridge Road	2	2
4	Fifth Street	13	1	0	130	75.0000 792	30	1	Founders Parkway	2	2

## Operational Results

### 2040 AM Peak - 60 minutes

#### Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Founders Parkway	None	878		902		815	1824		0.4911	
2	SH 86	Free	672	639	777	0	1003	1912	1325	0.3554	0.4835
3	Ridge Road	None	1150		1085		1003	1694		0.6997	
4	Fifth Street	Merge	397	161	1158	654	1076	1641	1124	0.2456	0.1448

#### Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Founders Parkway	None	6.97		6.97	5.28		A		A
2	SH 86	Free	3.21	0.00	1.65	1.85	0.00	A	A	A
3	Ridge Road	None	11.41		11.41	12.26		B		B
4	Fifth Street	Merge	4.50	3.70	4.27	1.53	0.49	A	A	A

## Global Results

### Performance and Accidents





#### 2040 AM Peak Global Performance

Parameter	Units	Entries	Bypasses	Total
Arrive Flows	veh/hr	3097	800	3897
Capacity	veh/hr	7071	2449	9520
Average Delay	sec/veh	7.49	0.74	6.10
L.O.S. (Signal)	A – F	A	A	A
L.O.S. (Unsig)	A – F	A	A	A
Total Delay	veh.hrs	6.44	0.17	6.61

ROUNABOUT REPORT																												
<b>General Information</b>								<b>Site Information</b>																				
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd																			
Agency or Co.	LSC							E/W Street Name	Enderud Blvd																			
Date Performed	12/03/2018							N/S Street Name	Ridge Road																			
Time Period	AM Peak							Analysis Year	2040 Total																			
Peak Hour Factor	0.92							Project ID	#170081																			
Project Description:																												
<b>Volume Adjustment and Site Characteristics</b>																												
	EB				WB				NB				SB															
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U												
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0													
Lane Assignment					LTR				R				T				TR				LT				T			
Right-Turn Bypass	None				None				None				None				None				None							
Conflicting Lanes	1				1				1				1				1				1							
Volume (V), veh/h				0	109	0	554	0		405	43	0		140	220		0											
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2											
Pedestrians Crossing	0				0				0				0				0											
<b>Critical and Follow-Up Headway Adjustment</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929													
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858													
<b>Flow Computations</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Circulating Flow ( $V_c$ ), pc/h	520				449				155				121															
Exiting Flow ( $V_{ex}$ ), pc/h	203				0				1063				365															
Entry Flow ( $V_e$ ), pc/h		190			345	390			233	263			188	212														
Entry Volume veh/h					338	382			228	258			184	208														
<b>Capacity and v/c Ratios</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Capacity ( $c_{PCE}$ ), pc/h		0			907	907			1140	1140			1170	1170														
Capacity (c), veh/h		0			889	889			1117	1117			1147	1147														
v/c Ratio (X)					0.38	0.43			0.20	0.23			0.16	0.18														
<b>Delay and Level of Service</b>																												
	EB				WB				NB				SB															
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass													
Lane Control Delay (d), s/veh					8.4	9.2			5.1	5.3			4.5	4.7														
Lane LOS		F			A	A			A	A			A	A														
Lane 95% Queue					1.8	2.2			0.8	0.9			0.6	0.7														
Approach Delay, s/veh					8.84				5.22				4.65															
Approach LOS, s/veh					A				A				A															
Intersection Delay, s/veh	6.71																											
Intersection LOS	A																											

HCM 6th TWSC  
4: Ridge Road & Site Access

2040 Total  
PM Peak







Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	36	695	11	73	1009
Future Vol, veh/h	0	36	695	11	73	1009
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	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	39	755	12	79	1097
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	384	0	0	767	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	614	-	-	842	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	614	-	-	842	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.3	0		0.7		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	614	842	-	
HCM Lane V/C Ratio	-	-	0.064	0.094	-	
HCM Control Delay (s)	-	-	11.3	9.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.3	-	

HCM 6th TWSC  
8: Enderud Blvd & Site Access

2040 Total  
PM Peak

Intersection

Int Delay, s/veh 0.8

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	8	31	45	565	320	14
Future Vol, veh/h	8	31	45	565	320	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	1000	0	200	-	-	-
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	9	34	49	614	348	15

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	761	182	363
Stage 1	356	-	-
Stage 2	405	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	342	829	1192
Stage 1	680	-	-
Stage 2	642	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	328	829	1192
Mov Cap-2 Maneuver	328	-	-
Stage 1	652	-	-
Stage 2	642	-	-

Approach	SE	NE	SW
HCM Control Delay, s	10.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	1192	-	328	829	-	-
HCM Lane V/C Ratio	0.041	-	0.027	0.041	-	-
HCM Control Delay (s)	8.1	-	16.3	9.5	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-



## Operational Data

### Main Geometry (ft)

#### Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Founders Parkway	10	0	24.00	2	28.00	2	150.00	75.00	20.00
2	SH 86	100	0	24.00	2	28.00	2	150.00	75.00	20.00
3	Ridge Road	170	0	24.00	2	28.00	2	150.00	75.00	20.00
4	Fifth Street	280	0	24.00	2	28.00	2	150.00	75.00	20.00

#### Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Founders Parkway	193.00	29.00	2	28.00	2	24.00	2
2	SH 86	193.00	29.00	2	28.00	2	24.00	2
3	Ridge Road	193.00	29.00	2	28.00	2	24.00	2
4	Fifth Street	193.00	29.00	2	28.00	2	24.00	2

## Bypass Geometry

### Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	SH 86	Free	601	24	2	12	1	24	2
4	Fifth Street	Merge	541	24	2	12	1	24	2

### Bypass Entry and Exit Geometry (ft)

Leg	Leg Names	Entry Geometry						Leg	Leg Names	Exit Lanes	
		Eb	neb	Lb	Lt	Rb	Phib			nex	Nmx
2	SH 86	13	1	0	130	75.0000 864	30	3	Ridge Road	2	2
4	Fifth Street	13	1	0	130	75.0000 864	30	1	Founders Parkway	2	2

## Operational Results

### 2040 PM Peak - 60 minutes

#### Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Founders Parkway	None	1569		1268		1163	1564		1.1967	
2	SH 86	Free	523	601	1673	0	1114	1276	1325	0.4166	0.4540
3	Ridge Road	None	834		1309		1488	1534		0.5531	
4	Fifth Street	Merge	987	541	903	622	1240	1823	1134	0.5501	0.4839

#### Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Founders Parkway	None	92.96		92.96	117.27		F		F
2	SH 86	Free	7.03	0.00	3.27	2.90	0.00	A	A	A
3	Ridge Road	None	7.45		7.45	4.95		A		A
4	Fifth Street	Merge	6.52	6.00	6.34	5.18	2.60	A	A	A

## Global Results

### Performance and Accidents

#### 2040 PM Peak Global Performance

Parameter	Units	Entries	Bypasses	Total
Arrive Flows	veh/hr	3913	1142	5055
Capacity	veh/hr	6198	2459	8657
Average Delay	sec/veh	41.45	2.84	32.73
L.O.S. (Signal)	A – F	D	A	C
L.O.S. (Unsig)	A – F	E	A	D
Total Delay	veh.hrs	45.05	0.90	45.95

ROUNABOUT REPORT																				
<b>General Information</b>								<b>Site Information</b>												
Analyst	KMK							Intersection	Ridge Road/ E. Enderud Blvd											
Agency or Co.	LSC							E/W Street Name	Enderud Blvd											
Date Performed	12/03/2018							N/S Street Name	Ridge Road											
Time Period	PM Peak							Analysis Year	2040 Total											
Peak Hour Factor	0.95							Project ID	#170081											
Project Description:																				
<b>Volume Adjustment and Site Characteristics</b>																				
	EB				WB				NB				SB							
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U				
Number of Lanes (N)	0	0	0		0	1	1		0	2	0		0	2	0					
Lane Assignment					LTR				R				T				TR			
Right-Turn Bypass	None				None				None				None							
Conflicting Lanes	1				1				1				1							
Volume (V), veh/h				0	61	0	290	0		405	106	0	504	505		0				
Heavy Veh. Adj. ( $f_{HV}$ ), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				
Pedestrians Crossing	0				0				0				0							
<b>Critical and Follow-Up Headway Adjustment</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Critical Headway (sec)	5.1929	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929		4.2000	4.2000	5.1929					
Follow-Up Headway (sec)	3.1858	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858		2.8000	2.8000	3.1858					
<b>Flow Computations</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Circulating Flow ( $V_c$ ), pc/h	1148				435				541				65							
Exiting Flow ( $V_{ex}$ ), pc/h	655				0				746				608							
Entry Flow ( $V_e$ ), pc/h		469			177	200			258	291			509	574						
Entry Volume veh/h					174	196			253	285			499	563						
<b>Capacity and v/c Ratios</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Capacity ( $c_{PCE}$ ), pc/h		0			917	917			844	844			1222	1222						
Capacity (c), veh/h		0			899	899			827	827			1198	1198						
v/c Ratio (X)					0.19	0.22			0.31	0.34			0.42	0.47						
<b>Delay and Level of Service</b>																				
	EB				WB				NB				SB							
	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass					
Lane Control Delay (d), s/veh					5.9	6.2			7.8	8.4			7.2	8.0						
Lane LOS		F			A	A			A	A			A	A						
Lane 95% Queue					0.7	0.8			1.3	1.5			2.1	2.6						
Approach Delay, s/veh					6.08				8.09				7.62							
Approach LOS, s/veh					A				A				A							
Intersection Delay, s/veh	7.46																			
Intersection LOS	A																			