Memo

To: Donna Ferguson - ToCR

From: James Mill, P.E. – Legacy Engineering, Inc

CC: Chris McGrannahan.

Date: January 17, 2018

Re: Ridge Estates TIS Work .

This memo is meant to serve as a cover sheet and summary of Ridge Estates Traffic Study work from May, 2016 until today. All mentioned studies are attached to this memo in the order given below and bookmarked according to each title.

1. RGE_TIS_12-20-12, Dec 20th, 2012 First TIS to address and defend 100 lot proposal on Ridge Estates combined with 104 already zoned lots on PA15S(sw).

2. RGE_-TIS-050616, May 6th, 2016 – Update of TIS with further information to address and defend 100 lot proposal on Ridge Estates. Addressed comments received from Town on Jan 31st, 2013. Accompanied PD/Annexation Resubmittal on May 6th 2016.

3. RGE_TIS-091916, September 19th, 2016 – Further update of TIS with more information to address and defend 100 lot proposal on Ridge Estates. Addressed comments received from Town on June 24th , 2016. Accompanied PD/Annexation Resubmittal on September 20th , 2016.

4. RGE Further Traffic Info for Nov 17 2016 mtg – Nov 11th, 2016 - Traffic apportionment diagrams for a meeting with the Town on Nov 17th 2016.

5. RGE_TIS_111516 – Nov 15th, 2016 - Additional TIS information adding discussion to diagrams for Nov 17th 2016 meeting with Town.

6. RGE_ADT-Letter-010417 – Jan 4th, 2017 - ADT analysis memo in response to request for information at Nov 17th 2016 meeting with Town staff.

7. RGE_ADT-Letter-011617 – Jan 16th 2017 – ADT and trip assignment memo to further address Town staff concerns.

8. PW Memo - Sensitivity Study Executive Summary – Jan 26th, 2017 – Memo from Town Public Work summarizing FHU summary analysis of LSC ADT Jan 16th 2017 memo.

9. RGE Traffic Memorandum – 030217 – March 2nd, 2017 – LSC Traffic memorandum summarizing new ADT's and trip assignments based on updated proposed total density of 142 lots on RGE and PA15S(sw).

10. RGE 42-52 DailyTripAssignments.R1 – March 13th , 2017 – LSC Traffic diagrams illustrating trip assignment result of 100 on PA15(sw) plus 42 on RGE versus 90 on PA15(sw) plus 52 on RGE – demonstrating zero difference.

11. RidgeEstates-011718 – Jan 17th, 2018 – Update of March 2nd, 2017 LSC Memo with additional explanation of equivalence between trip assignment result of 100 on PA15(sw) plus 42 on RGE versus 90 on PA15(sw) plus 52 on RGE.

LSC TRANSPORTATION CONSULTANTS, INC.

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TRANSPORTATION
CONSULTANTS, INC.

December 20, 2012

Mr. James J. Mill
Legacy Engineering, Inc.
1626 Thatch Circle
Castle Rock, CO 80109

Re: Crystal Valley Ranch
(Sellers Creek Ranch Estates)
Traffic Memorandum
LSC #120740

Dear Mr. Mill:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic memorandum for the proposed Crystal Valley Ranch (Sellers Creek Ranch Estates) residential development. As shown on Figure 1, the site is located on the south end of the Crystal Valley Ranch development in Castle Rock, Colorado.

REPORT CONTENTS

The report contains the following: the existing and proposed access roadways in the site's vicinity; the estimated site-generated traffic volumes that could result from the proposed development; the short-term and long-term assignment of these site-generated traffic volumes to the area roadways; the projected background and resulting total traffic volumes on the area roadways; and any recommended roadway improvements to mitigate the development's traffic impacts.

LAND USE AND ACCESS

The site is planned to include a total of 204 single-family dwelling units. Twenty dwelling units in the south half of the site were proposed in the 2006 *Sellers Creek TIA*, and 104 dwelling units immediately to the north were previously proposed as part of Crystal Valley Ranch.

The current proposal is to increase the previous density of 20 dwelling units on the south half to 100 dwelling units.

2013 BACKGROUND TRAFFIC

There is no existing traffic in the vicinity of the site because the roads don't currently exist.

2035 BACKGROUND TRAFFIC

Figure 2 shows the background traffic estimated on the area roads with no connection to the west or north.

TRIP GENERATION

Table 2 shows the estimated average weekday, morning peak-hour, and afternoon peak-hour trip generation for both the previously proposed and currently proposed sites. The current estimate is based on the rates from *Trip Generation, 9th Edition, 2012* by the Institute of Transportation Engineers (ITE).

The previously proposed 124 dwelling units were projected to generate about 1,187 vehicle-trips on the average weekday, with about half entering and half exiting the site 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 23 vehicles would enter and about 71 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 81 vehicles would enter and about 45 vehicles would exit the site.

The currently proposed 204 dwelling units are projected to generate about 1,940 vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour, about 38 vehicles would enter and about 115 vehicles would exit the site. During the afternoon peak-hour, about 129 vehicles would enter and about 75 vehicles would exit the site.

The additional 80 dwelling units would generate about 755 additional average weekday trips, with 59 additional trips during the morning peak-hour and 78 additional trips during the afternoon peak-hour.

TRIP DISTRIBUTION AND ASSIGNMENT

Figure 3 shows the estimated directional distribution of the site-generated traffic volumes on the area roadways. The estimates are consistent with those assumed in the 2006 *Sellers Creek TIA* which was based on the location of the site with respect to the regional population, employment, and activity centers and the site's proposed land use.

SITE-GENERATED TRAFFIC

Figure 4 shows the estimated site-generated traffic volumes for the site on the area roadways assuming no connection to the west or north, which were determined by applying the directional distribution percentages (from Figure 3) to the trip generation estimates (from Table 1).

2013 TOTAL TRAFFIC

The 2013 total traffic is the same as the short-term site-generated traffic.

2035 TOTAL TRAFFIC

Figure 5 shows the 2035 total traffic which is the sum of the 2035 background traffic volumes (from Figure 2) and the traffic volumes (from Figure 4).

CONCLUSIONS AND RECOMMENDATIONS

Proposed Land Use

1. The density of the south half of the Crystal Valley Ranch (Sellers Creek Ranch Estates) is proposed to be increased from the previously proposed 20 dwelling units to the currently proposed 100 dwelling units.

Proposed Access Plan

2. Access will be to West Loop Road with gated emergency access points to the south.

Trip Generation

3. The additional 80 dwelling units would generate about 755 additional average weekday trips, with 59 additional trips during the morning peak-hour and 78 additional trips during the afternoon peak-hour.

Overall Impact

4. The first short block of Sellers Gulch Road southwest from West Loop Road is expected to exceed 1,500 vehicle-trips per day and may need to be built as a residential collector. All other roads between the site and West Loop Road are expected to be below 1,500 vehicles per day.

5. The 2035 turning traffic volumes at the intersection of Sellers Gulch Road and West Loop Road support the need for a southbound right-turn lane on West Loop Road approaching Sellers Gulch Road. This was previously proposed in the 2006 *Sellers Creek TIA*. Figure 8 from the previous report is attached. Two-way stop control with West Loop Road operating freely will be adequate traffic control.

* * * * *

We trust this traffic memorandum analysis will assist you in gaining approval of the proposed Crystal Valley Ranch (Sellers Creek Ranch Estates) residential development. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By_____
Christopher S. McGranahan, PE, PTOE

COLORADO LICENSED CHRISTOPHER S. McGRANAHAN 39018 PROFESSIONAL ENGINEER

12-20-12

CSM/wc

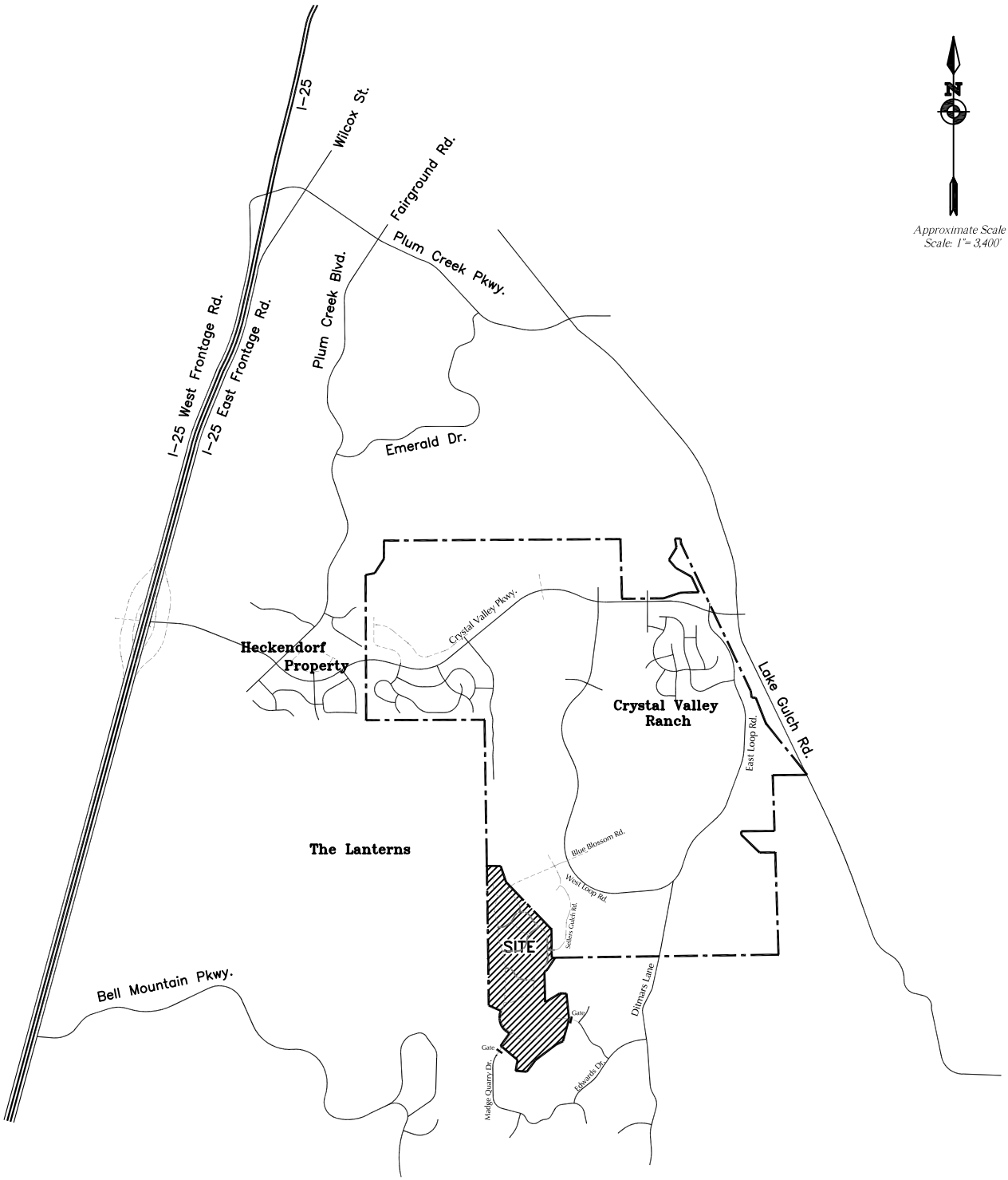
Enclosures: Table 1
Figures 1 - 5
Figure 8 from 2006 *Sellers Creek TIA*

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Table 1
ESTIMATED TRAFFIC GENERATION
Crystal Valley Ranch - Sellers Creek Ranch Estates
Castle Rock, CO
(LSC #120740; December, 2012)

		Trip Generation Rates[1]					External Vehicle - Trips Generated				
		Average	AM Peak-Hour		PM Peak-Hour		Average	AM Peak-Hour		PM Peak-Hour	
ITE Category	Quantity	Weekday	In	Out	In	Out	Weekday	In	Out	In	Out
Previously Proposed Land Use [2]											
Single-Family Housing [3]	124 DU [4]	9.57	0.19	0.57	0.65	0.36	1,187	23	71	81	45
Currently Proposed Land Use [5]											
Single-Family Housing	204 DU	9.52	0.19	0.56	0.63	0.37	1,942	38	115	129	75
					Difference =		**755**	**15**	**44**	**48**	**30**

Notes:
(1) Source: *Trip Generation*, Institute of Transportation Engineers, 7th Edition (2003) for previously proposed estimate and 9th Edition (2012) for current estimate.
(2) Includes 20 dwelling units from 2006 Sellers Creek TIA and 104 dwelling units immediately to the north of the 20 units.
(3) ITE Land Use #210 - Single-Family Detached Housing
(4) DU = Dwelling Units
(5) Includes currently proposed 100 dwelling units within the previously proposed 2006 TIA study area and 104 dwelling units mention in Note #2.



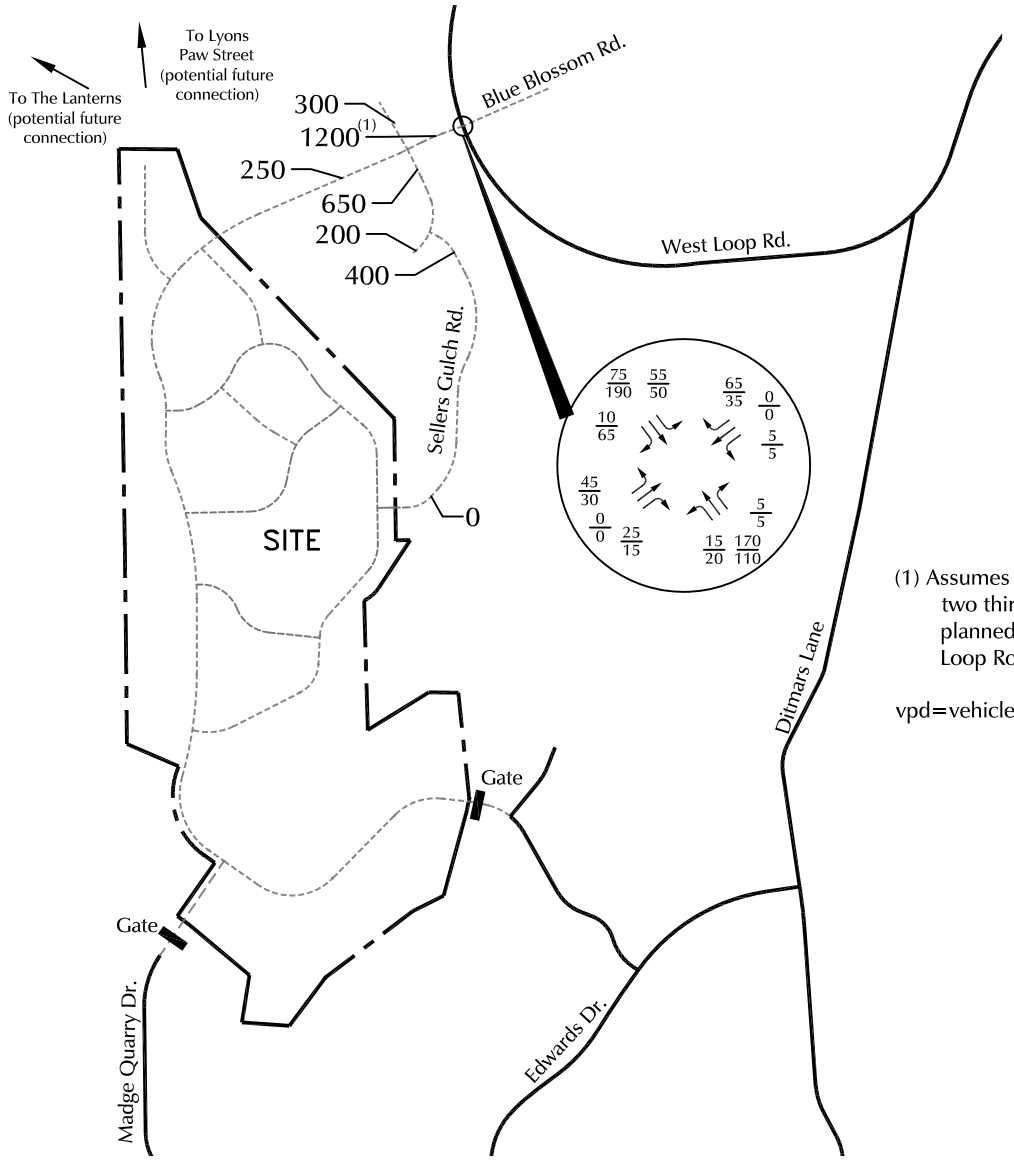
------ = Future Roadway Construction

Figure 1

Vicinity Map

Crystal Valley Ranch (Sellers Creek Ranch Estates) (LSC #120740)

LSC TRANSPORTATION CONSULTANTS, INC.



N

Approximate Scale
Scale: 1"= 600'

(1) Assumes 1,200vpd which is based on two thirds of the future 187 homes planned between the site and the West Loop Road.

vpd=vehicle trips per day

LEGEND:

$\frac{45}{65}$ = AM Peak-Hour Traffic / PM Peak-Hour Traffic

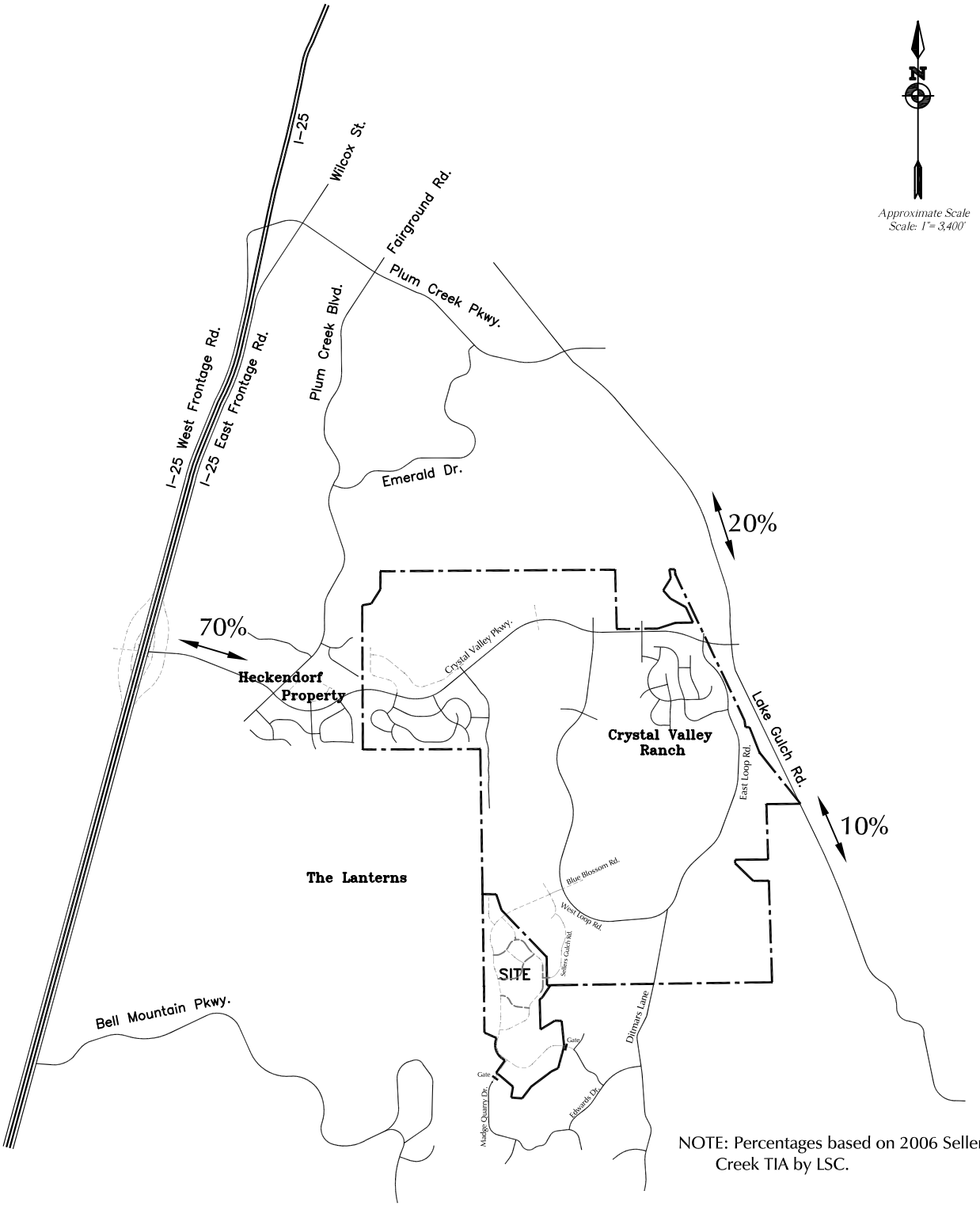
2,500 = Average Daily Traffic

------ = Future Roadway Construction

Figure 2

Year 2035 Background Traffic

Crystal Valley Ranch (Sellers Creek Ranch Estates) (LSC #120740)



LEGEND:

65% = Percent Directional Distribution

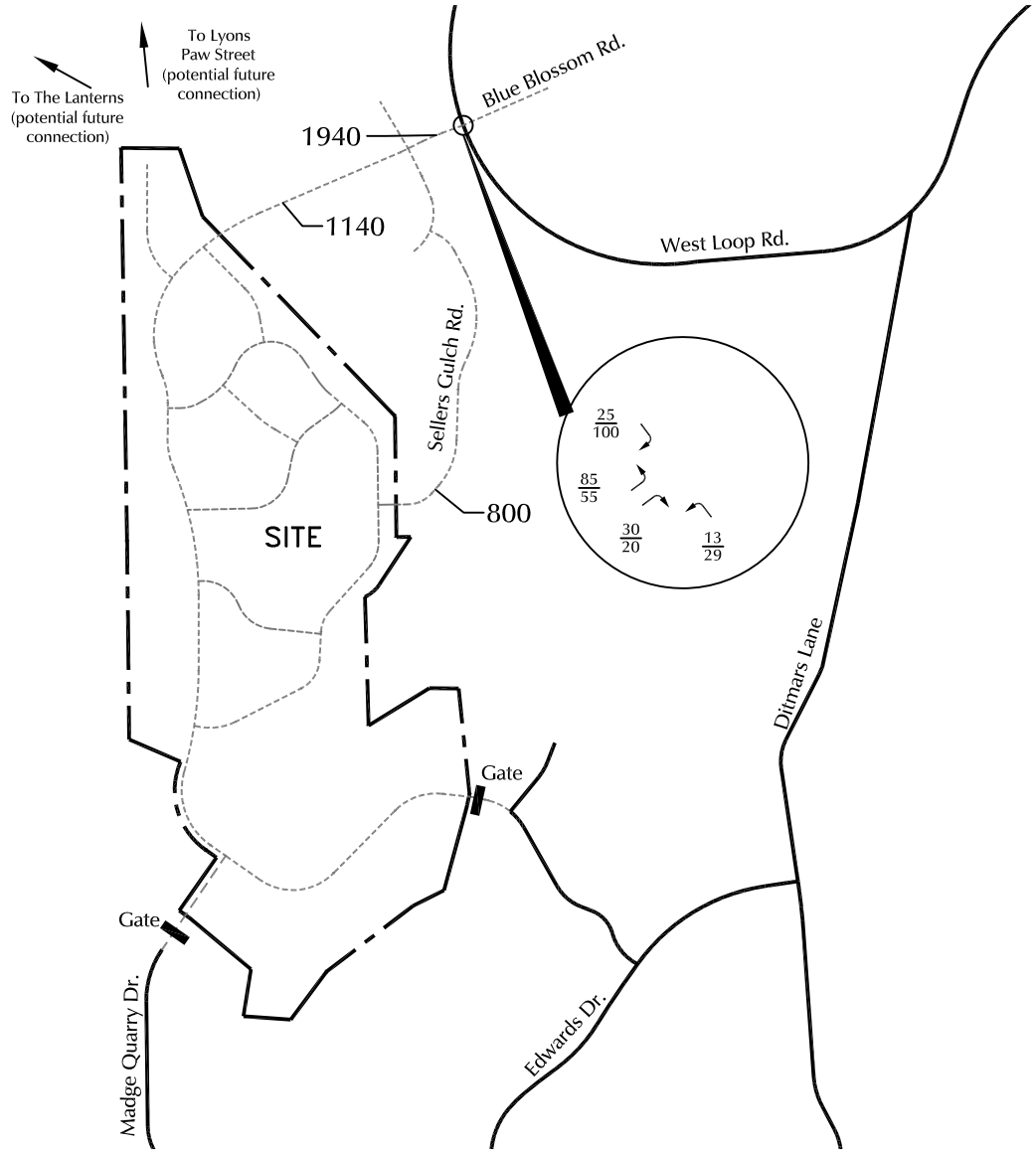
------ = Future Roadway Construction

TRANSPORTATION CONSULTANTS, INC.

Figure 3

Directional Distribution of Site-Generated Traffic

Crystal Valley Ranch (Sellers Creek Ranch Estates) (LSC #120740)



LEGEND:

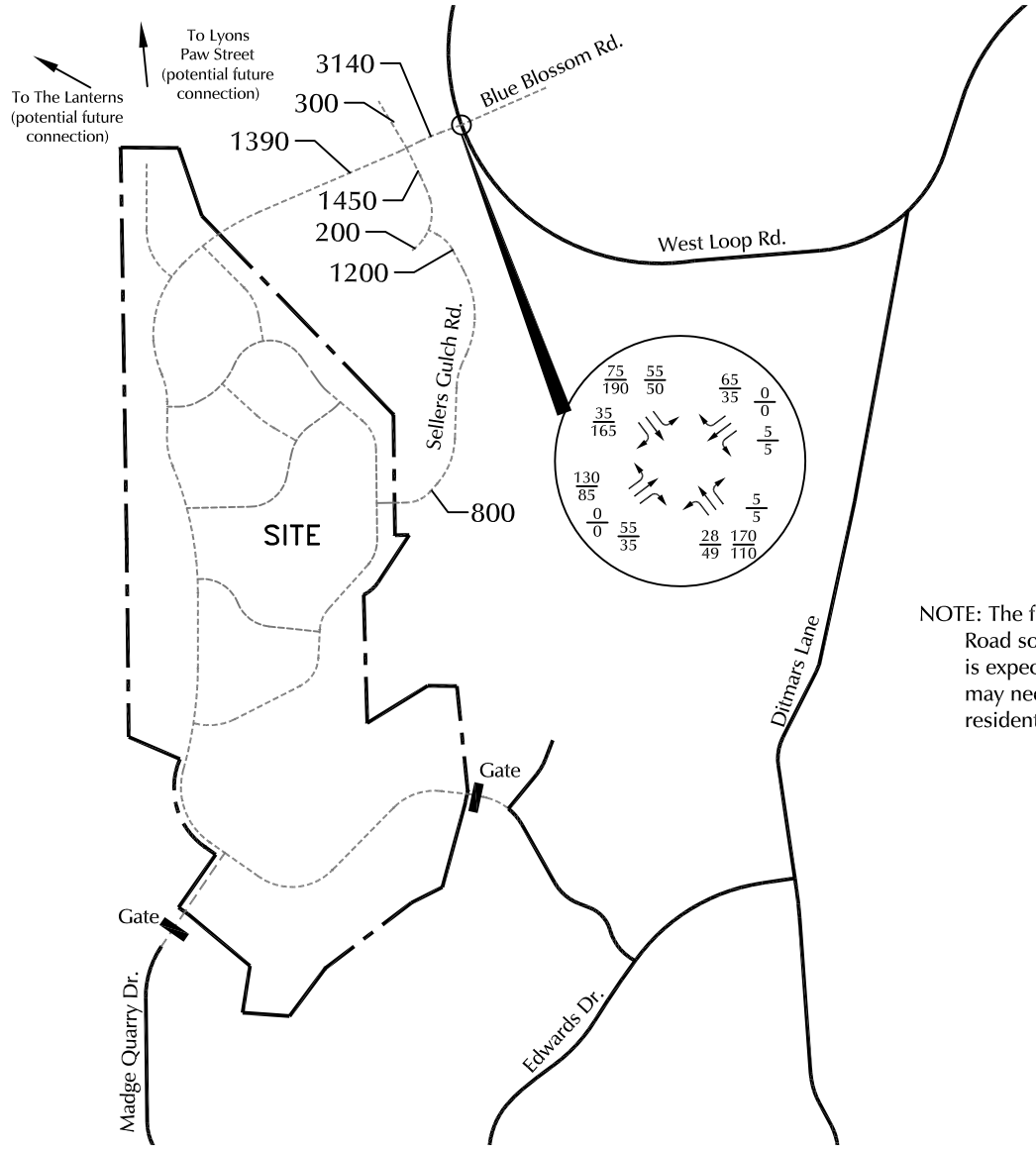
2,500 = Average Daily Traffic

------ = Future Roadway Construction

Figure 4

Assignment of Site-Generated Traffic

Crystal Valley Ranch (Sellers Creek Ranch Estates) (LSC #120740)



NOTE: The first short block of Sellers Gulch Road southwest from West Loop Road is expected to exceed 1,500vpd and may need to be built as a minor residential collector.

LEGEND:

$\frac{45}{65}$ = $\frac{\text{AM Peak-Hour Traffic}}{\text{PM Peak-Hour Traffic}}$

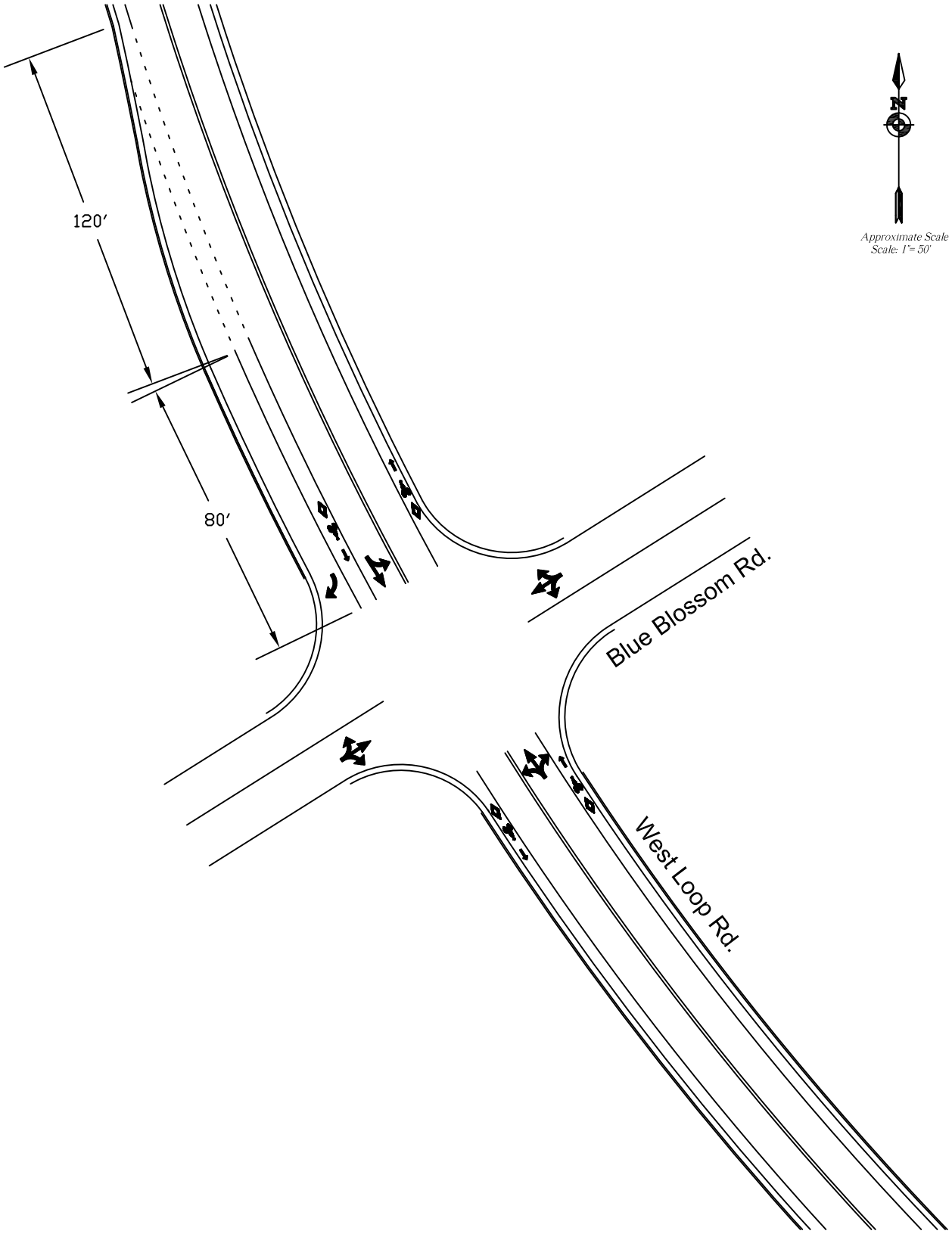
2,500 = Average Daily Traffic

------ = Future Roadway Construction

Figure 5

Year 2035 Total Traffic

Crystal Valley Ranch (Sellers Creek Ranch Estates) (LSC #120740)



Approximate Scale
Scale: 1"= 50'

Figure 8

Lane Recommendations

Sellers Creek (LSC #061580)

LSC TRANSPORTATION CONSULTANTS, INC.

LSC TRANSPORTATION CONSULTANTS, INC.

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May 6, 2016

Mr. Gregg Brown
Crystal Valley Ranch Development Company
Gregg@cvranch.com

Re: Ridge Estates
Castle Rock, CO
(LSC #150660)

Dear Mr. Brown:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the Ridge Estates development. As shown on Figure 1, the site is located south of the Crystal Valley Ranch development and is proposed for annexation into the Town of Castle Rock, Colorado.

REPORT CONTENTS

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site; the existing traffic volumes; the site-generated traffic volumes; the assignment of the site-generated traffic volumes; the resulting short and long-term total traffic volumes; the site's projected traffic impacts; and any recommended roadway improvements to mitigate the site's traffic impacts.

LAND USE AND ACCESS

The currently proposed land use for the site is about 100 single-family dwelling units. Figure 2a shows the conceptual site plan with the proposed access points. Figure 2b shows the site's various connections to Crystal Valley Parkway.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

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

- **Crystal Valley Parkway** is an east-west two-lane minor arterial north of the site. Crystal Valley Parkway has continuity from the east I-25 Frontage Road to Lake Gulch Road. It provides access to Heckendorf Ranch, Crystal Valley Ranch, and The Lanterns. The intersections with West and East Loop Road are two-way stop controlled. The posted speed

limit in the vicinity of the site is 35 mph. Long range plans are to widen to four through lanes with auxiliary turn lanes and connect Crystal Valley Parkway to Interstate 25 with a future interchange. Funds have been escrowed to construct up to four future traffic signals along Crystal Valley Parkway in this area.

- **West and East Loop Road** is a four-lane north-south collector roadway near Crystal Valley Parkway but only two lanes near the site with auxiliary turn lanes at the intersections with Crystal Valley Parkway. The posted speed limit in the vicinity of the site is 35 mph.

Existing Traffic Conditions

Figure 3 shows the existing traffic volumes, the existing lane geometry, and traffic control in the area. The weekday peak-hour traffic volumes are from the attached traffic counts conducted by Counter Measures in December, 2015.

2020 and 2035 Background Traffic

Figure 4 shows the estimated 2020 background traffic and assumes buildout of Crystal Valley filings already approved or in the review process. The volumes are based on the 2020 total traffic from the January 28, 2016 *Homestead at Crystal Valley TIA*. Figure 4 also shows the 2020 lane geometry and traffic control.

Figure 5 shows the estimated 2035 background traffic and is consistent with prior studies of this area. This estimate assumes completion of the I-25/Crystal Valley Parkway interchange and connectivity between Crystal Valley Ranch and Crystal Valley Parkway through the Lanterns development.

Existing, 2020 and 2035 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 both signalized and unsignalized intersections.

The intersections in Figures 3, 4, and 5 were analyzed to determine the existing, 2020, and 2035 background traffic levels of service based on the signalized and unsignalized intersection analysis procedures from the *Highway Capacity Manual*. Table 1 shows the level of service analysis results. The level of service reports are attached.

- **Crystal Valley Parkway/West Loop Road:** All movements of this two-way stop controlled currently operate at LOS "A" during both morning and afternoon peak-hours. By 2020, this intersection is expected to be signalized and as such is expected to operate at LOS "C" or better during both morning and afternoon peak-hours through 2035.

- **Crystal Valley Parkway/S. Lake Gulch Road:** All movements at this two-way stop-controlled intersection are expected to operate at LOS "B" or better through 2020. By 2035, all movements at this intersection are expected to operate at LOS "D" or better.

- **Crystal Valley Parkway/East Loop Road:** All movements of this two-way stop controlled currently operate at LOS "B" or better during both morning and afternoon peak-hours and are expected to operate at LOS "D" or better through 2020. By 2035, this intersection is expected to be signalized and as such is expected to operate at LOS "C" or better during both morning and afternoon peak-hours.

- **Loop Road/CVR 13 Access:** All movements of this two-way stop-controlled intersection are expected to operate at LOS "B" or better during both morning and afternoon peak-hours through 2035.

- **Loop Road/CVR 12 Access:** All movements of this two-way stop controlled intersection are expected to operate at LOS "B" or better during both morning and afternoon peak-hours through 2035.

TRIP GENERATION

Table 2 shows the estimated typical weekday, morning peak-hour, and afternoon peak-hour trip generation for the proposed land use based on the rates from *Trip Generation, 9th Edition,* 2012, by the Institute of Transportation Engineers (ITE).

The site is projected to generate about 952 vehicle-trips on the average weekday, with about half entering and half exiting the site 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 19 vehicles would enter and about 56 vehicles would exit the site. During the afternoon peak-hour, which generally occurs for one hour between 4:00 and 6:30 p.m., about 63 vehicles would enter and about 37 vehicles would exit the site.

TRIP DISTRIBUTION

Figure 6 shows the estimated directional distribution of the 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, and activity centers; and the site's proposed land use.

TRIP ASSIGNMENT

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

2020 AND 2035 TOTAL TRAFFIC

Figure 8 shows the 2020 total traffic which is the sum of 2020 background traffic (Figure 4) and the site-generated traffic (Figure 7). Figure 8 also shows the recommended 2020 lane geometry and traffic control.

Figure 9 shows the typical weekday 2035 total traffic which is the sum of 2035 background traffic (Figure 5) and the site-generated traffic (Figure 7). Figure 9 also shows the recommended 2035 lane geometry and traffic control.

PROJECTED LEVELS OF SERVICE

The intersections in Figures 8 and 9 were analyzed to determine the future levels of service based on the signalized and unsignalized intersection analysis procedures from the *Highway Capacity Manual*. Table 1 shows the level of service analysis results. The level of service reports are attached.

- **Crystal Valley Parkway/West Loop Road:** This future signalized intersection is expected to operate at an overall LOS "C" or better in 2020 and 2035 with or without the addition of site-generated traffic.

- **Crystal Valley Parkway/S. Lake Gulch Road:** All movements at this unsignalized intersection are expected to operate at LOS "C" or better through 2020. By 2035, all movements are expected to operate at LOS "D" or better with or without the addition of site traffic.

- **Crystal Valley Parkway/East Loop Road:** This unsignalized intersection is expected to operate at an overall LOS "D" or better through 2020 with or without the addition of site-generated traffic. By 2035, it is expected to be signalized and operate at LOS "C" or better in both peak-hours with or without the addition of site traffic.

- **Loop Road/CVR 13 Access:** All approaches of this stop-sign controlled intersection are expected to operate at LOS "B" or better through 2035 with or without the addition of site traffic.

- **Loop Road/CVR 12 Access:** All approaches of this stop-sign controlled intersection are expected to operate at LOS "B" or better through 2035 with or without the addition of site traffic.

ASSIGNMENT OF AVERAGE DAILY TRAFFIC

Figure 10 shows an assignment of buildout daily traffic on the various local streets in the site's vicinity.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. The site is projected to generate about 952 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, about 19 vehicles would enter and about 56 vehicles would exit the site. During the

afternoon peak-hour, about 63 vehicles would enter and about 37 vehicles would exit the site.

Levels of Service

2. The future signalized intersections of Crystal Valley Parkway with East Loop and West Loop Road are expected to operate at an overall LOS "C" or better during both morning and afternoon peak-hours through 2035 with or without the addition of site traffic.

3. All movements at the unsignalized intersections analyzed are expected to operate at LOS "D" or better through 2035 with or without the addition of site traffic.

Connectivity to the Lanterns

4. The planned connection between Crystal Valley Ranch and Crystal Valley Parkway through the Lanterns development will likely be necessary for Ridge Estates to be completed without overloading a few local streets between the site and Loop Road.

Recommended Improvements

5. The intersections of Crystal Valley Parkway with West Loop Road and East Loop Road should be signalized once traffic signal warrants are met. The funding for future traffic signals has been escrowed with the Town. A traffic signal is expected to be met at West Loop Road by 2020 and at East Loop Road between 2020 and 2035.

6. A northbound left-turn lane and southbound right-turn lane should be constructed on E. Lake Gulch Road approaching Crystal Valley Parkway. These improvements are currently planned to be completed by others.

7. Crystal Valley Parkway should be widened to the build-out cross-section by 2020. This is currently planned to be completed by others.

8. Figure 10 shows an assignment of buildout daily traffic on the various local streets within the site's vicinity. The planned connection between Crystal Valley Ranch and Crystal Valley Parkway through the Lanterns development will likely be necessary for Ridge Estates to be completed without overloading a few local streets between the site and Loop Road.

* * * * *

We trust this information will assist you in planning for the Ridge Estates development. Please contact me if you have any questions or need further assistance.

Respectfully submitted,

LSC Transportation Consultants, Inc.

By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

COLORADO LICENSED
CHRISTOPHER S. MCGRANAHAN
39018
PROFESSIONAL ENGINEER
5-6-16

CSM/wc

Enclosure: Tables 1 and 2
Figures 1 - 10
Traffic Count Data
Level of Service Definitions
Capacity Analyses

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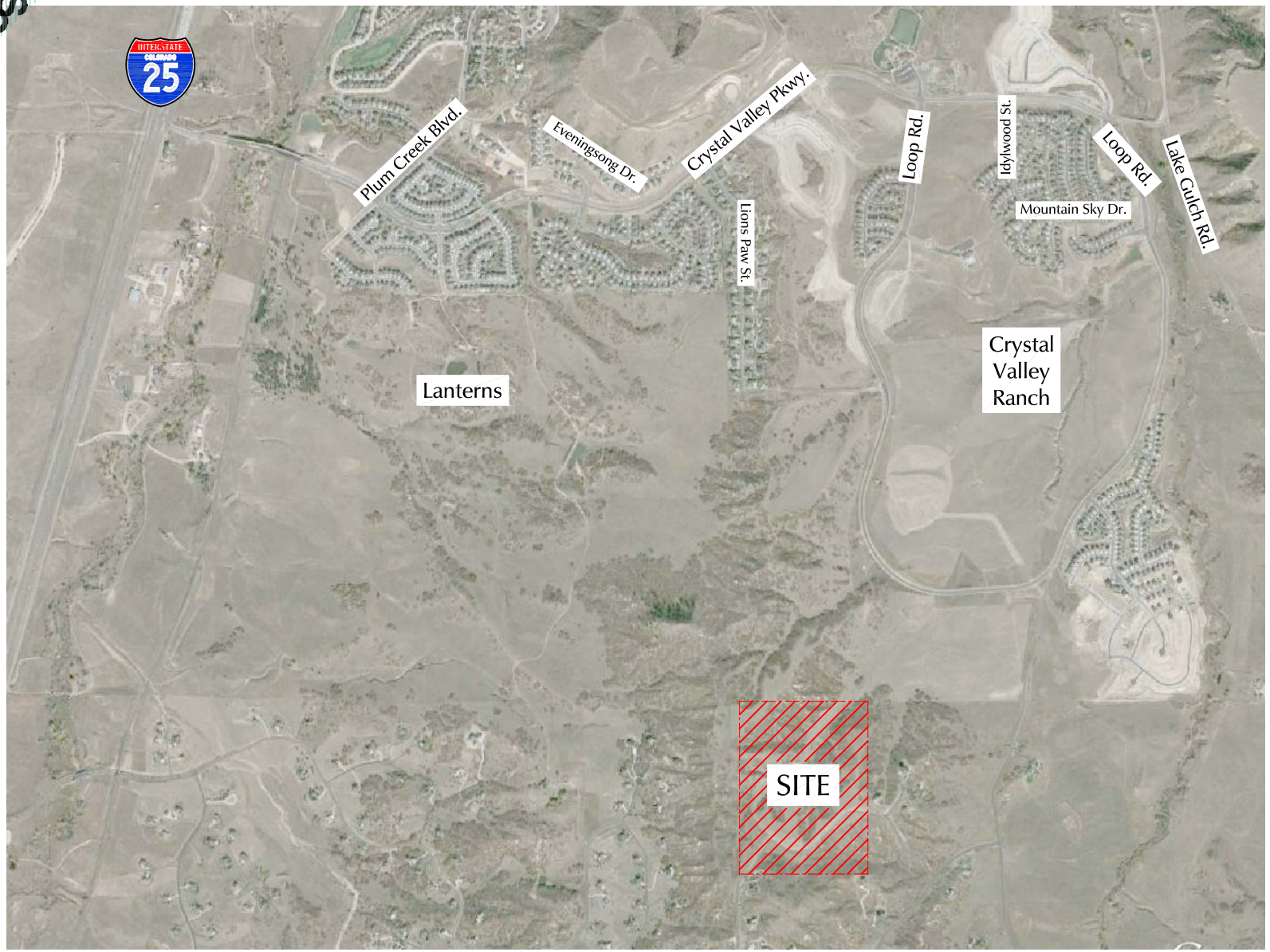
Table 1
Intersection Levels of Service Analysis
Ridge Estates
Castle Rock, CO
(LSC #150660; May, 2016)

Intersection Location	Traffic Control	Existing Traffic Level of Service AM	Existing Traffic Level of Service PM	2020 Background Level of Service AM	2020 Background Level of Service PM	2020 Total Traffic Level of Service AM	2020 Total Traffic Level of Service PM	2035 Background Level of Service AM	2035 Background Level of Service PM	2035 Total Level of Service AM	2035 Total Level of Service PM
Crystal Valley Parkway & W. Loop Road/	TWSC										
NB Left		A	A	--	--	--	--	--	--	--	--
NB Through		A	A	--	--	--	--	--	--	--	--
NB Right		A	A	--	--	--	--	--	--	--	--
EB Right		A	A	--	--	--	--	--	--	--	--
EB Left/Through		A	A	--	--	--	--	--	--	--	--
WB Left/Through/Right		A	A	--	--	--	--	--	--	--	--
SB Left/Through/Right		A	A	--	--	--	--	--	--	--	--
Critical Movement Delay		9.2	9.5	--	--	--	--	--	--	--	--
	Signalized										
EB Left		--	--	B	A	B	A	B	A	B	A
EB Through		--	--	B	A	B	A	B	B	B	B
EB Right		--	--	B	B	B	B	A	B	A	B
WB Left		--	--	A	A	A	A	B	A	B	A
WB Through		--	--	B	A	B	A	C	B	C	B
WB Right		--	--	A	A	A	A	B	B	B	B
NB Left		--	--	C	C	C	C	D	C	D	C
NB Through		--	--	B	C	B	C	C	C	C	C
NB Right		--	--	C	C	C	C	C	C	C	C
SB Left		--	--	C	C	C	C	C	D	C	D
SB Through/Right		--	--	C	D	C	D	D	D	D	D
Entire Intersection Delay (sec /veh)		--	--	20.2	14.9	20.5	15.2	26.5	17.6	26.8	18.0
Entire Intersection LOS		--	--	C	B	C	B	C	B	C	B
Crystal Valley Parkway/S. Lake Gulch Road	TWSC										
NB Left/Through		A	A	A	A	A	A	A	A	A	A
NB Left		--	--	B	B	C	B	D	D	D	D
EB Approach		B	B	--	--	--	--	--	--	--	--
Critical Movement Delay		10.1	10.1	14.8	13.3	15.2	13.5	31.0	25.6	33.7	26.8
Crystal Valley Parkway/East Loop Road	TWSC										
NB Left		A	A	C	D	C	D	--	--	--	--
NB Through/Right		A	A	C	C	C	C	--	--	--	--
EB Left		A	A	A	A	A	A	--	--	--	--
WB Left		A	A	A	A	A	A	--	--	--	--
SB Approach		A	B	--	--	--	--	--	--	--	--
SB Left		--	--	C	D	C	D	--	--	--	--
SB Right		--	--	C	C	C	C	--	--	--	--
Critical Movement Delay		9.2	11.5	20.6	32.0	21.7	34.9	--	--	--	--
	Signalized										
EB Left		--	--	--	--	--	--	A	A	A	A
EB Through		--	--	--	--	--	--	A	A	A	A
EB Right		--	--	--	--	--	--	A	A	A	A
WB Left		--	--	--	--	--	--	A	A	A	A
WB Through		--	--	--	--	--	--	A	A	A	A
WB Right		--	--	--	--	--	--	A	A	A	A
NB Left		--	--	--	--	--	--	D	D	D	D
NB Through/Right		--	--	--	--	--	--	D	D	D	D
SB Left		--	--	--	--	--	--	C	D	C	D
SB Through/Right		--	--	--	--	--	--	C	D	C	D
Entire Intersection Delay (sec /veh)		--	--	--	--	--	--	23.1	13.8	23.8	14.2
Entire Intersection LOS		--	--	--	--	--	--	C	B	C	B
Loop Road/CVR 13 Access	TWSC										
NB Approach		--	--	A	A	A	A	A	A	A	A
EB Approach		--	--	B	B	B	B	B	B	B	B
Critical Movement Delay		--	--	11.2	11.7	11.4	11.9	13.3	12.9	13.8	13.2
Loop Road/CVR 12 Access	TWSC										
NB Approach		--	--	B	B	B	B	B	B	B	B
WB Left		--	--	A	A	A	A	A	A	A	A
Critical Movement Delay		--	--	10.6	11.0	10.7	11.2	11.7	11.5	11.7	11.7

Table 2
ESTIMATED TRAFFIC GENERATION
Ridge Estates
Castle Rock, CO
(LSC #150660; May, 2016)

		Trip Generation Rates[1]					Vehicle - Trips Generated				
		Average	AM Peak Hour		PM Peak Hour		Average	AM Peak Hour		PM Peak - Hour	
Trip Generating Category	Quantity	Weekday	In	Out	In	Out	Weekday	In	Out	In	Out
Single-Family Residential [2]	100 DU [3]	9.52	0.188	0.563	0.630	0.370	952	19	56	63	37

Notes:
(1) Source: *Trip Generation*, Institute of Transportation Engineers, 9th Edition, 2012.
(2) ITE Land Use No. 210, Single-Family Detached Housing
(3) DU = Dwelling Units



N

Approximate Scale
Scale: 1"=2,000'

Figure 1

Vicinity Map

Ridge Estates (LSC #150660)

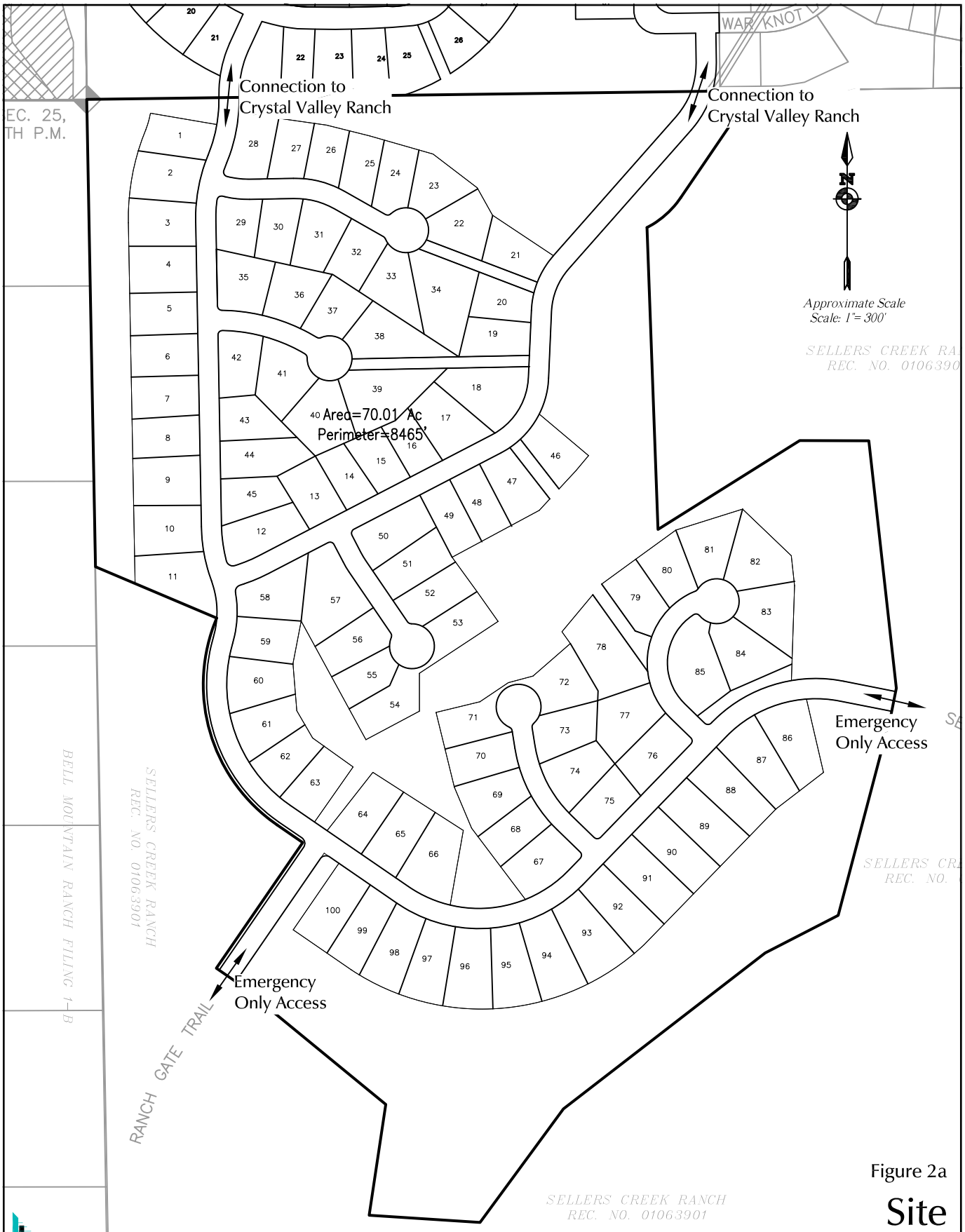
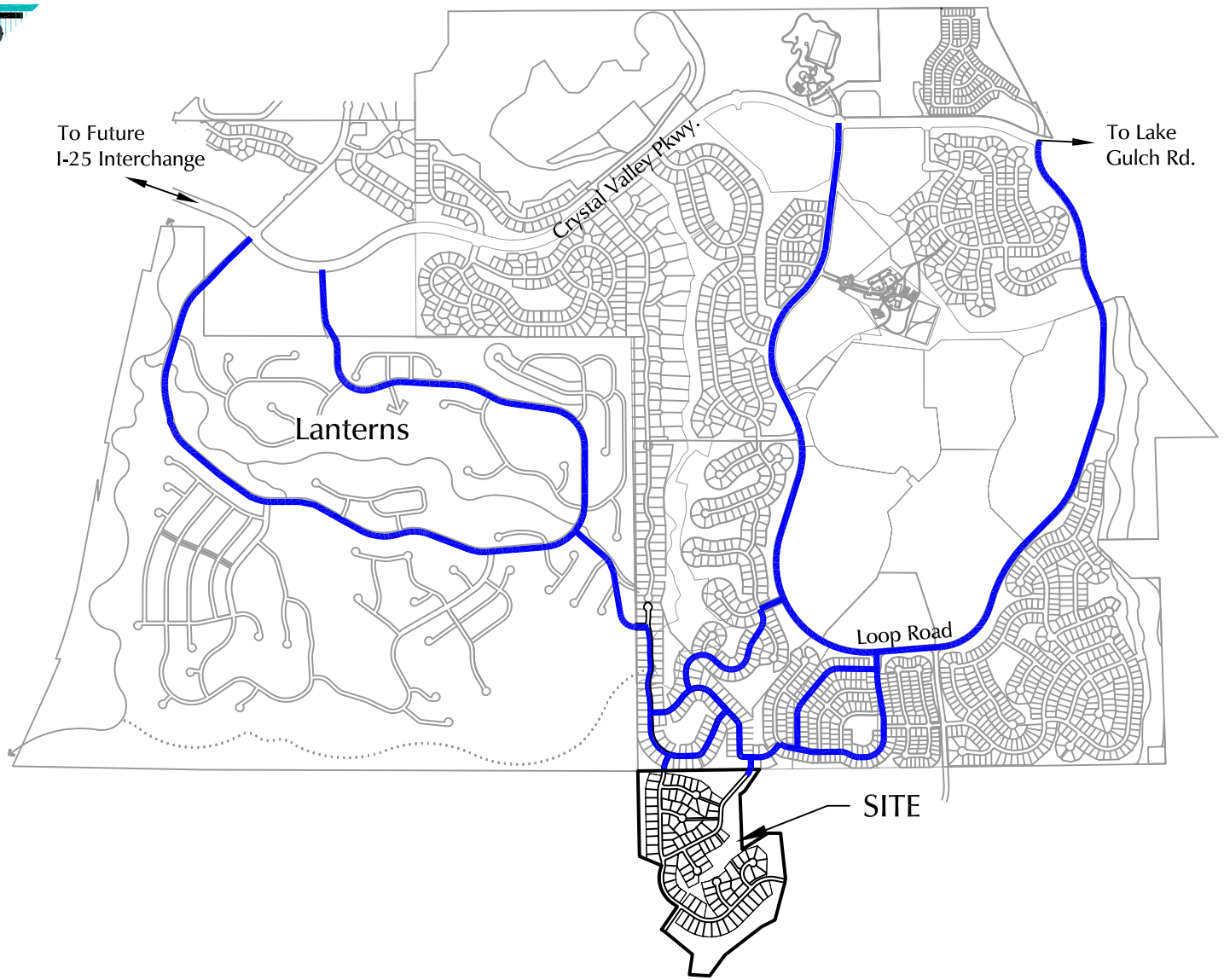


Figure 2a

Site Plan

Ridge Estates (LSC #150660)

TRANSPORTATION CONSULTANTS, INC.

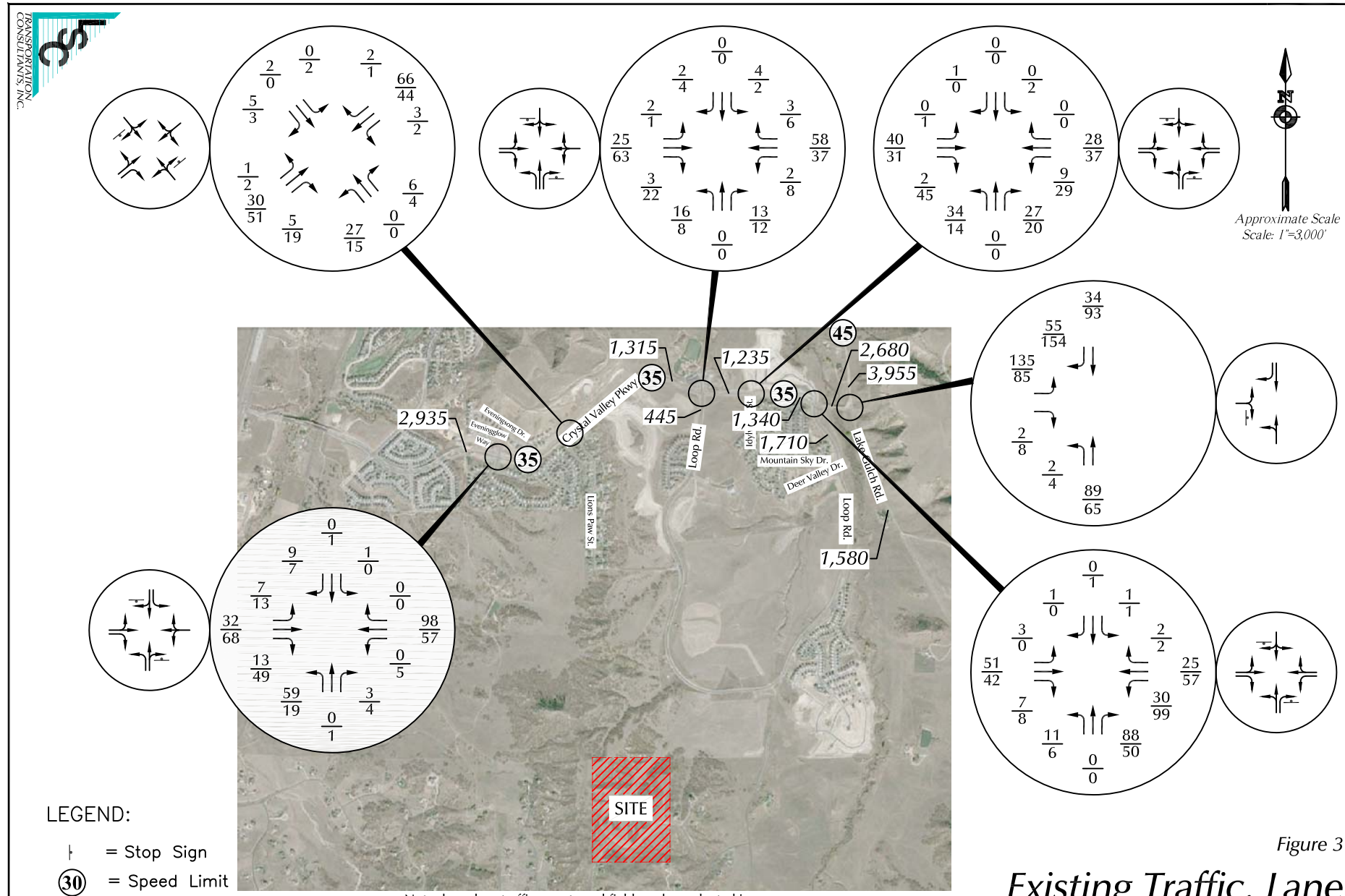


Approximate Scale
Scale: 1"= 2,000'

Figure 2b

Site Connections to Crystal Valley Parkway

Ridge Estates (LSC #150660)



LEGEND:

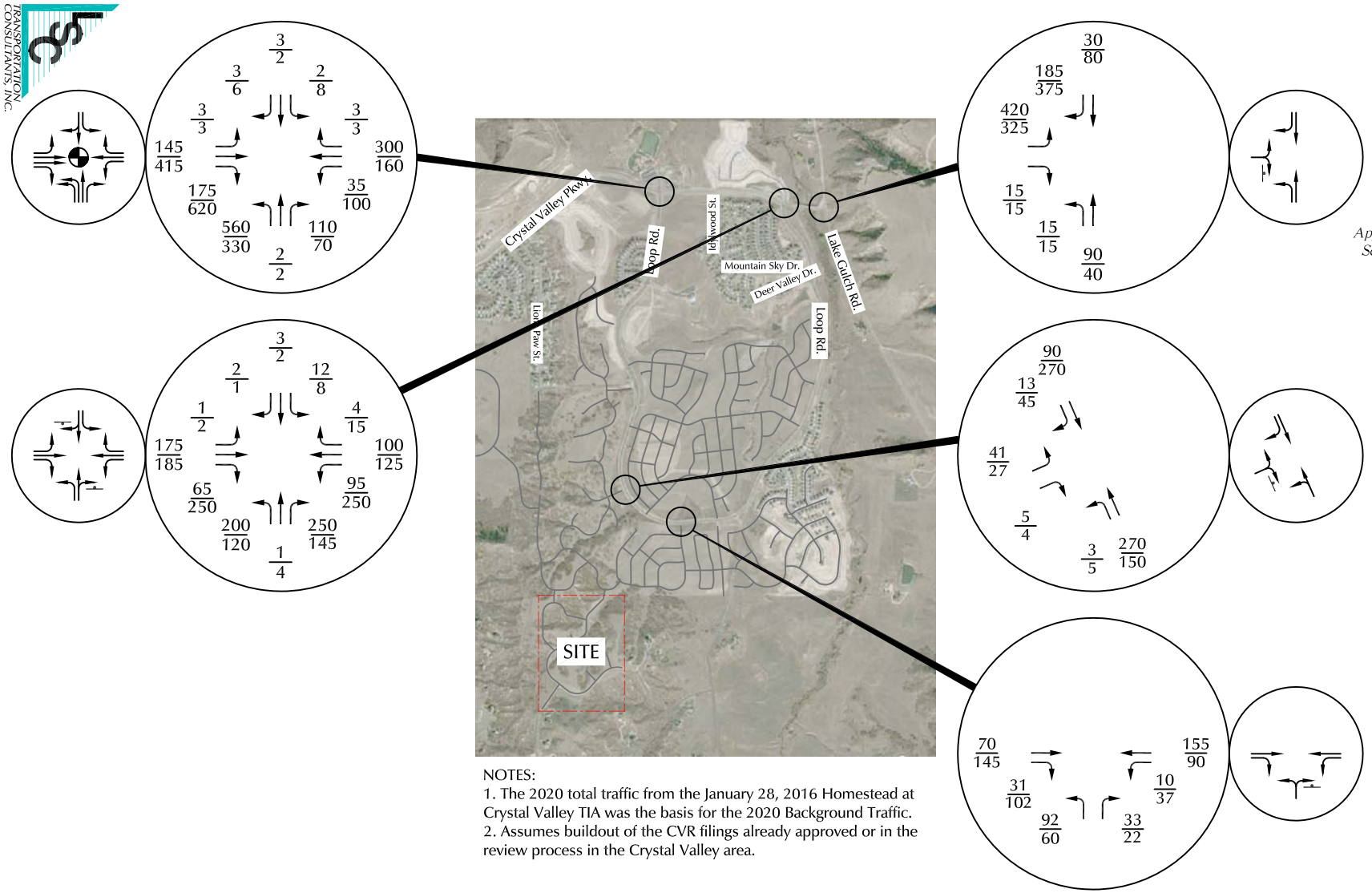
- ⊦ = Stop Sign
- (30) = Speed Limit
- 26/35 = AM Peak Hour Traffic / PM Peak Hour Traffic
- 2,500 = Average Daily Traffic

Note: based on traffic counts and field work conducted in December, 2015.

Figure 3

Existing Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



NOTES:
1. The 2020 total traffic from the January 28, 2016 Homestead at Crystal Valley TIA was the basis for the 2020 Background Traffic.
2. Assumes buildout of the CVR filings already approved or in the review process in the Crystal Valley area.

⊦ = Stop Sign

⊕ = Traffic Signal

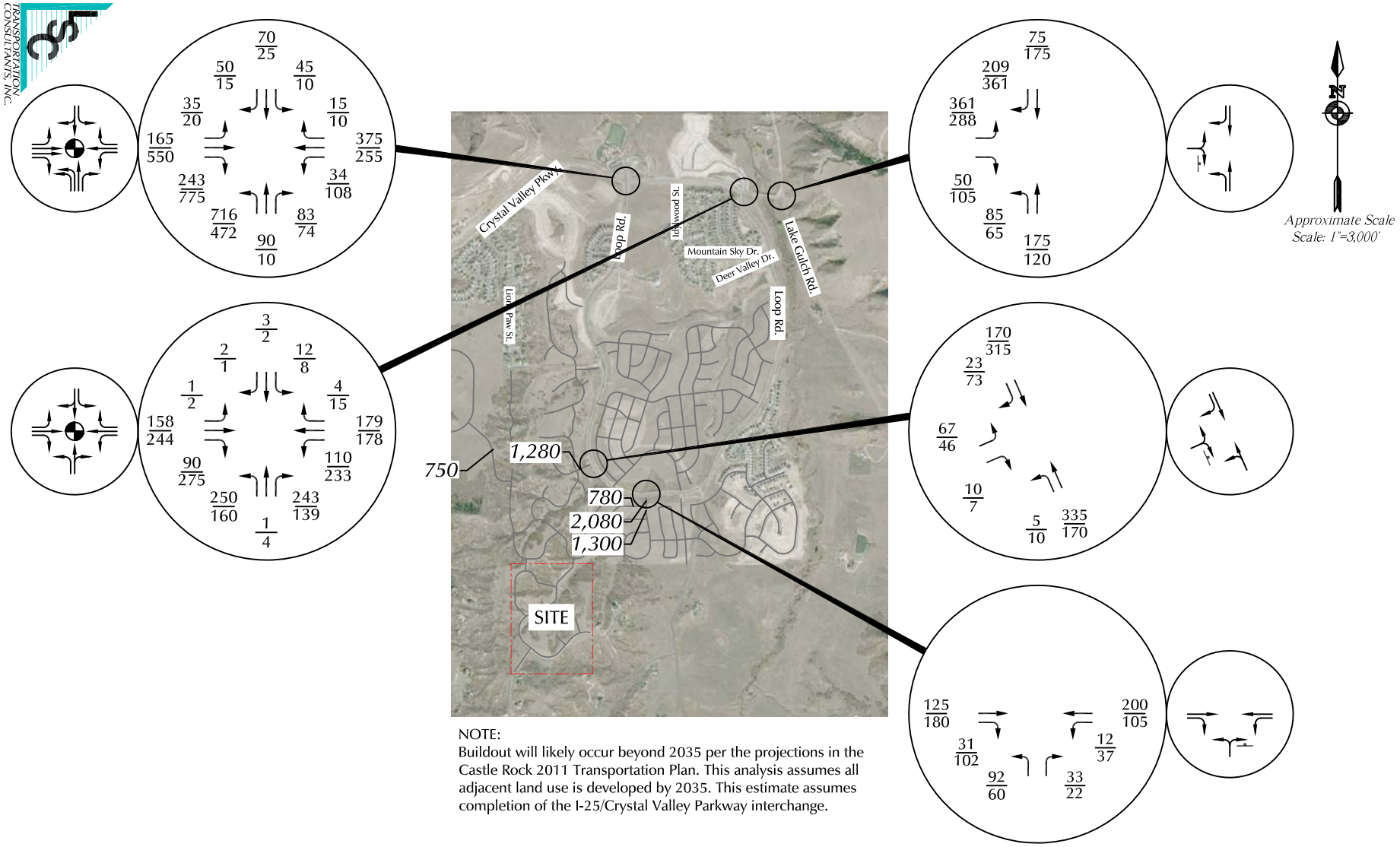
$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Figure 4

Year 2020 Background Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



NOTE:
Buildout will likely occur beyond 2035 per the projections in the Castle Rock 2011 Transportation Plan. This analysis assumes all adjacent land use is developed by 2035. This estimate assumes completion of the I-25/Crystal Valley Parkway interchange.

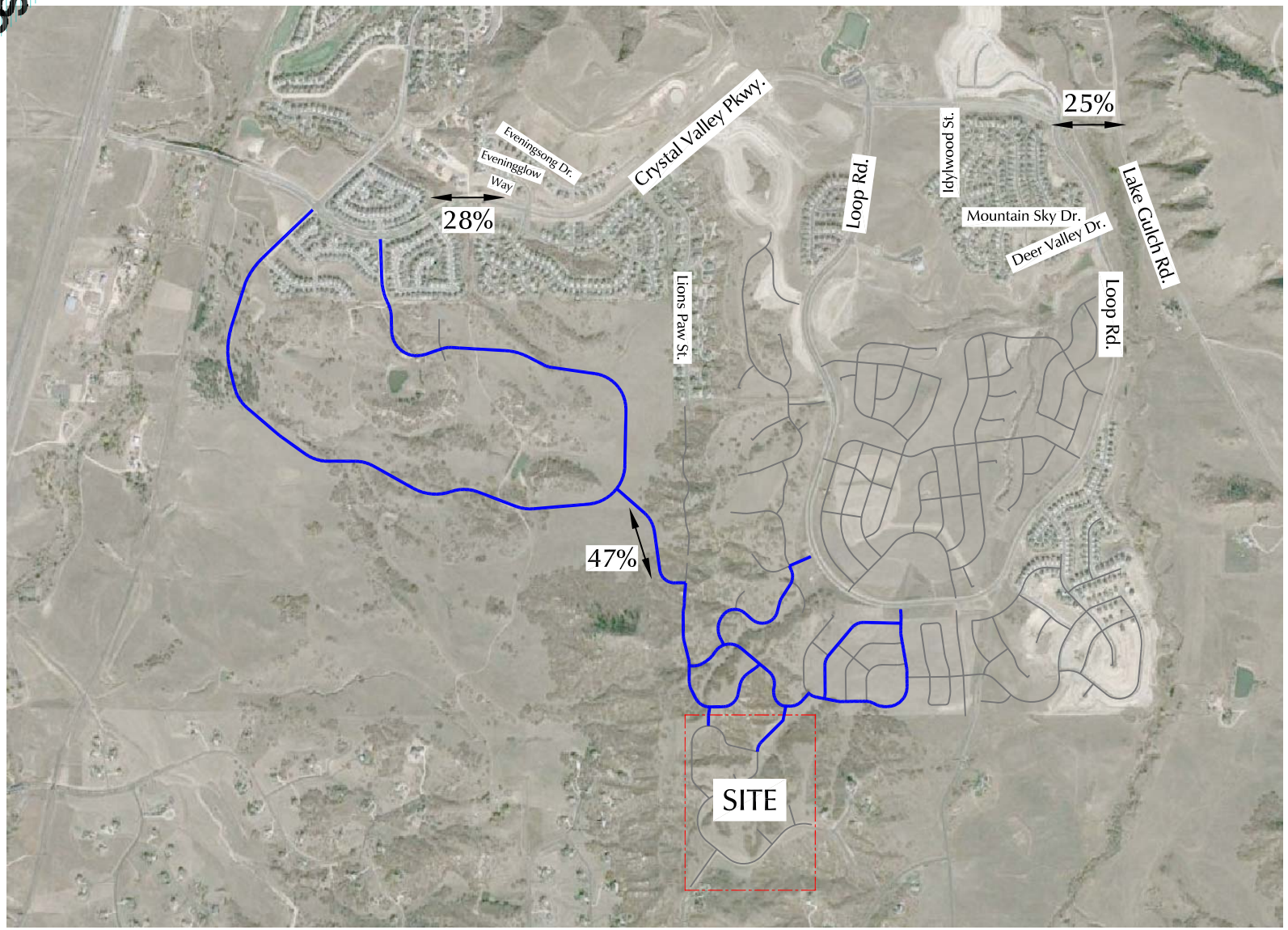
LEGEND:

- ⊦ = Stop Sign
- ◓ = Traffic Signal
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 2,500 = Average Daily Traffic

Figure 5

Year 2035 Background Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



Approximate Scale
Scale: 1"=2,000'

LEGEND:

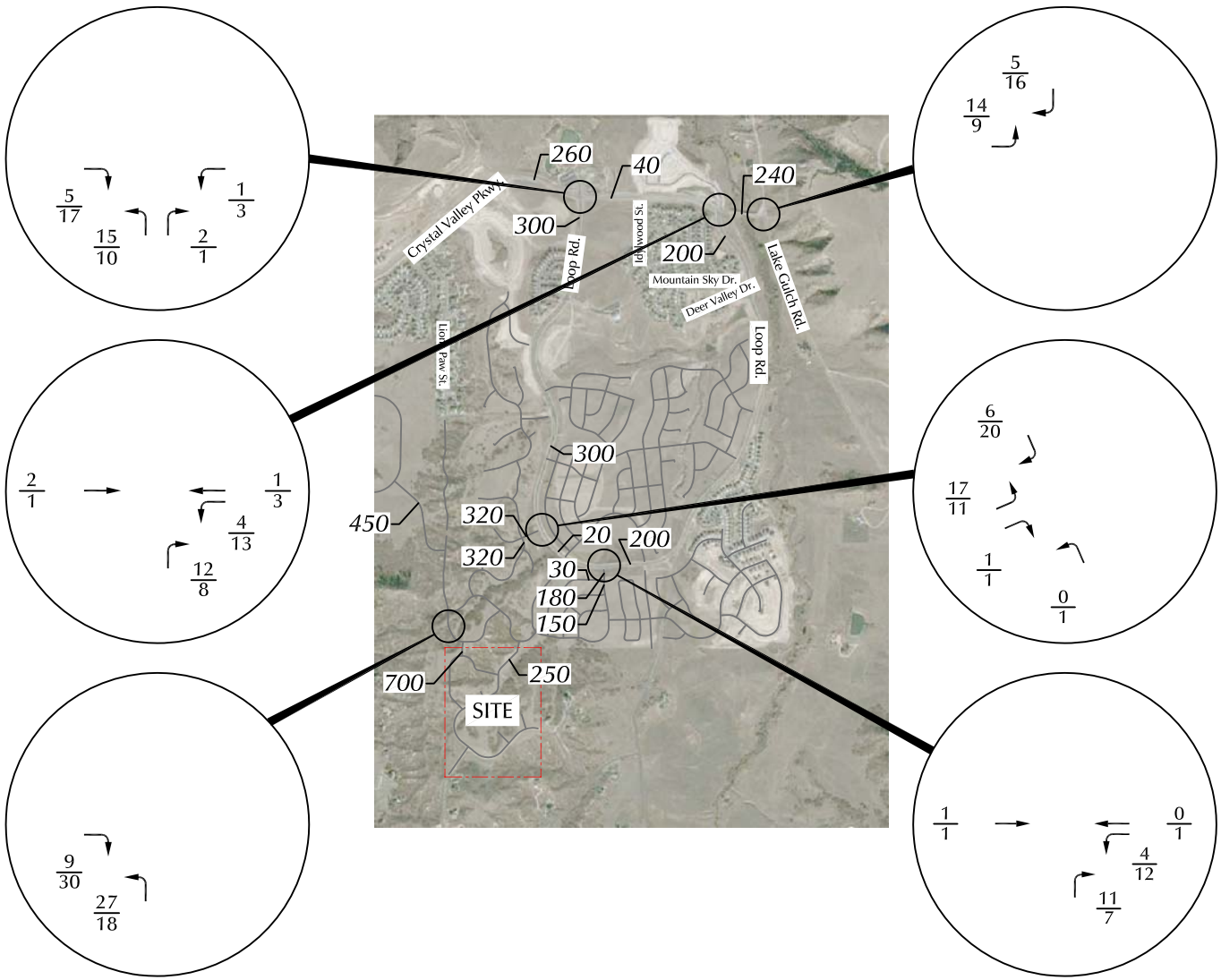
65% = Percent Directional Distribution

= Notes route options to Loop Road and/or Crystal Valley Parkway

Figure 6

Directional Distribution of Site-Generated Traffic

Ridge Estates (LSC #150660)



Approximate Scale
Scale: 1"=3,000'

LEGEND:

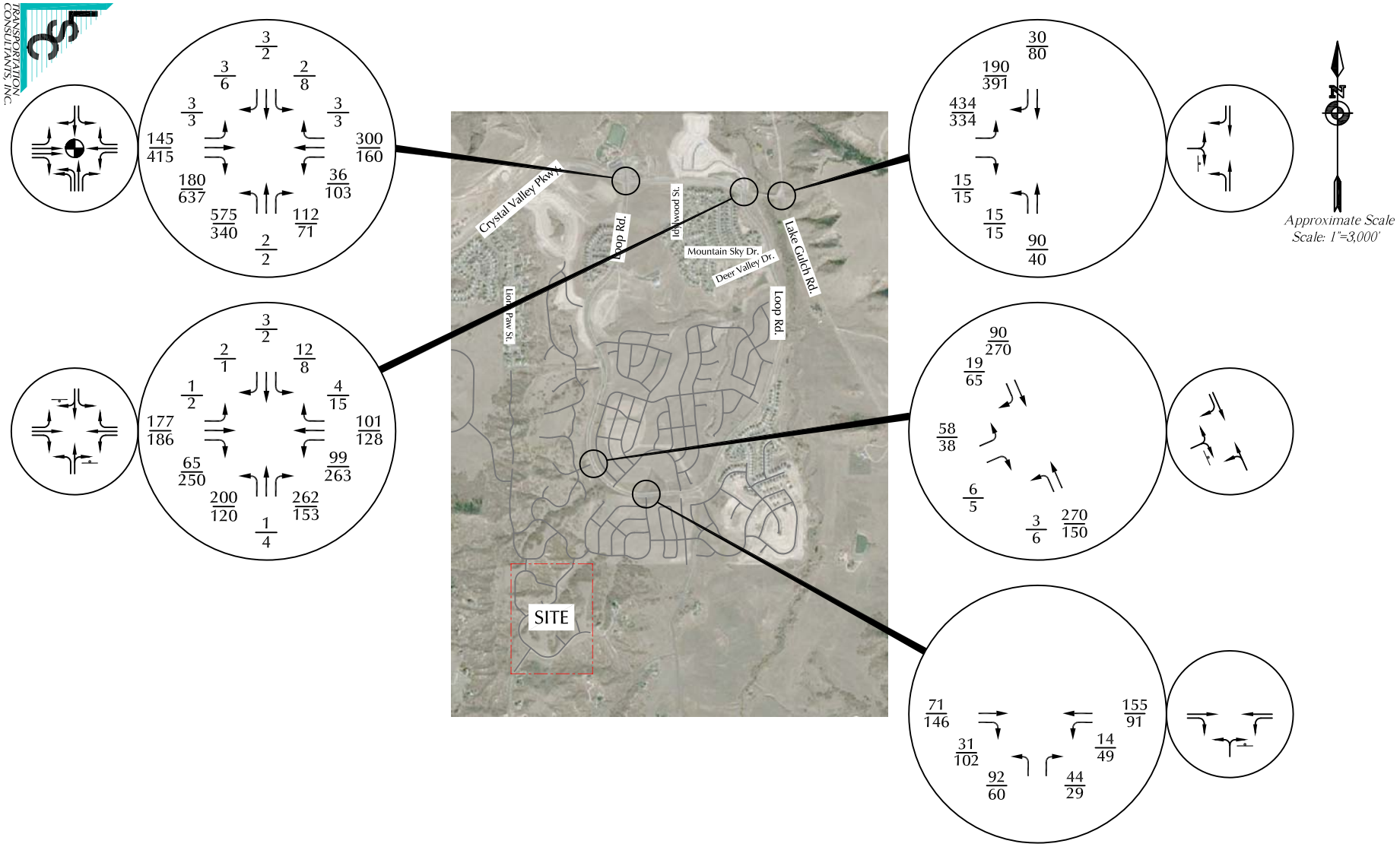
$\frac{26}{35}$ = AM Peak Hour Traffic / PM Peak Hour Traffic

2,500 = Average Daily Traffic

Figure 7

Assignment of Site-Generated Traffic

Ridge Estates (LSC #150660)



= Stop Sign

= Traffic Signal

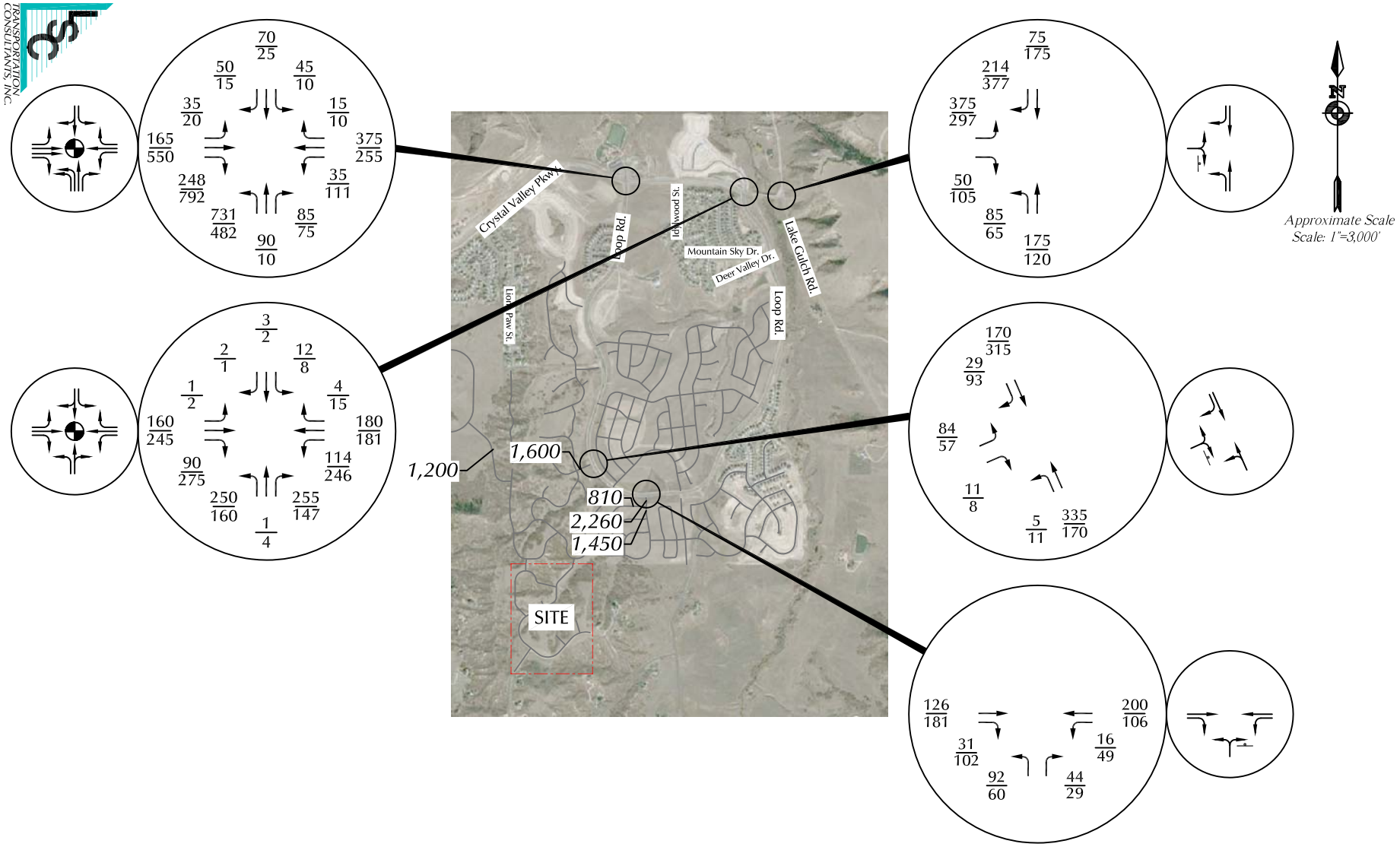
$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Figure 8

Year 2020 Total Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



LEGEND:

- ⊦ = Stop Sign
- ◓ = Traffic Signal
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 2,500 = Average Daily Traffic

Figure 9

Year 2035 Total Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)

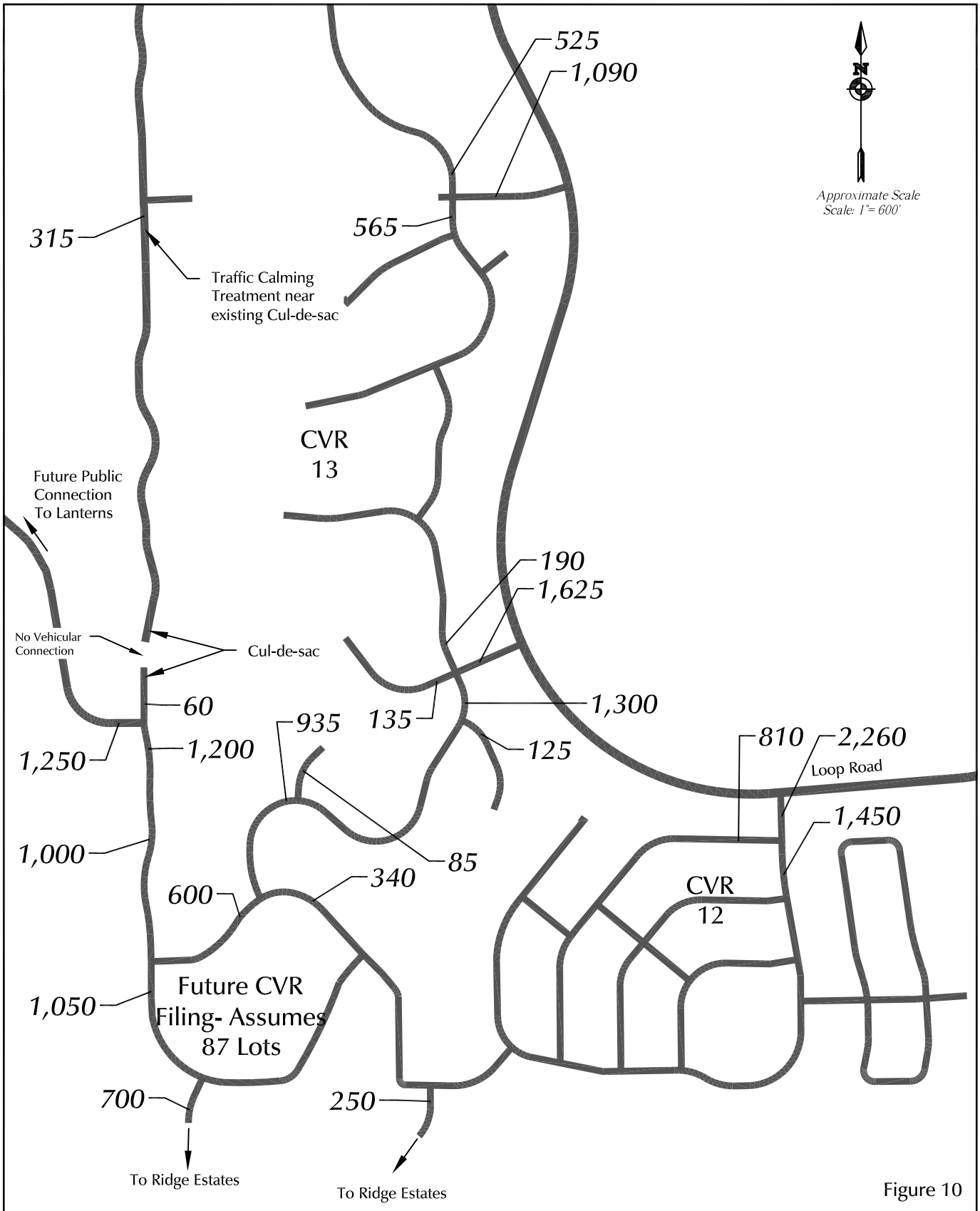


Figure 10

Assignment of Average Daily Traffic

Ridge Estates (LSC #150660)

LEGEND:

1,000 = Average Weekday Traffic (vehicles per day)

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E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : STARCRYS
Site Code : 00000014
Start Date : 12/1/2015
Page No : 1

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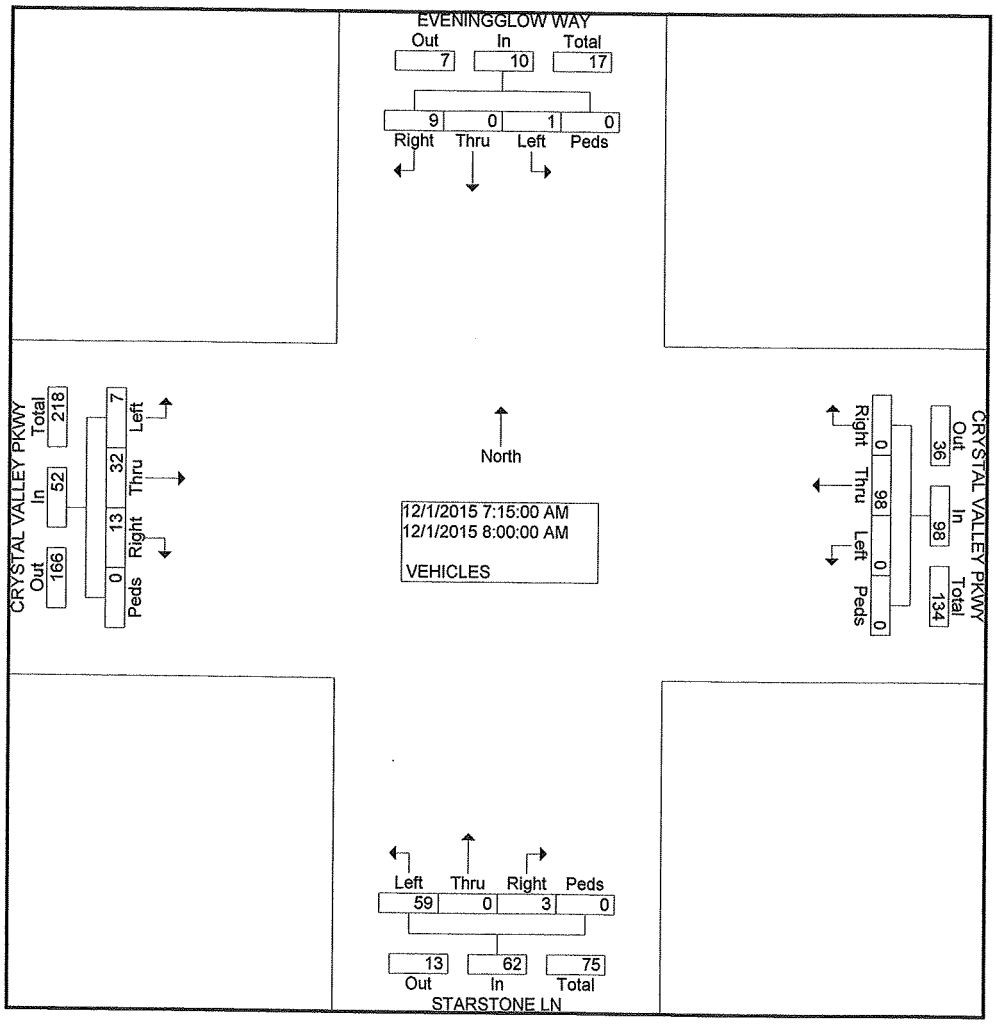
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Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	1	1	1	0	14	0	0	13	1	1	0	0	10	3	0	45
06:45 AM	0	0	3	0	0	16	0	0	22	0	1	0	2	3	2	0	49
Total	0	1	4	1	0	30	0	0	35	1	2	0	2	13	5	0	94
07:00 AM	0	1	5	0	0	31	0	0	21	0	1	0	0	5	1	0	65
07:15 AM	0	0	5	0	0	26	0	0	22	0	2	0	1	6	2	0	64
07:30 AM	0	0	1	0	0	28	0	0	14	0	0	0	1	1	3	0	48
07:45 AM	1	0	1	0	0	29	0	0	14	0	1	0	2	8	2	0	58
Total	1	1	12	0	0	114	0	0	71	0	4	0	4	20	8	0	235
08:00 AM	0	0	2	0	0	15	0	0	9	0	0	0	3	17	6	0	52
08:15 AM	0	1	2	0	0	17	0	0	10	0	1	0	1	10	0	0	42
Total	0	1	4	0	0	32	0	0	19	0	1	0	4	27	6	0	94
04:00 PM	0	0	2	0	0	9	0	0	5	0	0	0	4	16	11	0	47
04:15 PM	0	1	1	0	2	22	0	0	1	1	0	0	0	18	13	0	59
04:30 PM	0	0	0	0	3	11	0	0	8	0	2	0	2	16	9	0	51
04:45 PM	0	0	4	0	0	18	0	0	6	0	1	0	5	20	11	0	65
Total	0	1	7	0	5	60	0	0	20	1	3	0	11	70	44	0	222
05:00 PM	0	0	2	0	0	6	0	0	4	0	1	0	6	14	16	0	49
05:15 PM	0	0	0	0	2	3	0	0	6	0	1	0	2	20	12	0	46
05:30 PM	0	0	0	0	1	5	0	1	7	0	1	0	1	19	20	0	55
05:45 PM	0	0	0	0	1	6	0	0	4	0	0	0	2	19	13	0	45
Total	0	0	2	0	4	20	0	1	21	0	3	0	11	72	61	0	195
Grand Total	1	4	29	1	9	256	0	1	166	2	13	0	32	202	124	0	840
Apprch %	2.9	11.4	82.9	2.9	3.4	96.2	0.0	0.4	91.7	1.1	7.2	0.0	8.9	56.4	34.6	0.0	
Total %	0.1	0.5	3.5	0.1	1.1	30.5	0.0	0.1	19.8	0.2	1.5	0.0	3.8	24.0	14.8	0.0	

COUNTER MEASURES INC.
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DENVER.COLORADO
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N/S STREET:EVENINGGLOW WAY/STARSTONE LN
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : STARCRYS
Site Code : 00000014
Start Date : 12/1/2015
Page No : 2

	EVENINGGLOW WAY Southbound					CRYSTAL VALLEY PKWY Westbound					STARSTONE LN Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	1	0	9	0	10	0	98	0	0	98	59	0	3	0	62	7	32	13	0	52	222
Percent	10.0	0.0	90.0	0.0		0.0	100.0	0.0	0.0		95.2	0.0	4.8	0.0		13.5	61.5	25.0	0.0		
07:15 Volume	0	0	5	0	5	0	26	0	0	26	22	0	2	0	24	1	6	2	0	9	64
Peak Factor																					0.867
High Int.	07:15 AM					07:45 AM					07:15 AM					08:00 AM					
Volume	0	0	5	0	5	0	29	0	0	29	22	0	2	0	24	3	17	6	0	26	
Peak Factor					0.500					0.845					0.646					0.500	

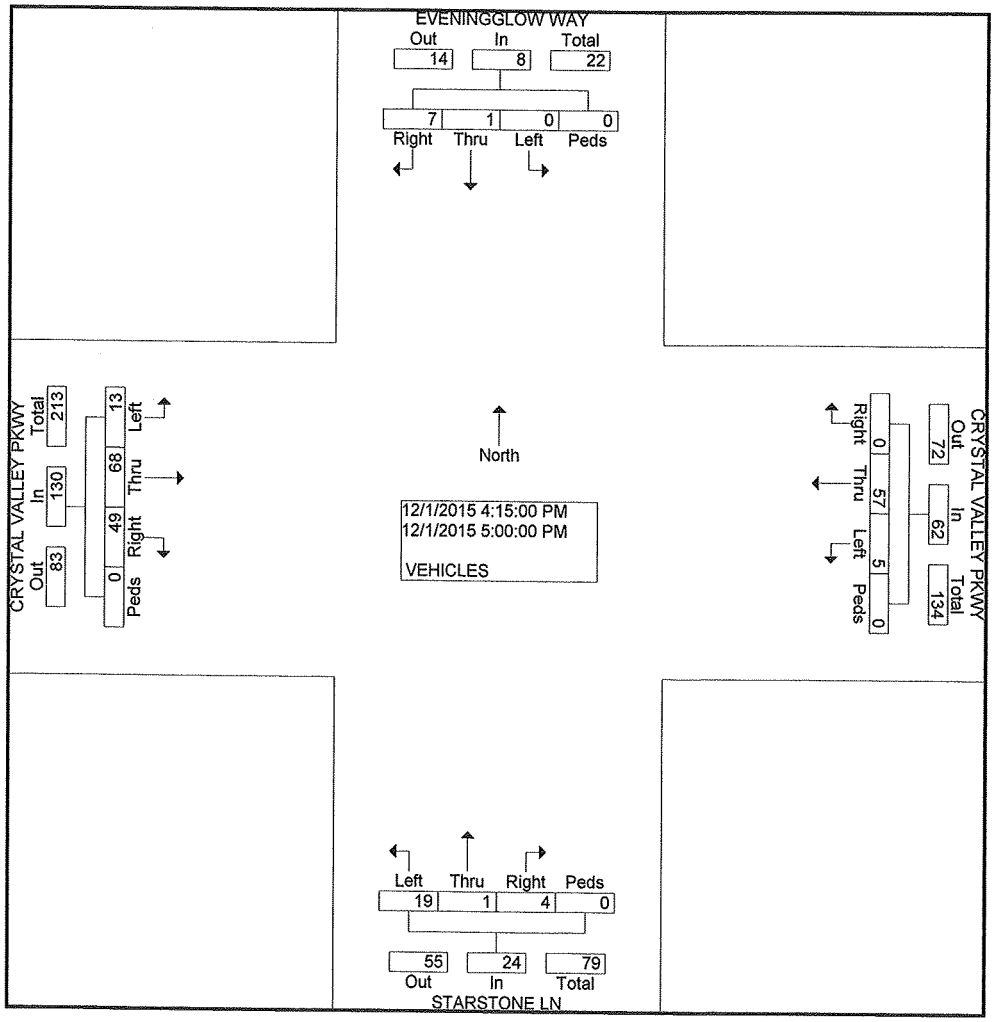


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Site Code : 00000014
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Page No : 2

	EVENINGGLOW WAY Southbound					CRYSTAL VALLEY PKWY Westbound					STARSTONE LN Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	0	1	7	0	8	5	57	0	0	62	19	1	4	0	24	13	68	49	0	130	224
Percent	0.0	12.5	87.5	0.0		8.1	91.9	0.0	0.0		79.2	4.2	16.7	0.0		10.0	52.3	37.7	0.0		
04:45 Volume	0	0	4	0	4	0	18	0	0	18	6	0	1	0	7	5	20	11	0	36	65
Peak Factor																					0.862
High Int.	04:45 PM					04:15 PM					04:30 PM					04:45 PM					
Volume	0	0	4	0	4	2	22	0	0	24	8	0	2	0	10	5	20	11	0	36	
Peak Factor					0.500					0.646					0.600					0.903	



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COUNTY: DOUGLAS

File Name : LIONCRYS
Site Code : 00000016
Start Date : 12/1/2015
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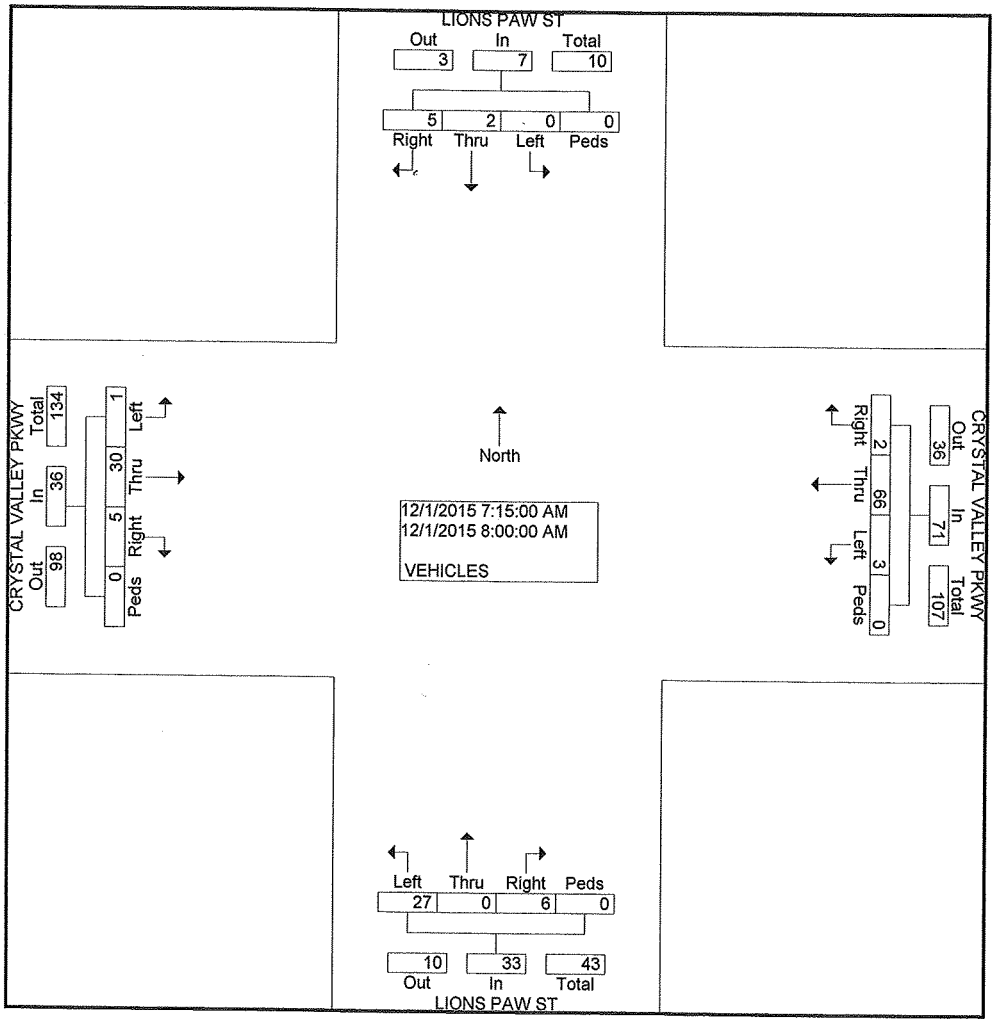
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Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	3	0	0	7	0	1	4	1	1	0	0	11	0	0	28
06:45 AM	0	0	2	0	1	14	0	0	0	0	4	0	1	3	0	0	25
Total	0	0	5	0	1	21	0	1	4	1	5	0	1	14	0	0	53
07:00 AM	0	0	1	0	0	26	0	1	4	0	3	0	0	4	2	0	41
07:15 AM	0	1	1	0	0	20	0	0	5	0	2	0	0	8	0	0	37
07:30 AM	0	1	0	0	3	18	1	0	10	0	1	0	0	1	0	0	35
07:45 AM	0	0	2	0	0	17	1	0	10	0	1	0	0	5	5	0	41
Total	0	2	4	0	3	81	2	1	29	0	7	0	0	18	7	0	154
08:00 AM	0	0	2	0	0	11	0	0	2	0	2	0	1	16	0	0	34
08:15 AM	0	0	0	0	1	15	0	0	2	0	1	0	2	8	1	0	30
Total	0	0	2	0	1	26	0	0	4	0	3	0	3	24	1	0	64
04:00 PM	1	0	0	0	0	8	0	0	1	0	0	0	0	11	5	0	26
04:15 PM	0	0	0	0	1	18	0	0	6	0	1	3	1	9	8	0	47
04:30 PM	0	0	1	0	1	11	1	0	2	0	0	1	0	14	4	0	35
04:45 PM	0	0	1	0	0	13	0	0	4	0	2	0	1	16	4	0	41
Total	1	0	2	0	2	50	1	0	13	0	3	4	2	50	21	0	149
05:00 PM	2	0	1	0	0	2	0	0	3	0	1	0	0	12	3	0	24
05:15 PM	0	0	0	0	2	4	0	0	1	0	0	0	2	17	2	0	28
05:30 PM	0	0	0	0	1	5	0	0	1	0	0	0	0	18	2	1	28
05:45 PM	0	0	2	0	0	4	1	0	1	0	0	0	0	14	5	0	27
Total	2	0	3	0	3	15	1	0	6	0	1	0	2	61	12	1	107
Grand Total	3	2	16	0	10	193	4	2	56	1	19	4	8	167	41	1	527
Apprch %	14.3	9.5	76.2	0.0	4.8	92.3	1.9	1.0	70.0	1.3	23.8	5.0	3.7	77.0	18.9	0.5	
Total %	0.6	0.4	3.0	0.0	1.9	36.6	0.8	0.4	10.6	0.2	3.6	0.8	1.5	31.7	7.8	0.2	

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N/S STREET: LIONS PAW ST
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CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LIONCRYS
Site Code : 00000016
Start Date : 12/1/2015
Page No : 2

	LIONS PAW ST Southbound					CRYSTAL VALLEY PKWY Westbound					LIONS PAW ST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	2	5	0	7	3	66	2	0	71	27	0	6	0	33	1	30	5	0	36	147
Percent	0.0	28.6	71.4	0.0		4.2	93.0	2.8	0.0		81.8	0.0	18.2	0.0		2.8	83.3	13.9	0.0		
07:45 Volume	0	0	2	0	2	0	17	1	0	18	10	0	1	0	11	0	5	5	0	10	41
Peak Factor																					0.896
High Int.	07:15 AM					07:30 AM					07:30 AM					08:00 AM					
Volume	0	1	1	0	2	3	18	1	0	22	10	0	1	0	11	1	16	0	0	17	
Peak Factor					0.875					0.807					0.750					0.529	

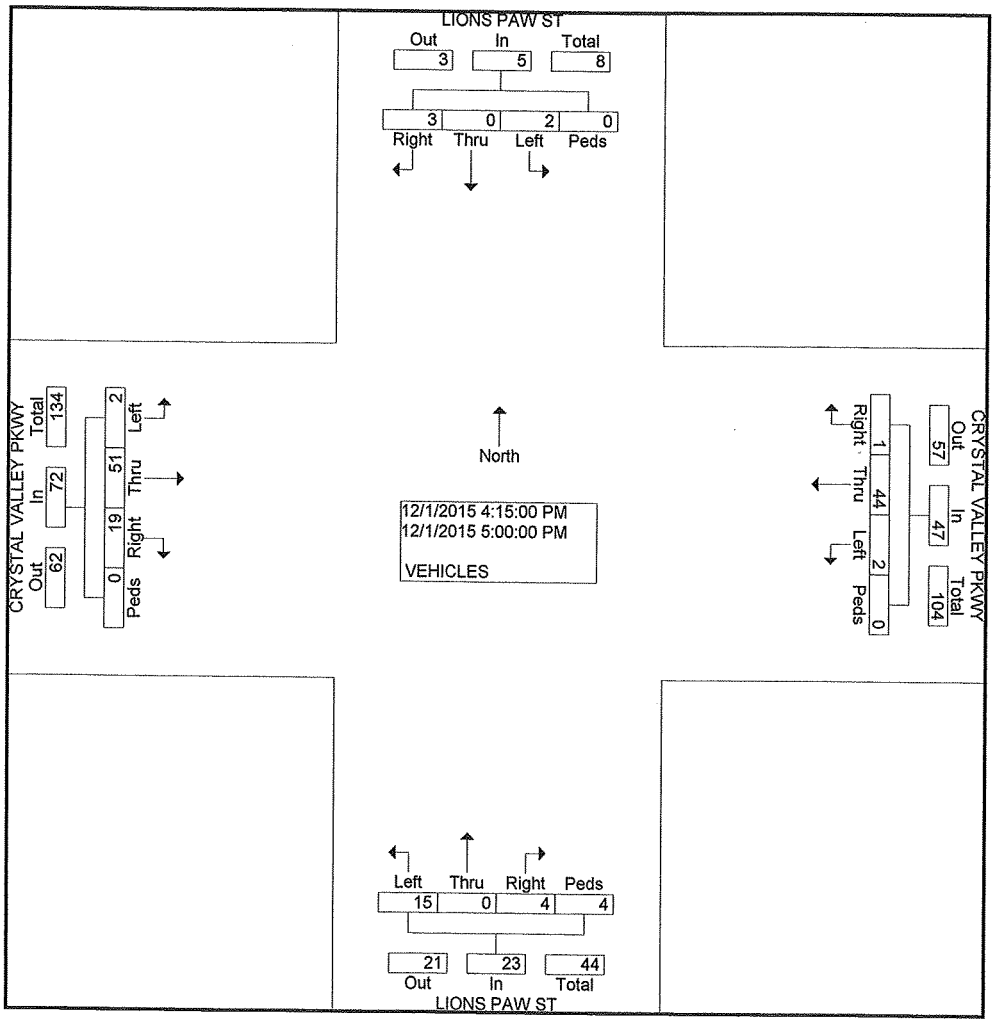


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COUNTY: DOUGLAS

File Name : LIONCRYS
Site Code : 00000016
Start Date : 12/1/2015
Page No : 2

	LIONS PAW ST Southbound					CRYSTAL VALLEY PKWY Westbound					LIONS PAW ST Northbound					CRYSTAL VALLEY PKWY 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 04:15 PM to 05:00 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	2	0	3	0	5	2	44	1	0	47	15	0	4	4	23	2	51	19	0	72	147
Percent	40.0	0.0	60.0	0.0		4.3	93.6	2.1	0.0		65.2	0.0	17.4	17.4		2.8	70.8	26.4	0.0		
04:15 Volume	0	0	0	0	0	1	18	0	0	19	6	0	1	3	10	1	9	8	0	18	47
Peak Factor																					0.782
High Int.	05:00 PM					04:15 PM					04:15 PM					04:45 PM					
Volume	2	0	1	0	3	1	18	0	0	19	6	0	1	3	10	1	16	4	0	21	
Peak Factor					0.417					0.618					0.575					0.857	



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E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSWEST
Site Code : 00000014
Start Date : 12/2/2015
Page No : 1

Groups Printed- VEHICLES

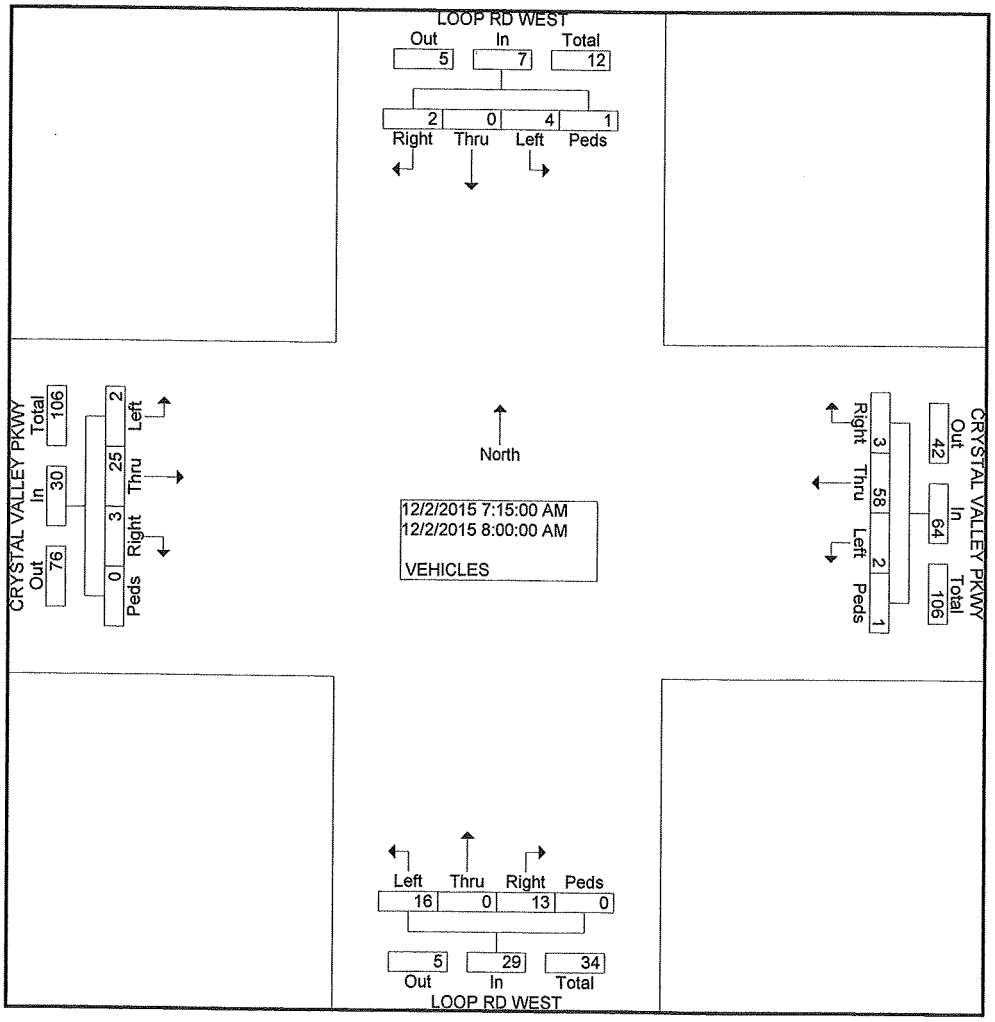
	LOOP RD WEST Southbound				CRYSTAL VALLEY PKWY Westbound				LOOP RD WEST Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	0	0	0	10	0	0	0	0	1	0	2	3	0	0	16
06:45 AM	0	0	0	0	1	8	2	0	2	0	2	0	0	6	2	0	23
Total	0	0	0	0	1	18	2	0	2	0	3	0	2	9	2	0	39
07:00 AM	0	0	1	0	0	14	0	0	8	0	6	0	0	5	1	0	35
07:15 AM	2	0	1	1	0	13	0	1	2	0	6	0	0	4	0	0	30
07:30 AM	0	0	0	0	0	17	3	0	7	0	2	0	2	1	0	0	32
07:45 AM	2	0	1	0	0	22	0	0	4	0	3	0	0	4	0	0	36
Total	4	0	3	1	0	66	3	1	21	0	17	0	2	14	1	0	133
08:00 AM	0	0	0	0	2	6	0	0	3	0	2	0	0	16	3	0	32
08:15 AM	0	0	0	0	2	4	0	0	0	0	1	0	1	10	2	0	20
Total	0	0	0	0	4	10	0	0	3	0	3	0	1	26	5	0	52
04:00 PM	3	0	0	0	2	5	1	0	1	0	1	0	0	8	2	0	23
04:15 PM	1	0	2	0	2	13	3	0	2	0	6	0	1	14	5	0	49
04:30 PM	1	0	1	0	3	6	0	0	3	0	2	0	0	14	6	0	36
04:45 PM	0	0	0	0	2	7	2	0	1	0	1	0	0	11	8	0	32
Total	5	0	3	0	9	31	6	0	7	0	10	0	1	47	21	0	140
05:00 PM	0	0	1	0	1	11	1	0	2	0	3	0	0	24	3	0	46
05:15 PM	0	0	0	0	5	6	0	0	1	0	1	0	0	13	8	0	34
05:30 PM	0	0	0	0	2	9	0	0	3	0	1	0	0	11	6	0	32
05:45 PM	0	0	4	0	4	9	0	0	0	0	1	0	0	9	3	0	30
Total	0	0	5	0	12	35	1	0	6	0	6	0	0	57	20	0	142
Grand Total	9	0	11	1	26	160	12	1	39	0	39	0	6	153	49	0	506
Apprch %	42.9	0.0	52.4	4.8	13.1	80.4	6.0	0.5	50.0	0.0	50.0	0.0	2.9	73.6	23.6	0.0	
Total %	1.8	0.0	2.2	0.2	5.1	31.6	2.4	0.2	7.7	0.0	7.7	0.0	1.2	30.2	9.7	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD WEST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSWEST
Site Code : 00000014
Start Date : 12/2/2015

	LOOP RD WEST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD WEST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	4	0	2	1	7	2	58	3	1	64	16	0	13	0	29	2	25	3	0	30	130
Percent	57.1	0.0	28.6	14.3		3.1	90.6	4.7	1.6		55.2	0.0	44.8	0.0		6.7	83.3	10.0	0.0		
07:45 Volume	2	0	1	0	3	0	22	0	0	22	4	0	3	0	7	0	4	0	0	4	36
Peak Factor																					0.903
High Int.	07:15 AM					07:45 AM					07:30 AM					08:00 AM					
Volume	2	0	1	1	4	0	22	0	0	22	7	0	2	0	9	0	16	3	0	19	
Peak Factor					0.438					0.727					0.806					0.395	

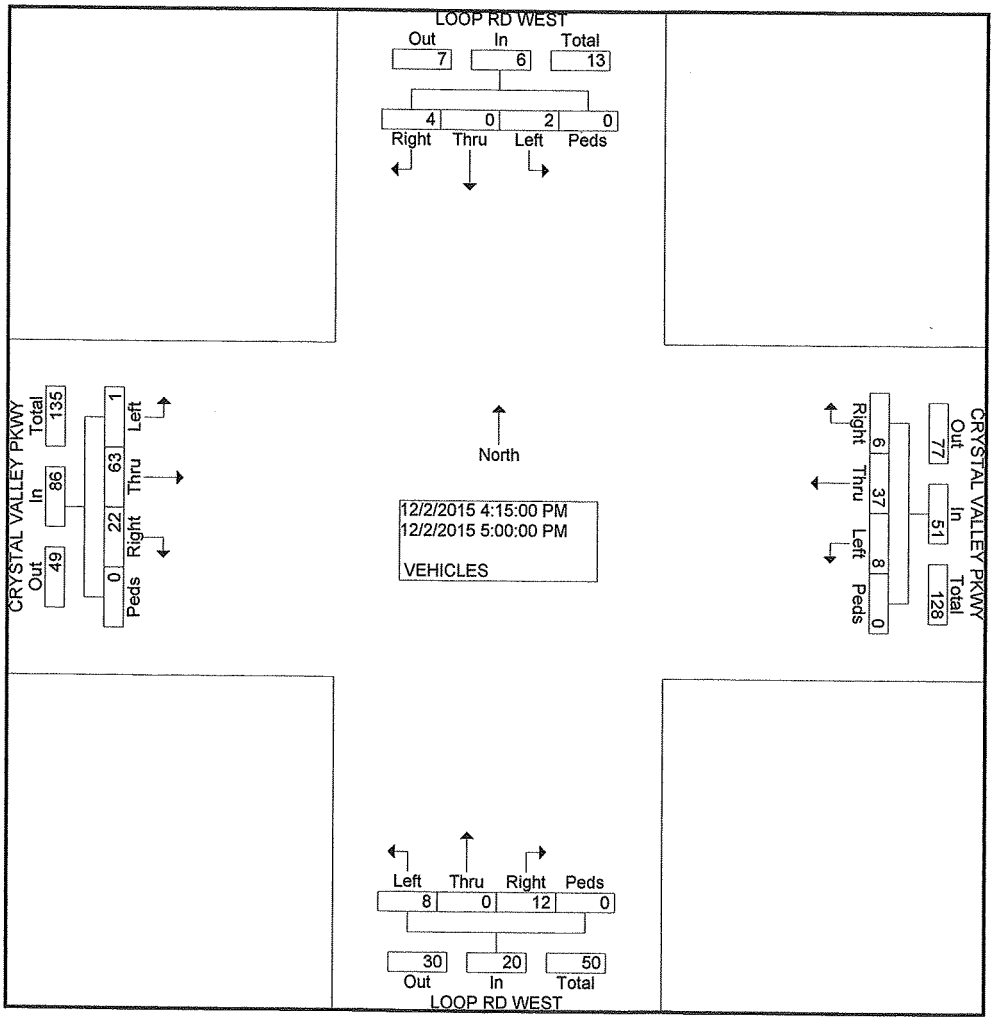


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD WEST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSWEST
Site Code : 00000014
Start Date : 12/2/2015

	LOOP RD WEST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD WEST Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	2	0	4	0	6	8	37	6	0	51	8	0	12	0	20	1	63	22	0	86	163
Percent	33.3	0.0	66.7	0.0		15.7	72.5	11.8	0.0		40.0	0.0	60.0	0.0		1.2	73.3	25.6	0.0		
04:15 Volume	1	0	2	0	3	2	13	3	0	18	2	0	6	0	8	1	14	5	0	20	49
Peak Factor																					0.832
High Int.	04:15 PM					04:15 PM					04:15 PM					05:00 PM					
Volume	1	0	2	0	3	2	13	3	0	18	2	0	6	0	8	0	24	3	0	27	
Peak Factor					0.500					0.708					0.625					0.796	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: IDLYWOOD ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : IALYCRYS
Site Code : 00000016
Start Date : 12/2/2015
Page No : 1

Groups Printed- VEHICLES

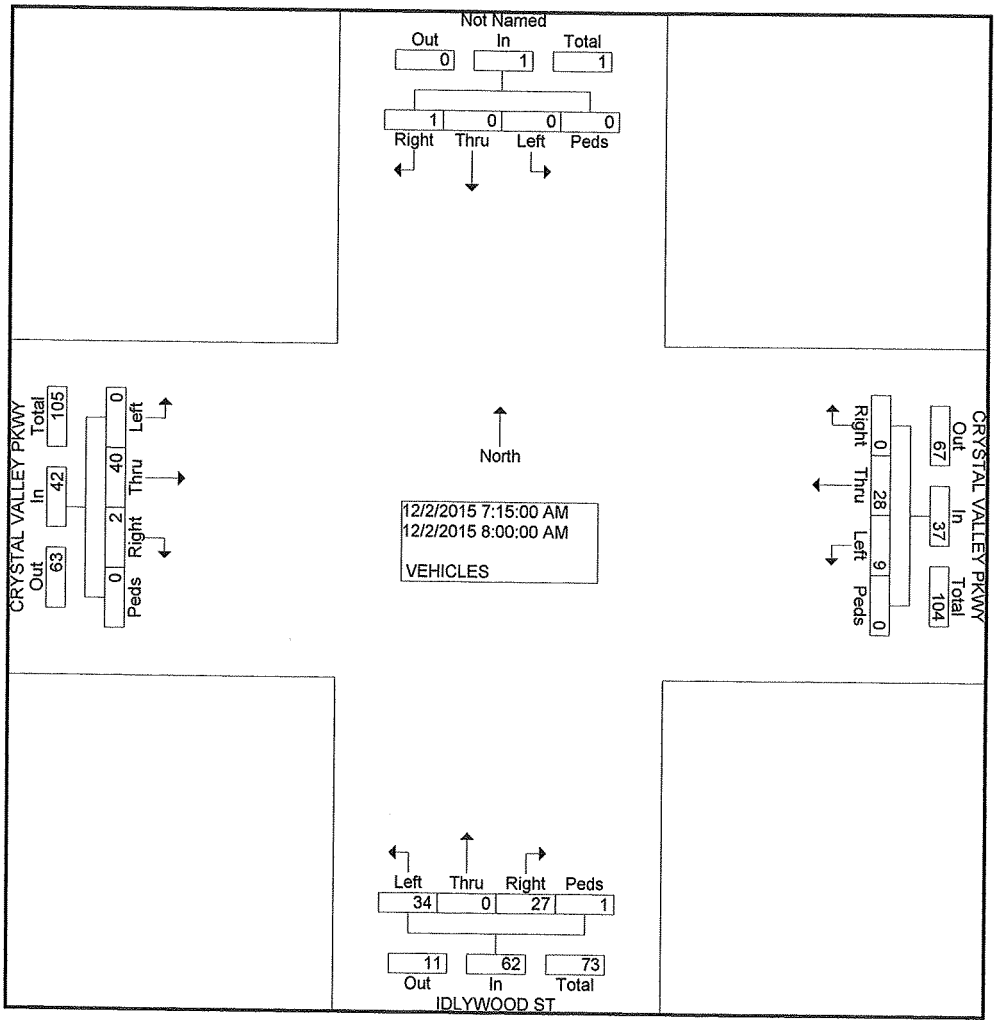
	Southbound				CRYSTAL VALLEY PKWY Westbound				IDLYWOOD ST Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	0	0	1	2	0	0	8	0	2	0	1	3	0	0	17
06:45 AM	0	0	0	0	0	5	0	0	6	0	4	0	0	9	1	0	25
Total	0	0	0	0	1	7	0	0	14	0	6	0	1	12	1	0	42
07:00 AM	0	0	0	0	2	5	0	0	9	0	13	0	0	10	1	0	40
07:15 AM	0	0	0	0	3	5	0	0	8	0	5	1	0	12	0	0	34
07:30 AM	0	0	1	0	4	10	0	0	9	0	6	0	0	3	0	0	33
07:45 AM	0	0	0	0	1	10	0	0	12	0	8	0	0	9	0	0	40
Total	0	0	1	0	10	30	0	0	38	0	32	1	0	34	1	0	147
08:00 AM	0	0	0	0	1	3	0	0	5	0	8	0	0	16	2	0	35
08:15 AM	0	0	0	0	3	3	0	0	3	0	6	0	0	8	3	0	26
Total	0	0	0	0	4	6	0	0	8	0	14	0	0	24	5	0	61
04:00 PM	0	0	0	0	6	7	0	0	1	0	5	1	0	6	6	0	32
04:15 PM	0	0	0	0	7	15	0	0	3	0	1	0	0	9	12	0	47
04:30 PM	0	0	0	0	7	5	0	0	4	0	6	0	0	8	9	0	39
04:45 PM	2	0	0	0	5	9	0	0	2	0	5	0	1	2	9	0	35
Total	2	0	0	0	25	36	0	0	10	0	17	1	1	25	36	0	153
05:00 PM	0	0	0	0	10	8	0	0	5	0	8	0	0	12	15	0	58
05:15 PM	0	0	0	0	2	9	0	0	2	0	7	0	0	7	7	0	34
05:30 PM	0	0	0	0	3	7	0	0	4	0	4	0	0	2	10	0	30
05:45 PM	0	0	0	0	10	8	0	0	5	0	6	0	0	5	5	0	39
Total	0	0	0	0	25	32	0	0	16	0	25	0	0	26	37	0	161
Grand Total	2	0	1	0	65	111	0	0	86	0	94	2	2	121	80	0	564
Apprch %	66.7	0.0	33.3	0.0	36.9	63.1	0.0	0.0	47.3	0.0	51.6	1.1	1.0	59.6	39.4	0.0	
Total %	0.4	0.0	0.2	0.0	11.5	19.7	0.0	0.0	15.2	0.0	16.7	0.4	0.4	21.5	14.2	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: IDLYWOOD ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : IALYCRYS
Site Code : 00000016
Start Date : 12/2/2015
Page No : 2

	Southbound					CRYSTAL VALLEY PKWY Westbound					IDLYWOOD ST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	0	1	0	1	9	28	0	0	37	34	0	27	1	62	0	40	2	0	42	142
Percent	0.0	0.0	100.0	0.0		24.3	75.7	0.0	0.0		54.8	0.0	43.5	1.6		0.0	95.2	4.8	0.0		
07:45 Volume	0	0	0	0	0	1	10	0	0	11	12	0	8	0	20	0	9	0	0	9	40
Peak Factor																					0.888
High Int.	07:30 AM					07:30 AM					07:45 AM					08:00 AM					
Volume	0	0	1	0	1	4	10	0	0	14	12	0	8	0	20	0	16	2	0	18	
Peak Factor					0.250					0.661					0.775					0.583	

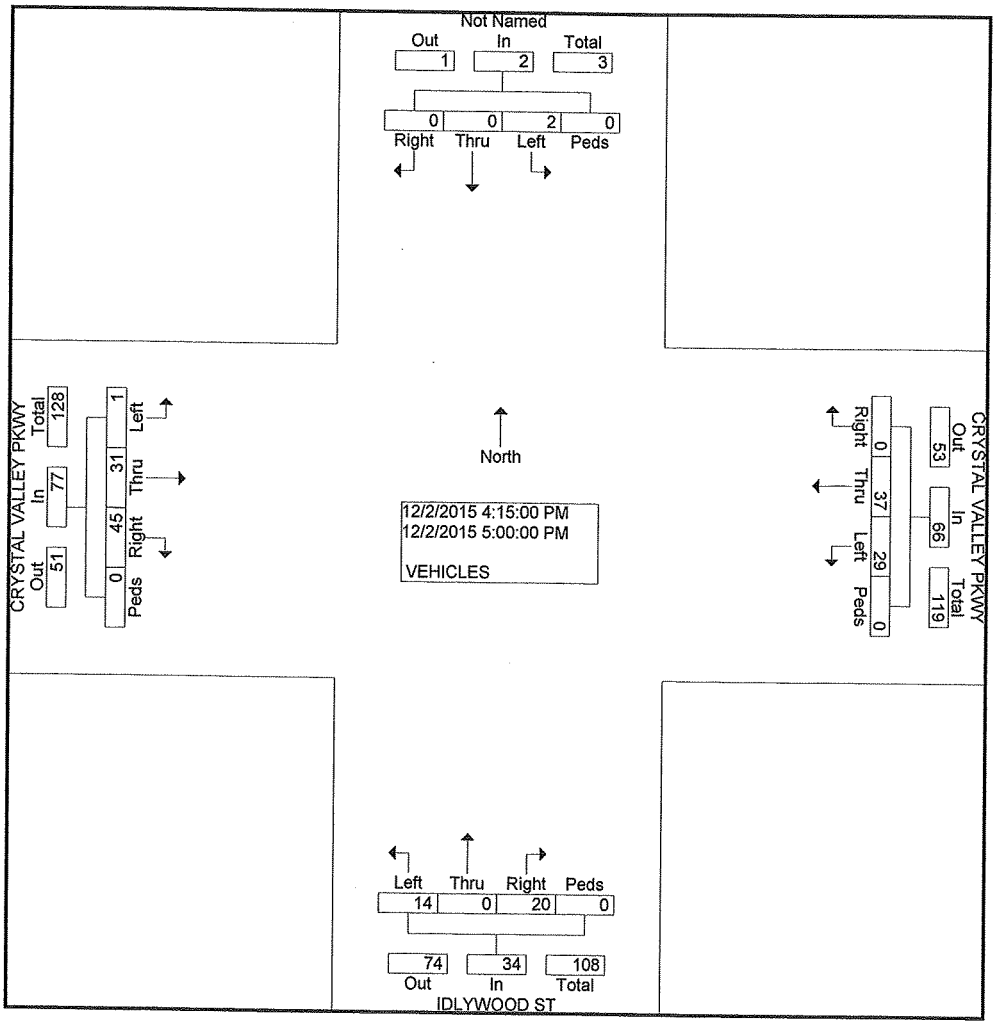


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: IDLYWOOD ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : IALYCRYS
Site Code : 00000016
Start Date : 12/2/2015
Page No : 2

	Southbound					CRYSTAL VALLEY PKWY Westbound					IDLYWOOD ST Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	2	0	0	0	2	29	37	0	0	66	14	0	20	0	34	1	31	45	0	77	179
Percent	100.0	0.0	0.0	0.0		43.9	56.1	0.0	0.0		41.2	0.0	58.8	0.0		1.3	40.3	58.4	0.0		
05:00 Volume	0	0	0	0	0	10	8	0	0	18	5	0	8	0	13	0	12	15	0	27	58
Peak Factor																					0.772
High Int.	04:45 PM					04:15 PM					05:00 PM					05:00 PM					
Volume	2	0	0	0	2	7	15	0	0	22	5	0	8	0	13	0	12	15	0	27	
Peak Factor					0.250					0.750					0.654					0.713	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD EAST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSEAST
Site Code : 00000014
Start Date : 12/3/2015
Page No : 1

Groups Printed- VEHICLES

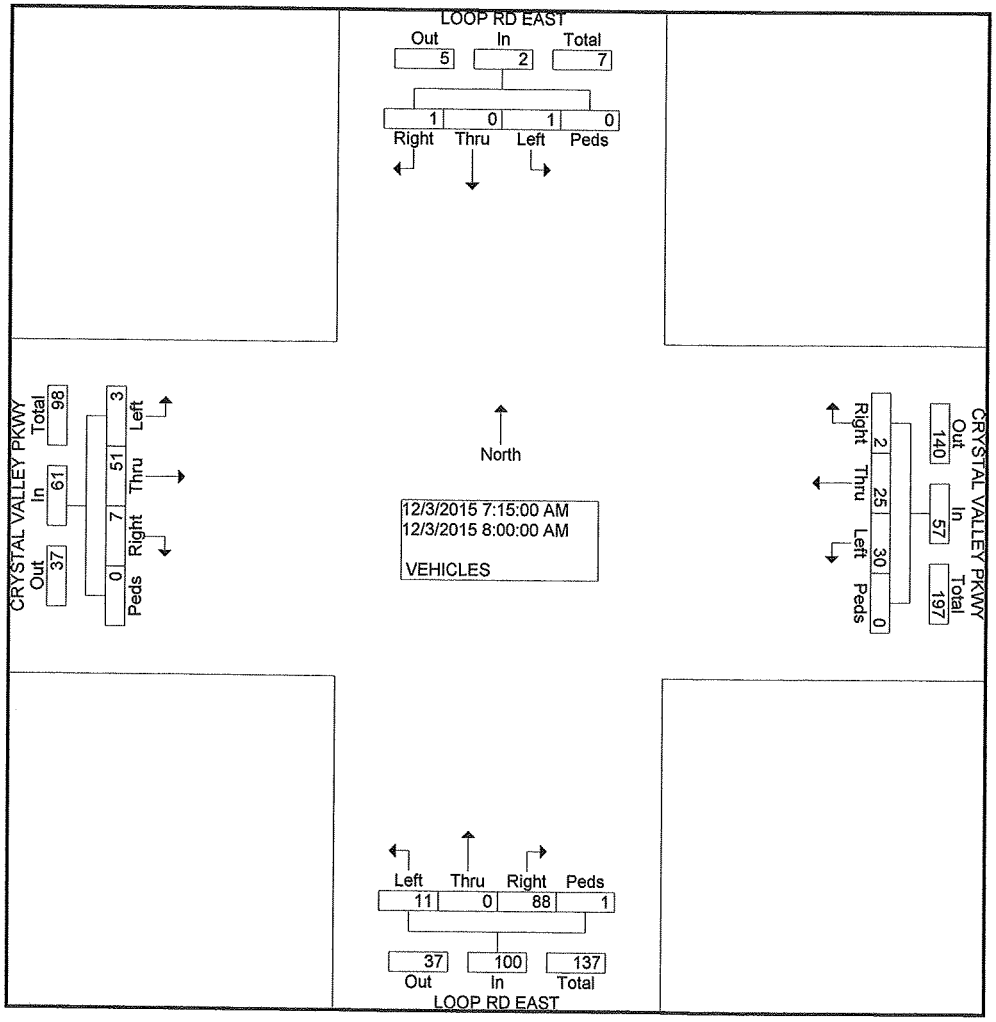
	LOOP RD EAST Southbound				CRYSTAL VALLEY PKWY Westbound				LOOP RD EAST Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	0	0	0	3	0	0	0	0	26	0	0	8	1	0	38
06:45 AM	0	0	0	0	11	7	0	0	2	0	19	0	0	14	1	0	54
Total	0	0	0	0	11	10	0	0	2	0	45	0	0	22	2	0	92
07:00 AM	0	0	0	0	5	3	0	0	3	0	22	0	0	15	2	0	50
07:15 AM	0	0	0	0	7	2	0	0	3	0	23	1	1	12	0	0	49
07:30 AM	0	0	1	0	10	7	0	0	0	0	25	0	0	8	1	0	52
07:45 AM	0	0	0	0	3	9	2	0	5	0	21	0	1	16	1	0	58
Total	0	0	1	0	25	21	2	0	11	0	91	1	2	51	4	0	209
08:00 AM	1	0	0	0	10	7	0	0	3	0	19	0	1	15	5	0	61
08:15 AM	0	1	2	0	11	12	0	0	1	0	12	0	0	20	3	0	62
Total	1	1	2	0	21	19	0	0	4	0	31	0	1	35	8	0	123
04:00 PM	2	0	0	0	18	20	1	0	1	0	10	0	1	9	0	0	62
04:15 PM	0	0	0	0	21	28	0	0	3	0	15	0	0	6	0	0	73
04:30 PM	1	1	0	0	32	13	0	0	0	0	8	0	0	12	2	0	69
04:45 PM	0	0	0	0	24	0	2	0	2	0	13	0	0	18	4	0	63
Total	3	1	0	0	95	61	3	0	6	0	46	0	1	45	6	0	267
05:00 PM	0	0	0	1	22	16	0	0	1	0	14	0	0	6	2	0	62
05:15 PM	0	0	0	0	16	11	0	0	2	0	20	0	0	14	1	0	64
05:30 PM	0	0	0	0	21	14	0	0	0	0	13	0	0	10	1	0	59
05:45 PM	0	0	0	0	19	17	0	0	0	0	10	0	0	11	1	0	58
Total	0	0	0	1	78	58	0	0	3	0	57	0	0	41	5	0	243
Grand Total	4	2	3	1	230	169	5	0	26	0	270	1	4	194	25	0	934
Apprch %	40.0	20.0	30.0	10.0	56.9	41.8	1.2	0.0	8.8	0.0	90.9	0.3	1.8	87.0	11.2	0.0	
Total %	0.4	0.2	0.3	0.1	24.6	18.1	0.5	0.0	2.8	0.0	28.9	0.1	0.4	20.8	2.7	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD EAST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSEAST
Site Code : 00000014
Start Date : 12/3/2015
Page No : 2

	LOOP RD EAST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD EAST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	1	0	1	0	2	30	25	2	0	57	11	0	88	1	100	3	51	7	0	61	220
Percent	50.0	0.0	50.0	0.0		52.6	43.9	3.5	0.0		11.0	0.0	88.0	1.0		4.9	83.6	11.5	0.0		
08:00 Volume	1	0	0	0	1	10	7	0	0	17	3	0	19	0	22	1	15	5	0	21	61
Peak Factor																					0.902
High Int.	07:30 AM					07:30 AM					07:15 AM					08:00 AM					
Volume	0	0	1	0	1	10	7	0	0	17	3	0	23	1	27	1	15	5	0	21	
Peak Factor					0.500					0.838					0.926					0.726	

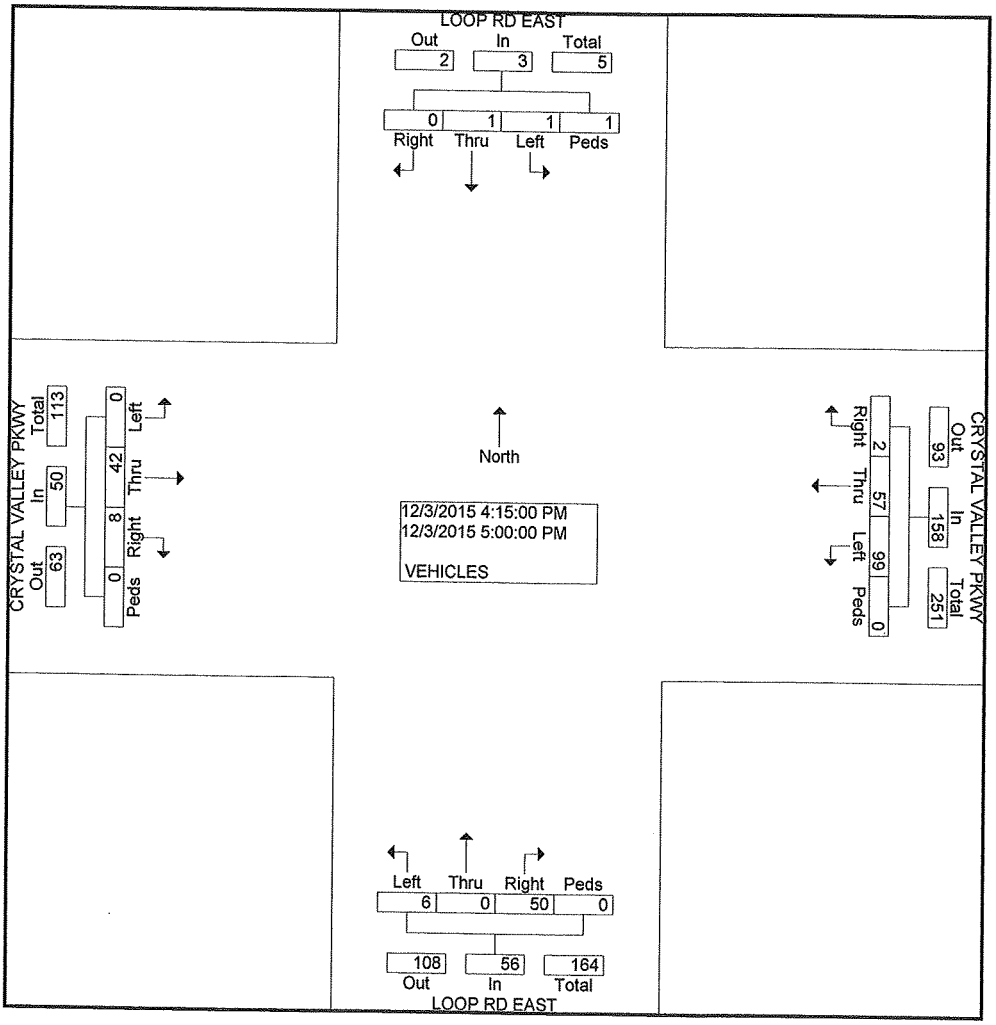


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD EAST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSEAST
Site Code : 00000014
Start Date : 12/3/2015
Page No : 2

	LOOP RD EAST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD EAST Northbound					CRYSTAL VALLEY PKWY 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 04:15 PM to 05:00 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	1	1	0	1	3	99	57	2	0	158	6	0	50	0	56	0	42	8	0	50	267
Percent	33.3	33.3	0.0	33.3		62.7	36.1	1.3	0.0		10.7	0.0	89.3	0.0		0.0	84.0	16.0	0.0		
04:15 Volume	0	0	0	0	0	21	28	0	0	49	3	0	15	0	18	0	6	0	0	6	73
Peak Factor																					0.914
High Int.	04:30 PM					04:15 PM					04:15 PM					04:45 PM					
Volume	1	1	0	0	2	21	28	0	0	49	3	0	15	0	18	0	18	4	0	22	
Peak Factor					0.375					0.806					0.778					0.568	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LAKE GULCH RD
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LAKECRYS
Site Code : 00000016
Start Date : 12/3/2015
Page No : 1

Groups Printed- VEHICLES

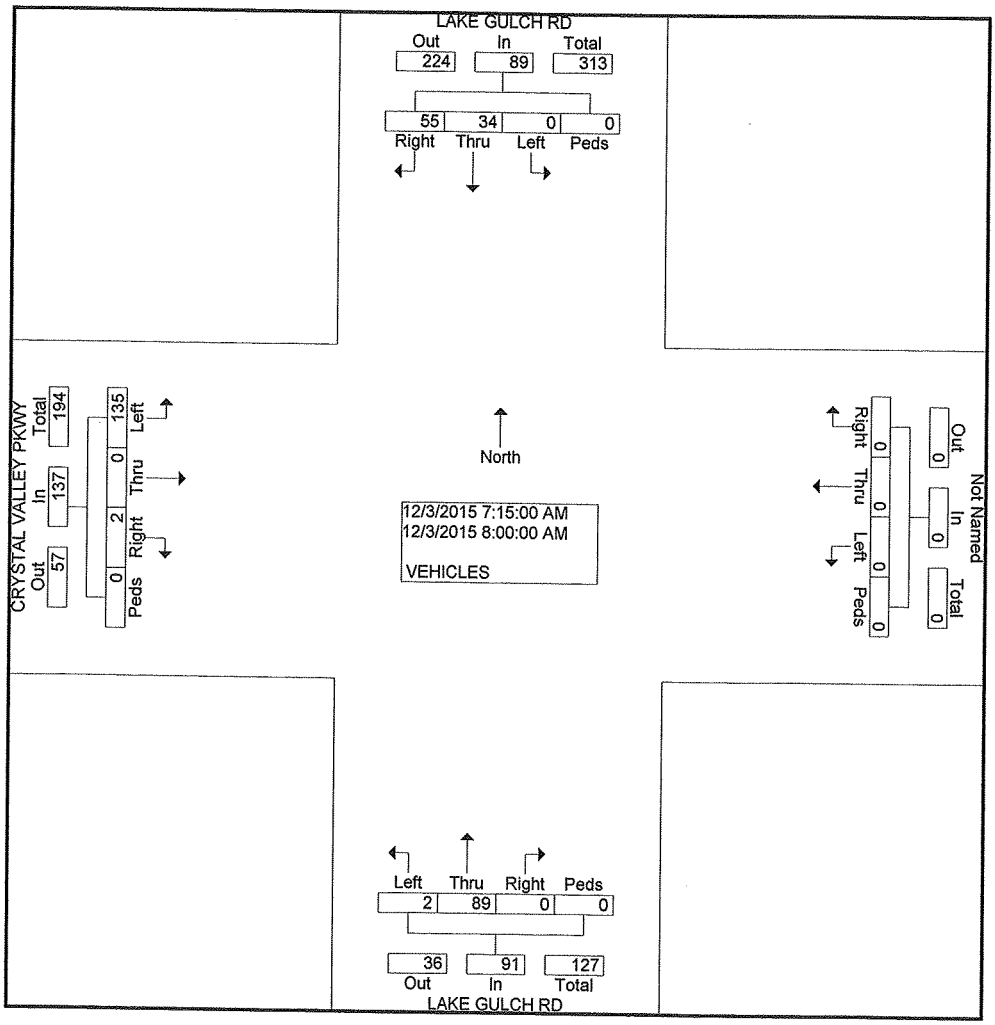
	LAKE GULCH RD Southbound				Westbound				LAKE GULCH RD Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	5	1	0	0	0	0	0	2	16	0	0	33	0	1	0	58
06:45 AM	0	7	18	0	0	0	0	0	0	16	0	0	32	0	1	0	74
Total	0	12	19	0	0	0	0	0	2	32	0	0	65	0	2	0	132
07:00 AM	0	3	7	0	0	0	0	0	1	20	0	0	36	0	1	0	68
07:15 AM	0	7	9	0	0	0	0	0	0	30	0	0	35	0	0	0	81
07:30 AM	0	6	16	0	0	0	0	0	1	29	0	0	33	0	0	0	85
07:45 AM	0	12	13	0	0	0	0	0	1	15	0	0	35	0	2	0	78
Total	0	28	45	0	0	0	0	0	3	94	0	0	139	0	3	0	312
08:00 AM	0	9	17	0	0	0	0	0	0	15	0	0	32	0	0	0	73
08:15 AM	0	4	22	0	0	0	0	0	1	4	0	0	29	0	0	0	60
Total	0	13	39	0	0	0	0	0	1	19	0	0	61	0	0	0	133
04:00 PM	0	15	38	0	0	0	0	0	1	12	0	0	19	0	2	0	87
04:15 PM	0	29	49	0	0	0	0	0	0	17	0	0	20	0	1	0	116
04:30 PM	0	19	43	0	0	0	0	0	2	15	0	0	17	0	4	0	100
04:45 PM	0	19	24	0	0	0	0	0	2	19	0	0	29	0	2	0	95
Total	0	82	154	0	0	0	0	0	5	63	0	0	85	0	9	0	398
05:00 PM	0	26	38	1	0	0	0	0	0	14	0	0	19	0	1	0	99
05:15 PM	0	19	26	0	0	0	0	0	1	13	0	0	31	0	3	0	93
05:30 PM	0	14	35	0	0	0	0	0	0	6	0	0	21	0	2	0	78
05:45 PM	0	19	35	0	0	0	0	0	1	7	0	0	20	0	1	0	83
Total	0	78	134	1	0	0	0	0	2	40	0	0	91	0	7	0	353
Grand Total	0	213	391	1	0	0	0	0	13	248	0	0	441	0	21	0	1328
Apprch %	0.0	35.2	64.6	0.2	0.0	0.0	0.0	0.0	5.0	95.0	0.0	0.0	95.5	0.0	4.5	0.0	
Total %	0.0	16.0	29.4	0.1	0.0	0.0	0.0	0.0	1.0	18.7	0.0	0.0	33.2	0.0	1.6	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LAKE GULCH RD
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LAKECRYS
Site Code : 00000016
Start Date : 12/3/2015

	LAKE GULCH RD Southbound					Westbound					LAKE GULCH RD Northbound					CRYSTAL VALLEY PKWY 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	07:15 AM																				
Volume	0	34	55	0	89	0	0	0	0	0	2	89	0	0	91	135	0	2	0	137	317
Percent	0.0	38.2	61.8	0.0		0.0	0.0	0.0	0.0		2.2	97.8	0.0	0.0		98.5	0.0	1.5	0.0		
07:30 Volume	0	6	16	0	22	0	0	0	0	0	1	29	0	0	30	33	0	0	0	33	85
Peak Factor																					0.932
High Int.	08:00 AM					6:15:00 AM					07:15 AM					07:45 AM					
Volume	0	9	17	0	26	0	0	0	0	0	0	30	0	0	30	35	0	2	0	37	
Peak Factor					0.856										0.758					0.926	

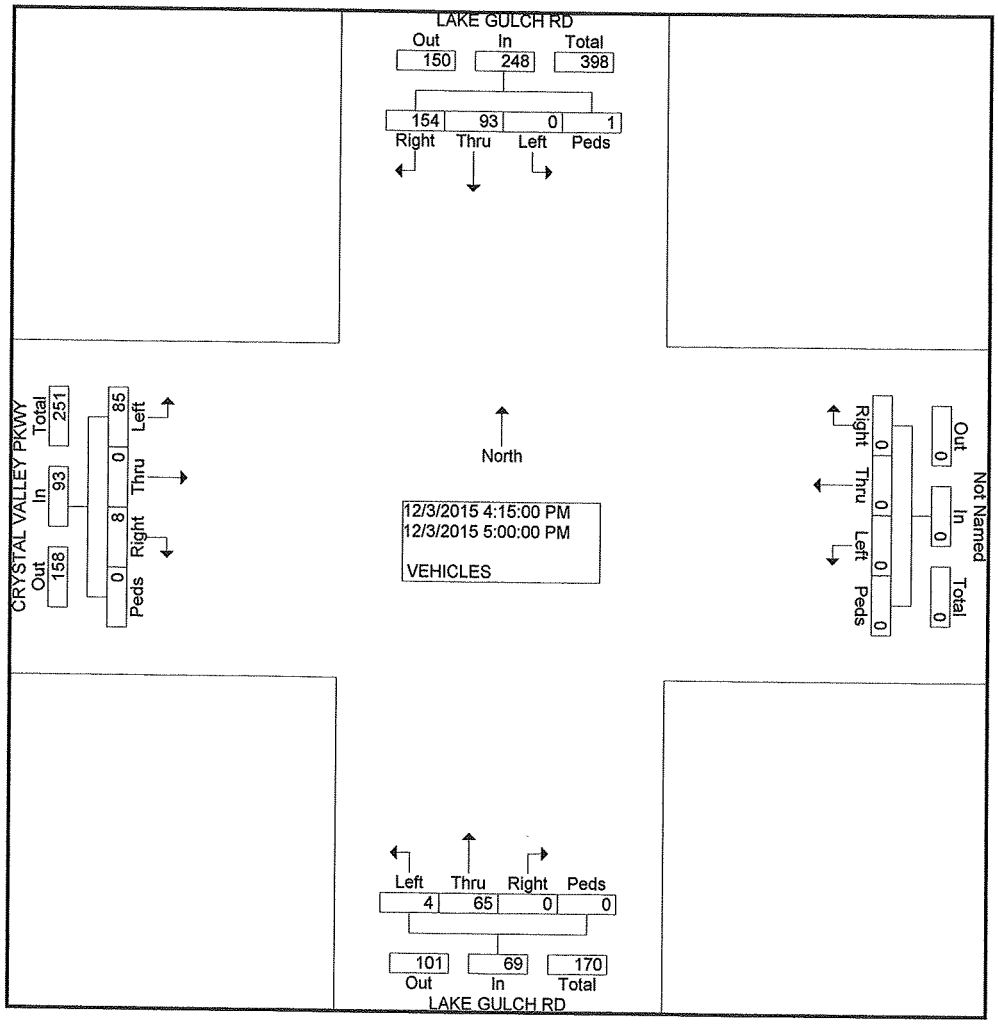


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LAKE GULCH RD
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LAKECRYS
Site Code : 00000016
Start Date : 12/3/2015

	LAKE GULCH RD Southbound					Westbound					LAKE GULCH RD Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	0	93	154	1	248	0	0	0	0	0	4	65	0	0	69	85	0	8	0	93	410
Percent	0.0	37.5	62.1	0.4		0.0	0.0	0.0	0.0		5.8	94.2	0.0	0.0		91.4	0.0	8.6	0.0		
04:15 Volume	0	29	49	0	78	0	0	0	0	0	0	17	0	0	17	20	0	1	0	21	116
Peak Factor																					0.884
High Int.	04:15 PM										04:45 PM					04:45 PM					
Volume	0	29	49	0	78	0	0	0	0	0	2	19	0	0	21	29	0	2	0	31	
Peak Factor					0.795										0.821					0.750	



Agency Name:Counter Measures Inc

Site ID:120366000000
Station Name:
Description:LAKE GULCH RD N/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (North)	Lane 2 (South)	All Lanes
00:00	6	3	9
01:00	3	6	9
02:00	3	3	6
03:00	3	1	4
04:00	20	3	23
05:00	52	9	61
06:00	150	63	213
07:00	221	97	318
08:00	165	104	269
09:00	138	107	245
10:00	109	98	207
11:00	127	95	222
12:00	103	106	209
13:00	89	113	202
14:00	133	99	232
15:00	152	184	336
16:00	148	244	392
17:00	136	217	353
18:00	74	191	265
19:00	29	96	125
20:00	36	98	134
21:00	18	49	67
22:00	9	27	36
23:00	7	10	17
AM Peak Hour	07:00 - 07:59	09:00 - 09:59	07:00 - 07:59
AM Peak Value	221	107	318
PM Peak Hour	15:00 - 15:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	152	244	392
Total	1931	2023	3954
Percentages	48.84%	51.16%	100.00%

Agency Name:Counter Measures Inc

Site ID:120374000000
Station Name:
Description:LAKE GULCH RD S/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (South)	Lane 2 (North)	All Lanes
00:00	1	3	4
01:00	3	1	4
02:00	1	2	3
03:00	1	1	2
04:00	1	10	11
05:00	10	23	33
06:00	40	68	108
07:00	40	83	123
08:00	37	57	94
09:00	53	54	107
10:00	50	46	96
11:00	40	57	97
12:00	45	32	77
13:00	35	41	76
14:00	48	62	110
15:00	66	61	127
16:00	93	69	162
17:00	89	39	128
18:00	66	23	89
19:00	34	5	39
20:00	35	13	48
21:00	13	4	17
22:00	12	8	20
23:00	3	3	6
AM Peak Hour	09:00 - 09:59	07:00 - 07:59	07:00 - 07:59
AM Peak Value	53	83	123
PM Peak Hour	16:00 - 16:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	93	69	162
Total	816	765	1581
Percentages	51.61%	48.39%	100.00%

Agency Name:Counter Measures Inc

Site ID:120362000000
Station Name:
Description:CRYSTAL VALLEY PKWY E/O LOOP DR EAST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (East)	Lane 2 (West)	All Lanes
00:00	3	2	5
01:00	1	3	4
02:00	1	2	3
03:00	2	0	2
04:00	10	1	11
05:00	34	2	36
06:00	92	24	116
07:00	153	73	226
08:00	124	82	206
09:00	82	81	163
10:00	73	59	132
11:00	83	65	148
12:00	81	69	150
13:00	55	80	135
14:00	94	63	157
15:00	107	122	229
16:00	95	163	258
17:00	106	136	242
18:00	62	130	192
19:00	28	61	89
20:00	30	65	95
21:00	15	35	50
22:00	2	14	16
23:00	5	8	13
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	07:00 - 07:59
AM Peak Value	153	82	226
PM Peak Hour	15:00 - 15:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	107	163	258
Total	1338	1340	2678
Percentages	49.96%	50.04%	100.00%

Agency Name:Counter Measures Inc

Site ID:120355000000
Station Name:
Description:LOOP DR EAST S/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (North)	Lane 2 (South)	All Lanes
00:00	2	2	4
01:00	0	0	0
02:00	1	3	4
03:00	3	0	3
04:00	6	1	7
05:00	27	0	27
06:00	66	14	80
07:00	103	45	148
08:00	65	55	120
09:00	59	52	111
10:00	53	44	97
11:00	59	42	101
12:00	55	44	99
13:00	32	56	88
14:00	48	31	79
15:00	60	75	135
16:00	55	103	158
17:00	61	83	144
18:00	36	91	127
19:00	18	51	69
20:00	13	37	50
21:00	7	25	32
22:00	5	10	15
23:00	4	8	12
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	07:00 - 07:59
AM Peak Value	103	55	148
PM Peak Hour	17:00 - 17:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	61	103	158
Total	838	872	1710
Percentages	49.01%	50.99%	100.00%

Agency Name:Counter Measures Inc

Site ID:120371000000
Station Name:
Description:CRYSTAL VALLEY PKWY E/O IDLYWOOD ST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (East)	Lane 2 (West)	All Lanes
00:00	1	0	1
01:00	1	3	4
02:00	2	1	3
03:00	0	1	1
04:00	4	0	4
05:00	6	4	10
06:00	28	13	41
07:00	66	36	102
08:00	74	46	120
09:00	36	40	76
10:00	41	45	86
11:00	42	35	77
12:00	33	30	63
13:00	31	37	68
14:00	55	35	90
15:00	67	73	140
16:00	51	66	117
17:00	52	56	108
18:00	36	53	89
19:00	19	25	44
20:00	22	29	51
21:00	10	15	25
22:00	2	8	10
23:00	5	4	9
AM Peak Hour	08:00 - 08:59	08:00 - 08:59	08:00 - 08:59
AM Peak Value	74	46	120
PM Peak Hour	15:00 - 15:59	15:00 - 15:59	15:00 - 15:59
PM Peak Value	67	73	140
Total	684	655	1339
Percentages	51.08%	48.92%	100.00%

Agency Name:Counter Measures Inc

Site ID:120351000000
Station Name:
Description:CRYSTAL VALLEY PKWY W/O IDYLWOOD ST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (East)	Lane 2 (West)	All Lanes
00:00	1	0	1
01:00	1	2	3
02:00	3	1	4
03:00	0	3	3
04:00	1	0	1
05:00	6	14	20
06:00	18	33	51
07:00	28	61	89
08:00	62	50	112
09:00	30	46	76
10:00	34	45	79
11:00	34	31	65
12:00	30	31	61
13:00	28	35	63
14:00	46	35	81
15:00	66	58	124
16:00	55	49	104
17:00	45	38	83
18:00	62	35	97
19:00	26	18	44
20:00	23	11	34
21:00	7	8	15
22:00	7	5	12
23:00	6	8	14
AM Peak Hour	08:00 - 08:59	07:00 - 07:59	08:00 - 08:59
AM Peak Value	62	61	112
PM Peak Hour	15:00 - 15:59	15:00 - 15:59	15:00 - 15:59
PM Peak Value	66	58	124
Total	619	617	1236
Percentages	50.08%	49.92%	100.00%

Agency Name:Counter Measures Inc

Site ID:120361000000
Station Name:
Description:LOOP DR WEST S/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (North)	Lane 2 (South)	All Lanes
00:00	1	0	1
01:00	0	0	0
02:00	0	0	0
03:00	1	0	1
04:00	0	0	0
05:00	6	4	10
06:00	19	3	22
07:00	33	8	41
08:00	17	13	30
09:00	9	13	22
10:00	16	10	26
11:00	14	9	23
12:00	9	12	21
13:00	5	14	19
14:00	17	12	29
15:00	14	21	35
16:00	14	28	42
17:00	11	25	36
18:00	8	25	33
19:00	5	13	18
20:00	3	9	12
21:00	4	11	15
22:00	0	7	7
23:00	0	1	1
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	07:00 - 07:59
AM Peak Value	33	13	41
PM Peak Hour	14:00 - 14:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	17	28	42
Total	206	238	444
Percentages	46.40%	53.60%	100.00%

Agency Name:Counter Measures Inc

Site ID:120356000000
Station Name:
Description:CRYSTAL VALLEY PKWY W/O LOOP DR WEST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (West)	Lane 2 (East)	All Lanes
00:00	0	0	0
01:00	2	1	3
02:00	1	3	4
03:00	4	0	4
04:00	0	1	1
05:00	15	5	20
06:00	47	17	64
07:00	82	22	104
08:00	56	61	117
09:00	49	35	84
10:00	48	29	77
11:00	37	32	69
12:00	34	37	71
13:00	28	31	59
14:00	33	48	81
15:00	60	73	133
16:00	46	63	109
17:00	37	52	89
18:00	26	71	97
19:00	16	32	48
20:00	8	26	34
21:00	7	12	19
22:00	4	12	16
23:00	6	5	11
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	08:00 - 08:59
AM Peak Value	82	61	117
PM Peak Hour	15:00 - 15:59	15:00 - 15:59	15:00 - 15:59
PM Peak Value	60	73	133
Total	646	668	1314
Percentages	49.16%	50.84%	100.00%

LEVEL OF SERVICE DEFINITIONS

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

SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

LOS	Average Vehicle Delay sec/vehicle	Operational Characteristics
A	<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	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.
C	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.
D	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.
E	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.
F	>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. The delay could be up to 15 seconds. 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. 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.
D	25 to 35 seconds	This is the point at which a traffic signal may be warranted for this intersection. 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. There is a high probability that this intersection will meet traffic signal warrants. 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. The only remedy for these long delays is installing a traffic signal or restricting the accesses. 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.

Intersection	
Intersection Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	25	3	2	58	3	16	0	13	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	28	3	2	64	3	18	0	14	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	68	0	0	28	0	0	104	104	28	103	103	66
Stage 1	-	-	-	-	-	-	32	32	-	71	71	-
Stage 2	-	-	-	-	-	-	72	72	-	32	32	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1533	-	-	1585	-	-	876	786	1047	877	787	998
Stage 1	-	-	-	-	-	-	984	868	-	939	836	-
Stage 2	-	-	-	-	-	-	938	835	-	984	868	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1533	-	-	1585	-	-	873	784	1047	864	785	998
Mov Capacity-2 Maneuver	-	-	-	-	-	-	873	784	-	864	785	-
Stage 1	-	-	-	-	-	-	983	867	-	938	835	-
Stage 2	-	-	-	-	-	-	935	834	-	969	867	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	8.9	9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	873	0	1047	1533	-	-	1585	-	-	904
HCM Lane V/C Ratio	0.02	+	0.014	0.001	-	-	0.001	-	-	0.007
HCM Control Delay (s)	9.2	0	8.5	7.352	0	-	7.274	0	-	9
HCM Lane LOS	A	A	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.062	+	0.042	0.004	-	-	0.004	-	-	0.022

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	135	2	2	89	34	55
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	-	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	145	2	2	96	37	59

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	37	37	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	100	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	856	1035	1574	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	924	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	855	1035	1574	-	-	-
Mov Capacity-2 Maneuver	855	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	923	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1574	-	857	-	-
HCM Lane V/C Ratio	0.001	-	0.172	-	-
HCM Control Delay (s)	7.29	0	10.1	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.004	-	0.618	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	40	2	9	28	0	34	0	27	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	45	2	10	31	0	38	0	30	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	45	0	0	97	97	45	97	97	31
Stage 1	-	-	-	-	-	-	45	45	-	52	52	-
Stage 2	-	-	-	-	-	-	52	52	-	45	45	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1582	-	-	1563	-	-	885	793	1025	885	793	1043
Stage 1	-	-	-	-	-	-	969	857	-	961	852	-
Stage 2	-	-	-	-	-	-	961	852	-	969	857	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1582	-	-	1563	-	-	880	788	1025	855	788	1043
Mov Capacity-2 Maneuver	-	-	-	-	-	-	880	788	-	855	788	-
Stage 1	-	-	-	-	-	-	969	857	-	961	847	-
Stage 2	-	-	-	-	-	-	954	847	-	940	857	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.8	9	8.5
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	907	1025	1582	-	-	1563	-	-	1043
HCM Lane V/C Ratio	0.053	0.02	-	-	-	0.006	-	-	0.001
HCM Control Delay (s)	9.2	8.6	0	-	-	7.318	-	-	8.5
HCM Lane LOS	A	A	A			A			A
HCM 95th %tile Q(veh)	0.169	0.06	0	-	-	0.02	-	-	0.003

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	30	5	3	66	2	27	0	6	0	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	33	6	3	73	2	30	0	7	0	2	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	33	0	0	121	118	33	120	117	74
Stage 1	-	-	-	-	-	-	36	36	-	81	81	-
Stage 2	-	-	-	-	-	-	85	82	-	39	36	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1523	-	-	1579	-	-	854	772	1041	855	773	988
Stage 1	-	-	-	-	-	-	980	865	-	927	828	-
Stage 2	-	-	-	-	-	-	923	827	-	976	865	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1523	-	-	1579	-	-	845	770	1041	848	771	988
Mov Capacity-2 Maneuver	-	-	-	-	-	-	845	770	-	848	771	-
Stage 1	-	-	-	-	-	-	979	864	-	926	826	-
Stage 2	-	-	-	-	-	-	914	825	-	969	864	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	9.3	9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	875	1523	-	-	1579	-	-	914
HCM Lane V/C Ratio	0.042	0.001	-	-	0.002	-	-	0.009
HCM Control Delay (s)	9.3	7.365	0	-	7.285	0	-	9
HCM Lane LOS	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.131	0.002	-	-	0.006	-	-	0.026

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	32	13	0	98	0	59	0	3	1	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	37	15	0	113	0	68	0	3	1	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	113	0	0	37	0	0	171	166	37	168	166	113
Stage 1	-	-	-	-	-	-	53	53	-	113	113	-
Stage 2	-	-	-	-	-	-	118	113	-	55	53	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1476	-	-	1574	-	-	792	727	1035	796	727	940
Stage 1	-	-	-	-	-	-	960	851	-	892	802	-
Stage 2	-	-	-	-	-	-	887	802	-	957	851	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1476	-	-	1574	-	-	780	723	1035	790	723	940
Mov Capacity-2 Maneuver	-	-	-	-	-	-	780	723	-	790	723	-
Stage 1	-	-	-	-	-	-	954	846	-	887	802	-
Stage 2	-	-	-	-	-	-	877	802	-	948	846	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	9.8	8.9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	780	806	1476	-	-	1574	-	-	790	934
HCM Lane V/C Ratio	0.058	0.032	0.005	-	-	-	-	-	0.001	0.011
HCM Control Delay (s)	9.9	9.6	7.452	0	-	0	-	-	9.6	8.9
HCM Lane LOS	A	A	A	A		A			A	A
HCM 95th %tile Q(veh)	0.184	0.1	0.016	-	-	0	-	-	0.003	0.035

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	51	7	30	25	2	11	0	88	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	57	8	33	28	2	12	0	98	1	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	30	0	0	57	0	0	159	160	57	159	159	29
Stage 1	-	-	-	-	-	-	63	63	-	96	96	-
Stage 2	-	-	-	-	-	-	96	97	-	63	63	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1583	-	-	1547	-	-	807	732	1009	807	733	1046
Stage 1	-	-	-	-	-	-	948	842	-	911	815	-
Stage 2	-	-	-	-	-	-	911	815	-	948	842	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1583	-	-	1547	-	-	792	715	1009	716	716	1046
Mov Capacity-2 Maneuver	-	-	-	-	-	-	792	715	-	716	716	-
Stage 1	-	-	-	-	-	-	946	840	-	909	798	-
Stage 2	-	-	-	-	-	-	891	798	-	854	840	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	3.9	8.9	9.2
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	939	1009	1583	-	-	1547	-	-	850
HCM Lane V/C Ratio	0.048	0.065	0.002	-	-	0.022	-	-	0.003
HCM Control Delay (s)	9	8.8	7.279	0	-	7.378	-	-	9.2
HCM Lane LOS	A	A	A	A		A			A
HCM 95th %tile Q(veh)	0.15	0.207	0.006	-	-	0.066	-	-	0.008

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	63	22	8	37	6	8	0	12	2	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	76	27	10	45	7	10	0	14	2	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	52	0	0	76	0	0	148	149	76	145	145	48
Stage 1	-	-	-	-	-	-	78	78	-	67	67	-
Stage 2	-	-	-	-	-	-	70	71	-	78	78	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1554	-	-	1523	-	-	820	743	985	824	746	1021
Stage 1	-	-	-	-	-	-	931	830	-	943	839	-
Stage 2	-	-	-	-	-	-	940	836	-	931	830	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1554	-	-	1523	-	-	811	737	985	807	740	1021
Mov Capacity-2 Maneuver	-	-	-	-	-	-	811	737	-	807	740	-
Stage 1	-	-	-	-	-	-	930	829	-	942	833	-
Stage 2	-	-	-	-	-	-	929	830	-	916	829	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	9	8.9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	811	0	985	1554	-	-	1523	-	-	938
HCM Lane V/C Ratio	0.012	+	0.015	0.001	-	-	0.006	-	-	0.008
HCM Control Delay (s)	9.5	0	8.7	7.318	0	-	7.379	0	-	8.9
HCM Lane LOS	A	A	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.036	+	0.045	0.002	-	-	0.019	-	-	0.023

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	85	8	4	65	93	154
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	-	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	9	5	74	106	175

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	189	106	106	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	800	948	1485	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	797	948	1485	-	-	-
Mov Capacity-2 Maneuver	797	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.4	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	808	-	-
HCM Lane V/C Ratio	0.003	-	0.131	-	-
HCM Control Delay (s)	7.432	0	10.1	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.009	-	0.449	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	31	45	29	37	0	14	0	20	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	40	58	38	48	0	18	0	26	3	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	48	0	0	40	0	0	166	166	40	166	166	48
Stage 1	-	-	-	-	-	-	43	43	-	123	123	-
Stage 2	-	-	-	-	-	-	123	123	-	43	43	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1559	-	-	1570	-	-	798	727	1031	798	727	1021
Stage 1	-	-	-	-	-	-	971	859	-	881	794	-
Stage 2	-	-	-	-	-	-	881	794	-	971	859	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1559	-	-	1570	-	-	783	709	1031	763	709	1021
Mov Capacity-2 Maneuver	-	-	-	-	-	-	783	709	-	763	709	-
Stage 1	-	-	-	-	-	-	970	858	-	880	775	-
Stage 2	-	-	-	-	-	-	860	775	-	946	858	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.2	9.1	9.7
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	849	1031	1559	-	-	1570	-	-	763
HCM Lane V/C Ratio	0.032	0.017	0.001	-	-	0.024	-	-	0.003
HCM Control Delay (s)	9.4	8.6	7.311	0	-	7.349	-	-	9.7
HCM Lane LOS	A	A	A	A		A			A
HCM 95th %tile Q(veh)	0.098	0.051	0.003	-	-	0.074	-	-	0.01

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	51	19	2	44	1	15	0	4	2	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	65	24	3	56	1	19	0	5	3	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	58	0	0	65	0	0	135	134	65	135	133	57
Stage 1	-	-	-	-	-	-	71	71	-	62	62	-
Stage 2	-	-	-	-	-	-	64	63	-	73	71	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1546	-	-	1537	-	-	836	757	999	836	758	1009
Stage 1	-	-	-	-	-	-	939	836	-	949	843	-
Stage 2	-	-	-	-	-	-	947	842	-	937	836	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1546	-	-	1537	-	-	830	754	999	829	755	1009
Mov Capacity-2 Maneuver	-	-	-	-	-	-	830	754	-	829	755	-
Stage 1	-	-	-	-	-	-	937	834	-	947	841	-
Stage 2	-	-	-	-	-	-	942	840	-	930	834	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	9.3	8.9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	861	1546	-	-	1537	-	-	928
HCM Lane V/C Ratio	0.028	0.002	-	-	0.002	-	-	0.007
HCM Control Delay (s)	9.3	7.332	0	-	7.346	0	-	8.9
HCM Lane LOS	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.087	0.005	-	-	0.005	-	-	0.021

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	13	68	49	5	57	0	19	1	4	0	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	79	57	6	66	0	22	1	5	0	1	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	66	0	0	79	0	0	192	187	79	190	187	66
Stage 1	-	-	-	-	-	-	109	109	-	78	78	-
Stage 2	-	-	-	-	-	-	83	78	-	112	109	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1536	-	-	1519	-	-	768	708	981	770	708	998
Stage 1	-	-	-	-	-	-	896	805	-	931	830	-
Stage 2	-	-	-	-	-	-	925	830	-	893	805	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1536	-	-	1519	-	-	752	697	981	757	697	998
Mov Capacity-2 Maneuver	-	-	-	-	-	-	752	697	-	757	697	-
Stage 1	-	-	-	-	-	-	886	796	-	921	827	-
Stage 2	-	-	-	-	-	-	913	827	-	878	796	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.6	9.7	8.8
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	752	813	1536	-	-	1519	-	-	0	947
HCM Lane V/C Ratio	0.02	0.016	0.01	-	-	0.004	-	-	+	0.01
HCM Control Delay (s)	9.9	9.5	7.367	0	-	7.379	0	-	0	8.8
HCM Lane LOS	A	A	A	A		A	A		A	A
HCM 95th %tile Q(veh)	0.06	0.049	0.03	-	-	0.012	-	-	+	0.03

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	42	8	99	57	2	6	0	50	1	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	46	9	109	63	2	7	0	55	1	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	46	0	0	328	328	46	327	327	64
Stage 1	-	-	-	-	-	-	46	46	-	281	281	-
Stage 2	-	-	-	-	-	-	282	282	-	46	46	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1537	-	-	1562	-	-	625	591	1023	626	591	1000
Stage 1	-	-	-	-	-	-	968	857	-	726	678	-
Stage 2	-	-	-	-	-	-	725	678	-	968	857	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1537	-	-	1562	-	-	591	550	1023	561	550	1000
Mov Capacity-2 Maneuver	-	-	-	-	-	-	591	550	-	561	550	-
Stage 1	-	-	-	-	-	-	968	857	-	726	631	-
Stage 2	-	-	-	-	-	-	673	631	-	916	857	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.7	8.9	11.5
HCM LOS			A	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	857	1023	1537	-	-	1562	-	-	555
HCM Lane V/C Ratio	0.029	0.036	-	-	-	0.07	-	-	0.004
HCM Control Delay (s)	9.3	8.7	0	-	-	7.477	-	-	11.5
HCM Lane LOS	A	A	A			A			B
HCM 95th %tile Q(veh)	0.09	0.111	0	-	-	0.224	-	-	0.012

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	145	175	35	300	3	560	2	110	2	3	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	521	1798	764	619	948	806	768	505	429	164	43	43
Arrive On Green	0.00	0.48	0.48	0.03	0.51	0.51	0.22	0.27	0.27	0.00	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	856	856
Grp Volume(v), veh/h	3	161	194	39	333	3	622	2	122	2	0	6
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1712
Q Serve(g_s), s	0.1	1.7	5.4	0.8	8.0	0.1	12.8	0.1	4.5	0.1	0.0	0.2
Cycle Q Clear(g_c), s	0.1	1.7	5.4	0.8	8.0	0.1	12.8	0.1	4.5	0.1	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	521	1798	764	619	948	806	768	505	429	164	0	86
V/C Ratio(X)	0.01	0.09	0.25	0.06	0.35	0.00	0.81	0.00	0.28	0.01	0.00	0.07
Avail Cap(c_a), veh/h	658	1798	764	709	948	806	1200	899	764	302	0	367
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.1	10.4	11.4	8.2	10.9	9.0	27.5	19.8	21.5	33.5	0.0	33.8
Incr Delay (d2), s/veh	0.0	0.1	0.8	0.0	1.0	0.0	2.4	0.0	0.4	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.7	2.0	0.3	3.4	0.0	5.4	0.0	0.0	0.0	0.0	0.1
Lane Grp Delay (d), s/veh	10.1	10.5	12.2	8.3	12.0	9.0	29.9	19.8	21.8	33.6	0.0	34.1
Lane Grp LOS	B	B	B	A	B	A	C	B	C	C		C
Approach Vol, veh/h		358			375			746			8	
Approach Delay, s/veh		11.4			11.6			28.5			34.0	
Approach LOS		B			B			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.2	40.0		6.2	42.0		20.6	24.2		4.2	7.7	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	7.4		2.8	10.0		14.8	6.5		2.1	2.2	
Green Ext Time (p_c), s	0.0	3.8		0.0	3.8		1.9	0.4		0.0	0.3	

Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	8.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	420	15	15	90	30	185
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	452	16	16	97	32	199

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	161	32	32	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	129	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	830	1042	1580	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	822	1042	1580	-	-	-
Mov Capacity-2 Maneuver	822	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1580	-	828	-	-
HCM Lane V/C Ratio	0.01	-	0.565	-	-
HCM Control Delay (s)	7.302	-	14.8	-	-
HCM Lane LOS	A		B		
HCM 95th %tile Q(veh)	0.031	-	3.606	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	175	65	95	100	4	200	1	250	12	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	194	72	106	111	4	222	1	278	13	3	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	111	0	0	194	0	0	522	519	194	658	519	111
Stage 1	-	-	-	-	-	-	197	197	-	322	322	-
Stage 2	-	-	-	-	-	-	325	322	-	336	197	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1479	-	-	1379	-	-	465	461	847	378	461	942
Stage 1	-	-	-	-	-	-	805	738	-	690	651	-
Stage 2	-	-	-	-	-	-	687	651	-	678	738	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1479	-	-	1379	-	-	434	425	847	239	425	942
Mov Capacity-2 Maneuver	-	-	-	-	-	-	434	425	-	239	425	-
Stage 1	-	-	-	-	-	-	804	738	-	690	601	-
Stage 2	-	-	-	-	-	-	629	601	-	455	738	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.7	15.8	18
HCM LOS			C	C

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	434	704	1479	-	-	1379	-	-	239	347
HCM Lane V/C Ratio	0.341	0.501	0.001	-	-	0.077	-	-	0.037	0.029
HCM Control Delay (s)	17.5	15.1	7.436	-	-	7.827	-	-	20.6	15.7
HCM Lane LOS	C	C	A			A			C	C
HCM 95th %tile Q(veh)	1.492	2.833	0.002	-	-	0.248	-	-	0.115	0.089

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	41	5	3	270	90	13
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	-	-	-	-	150
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	45	5	3	293	98	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	398	98	98	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	607	958	1495	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	606	958	1495	-	-	-
Mov Capacity-2 Maneuver	606	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	750	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1495	-	631	-	-
HCM Lane V/C Ratio	0.002	-	0.079	-	-
HCM Control Delay (s)	7.413	0	11.2	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.007	-	0.257	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	70	31	10	155	92	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	34	11	168	100	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	76	0	266	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	190	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1523	-	723	985
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	842	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1523	-	718	985
Mov Capacity-2 Maneuver	-	-	-	-	718	-
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	10.6
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	773	-	-	1523	-
HCM Lane V/C Ratio	0.176	-	-	0.007	-
HCM Control Delay (s)	10.6	-	-	7.381	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.635	-	-	0.022	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	415	620	100	160	3	330	2	70	8	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	738	2018	1097	390	1091	928	521	351	298	174	17	60
Arrive On Green	0.00	0.54	0.54	0.05	0.59	0.59	0.15	0.19	0.19	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	364	1274
Grp Volume(v), veh/h	4	500	747	120	193	4	398	2	84	10	0	9
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1638
Q Serve(g_s), s	0.1	5.4	20.8	1.9	3.6	0.1	8.4	0.1	3.4	0.4	0.0	0.4
Cycle Q Clear(g_c), s	0.1	5.4	20.8	1.9	3.6	0.1	8.4	0.1	3.4	0.4	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	738	2018	1097	390	1091	928	521	351	298	174	0	77
V/C Ratio(X)	0.01	0.25	0.68	0.31	0.18	0.00	0.76	0.01	0.28	0.06	0.00	0.12
Avail Cap(c_a), veh/h	871	2018	1097	445	1091	928	955	763	648	297	0	346
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.8	9.2	6.8	5.8	7.2	6.5	30.8	25.0	26.3	33.8	0.0	34.6
Incr Delay (d2), s/veh	0.0	0.3	3.4	0.4	0.4	0.0	2.4	0.0	0.5	0.1	0.0	0.7
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 Back of Q (50%), veh/ln	0.0	2.2	6.5	0.7	1.4	0.0	3.7	0.0	1.3	0.2	0.0	0.2
Lane Grp Delay (d), s/veh	7.8	9.5	10.2	6.3	7.6	6.5	33.2	25.0	26.8	34.0	0.0	35.2
Lane Grp LOS	A	A	B	A	A	A	C	C	C	C		D
Approach Vol, veh/h		1251			317			484			19	
Approach Delay, s/veh		9.9			7.1			32.0			34.6	
Approach LOS		A			A			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.3	45.0		7.7	48.4		15.5	18.3		4.8	7.6	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	22.8		3.9	5.6		10.4	5.4		2.4	2.4	
Green Ext Time (p_c), s	0.0	7.5		0.1	9.3		1.1	0.3		0.0	0.2	

Intersection Summary			
HCM 2010 Ctrl Delay		14.9	
HCM 2010 LOS		B	

Notes

Intersection	
Intersection Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	325	15	15	40	80	375
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	369	17	17	45	91	426

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	171	91	91	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	819	967	1504	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	810	967	1504	-	-	-
Mov Capacity-2 Maneuver	810	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1504	-	816	-	-
HCM Lane V/C Ratio	0.011	-	0.473	-	-
HCM Control Delay (s)	7.421	-	13.3	-	-
HCM Lane LOS	A		B		
HCM 95th %tile Q(veh)	0.034	-	2.574	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	185	250	250	125	15	120	4	145	8	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	203	275	275	137	16	132	4	159	9	2	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	137	0	0	203	0	0	896	895	203	977	895	137
Stage 1	-	-	-	-	-	-	208	208	-	687	687	-
Stage 2	-	-	-	-	-	-	688	687	-	290	208	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1447	-	-	1369	-	-	261	280	838	230	280	911
Stage 1	-	-	-	-	-	-	794	730	-	437	447	-
Stage 2	-	-	-	-	-	-	436	447	-	718	730	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1447	-	-	1369	-	-	219	223	838	155	223	911
Mov Capacity-2 Maneuver	-	-	-	-	-	-	219	223	-	155	223	-
Stage 1	-	-	-	-	-	-	793	729	-	436	357	-
Stage 2	-	-	-	-	-	-	346	357	-	577	729	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.3	21.5	25.9
HCM LOS			C	D

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	219	506	1447	-	-	1369	-	-	155	208
HCM Lane V/C Ratio	0.401	0.41	0.002	-	-	0.201	-	-	0.038	0.03
HCM Control Delay (s)	32	17	7.492	-	-	8.289	-	-	29.1	22.8
HCM Lane LOS	D	C	A			A			D	C
HCM 95th %tile Q(veh)	1.812	1.983	0.005	-	-	0.749	-	-	0.117	0.092

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	27	4	5	150	270	45
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	-	-	-	-	150
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	29	4	5	163	293	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	467	293	293	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	554	746	1269	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	552	746	1269	-	-	-
Mov Capacity-2 Maneuver	552	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	853	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.3	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1269	-	571	-	-
HCM Lane V/C Ratio	0.004	-	0.059	-	-
HCM Control Delay (s)	7.849	0	11.7	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.013	-	0.188	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	145	102	37	90	60	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	158	111	40	98	65	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	158	0	336	158
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	178	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1422	-	659	887
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	853	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1422	-	640	887
Mov Capacity-2 Maneuver	-	-	-	-	640	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	829	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	11
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	692	-	-	1422	-
HCM Lane V/C Ratio	0.129	-	-	0.028	-
HCM Control Delay (s)	11	-	-	7.605	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.441	-	-	0.087	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	145	180	36	300	3	575	2	112	2	3	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	516	1785	759	612	943	801	784	513	436	163	43	43
Arrive On Green	0.00	0.48	0.48	0.03	0.51	0.51	0.23	0.28	0.28	0.00	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	856	856
Grp Volume(v), veh/h	3	161	200	40	333	3	639	2	124	2	0	6
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1712
Q Serve(g_s), s	0.1	1.8	5.7	0.8	8.1	0.1	13.2	0.1	4.6	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.1	1.8	5.7	0.8	8.1	0.1	13.2	0.1	4.6	0.1	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	516	1785	759	612	943	801	784	513	436	163	0	86
V/C Ratio(X)	0.01	0.09	0.26	0.07	0.35	0.00	0.82	0.00	0.28	0.01	0.00	0.07
Avail Cap(c_a), veh/h	652	1785	759	701	943	801	1191	893	759	300	0	365
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.3	10.6	11.7	8.4	11.2	9.2	27.5	19.7	21.4	33.8	0.0	34.0
Incr Delay (d2), s/veh	0.0	0.1	0.8	0.0	1.0	0.0	2.7	0.0	0.4	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.7	2.1	0.3	3.5	0.0	5.7	0.0	0.0	0.0	0.0	0.1
Lane Grp Delay (d), s/veh	10.3	10.7	12.5	8.4	12.2	9.2	30.2	19.7	21.7	33.8	0.0	34.4
Lane Grp LOS	B	B	B	A	B	A	C	B	C	C		C
Approach Vol, veh/h		364			376			765			8	
Approach Delay, s/veh		11.7			11.8			28.8			34.2	
Approach LOS		B			B			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.2	40.0		6.3	42.0		21.1	24.7		4.2	7.8	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	7.7		2.8	10.1		15.2	6.6		2.1	2.3	
Green Ext Time (p_c), s	0.0	3.8		0.0	3.8		1.9	0.4		0.0	0.3	

Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	434	15	15	90	30	190
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	467	16	16	97	32	204

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	161	32	32	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	129	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	830	1042	1580	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	822	1042	1580	-	-	-
Mov Capacity-2 Maneuver	822	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.2	1	0
HCM LOS	C		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1580	-	828	-	-
HCM Lane V/C Ratio	0.01	-	0.583	-	-
HCM Control Delay (s)	7.302	-	15.2	-	-
HCM Lane LOS	A		C		
HCM 95th %tile Q(veh)	0.031	-	3.852	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	177	65	99	101	4	200	1	262	12	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	197	72	110	112	4	222	1	291	13	3	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	112	0	0	197	0	0	534	531	197	677	531	112
Stage 1	-	-	-	-	-	-	199	199	-	332	332	-
Stage 2	-	-	-	-	-	-	335	332	-	345	199	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1478	-	-	1376	-	-	457	454	844	367	454	941
Stage 1	-	-	-	-	-	-	803	736	-	681	644	-
Stage 2	-	-	-	-	-	-	679	644	-	671	736	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1478	-	-	1376	-	-	425	417	844	225	417	941
Mov Capacity-2 Maneuver	-	-	-	-	-	-	425	417	-	225	417	-
Stage 1	-	-	-	-	-	-	802	736	-	681	593	-
Stage 2	-	-	-	-	-	-	620	593	-	439	736	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.8	16.3	18.8
HCM LOS			C	C

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	425	702	1478	-	-	1376	-	-	225	332
HCM Lane V/C Ratio	0.349	0.522	0.001	-	-	0.08	-	-	0.04	0.03
HCM Control Delay (s)	17.9	15.6	7.438	-	-	7.843	-	-	21.7	16.2
HCM Lane LOS	C	C	A			A			C	C
HCM 95th %tile Q(veh)	1.537	3.051	0.002	-	-	0.26	-	-	0.123	0.093

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	58	6	3	270	90	19
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	-	-	-	-	150
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	63	7	3	293	98	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	398	98	98	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	607	958	1495	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	606	958	1495	-	-	-
Mov Capacity-2 Maneuver	606	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	750	-	-	-	-	-

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

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1495	-	628	-	-
HCM Lane V/C Ratio	0.002	-	0.111	-	-
HCM Control Delay (s)	7.413	0	11.4	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.007	-	0.372	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	71	31	14	155	92	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	34	15	168	100	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	77	0	276	77
Stage 1	-	-	-	-	77	-
Stage 2	-	-	-	-	199	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1522	-	714	984
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	835	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1522	-	707	984
Mov Capacity-2 Maneuver	-	-	-	-	707	-
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	778	-	-	1522	-
HCM Lane V/C Ratio	0.19	-	-	0.01	-
HCM Control Delay (s)	10.7	-	-	7.389	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.698	-	-	0.03	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	415	637	103	160	3	340	2	71	8	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	734	2007	1098	385	1087	924	533	358	304	174	17	60
Arrive On Green	0.00	0.54	0.54	0.05	0.58	0.58	0.15	0.19	0.19	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	364	1274
Grp Volume(v), veh/h	4	500	767	124	193	4	410	2	86	10	0	9
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1638
Q Serve(g_s), s	0.1	5.4	21.9	2.0	3.7	0.1	8.7	0.1	3.5	0.4	0.0	0.4
Cycle Q Clear(g_c), s	0.1	5.4	21.9	2.0	3.7	0.1	8.7	0.1	3.5	0.4	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	734	2007	1098	385	1087	924	533	358	304	174	0	77
V/C Ratio(X)	0.01	0.25	0.70	0.32	0.18	0.00	0.77	0.01	0.28	0.06	0.00	0.12
Avail Cap(c_a), veh/h	867	2007	1098	438	1087	924	949	759	645	296	0	344
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	9.4	6.9	5.9	7.4	6.6	30.9	24.9	26.3	34.0	0.0	34.8
Incr Delay (d2), s/veh	0.0	0.3	3.7	0.5	0.4	0.0	2.4	0.0	0.5	0.1	0.0	0.7
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 Back of Q (50%), veh/ln	0.0	2.2	7.0	0.7	1.4	0.0	3.8	0.0	0.0	0.2	0.0	0.2
Lane Grp Delay (d), s/veh	8.0	9.7	10.6	6.4	7.7	6.6	33.2	24.9	26.8	34.2	0.0	35.4
Lane Grp LOS	A	A	B	A	A	A	C	C	C	C		D
Approach Vol, veh/h		1271			321			498			19	
Approach Delay, s/veh		10.2			7.2			32.1			34.8	
Approach LOS		B			A			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.3	45.0		7.8	48.4		15.8	18.6		4.8	7.6	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	23.9		4.0	5.7		10.7	5.5		2.4	2.4	
Green Ext Time (p_c), s	0.0	7.4		0.1	9.5		1.1	0.3		0.0	0.2	

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	334	15	15	40	80	391
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	380	17	17	45	91	444

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	171	91	91	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	819	967	1504	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	810	967	1504	-	-	-
Mov Capacity-2 Maneuver	810	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1504	-	816	-	-
HCM Lane V/C Ratio	0.011	-	0.486	-	-
HCM Control Delay (s)	7.421	-	13.5	-	-
HCM Lane LOS	A		B		
HCM 95th %tile Q(veh)	0.034	-	2.698	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	186	250	263	128	15	120	4	153	8	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	204	275	289	141	16	132	4	168	9	2	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	141	0	0	204	0	0	929	928	204	1014	928	141
Stage 1	-	-	-	-	-	-	209	209	-	719	719	-
Stage 2	-	-	-	-	-	-	720	719	-	295	209	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1442	-	-	1368	-	-	248	268	837	217	268	907
Stage 1	-	-	-	-	-	-	793	729	-	420	433	-
Stage 2	-	-	-	-	-	-	419	433	-	713	729	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1442	-	-	1368	-	-	206	211	837	143	211	907
Mov Capacity-2 Maneuver	-	-	-	-	-	-	206	211	-	143	211	-
Stage 1	-	-	-	-	-	-	792	728	-	419	342	-
Stage 2	-	-	-	-	-	-	328	342	-	566	728	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.4	22.7	27.6
HCM LOS			C	D

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	206	498	1442	-	-	1368	-	-	143	194
HCM Lane V/C Ratio	0.427	0.435	0.002	-	-	0.211	-	-	0.041	0.032
HCM Control Delay (s)	34.9	17.7	7.5	-	-	8.335	-	-	31.2	24.2
HCM Lane LOS	D	C	A			A			D	C
HCM 95th %tile Q(veh)	1.97	2.173	0.005	-	-	0.799	-	-	0.127	0.099

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	38	5	6	150	270	65
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	-	-	-	-	150
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	41	5	7	163	293	71

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	469	293	293	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	176	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	553	746	1269	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	550	746	1269	-	-	-
Mov Capacity-2 Maneuver	550	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	850	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.3	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1269	-	567	-	-
HCM Lane V/C Ratio	0.005	-	0.082	-	-
HCM Control Delay (s)	7.852	0	11.9	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.015	-	0.268	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	146	102	49	91	60	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	159	111	53	99	65	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	159	0	364	159
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	205	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1420	-	635	886
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	829	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1420	-	611	886
Mov Capacity-2 Maneuver	-	-	-	-	611	-
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	798	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	11.2
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	680	-	-	1420	-
HCM Lane V/C Ratio	0.142	-	-	0.038	-
HCM Control Delay (s)	11.2	-	-	7.634	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.494	-	-	0.117	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	165	243	34	375	15	716	90	83	45	70	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	361	1571	1075	503	784	667	906	616	524	269	108	77
Arrive On Green	0.03	0.42	0.42	0.02	0.28	0.28	0.26	0.33	0.33	0.03	0.11	0.11
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1015	721
Grp Volume(v), veh/h	38	179	264	37	408	16	778	98	90	49	0	130
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1736
Q Serve(g_s), s	1.0	2.5	5.5	1.0	15.8	0.6	18.4	3.2	3.4	2.1	0.0	6.2
Cycle Q Clear(g_c), s	1.0	2.5	5.5	1.0	15.8	0.6	18.4	3.2	3.4	2.1	0.0	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	361	1571	1075	503	784	667	906	616	524	269	0	185
V/C Ratio(X)	0.11	0.11	0.25	0.07	0.52	0.02	0.86	0.16	0.17	0.18	0.00	0.70
Avail Cap(c_a), veh/h	436	1571	1075	579	784	667	1067	784	667	335	0	325
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	15.0	5.3	13.4	23.4	18.0	30.0	20.2	20.3	32.6	0.0	36.9
Incr Delay (d2), s/veh	0.1	0.1	0.5	0.1	2.5	0.1	6.3	0.1	0.2	0.3	0.0	4.8
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 Back of Q (50%), veh/ln	0.4	1.1	0.2	0.4	7.9	0.2	8.2	1.4	1.3	0.9	0.0	2.9
Lane Grp Delay (d), s/veh	14.9	15.2	5.8	13.5	25.9	18.1	36.3	20.3	20.4	32.9	0.0	41.7
Lane Grp LOS	B	B	A	B	C	B	D	C	C	C		D
Approach Vol, veh/h		481			461			966			179	
Approach Delay, s/veh		10.0			24.6			33.2			39.3	
Approach LOS		B			C			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	6.4	40.0		6.3	40.0		26.0	32.3		6.8	13.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	3.0	7.5		3.0	17.8		20.4	5.4		4.1	8.2	
Green Ext Time (p_c), s	0.0	4.9		0.0	4.4		1.6	1.6		0.0	0.9	

Intersection Summary	
HCM 2010 Ctrl Delay	26.5
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	14

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	361	50	85	175	75	209
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	388	54	91	188	81	225

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	452	81	81	0	-	0
Stage 1	81	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	565	979	1517	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	531	979	1517	-	-	-
Mov Capacity-2 Maneuver	531	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	656	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31	2.5	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	562	-	-
HCM Lane V/C Ratio	0.06	-	0.786	-	-
HCM Control Delay (s)	7.525	-	31	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.192	-	7.397	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	158	90	110	179	4	250	1	243	12	3	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	755	1066	906	791	1146	974	389	1	303	135	143	95
Arrive On Green	0.00	1.00	1.00	0.04	0.62	0.62	0.07	0.19	0.19	0.01	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	6	1578	1774	1044	696
Grp Volume(v), veh/h	1	172	98	120	195	4	272	0	265	13	0	5
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1584	1774	0	1740
Q Serve(g_s), s	0.0	0.0	0.0	2.1	4.0	0.1	6.0	0.0	14.5	0.6	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.1	4.0	0.1	6.0	0.0	14.5	0.6	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	755	1066	906	791	1146	974	389	0	304	135	0	238
V/C Ratio(X)	0.00	0.16	0.11	0.15	0.17	0.00	0.70	0.00	0.87	0.10	0.00	0.02
Avail Cap(c_a), veh/h	872	1066	906	833	1146	974	389	0	373	233	0	410
HCM Platoon Ratio	2.00	2.00	2.00	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.1	0.0	0.0	5.1	7.4	6.6	30.9	0.0	34.9	33.0	0.0	33.3
Incr Delay (d2), s/veh	0.0	0.3	0.2	0.1	0.3	0.0	5.5	0.0	17.0	0.3	0.0	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 Back of Q (50%), veh/ln	0.0	0.1	0.1	0.8	1.8	0.0	3.4	0.0	7.0	0.2	0.0	0.1
Lane Grp Delay (d), s/veh	8.1	0.3	0.2	5.2	7.7	6.6	36.3	0.0	51.9	33.3	0.0	33.3
Lane Grp LOS	A	A	A	A	A	A	D		D	C		C
Approach Vol, veh/h		271			319			537			18	
Approach Delay, s/veh		0.3			6.7			44.0			33.3	
Approach LOS		A			A			D			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.1	55.0		7.9	58.8		10.0	21.1		5.1	16.2	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	51.0		6.0	51.0		6.0	21.0		6.0	21.0	
Max Q Clear Time (g_c+I1), s	2.0	2.0		4.1	6.0		8.0	16.5		2.6	2.2	
Green Ext Time (p_c), s	0.0	2.6		0.0	2.6		0.0	0.6		0.0	1.6	

Intersection Summary												
HCM 2010 Ctrl Delay			23.1									
HCM 2010 LOS			C									

Notes

Intersection	
Intersection Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	67	10	5	335	170	23
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	-	-	-	-	150
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	73	11	5	364	185	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	560	185	185	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	489	857	1390	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	487	857	1390	-	-	-
Mov Capacity-2 Maneuver	487	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1390	-	516	-	-
HCM Lane V/C Ratio	0.004	-	0.162	-	-
HCM Control Delay (s)	7.6	0	13.3	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.012	-	0.575	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	125	31	12	200	92	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	34	13	217	100	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	136	0	379	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	243	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1448	-	623	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	797	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1448	-	617	913
Mov Capacity-2 Maneuver	-	-	-	-	617	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	675	-	-	1448	-
HCM Lane V/C Ratio	0.201	-	-	0.009	-
HCM Control Delay (s)	11.7	-	-	7.509	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.748	-	-	0.027	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	550	775	108	255	10	472	10	74	10	25	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	579	1921	1145	335	1017	864	650	415	353	176	56	33
Arrive On Green	0.02	0.52	0.53	0.02	0.18	0.18	0.19	0.22	0.22	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1098	650
Grp Volume(v), veh/h	22	598	842	117	277	11	513	11	80	11	0	43
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1748
Q Serve(g_s), s	0.5	7.4	25.0	2.2	10.2	0.5	11.3	0.4	3.3	0.5	0.0	1.9
Cycle Q Clear(g_c), s	0.5	7.4	25.0	2.2	10.2	0.5	11.3	0.4	3.3	0.5	0.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	579	1921	1145	335	1017	864	650	415	353	176	0	89
V/C Ratio(X)	0.04	0.31	0.74	0.35	0.27	0.01	0.79	0.03	0.23	0.06	0.00	0.48
Avail Cap(c_a), veh/h	678	1921	1145	381	1017	864	930	726	617	291	0	352
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.1	11.1	6.5	8.0	19.0	15.0	30.7	24.2	25.3	35.2	0.0	36.7
Incr Delay (d2), s/veh	0.0	0.4	4.2	0.6	0.7	0.0	3.0	0.0	0.3	0.1	0.0	4.0
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 Back of Q (50%), veh/ln	0.2	3.0	7.7	0.9	5.3	0.2	4.9	0.2	1.3	0.2	0.0	0.9
Lane Grp Delay (d), s/veh	9.1	11.5	10.7	8.7	19.7	15.0	33.7	24.2	25.6	35.3	0.0	40.7
Lane Grp LOS	A	B	B	A	B	B	C	C	C	D		D
Approach Vol, veh/h		1462			405			604			54	
Approach Delay, s/veh		11.0			16.4			32.5			39.6	
Approach LOS		B			B			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	5.5	45.0		7.9	47.4		18.5	21.7		4.9	8.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.5	27.0		4.2	12.2		13.3	5.3		2.5	3.9	
Green Ext Time (p_c), s	0.0	7.9		0.0	11.5		1.2	0.5		0.0	0.3	

Intersection Summary	
HCM 2010 Ctrl Delay	17.6
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	9.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	288	105	65	120	175	361
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	150
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	313	114	71	130	190	392

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	462	190	190	0	-	0
Stage 1	190	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	558	852	1384	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	529	852	1384	-	-	-
Mov Capacity-2 Maneuver	529	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	734	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.6	2.7	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1384	-	589	-	-
HCM Lane V/C Ratio	0.051	-	0.725	-	-
HCM Control Delay (s)	7.741	-	25.6	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.161	-	6.087	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	244	275	233	178	15	160	4	139	8	2	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	797	1139	968	702	1248	1061	247	5	187	127	81	40
Arrive On Green	0.00	1.00	1.00	0.06	0.67	0.67	0.05	0.12	0.12	0.01	0.07	0.07
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	41	1548	1774	1173	586
Grp Volume(v), veh/h	2	265	299	253	193	16	174	0	155	9	0	3
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1589	1774	0	1759
Q Serve(g_s), s	0.0	0.0	0.0	3.7	3.5	0.3	4.5	0.0	8.6	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.7	3.5	0.3	4.5	0.0	8.6	0.4	0.0	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.33
Lane Grp Cap(c), veh/h	797	1139	968	702	1248	1061	247	0	192	127	0	121
V/C Ratio(X)	0.00	0.23	0.31	0.36	0.15	0.02	0.71	0.00	0.81	0.07	0.00	0.02
Avail Cap(c_a), veh/h	901	1139	968	702	1248	1061	247	0	271	218	0	300
HCM Platoon Ratio	1.67	1.67	1.67	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	0.0	3.7	5.5	5.0	37.0	0.0	38.9	38.9	0.0	39.4
Incr Delay (d2), s/veh	0.0	0.5	0.8	0.3	0.3	0.0	8.8	0.0	11.5	0.2	0.0	0.1
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 Back of Q (50%), veh/ln	0.0	0.2	0.2	1.3	1.4	0.1	2.3	0.0	4.0	0.2	0.0	0.1
Lane Grp Delay (d), s/veh	6.8	0.5	0.8	4.0	5.8	5.0	45.9	0.0	50.4	39.1	0.0	39.5
Lane Grp LOS	A	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		566			462			329			12	
Approach Delay, s/veh		0.7			4.8			48.0			39.2	
Approach LOS		A			A			D			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.7	60.0		10.0	65.3		10.0	15.4		5.3	10.8	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Max Green Setting (Gmax), s	5.5	55.5		5.5	55.5		5.5	15.5		5.5	15.5	
Max Q Clear Time (g_c+I1), s	2.0	2.0		5.7	5.5		6.5	10.6		2.4	2.1	
Green Ext Time (p_c), s	0.0	4.1		0.0	4.1		0.0	0.3		0.0	0.7	

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	46	7	10	170	315	73
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	-	-	-	-	150
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	50	8	11	185	342	79

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	549	342	342	0	-	0
Stage 1	342	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	497	701	1217	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	492	701	1217	-	-	-
Mov Capacity-2 Maneuver	492	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	820	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.4	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1217	-	512	-	-
HCM Lane V/C Ratio	0.009	-	0.113	-	-
HCM Control Delay (s)	7.985	0	12.9	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.027	-	0.378	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	180	102	37	105	60	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	196	111	40	114	65	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	196	0	391	196
Stage 1	-	-	-	-	196	-
Stage 2	-	-	-	-	195	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1377	-	613	845
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	838	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1377	-	595	845
Mov Capacity-2 Maneuver	-	-	-	-	595	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	814	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	11.5
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1377	-
HCM Lane V/C Ratio	0.138	-	-	0.029	-
HCM Control Delay (s)	11.5	-	-	7.693	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.477	-	-	0.09	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	165	248	35	375	15	731	90	85	45	70	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	357	1559	1077	498	780	663	920	623	530	269	108	77
Arrive On Green	0.03	0.42	0.42	0.02	0.28	0.28	0.27	0.33	0.33	0.03	0.11	0.11
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1015	721
Grp Volume(v), veh/h	38	179	270	38	408	16	795	98	92	49	0	130
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1736
Q Serve(g_s), s	1.0	2.5	5.7	1.0	15.9	0.6	18.9	3.2	3.5	2.1	0.0	6.2
Cycle Q Clear(g_c), s	1.0	2.5	5.7	1.0	15.9	0.6	18.9	3.2	3.5	2.1	0.0	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	357	1559	1077	498	780	663	920	623	530	269	0	184
V/C Ratio(X)	0.11	0.11	0.25	0.08	0.52	0.02	0.86	0.16	0.17	0.18	0.00	0.70
Avail Cap(c_a), veh/h	432	1559	1077	572	780	663	1060	780	663	334	0	323
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.0	15.3	5.3	13.6	23.7	18.2	30.0	20.1	20.2	32.8	0.0	37.1
Incr Delay (d2), s/veh	0.1	0.1	0.6	0.1	2.5	0.1	6.8	0.1	0.2	0.3	0.0	4.9
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 Back of Q (50%), veh/ln	0.4	1.1	1.7	0.4	8.1	0.2	8.7	1.4	1.3	0.9	0.0	2.9
Lane Grp Delay (d), s/veh	15.1	15.4	5.9	13.7	26.2	18.3	36.9	20.2	20.4	33.1	0.0	42.0
Lane Grp LOS	B	B	A	B	C	B	D	C	C	C		D
Approach Vol, veh/h		487			462			985			179	
Approach Delay, s/veh		10.1			24.9			33.7			39.6	
Approach LOS		B			C			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	6.4	40.0		6.4	40.0		26.5	32.8		6.8	13.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	3.0	7.7		3.0	17.9		20.9	5.5		4.1	8.2	
Green Ext Time (p_c), s	0.0	4.9		0.0	4.4		1.5	1.6		0.0	0.9	

Intersection Summary			
HCM 2010 Ctrl Delay		26.8	
HCM 2010 LOS		C	

Notes

Intersection	
Intersection Delay, s/veh	15.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	375	50	85	175	75	214
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	403	54	91	188	81	230

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	452	81	81	0	-	0
Stage 1	81	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	565	979	1517	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	531	979	1517	-	-	-
Mov Capacity-2 Maneuver	531	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	656	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.7	2.5	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	561	-	-
HCM Lane V/C Ratio	0.06	-	0.815	-	-
HCM Control Delay (s)	7.525	-	33.7	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.192	-	8.115	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	160	90	114	180	4	250	1	255	12	3	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	746	1055	897	784	1136	966	398	1	314	133	151	101
Arrive On Green	0.00	1.00	1.00	0.04	0.61	0.61	0.07	0.20	0.20	0.01	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	6	1578	1774	1044	696
Grp Volume(v), veh/h	1	174	98	124	196	4	272	0	278	13	0	5
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1584	1774	0	1740
Q Serve(g_s), s	0.0	0.0	0.0	2.2	4.1	0.1	6.0	0.0	15.4	0.6	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.2	4.1	0.1	6.0	0.0	15.4	0.6	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	746	1055	897	784	1136	966	398	0	315	133	0	252
V/C Ratio(X)	0.00	0.16	0.11	0.16	0.17	0.00	0.68	0.00	0.88	0.10	0.00	0.02
Avail Cap(c_a), veh/h	863	1055	897	823	1136	966	398	0	369	229	0	406
HCM Platoon Ratio	2.00	2.00	2.00	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.4	0.0	0.0	5.3	7.7	6.9	30.7	0.0	35.1	32.9	0.0	33.0
Incr Delay (d2), s/veh	0.0	0.3	0.2	0.1	0.3	0.0	4.8	0.0	19.2	0.3	0.0	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 Back of Q (50%), veh/ln	0.0	0.1	0.1	0.8	1.8	0.0	3.3	0.0	7.6	0.3	0.0	0.1
Lane Grp Delay (d), s/veh	8.4	0.3	0.2	5.4	8.0	6.9	35.5	0.0	54.3	33.2	0.0	33.1
Lane Grp LOS	A	A	A	A	A	A	D		D	C		C
Approach Vol, veh/h		273			324			550			18	
Approach Delay, s/veh		0.3			7.0			45.0			33.2	
Approach LOS		A			A			D			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.1	55.0		8.0	58.9		10.0	21.9		5.1	17.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	51.0		6.0	51.0		6.0	21.0		6.0	21.0	
Max Q Clear Time (g_c+I1), s	2.0	2.0		4.2	6.1		8.0	17.4		2.6	2.2	
Green Ext Time (p_c), s	0.0	2.6		0.0	2.6		0.0	0.6		0.0	1.6	

Intersection Summary			
HCM 2010 Ctrl Delay		23.8	
HCM 2010 LOS		C	

Notes

Intersection	
Intersection Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	84	11	5	335	170	29
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	-	-	-	-	150
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	91	12	5	364	185	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	560	185	185	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	489	857	1390	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	487	857	1390	-	-	-
Mov Capacity-2 Maneuver	487	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1390	-	513	-	-
HCM Lane V/C Ratio	0.004	-	0.201	-	-
HCM Control Delay (s)	7.6	0	13.8	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.012	-	0.745	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	126	31	16	200	92	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	34	17	217	100	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	137	0	389	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	252	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1447	-	615	911
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	790	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1447	-	608	911
Mov Capacity-2 Maneuver	-	-	-	-	608	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	781	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	11.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	681	-	-	1447	-
HCM Lane V/C Ratio	0.217	-	-	0.012	-
HCM Control Delay (s)	11.7	-	-	7.518	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.822	-	-	0.036	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	550	792	111	255	10	482	10	75	10	25	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	576	1910	1145	332	1013	861	660	421	358	176	56	33
Arrive On Green	0.02	0.51	0.53	0.02	0.18	0.18	0.19	0.23	0.23	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1098	650
Grp Volume(v), veh/h	22	598	861	121	277	11	524	11	82	11	0	43
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1748
Q Serve(g_s), s	0.5	7.5	26.4	2.3	10.3	0.5	11.6	0.4	3.4	0.5	0.0	1.9
Cycle Q Clear(g_c), s	0.5	7.5	26.4	2.3	10.3	0.5	11.6	0.4	3.4	0.5	0.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	576	1910	1145	332	1013	861	660	421	358	176	0	90
V/C Ratio(X)	0.04	0.31	0.75	0.36	0.27	0.01	0.79	0.03	0.23	0.06	0.00	0.48
Avail Cap(c_a), veh/h	675	1910	1145	375	1013	861	925	722	614	290	0	350
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.3	11.3	6.7	8.2	19.2	15.2	30.8	24.1	25.3	35.4	0.0	36.9
Incr Delay (d2), s/veh	0.0	0.4	4.6	0.7	0.7	0.0	3.3	0.0	0.3	0.1	0.0	3.9
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 Back of Q (50%), veh/ln	0.2	3.0	8.2	0.9	5.3	0.2	5.1	0.2	1.3	0.2	0.0	0.9
Lane Grp Delay (d), s/veh	9.3	11.7	11.3	8.8	19.8	15.2	34.1	24.1	25.6	35.5	0.0	40.9
Lane Grp LOS	A	B	B	A	B	B	C	C	C	D		D
Approach Vol, veh/h		1481			409			617			54	
Approach Delay, s/veh		11.5			16.5			32.8			39.8	
Approach LOS		B			B			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	5.5	45.0		8.1	47.5		18.8	22.1		4.9	8.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.5	28.4		4.3	12.3		13.6	5.4		2.5	3.9	
Green Ext Time (p_c), s	0.0	7.5		0.0	11.7		1.2	0.5		0.0	0.3	

Intersection Summary												
HCM 2010 Ctrl Delay			18.0									
HCM 2010 LOS			B									

Notes

Intersection	
Intersection Delay, s/veh	9.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	297	105	65	120	175	377
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	-	150	-	-	150
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	323	114	71	130	190	410

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	462	190	190	0	-	0
Stage 1	190	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	558	852	1384	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	529	852	1384	-	-	-
Mov Capacity-2 Maneuver	529	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	734	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.8	2.7	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1384	-	587	-	-
HCM Lane V/C Ratio	0.051	-	0.744	-	-
HCM Control Delay (s)	7.741	-	26.8	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.161	-	6.49	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	245	275	246	181	15	160	4	147	8	2	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	785	1130	960	690	1238	1052	256	5	198	125	90	45
Arrive On Green	0.00	1.00	1.00	0.06	0.66	0.66	0.05	0.13	0.13	0.01	0.08	0.08
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	38	1551	1774	1173	586
Grp Volume(v), veh/h	2	272	306	273	201	17	178	0	167	9	0	3
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1589	1774	0	1759
Q Serve(g_s), s	0.0	0.0	0.0	4.2	3.7	0.3	4.5	0.0	9.4	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.2	3.7	0.3	4.5	0.0	9.4	0.4	0.0	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.33
Lane Grp Cap(c), veh/h	785	1130	960	690	1238	1052	256	0	203	125	0	135
V/C Ratio(X)	0.00	0.24	0.32	0.40	0.16	0.02	0.70	0.00	0.82	0.07	0.00	0.02
Avail Cap(c_a), veh/h	888	1130	960	690	1238	1052	256	0	269	216	0	298
HCM Platoon Ratio	1.67	1.67	1.67	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	0.0	0.0	3.9	5.8	5.2	37.0	0.0	38.9	38.6	0.0	39.1
Incr Delay (d2), s/veh	0.0	0.5	0.9	0.4	0.3	0.0	7.9	0.0	14.2	0.2	0.0	0.1
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 Back of Q (50%), veh/ln	0.0	0.2	0.2	1.4	1.5	0.1	2.3	0.0	4.5	0.2	0.0	0.1
Lane Grp Delay (d), s/veh	7.0	0.5	0.9	4.3	6.1	5.2	44.9	0.0	53.1	38.8	0.0	39.2
Lane Grp LOS	A	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		580			491			345			12	
Approach Delay, s/veh		0.7			5.0			48.9			38.9	
Approach LOS		A			A			D			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.7	60.0		10.0	65.3		10.0	16.2		5.3	11.5	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Max Green Setting (Gmax), s	5.5	55.5		5.5	55.5		5.5	15.5		5.5	15.5	
Max Q Clear Time (g_c+I1), s	2.0	2.0		6.2	5.7		6.5	11.4		2.4	2.1	
Green Ext Time (p_c), s	0.0	4.3		0.0	4.3		0.0	0.3		0.0	0.7	

Intersection Summary	
HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	57	8	11	170	315	93
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	-	-	-	-	150
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	62	9	12	185	342	101

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	551	342	342	0	-	0
Stage 1	342	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	495	701	1217	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	490	701	1217	-	-	-
Mov Capacity-2 Maneuver	490	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0.5	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1217	-	509	-	-
HCM Lane V/C Ratio	0.01	-	0.139	-	-
HCM Control Delay (s)	7.987	0	13.2	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.03	-	0.479	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	181	102	49	106	60	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	197	111	53	115	65	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	197	0	419	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	222	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1376	-	591	844
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	815	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1376	-	568	844
Mov Capacity-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	784	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	11.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	636	-	-	1376	-
HCM Lane V/C Ratio	0.152	-	-	0.039	-
HCM Control Delay (s)	11.7	-	-	7.722	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.534	-	-	0.121	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

LSC TRANSPORTATION CONSULTANTS, INC.

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September 19, 2016

Mr. Gregg Brown
Crystal Valley Ranch Development Company
Gregg@cvranch.com

Re: Ridge Estates
Castle Rock, CO
(LSC #150660)

Dear Mr. Brown:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the Ridge Estates development. As shown on Figure 1, the site is located south of the Crystal Valley Ranch development and is proposed for annexation into the Town of Castle Rock, Colorado.

REPORT CONTENTS

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site; the existing traffic volumes; the site-generated traffic volumes; the assignment of the site-generated traffic volumes; the resulting short and long-term total traffic volumes; the site's projected traffic impacts; and any recommended roadway improvements to mitigate the site's traffic impacts.

LAND USE AND ACCESS

The currently proposed land use for the site is about 100 single-family dwelling units. Figure 2a shows the conceptual site plan with the proposed access points. Figure 2b shows the site's various connections to Crystal Valley Parkway. The proposed internal street network of the site was modified to encourage residents to use the western connection to the north and discourage residents to use the eastern connection to the north. This was done to better balance the total traffic loadings through CVR 12 and CVR 13 to Loop Road.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

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

- **Crystal Valley Parkway** is an east-west two-lane minor arterial north of the site. Crystal Valley Parkway has continuity from the east I-25 Frontage Road to Lake Gulch Road. It provides access to Heckendorf Ranch, Crystal Valley Ranch, and The Lanterns. The inter-

sections with West and East Loop Road are two-way stop controlled. The posted speed limit in the vicinity of the site is 35 mph. Long range plans are to widen to four through lanes with auxiliary turn lanes and connect Crystal Valley Parkway to Interstate 25 with a future interchange. Funds have been escrowed to construct up to four future traffic signals along Crystal Valley Parkway in this area.

- **West and East Loop Road** is a four-lane north-south collector roadway near Crystal Valley Parkway but only two lanes near the site with auxiliary turn lanes at the intersections with Crystal Valley Parkway. The posted speed limit in the vicinity of the site is 35 mph.

Existing Traffic Conditions

Figure 3 shows the existing traffic volumes, the existing lane geometry, and traffic control in the area. The weekday peak-hour traffic volumes are from the attached traffic counts conducted by Counter Measures in December, 2015.

2020 and 2035 Background Traffic

Figure 4 shows the estimated 2020 background traffic and assumes buildout of Crystal Valley filings already approved or in the review process. The volumes are based on the 2020 total traffic from the January 28, 2016 *Homestead at Crystal Valley TIA*. Figure 4 also shows the 2020 lane geometry and traffic control.

Figure 5 shows the estimated 2035 background traffic and is consistent with prior studies of this area. This estimate assumes completion of the I-25/Crystal Valley Parkway interchange and connectivity between Crystal Valley Ranch and Crystal Valley Parkway through the Lanterns development.

Existing, 2020 and 2035 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 both signalized and unsignalized intersections.

The intersections in Figures 3, 4, and 5 were analyzed to determine the existing, 2020, and 2035 background traffic levels of service based on the signalized and unsignalized intersection analysis procedures from the *Highway Capacity Manual*. Table 1 shows the level of service analysis results. The level of service reports are attached.

- **Crystal Valley Parkway/West Loop Road:** All movements of this two-way stop controlled currently operate at LOS "A" during both morning and afternoon peak-hours. By 2020, this intersection is expected to be signalized and as such is expected to operate at LOS "C" or better during both morning and afternoon peak-hours through 2035.

- **Crystal Valley Parkway/S. Lake Gulch Road:** All movements at this two-way stop-controlled intersection are expected to operate at LOS "B" or better through 2020. By 2035, all movements at this intersection are expected to operate at LOS "D" or better.

- **Crystal Valley Parkway/East Loop Road:** All movements of this two-way stop controlled currently operate at LOS "B" or better during both morning and afternoon peak-hours and are expected to operate at LOS "D" or better through 2020. By 2035, this intersection is expected to be signalized and as such is expected to operate at LOS "C" or better during both morning and afternoon peak-hours.

- **Loop Road/CVR 13 Access:** All movements of this two-way stop-controlled intersection are expected to operate at LOS "B" or better during both morning and afternoon peak-hours through 2035.

- **Loop Road/CVR 12 Access:** All movements of this two-way stop controlled intersection are expected to operate at LOS "B" or better during both morning and afternoon peak-hours through 2035.

TRIP GENERATION

Table 2 shows the estimated typical weekday, morning peak-hour, and afternoon peak-hour trip generation for the proposed land use based on the rates from *Trip Generation, 9th Edition,* 2012, by the Institute of Transportation Engineers (ITE).

The site is projected to generate about 952 vehicle-trips on the average weekday, with about half entering and half exiting the site 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 19 vehicles would enter and about 56 vehicles would exit the site. During the afternoon peak-hour, which generally occurs for one hour between 4:00 and 6:30 p.m., about 63 vehicles would enter and about 37 vehicles would exit the site.

TRIP DISTRIBUTION

Figure 6 shows the estimated directional distribution of the 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, and activity centers; and the site's proposed land use.

TRIP ASSIGNMENT

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

2020 AND 2035 TOTAL TRAFFIC

Figure 8 shows the 2020 total traffic which is the sum of 2020 background traffic (Figure 4) and the site-generated traffic (Figure 7). Figure 8 also shows the recommended 2020 lane geometry and traffic control.

Figure 9 shows the typical weekday 2035 total traffic which is the sum of 2035 background traffic (Figure 5) and the site-generated traffic (Figure 7). Figure 9 also shows the recommended 2035 lane geometry and traffic control.

PROJECTED LEVELS OF SERVICE

The intersections in Figures 8 and 9 were analyzed to determine the future levels of service based on the signalized and unsignalized intersection analysis procedures from the *Highway Capacity Manual*. Table 1 shows the level of service analysis results. The level of service reports are attached.

- **Crystal Valley Parkway/West Loop Road:** This future signalized intersection is expected to operate at an overall LOS "C" or better in 2020 and 2035 with or without the addition of site-generated traffic.

- **Crystal Valley Parkway/S. Lake Gulch Road:** All movements at this unsignalized intersection are expected to operate at LOS "C" or better through 2020. By 2035, all movements are expected to operate at LOS "D" or better with or without the addition of site traffic.

- **Crystal Valley Parkway/East Loop Road:** This unsignalized intersection is expected to operate at an overall LOS "D" or better through 2020 with or without the addition of site-generated traffic. By 2035, it is expected to be signalized and operate at LOS "C" or better in both peak-hours with or without the addition of site traffic.

- **Loop Road/CVR 13 Access:** All approaches of this stop-sign controlled intersection are expected to operate at LOS "B" or better through 2035 with or without the addition of site traffic.

- **Loop Road/CVR 12 Access:** All approaches of this stop-sign controlled intersection are expected to operate at LOS "B" or better through 2035 with or without the addition of site traffic.

ASSIGNMENT OF AVERAGE DAILY TRAFFIC

Figure 10 shows an assignment of buildout daily traffic on the various local streets in the site's vicinity. Figure 11 shows an alternative assignment of overall trips assuming no connection is made through the Lanterns property to the west. Figure 11 shows some of the density in either PA-15 or Sellers Estates may not be able to develop prior to the Lanterns connection being made. There are three street segments in PA-15 or CVR 13 and one street segment in CVR 12 that are expected to be over 1,500 vpd and are proposed with driveway frontages. About 64 of the homes proposed in Ridge Estates or in PA-15 may need to wait to develop until the Lanters connection is made.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. The site is projected to generate about 952 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, about 19 vehicles would enter and about 56 vehicles would exit the site. During the afternoon peak-hour, about 63 vehicles would enter and about 37 vehicles would exit the site.

Levels of Service

2. The future signalized intersections of Crystal Valley Parkway with East Loop and West Loop Road are expected to operate at an overall LOS "C" or better during both morning and afternoon peak-hours through 2035 with or without the addition of site traffic.

3. All movements at the unsignalized intersections analyzed are expected to operate at LOS "D" or better through 2035 with or without the addition of site traffic.

Connectivity to the Lanterns

4. The planned connection between Crystal Valley Ranch and Crystal Valley Parkway through the Lanterns development will likely be necessary for Ridge Estates to be completed without overloading a few local streets between the site and Loop Road. Reviewing the volumes in Figure 11 suggests about 64 homes will have to wait to be developed until all the connections are made through CVR 12, CVR 13, and the Lanterns.

Recommended Improvements

5. The intersections of Crystal Valley Parkway with West Loop Road and East Loop Road should be signalized once traffic signal warrants are met. The funding for future traffic signals has been escrowed with the Town. A traffic signal is expected to be met at West Loop Road by 2020 and at East Loop Road between 2020 and 2035.

6. A northbound left-turn lane and southbound right-turn lane should be constructed on E. Lake Gulch Road approaching Crystal Valley Parkway. These improvements are currently planned to be completed by others.

7. Crystal Valley Parkway should be widened to the build-out cross-section by 2020. This is currently planned to be completed by others.

8. Figure 10 shows an assignment of buildout daily traffic on the various local streets within the site's vicinity. The planned connection between Crystal Valley Ranch and Crystal Valley Parkway through the Lanterns development will likely be necessary for Ridge Estates to be completed without overloading a few local streets between the site and Loop Road. Figure 11 shows a modified daily trip assignment without the proposed Lanterns connection. About 64 homes will have to wait to be developed until all the connections are made through CVR 12, CVR 13, and the Lanterns to avoid three street segments in PA-15

and CVR 13 and one street segment in CVR 12 that have driveway frontage from increasing to over 1,500 vpd.

* * * * *

We trust this information will assist you in planning for the Ridge Estates development. Please contact me if you have any questions or need further assistance.

Respectfully submitted,

LSC Transportation Consultants, Inc.



By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

9-19-16

CSM/wc

Enclosure: Tables 1 and 2
Figures 1 - 11
Traffic Count Data
Level of Service Definitions
Capacity Analyses

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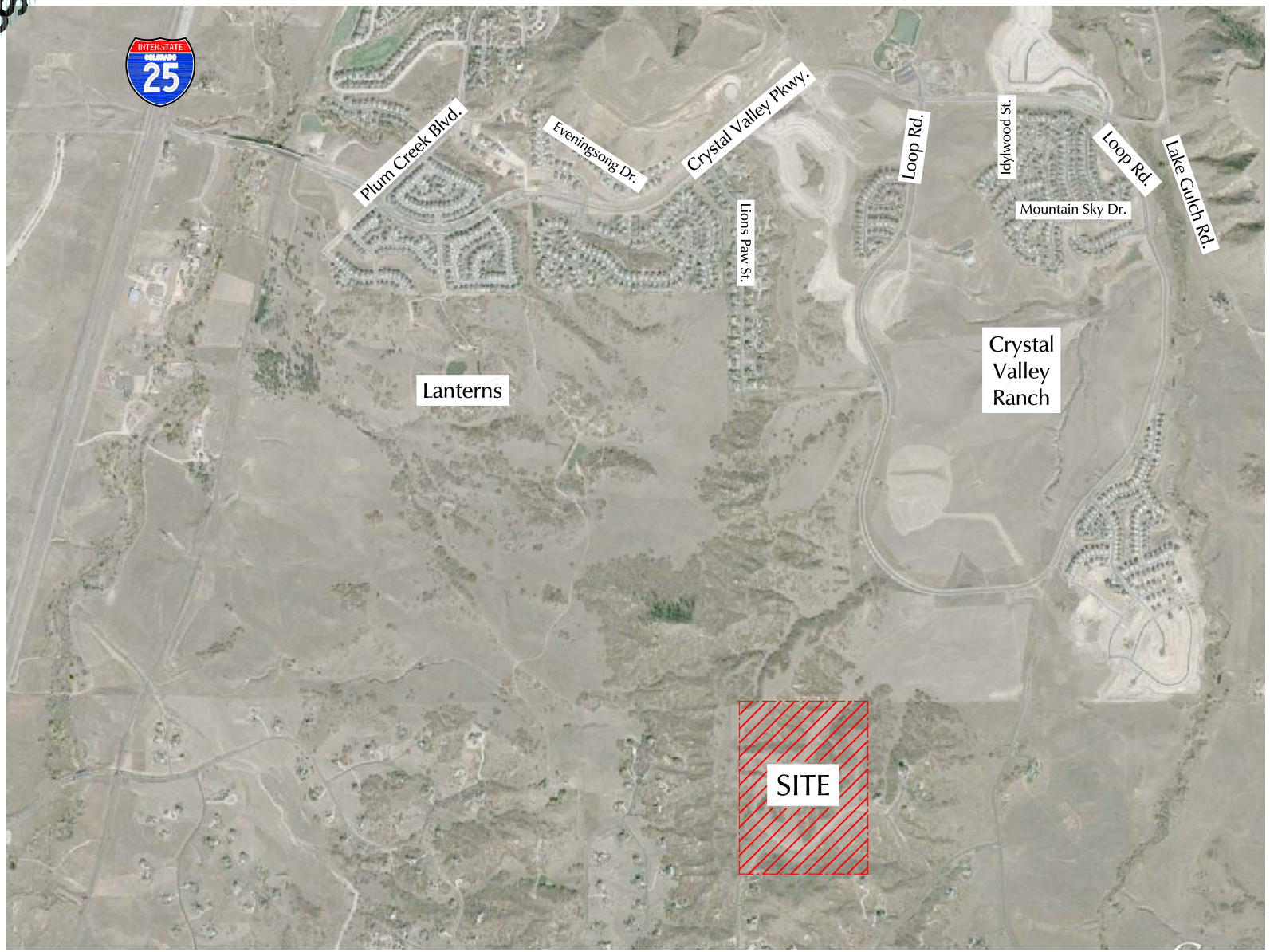
Table 1
Intersection Levels of Service Analysis
Ridge Estates
Castle Rock, CO
(LSC #150660; September, 2016)

		Existing Traffic		2020 Background		2020 Total Traffic		2035 Background		2035 Total	
Intersection Location	Traffic Control	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
Crystal Valley Parkway & W. Loop Road/	TWSC										
NB Left		A	A	--	--	--	--	--	--	--	--
NB Through		A	A	--	--	--	--	--	--	--	--
NB Right		A	A	--	--	--	--	--	--	--	--
EB Right		A	A	--	--	--	--	--	--	--	--
EB Left/Through		A	A	--	--	--	--	--	--	--	--
WB Left/Through/Right		A	A	--	--	--	--	--	--	--	--
SB Left/Through/Right		A	A	--	--	--	--	--	--	--	--
Critical Movement Delay		9.2	9.5	--	--	--	--	--	--	--	--
	Signalized										
EB Left		--	--	B	A	B	A	B	A	B	A
EB Through		--	--	B	A	B	A	B	B	B	B
EB Right		--	--	B	B	B	B	A	B	A	B
WB Left		--	--	A	A	A	A	B	A	B	A
WB Through		--	--	B	A	B	A	C	B	C	B
WB Right		--	--	A	A	A	A	B	B	B	B
NB Left		--	--	C	C	C	C	D	C	D	C
NB Through		--	--	B	C	B	C	C	C	C	C
NB Right		--	--	C	C	C	C	C	C	C	C
SB Left		--	--	C	C	C	C	C	D	C	D
SB Through/Right		--	--	C	D	C	D	D	D	D	D
Entire Intersection Delay (sec /veh)		--	--	20.2	14.9	20.5	15.2	26.5	17.6	26.8	18.0
Entire Intersection LOS		--	--	C	B	C	B	C	B	C	B
Crystal Valley Parkway/S. Lake Gulch Road	TWSC										
NB Left/Through		A	A	A	A	A	A	A	A	A	A
NB Left		--	--	B	B	C	B	D	D	D	D
EB Approach		B	B	--	--	--	--	--	--	--	--
Critical Movement Delay		10.1	10.1	14.8	13.3	15.2	13.5	31.0	25.6	33.7	26.8
Crystal Valley Parkway/East Loop Road	TWSC										
NB Left		A	A	C	D	C	D	--	--	--	--
NB Through/Right		A	A	C	C	C	C	--	--	--	--
EB Left		A	A	A	A	A	A	--	--	--	--
WB Left		A	A	A	A	A	A	--	--	--	--
SB Approach		A	B	--	--	--	--	--	--	--	--
SB Left		--	--	C	D	C	D	--	--	--	--
SB Right		--	--	C	C	C	C	--	--	--	--
Critical Movement Delay		9.2	11.5	20.6	32.0	21.7	34.9	--	--	--	--
	Signalized										
EB Left		--	--	--	--	--	--	A	A	A	A
EB Through		--	--	--	--	--	--	A	A	A	A
EB Right		--	--	--	--	--	--	A	A	A	A
WB Left		--	--	--	--	--	--	A	A	A	A
WB Through		--	--	--	--	--	--	A	A	A	A
WB Right		--	--	--	--	--	--	A	A	A	A
NB Left		--	--	--	--	--	--	D	D	D	D
NB Through/Right		--	--	--	--	--	--	D	D	D	D
SB Left		--	--	--	--	--	--	C	D	C	D
SB Through/Right		--	--	--	--	--	--	C	D	C	D
Entire Intersection Delay (sec /veh)		--	--	--	--	--	--	23.1	13.8	23.8	14.2
Entire Intersection LOS		--	--	--	--	--	--	C	B	C	B
Loop Road/CVR 13 Access	TWSC										
NB Approach		--	--	A	A	A	A	A	A	A	A
EB Approach		--	--	B	B	B	B	B	B	B	B
Critical Movement Delay		--	--	11.2	11.7	11.4	11.9	13.3	12.9	13.8	13.2
Loop Road/CVR 12 Access	TWSC										
NB Approach		--	--	B	B	B	B	B	B	B	B
WB Left		--	--	A	A	A	A	A	A	A	A
Critical Movement Delay		--	--	10.6	11.0	10.7	11.2	11.7	11.5	11.7	11.7

Table 2
ESTIMATED TRAFFIC GENERATION
Ridge Estates
Castle Rock, CO
LSC #150660; September, 2016

		Trip Generation Rates[1]					Vehicle - Trips Generated				
		Average	AM Peak Hour		PM Peak Hour		Average	AM Peak Hour		PM Peak - Hour	
Trip Generating Category	Quantity	Weekday	In	Out	In	Out	Weekday	In	Out	In	Out
Single-Family Residential [2]	100 DU [3]	9.52	0.188	0.563	0.630	0.370	952	19	56	63	37

Notes:
(1) Source: *Trip Generation*, Institute of Transportation Engineers, 9th Edition, 2012.
(2) ITE Land Use No. 210, Single-Family Detached Housing
(3) DU = Dwelling Units



N

Approximate Scale
Scale: 1"=2,000'

Figure 1

Vicinity Map

Ridge Estates (LSC #150660)

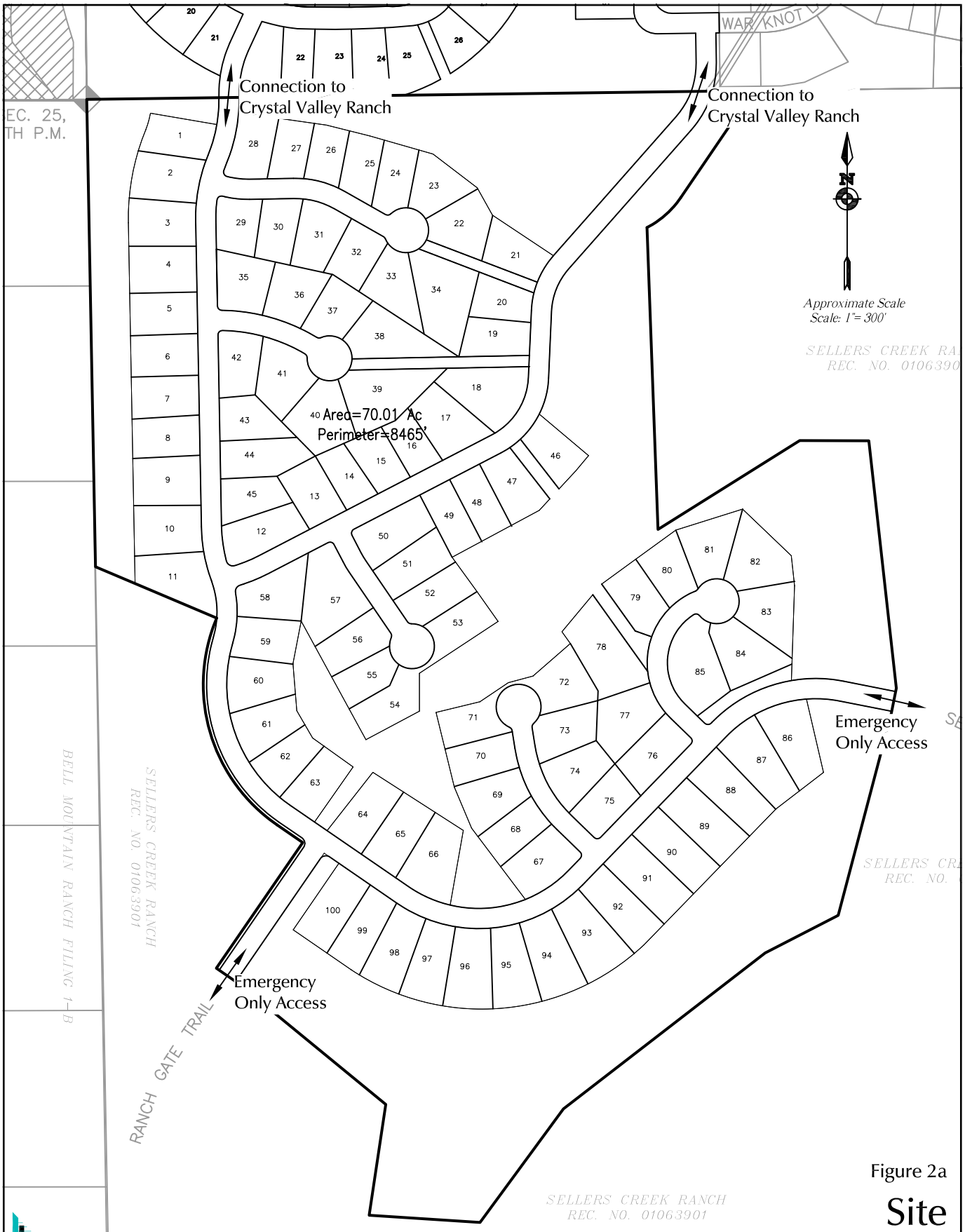
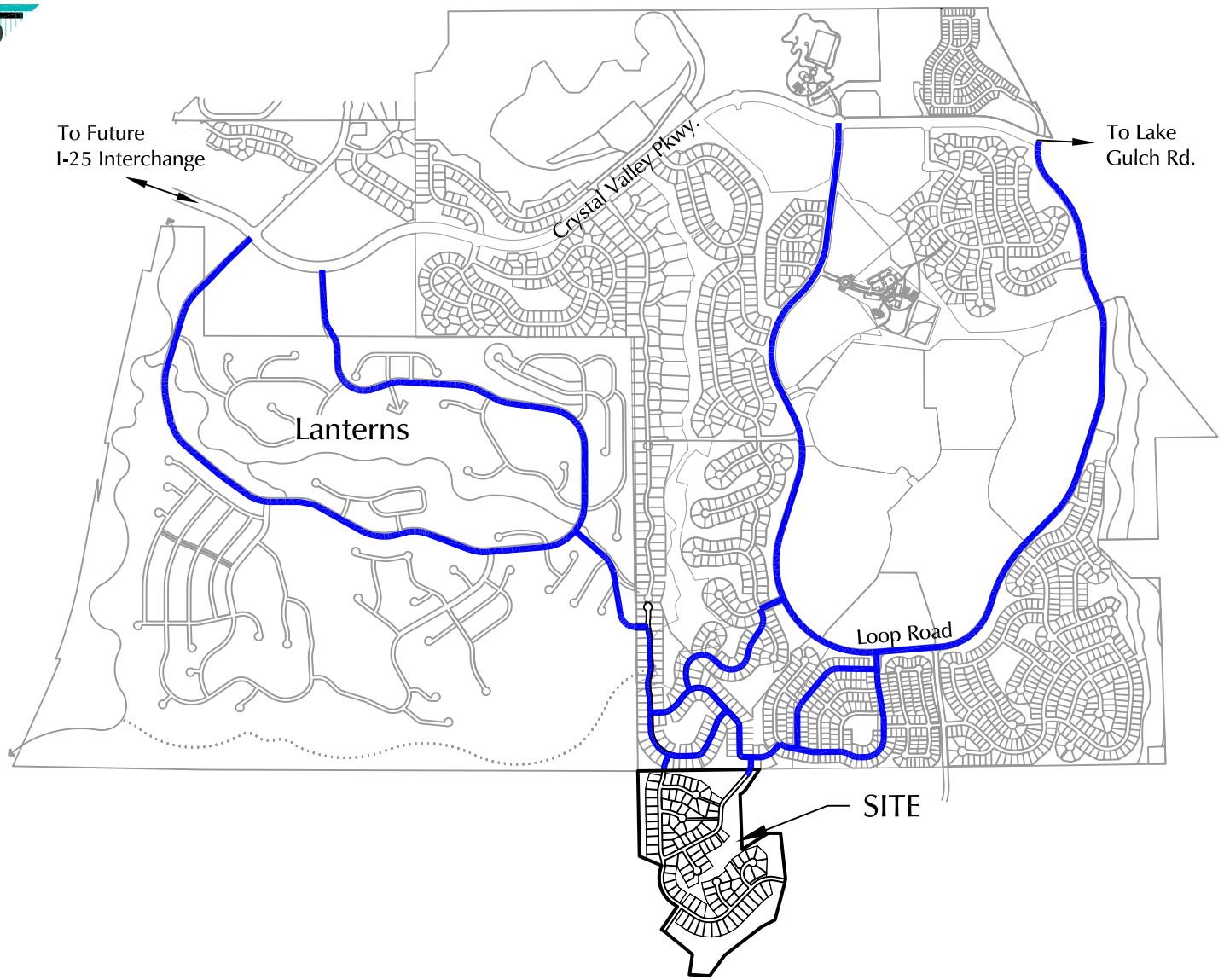


Figure 2a

Site Plan

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

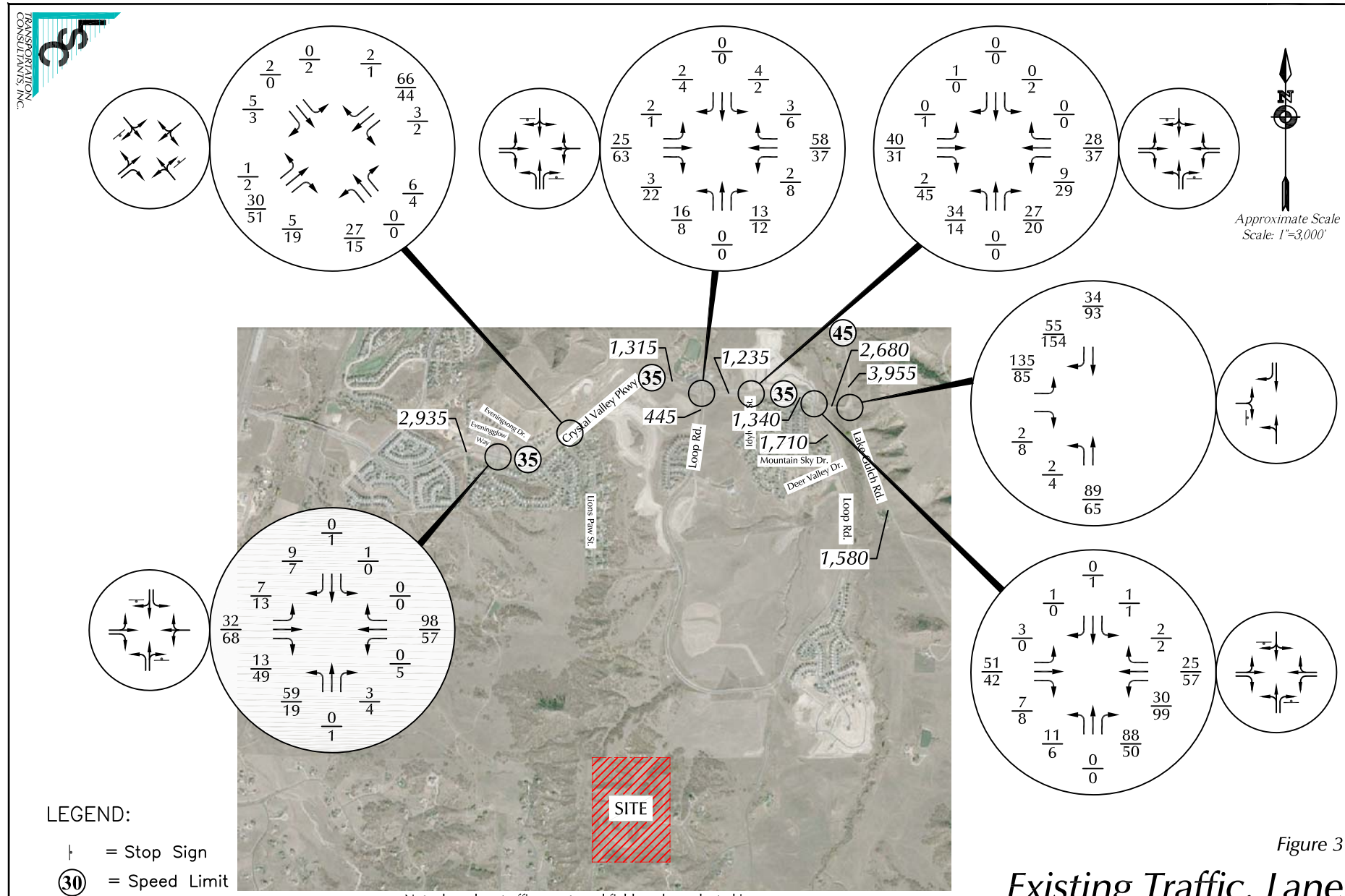


Approximate Scale
Scale: 1"= 2,000'

Figure 2b

Site Connections to Crystal Valley Parkway

Ridge Estates (LSC #150660)



LEGEND:

⊦ = Stop Sign

(30) = Speed Limit

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

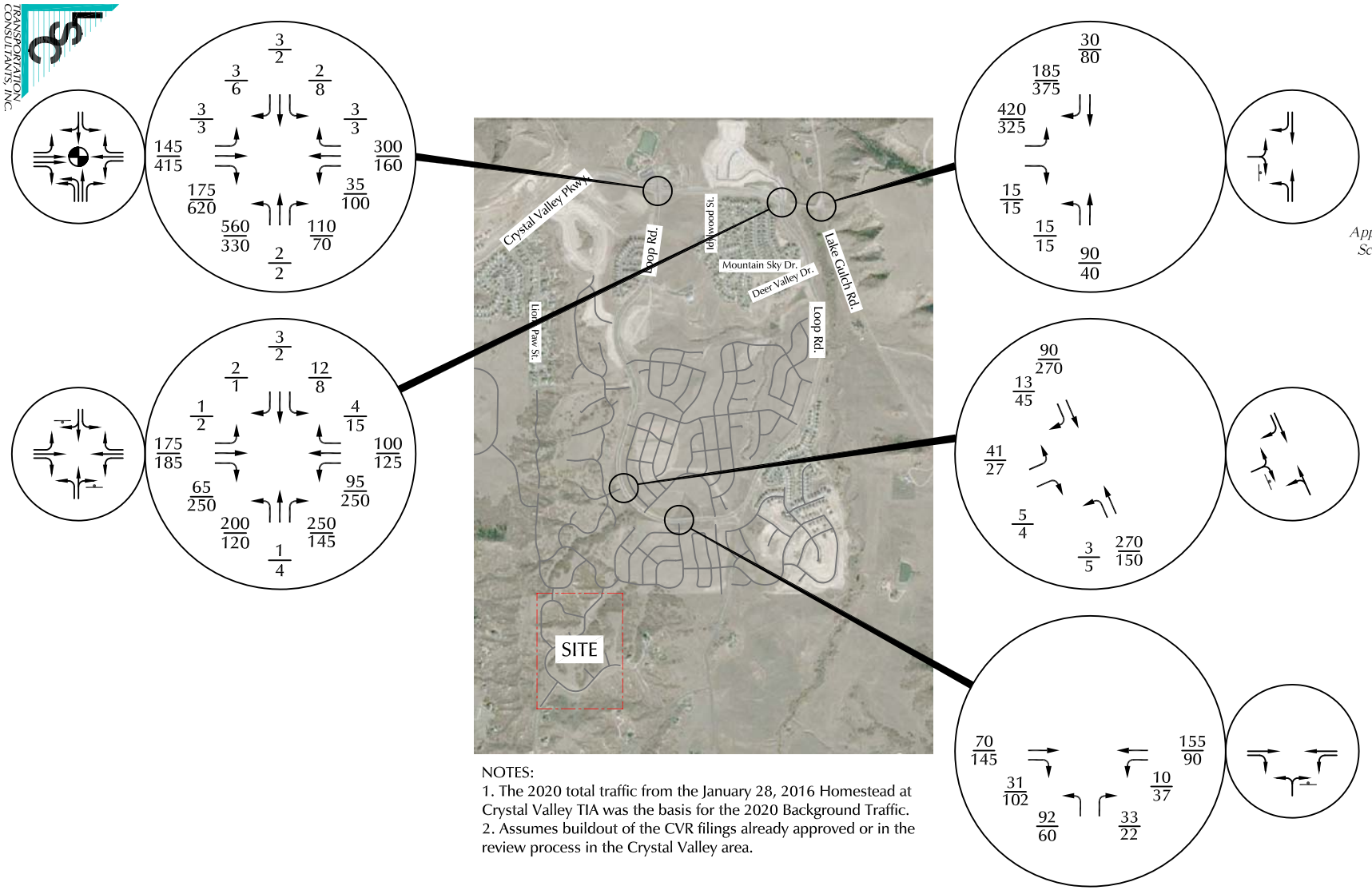
2,500 = Average Daily Traffic

Note: based on traffic counts and field work conducted in December, 2015.

Figure 3

Existing Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



NOTES:
1. The 2020 total traffic from the January 28, 2016 Homestead at Crystal Valley TIA was the basis for the 2020 Background Traffic.
2. Assumes buildout of the CVR filings already approved or in the review process in the Crystal Valley area.

⊦ = Stop Sign

⊕ = Traffic Signal

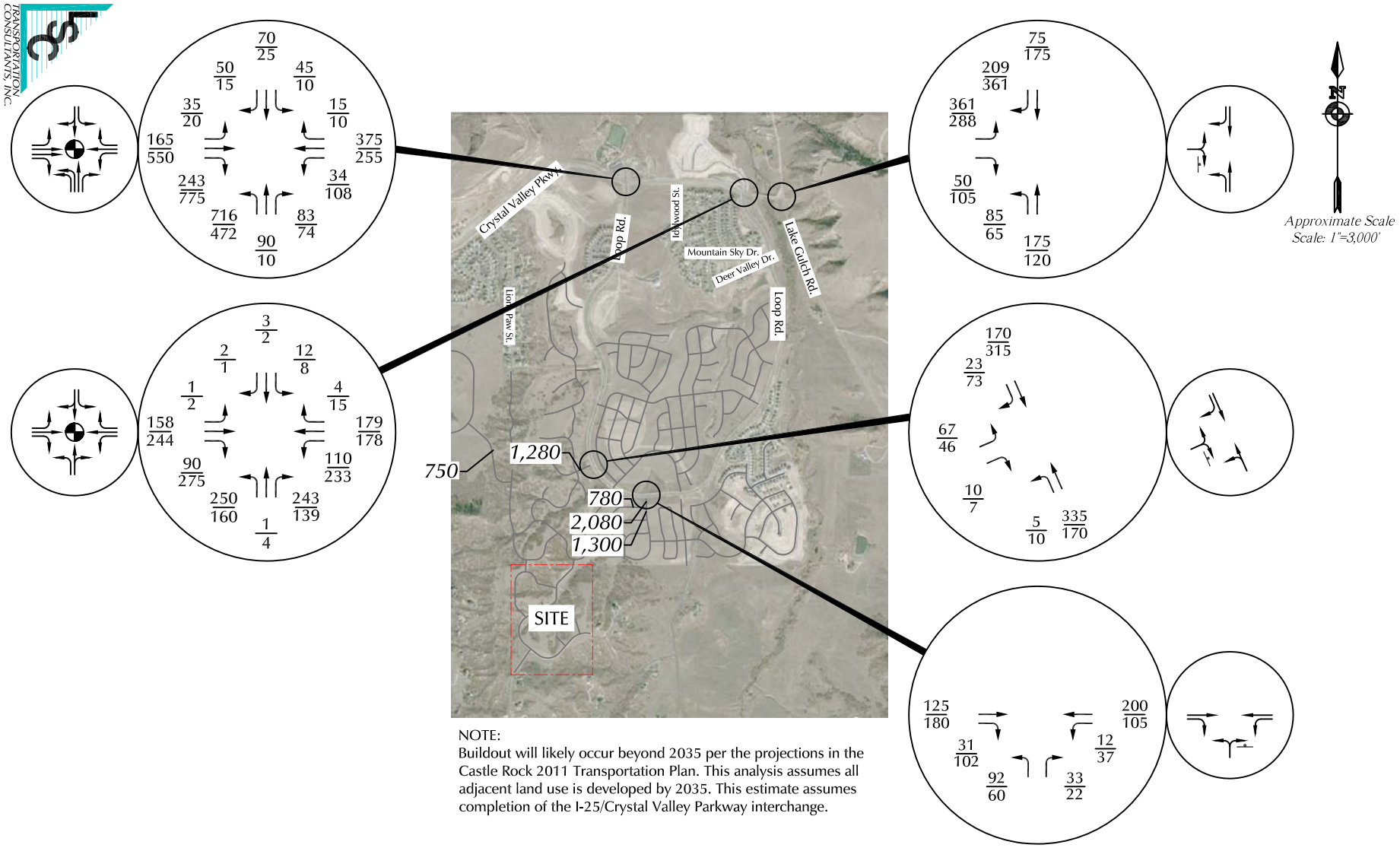
$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Figure 4

Year 2020 Background Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



NOTE:
Buildout will likely occur beyond 2035 per the projections in the Castle Rock 2011 Transportation Plan. This analysis assumes all adjacent land use is developed by 2035. This estimate assumes completion of the I-25/Crystal Valley Parkway interchange.

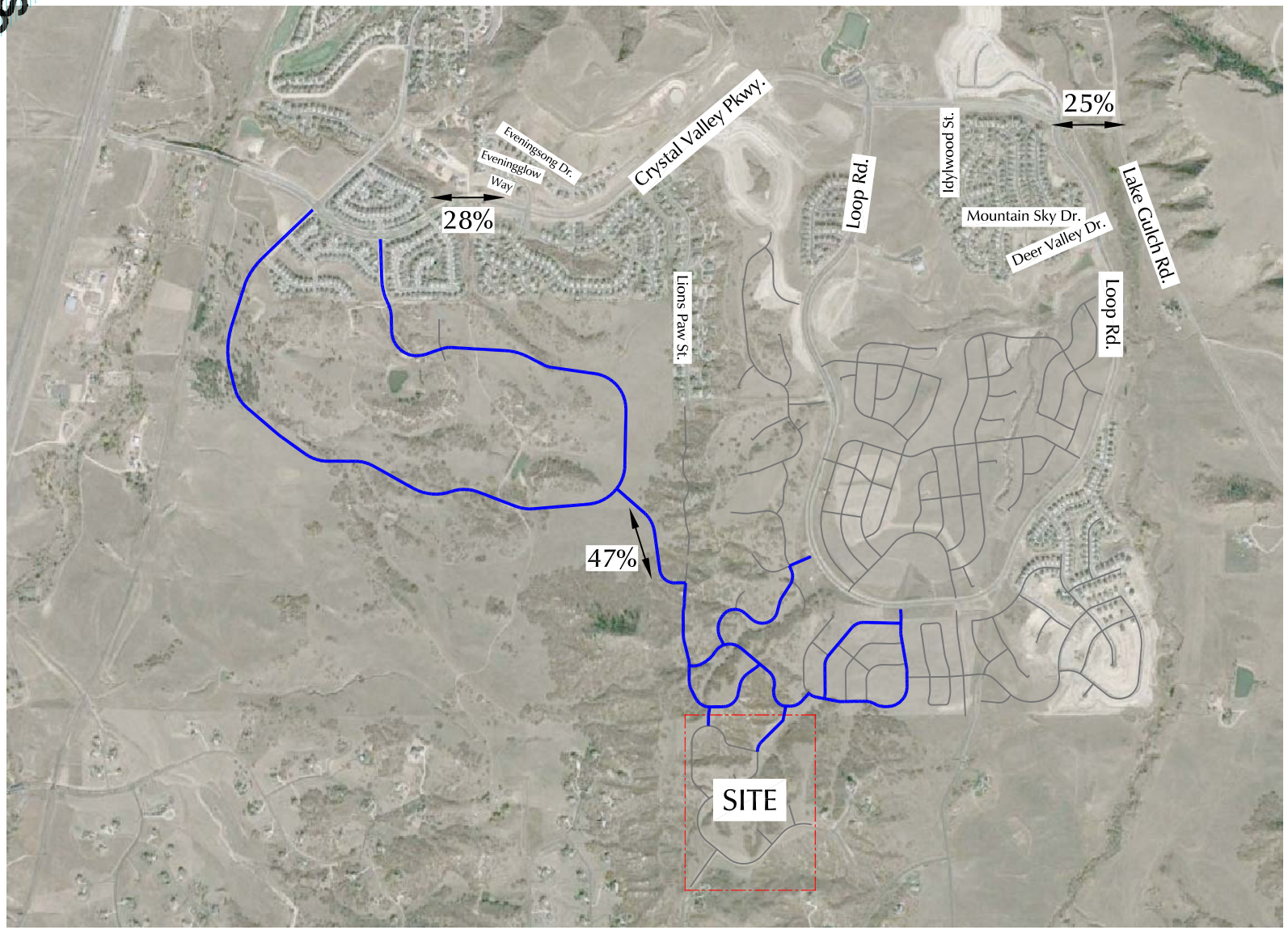
LEGEND:

- ⊦ = Stop Sign
- ◓ = Traffic Signal
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 2,500 = Average Daily Traffic

Figure 5

Year 2035 Background Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



LEGEND:

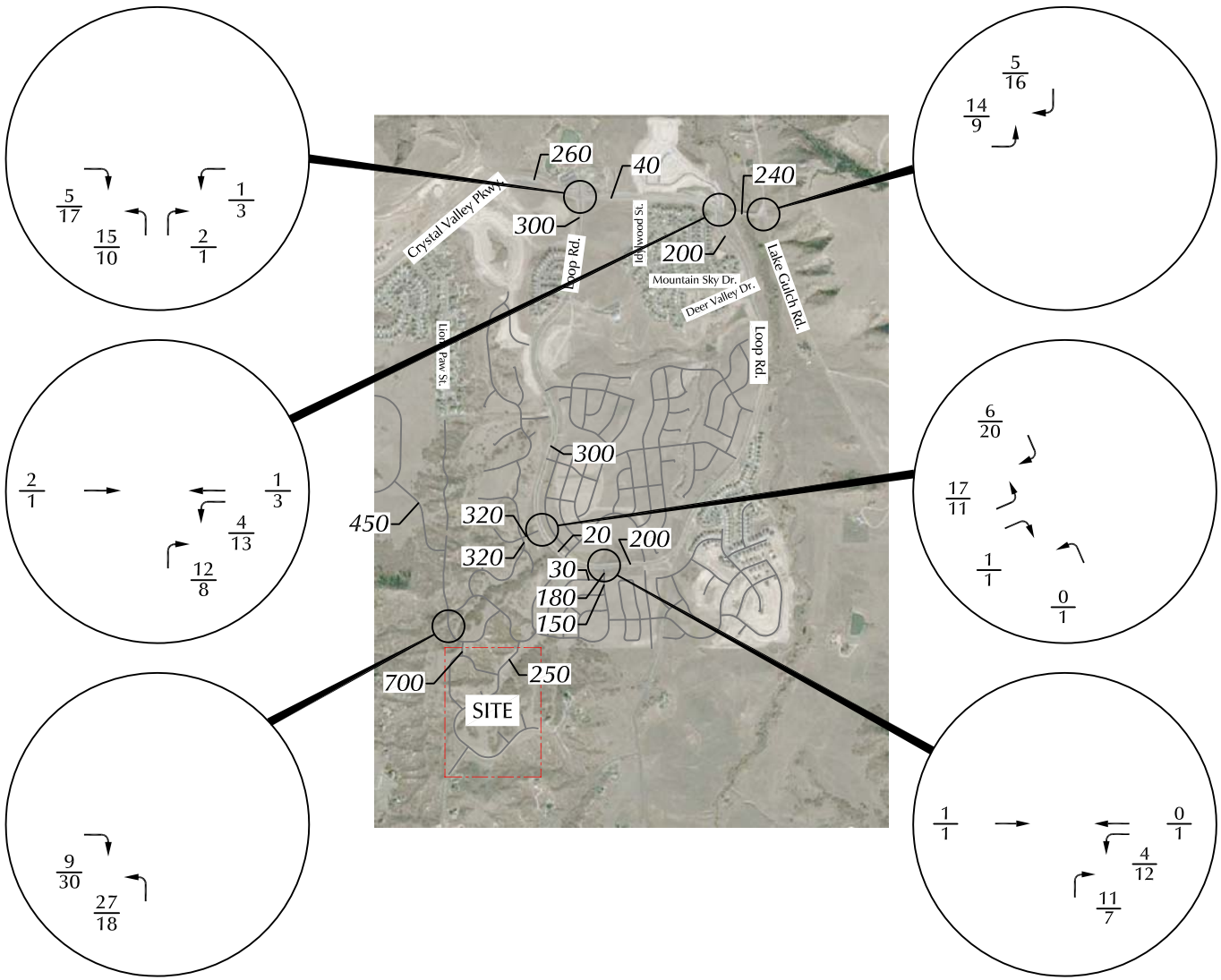
65% = Percent Directional Distribution

= Notes route options to Loop Road and/or Crystal Valley Parkway

Figure 6

Directional Distribution of Site-Generated Traffic

Ridge Estates (LSC #150660)



LEGEND:

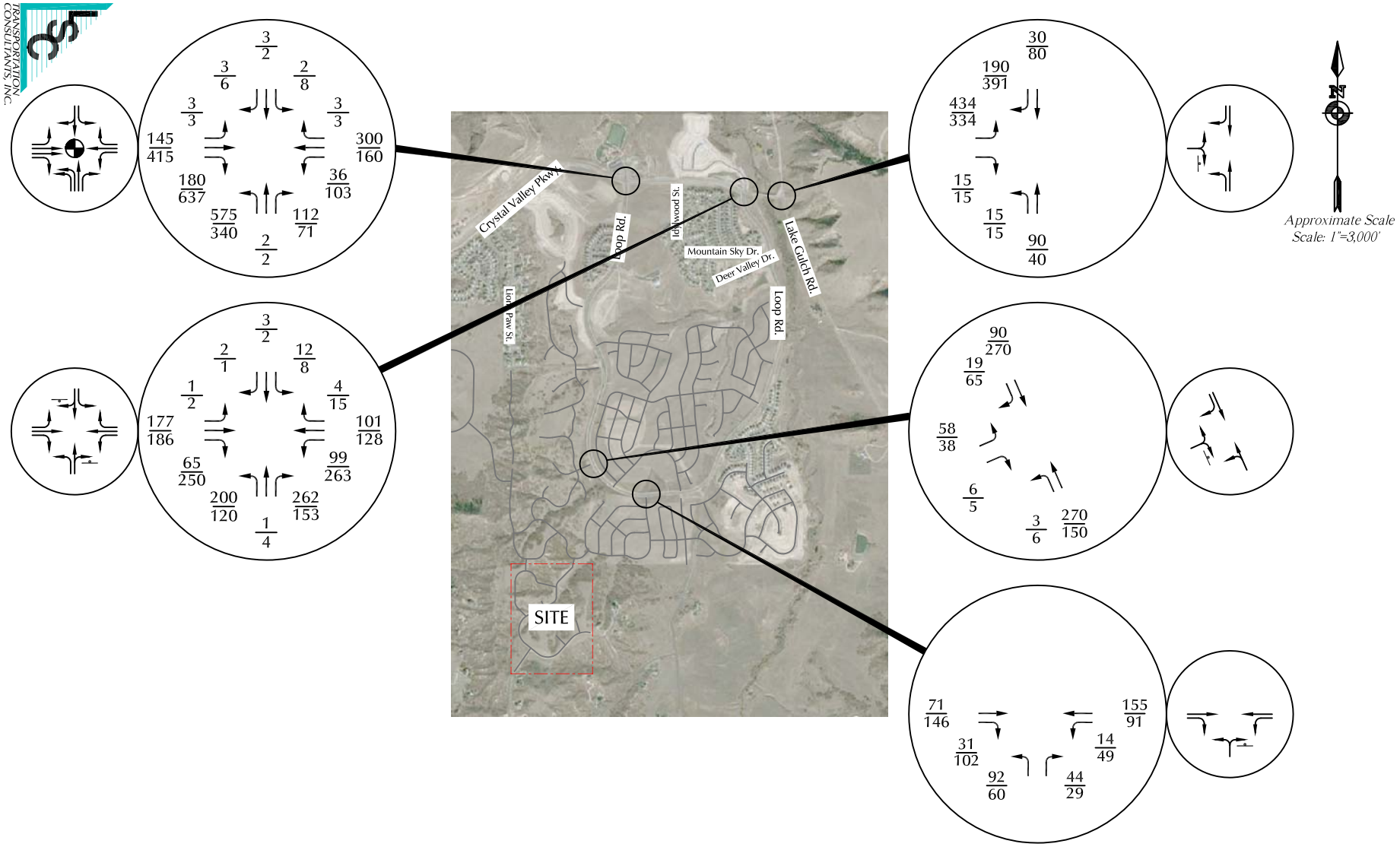
$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Figure 7

Assignment of Site-Generated Traffic

Ridge Estates (LSC #150660)



= Stop Sign

= Traffic Signal

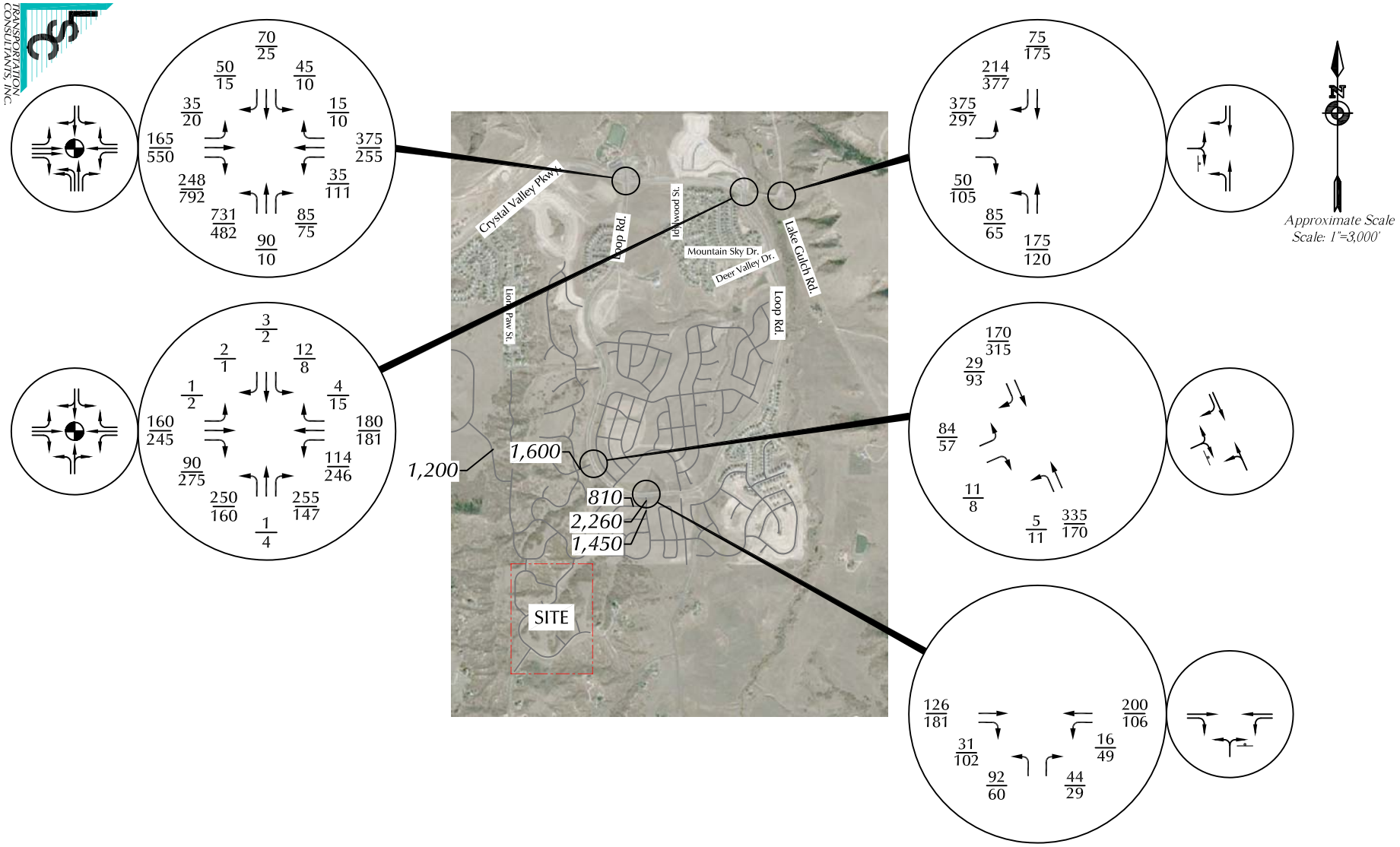
$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Figure 8

Year 2020 Total Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



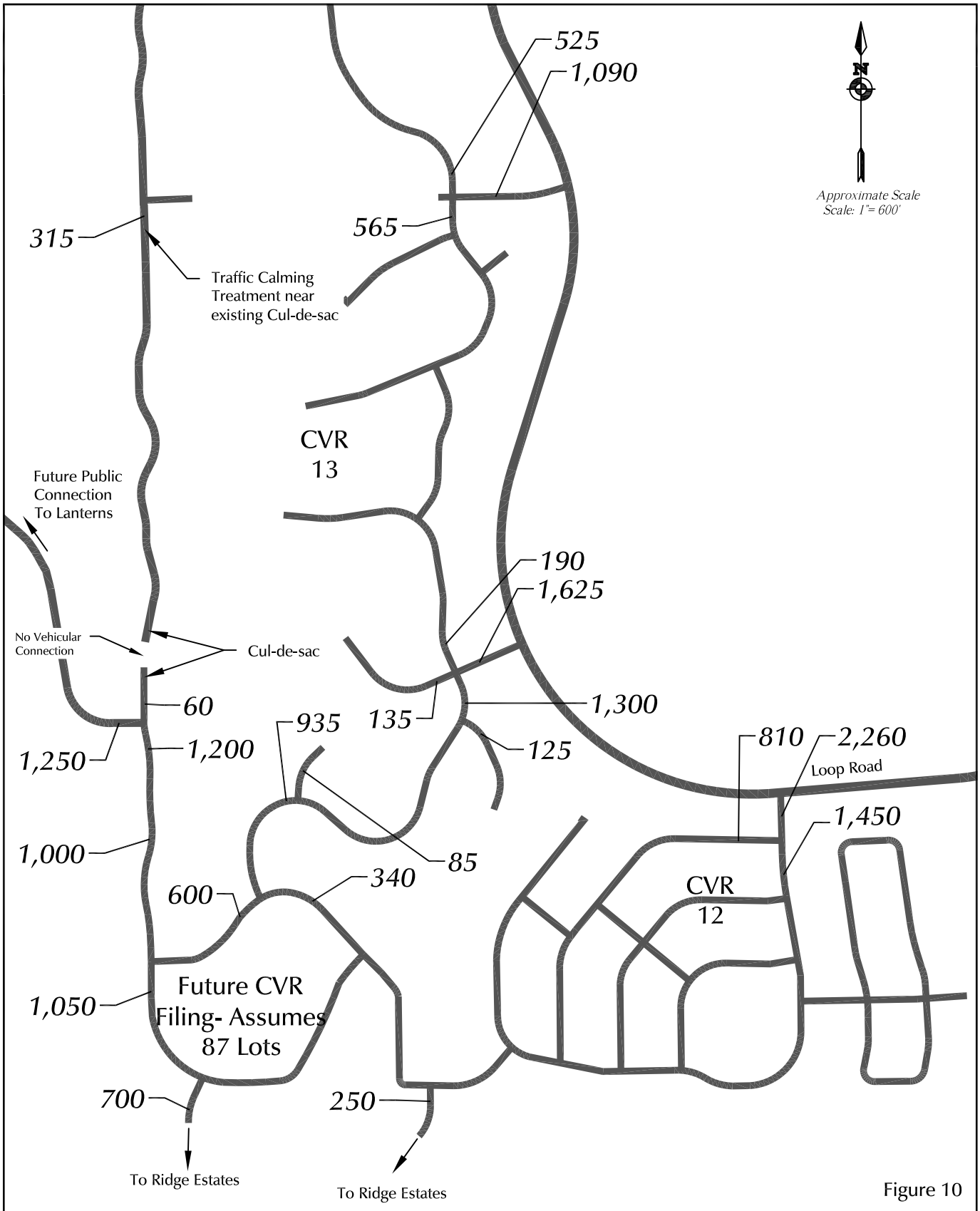
LEGEND:

- ⊦ = Stop Sign
- ◓ = Traffic Signal
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 2,500 = Average Daily Traffic

Figure 9

Year 2035 Total Traffic, Lane Geometry and Traffic Control

Ridge Estates (LSC #150660)



LEGEND:
1,000 = Average Weekday Traffic (vehicles per day)

LSC TRANSPORTATION CONSULTANTS, INC.

Figure 10

Assignment of Average Daily Traffic

Ridge Estates (LSC #150660)

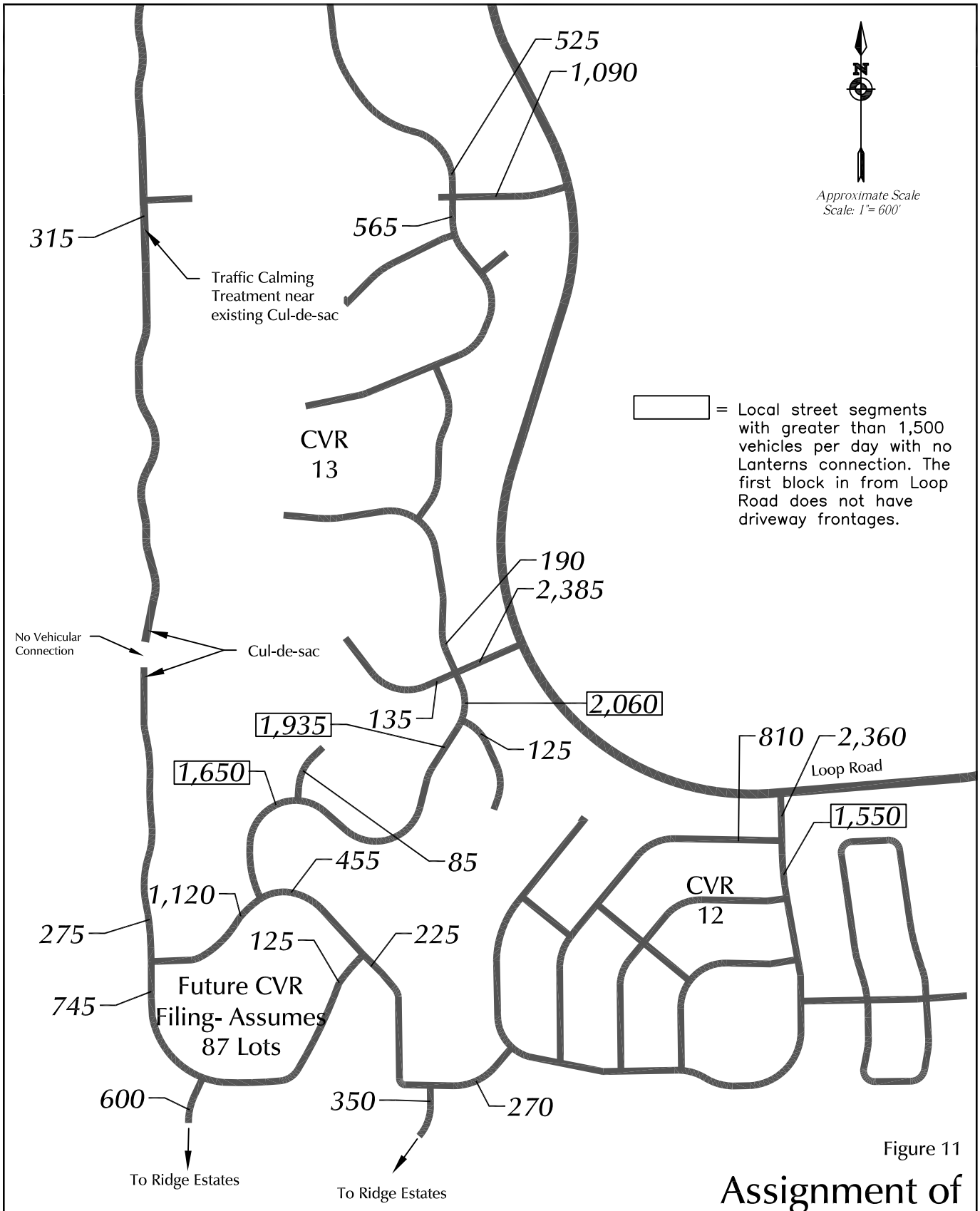


Figure 11

Assignment of Average Daily Traffic w/o Connection to Lanterns

Ridge Estates (LSC #150660)

LEGEND:

1,000 = Average Weekday Traffic (vehicles per day)

LSC TRANSPORTATION CONSULTANTS, INC.

COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET:EVENINGGLOW WAY/STARSTONE LN
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : STARCRYS
Site Code : 00000014
Start Date : 12/1/2015
Page No : 1

Groups Printed- VEHICLES

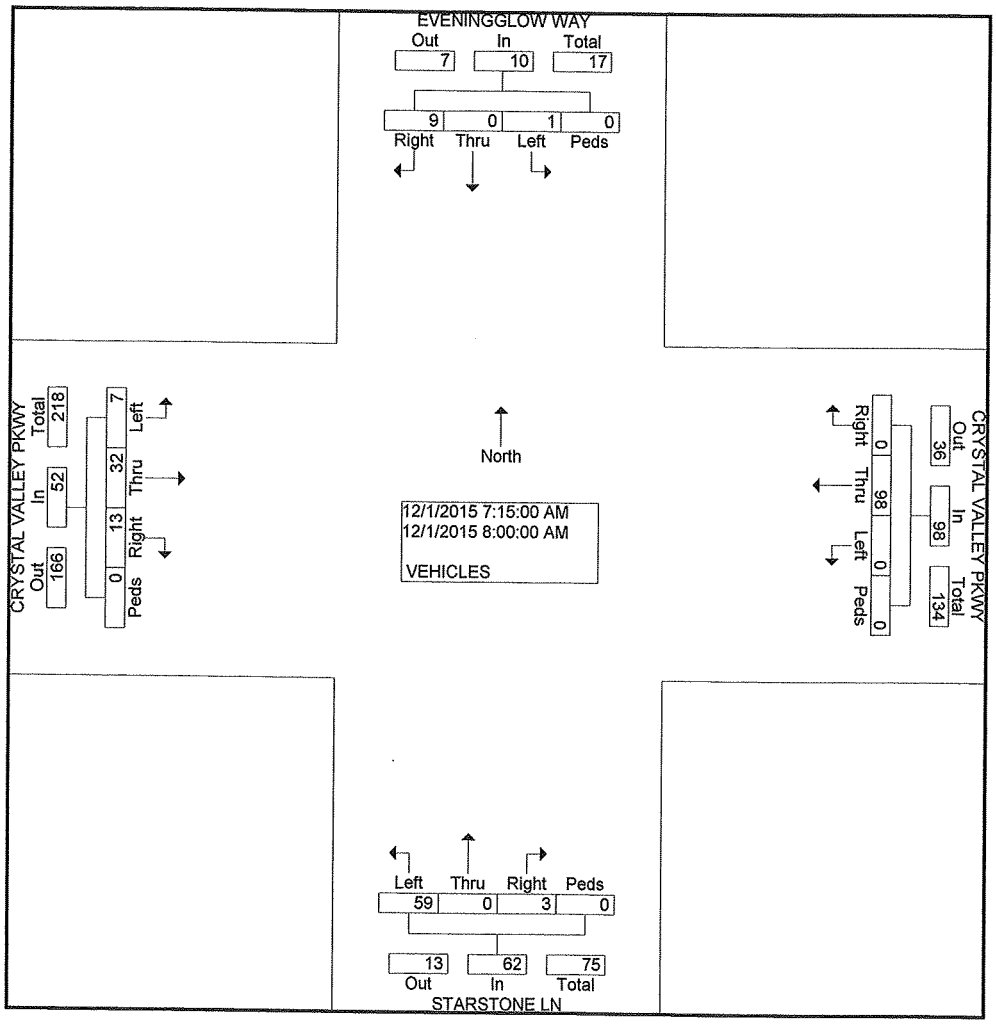
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Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	1	1	1	0	14	0	0	13	1	1	0	0	10	3	0	45
06:45 AM	0	0	3	0	0	16	0	0	22	0	1	0	2	3	2	0	49
Total	0	1	4	1	0	30	0	0	35	1	2	0	2	13	5	0	94
07:00 AM	0	1	5	0	0	31	0	0	21	0	1	0	0	5	1	0	65
07:15 AM	0	0	5	0	0	26	0	0	22	0	2	0	1	6	2	0	64
07:30 AM	0	0	1	0	0	28	0	0	14	0	0	0	1	1	3	0	48
07:45 AM	1	0	1	0	0	29	0	0	14	0	1	0	2	8	2	0	58
Total	1	1	12	0	0	114	0	0	71	0	4	0	4	20	8	0	235
08:00 AM	0	0	2	0	0	15	0	0	9	0	0	0	3	17	6	0	52
08:15 AM	0	1	2	0	0	17	0	0	10	0	1	0	1	10	0	0	42
Total	0	1	4	0	0	32	0	0	19	0	1	0	4	27	6	0	94
04:00 PM	0	0	2	0	0	9	0	0	5	0	0	0	4	16	11	0	47
04:15 PM	0	1	1	0	2	22	0	0	1	1	0	0	0	18	13	0	59
04:30 PM	0	0	0	0	3	11	0	0	8	0	2	0	2	16	9	0	51
04:45 PM	0	0	4	0	0	18	0	0	6	0	1	0	5	20	11	0	65
Total	0	1	7	0	5	60	0	0	20	1	3	0	11	70	44	0	222
05:00 PM	0	0	2	0	0	6	0	0	4	0	1	0	6	14	16	0	49
05:15 PM	0	0	0	0	2	3	0	0	6	0	1	0	2	20	12	0	46
05:30 PM	0	0	0	0	1	5	0	1	7	0	1	0	1	19	20	0	55
05:45 PM	0	0	0	0	1	6	0	0	4	0	0	0	2	19	13	0	45
Total	0	0	2	0	4	20	0	1	21	0	3	0	11	72	61	0	195
Grand Total	1	4	29	1	9	256	0	1	166	2	13	0	32	202	124	0	840
Apprch %	2.9	11.4	82.9	2.9	3.4	96.2	0.0	0.4	91.7	1.1	7.2	0.0	8.9	56.4	34.6	0.0	
Total %	0.1	0.5	3.5	0.1	1.1	30.5	0.0	0.1	19.8	0.2	1.5	0.0	3.8	24.0	14.8	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET:EVENINGGLOW WAY/STARSTONE LN
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : STARCRYS
Site Code : 00000014
Start Date : 12/1/2015
Page No : 2

	EVENINGGLOW WAY Southbound					CRYSTAL VALLEY PKWY Westbound					STARSTONE LN Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	1	0	9	0	10	0	98	0	0	98	59	0	3	0	62	7	32	13	0	52	222
Percent	10.0	0.0	90.0	0.0		0.0	100.0	0.0	0.0		95.2	0.0	4.8	0.0		13.5	61.5	25.0	0.0		
07:15 Volume	0	0	5	0	5	0	26	0	0	26	22	0	2	0	24	1	6	2	0	9	64
Peak Factor																					0.867
High Int.	07:15 AM					07:45 AM					07:15 AM					08:00 AM					
Volume	0	0	5	0	5	0	29	0	0	29	22	0	2	0	24	3	17	6	0	26	
Peak Factor					0.500					0.845					0.646					0.500	

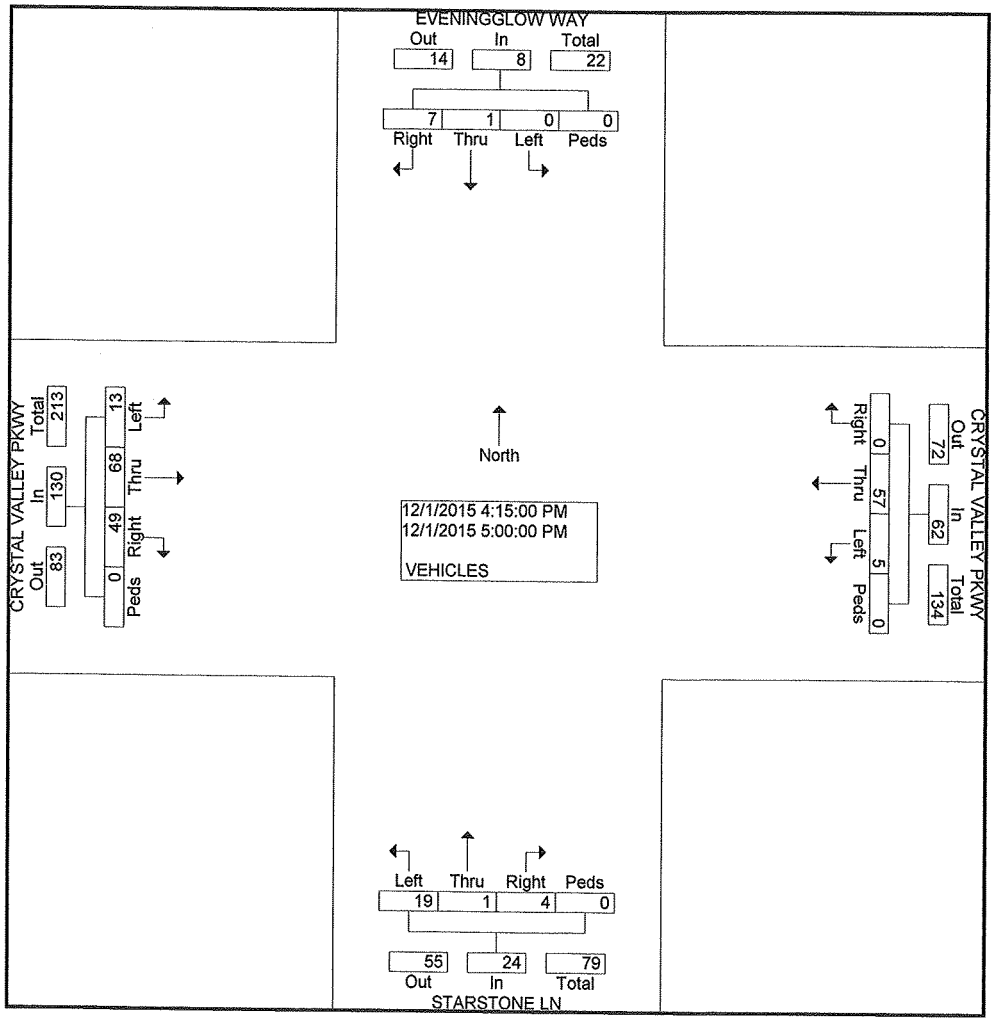


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N/S STREET:EVENINGGLOW WAY/STARSTONE LN
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CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : STARCRYS
Site Code : 00000014
Start Date : 12/1/2015
Page No : 2

	EVENINGGLOW WAY Southbound					CRYSTAL VALLEY PKWY Westbound					STARSTONE LN Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	0	1	7	0	8	5	57	0	0	62	19	1	4	0	24	13	68	49	0	130	224
Percent	0.0	12.5	87.5	0.0		8.1	91.9	0.0	0.0		79.2	4.2	16.7	0.0		10.0	52.3	37.7	0.0		
04:45 Volume	0	0	4	0	4	0	18	0	0	18	6	0	1	0	7	5	20	11	0	36	65
Peak Factor																					0.862
High Int.	04:45 PM					04:15 PM					04:30 PM					04:45 PM					
Volume	0	0	4	0	4	2	22	0	0	24	8	0	2	0	10	5	20	11	0	36	
Peak Factor					0.500					0.646					0.600					0.903	



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N/S STREET: LIONS PAW ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LIONCRYS
Site Code : 00000016
Start Date : 12/1/2015
Page No : 1

Groups Printed- VEHICLES

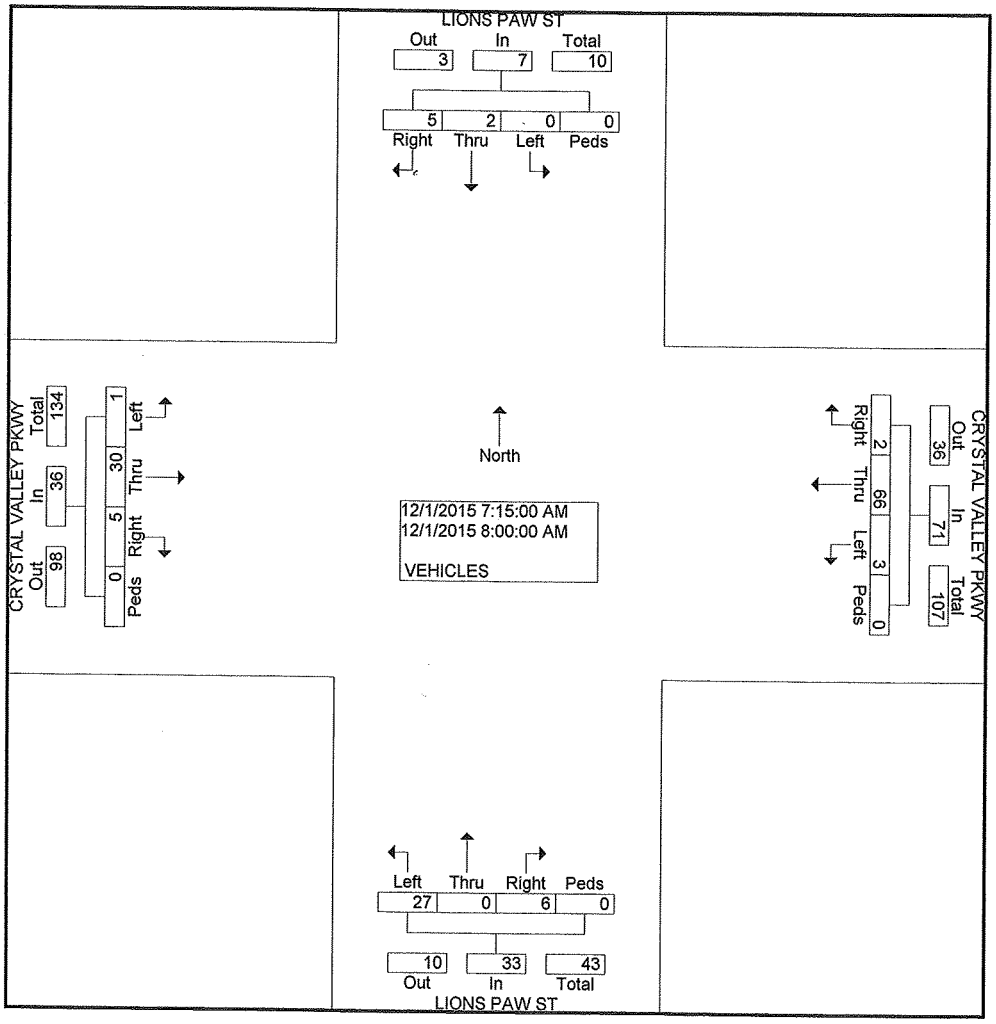
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Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	3	0	0	7	0	1	4	1	1	0	0	11	0	0	28
06:45 AM	0	0	2	0	1	14	0	0	0	0	4	0	1	3	0	0	25
Total	0	0	5	0	1	21	0	1	4	1	5	0	1	14	0	0	53
07:00 AM	0	0	1	0	0	26	0	1	4	0	3	0	0	4	2	0	41
07:15 AM	0	1	1	0	0	20	0	0	5	0	2	0	0	8	0	0	37
07:30 AM	0	1	0	0	3	18	1	0	10	0	1	0	0	1	0	0	35
07:45 AM	0	0	2	0	0	17	1	0	10	0	1	0	0	5	5	0	41
Total	0	2	4	0	3	81	2	1	29	0	7	0	0	18	7	0	154
08:00 AM	0	0	2	0	0	11	0	0	2	0	2	0	1	16	0	0	34
08:15 AM	0	0	0	0	1	15	0	0	2	0	1	0	2	8	1	0	30
Total	0	0	2	0	1	26	0	0	4	0	3	0	3	24	1	0	64
04:00 PM	1	0	0	0	0	8	0	0	1	0	0	0	0	11	5	0	26
04:15 PM	0	0	0	0	1	18	0	0	6	0	1	3	1	9	8	0	47
04:30 PM	0	0	1	0	1	11	1	0	2	0	0	1	0	14	4	0	35
04:45 PM	0	0	1	0	0	13	0	0	4	0	2	0	1	16	4	0	41
Total	1	0	2	0	2	50	1	0	13	0	3	4	2	50	21	0	149
05:00 PM	2	0	1	0	0	2	0	0	3	0	1	0	0	12	3	0	24
05:15 PM	0	0	0	0	2	4	0	0	1	0	0	0	2	17	2	0	28
05:30 PM	0	0	0	0	1	5	0	0	1	0	0	0	0	18	2	1	28
05:45 PM	0	0	2	0	0	4	1	0	1	0	0	0	0	14	5	0	27
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Grand Total	3	2	16	0	10	193	4	2	56	1	19	4	8	167	41	1	527
Apprch %	14.3	9.5	76.2	0.0	4.8	92.3	1.9	1.0	70.0	1.3	23.8	5.0	3.7	77.0	18.9	0.5	
Total %	0.6	0.4	3.0	0.0	1.9	36.6	0.8	0.4	10.6	0.2	3.6	0.8	1.5	31.7	7.8	0.2	

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1889 YORK STREET
DENVER,COLORADO
303-333-7409

N/S STREET: LIONS PAW ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LIONCRYS
Site Code : 00000016
Start Date : 12/1/2015
Page No : 2

	LIONS PAW ST Southbound					CRYSTAL VALLEY PKWY Westbound					LIONS PAW ST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	2	5	0	7	3	66	2	0	71	27	0	6	0	33	1	30	5	0	36	147
Percent	0.0	28.6	71.4	0.0		4.2	93.0	2.8	0.0		81.8	0.0	18.2	0.0		2.8	83.3	13.9	0.0		
07:45 Volume	0	0	2	0	2	0	17	1	0	18	10	0	1	0	11	0	5	5	0	10	41
Peak Factor																					0.896
High Int.	07:15 AM					07:30 AM					07:30 AM					08:00 AM					
Volume	0	1	1	0	2	3	18	1	0	22	10	0	1	0	11	1	16	0	0	17	
Peak Factor					0.875					0.807					0.750					0.529	

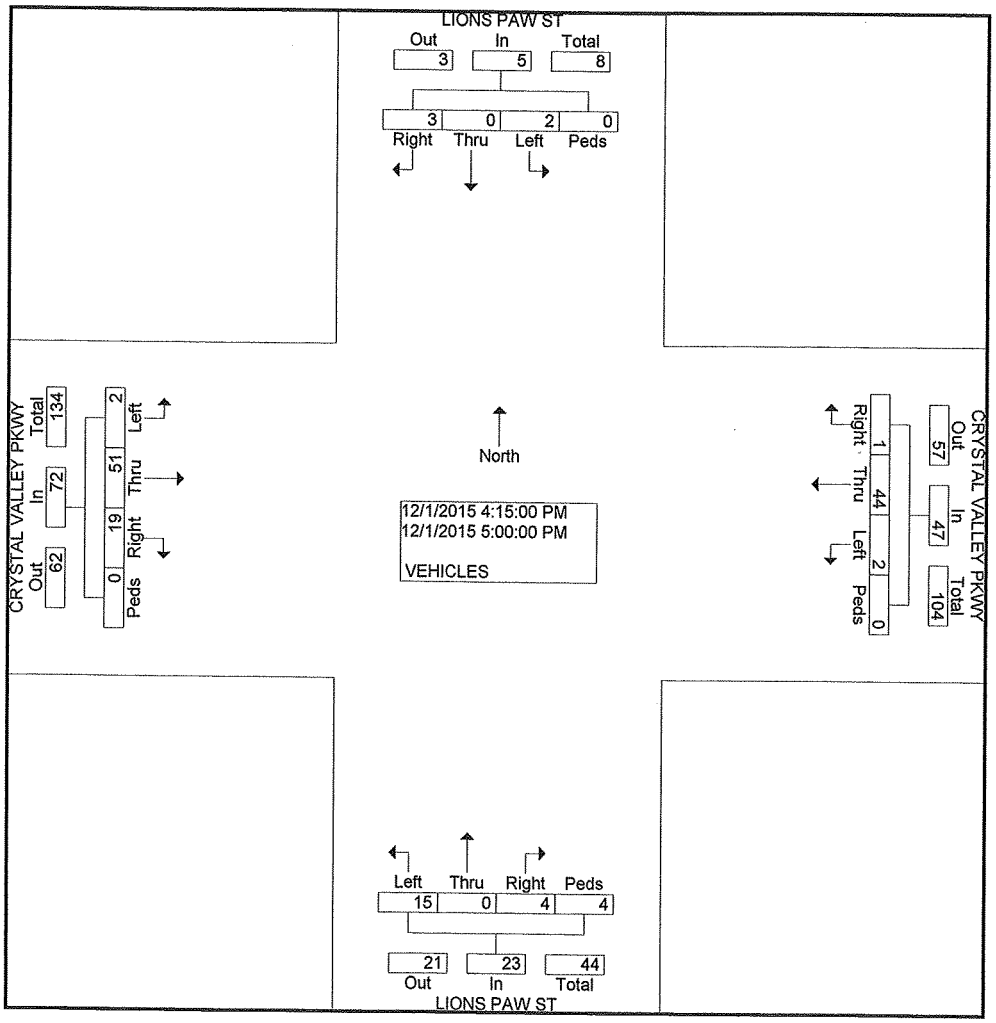


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1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LIONS PAW ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LIONCRYS
Site Code : 00000016
Start Date : 12/1/2015
Page No : 2

	LIONS PAW ST Southbound					CRYSTAL VALLEY PKWY Westbound					LIONS PAW ST Northbound					CRYSTAL VALLEY PKWY 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 04:15 PM to 05:00 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	2	0	3	0	5	2	44	1	0	47	15	0	4	4	23	2	51	19	0	72	147
Percent	40.0	0.0	60.0	0.0		4.3	93.6	2.1	0.0		65.2	0.0	17.4	17.4		2.8	70.8	26.4	0.0		
04:15 Volume	0	0	0	0	0	1	18	0	0	19	6	0	1	3	10	1	9	8	0	18	47
Peak Factor																					0.782
High Int.	05:00 PM					04:15 PM					04:15 PM					04:45 PM					
Volume	2	0	1	0	3	1	18	0	0	19	6	0	1	3	10	1	16	4	0	21	
Peak Factor					0.417					0.618					0.575					0.857	



COUNTER MEASURES INC.
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N/S STREET: LOOP RD WEST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSWEST
Site Code : 00000014
Start Date : 12/2/2015
Page No : 1

Groups Printed- VEHICLES

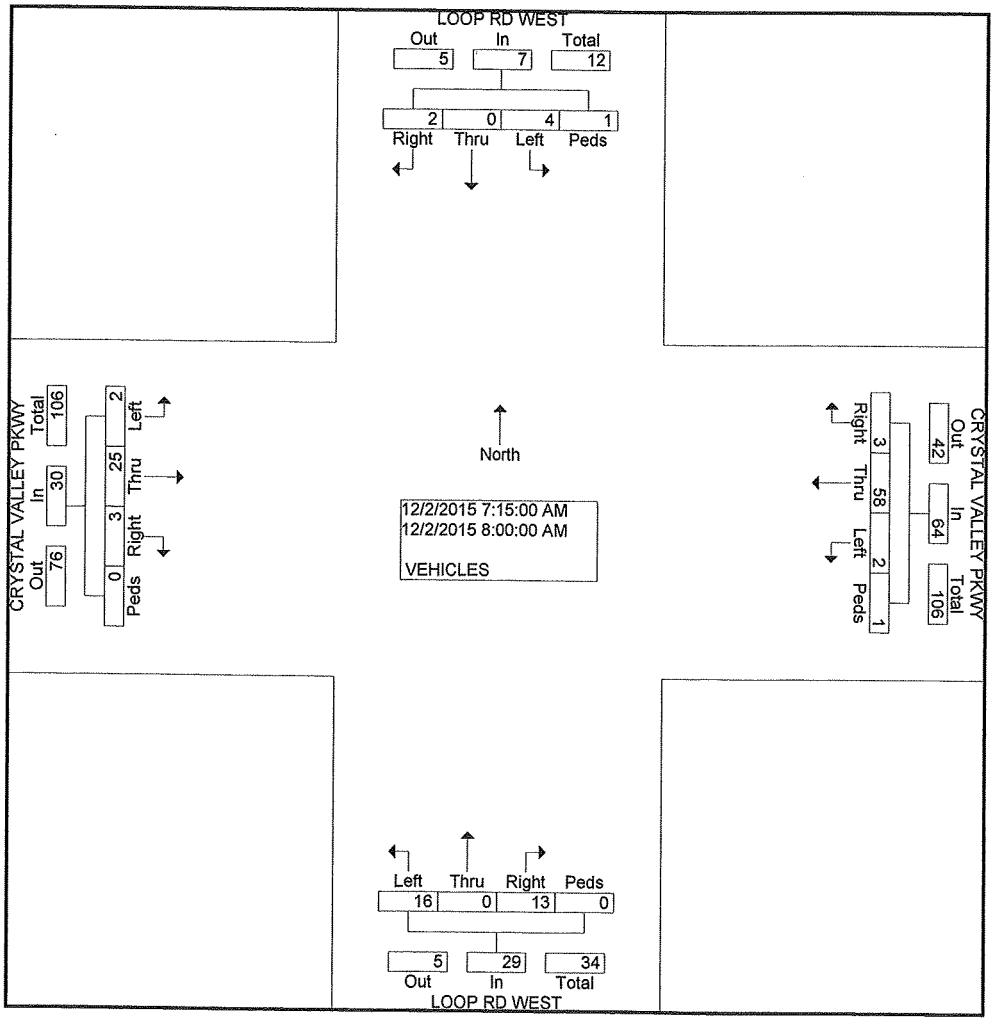
	LOOP RD WEST Southbound				CRYSTAL VALLEY PKWY Westbound				LOOP RD WEST Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	0	0	0	10	0	0	0	0	1	0	2	3	0	0	16
06:45 AM	0	0	0	0	1	8	2	0	2	0	2	0	0	6	2	0	23
Total	0	0	0	0	1	18	2	0	2	0	3	0	2	9	2	0	39
07:00 AM	0	0	1	0	0	14	0	0	8	0	6	0	0	5	1	0	35
07:15 AM	2	0	1	1	0	13	0	1	2	0	6	0	0	4	0	0	30
07:30 AM	0	0	0	0	0	17	3	0	7	0	2	0	2	1	0	0	32
07:45 AM	2	0	1	0	0	22	0	0	4	0	3	0	0	4	0	0	36
Total	4	0	3	1	0	66	3	1	21	0	17	0	2	14	1	0	133
08:00 AM	0	0	0	0	2	6	0	0	3	0	2	0	0	16	3	0	32
08:15 AM	0	0	0	0	2	4	0	0	0	0	1	0	1	10	2	0	20
Total	0	0	0	0	4	10	0	0	3	0	3	0	1	26	5	0	52
04:00 PM	3	0	0	0	2	5	1	0	1	0	1	0	0	8	2	0	23
04:15 PM	1	0	2	0	2	13	3	0	2	0	6	0	1	14	5	0	49
04:30 PM	1	0	1	0	3	6	0	0	3	0	2	0	0	14	6	0	36
04:45 PM	0	0	0	0	2	7	2	0	1	0	1	0	0	11	8	0	32
Total	5	0	3	0	9	31	6	0	7	0	10	0	1	47	21	0	140
05:00 PM	0	0	1	0	1	11	1	0	2	0	3	0	0	24	3	0	46
05:15 PM	0	0	0	0	5	6	0	0	1	0	1	0	0	13	8	0	34
05:30 PM	0	0	0	0	2	9	0	0	3	0	1	0	0	11	6	0	32
05:45 PM	0	0	4	0	4	9	0	0	0	0	1	0	0	9	3	0	30
Total	0	0	5	0	12	35	1	0	6	0	6	0	0	57	20	0	142
Grand Total	9	0	11	1	26	160	12	1	39	0	39	0	6	153	49	0	506
Apprch %	42.9	0.0	52.4	4.8	13.1	80.4	6.0	0.5	50.0	0.0	50.0	0.0	2.9	73.6	23.6	0.0	
Total %	1.8	0.0	2.2	0.2	5.1	31.6	2.4	0.2	7.7	0.0	7.7	0.0	1.2	30.2	9.7	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD WEST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSWEST
Site Code : 00000014
Start Date : 12/2/2015

	LOOP RD WEST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD WEST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	4	0	2	1	7	2	58	3	1	64	16	0	13	0	29	2	25	3	0	30	130
Percent	57.1	0.0	28.6	14.3		3.1	90.6	4.7	1.6		55.2	0.0	44.8	0.0		6.7	83.3	10.0	0.0		
07:45 Volume	2	0	1	0	3	0	22	0	0	22	4	0	3	0	7	0	4	0	0	4	36
Peak Factor																					0.903
High Int.	07:15 AM					07:45 AM					07:30 AM					08:00 AM					
Volume	2	0	1	1	4	0	22	0	0	22	7	0	2	0	9	0	16	3	0	19	
Peak Factor					0.438					0.727					0.806					0.395	

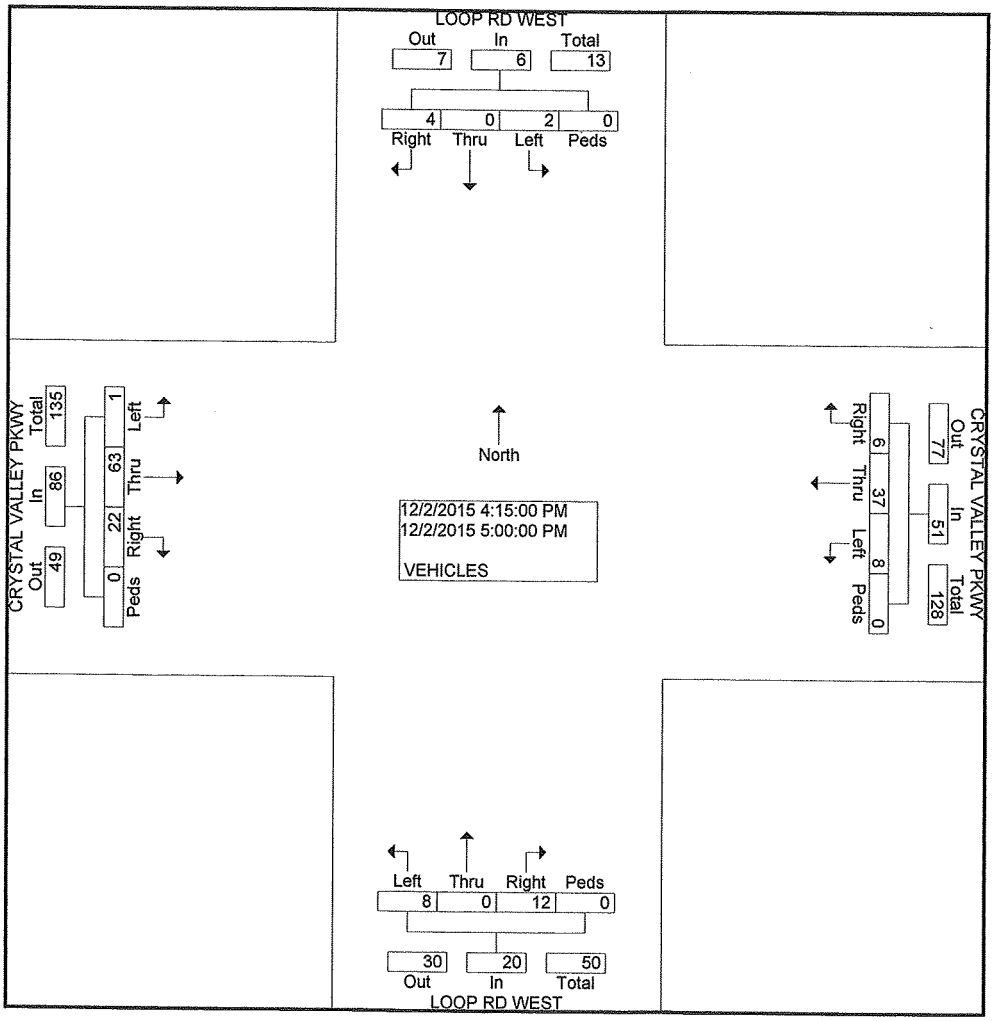


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD WEST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSWEST
Site Code : 00000014
Start Date : 12/2/2015

	LOOP RD WEST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD WEST Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	2	0	4	0	6	8	37	6	0	51	8	0	12	0	20	1	63	22	0	86	163
Percent	33.3	0.0	66.7	0.0		15.7	72.5	11.8	0.0		40.0	0.0	60.0	0.0		1.2	73.3	25.6	0.0		
04:15 Volume	1	0	2	0	3	2	13	3	0	18	2	0	6	0	8	1	14	5	0	20	49
Peak Factor																					0.832
High Int.	04:15 PM					04:15 PM					04:15 PM					05:00 PM					
Volume	1	0	2	0	3	2	13	3	0	18	2	0	6	0	8	0	24	3	0	27	
Peak Factor					0.500					0.708					0.625					0.796	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: IDLYWOOD ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : IALYCRYS
Site Code : 00000016
Start Date : 12/2/2015
Page No : 1

Groups Printed- VEHICLES

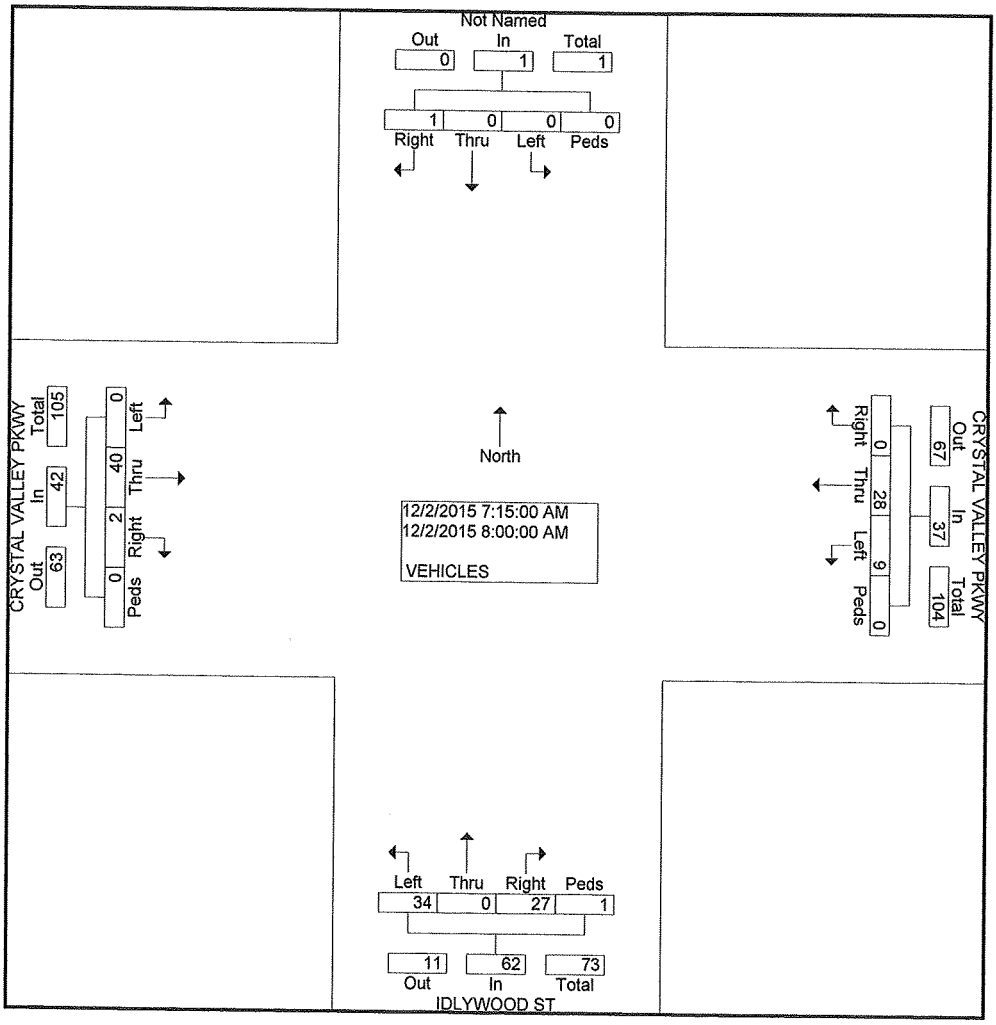
	Southbound				CRYSTAL VALLEY PKWY Westbound				IDLYWOOD ST Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	0	0	1	2	0	0	8	0	2	0	1	3	0	0	17
06:45 AM	0	0	0	0	0	5	0	0	6	0	4	0	0	9	1	0	25
Total	0	0	0	0	1	7	0	0	14	0	6	0	1	12	1	0	42
07:00 AM	0	0	0	0	2	5	0	0	9	0	13	0	0	10	1	0	40
07:15 AM	0	0	0	0	3	5	0	0	8	0	5	1	0	12	0	0	34
07:30 AM	0	0	1	0	4	10	0	0	9	0	6	0	0	3	0	0	33
07:45 AM	0	0	0	0	1	10	0	0	12	0	8	0	0	9	0	0	40
Total	0	0	1	0	10	30	0	0	38	0	32	1	0	34	1	0	147
08:00 AM	0	0	0	0	1	3	0	0	5	0	8	0	0	16	2	0	35
08:15 AM	0	0	0	0	3	3	0	0	3	0	6	0	0	8	3	0	26
Total	0	0	0	0	4	6	0	0	8	0	14	0	0	24	5	0	61
04:00 PM	0	0	0	0	6	7	0	0	1	0	5	1	0	6	6	0	32
04:15 PM	0	0	0	0	7	15	0	0	3	0	1	0	0	9	12	0	47
04:30 PM	0	0	0	0	7	5	0	0	4	0	6	0	0	8	9	0	39
04:45 PM	2	0	0	0	5	9	0	0	2	0	5	0	1	2	9	0	35
Total	2	0	0	0	25	36	0	0	10	0	17	1	1	25	36	0	153
05:00 PM	0	0	0	0	10	8	0	0	5	0	8	0	0	12	15	0	58
05:15 PM	0	0	0	0	2	9	0	0	2	0	7	0	0	7	7	0	34
05:30 PM	0	0	0	0	3	7	0	0	4	0	4	0	0	2	10	0	30
05:45 PM	0	0	0	0	10	8	0	0	5	0	6	0	0	5	5	0	39
Total	0	0	0	0	25	32	0	0	16	0	25	0	0	26	37	0	161
Grand Total	2	0	1	0	65	111	0	0	86	0	94	2	2	121	80	0	564
Apprch %	66.7	0.0	33.3	0.0	36.9	63.1	0.0	0.0	47.3	0.0	51.6	1.1	1.0	59.6	39.4	0.0	
Total %	0.4	0.0	0.2	0.0	11.5	19.7	0.0	0.0	15.2	0.0	16.7	0.4	0.4	21.5	14.2	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: IDLYWOOD ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : IALYCRYS
Site Code : 00000016
Start Date : 12/2/2015
Page No : 2

	Southbound					CRYSTAL VALLEY PKWY Westbound					IDLYWOOD ST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	0	1	0	1	9	28	0	0	37	34	0	27	1	62	0	40	2	0	42	142
Percent	0.0	0.0	100.0	0.0		24.3	75.7	0.0	0.0		54.8	0.0	43.5	1.6		0.0	95.2	4.8	0.0		
07:45 Volume	0	0	0	0	0	1	10	0	0	11	12	0	8	0	20	0	9	0	0	9	40
Peak Factor																					0.888
High Int.	07:30 AM					07:30 AM					07:45 AM					08:00 AM					
Volume	0	0	1	0	1	4	10	0	0	14	12	0	8	0	20	0	16	2	0	18	
Peak Factor					0.250					0.661					0.775					0.583	

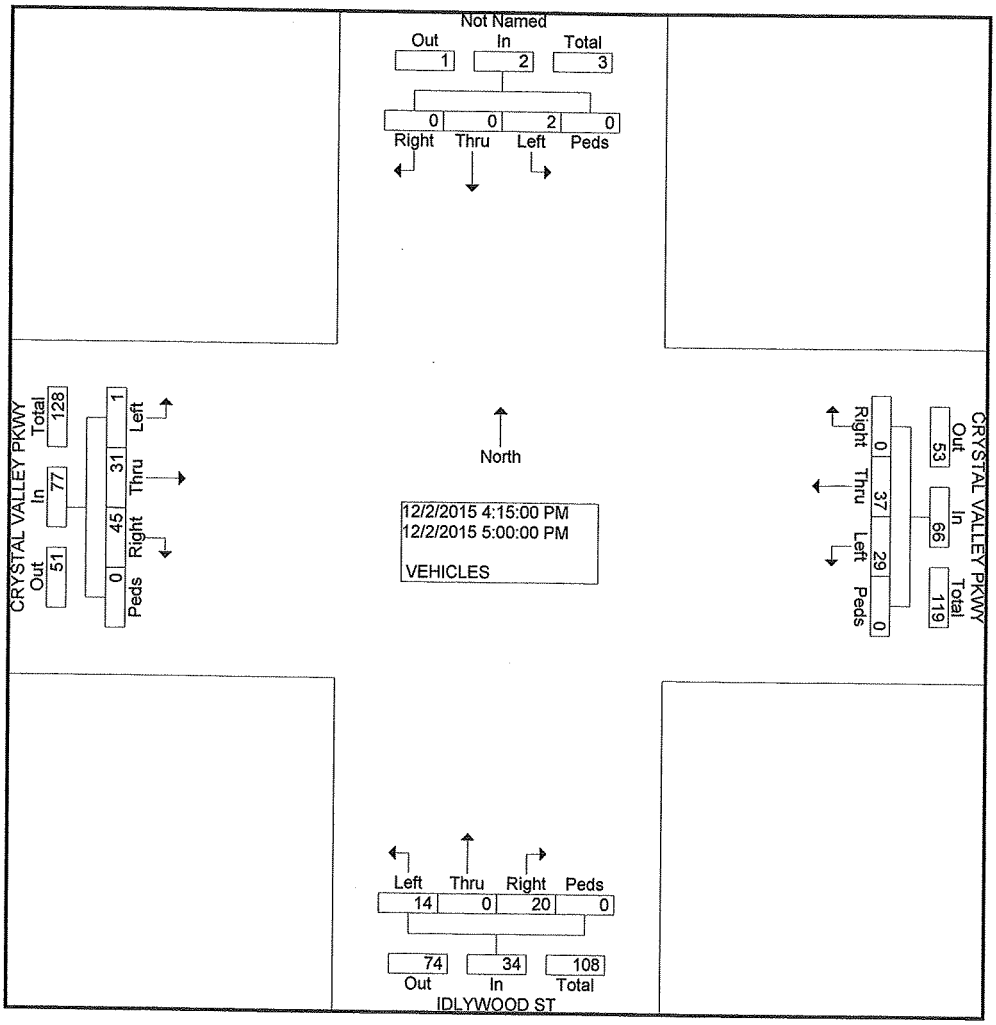


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: IDLYWOOD ST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : IALYCRYS
Site Code : 00000016
Start Date : 12/2/2015
Page No : 2

	Southbound					CRYSTAL VALLEY PKWY Westbound					IDLYWOOD ST Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	2	0	0	0	2	29	37	0	0	66	14	0	20	0	34	1	31	45	0	77	179
Percent	100.0	0.0	0.0	0.0		43.9	56.1	0.0	0.0		41.2	0.0	58.8	0.0		1.3	40.3	58.4	0.0		
05:00 Volume	0	0	0	0	0	10	8	0	0	18	5	0	8	0	13	0	12	15	0	27	58
Peak Factor																					0.772
High Int.	04:45 PM					04:15 PM					05:00 PM					05:00 PM					
Volume	2	0	0	0	2	7	15	0	0	22	5	0	8	0	13	0	12	15	0	27	
Peak Factor					0.250					0.750					0.654					0.713	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD EAST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSEAST
Site Code : 00000014
Start Date : 12/3/2015
Page No : 1

Groups Printed- VEHICLES

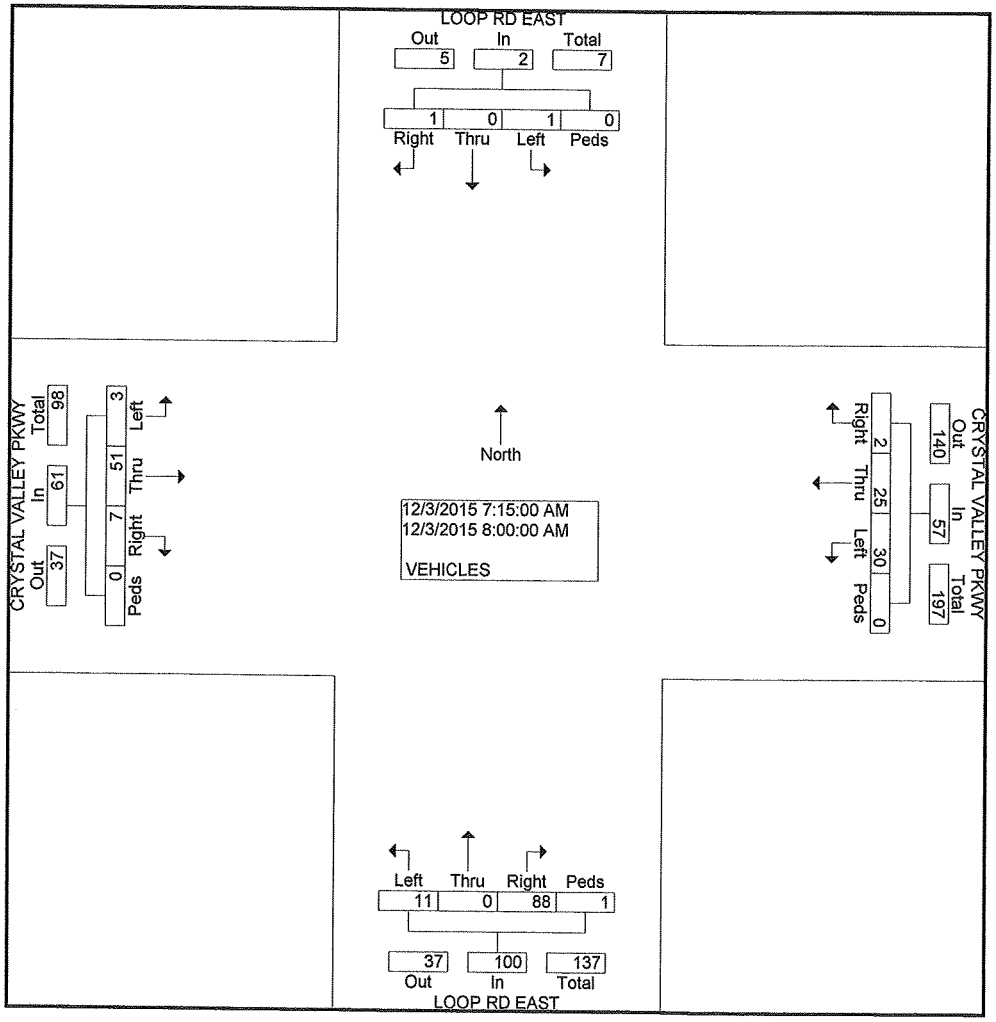
	LOOP RD EAST Southbound				CRYSTAL VALLEY PKWY Westbound				LOOP RD EAST Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	0	0	0	3	0	0	0	0	26	0	0	8	1	0	38
06:45 AM	0	0	0	0	11	7	0	0	2	0	19	0	0	14	1	0	54
Total	0	0	0	0	11	10	0	0	2	0	45	0	0	22	2	0	92
07:00 AM	0	0	0	0	5	3	0	0	3	0	22	0	0	15	2	0	50
07:15 AM	0	0	0	0	7	2	0	0	3	0	23	1	1	12	0	0	49
07:30 AM	0	0	1	0	10	7	0	0	0	0	25	0	0	8	1	0	52
07:45 AM	0	0	0	0	3	9	2	0	5	0	21	0	1	16	1	0	58
Total	0	0	1	0	25	21	2	0	11	0	91	1	2	51	4	0	209
08:00 AM	1	0	0	0	10	7	0	0	3	0	19	0	1	15	5	0	61
08:15 AM	0	1	2	0	11	12	0	0	1	0	12	0	0	20	3	0	62
Total	1	1	2	0	21	19	0	0	4	0	31	0	1	35	8	0	123
04:00 PM	2	0	0	0	18	20	1	0	1	0	10	0	1	9	0	0	62
04:15 PM	0	0	0	0	21	28	0	0	3	0	15	0	0	6	0	0	73
04:30 PM	1	1	0	0	32	13	0	0	0	0	8	0	0	12	2	0	69
04:45 PM	0	0	0	0	24	0	2	0	2	0	13	0	0	18	4	0	63
Total	3	1	0	0	95	61	3	0	6	0	46	0	1	45	6	0	267
05:00 PM	0	0	0	1	22	16	0	0	1	0	14	0	0	6	2	0	62
05:15 PM	0	0	0	0	16	11	0	0	2	0	20	0	0	14	1	0	64
05:30 PM	0	0	0	0	21	14	0	0	0	0	13	0	0	10	1	0	59
05:45 PM	0	0	0	0	19	17	0	0	0	0	10	0	0	11	1	0	58
Total	0	0	0	1	78	58	0	0	3	0	57	0	0	41	5	0	243
Grand Total	4	2	3	1	230	169	5	0	26	0	270	1	4	194	25	0	934
Apprch %	40.0	20.0	30.0	10.0	56.9	41.8	1.2	0.0	8.8	0.0	90.9	0.3	1.8	87.0	11.2	0.0	
Total %	0.4	0.2	0.3	0.1	24.6	18.1	0.5	0.0	2.8	0.0	28.9	0.1	0.4	20.8	2.7	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD EAST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSEAST
Site Code : 00000014
Start Date : 12/3/2015
Page No : 2

	LOOP RD EAST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD EAST Northbound					CRYSTAL VALLEY PKWY 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 07:15 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	1	0	1	0	2	30	25	2	0	57	11	0	88	1	100	3	51	7	0	61	220
Percent	50.0	0.0	50.0	0.0		52.6	43.9	3.5	0.0		11.0	0.0	88.0	1.0		4.9	83.6	11.5	0.0		
08:00 Volume	1	0	0	0	1	10	7	0	0	17	3	0	19	0	22	1	15	5	0	21	61
Peak Factor																					0.902
High Int.	07:30 AM					07:30 AM					07:15 AM					08:00 AM					
Volume	0	0	1	0	1	10	7	0	0	17	3	0	23	1	27	1	15	5	0	21	
Peak Factor					0.500					0.838					0.926					0.726	

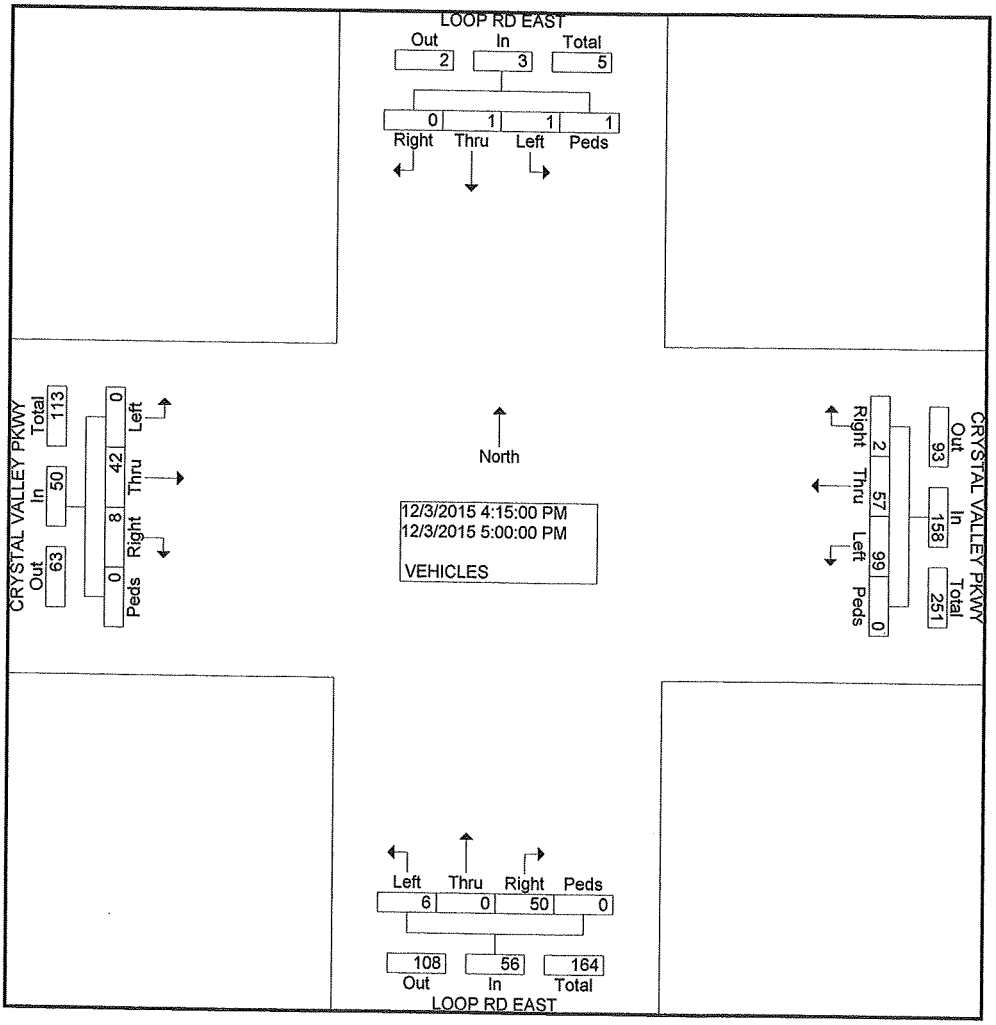


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LOOP RD EAST
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LOOPCRYSEAST
Site Code : 00000014
Start Date : 12/3/2015
Page No : 2

	LOOP RD EAST Southbound					CRYSTAL VALLEY PKWY Westbound					LOOP RD EAST Northbound					CRYSTAL VALLEY PKWY 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 04:15 PM to 05:00 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	1	1	0	1	3	99	57	2	0	158	6	0	50	0	56	0	42	8	0	50	267
Percent	33.3	33.3	0.0	33.3		62.7	36.1	1.3	0.0		10.7	0.0	89.3	0.0		0.0	84.0	16.0	0.0		
04:15 Volume	0	0	0	0	0	21	28	0	0	49	3	0	15	0	18	0	6	0	0	6	73
Peak Factor																					0.914
High Int.	04:30 PM					04:15 PM					04:15 PM					04:45 PM					
Volume	1	1	0	0	2	21	28	0	0	49	3	0	15	0	18	0	18	4	0	22	
Peak Factor					0.375					0.806					0.778					0.568	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LAKE GULCH RD
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LAKECRYS
Site Code : 00000016
Start Date : 12/3/2015
Page No : 1

Groups Printed- VEHICLES

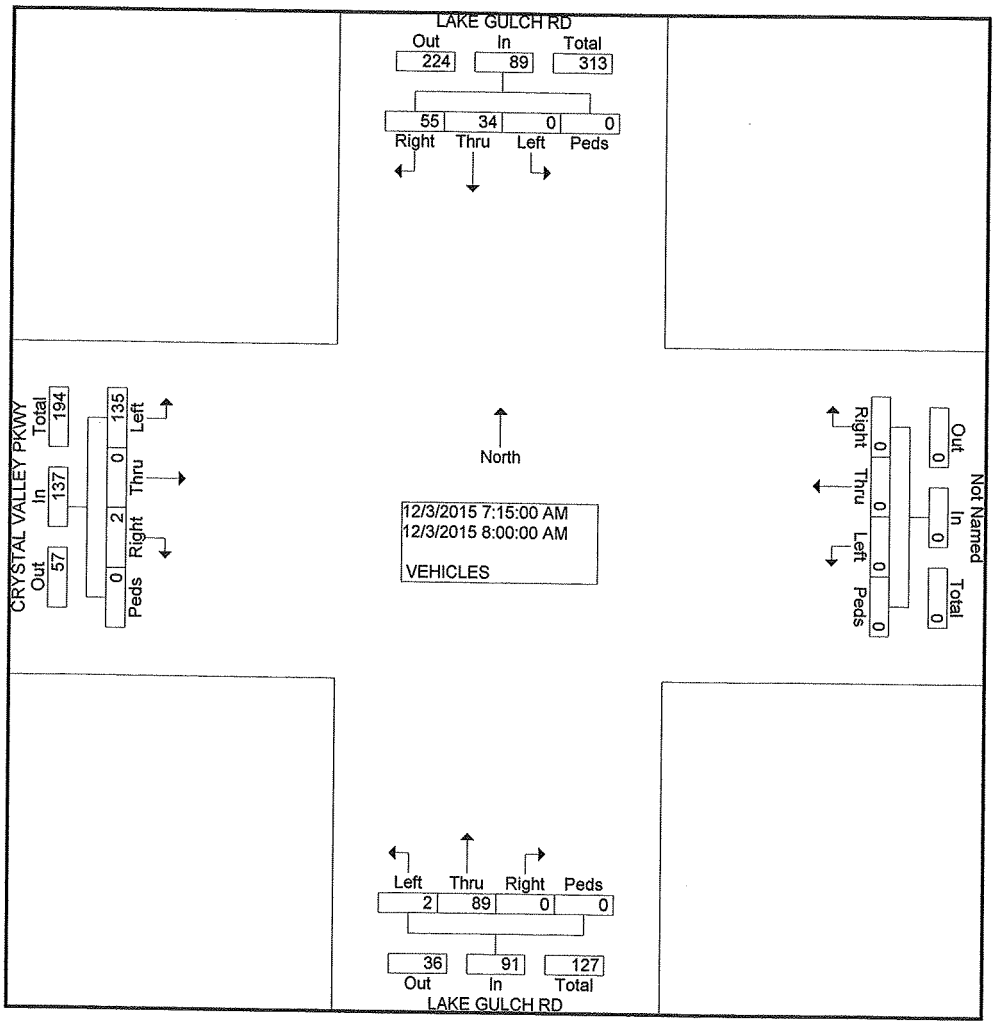
	LAKE GULCH RD Southbound				Westbound				LAKE GULCH RD Northbound				CRYSTAL VALLEY PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	5	1	0	0	0	0	0	2	16	0	0	33	0	1	0	58
06:45 AM	0	7	18	0	0	0	0	0	0	16	0	0	32	0	1	0	74
Total	0	12	19	0	0	0	0	0	2	32	0	0	65	0	2	0	132
07:00 AM	0	3	7	0	0	0	0	0	1	20	0	0	36	0	1	0	68
07:15 AM	0	7	9	0	0	0	0	0	0	30	0	0	35	0	0	0	81
07:30 AM	0	6	16	0	0	0	0	0	1	29	0	0	33	0	0	0	85
07:45 AM	0	12	13	0	0	0	0	0	1	15	0	0	35	0	2	0	78
Total	0	28	45	0	0	0	0	0	3	94	0	0	139	0	3	0	312
08:00 AM	0	9	17	0	0	0	0	0	0	15	0	0	32	0	0	0	73
08:15 AM	0	4	22	0	0	0	0	0	1	4	0	0	29	0	0	0	60
Total	0	13	39	0	0	0	0	0	1	19	0	0	61	0	0	0	133
04:00 PM	0	15	38	0	0	0	0	0	1	12	0	0	19	0	2	0	87
04:15 PM	0	29	49	0	0	0	0	0	0	17	0	0	20	0	1	0	116
04:30 PM	0	19	43	0	0	0	0	0	2	15	0	0	17	0	4	0	100
04:45 PM	0	19	24	0	0	0	0	0	2	19	0	0	29	0	2	0	95
Total	0	82	154	0	0	0	0	0	5	63	0	0	85	0	9	0	398
05:00 PM	0	26	38	1	0	0	0	0	0	14	0	0	19	0	1	0	99
05:15 PM	0	19	26	0	0	0	0	0	1	13	0	0	31	0	3	0	93
05:30 PM	0	14	35	0	0	0	0	0	0	6	0	0	21	0	2	0	78
05:45 PM	0	19	35	0	0	0	0	0	1	7	0	0	20	0	1	0	83
Total	0	78	134	1	0	0	0	0	2	40	0	0	91	0	7	0	353
Grand Total	0	213	391	1	0	0	0	0	13	248	0	0	441	0	21	0	1328
Apprch %	0.0	35.2	64.6	0.2	0.0	0.0	0.0	0.0	5.0	95.0	0.0	0.0	95.5	0.0	4.5	0.0	
Total %	0.0	16.0	29.4	0.1	0.0	0.0	0.0	0.0	1.0	18.7	0.0	0.0	33.2	0.0	1.6	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LAKE GULCH RD
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LAKECRYS
Site Code : 00000016
Start Date : 12/3/2015

	LAKE GULCH RD Southbound					Westbound					LAKE GULCH RD Northbound					CRYSTAL VALLEY PKWY 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	07:15 AM																				
Volume	0	34	55	0	89	0	0	0	0	0	2	89	0	0	91	135	0	2	0	137	317
Percent	0.0	38.2	61.8	0.0		0.0	0.0	0.0	0.0		2.2	97.8	0.0	0.0		98.5	0.0	1.5	0.0		
07:30 Volume	0	6	16	0	22	0	0	0	0	0	1	29	0	0	30	33	0	0	0	33	85
Peak Factor																					0.932
High Int.	08:00 AM					6:15:00 AM					07:15 AM					07:45 AM					
Volume	0	9	17	0	26	0	0	0	0	0	0	30	0	0	30	35	0	2	0	37	
Peak Factor					0.856										0.758					0.926	

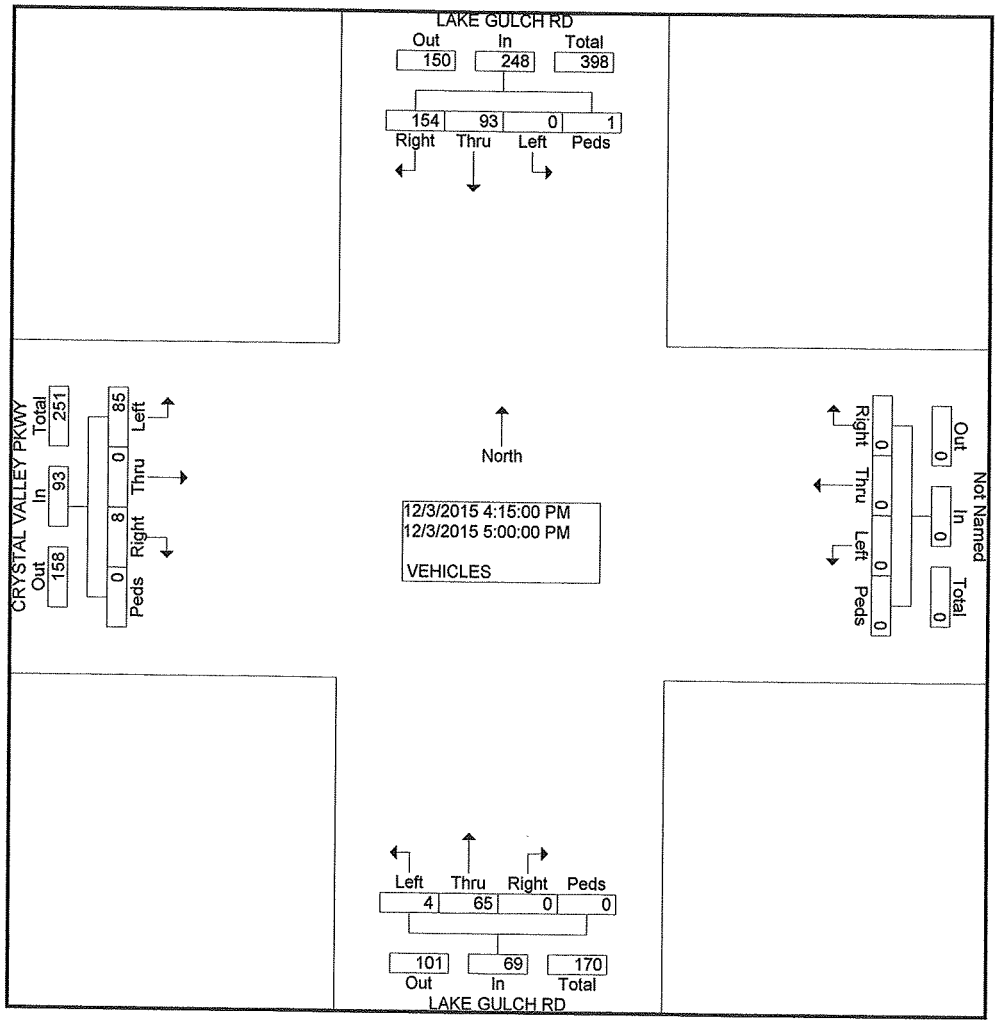


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: LAKE GULCH RD
E/W STREET: CRYSTAL VALLEY PKWY
CITY: CASTLE ROCK
COUNTY: DOUGLAS

File Name : LAKECRYS
Site Code : 00000016
Start Date : 12/3/2015

	LAKE GULCH RD Southbound					Westbound					LAKE GULCH RD Northbound					CRYSTAL VALLEY PKWY 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	04:15 PM																				
Volume	0	93	154	1	248	0	0	0	0	0	4	65	0	0	69	85	0	8	0	93	410
Percent	0.0	37.5	62.1	0.4		0.0	0.0	0.0	0.0		5.8	94.2	0.0	0.0		91.4	0.0	8.6	0.0		
04:15 Volume	0	29	49	0	78	0	0	0	0	0	0	17	0	0	17	20	0	1	0	21	116
Peak Factor																					0.884
High Int.	04:15 PM										04:45 PM					04:45 PM					
Volume	0	29	49	0	78	0	0	0	0	0	2	19	0	0	21	29	0	2	0	31	
Peak Factor					0.795										0.821					0.750	



Agency Name:Counter Measures Inc

Site ID:120366000000
Station Name:
Description:LAKE GULCH RD N/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (North)	Lane 2 (South)	All Lanes
00:00	6	3	9
01:00	3	6	9
02:00	3	3	6
03:00	3	1	4
04:00	20	3	23
05:00	52	9	61
06:00	150	63	213
07:00	221	97	318
08:00	165	104	269
09:00	138	107	245
10:00	109	98	207
11:00	127	95	222
12:00	103	106	209
13:00	89	113	202
14:00	133	99	232
15:00	152	184	336
16:00	148	244	392
17:00	136	217	353
18:00	74	191	265
19:00	29	96	125
20:00	36	98	134
21:00	18	49	67
22:00	9	27	36
23:00	7	10	17
AM Peak Hour	07:00 - 07:59	09:00 - 09:59	07:00 - 07:59
AM Peak Value	221	107	318
PM Peak Hour	15:00 - 15:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	152	244	392
Total	1931	2023	3954
Percentages	48.84%	51.16%	100.00%

Agency Name:Counter Measures Inc

Site ID:120374000000
Station Name:
Description:LAKE GULCH RD S/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (South)	Lane 2 (North)	All Lanes
00:00	1	3	4
01:00	3	1	4
02:00	1	2	3
03:00	1	1	2
04:00	1	10	11
05:00	10	23	33
06:00	40	68	108
07:00	40	83	123
08:00	37	57	94
09:00	53	54	107
10:00	50	46	96
11:00	40	57	97
12:00	45	32	77
13:00	35	41	76
14:00	48	62	110
15:00	66	61	127
16:00	93	69	162
17:00	89	39	128
18:00	66	23	89
19:00	34	5	39
20:00	35	13	48
21:00	13	4	17
22:00	12	8	20
23:00	3	3	6
AM Peak Hour	09:00 - 09:59	07:00 - 07:59	07:00 - 07:59
AM Peak Value	53	83	123
PM Peak Hour	16:00 - 16:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	93	69	162
Total	816	765	1581
Percentages	51.61%	48.39%	100.00%

Agency Name:Counter Measures Inc

Site ID:120362000000
Station Name:
Description:CRYSTAL VALLEY PKWY E/O LOOP DR EAST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (East)	Lane 2 (West)	All Lanes
00:00	3	2	5
01:00	1	3	4
02:00	1	2	3
03:00	2	0	2
04:00	10	1	11
05:00	34	2	36
06:00	92	24	116
07:00	153	73	226
08:00	124	82	206
09:00	82	81	163
10:00	73	59	132
11:00	83	65	148
12:00	81	69	150
13:00	55	80	135
14:00	94	63	157
15:00	107	122	229
16:00	95	163	258
17:00	106	136	242
18:00	62	130	192
19:00	28	61	89
20:00	30	65	95
21:00	15	35	50
22:00	2	14	16
23:00	5	8	13
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	07:00 - 07:59
AM Peak Value	153	82	226
PM Peak Hour	15:00 - 15:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	107	163	258
Total	1338	1340	2678
Percentages	49.96%	50.04%	100.00%

Agency Name:Counter Measures Inc

Site ID:120355000000
Station Name:
Description:LOOP DR EAST S/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (North)	Lane 2 (South)	All Lanes
00:00	2	2	4
01:00	0	0	0
02:00	1	3	4
03:00	3	0	3
04:00	6	1	7
05:00	27	0	27
06:00	66	14	80
07:00	103	45	148
08:00	65	55	120
09:00	59	52	111
10:00	53	44	97
11:00	59	42	101
12:00	55	44	99
13:00	32	56	88
14:00	48	31	79
15:00	60	75	135
16:00	55	103	158
17:00	61	83	144
18:00	36	91	127
19:00	18	51	69
20:00	13	37	50
21:00	7	25	32
22:00	5	10	15
23:00	4	8	12
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	07:00 - 07:59
AM Peak Value	103	55	148
PM Peak Hour	17:00 - 17:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	61	103	158
Total	838	872	1710
Percentages	49.01%	50.99%	100.00%

Agency Name:Counter Measures Inc

Site ID:120371000000
Station Name:
Description:CRYSTAL VALLEY PKWY E/O IDLYWOOD ST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (East)	Lane 2 (West)	All Lanes
00:00	1	0	1
01:00	1	3	4
02:00	2	1	3
03:00	0	1	1
04:00	4	0	4
05:00	6	4	10
06:00	28	13	41
07:00	66	36	102
08:00	74	46	120
09:00	36	40	76
10:00	41	45	86
11:00	42	35	77
12:00	33	30	63
13:00	31	37	68
14:00	55	35	90
15:00	67	73	140
16:00	51	66	117
17:00	52	56	108
18:00	36	53	89
19:00	19	25	44
20:00	22	29	51
21:00	10	15	25
22:00	2	8	10
23:00	5	4	9
AM Peak Hour	08:00 - 08:59	08:00 - 08:59	08:00 - 08:59
AM Peak Value	74	46	120
PM Peak Hour	15:00 - 15:59	15:00 - 15:59	15:00 - 15:59
PM Peak Value	67	73	140
Total	684	655	1339
Percentages	51.08%	48.92%	100.00%

Agency Name:Counter Measures Inc

Site ID:120351000000
Station Name:
Description:CRYSTAL VALLEY PKWY W/O IDYLWOOD ST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (East)	Lane 2 (West)	All Lanes
00:00	1	0	1
01:00	1	2	3
02:00	3	1	4
03:00	0	3	3
04:00	1	0	1
05:00	6	14	20
06:00	18	33	51
07:00	28	61	89
08:00	62	50	112
09:00	30	46	76
10:00	34	45	79
11:00	34	31	65
12:00	30	31	61
13:00	28	35	63
14:00	46	35	81
15:00	66	58	124
16:00	55	49	104
17:00	45	38	83
18:00	62	35	97
19:00	26	18	44
20:00	23	11	34
21:00	7	8	15
22:00	7	5	12
23:00	6	8	14
AM Peak Hour	08:00 - 08:59	07:00 - 07:59	08:00 - 08:59
AM Peak Value	62	61	112
PM Peak Hour	15:00 - 15:59	15:00 - 15:59	15:00 - 15:59
PM Peak Value	66	58	124
Total	619	617	1236
Percentages	50.08%	49.92%	100.00%

Agency Name:Counter Measures Inc

Site ID:120361000000
Station Name:
Description:LOOP DR WEST S/O CRYSTAL VALLEY PKWY
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (North)	Lane 2 (South)	All Lanes
00:00	1	0	1
01:00	0	0	0
02:00	0	0	0
03:00	1	0	1
04:00	0	0	0
05:00	6	4	10
06:00	19	3	22
07:00	33	8	41
08:00	17	13	30
09:00	9	13	22
10:00	16	10	26
11:00	14	9	23
12:00	9	12	21
13:00	5	14	19
14:00	17	12	29
15:00	14	21	35
16:00	14	28	42
17:00	11	25	36
18:00	8	25	33
19:00	5	13	18
20:00	3	9	12
21:00	4	11	15
22:00	0	7	7
23:00	0	1	1
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	07:00 - 07:59
AM Peak Value	33	13	41
PM Peak Hour	14:00 - 14:59	16:00 - 16:59	16:00 - 16:59
PM Peak Value	17	28	42
Total	206	238	444
Percentages	46.40%	53.60%	100.00%

Agency Name:Counter Measures Inc

Site ID:120356000000
Station Name:
Description:CRYSTAL VALLEY PKWY W/O LOOP DR WEST
City:CASTLE ROCK
County:DOUGLAS

12/3/2015	Lane 1 (West)	Lane 2 (East)	All Lanes
00:00	0	0	0
01:00	2	1	3
02:00	1	3	4
03:00	4	0	4
04:00	0	1	1
05:00	15	5	20
06:00	47	17	64
07:00	82	22	104
08:00	56	61	117
09:00	49	35	84
10:00	48	29	77
11:00	37	32	69
12:00	34	37	71
13:00	28	31	59
14:00	33	48	81
15:00	60	73	133
16:00	46	63	109
17:00	37	52	89
18:00	26	71	97
19:00	16	32	48
20:00	8	26	34
21:00	7	12	19
22:00	4	12	16
23:00	6	5	11
AM Peak Hour	07:00 - 07:59	08:00 - 08:59	08:00 - 08:59
AM Peak Value	82	61	117
PM Peak Hour	15:00 - 15:59	15:00 - 15:59	15:00 - 15:59
PM Peak Value	60	73	133
Total	646	668	1314
Percentages	49.16%	50.84%	100.00%

LEVEL OF SERVICE DEFINITIONS

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

SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

LOS	Average Vehicle Delay sec/vehicle	Operational Characteristics
A	<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	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.
C	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.
D	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.
E	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.
F	>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. The delay could be up to 15 seconds. 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. 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.
D	25 to 35 seconds	This is the point at which a traffic signal may be warranted for this intersection. 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. There is a high probability that this intersection will meet traffic signal warrants. 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. The only remedy for these long delays is installing a traffic signal or restricting the accesses. 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.

Intersection	
Intersection Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	25	3	2	58	3	16	0	13	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	28	3	2	64	3	18	0	14	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	68	0	0	28	0	0	104	104	28	103	103	66
Stage 1	-	-	-	-	-	-	32	32	-	71	71	-
Stage 2	-	-	-	-	-	-	72	72	-	32	32	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1533	-	-	1585	-	-	876	786	1047	877	787	998
Stage 1	-	-	-	-	-	-	984	868	-	939	836	-
Stage 2	-	-	-	-	-	-	938	835	-	984	868	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1533	-	-	1585	-	-	873	784	1047	864	785	998
Mov Capacity-2 Maneuver	-	-	-	-	-	-	873	784	-	864	785	-
Stage 1	-	-	-	-	-	-	983	867	-	938	835	-
Stage 2	-	-	-	-	-	-	935	834	-	969	867	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	8.9	9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	873	0	1047	1533	-	-	1585	-	-	904
HCM Lane V/C Ratio	0.02	+	0.014	0.001	-	-	0.001	-	-	0.007
HCM Control Delay (s)	9.2	0	8.5	7.352	0	-	7.274	0	-	9
HCM Lane LOS	A	A	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.062	+	0.042	0.004	-	-	0.004	-	-	0.022

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	135	2	2	89	34	55
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	-	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	145	2	2	96	37	59

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	37	37	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	100	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	856	1035	1574	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	924	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	855	1035	1574	-	-	-
Mov Capacity-2 Maneuver	855	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	923	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1574	-	857	-	-
HCM Lane V/C Ratio	0.001	-	0.172	-	-
HCM Control Delay (s)	7.29	0	10.1	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.004	-	0.618	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	40	2	9	28	0	34	0	27	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	45	2	10	31	0	38	0	30	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	45	0	0	97	97	45	97	97	31
Stage 1	-	-	-	-	-	-	45	45	-	52	52	-
Stage 2	-	-	-	-	-	-	52	52	-	45	45	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1582	-	-	1563	-	-	885	793	1025	885	793	1043
Stage 1	-	-	-	-	-	-	969	857	-	961	852	-
Stage 2	-	-	-	-	-	-	961	852	-	969	857	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1582	-	-	1563	-	-	880	788	1025	855	788	1043
Mov Capacity-2 Maneuver	-	-	-	-	-	-	880	788	-	855	788	-
Stage 1	-	-	-	-	-	-	969	857	-	961	847	-
Stage 2	-	-	-	-	-	-	954	847	-	940	857	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.8	9	8.5
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	907	1025	1582	-	-	1563	-	-	1043
HCM Lane V/C Ratio	0.053	0.02	-	-	-	0.006	-	-	0.001
HCM Control Delay (s)	9.2	8.6	0	-	-	7.318	-	-	8.5
HCM Lane LOS	A	A	A			A			A
HCM 95th %tile Q(veh)	0.169	0.06	0	-	-	0.02	-	-	0.003

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	30	5	3	66	2	27	0	6	0	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	33	6	3	73	2	30	0	7	0	2	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	33	0	0	121	118	33	120	117	74
Stage 1	-	-	-	-	-	-	36	36	-	81	81	-
Stage 2	-	-	-	-	-	-	85	82	-	39	36	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1523	-	-	1579	-	-	854	772	1041	855	773	988
Stage 1	-	-	-	-	-	-	980	865	-	927	828	-
Stage 2	-	-	-	-	-	-	923	827	-	976	865	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1523	-	-	1579	-	-	845	770	1041	848	771	988
Mov Capacity-2 Maneuver	-	-	-	-	-	-	845	770	-	848	771	-
Stage 1	-	-	-	-	-	-	979	864	-	926	826	-
Stage 2	-	-	-	-	-	-	914	825	-	969	864	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	9.3	9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	875	1523	-	-	1579	-	-	914
HCM Lane V/C Ratio	0.042	0.001	-	-	0.002	-	-	0.009
HCM Control Delay (s)	9.3	7.365	0	-	7.285	0	-	9
HCM Lane LOS	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.131	0.002	-	-	0.006	-	-	0.026

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	32	13	0	98	0	59	0	3	1	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	37	15	0	113	0	68	0	3	1	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	113	0	0	37	0	0	171	166	37	168	166	113
Stage 1	-	-	-	-	-	-	53	53	-	113	113	-
Stage 2	-	-	-	-	-	-	118	113	-	55	53	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1476	-	-	1574	-	-	792	727	1035	796	727	940
Stage 1	-	-	-	-	-	-	960	851	-	892	802	-
Stage 2	-	-	-	-	-	-	887	802	-	957	851	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1476	-	-	1574	-	-	780	723	1035	790	723	940
Mov Capacity-2 Maneuver	-	-	-	-	-	-	780	723	-	790	723	-
Stage 1	-	-	-	-	-	-	954	846	-	887	802	-
Stage 2	-	-	-	-	-	-	877	802	-	948	846	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	9.8	8.9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	780	806	1476	-	-	1574	-	-	790	934
HCM Lane V/C Ratio	0.058	0.032	0.005	-	-	-	-	-	0.001	0.011
HCM Control Delay (s)	9.9	9.6	7.452	0	-	0	-	-	9.6	8.9
HCM Lane LOS	A	A	A	A		A			A	A
HCM 95th %tile Q(veh)	0.184	0.1	0.016	-	-	0	-	-	0.003	0.035

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	51	7	30	25	2	11	0	88	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	57	8	33	28	2	12	0	98	1	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	30	0	0	57	0	0	159	160	57	159	159	29
Stage 1	-	-	-	-	-	-	63	63	-	96	96	-
Stage 2	-	-	-	-	-	-	96	97	-	63	63	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1583	-	-	1547	-	-	807	732	1009	807	733	1046
Stage 1	-	-	-	-	-	-	948	842	-	911	815	-
Stage 2	-	-	-	-	-	-	911	815	-	948	842	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1583	-	-	1547	-	-	792	715	1009	716	716	1046
Mov Capacity-2 Maneuver	-	-	-	-	-	-	792	715	-	716	716	-
Stage 1	-	-	-	-	-	-	946	840	-	909	798	-
Stage 2	-	-	-	-	-	-	891	798	-	854	840	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	3.9	8.9	9.2
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	939	1009	1583	-	-	1547	-	-	850
HCM Lane V/C Ratio	0.048	0.065	0.002	-	-	0.022	-	-	0.003
HCM Control Delay (s)	9	8.8	7.279	0	-	7.378	-	-	9.2
HCM Lane LOS	A	A	A	A		A			A
HCM 95th %tile Q(veh)	0.15	0.207	0.006	-	-	0.066	-	-	0.008

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	63	22	8	37	6	8	0	12	2	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	76	27	10	45	7	10	0	14	2	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	52	0	0	76	0	0	148	149	76	145	145	48
Stage 1	-	-	-	-	-	-	78	78	-	67	67	-
Stage 2	-	-	-	-	-	-	70	71	-	78	78	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1554	-	-	1523	-	-	820	743	985	824	746	1021
Stage 1	-	-	-	-	-	-	931	830	-	943	839	-
Stage 2	-	-	-	-	-	-	940	836	-	931	830	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1554	-	-	1523	-	-	811	737	985	807	740	1021
Mov Capacity-2 Maneuver	-	-	-	-	-	-	811	737	-	807	740	-
Stage 1	-	-	-	-	-	-	930	829	-	942	833	-
Stage 2	-	-	-	-	-	-	929	830	-	916	829	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	9	8.9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	811	0	985	1554	-	-	1523	-	-	938
HCM Lane V/C Ratio	0.012	+	0.015	0.001	-	-	0.006	-	-	0.008
HCM Control Delay (s)	9.5	0	8.7	7.318	0	-	7.379	0	-	8.9
HCM Lane LOS	A	A	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.036	+	0.045	0.002	-	-	0.019	-	-	0.023

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	85	8	4	65	93	154
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	-	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	9	5	74	106	175

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	189	106	106	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	800	948	1485	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	797	948	1485	-	-	-
Mov Capacity-2 Maneuver	797	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.4	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	808	-	-
HCM Lane V/C Ratio	0.003	-	0.131	-	-
HCM Control Delay (s)	7.432	0	10.1	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.009	-	0.449	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	31	45	29	37	0	14	0	20	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	40	58	38	48	0	18	0	26	3	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	48	0	0	40	0	0	166	166	40	166	166	48
Stage 1	-	-	-	-	-	-	43	43	-	123	123	-
Stage 2	-	-	-	-	-	-	123	123	-	43	43	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1559	-	-	1570	-	-	798	727	1031	798	727	1021
Stage 1	-	-	-	-	-	-	971	859	-	881	794	-
Stage 2	-	-	-	-	-	-	881	794	-	971	859	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1559	-	-	1570	-	-	783	709	1031	763	709	1021
Mov Capacity-2 Maneuver	-	-	-	-	-	-	783	709	-	763	709	-
Stage 1	-	-	-	-	-	-	970	858	-	880	775	-
Stage 2	-	-	-	-	-	-	860	775	-	946	858	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.2	9.1	9.7
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	849	1031	1559	-	-	1570	-	-	763
HCM Lane V/C Ratio	0.032	0.017	0.001	-	-	0.024	-	-	0.003
HCM Control Delay (s)	9.4	8.6	7.311	0	-	7.349	-	-	9.7
HCM Lane LOS	A	A	A	A		A			A
HCM 95th %tile Q(veh)	0.098	0.051	0.003	-	-	0.074	-	-	0.01

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	51	19	2	44	1	15	0	4	2	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	65	24	3	56	1	19	0	5	3	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	58	0	0	65	0	0	135	134	65	135	133	57
Stage 1	-	-	-	-	-	-	71	71	-	62	62	-
Stage 2	-	-	-	-	-	-	64	63	-	73	71	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1546	-	-	1537	-	-	836	757	999	836	758	1009
Stage 1	-	-	-	-	-	-	939	836	-	949	843	-
Stage 2	-	-	-	-	-	-	947	842	-	937	836	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1546	-	-	1537	-	-	830	754	999	829	755	1009
Mov Capacity-2 Maneuver	-	-	-	-	-	-	830	754	-	829	755	-
Stage 1	-	-	-	-	-	-	937	834	-	947	841	-
Stage 2	-	-	-	-	-	-	942	840	-	930	834	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	9.3	8.9
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	861	1546	-	-	1537	-	-	928
HCM Lane V/C Ratio	0.028	0.002	-	-	0.002	-	-	0.007
HCM Control Delay (s)	9.3	7.332	0	-	7.346	0	-	8.9
HCM Lane LOS	A	A	A		A	A		A
HCM 95th %tile Q(veh)	0.087	0.005	-	-	0.005	-	-	0.021

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	13	68	49	5	57	0	19	1	4	0	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	79	57	6	66	0	22	1	5	0	1	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	66	0	0	79	0	0	192	187	79	190	187	66
Stage 1	-	-	-	-	-	-	109	109	-	78	78	-
Stage 2	-	-	-	-	-	-	83	78	-	112	109	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1536	-	-	1519	-	-	768	708	981	770	708	998
Stage 1	-	-	-	-	-	-	896	805	-	931	830	-
Stage 2	-	-	-	-	-	-	925	830	-	893	805	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1536	-	-	1519	-	-	752	697	981	757	697	998
Mov Capacity-2 Maneuver	-	-	-	-	-	-	752	697	-	757	697	-
Stage 1	-	-	-	-	-	-	886	796	-	921	827	-
Stage 2	-	-	-	-	-	-	913	827	-	878	796	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.6	9.7	8.8
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	752	813	1536	-	-	1519	-	-	0	947
HCM Lane V/C Ratio	0.02	0.016	0.01	-	-	0.004	-	-	+	0.01
HCM Control Delay (s)	9.9	9.5	7.367	0	-	7.379	0	-	0	8.8
HCM Lane LOS	A	A	A	A		A	A		A	A
HCM 95th %tile Q(veh)	0.06	0.049	0.03	-	-	0.012	-	-	+	0.03

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	42	8	99	57	2	6	0	50	1	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	46	9	109	63	2	7	0	55	1	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	46	0	0	328	328	46	327	327	64
Stage 1	-	-	-	-	-	-	46	46	-	281	281	-
Stage 2	-	-	-	-	-	-	282	282	-	46	46	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1537	-	-	1562	-	-	625	591	1023	626	591	1000
Stage 1	-	-	-	-	-	-	968	857	-	726	678	-
Stage 2	-	-	-	-	-	-	725	678	-	968	857	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1537	-	-	1562	-	-	591	550	1023	561	550	1000
Mov Capacity-2 Maneuver	-	-	-	-	-	-	591	550	-	561	550	-
Stage 1	-	-	-	-	-	-	968	857	-	726	631	-
Stage 2	-	-	-	-	-	-	673	631	-	916	857	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.7	8.9	11.5
HCM LOS			A	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	857	1023	1537	-	-	1562	-	-	555
HCM Lane V/C Ratio	0.029	0.036	-	-	-	0.07	-	-	0.004
HCM Control Delay (s)	9.3	8.7	0	-	-	7.477	-	-	11.5
HCM Lane LOS	A	A	A			A			B
HCM 95th %tile Q(veh)	0.09	0.111	0	-	-	0.224	-	-	0.012

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	145	175	35	300	3	560	2	110	2	3	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	521	1798	764	619	948	806	768	505	429	164	43	43
Arrive On Green	0.00	0.48	0.48	0.03	0.51	0.51	0.22	0.27	0.27	0.00	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	856	856
Grp Volume(v), veh/h	3	161	194	39	333	3	622	2	122	2	0	6
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1712
Q Serve(g_s), s	0.1	1.7	5.4	0.8	8.0	0.1	12.8	0.1	4.5	0.1	0.0	0.2
Cycle Q Clear(g_c), s	0.1	1.7	5.4	0.8	8.0	0.1	12.8	0.1	4.5	0.1	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	521	1798	764	619	948	806	768	505	429	164	0	86
V/C Ratio(X)	0.01	0.09	0.25	0.06	0.35	0.00	0.81	0.00	0.28	0.01	0.00	0.07
Avail Cap(c_a), veh/h	658	1798	764	709	948	806	1200	899	764	302	0	367
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.1	10.4	11.4	8.2	10.9	9.0	27.5	19.8	21.5	33.5	0.0	33.8
Incr Delay (d2), s/veh	0.0	0.1	0.8	0.0	1.0	0.0	2.4	0.0	0.4	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.7	2.0	0.3	3.4	0.0	5.4	0.0	0.0	0.0	0.0	0.1
Lane Grp Delay (d), s/veh	10.1	10.5	12.2	8.3	12.0	9.0	29.9	19.8	21.8	33.6	0.0	34.1
Lane Grp LOS	B	B	B	A	B	A	C	B	C	C		C
Approach Vol, veh/h		358			375			746			8	
Approach Delay, s/veh		11.4			11.6			28.5			34.0	
Approach LOS		B			B			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.2	40.0		6.2	42.0		20.6	24.2		4.2	7.7	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	7.4		2.8	10.0		14.8	6.5		2.1	2.2	
Green Ext Time (p_c), s	0.0	3.8		0.0	3.8		1.9	0.4		0.0	0.3	

Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	8.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	420	15	15	90	30	185
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	452	16	16	97	32	199

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	161	32	32	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	129	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	830	1042	1580	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	822	1042	1580	-	-	-
Mov Capacity-2 Maneuver	822	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1580	-	828	-	-
HCM Lane V/C Ratio	0.01	-	0.565	-	-
HCM Control Delay (s)	7.302	-	14.8	-	-
HCM Lane LOS	A		B		
HCM 95th %tile Q(veh)	0.031	-	3.606	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	175	65	95	100	4	200	1	250	12	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	194	72	106	111	4	222	1	278	13	3	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	111	0	0	194	0	0	522	519	194	658	519	111
Stage 1	-	-	-	-	-	-	197	197	-	322	322	-
Stage 2	-	-	-	-	-	-	325	322	-	336	197	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1479	-	-	1379	-	-	465	461	847	378	461	942
Stage 1	-	-	-	-	-	-	805	738	-	690	651	-
Stage 2	-	-	-	-	-	-	687	651	-	678	738	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1479	-	-	1379	-	-	434	425	847	239	425	942
Mov Capacity-2 Maneuver	-	-	-	-	-	-	434	425	-	239	425	-
Stage 1	-	-	-	-	-	-	804	738	-	690	601	-
Stage 2	-	-	-	-	-	-	629	601	-	455	738	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.7	15.8	18
HCM LOS			C	C

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	434	704	1479	-	-	1379	-	-	239	347
HCM Lane V/C Ratio	0.341	0.501	0.001	-	-	0.077	-	-	0.037	0.029
HCM Control Delay (s)	17.5	15.1	7.436	-	-	7.827	-	-	20.6	15.7
HCM Lane LOS	C	C	A			A			C	C
HCM 95th %tile Q(veh)	1.492	2.833	0.002	-	-	0.248	-	-	0.115	0.089

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	41	5	3	270	90	13
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	-	-	-	-	150
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	45	5	3	293	98	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	398	98	98	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	607	958	1495	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	606	958	1495	-	-	-
Mov Capacity-2 Maneuver	606	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	750	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1495	-	631	-	-
HCM Lane V/C Ratio	0.002	-	0.079	-	-
HCM Control Delay (s)	7.413	0	11.2	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.007	-	0.257	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	70	31	10	155	92	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	34	11	168	100	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	76	0	266	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	190	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1523	-	723	985
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	842	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1523	-	718	985
Mov Capacity-2 Maneuver	-	-	-	-	718	-
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	10.6
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	773	-	-	1523	-
HCM Lane V/C Ratio	0.176	-	-	0.007	-
HCM Control Delay (s)	10.6	-	-	7.381	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.635	-	-	0.022	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	415	620	100	160	3	330	2	70	8	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	738	2018	1097	390	1091	928	521	351	298	174	17	60
Arrive On Green	0.00	0.54	0.54	0.05	0.59	0.59	0.15	0.19	0.19	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	364	1274
Grp Volume(v), veh/h	4	500	747	120	193	4	398	2	84	10	0	9
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1638
Q Serve(g_s), s	0.1	5.4	20.8	1.9	3.6	0.1	8.4	0.1	3.4	0.4	0.0	0.4
Cycle Q Clear(g_c), s	0.1	5.4	20.8	1.9	3.6	0.1	8.4	0.1	3.4	0.4	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	738	2018	1097	390	1091	928	521	351	298	174	0	77
V/C Ratio(X)	0.01	0.25	0.68	0.31	0.18	0.00	0.76	0.01	0.28	0.06	0.00	0.12
Avail Cap(c_a), veh/h	871	2018	1097	445	1091	928	955	763	648	297	0	346
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.8	9.2	6.8	5.8	7.2	6.5	30.8	25.0	26.3	33.8	0.0	34.6
Incr Delay (d2), s/veh	0.0	0.3	3.4	0.4	0.4	0.0	2.4	0.0	0.5	0.1	0.0	0.7
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 Back of Q (50%), veh/ln	0.0	2.2	6.5	0.7	1.4	0.0	3.7	0.0	1.3	0.2	0.0	0.2
Lane Grp Delay (d), s/veh	7.8	9.5	10.2	6.3	7.6	6.5	33.2	25.0	26.8	34.0	0.0	35.2
Lane Grp LOS	A	A	B	A	A	A	C	C	C	C		D
Approach Vol, veh/h		1251			317			484			19	
Approach Delay, s/veh		9.9			7.1			32.0			34.6	
Approach LOS		A			A			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.3	45.0		7.7	48.4		15.5	18.3		4.8	7.6	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	22.8		3.9	5.6		10.4	5.4		2.4	2.4	
Green Ext Time (p_c), s	0.0	7.5		0.1	9.3		1.1	0.3		0.0	0.2	

Intersection Summary		
HCM 2010 Ctrl Delay		14.9
HCM 2010 LOS		B

Notes

Intersection	
Intersection Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	325	15	15	40	80	375
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	369	17	17	45	91	426

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	171	91	91	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	819	967	1504	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	810	967	1504	-	-	-
Mov Capacity-2 Maneuver	810	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1504	-	816	-	-
HCM Lane V/C Ratio	0.011	-	0.473	-	-
HCM Control Delay (s)	7.421	-	13.3	-	-
HCM Lane LOS	A		B		
HCM 95th %tile Q(veh)	0.034	-	2.574	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	185	250	250	125	15	120	4	145	8	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	203	275	275	137	16	132	4	159	9	2	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	137	0	0	203	0	0	896	895	203	977	895	137
Stage 1	-	-	-	-	-	-	208	208	-	687	687	-
Stage 2	-	-	-	-	-	-	688	687	-	290	208	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1447	-	-	1369	-	-	261	280	838	230	280	911
Stage 1	-	-	-	-	-	-	794	730	-	437	447	-
Stage 2	-	-	-	-	-	-	436	447	-	718	730	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1447	-	-	1369	-	-	219	223	838	155	223	911
Mov Capacity-2 Maneuver	-	-	-	-	-	-	219	223	-	155	223	-
Stage 1	-	-	-	-	-	-	793	729	-	436	357	-
Stage 2	-	-	-	-	-	-	346	357	-	577	729	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.3	21.5	25.9
HCM LOS			C	D

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	219	506	1447	-	-	1369	-	-	155	208
HCM Lane V/C Ratio	0.401	0.41	0.002	-	-	0.201	-	-	0.038	0.03
HCM Control Delay (s)	32	17	7.492	-	-	8.289	-	-	29.1	22.8
HCM Lane LOS	D	C	A			A			D	C
HCM 95th %tile Q(veh)	1.812	1.983	0.005	-	-	0.749	-	-	0.117	0.092

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	27	4	5	150	270	45
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	-	-	-	-	150
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	29	4	5	163	293	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	467	293	293	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	554	746	1269	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	552	746	1269	-	-	-
Mov Capacity-2 Maneuver	552	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	853	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.3	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1269	-	571	-	-
HCM Lane V/C Ratio	0.004	-	0.059	-	-
HCM Control Delay (s)	7.849	0	11.7	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.013	-	0.188	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	145	102	37	90	60	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	158	111	40	98	65	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	158	0	336	158
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	178	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1422	-	659	887
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	853	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1422	-	640	887
Mov Capacity-2 Maneuver	-	-	-	-	640	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	829	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	11
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	692	-	-	1422	-
HCM Lane V/C Ratio	0.129	-	-	0.028	-
HCM Control Delay (s)	11	-	-	7.605	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.441	-	-	0.087	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	145	180	36	300	3	575	2	112	2	3	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	516	1785	759	612	943	801	784	513	436	163	43	43
Arrive On Green	0.00	0.48	0.48	0.03	0.51	0.51	0.23	0.28	0.28	0.00	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	856	856
Grp Volume(v), veh/h	3	161	200	40	333	3	639	2	124	2	0	6
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1712
Q Serve(g_s), s	0.1	1.8	5.7	0.8	8.1	0.1	13.2	0.1	4.6	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.1	1.8	5.7	0.8	8.1	0.1	13.2	0.1	4.6	0.1	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	516	1785	759	612	943	801	784	513	436	163	0	86
V/C Ratio(X)	0.01	0.09	0.26	0.07	0.35	0.00	0.82	0.00	0.28	0.01	0.00	0.07
Avail Cap(c_a), veh/h	652	1785	759	701	943	801	1191	893	759	300	0	365
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.3	10.6	11.7	8.4	11.2	9.2	27.5	19.7	21.4	33.8	0.0	34.0
Incr Delay (d2), s/veh	0.0	0.1	0.8	0.0	1.0	0.0	2.7	0.0	0.4	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.7	2.1	0.3	3.5	0.0	5.7	0.0	0.0	0.0	0.0	0.1
Lane Grp Delay (d), s/veh	10.3	10.7	12.5	8.4	12.2	9.2	30.2	19.7	21.7	33.8	0.0	34.4
Lane Grp LOS	B	B	B	A	B	A	C	B	C	C		C
Approach Vol, veh/h		364			376			765			8	
Approach Delay, s/veh		11.7			11.8			28.8			34.2	
Approach LOS		B			B			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.2	40.0		6.3	42.0		21.1	24.7		4.2	7.8	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	7.7		2.8	10.1		15.2	6.6		2.1	2.3	
Green Ext Time (p_c), s	0.0	3.8		0.0	3.8		1.9	0.4		0.0	0.3	

Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	434	15	15	90	30	190
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	467	16	16	97	32	204

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	161	32	32	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	129	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	830	1042	1580	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	822	1042	1580	-	-	-
Mov Capacity-2 Maneuver	822	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.2	1	0
HCM LOS	C		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1580	-	828	-	-
HCM Lane V/C Ratio	0.01	-	0.583	-	-
HCM Control Delay (s)	7.302	-	15.2	-	-
HCM Lane LOS	A		C		
HCM 95th %tile Q(veh)	0.031	-	3.852	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	177	65	99	101	4	200	1	262	12	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	197	72	110	112	4	222	1	291	13	3	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	112	0	0	197	0	0	534	531	197	677	531	112
Stage 1	-	-	-	-	-	-	199	199	-	332	332	-
Stage 2	-	-	-	-	-	-	335	332	-	345	199	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1478	-	-	1376	-	-	457	454	844	367	454	941
Stage 1	-	-	-	-	-	-	803	736	-	681	644	-
Stage 2	-	-	-	-	-	-	679	644	-	671	736	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1478	-	-	1376	-	-	425	417	844	225	417	941
Mov Capacity-2 Maneuver	-	-	-	-	-	-	425	417	-	225	417	-
Stage 1	-	-	-	-	-	-	802	736	-	681	593	-
Stage 2	-	-	-	-	-	-	620	593	-	439	736	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.8	16.3	18.8
HCM LOS			C	C

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	425	702	1478	-	-	1376	-	-	225	332
HCM Lane V/C Ratio	0.349	0.522	0.001	-	-	0.08	-	-	0.04	0.03
HCM Control Delay (s)	17.9	15.6	7.438	-	-	7.843	-	-	21.7	16.2
HCM Lane LOS	C	C	A			A			C	C
HCM 95th %tile Q(veh)	1.537	3.051	0.002	-	-	0.26	-	-	0.123	0.093

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	58	6	3	270	90	19
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	-	-	-	-	150
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	63	7	3	293	98	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	398	98	98	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	607	958	1495	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	606	958	1495	-	-	-
Mov Capacity-2 Maneuver	606	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	750	-	-	-	-	-

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

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1495	-	628	-	-
HCM Lane V/C Ratio	0.002	-	0.111	-	-
HCM Control Delay (s)	7.413	0	11.4	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.007	-	0.372	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	71	31	14	155	92	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	34	15	168	100	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	77	0	276	77
Stage 1	-	-	-	-	77	-
Stage 2	-	-	-	-	199	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1522	-	714	984
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	835	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1522	-	707	984
Mov Capacity-2 Maneuver	-	-	-	-	707	-
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	778	-	-	1522	-
HCM Lane V/C Ratio	0.19	-	-	0.01	-
HCM Control Delay (s)	10.7	-	-	7.389	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.698	-	-	0.03	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	415	637	103	160	3	340	2	71	8	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	734	2007	1098	385	1087	924	533	358	304	174	17	60
Arrive On Green	0.00	0.54	0.54	0.05	0.58	0.58	0.15	0.19	0.19	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	364	1274
Grp Volume(v), veh/h	4	500	767	124	193	4	410	2	86	10	0	9
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1638
Q Serve(g_s), s	0.1	5.4	21.9	2.0	3.7	0.1	8.7	0.1	3.5	0.4	0.0	0.4
Cycle Q Clear(g_c), s	0.1	5.4	21.9	2.0	3.7	0.1	8.7	0.1	3.5	0.4	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	734	2007	1098	385	1087	924	533	358	304	174	0	77
V/C Ratio(X)	0.01	0.25	0.70	0.32	0.18	0.00	0.77	0.01	0.28	0.06	0.00	0.12
Avail Cap(c_a), veh/h	867	2007	1098	438	1087	924	949	759	645	296	0	344
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	9.4	6.9	5.9	7.4	6.6	30.9	24.9	26.3	34.0	0.0	34.8
Incr Delay (d2), s/veh	0.0	0.3	3.7	0.5	0.4	0.0	2.4	0.0	0.5	0.1	0.0	0.7
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 Back of Q (50%), veh/ln	0.0	2.2	7.0	0.7	1.4	0.0	3.8	0.0	0.0	0.2	0.0	0.2
Lane Grp Delay (d), s/veh	8.0	9.7	10.6	6.4	7.7	6.6	33.2	24.9	26.8	34.2	0.0	35.4
Lane Grp LOS	A	A	B	A	A	A	C	C	C	C		D
Approach Vol, veh/h		1271			321			498			19	
Approach Delay, s/veh		10.2			7.2			32.1			34.8	
Approach LOS		B			A			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.3	45.0		7.8	48.4		15.8	18.6		4.8	7.6	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.1	23.9		4.0	5.7		10.7	5.5		2.4	2.4	
Green Ext Time (p_c), s	0.0	7.4		0.1	9.5		1.1	0.3		0.0	0.2	

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	334	15	15	40	80	391
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	380	17	17	45	91	444

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	171	91	91	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	819	967	1504	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	810	967	1504	-	-	-
Mov Capacity-2 Maneuver	810	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1504	-	816	-	-
HCM Lane V/C Ratio	0.011	-	0.486	-	-
HCM Control Delay (s)	7.421	-	13.5	-	-
HCM Lane LOS	A		B		
HCM 95th %tile Q(veh)	0.034	-	2.698	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	186	250	263	128	15	120	4	153	8	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	204	275	289	141	16	132	4	168	9	2	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	141	0	0	204	0	0	929	928	204	1014	928	141
Stage 1	-	-	-	-	-	-	209	209	-	719	719	-
Stage 2	-	-	-	-	-	-	720	719	-	295	209	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1442	-	-	1368	-	-	248	268	837	217	268	907
Stage 1	-	-	-	-	-	-	793	729	-	420	433	-
Stage 2	-	-	-	-	-	-	419	433	-	713	729	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1442	-	-	1368	-	-	206	211	837	143	211	907
Mov Capacity-2 Maneuver	-	-	-	-	-	-	206	211	-	143	211	-
Stage 1	-	-	-	-	-	-	792	728	-	419	342	-
Stage 2	-	-	-	-	-	-	328	342	-	566	728	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.4	22.7	27.6
HCM LOS			C	D

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	206	498	1442	-	-	1368	-	-	143	194
HCM Lane V/C Ratio	0.427	0.435	0.002	-	-	0.211	-	-	0.041	0.032
HCM Control Delay (s)	34.9	17.7	7.5	-	-	8.335	-	-	31.2	24.2
HCM Lane LOS	D	C	A			A			D	C
HCM 95th %tile Q(veh)	1.97	2.173	0.005	-	-	0.799	-	-	0.127	0.099

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	38	5	6	150	270	65
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	-	-	-	-	150
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	41	5	7	163	293	71

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	469	293	293	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	176	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	553	746	1269	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	550	746	1269	-	-	-
Mov Capacity-2 Maneuver	550	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	850	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.3	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1269	-	567	-	-
HCM Lane V/C Ratio	0.005	-	0.082	-	-
HCM Control Delay (s)	7.852	0	11.9	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.015	-	0.268	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	146	102	49	91	60	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	159	111	53	99	65	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	159	0	364	159
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	205	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1420	-	635	886
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	829	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1420	-	611	886
Mov Capacity-2 Maneuver	-	-	-	-	611	-
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	798	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	11.2
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	680	-	-	1420	-
HCM Lane V/C Ratio	0.142	-	-	0.038	-
HCM Control Delay (s)	11.2	-	-	7.634	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.494	-	-	0.117	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	165	243	34	375	15	716	90	83	45	70	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	361	1571	1075	503	784	667	906	616	524	269	108	77
Arrive On Green	0.03	0.42	0.42	0.02	0.28	0.28	0.26	0.33	0.33	0.03	0.11	0.11
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1015	721
Grp Volume(v), veh/h	38	179	264	37	408	16	778	98	90	49	0	130
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1736
Q Serve(g_s), s	1.0	2.5	5.5	1.0	15.8	0.6	18.4	3.2	3.4	2.1	0.0	6.2
Cycle Q Clear(g_c), s	1.0	2.5	5.5	1.0	15.8	0.6	18.4	3.2	3.4	2.1	0.0	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	361	1571	1075	503	784	667	906	616	524	269	0	185
V/C Ratio(X)	0.11	0.11	0.25	0.07	0.52	0.02	0.86	0.16	0.17	0.18	0.00	0.70
Avail Cap(c_a), veh/h	436	1571	1075	579	784	667	1067	784	667	335	0	325
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	15.0	5.3	13.4	23.4	18.0	30.0	20.2	20.3	32.6	0.0	36.9
Incr Delay (d2), s/veh	0.1	0.1	0.5	0.1	2.5	0.1	6.3	0.1	0.2	0.3	0.0	4.8
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 Back of Q (50%), veh/ln	0.4	1.1	0.2	0.4	7.9	0.2	8.2	1.4	1.3	0.9	0.0	2.9
Lane Grp Delay (d), s/veh	14.9	15.2	5.8	13.5	25.9	18.1	36.3	20.3	20.4	32.9	0.0	41.7
Lane Grp LOS	B	B	A	B	C	B	D	C	C	C		D
Approach Vol, veh/h		481			461			966			179	
Approach Delay, s/veh		10.0			24.6			33.2			39.3	
Approach LOS		B			C			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	6.4	40.0		6.3	40.0		26.0	32.3		6.8	13.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	3.0	7.5		3.0	17.8		20.4	5.4		4.1	8.2	
Green Ext Time (p_c), s	0.0	4.9		0.0	4.4		1.6	1.6		0.0	0.9	

Intersection Summary	
HCM 2010 Ctrl Delay	26.5
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	14

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	361	50	85	175	75	209
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	388	54	91	188	81	225

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	452	81	81	0	-	0
Stage 1	81	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	565	979	1517	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	531	979	1517	-	-	-
Mov Capacity-2 Maneuver	531	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	656	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31	2.5	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	562	-	-
HCM Lane V/C Ratio	0.06	-	0.786	-	-
HCM Control Delay (s)	7.525	-	31	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.192	-	7.397	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	158	90	110	179	4	250	1	243	12	3	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	755	1066	906	791	1146	974	389	1	303	135	143	95
Arrive On Green	0.00	1.00	1.00	0.04	0.62	0.62	0.07	0.19	0.19	0.01	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	6	1578	1774	1044	696
Grp Volume(v), veh/h	1	172	98	120	195	4	272	0	265	13	0	5
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1584	1774	0	1740
Q Serve(g_s), s	0.0	0.0	0.0	2.1	4.0	0.1	6.0	0.0	14.5	0.6	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.1	4.0	0.1	6.0	0.0	14.5	0.6	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	755	1066	906	791	1146	974	389	0	304	135	0	238
V/C Ratio(X)	0.00	0.16	0.11	0.15	0.17	0.00	0.70	0.00	0.87	0.10	0.00	0.02
Avail Cap(c_a), veh/h	872	1066	906	833	1146	974	389	0	373	233	0	410
HCM Platoon Ratio	2.00	2.00	2.00	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.1	0.0	0.0	5.1	7.4	6.6	30.9	0.0	34.9	33.0	0.0	33.3
Incr Delay (d2), s/veh	0.0	0.3	0.2	0.1	0.3	0.0	5.5	0.0	17.0	0.3	0.0	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 Back of Q (50%), veh/ln	0.0	0.1	0.1	0.8	1.8	0.0	3.4	0.0	7.0	0.2	0.0	0.1
Lane Grp Delay (d), s/veh	8.1	0.3	0.2	5.2	7.7	6.6	36.3	0.0	51.9	33.3	0.0	33.3
Lane Grp LOS	A	A	A	A	A	A	D		D	C		C
Approach Vol, veh/h		271			319			537			18	
Approach Delay, s/veh		0.3			6.7			44.0			33.3	
Approach LOS		A			A			D			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.1	55.0		7.9	58.8		10.0	21.1		5.1	16.2	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	51.0		6.0	51.0		6.0	21.0		6.0	21.0	
Max Q Clear Time (g_c+I1), s	2.0	2.0		4.1	6.0		8.0	16.5		2.6	2.2	
Green Ext Time (p_c), s	0.0	2.6		0.0	2.6		0.0	0.6		0.0	1.6	

Intersection Summary			
HCM 2010 Ctrl Delay		23.1	
HCM 2010 LOS		C	

Notes

Intersection	
Intersection Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	67	10	5	335	170	23
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	-	-	-	-	150
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	73	11	5	364	185	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	560	185	185	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	489	857	1390	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	487	857	1390	-	-	-
Mov Capacity-2 Maneuver	487	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1390	-	516	-	-
HCM Lane V/C Ratio	0.004	-	0.162	-	-
HCM Control Delay (s)	7.6	0	13.3	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.012	-	0.575	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	125	31	12	200	92	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	34	13	217	100	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	136	0	379	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	243	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1448	-	623	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	797	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1448	-	617	913
Mov Capacity-2 Maneuver	-	-	-	-	617	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	675	-	-	1448	-
HCM Lane V/C Ratio	0.201	-	-	0.009	-
HCM Control Delay (s)	11.7	-	-	7.509	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.748	-	-	0.027	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	550	775	108	255	10	472	10	74	10	25	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	579	1921	1145	335	1017	864	650	415	353	176	56	33
Arrive On Green	0.02	0.52	0.53	0.02	0.18	0.18	0.19	0.22	0.22	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1098	650
Grp Volume(v), veh/h	22	598	842	117	277	11	513	11	80	11	0	43
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1748
Q Serve(g_s), s	0.5	7.4	25.0	2.2	10.2	0.5	11.3	0.4	3.3	0.5	0.0	1.9
Cycle Q Clear(g_c), s	0.5	7.4	25.0	2.2	10.2	0.5	11.3	0.4	3.3	0.5	0.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	579	1921	1145	335	1017	864	650	415	353	176	0	89
V/C Ratio(X)	0.04	0.31	0.74	0.35	0.27	0.01	0.79	0.03	0.23	0.06	0.00	0.48
Avail Cap(c_a), veh/h	678	1921	1145	381	1017	864	930	726	617	291	0	352
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.1	11.1	6.5	8.0	19.0	15.0	30.7	24.2	25.3	35.2	0.0	36.7
Incr Delay (d2), s/veh	0.0	0.4	4.2	0.6	0.7	0.0	3.0	0.0	0.3	0.1	0.0	4.0
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 Back of Q (50%), veh/ln	0.2	3.0	7.7	0.9	5.3	0.2	4.9	0.2	1.3	0.2	0.0	0.9
Lane Grp Delay (d), s/veh	9.1	11.5	10.7	8.7	19.7	15.0	33.7	24.2	25.6	35.3	0.0	40.7
Lane Grp LOS	A	B	B	A	B	B	C	C	C	D		D
Approach Vol, veh/h		1462			405			604			54	
Approach Delay, s/veh		11.0			16.4			32.5			39.6	
Approach LOS		B			B			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	5.5	45.0		7.9	47.4		18.5	21.7		4.9	8.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.5	27.0		4.2	12.2		13.3	5.3		2.5	3.9	
Green Ext Time (p_c), s	0.0	7.9		0.0	11.5		1.2	0.5		0.0	0.3	

Intersection Summary	
HCM 2010 Ctrl Delay	17.6
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	9.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	288	105	65	120	175	361
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	150
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	313	114	71	130	190	392

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	462	190	190	0	-	0
Stage 1	190	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	558	852	1384	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	529	852	1384	-	-	-
Mov Capacity-2 Maneuver	529	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	734	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.6	2.7	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1384	-	589	-	-
HCM Lane V/C Ratio	0.051	-	0.725	-	-
HCM Control Delay (s)	7.741	-	25.6	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.161	-	6.087	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	244	275	233	178	15	160	4	139	8	2	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	797	1139	968	702	1248	1061	247	5	187	127	81	40
Arrive On Green	0.00	1.00	1.00	0.06	0.67	0.67	0.05	0.12	0.12	0.01	0.07	0.07
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	41	1548	1774	1173	586
Grp Volume(v), veh/h	2	265	299	253	193	16	174	0	155	9	0	3
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1589	1774	0	1759
Q Serve(g_s), s	0.0	0.0	0.0	3.7	3.5	0.3	4.5	0.0	8.6	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.7	3.5	0.3	4.5	0.0	8.6	0.4	0.0	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.33
Lane Grp Cap(c), veh/h	797	1139	968	702	1248	1061	247	0	192	127	0	121
V/C Ratio(X)	0.00	0.23	0.31	0.36	0.15	0.02	0.71	0.00	0.81	0.07	0.00	0.02
Avail Cap(c_a), veh/h	901	1139	968	702	1248	1061	247	0	271	218	0	300
HCM Platoon Ratio	1.67	1.67	1.67	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	0.0	3.7	5.5	5.0	37.0	0.0	38.9	38.9	0.0	39.4
Incr Delay (d2), s/veh	0.0	0.5	0.8	0.3	0.3	0.0	8.8	0.0	11.5	0.2	0.0	0.1
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 Back of Q (50%), veh/ln	0.0	0.2	0.2	1.3	1.4	0.1	2.3	0.0	4.0	0.2	0.0	0.1
Lane Grp Delay (d), s/veh	6.8	0.5	0.8	4.0	5.8	5.0	45.9	0.0	50.4	39.1	0.0	39.5
Lane Grp LOS	A	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		566			462			329			12	
Approach Delay, s/veh		0.7			4.8			48.0			39.2	
Approach LOS		A			A			D			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.7	60.0		10.0	65.3		10.0	15.4		5.3	10.8	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Max Green Setting (Gmax), s	5.5	55.5		5.5	55.5		5.5	15.5		5.5	15.5	
Max Q Clear Time (g_c+I1), s	2.0	2.0		5.7	5.5		6.5	10.6		2.4	2.1	
Green Ext Time (p_c), s	0.0	4.1		0.0	4.1		0.0	0.3		0.0	0.7	

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	46	7	10	170	315	73
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	-	-	-	-	150
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	50	8	11	185	342	79

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	549	342	342	0	-	0
Stage 1	342	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	497	701	1217	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	492	701	1217	-	-	-
Mov Capacity-2 Maneuver	492	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	820	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.4	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1217	-	512	-	-
HCM Lane V/C Ratio	0.009	-	0.113	-	-
HCM Control Delay (s)	7.985	0	12.9	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.027	-	0.378	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	180	102	37	105	60	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	196	111	40	114	65	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	196	0	391	196
Stage 1	-	-	-	-	196	-
Stage 2	-	-	-	-	195	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1377	-	613	845
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	838	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1377	-	595	845
Mov Capacity-2 Maneuver	-	-	-	-	595	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	814	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	11.5
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1377	-
HCM Lane V/C Ratio	0.138	-	-	0.029	-
HCM Control Delay (s)	11.5	-	-	7.693	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.477	-	-	0.09	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	165	248	35	375	15	731	90	85	45	70	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	357	1559	1077	498	780	663	920	623	530	269	108	77
Arrive On Green	0.03	0.42	0.42	0.02	0.28	0.28	0.27	0.33	0.33	0.03	0.11	0.11
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1015	721
Grp Volume(v), veh/h	38	179	270	38	408	16	795	98	92	49	0	130
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1736
Q Serve(g_s), s	1.0	2.5	5.7	1.0	15.9	0.6	18.9	3.2	3.5	2.1	0.0	6.2
Cycle Q Clear(g_c), s	1.0	2.5	5.7	1.0	15.9	0.6	18.9	3.2	3.5	2.1	0.0	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	357	1559	1077	498	780	663	920	623	530	269	0	184
V/C Ratio(X)	0.11	0.11	0.25	0.08	0.52	0.02	0.86	0.16	0.17	0.18	0.00	0.70
Avail Cap(c_a), veh/h	432	1559	1077	572	780	663	1060	780	663	334	0	323
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.0	15.3	5.3	13.6	23.7	18.2	30.0	20.1	20.2	32.8	0.0	37.1
Incr Delay (d2), s/veh	0.1	0.1	0.6	0.1	2.5	0.1	6.8	0.1	0.2	0.3	0.0	4.9
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 Back of Q (50%), veh/ln	0.4	1.1	1.7	0.4	8.1	0.2	8.7	1.4	1.3	0.9	0.0	2.9
Lane Grp Delay (d), s/veh	15.1	15.4	5.9	13.7	26.2	18.3	36.9	20.2	20.4	33.1	0.0	42.0
Lane Grp LOS	B	B	A	B	C	B	D	C	C	C		D
Approach Vol, veh/h		487			462			985			179	
Approach Delay, s/veh		10.1			24.9			33.7			39.6	
Approach LOS		B			C			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	6.4	40.0		6.4	40.0		26.5	32.8		6.8	13.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	36.0		6.0	36.0		26.0	36.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	3.0	7.7		3.0	17.9		20.9	5.5		4.1	8.2	
Green Ext Time (p_c), s	0.0	4.9		0.0	4.4		1.5	1.6		0.0	0.9	

Intersection Summary			
HCM 2010 Ctrl Delay		26.8	
HCM 2010 LOS		C	

Notes

Intersection	
Intersection Delay, s/veh	15.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	375	50	85	175	75	214
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	-	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	403	54	91	188	81	230

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	452	81	81	0	-	0
Stage 1	81	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	565	979	1517	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	531	979	1517	-	-	-
Mov Capacity-2 Maneuver	531	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	656	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.7	2.5	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	561	-	-
HCM Lane V/C Ratio	0.06	-	0.815	-	-
HCM Control Delay (s)	7.525	-	33.7	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.192	-	8.115	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	160	90	114	180	4	250	1	255	12	3	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	746	1055	897	784	1136	966	398	1	314	133	151	101
Arrive On Green	0.00	1.00	1.00	0.04	0.61	0.61	0.07	0.20	0.20	0.01	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	6	1578	1774	1044	696
Grp Volume(v), veh/h	1	174	98	124	196	4	272	0	278	13	0	5
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1584	1774	0	1740
Q Serve(g_s), s	0.0	0.0	0.0	2.2	4.1	0.1	6.0	0.0	15.4	0.6	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.2	4.1	0.1	6.0	0.0	15.4	0.6	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	746	1055	897	784	1136	966	398	0	315	133	0	252
V/C Ratio(X)	0.00	0.16	0.11	0.16	0.17	0.00	0.68	0.00	0.88	0.10	0.00	0.02
Avail Cap(c_a), veh/h	863	1055	897	823	1136	966	398	0	369	229	0	406
HCM Platoon Ratio	2.00	2.00	2.00	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.4	0.0	0.0	5.3	7.7	6.9	30.7	0.0	35.1	32.9	0.0	33.0
Incr Delay (d2), s/veh	0.0	0.3	0.2	0.1	0.3	0.0	4.8	0.0	19.2	0.3	0.0	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 Back of Q (50%), veh/ln	0.0	0.1	0.1	0.8	1.8	0.0	3.3	0.0	7.6	0.3	0.0	0.1
Lane Grp Delay (d), s/veh	8.4	0.3	0.2	5.4	8.0	6.9	35.5	0.0	54.3	33.2	0.0	33.1
Lane Grp LOS	A	A	A	A	A	A	D		D	C		C
Approach Vol, veh/h		273			324			550			18	
Approach Delay, s/veh		0.3			7.0			45.0			33.2	
Approach LOS		A			A			D			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.1	55.0		8.0	58.9		10.0	21.9		5.1	17.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	51.0		6.0	51.0		6.0	21.0		6.0	21.0	
Max Q Clear Time (g_c+I1), s	2.0	2.0		4.2	6.1		8.0	17.4		2.6	2.2	
Green Ext Time (p_c), s	0.0	2.6		0.0	2.6		0.0	0.6		0.0	1.6	

Intersection Summary			
HCM 2010 Ctrl Delay		23.8	
HCM 2010 LOS		C	

Notes

Intersection	
Intersection Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	84	11	5	335	170	29
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	-	-	-	-	150
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	91	12	5	364	185	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	560	185	185	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	489	857	1390	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	487	857	1390	-	-	-
Mov Capacity-2 Maneuver	487	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1390	-	513	-	-
HCM Lane V/C Ratio	0.004	-	0.201	-	-
HCM Control Delay (s)	7.6	0	13.8	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.012	-	0.745	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	126	31	16	200	92	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	34	17	217	100	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	137	0	389	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	252	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1447	-	615	911
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	790	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1447	-	608	911
Mov Capacity-2 Maneuver	-	-	-	-	608	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	781	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	11.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	681	-	-	1447	-
HCM Lane V/C Ratio	0.217	-	-	0.012	-
HCM Control Delay (s)	11.7	-	-	7.518	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.822	-	-	0.036	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	550	792	111	255	10	482	10	75	10	25	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0
Lanes	1	2	1	1	1	1	2	1	1	1	1	0
Cap, veh/h	576	1910	1145	332	1013	861	660	421	358	176	56	33
Arrive On Green	0.02	0.51	0.53	0.02	0.18	0.18	0.19	0.23	0.23	0.01	0.05	0.05
Sat Flow, veh/h	1774	3725	1583	1774	1863	1583	3442	1863	1583	1774	1098	650
Grp Volume(v), veh/h	22	598	861	121	277	11	524	11	82	11	0	43
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1863	1583	1774	0	1748
Q Serve(g_s), s	0.5	7.5	26.4	2.3	10.3	0.5	11.6	0.4	3.4	0.5	0.0	1.9
Cycle Q Clear(g_c), s	0.5	7.5	26.4	2.3	10.3	0.5	11.6	0.4	3.4	0.5	0.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	576	1910	1145	332	1013	861	660	421	358	176	0	90
V/C Ratio(X)	0.04	0.31	0.75	0.36	0.27	0.01	0.79	0.03	0.23	0.06	0.00	0.48
Avail Cap(c_a), veh/h	675	1910	1145	375	1013	861	925	722	614	290	0	350
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.3	11.3	6.7	8.2	19.2	15.2	30.8	24.1	25.3	35.4	0.0	36.9
Incr Delay (d2), s/veh	0.0	0.4	4.6	0.7	0.7	0.0	3.3	0.0	0.3	0.1	0.0	3.9
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 Back of Q (50%), veh/ln	0.2	3.0	8.2	0.9	5.3	0.2	5.1	0.2	1.3	0.2	0.0	0.9
Lane Grp Delay (d), s/veh	9.3	11.7	11.3	8.8	19.8	15.2	34.1	24.1	25.6	35.5	0.0	40.9
Lane Grp LOS	A	B	B	A	B	B	C	C	C	D		D
Approach Vol, veh/h		1481			409			617			54	
Approach Delay, s/veh		11.5			16.5			32.8			39.8	
Approach LOS		B			B			C			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	5.5	45.0		8.1	47.5		18.8	22.1		4.9	8.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	41.0		6.0	41.0		21.0	31.0		6.0	16.0	
Max Q Clear Time (g_c+I1), s	2.5	28.4		4.3	12.3		13.6	5.4		2.5	3.9	
Green Ext Time (p_c), s	0.0	7.5		0.0	11.7		1.2	0.5		0.0	0.3	

Intersection Summary												
HCM 2010 Ctrl Delay			18.0									
HCM 2010 LOS			B									

Notes

Intersection	
Intersection Delay, s/veh	9.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	297	105	65	120	175	377
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	-	150	-	-	150
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	323	114	71	130	190	410

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	462	190	190	0	-	0
Stage 1	190	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	558	852	1384	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	529	852	1384	-	-	-
Mov Capacity-2 Maneuver	529	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	734	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.8	2.7	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1384	-	587	-	-
HCM Lane V/C Ratio	0.051	-	0.744	-	-
HCM Control Delay (s)	7.741	-	26.8	-	-
HCM Lane LOS	A		D		
HCM 95th %tile Q(veh)	0.161	-	6.49	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	245	275	246	181	15	160	4	147	8	2	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Cap, veh/h	785	1130	960	690	1238	1052	256	5	198	125	90	45
Arrive On Green	0.00	1.00	1.00	0.06	0.66	0.66	0.05	0.13	0.13	0.01	0.08	0.08
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	38	1551	1774	1173	586
Grp Volume(v), veh/h	2	272	306	273	201	17	178	0	167	9	0	3
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1589	1774	0	1759
Q Serve(g_s), s	0.0	0.0	0.0	4.2	3.7	0.3	4.5	0.0	9.4	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.2	3.7	0.3	4.5	0.0	9.4	0.4	0.0	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.33
Lane Grp Cap(c), veh/h	785	1130	960	690	1238	1052	256	0	203	125	0	135
V/C Ratio(X)	0.00	0.24	0.32	0.40	0.16	0.02	0.70	0.00	0.82	0.07	0.00	0.02
Avail Cap(c_a), veh/h	888	1130	960	690	1238	1052	256	0	269	216	0	298
HCM Platoon Ratio	1.67	1.67	1.67	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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	0.0	0.0	3.9	5.8	5.2	37.0	0.0	38.9	38.6	0.0	39.1
Incr Delay (d2), s/veh	0.0	0.5	0.9	0.4	0.3	0.0	7.9	0.0	14.2	0.2	0.0	0.1
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 Back of Q (50%), veh/ln	0.0	0.2	0.2	1.4	1.5	0.1	2.3	0.0	4.5	0.2	0.0	0.1
Lane Grp Delay (d), s/veh	7.0	0.5	0.9	4.3	6.1	5.2	44.9	0.0	53.1	38.8	0.0	39.2
Lane Grp LOS	A	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		580			491			345			12	
Approach Delay, s/veh		0.7			5.0			48.9			38.9	
Approach LOS		A			A			D			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	4.7	60.0		10.0	65.3		10.0	16.2		5.3	11.5	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Max Green Setting (Gmax), s	5.5	55.5		5.5	55.5		5.5	15.5		5.5	15.5	
Max Q Clear Time (g_c+I1), s	2.0	2.0		6.2	5.7		6.5	11.4		2.4	2.1	
Green Ext Time (p_c), s	0.0	4.3		0.0	4.3		0.0	0.3		0.0	0.7	

Intersection Summary	
HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	57	8	11	170	315	93
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	-	-	-	-	150
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	62	9	12	185	342	101

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	551	342	342	0	-	0
Stage 1	342	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	495	701	1217	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	490	701	1217	-	-	-
Mov Capacity-2 Maneuver	490	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0.5	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1217	-	509	-	-
HCM Lane V/C Ratio	0.01	-	0.139	-	-
HCM Control Delay (s)	7.987	0	13.2	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.03	-	0.479	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	181	102	49	106	60	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	197	111	53	115	65	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	197	0	419	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	222	-
Follow-up Headway	-	-	2.218	-	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1376	-	591	844
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	815	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1376	-	568	844
Mov Capacity-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	784	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	11.7
HCM LOS			B

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	636	-	-	1376	-
HCM Lane V/C Ratio	0.152	-	-	0.039	-
HCM Control Delay (s)	11.7	-	-	7.722	-
HCM Lane LOS	B			A	
HCM 95th %tile Q(veh)	0.534	-	-	0.121	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

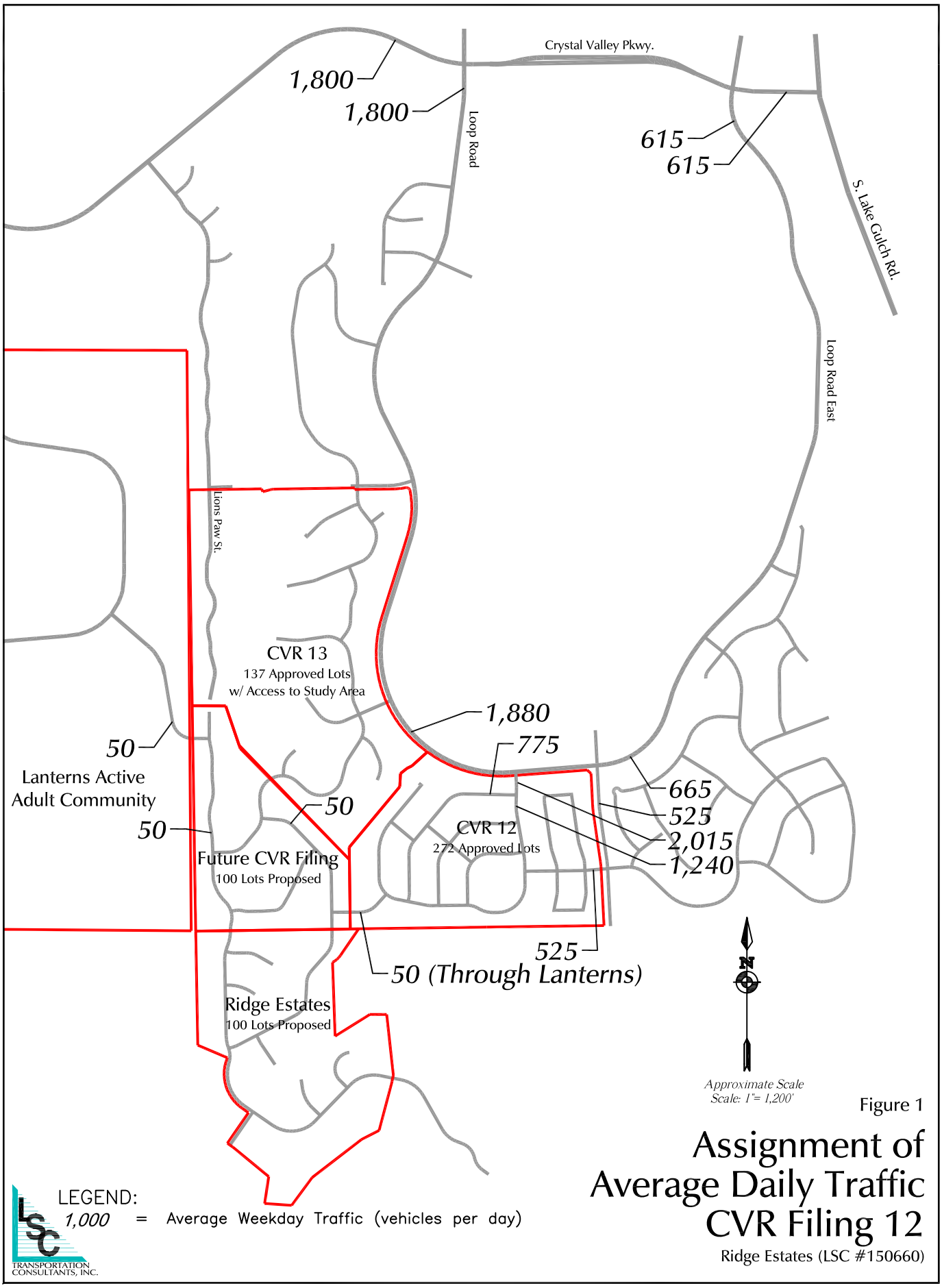


Figure 1

Assignment of Average Daily Traffic CVR Filing 12

Ridge Estates (LSC #150660)

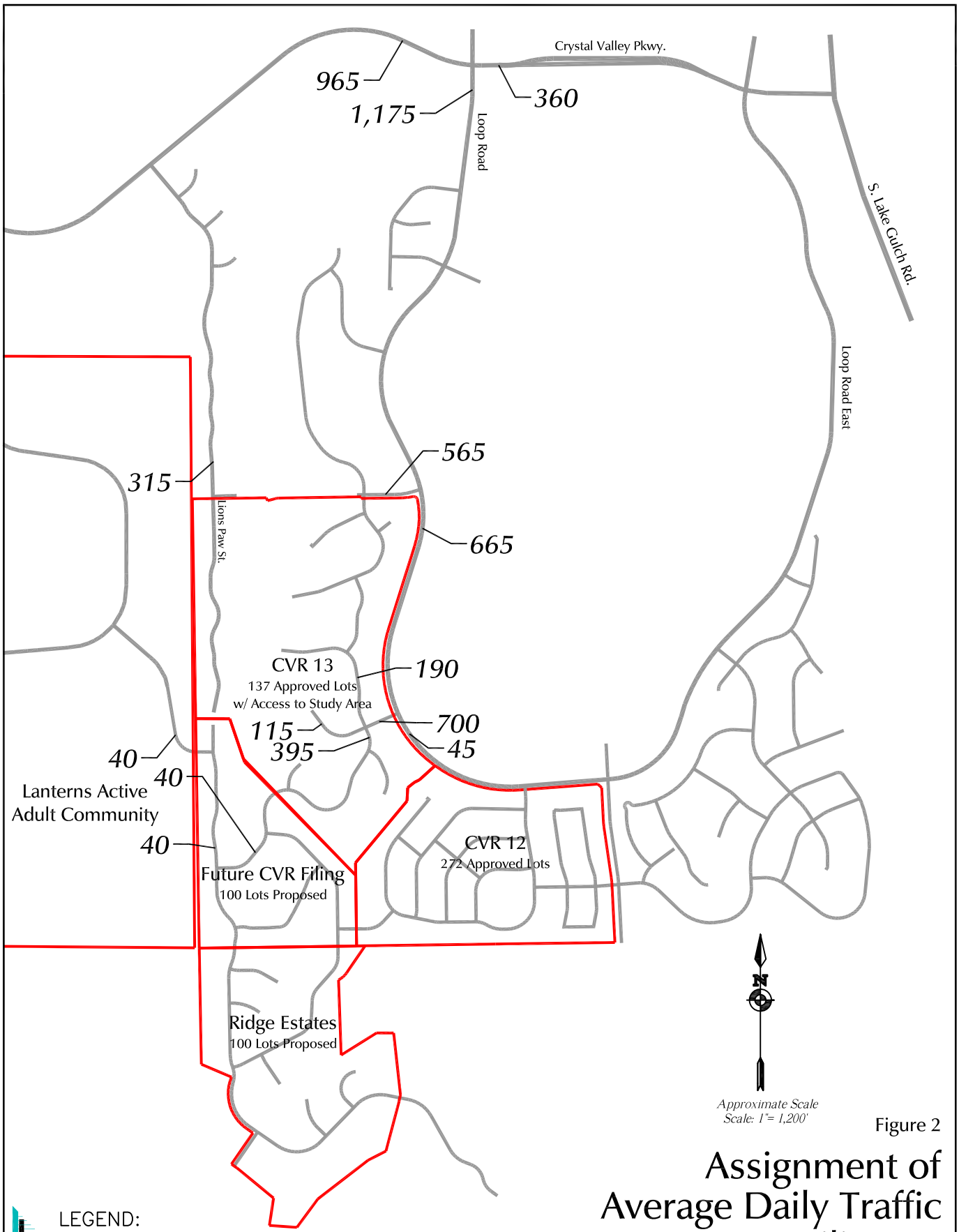
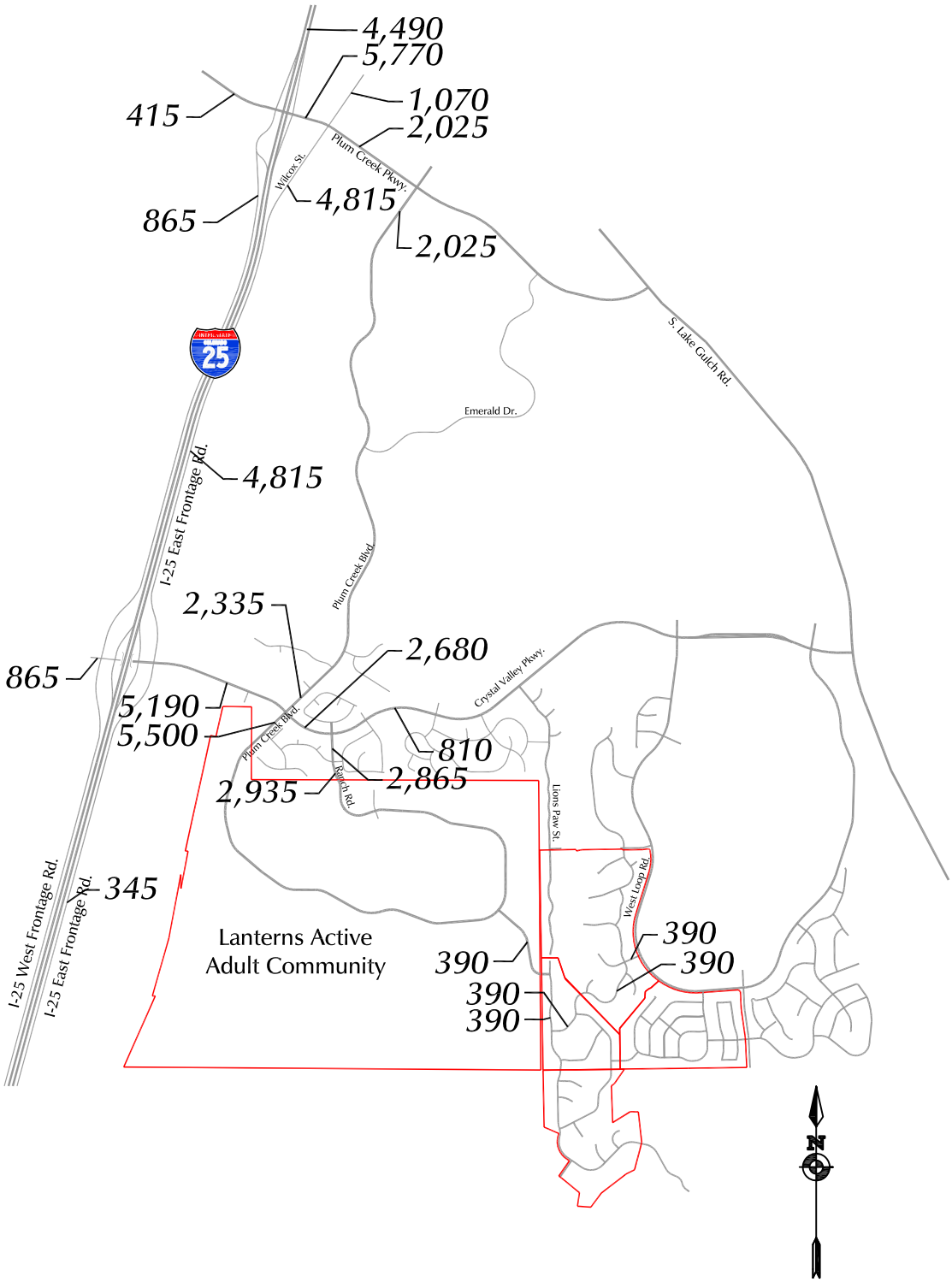


Figure 2

Assignment of Average Daily Traffic CVR Filing 13

Ridge Estates (LSC #150660)



Approximate Scale
Scale: 1"= 3,000'

Figure 3

Assignment of Average Daily Traffic Lanterns Active Adult Community

Ridge Estates (LSC #150660)

LEGEND:
1,000 = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

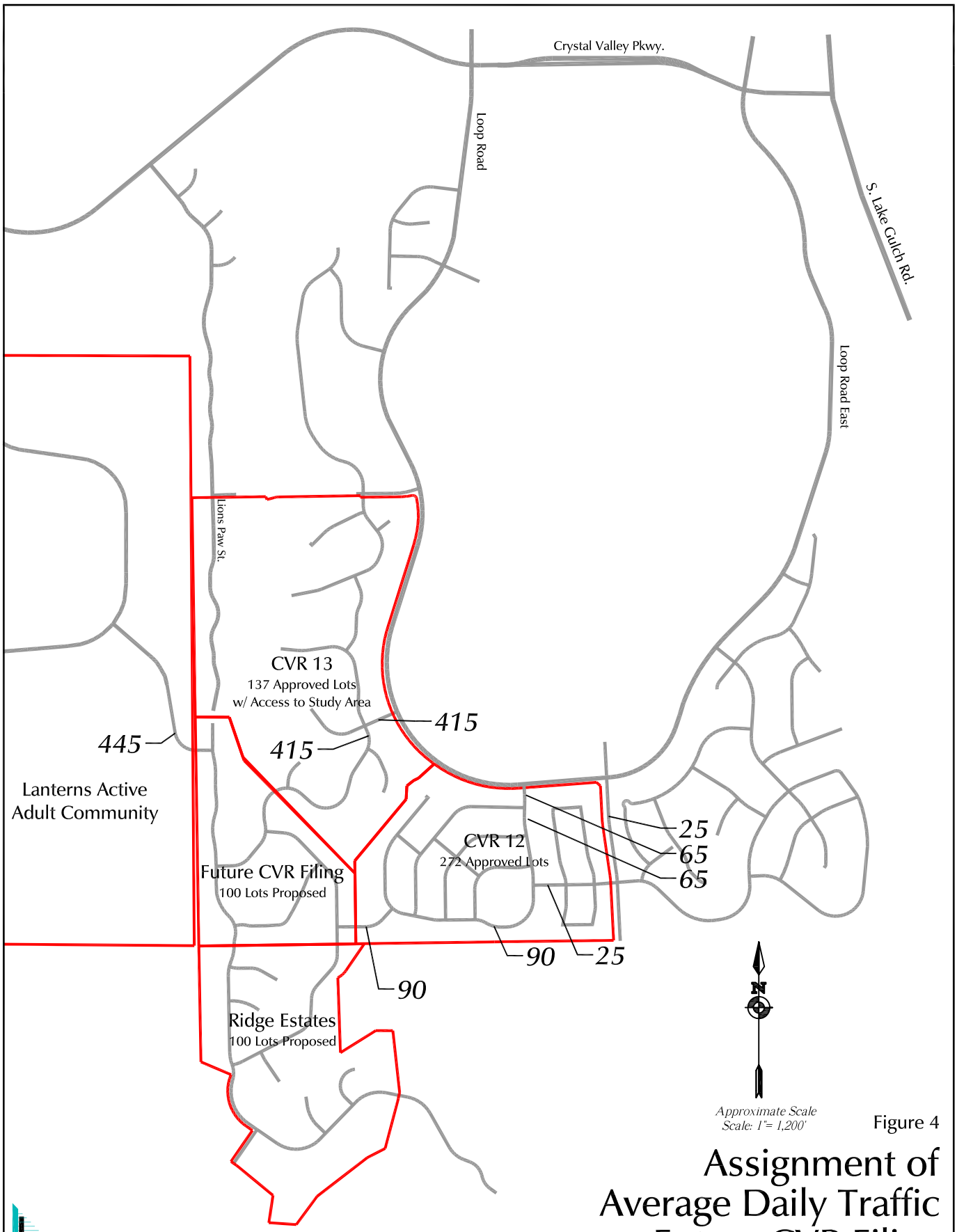


Figure 4

Assignment of Average Daily Traffic Future CVR Filing

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

LEGEND:

1,000 = Average Weekday Traffic (vehicles per day)

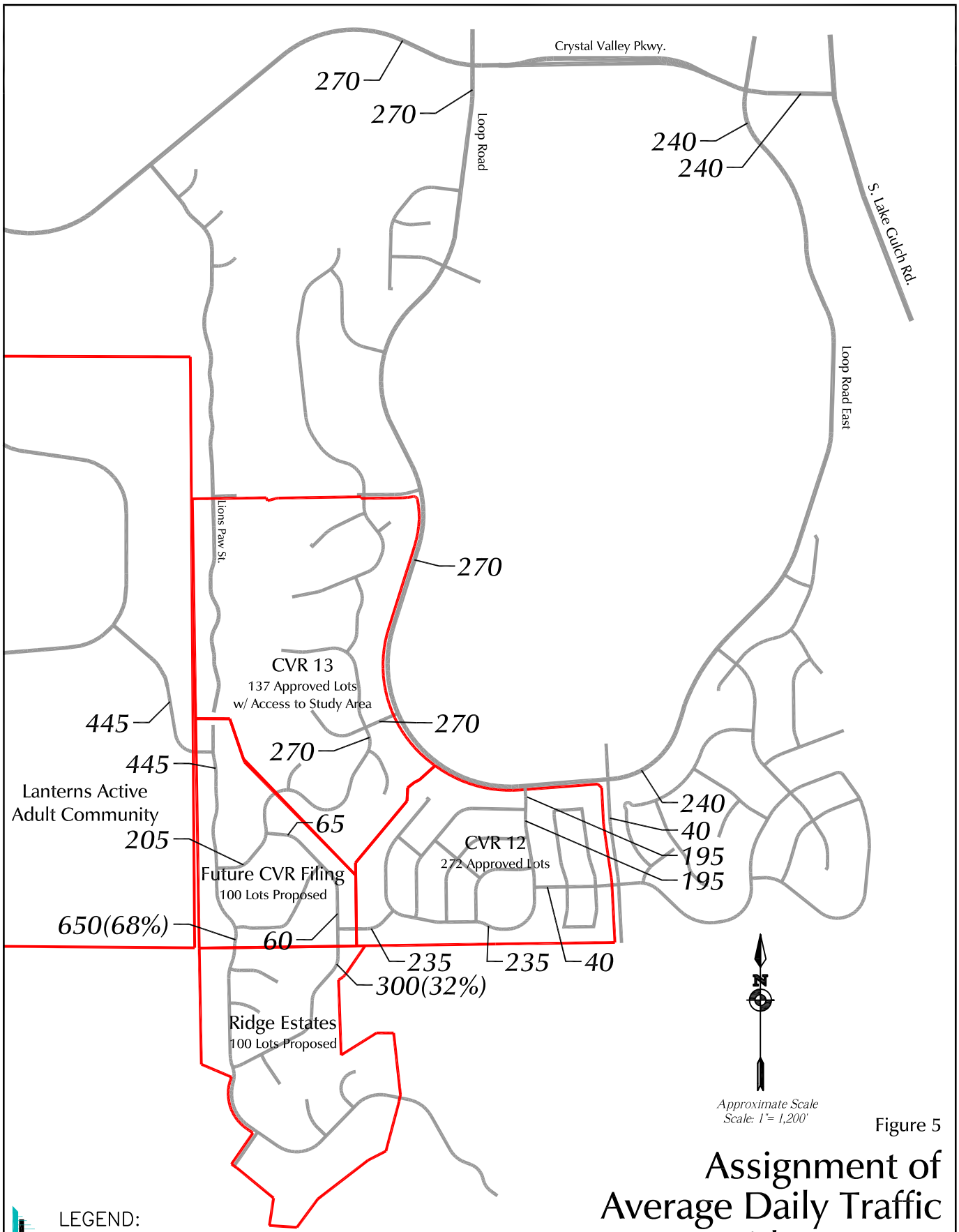


Figure 5

Assignment of Average Daily Traffic Ridge Estates

Ridge Estates (LSC #150660)

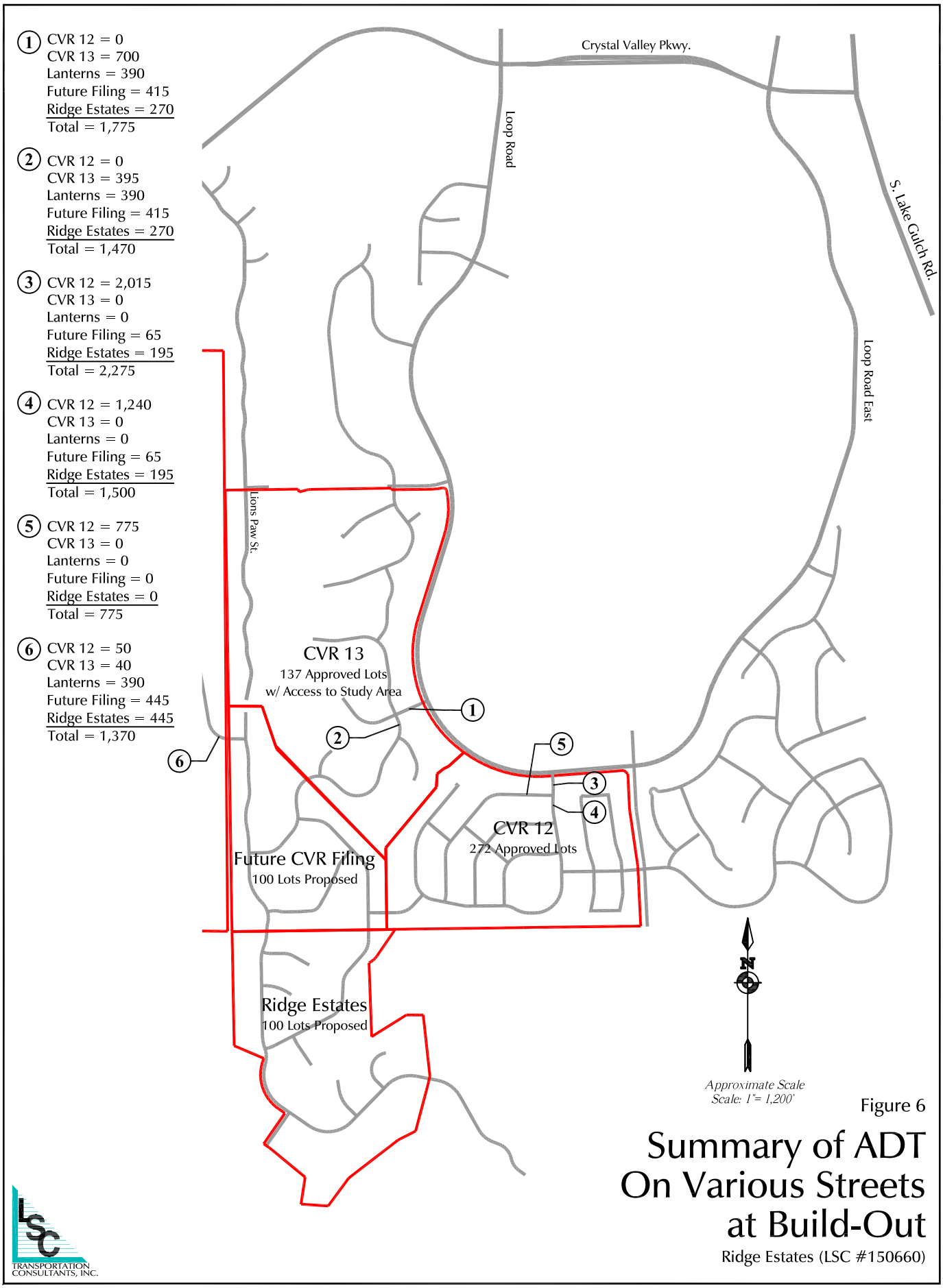


Figure 6

Summary of ADT On Various Streets at Build-Out

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street
Denver, CO 80206
(303) 333-1105
FAX (303) 333-1107
E-mail: lsc@lscdenver.com

November 15, 2016

Mr. Gregg Brown
Crystal Valley Ranch Development Company
Gregg@cvranch.com

Re: Ridge Estates
Castle Rock, CO
(LSC #150660)

Dear Mr. Brown:

In response to your request, LSC Transportation Consultants, Inc. has reviewed the estimated average daily traffic assignment from five different developments including the Ridge Estates development proposed for annexation into the Town of Castle Rock, Colorado.

The following is an explanation of the average daily traffic assignment for each of the five developments.

Crystal Valley Ranch Filing 12 (CVR 12)

The traffic impact for the 272 lots approved in CVR 12 was studied in the March 13, 2014 CVR 12 TIA by LSC. The trip assignment was shown in the attached Figure 7 from the TIA. At that time, the details of the connection from Crystal Valley Ranch west into the Lanterns was unknown so no trips were assigned through the Lanterns.

Figure 1 shows a modified assignment of the daily traffic for CVR 12 assuming four percent of CVR 12 trips pass through the Lanterns.

Crystal Valley Ranch Filing 13

The traffic impact for the 137 lots approved in CVR 13 with access to the study area (there were 33 lots approved with public access only via Lions Paw Street to the north) was studied in the January 22, 2015 CVR 13 TIA by LSC. The trip assignment was shown in the attached Figure 7 from the TIA.

Figure 2 shows a slightly modified assignment of the daily traffic for CVR 13 with an additional 25 vpd passing through the Lanterns.

Lanterns Active Adult Community (Lanterns)

The traffic impact for the 1,200 lots (475 non-active adult and 725 active adult) approved in the Lanterns was studied in the November 15, 2013 *The Lanterns Update TIA* by LSC. The trip assignment was shown in the attached Figure 7 from the TIA.

Figure 3 shows the assignment of the daily traffic for the proposed Lanterns Active Adult Community and is consistent with the TIA.

Future Crystal Valley Ranch

Figure 4 shows the assignment of the estimated average daily traffic for the future Crystal Valley Ranch filing between CVR 13 and Ridge Estates.

Ridge Estates

Prior daily traffic estimates for this parcel assumed 60 percent of trips would use the western access into Crystal Valley Ranch and 40 percent would use the eastern access. The Ridge Estates project team has had significant coordination over the last few months to discuss the appropriateness of this 60/40 split. The lot layouts and roadway orientation in Ridge Estates and the southern portion of the future CVR Fling were modified to encourage heavier use of the western access. Figure 5 shows a trip assignment based on a 66/34 split which reflects the modified roadway layout.

Summary

Figure 6 shows a summary of the average daily traffic assignment from each of the five properties along with the buildout total estimated at each location. Locations 1 and 3 are expected to exceed 1,500 vpd but are proposed as entry streets with no lot frontages which are allowed to exceed 1,500 vpd. The other four locations are expected to be less than 1,500 vpd.

* * * * *

We trust this information will assist you in planning for the Ridge Estates development. Please contact me if you have any questions or need further assistance.

Respectfully submitted,

LSC Transportation Consultants, Inc.



By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

11-15-16

CSM/wc

Enclosure: Figures 1 - 6
Figure 7 - CVR 12 TIA
Figure 7 - CVR 13 TIA
Figure 7 - The Lanterns Update TIA

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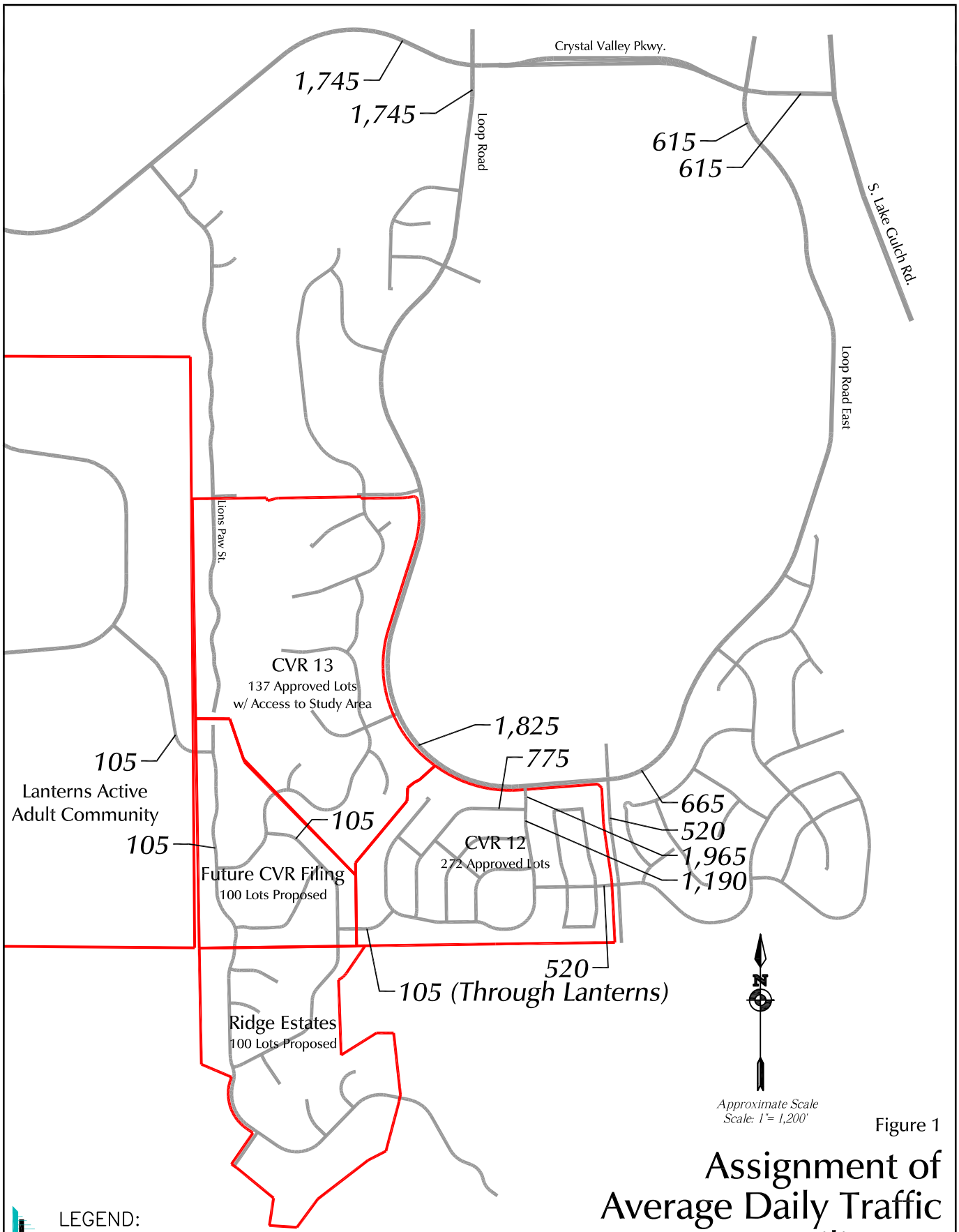


Figure 1

Assignment of Average Daily Traffic CVR Filing 12

Ridge Estates (LSC #150660)

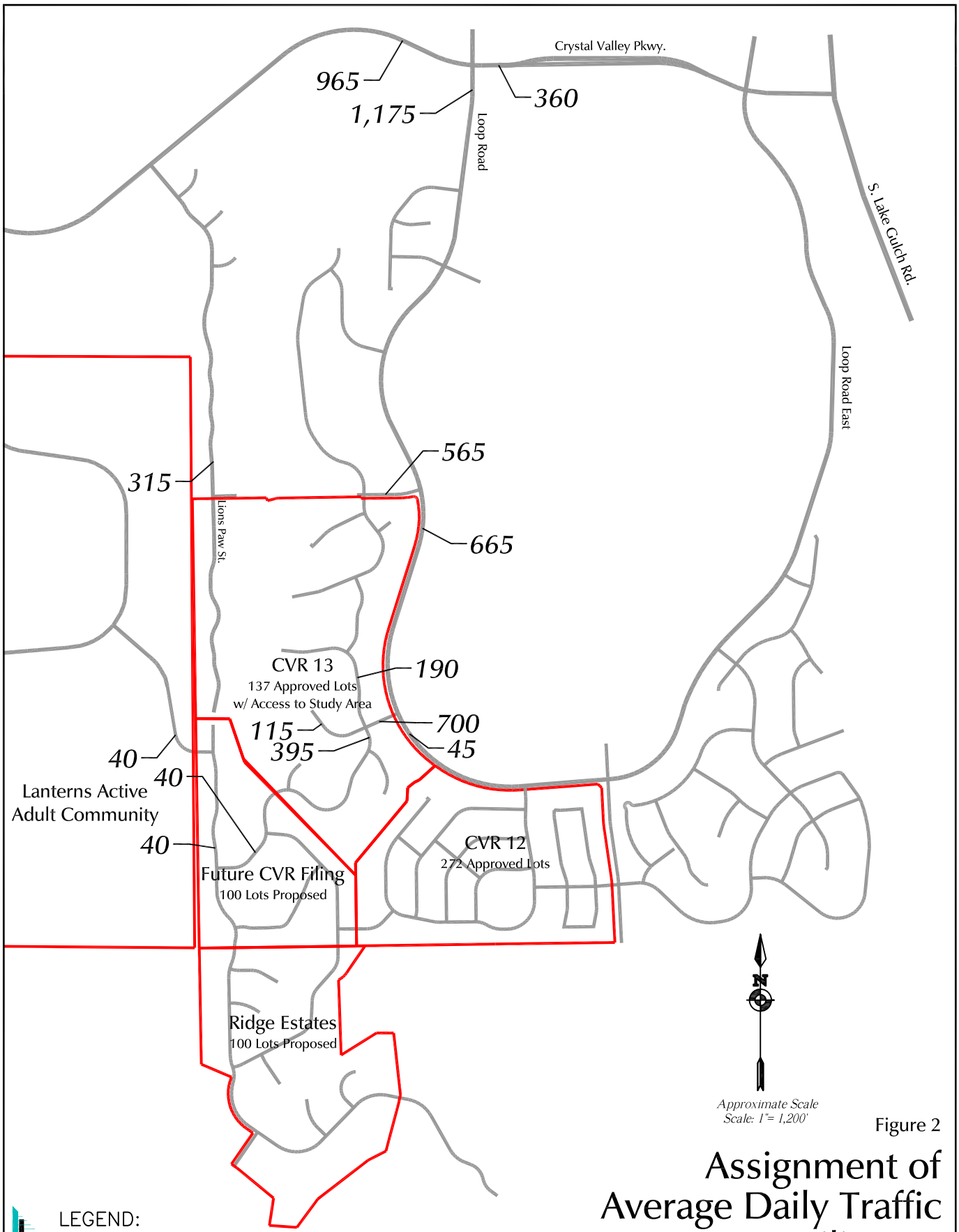
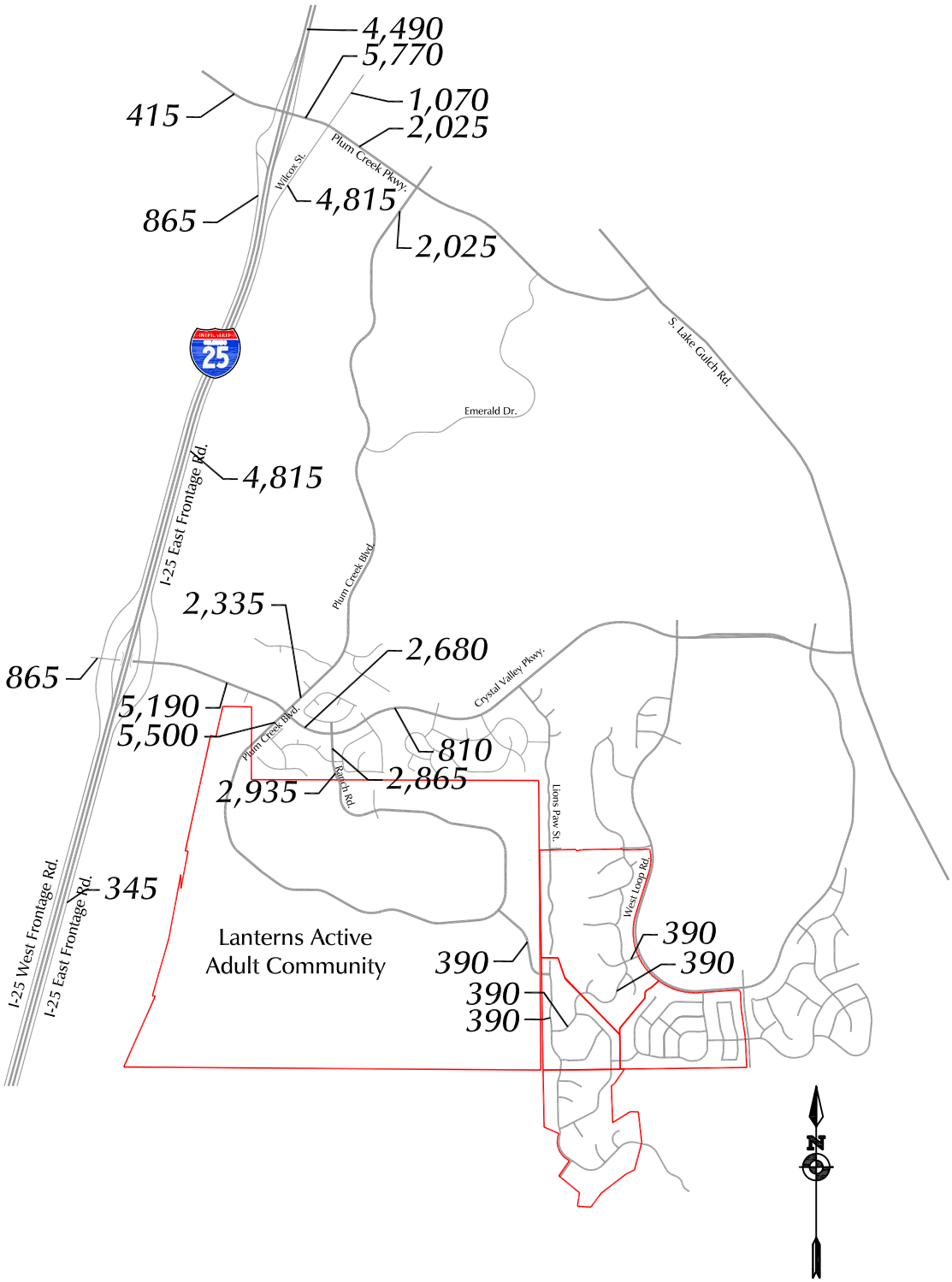


Figure 2

Assignment of Average Daily Traffic CVR Filing 13

Ridge Estates (LSC #150660)



Approximate Scale
Scale: 1"= 3,000'

Figure 3

Assignment of Average Daily Traffic Lanterns Active Adult Community

Ridge Estates (LSC #150660)

LEGEND:
1,000 = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

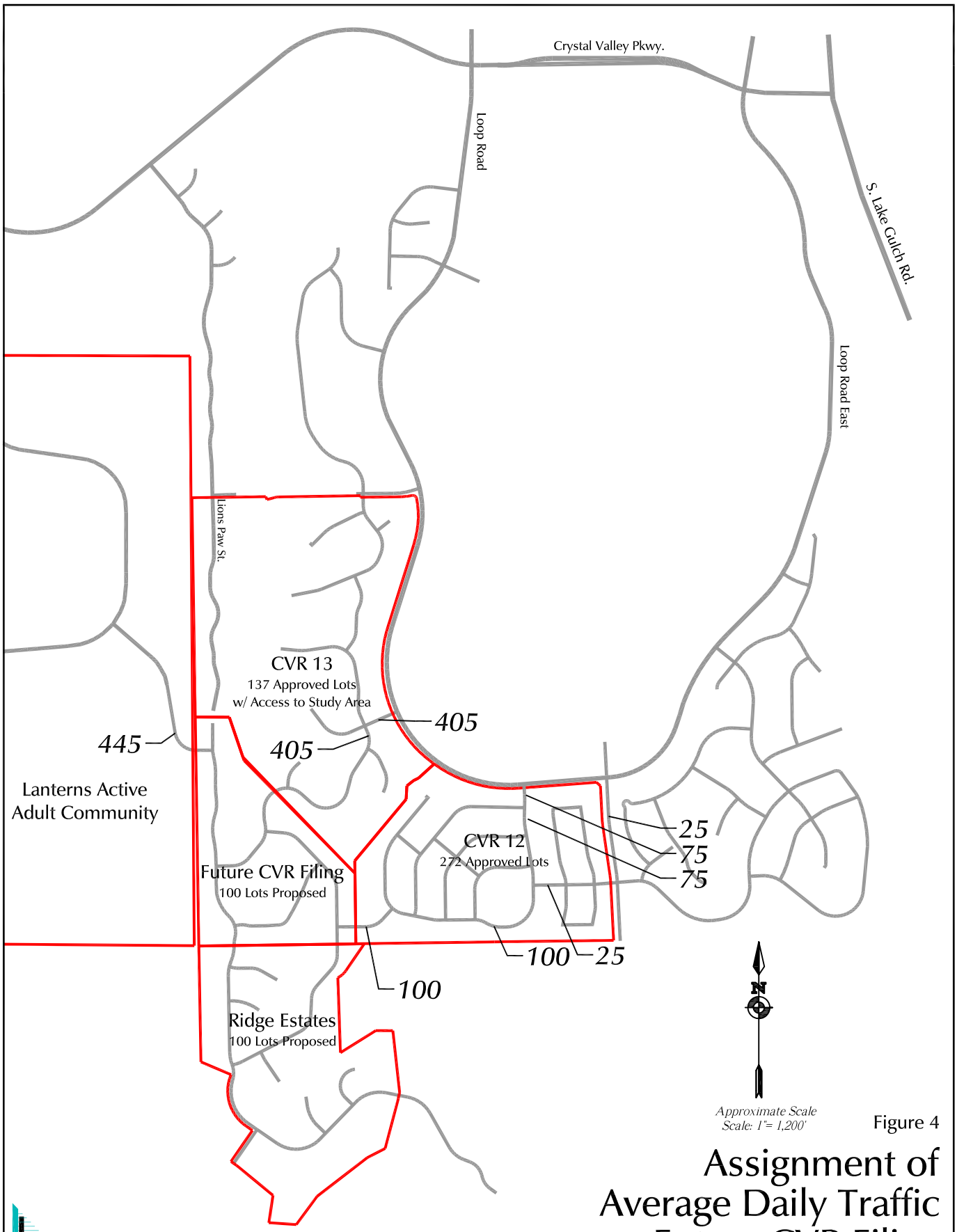


Figure 4

Assignment of Average Daily Traffic Future CVR Filing

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

LEGEND:

1,000 = Average Weekday Traffic (vehicles per day)

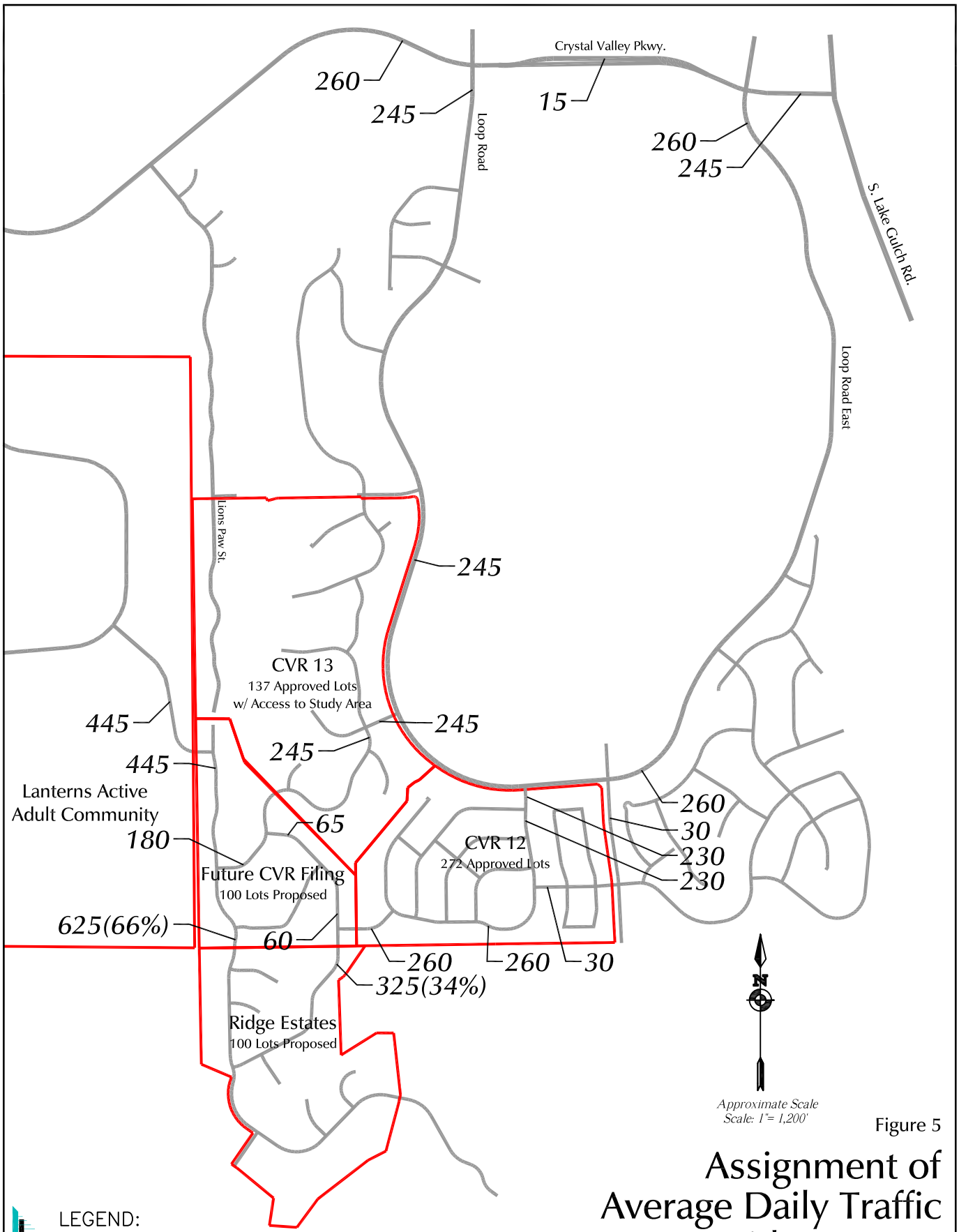


Figure 5

Assignment of Average Daily Traffic Ridge Estates

Ridge Estates (LSC #150660)

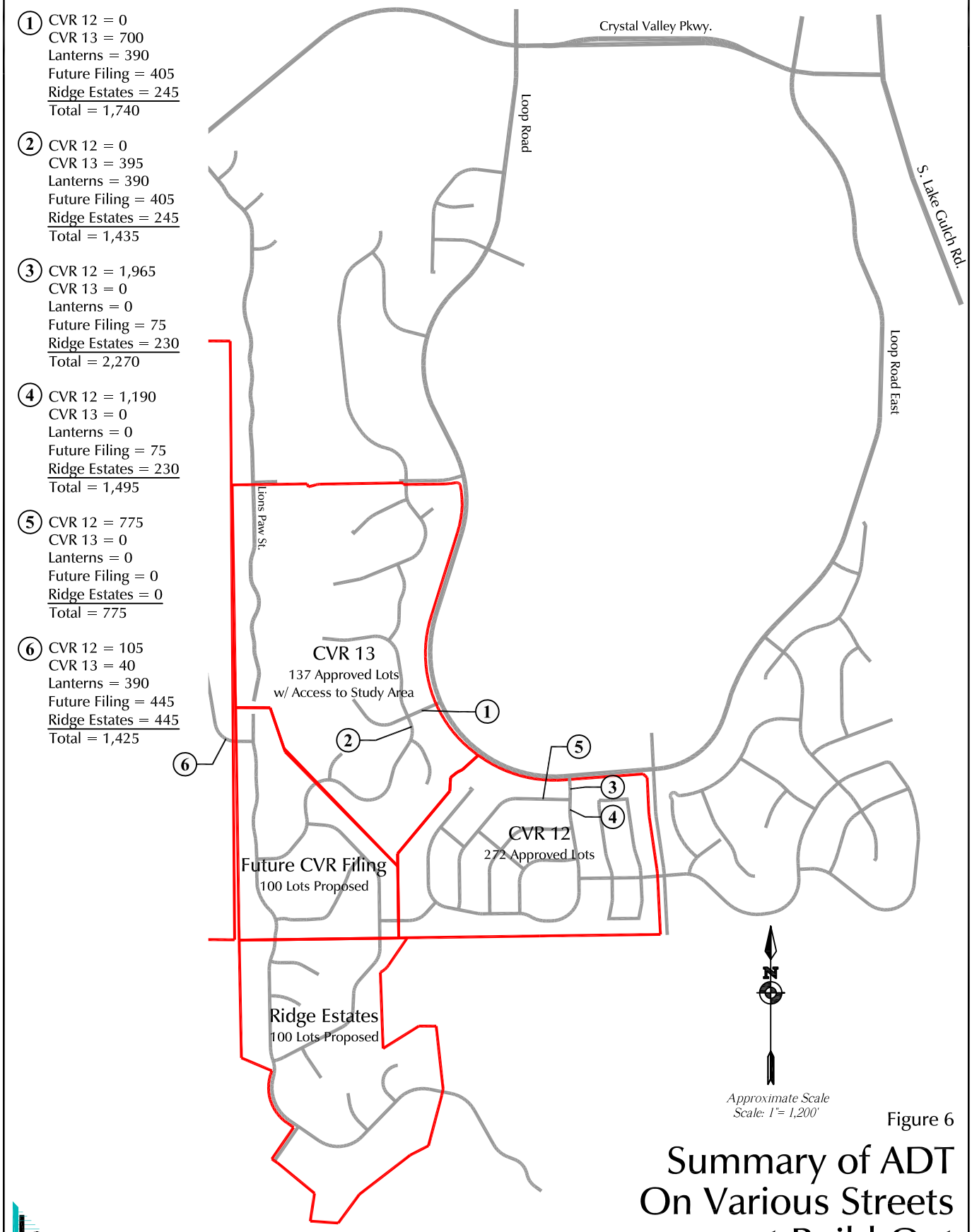
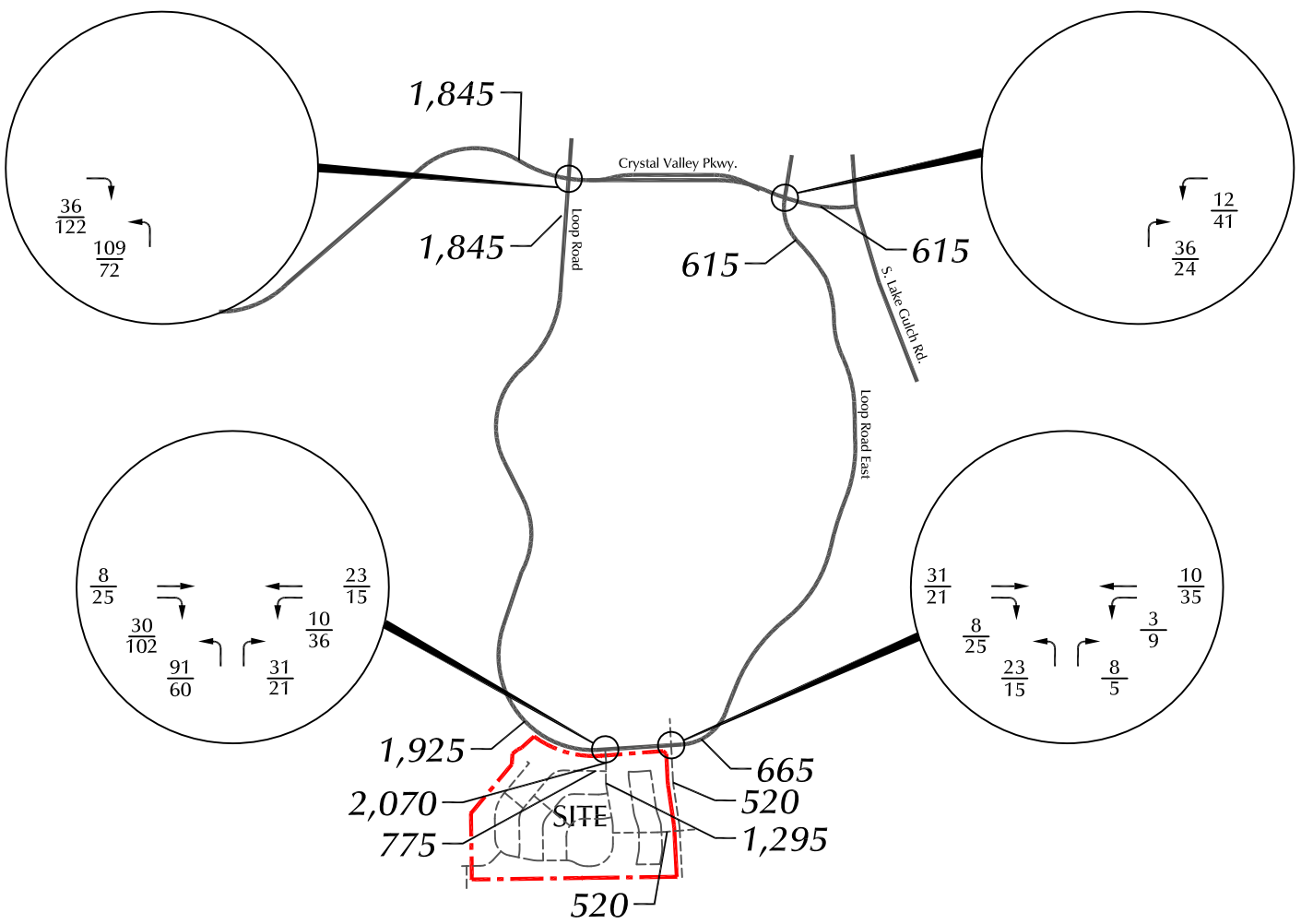


Figure 6

Summary of ADT On Various Streets at Build-Out

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.



Approximate Scale
Scale: 1"= 2,000'

Figure 7

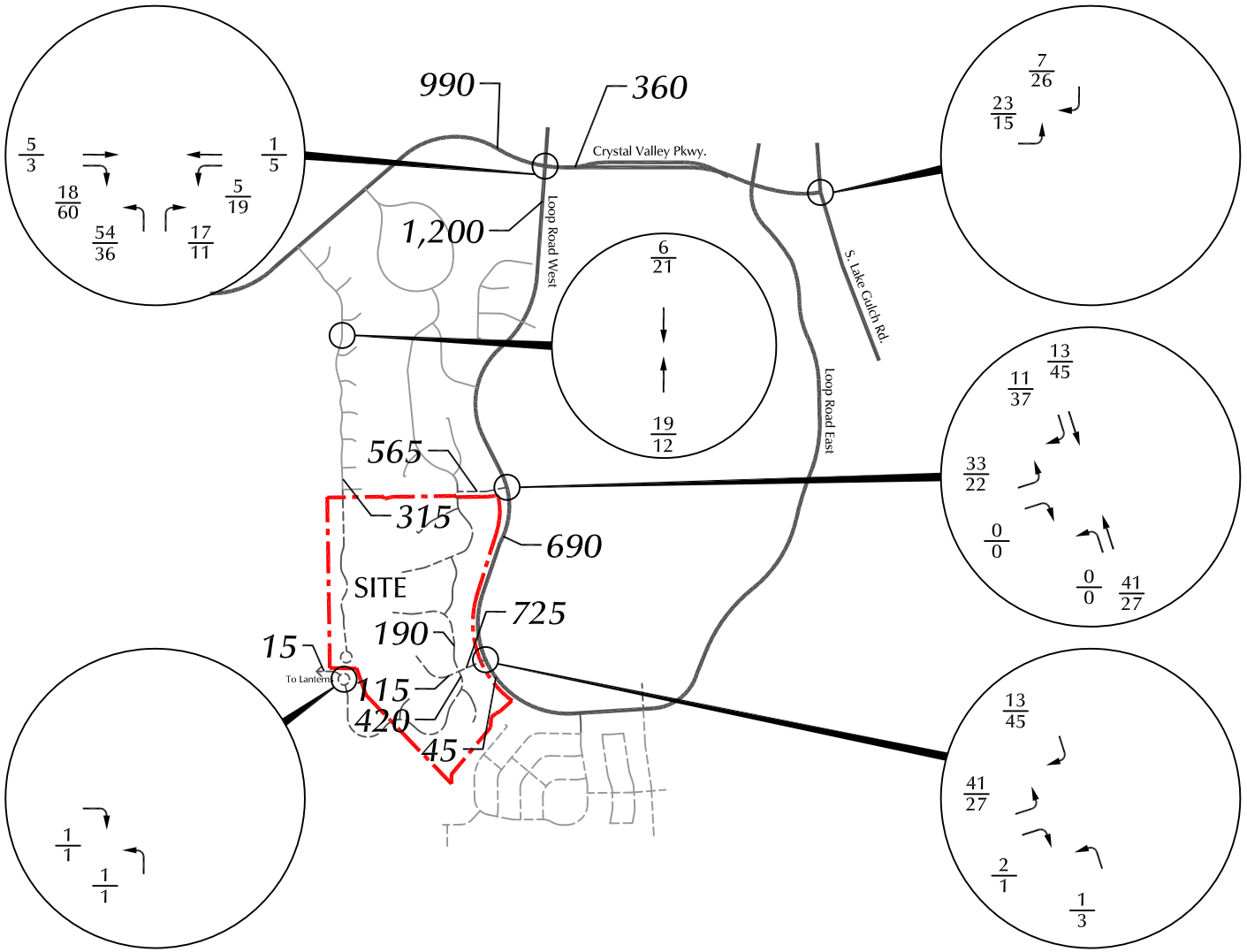
Assignment of Site-Generated Traffic

CVR- Filing No. 12 (LSC #130880)

LEGEND:

$\frac{26}{31}$ = AM Weekday Peak–Hour Traffic (vehicles per hour) / PM Weekday Peak–Hour Traffic (vehicles per hour)

2,000 = Average Weekday Traffic (vehicles per day)



Approximate Scale
Scale: 1"= 2,000'

Figure 7

Assignment of Site-Generated Traffic

CVR- Filing No. 13 (LSC #140470)

LEGEND:

$\frac{26}{31}$ = $\frac{\text{AM Weekday Peak–Hour Traffic (vehicles per hour)}}{\text{PM Weekday Peak–Hour Traffic (vehicles per hour)}}$

2,000 = Average Weekday Traffic (vehicles per day)

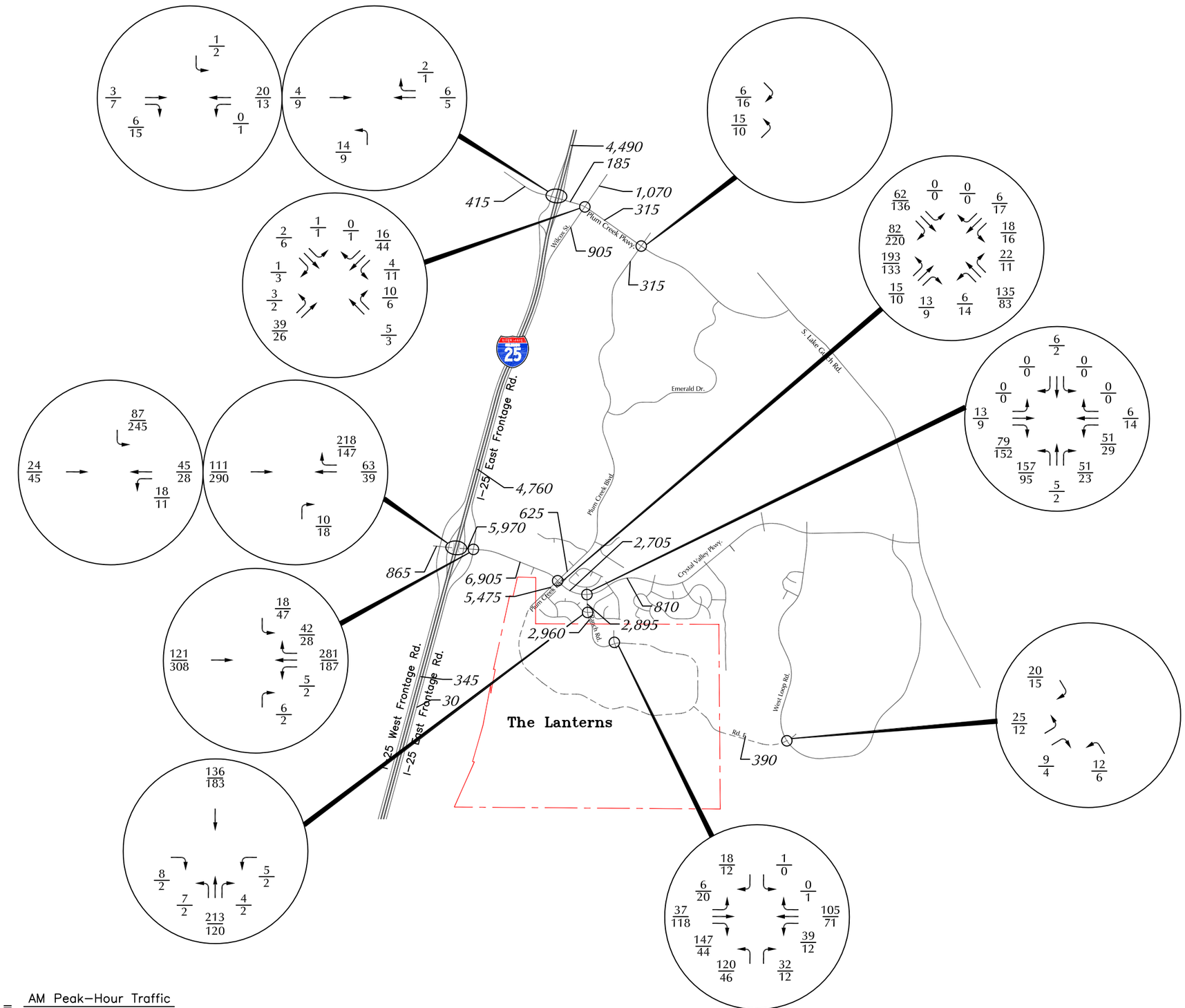


Figure 7

Assignment of Site-Generated Traffic

The Lanterns Update (LSC #130370)

LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street
Denver, CO 80206
(303) 333-1105
FAX (303) 333-1107
E-mail: lsc@lscdenver.com

January 4, 2017

Mr. Gregg Brown
Crystal Valley Ranch Development Company
Gregg@cvranch.com

Re: Ridge Estates
ADT Impacts to CVR 12
Castle Rock, CO
(LSC #150660)

Dear Mr. Brown:

In response to your request, LSC Transportation Consultants, Inc. has reviewed the estimated average daily traffic impacts from Ridge Estates and the undeveloped portion of CVR between CVR 13 and Ridge Estates. The following is a detailed explanation of the average daily traffic impacts to CVR 12 from these two planned developments.

INTRODUCTION - OVERVIEW

The November, 2016 Memorandum assumed the following daily impacts to CVR 12 from Ridge Estates and the Future CVR Filing:

Ridge Estates	⇒	260 ADT
Future CVR Filing	⇒	100 ADT
Impact	⇒	360 ADT

The more recent detailed assignment we have completed shows the following impacts to CVR 12:

Ridge Estates to/from School	⇒	56 ADT
Ridge Estates to/from East Loop Road	⇒	176 ADT
Ridge Estates to/from West Loop Road	⇒	0 ADT
		232 ADT
Future CVR Filing to/from School	⇒	8 ADT
Future CVR Filing to/from East Loop Road	⇒	93 ADT
Future CVR Filing to/from West Loop Road	⇒	0 ADT
		101 ADT
Total Impact	⇒	**333 ADT**

Assumptions

- Does not include redundancy of trips to/from the school and those to/from Lake Gulch Road or East Loop Road.
- Assumes four trips per day between schools and homes with children. Some households will drop off or pick up on the way to/from another destination such as their place of employment. The actual rate could be closer to three trips per home.
- Does not account for an occasional trip between the two sites and other destinations between the two sites and the intersection of East Loop Road/Crystal Valley Parkway. These additional trips are likely to be about the same or less than the 27 ADT difference in the estimates.

DETAILED CALCULATIONS FOR RIDGE ESTATES

Ridge Estates To/From School

Data from Douglas County schools suggests 100 single-family homes in the Ridge Estates price range would generate about 42 K-8 students. Many homes will have more than one child so it was assumed 30 of the 100 homes will have K-8 students. Based on this 30 percent of the homes are expected to have K-8 students.

Twenty-one dwelling units in the yellow shaded area on Figure 1 would have about seven dwelling units with K-8 students. This analysis assumes four trips per day per dwelling unit to/from the school. All 28 trips would likely use CVR 12 to do so.

Forty-five dwelling units in the green shaded area on Figure 1 would have about 14 dwelling units with K-8 students. This analysis assumes four trips per day per dwelling unit to/from the school. About half of 56 trips (28 trips) would likely use CVR 12 to do so.

The total number of daily trips between Ridge Estates and the school that pass through CVR 12 is estimated to be about 56 ADT.

Ridge Estates To/From Lake Gulch Road

As shown on Figure 2, 74 of the 100 dwelling units would likely use CVR 12 to/from Lake Gulch Road. The number of daily trips can be calculated as follows:

74 DU x 9.52 x 0.25 (25% to/from Lake Gulch Road) = 176 ADT.

Subtotal for Ridge Estates

The trips summarized above total to 232 ADT.

Figure 5 of the November, 2016 memorandum assumed 260 trips would pass through CVR 12 with 30 trips diverting east to Ditmars Lane to avoid school impacts along Loop Road or just as a personal preference.

DETAILED CALCULATIONS FOR FUTURE CVR FILING

Future CVR Filing To/From School

Data from Douglas County Schools suggests 100 single-family homes in the future filing of CVR 13 would generate about 42 K-8 students. Many homes will have more than one child so it was assumed 30 of the 100 homes will have K-8 students. Based on this 30 percent of the homes are expected to have K-8 students.

Seven dwelling units in the yellow shaded area on Figure 3 would have about two dwelling units with K-8 students. This assumes four trips per day per dwelling unit to/from the school. All eight trips would likely use CVR 12 to do so.

Future CVR Filing To/From Lake Gulch Road

As shown on Figure 4, 39 of the 100 dwelling units would likely use CVR 12 to/from Lake Gulch Road. The number of daily trips can be calculated as follows:

39 DU x 9.52 x 0.25 (25% to/from Lake Gulch Road) = 93 ADT.

Subtotal for Future CVR Filing

The trips summarized above total to 101 ADT.

Figure 4 of the November, 2016 memorandum assumed 100 trips would pass through CVR 12 with 25 trips diverting east to Ditmars Lane to avoid school impacts along Loop Road or just as a personal preference.

IMPACTS TO/FROM WEST LOOP ROAD

Figure 5 shows that it is very unlikely site-generated traffic from either Ridge Estates or the future CVR Filing would pass through CVR 12 to/from West Loop Road.

SUMMARY

The November, 2016 memorandum assumed:

Ridge Estates	⇒	260 ADT through CVR 12
Future CVR Filing	⇒	100 ADT through CVR 12
Total Impact	⇒	360 ADT through CVR 12

The current, more detailed, estimate assumes:

Ridge Estates to/from School	⇒	56 ADT
Ridge Estates through CVR 12 to/from East Loop Road/Lake Gulch Road	⇒	176 ADT
Ridge Estates through CVR 12 to/from West Loop Road	⇒	0 ADT
		232 ADT

Future CVR Filing to/from School	⇒	8 ADT
Future CVR Filing through CVR 12 to/from East Loop Road/Lake Gulch Road	⇒	93 ADT
Future CVR Filing through CVR 12 to/from West Loop Road	⇒	0 ADT
		101 ADT
Occasional trips between the two sites and destinations on East Loop Road between the school and Crystal Valley Parkway	⇒	27 ADT
Total Impact	⇒	**360 ADT**

This more detailed analysis supports the trip assignment for both Ridge Estates and the Future CVR Filing presented in the November, 2016 Memorandum. This includes the Ridge Estates trips being assigned based on 66 percent using the west access into CVR and 34 percent using the east access into CVR 12 rather than the original 60/40 split assumed. This was accomplished by revising the internal roadways and lot locations within Ridge Estates and the Future CVR Filing to increase the attractiveness of the western access.

Assumptions

- Does not include redundancy of trips to/from the school and those to/from Lake Gulch Road or East Loop Road.
- Assumes four trips per day between schools and homes with K-8 children. Some households will drop off or pick up on the way to/from another destination such as work. The actual rate could be closer to three trips per home.
- Assumes the internal roadways of the two sites are constructed consistent with the current layout being shown. The prior layout shifted more trips through CVR 12.

* * * * *

We trust this information will assist you in planning for the Ridge Estates development. Please contact me if you have any questions or need further assistance.

Respectfully submitted,

LSC Transportation Consultants, Inc.

COLORADO LICENSED CHRISTOPHER S. MCGRANAHAN 39018 PROFESSIONAL ENGINEER

By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

1-4-17

CSM/wc

Enclosure: Figures 1 - 5
Figures 4 and 5 - November, 2016 Memorandum

Y:\LSC\Projects\2015\150660-RidgeEstates(SellersCreek2015)\Jan-2017\RidgeEstatesADT-Letter-010416.wpd

Figure 1 - Ridge Estates To/From School



Figure 2 - Ridge Estates To/From Lake Gulch Road



Figure 3 - Future CVR Filing To/From School

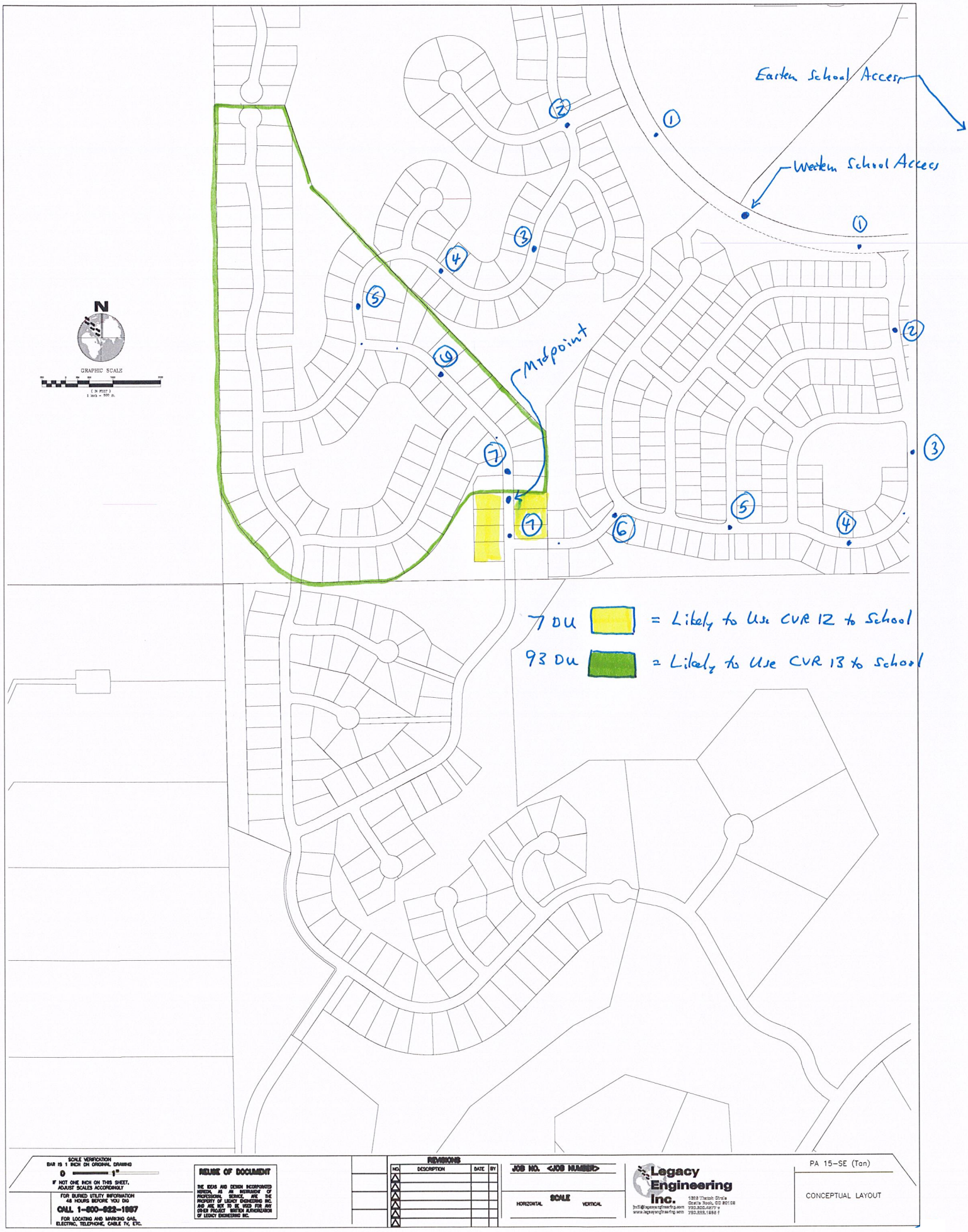


Figure 4 - Future CVR Filing To/From School



Figure 5 - Both Projects To/From West Loop Road



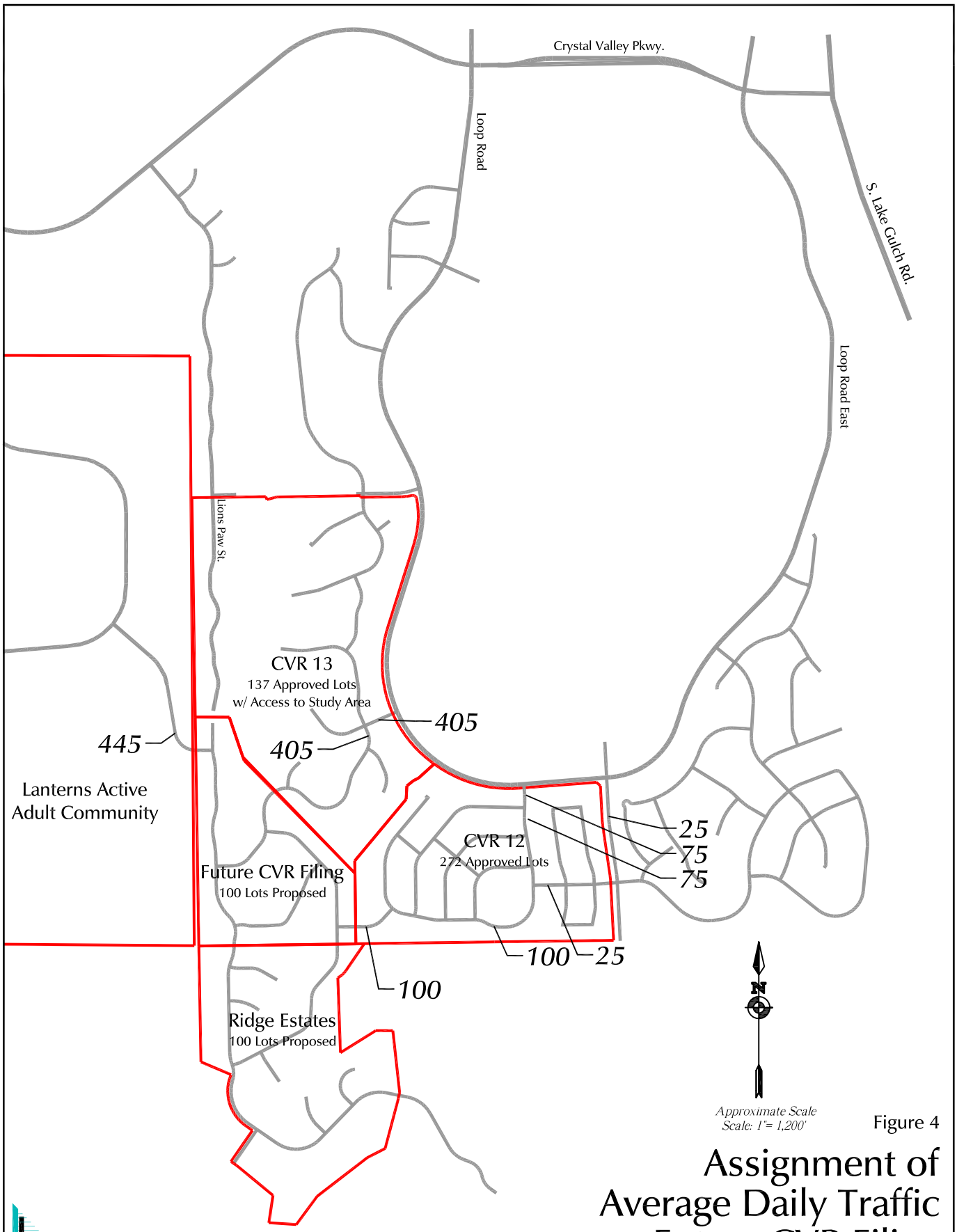


Figure 4

Assignment of Average Daily Traffic Future CVR Filing

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

LEGEND:

1,000 = Average Weekday Traffic (vehicles per day)

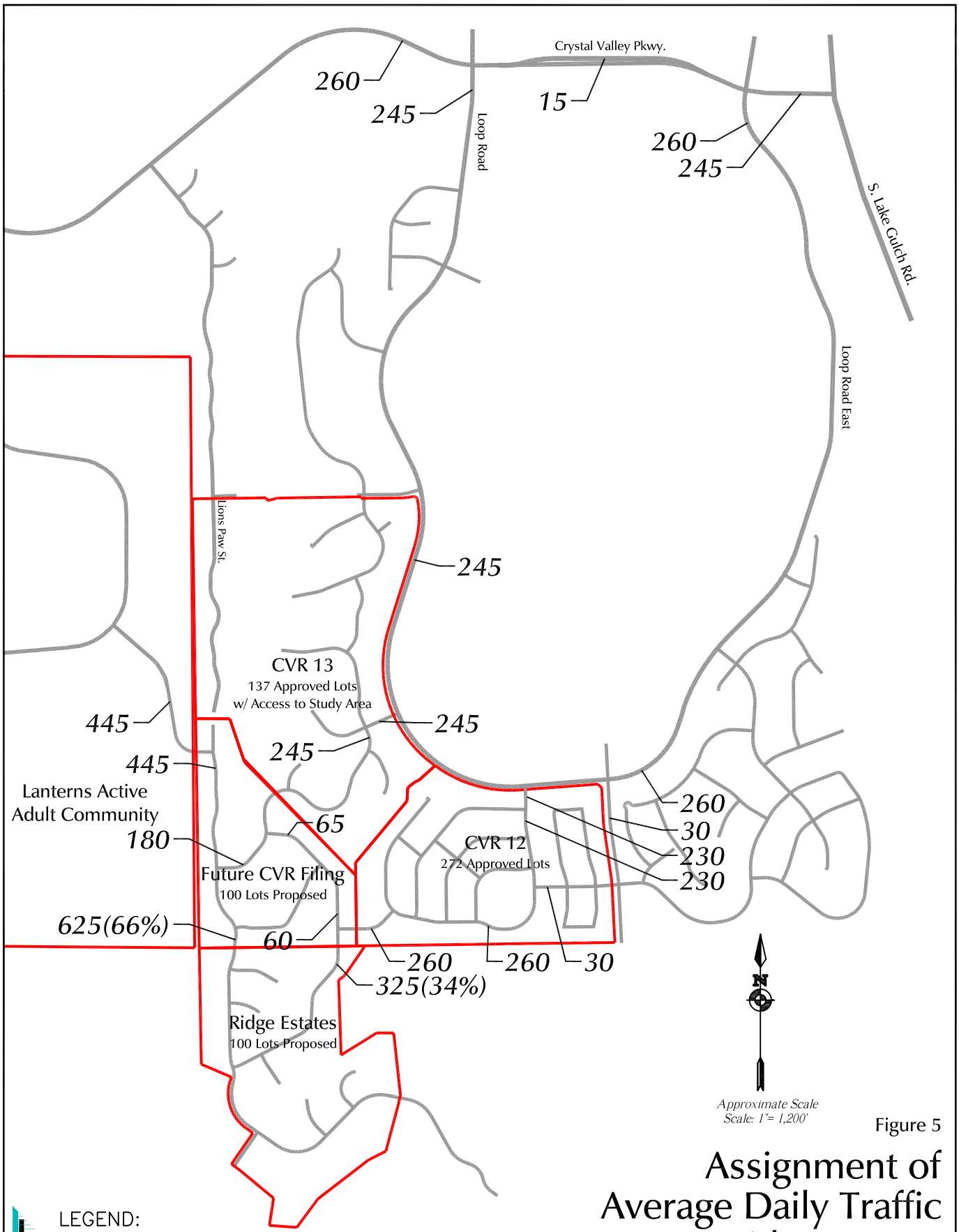


Figure 5

Assignment of Average Daily Traffic Ridge Estates

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street
Denver, CO 80206
(303) 333-1105
FAX (303) 333-1107
E-mail: lsc@lscdenver.com

January 16, 2017

Mr. Gregg Brown
Crystal Valley Ranch Development Company
Gregg@cvranch.com

Re: Ridge Estates
Supplemental Letter
Castle Rock, CO
(LSC #150660)

Dear Mr. Brown:

In response to your request, LSC Transportation Consultants, Inc. has prepared this supplemental traffic letter for the proposed Ridge Estates development.

Figures 1a through 6b show multiple trip assignment scenarios for the proposed roadways in the area. These trip assignments supplement the findings in the September 19, 2016 *Ridge Estates Traffic Impact Analysis* and the January 5, 2017 *ADT Impacts to CVR 12 Letter* by LSC.

* * * * *

We trust this information will assist you in planning for the proposed Ridge Estates development. Please contact me if you have any questions or need further assistance.

Respectfully submitted,

LSC Transportation Consultants, Inc.

COLORADO LICENSED
CHRISTOPHER S. MCGRANAHAN
39018
PROFESSIONAL ENGINEER

By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

1-16-17

CSM/wc

Enclosure: Figures 1a - 6b

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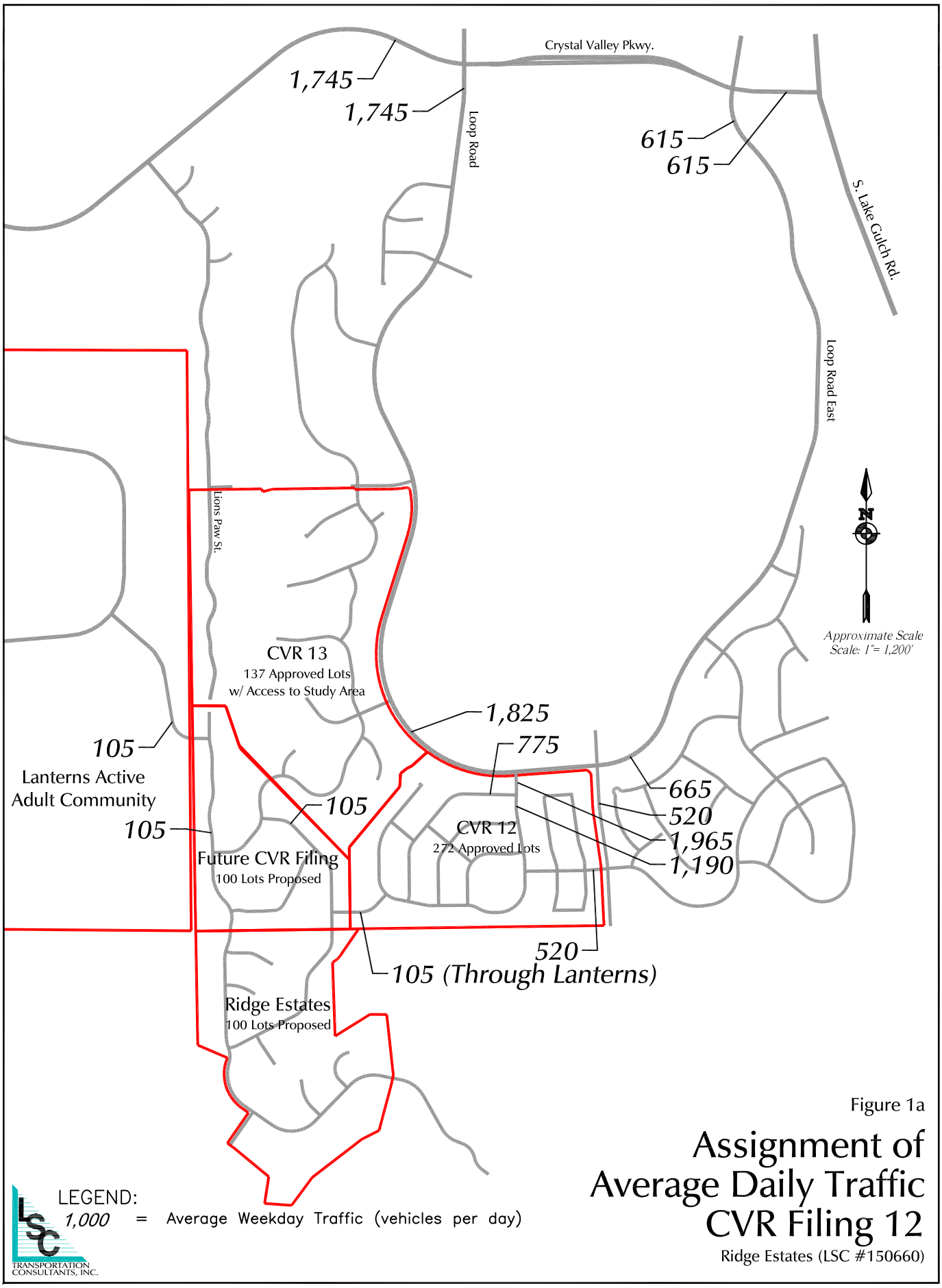


Figure 1a

Assignment of Average Daily Traffic CVR Filing 12

Ridge Estates (LSC #150660)

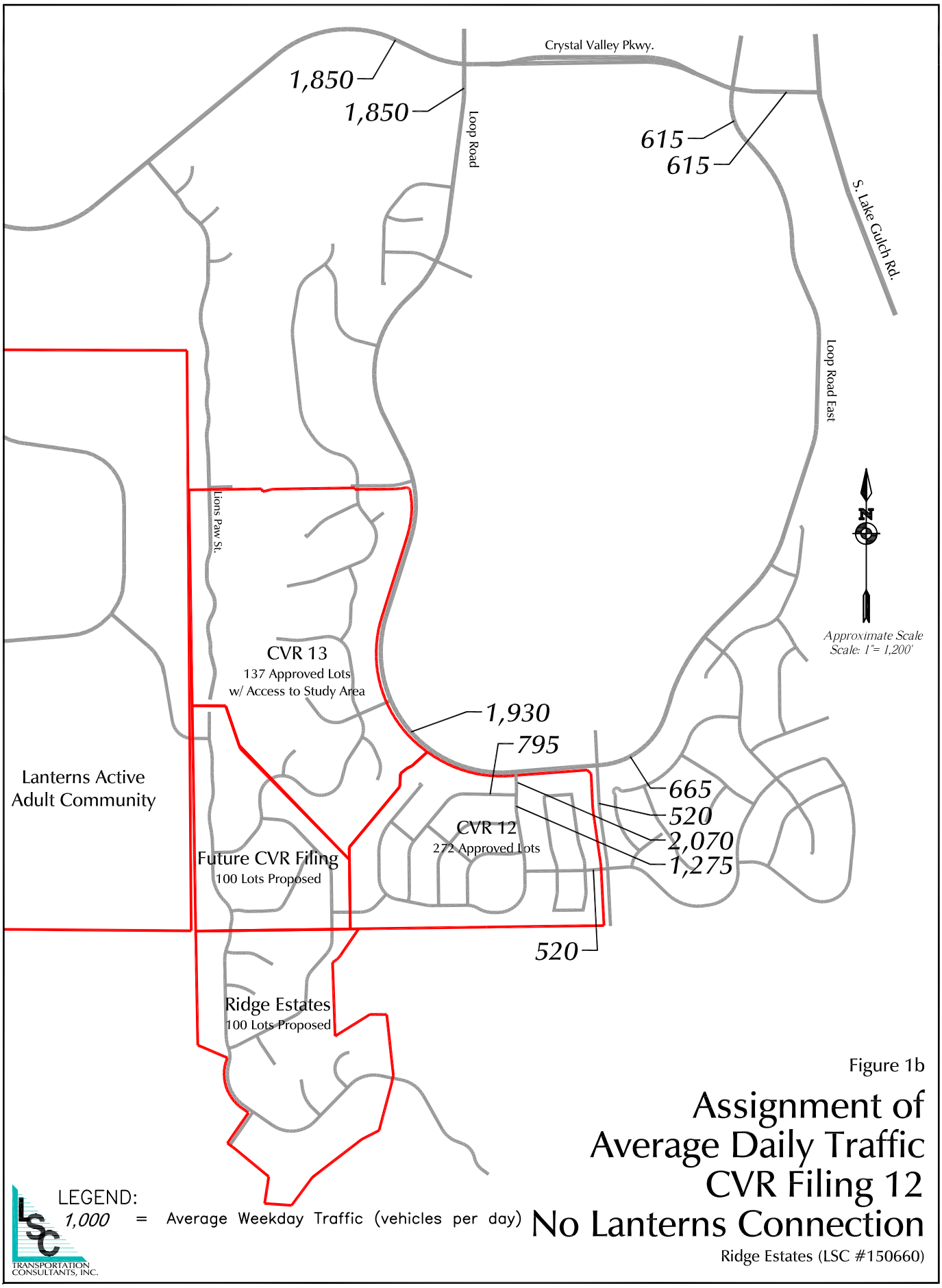


Figure 1b

Assignment of Average Daily Traffic CVR Filing 12 No Lanterns Connection

Ridge Estates (LSC #150660)

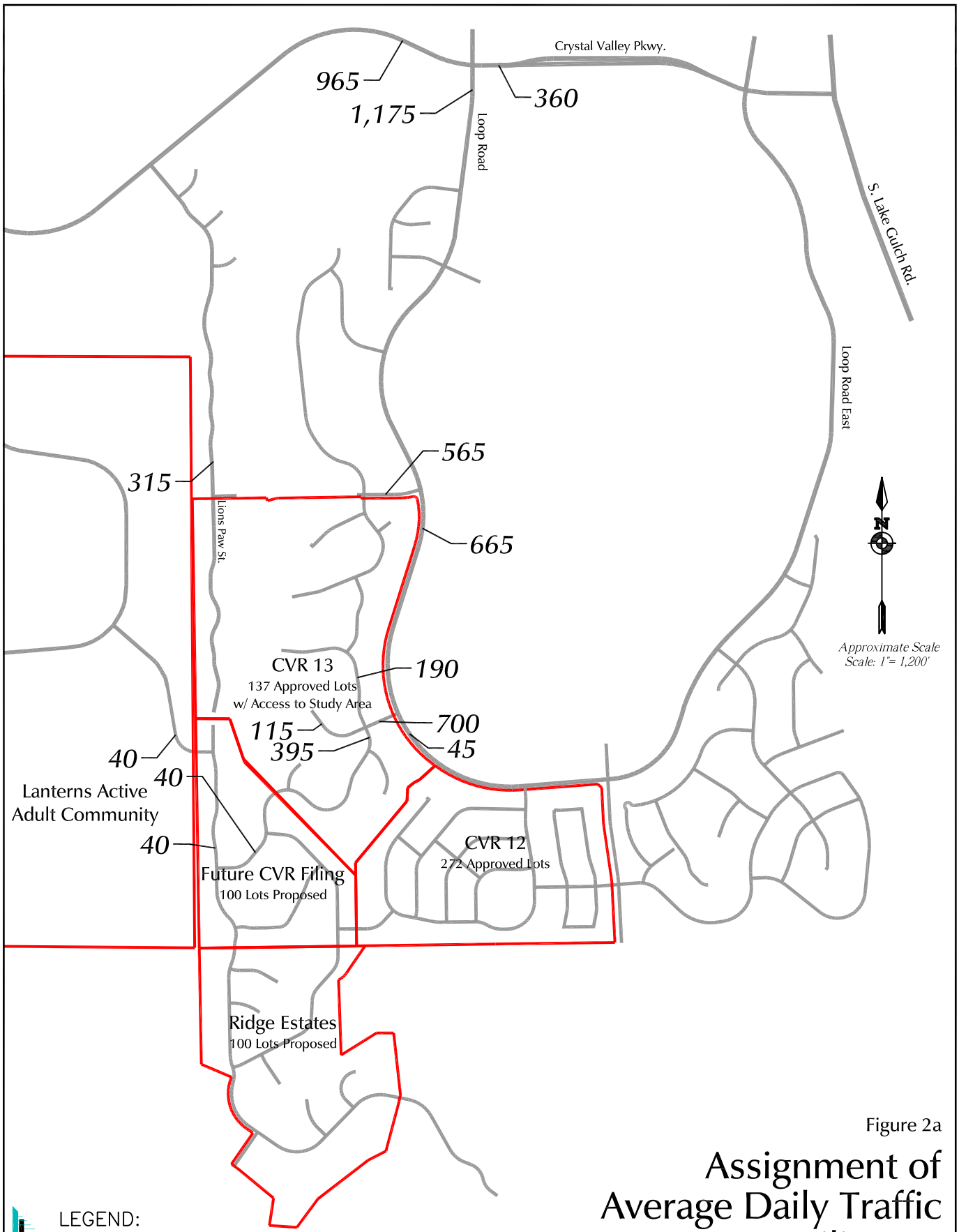


Figure 2a

Assignment of Average Daily Traffic CVR Filing 13

Ridge Estates (LSC #150660)

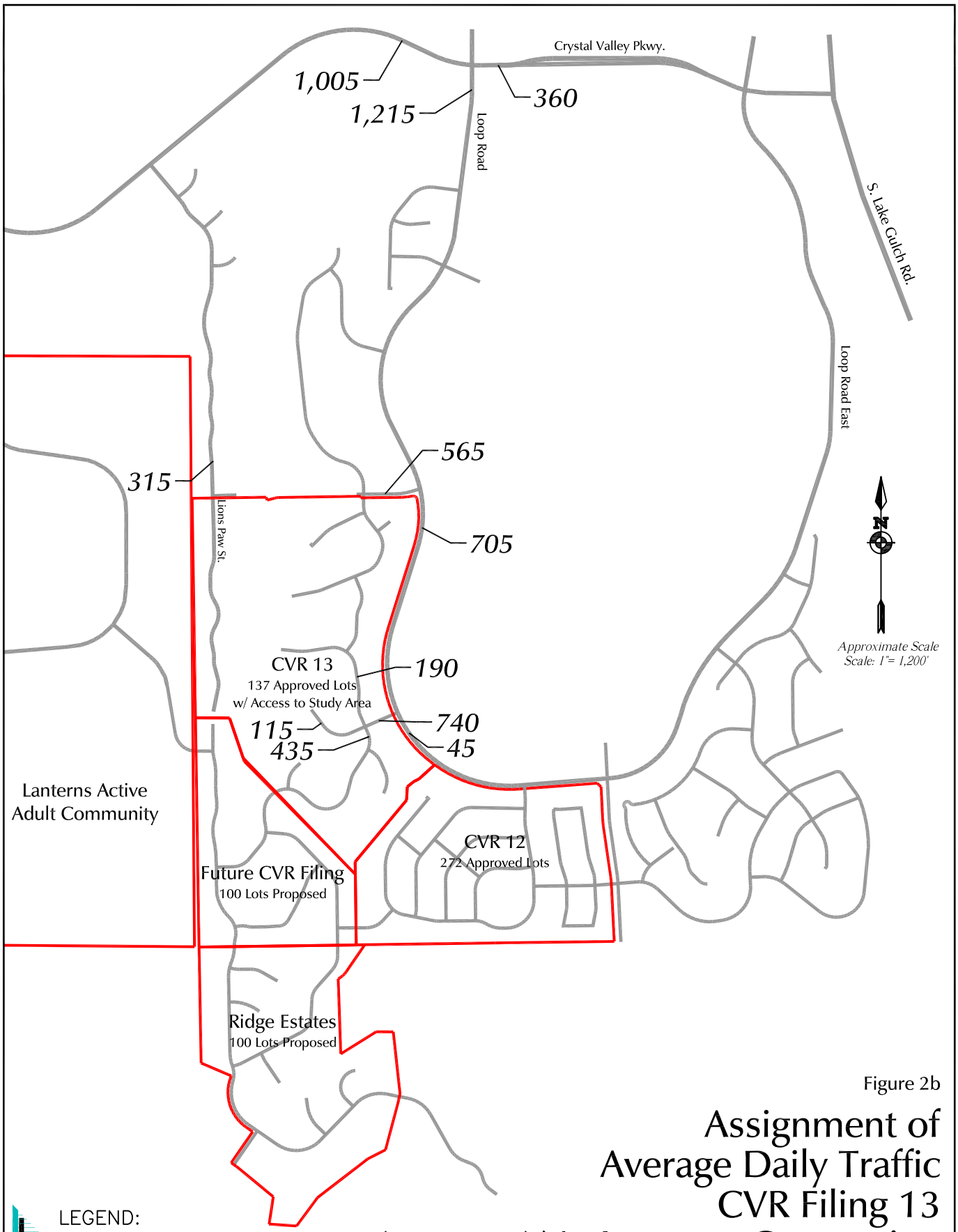


Figure 2b

Assignment of Average Daily Traffic CVR Filing 13 No Lanterns Connection

Ridge Estates (LSC #150660)

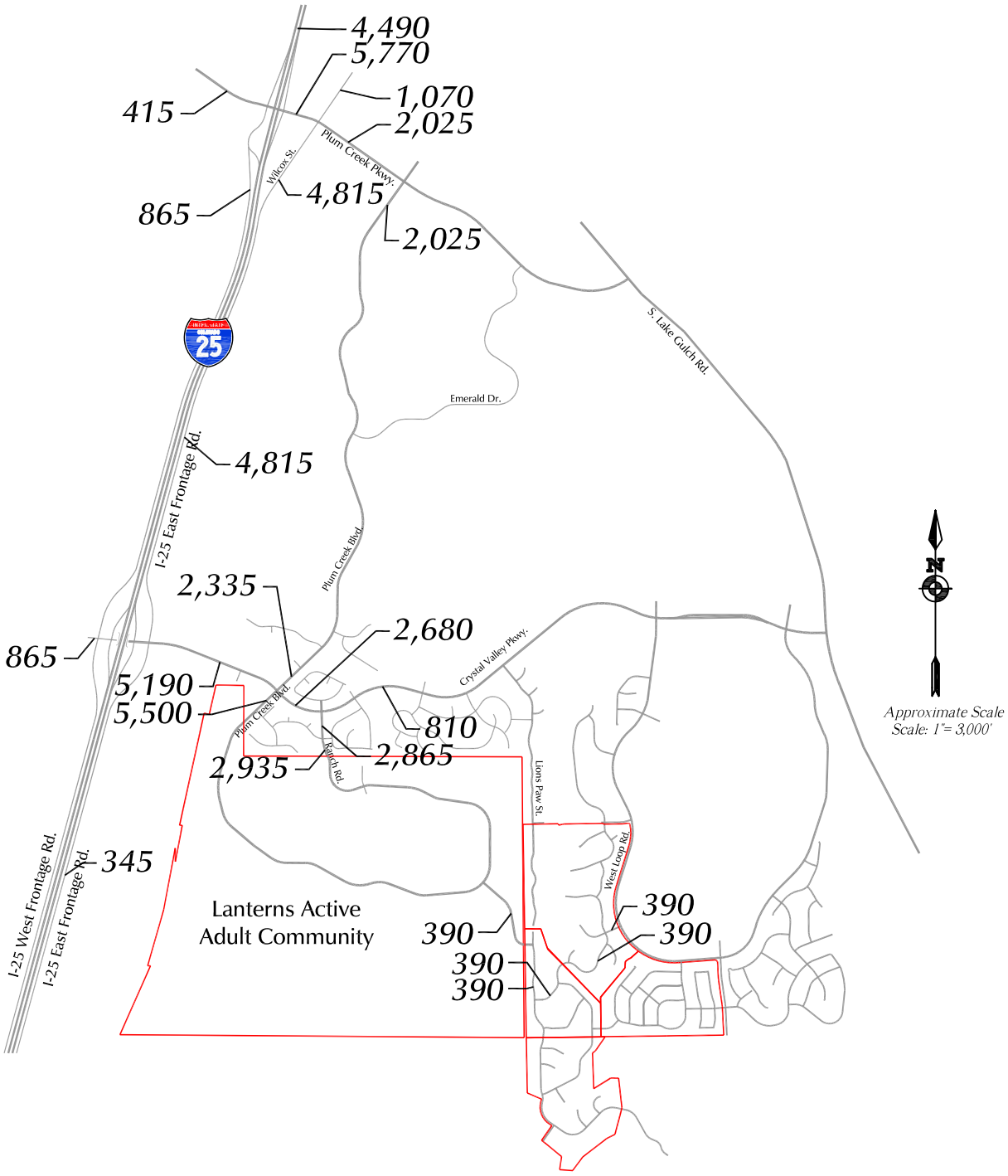


Figure 3a

Assignment of Average Daily Traffic Lanterns Active Adult Community

Ridge Estates (LSC #150660)

LEGEND:
1,000 = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

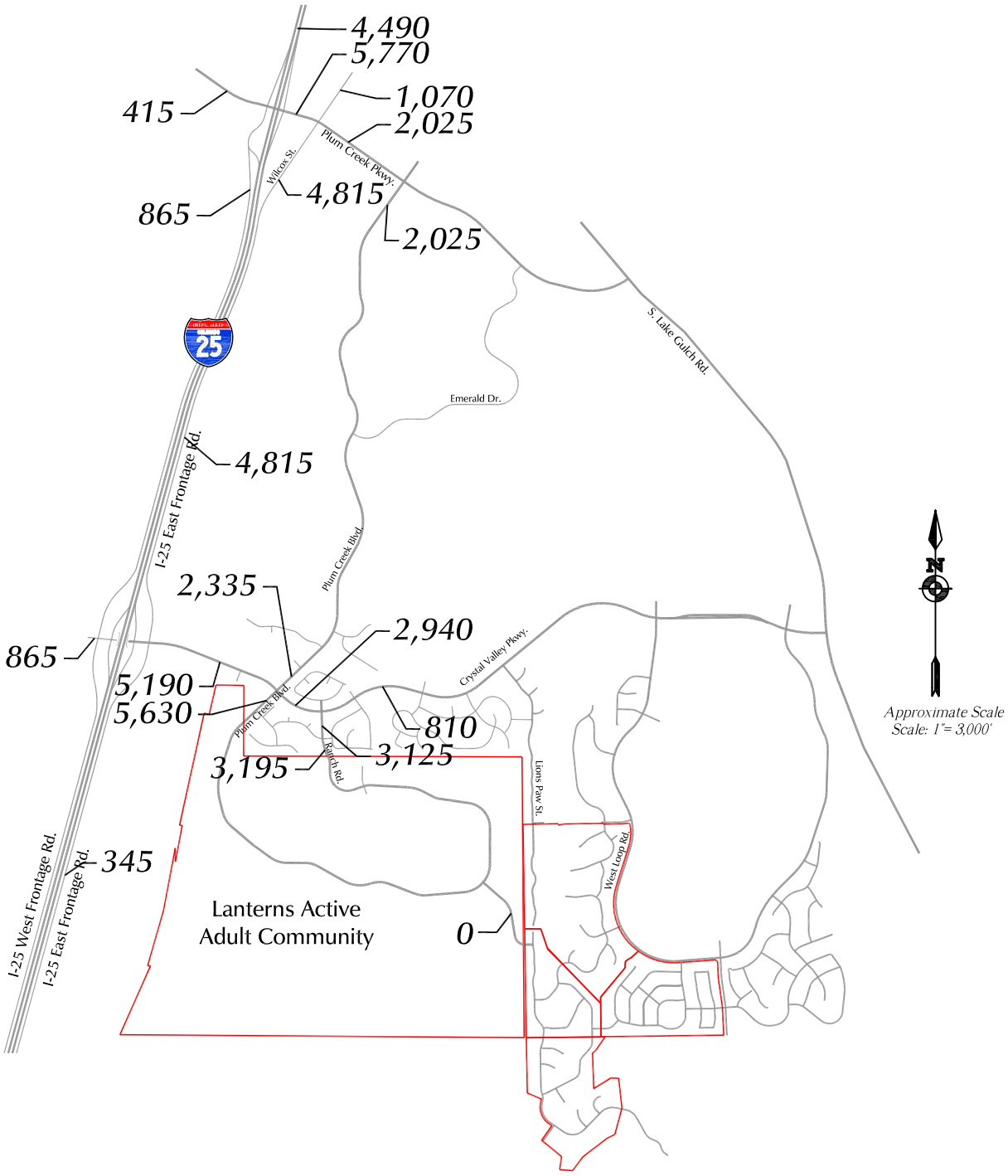


Figure 3b

Assignment of Average Daily Traffic Lanterns Active Adult Community No Lanterns Connection

LEGEND:
1,000 = Average Weekday Traffic (vehicles per day)

Ridge Estates (LSC #150660)

TRANSPORTATION CONSULTANTS, INC.

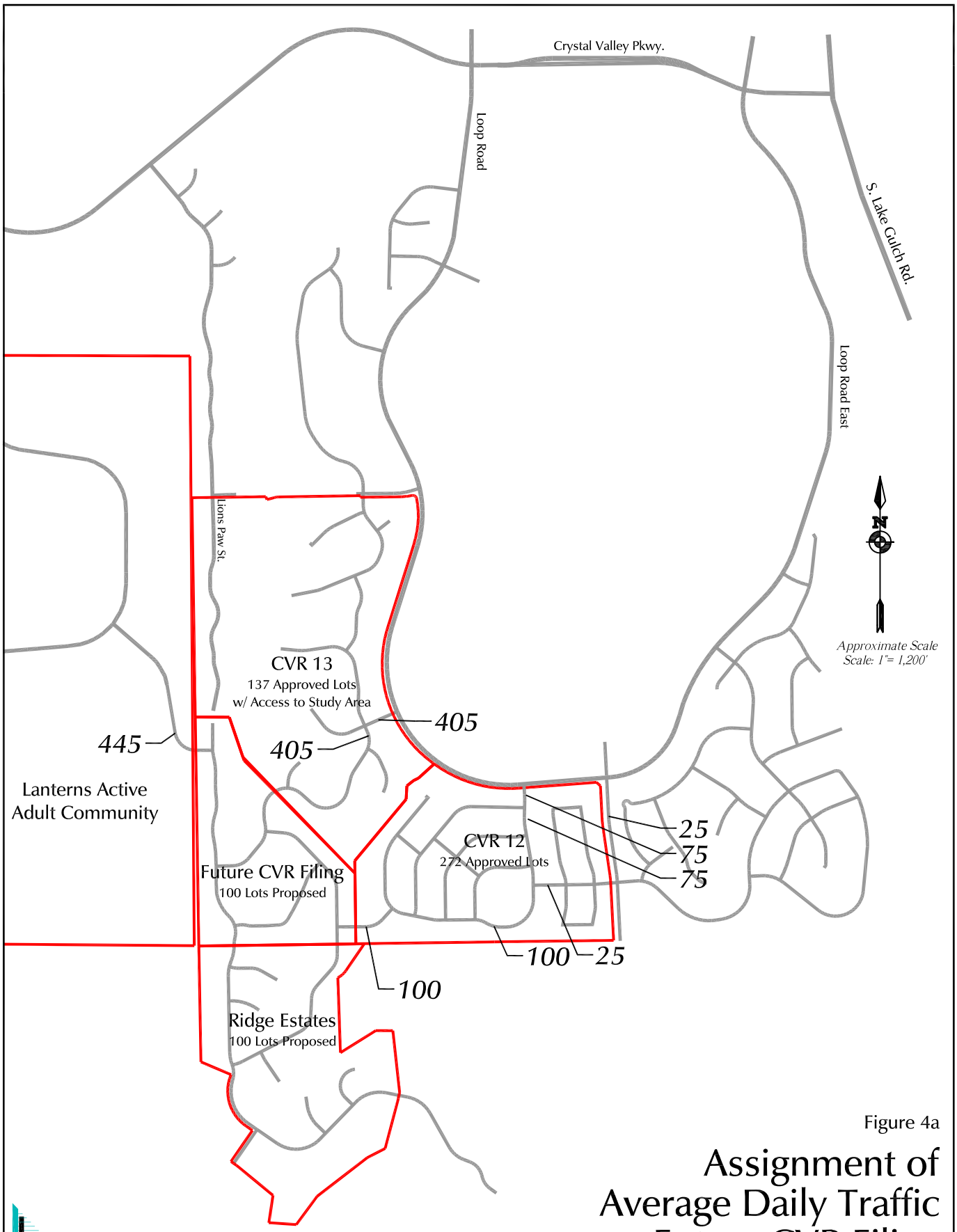


Figure 4a

Assignment of Average Daily Traffic Future CVR Filing

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

LEGEND:
1,000 = Average Weekday Traffic (vehicles per day)

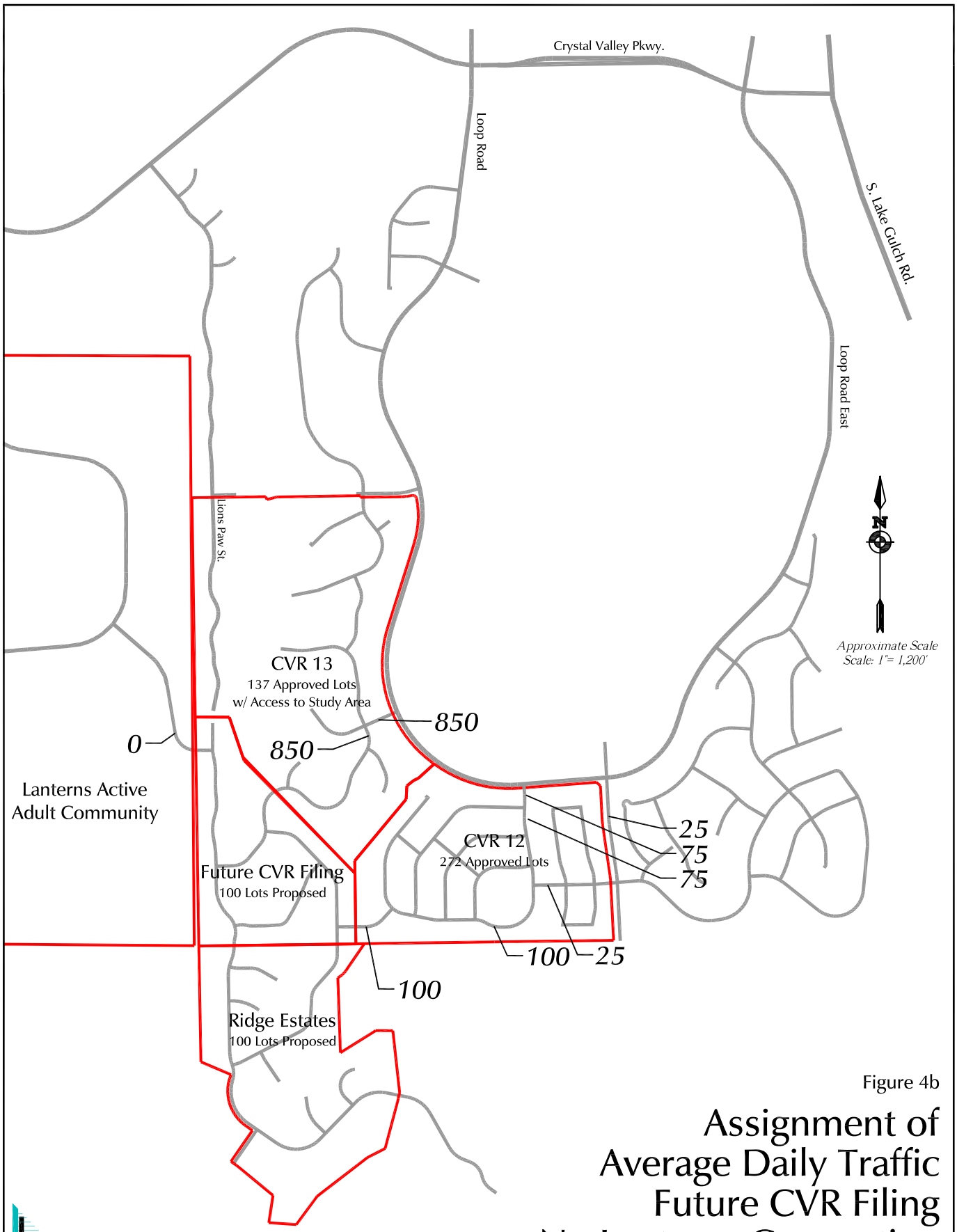


Figure 4b

Assignment of Average Daily Traffic Future CVR Filing No Lanterns Connection

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

LEGEND:
1,000 = Average Weekday Traffic (vehicles per day)

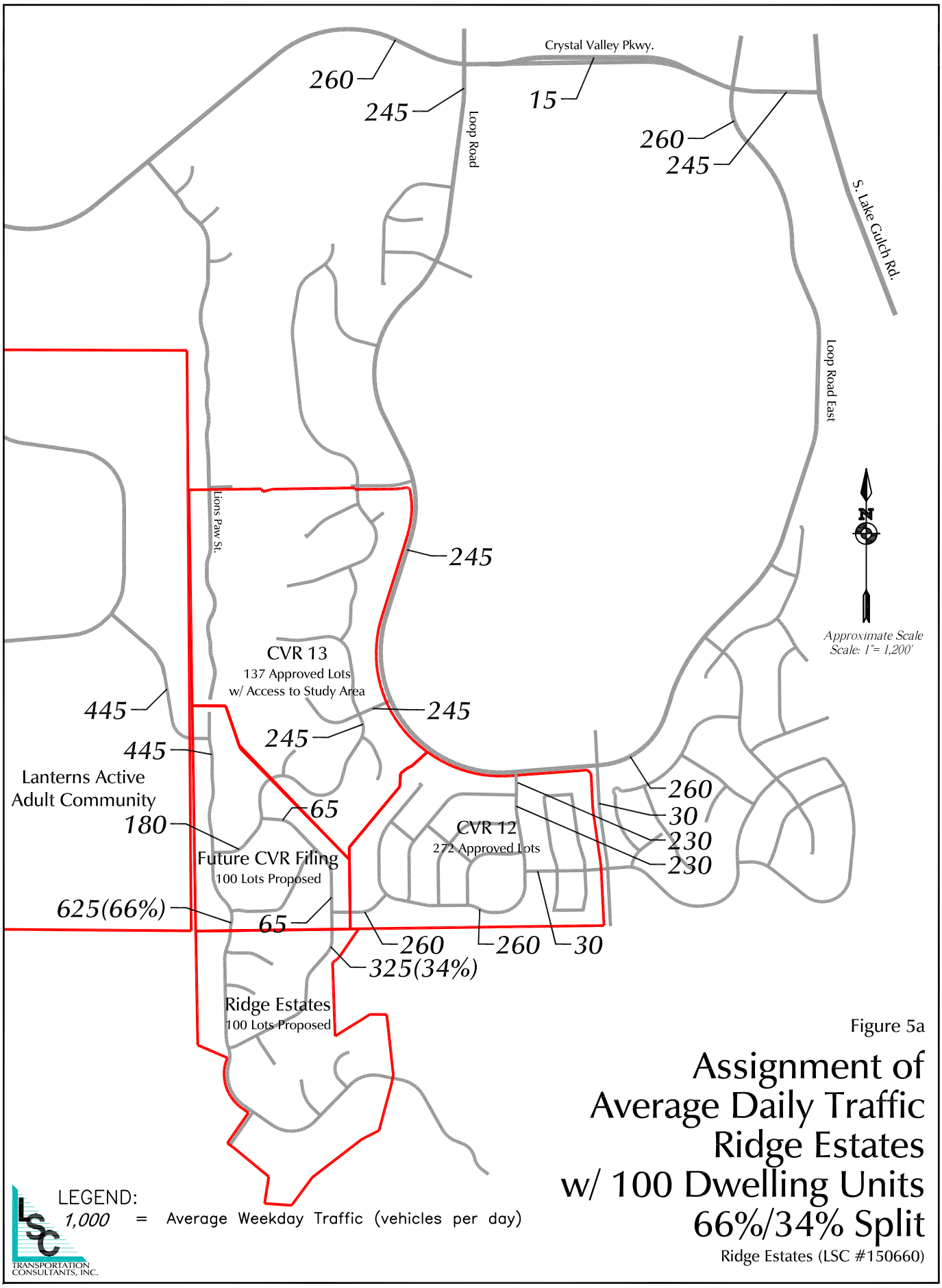


Figure 5a

Assignment of Average Daily Traffic Ridge Estates w/ 100 Dwelling Units 66%/34% Split

Ridge Estates (LSC #150660)

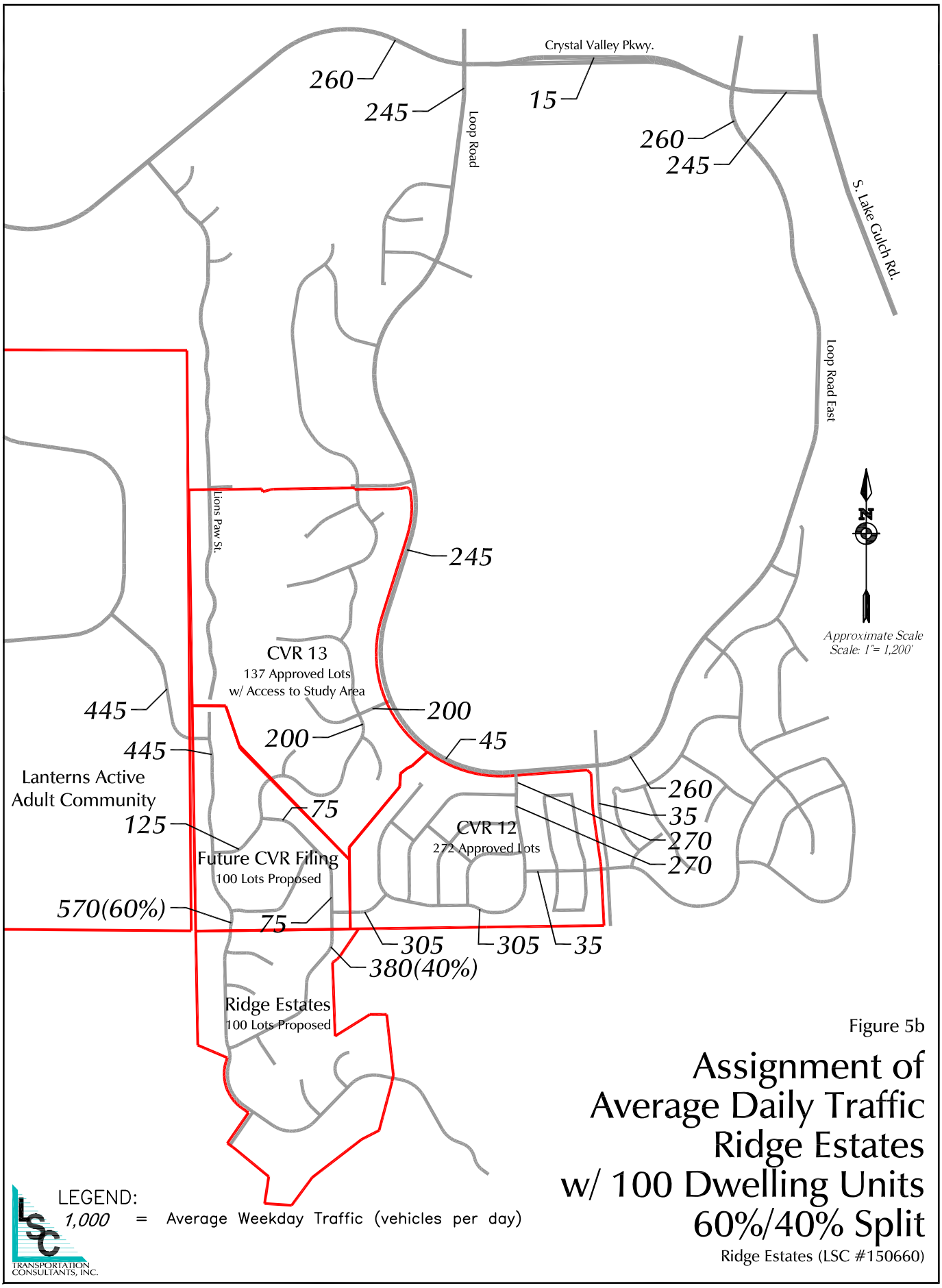


Figure 5b

Assignment of Average Daily Traffic Ridge Estates w/ 100 Dwelling Units 60%/40% Split

Ridge Estates (LSC #150660)

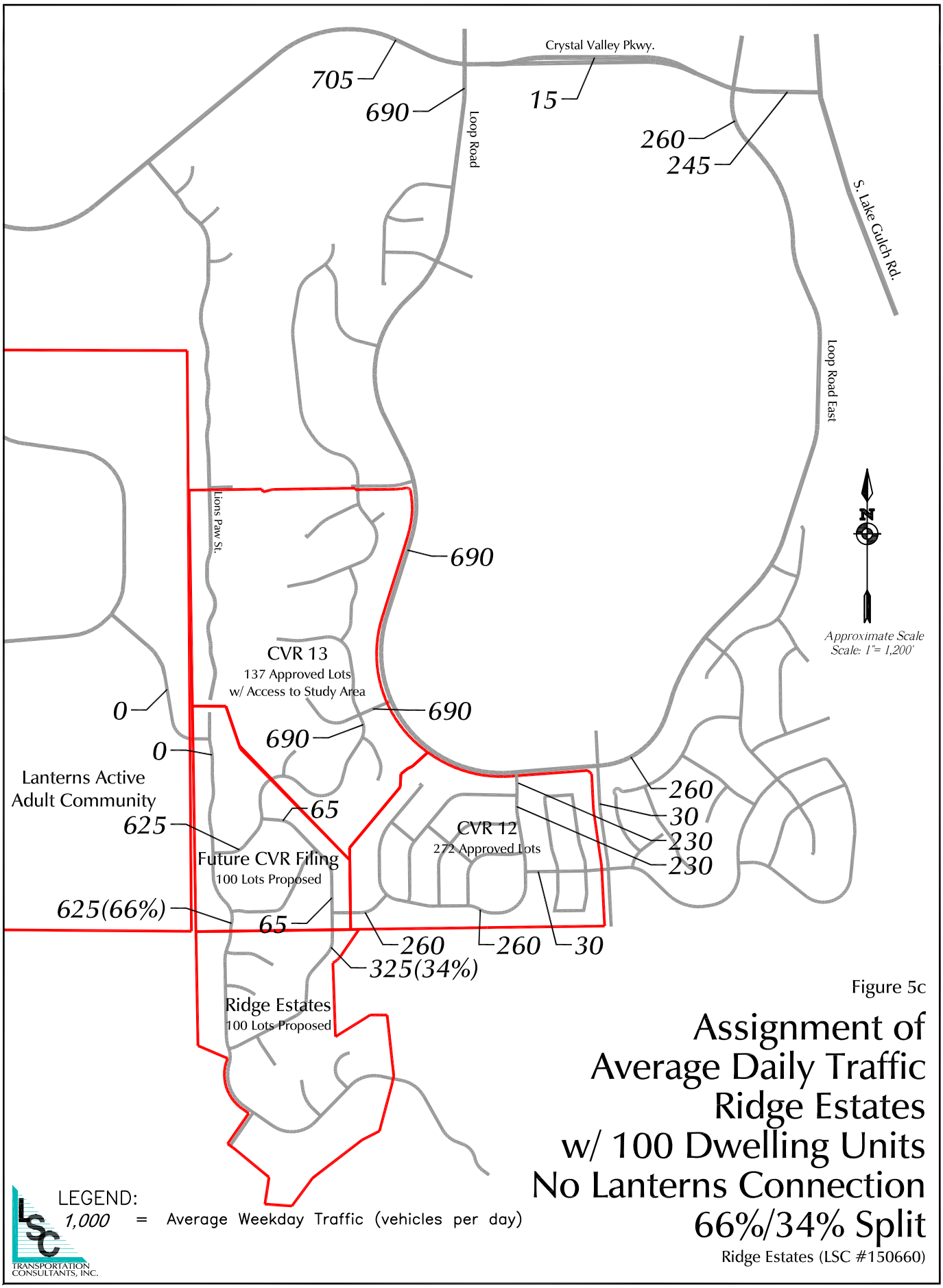


Figure 5c

Assignment of Average Daily Traffic Ridge Estates w/ 100 Dwelling Units No Lanterns Connection 66%/34% Split

Ridge Estates (LSC #150660)

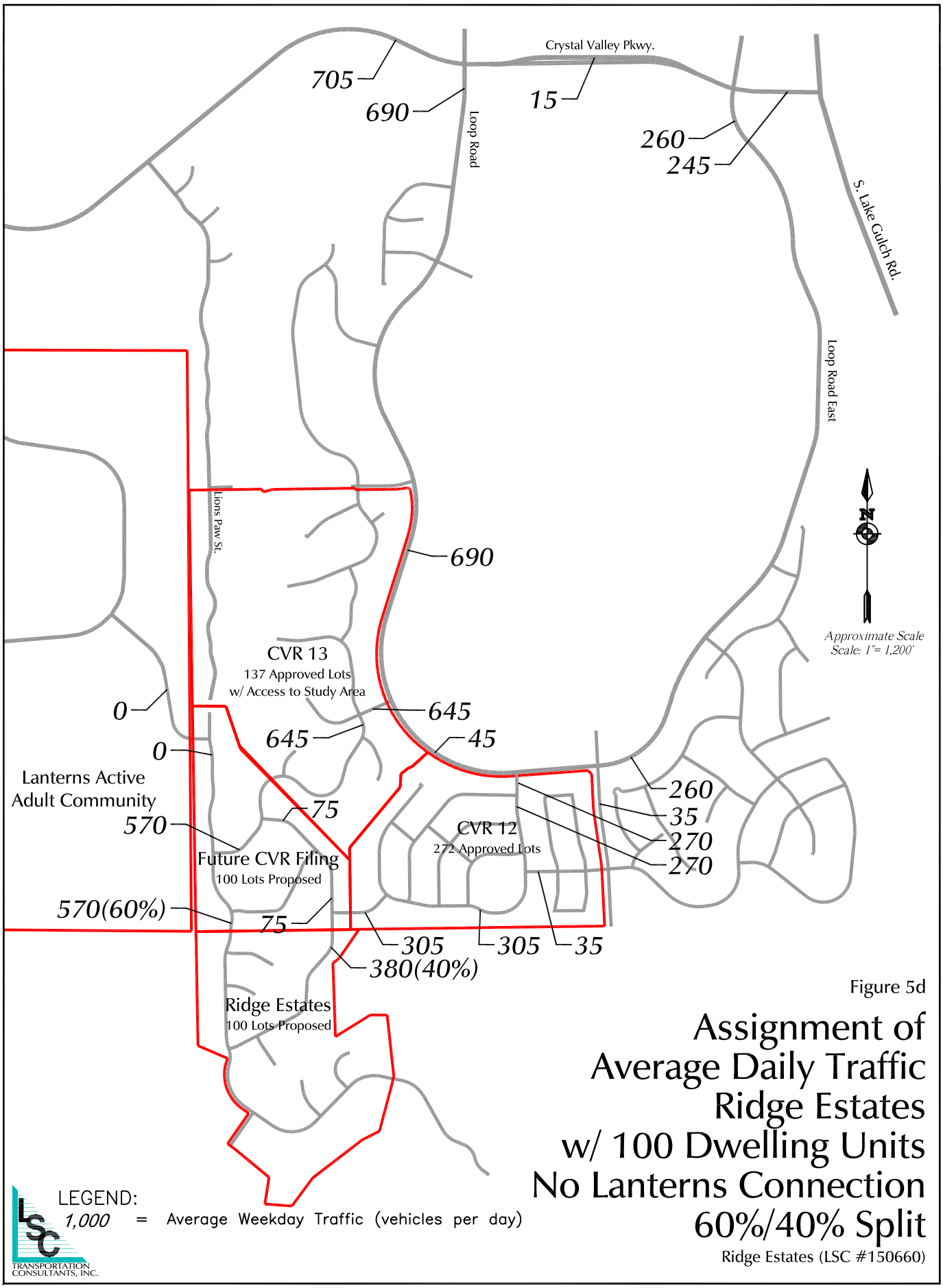


Figure 5d

Assignment of Average Daily Traffic Ridge Estates w/ 100 Dwelling Units No Lanterns Connection 60%/40% Split

Ridge Estates (LSC #150660)

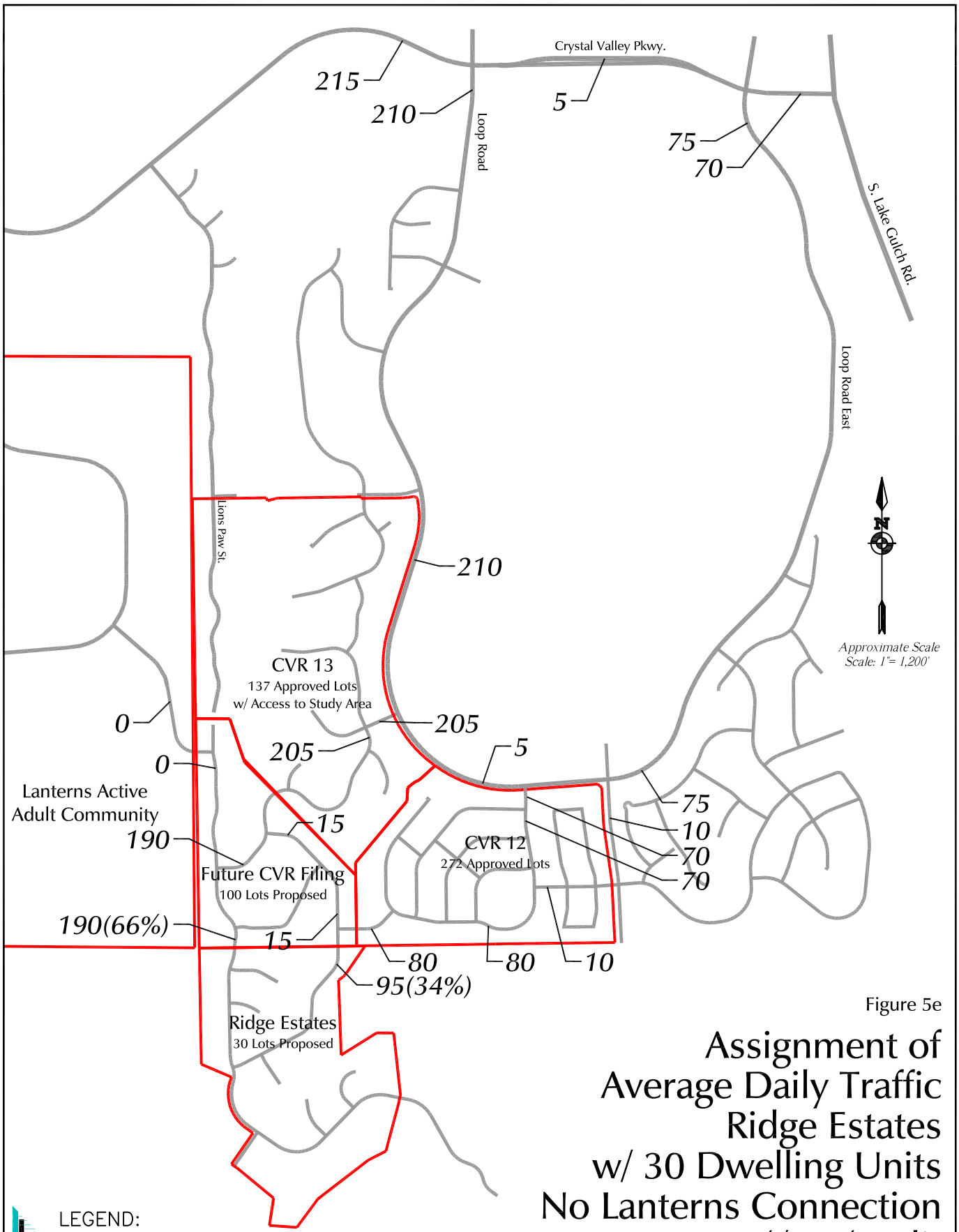


Figure 5e

Assignment of Average Daily Traffic Ridge Estates w/ 30 Dwelling Units No Lanterns Connection 66%/34% Split

Ridge Estates (LSC #150660)

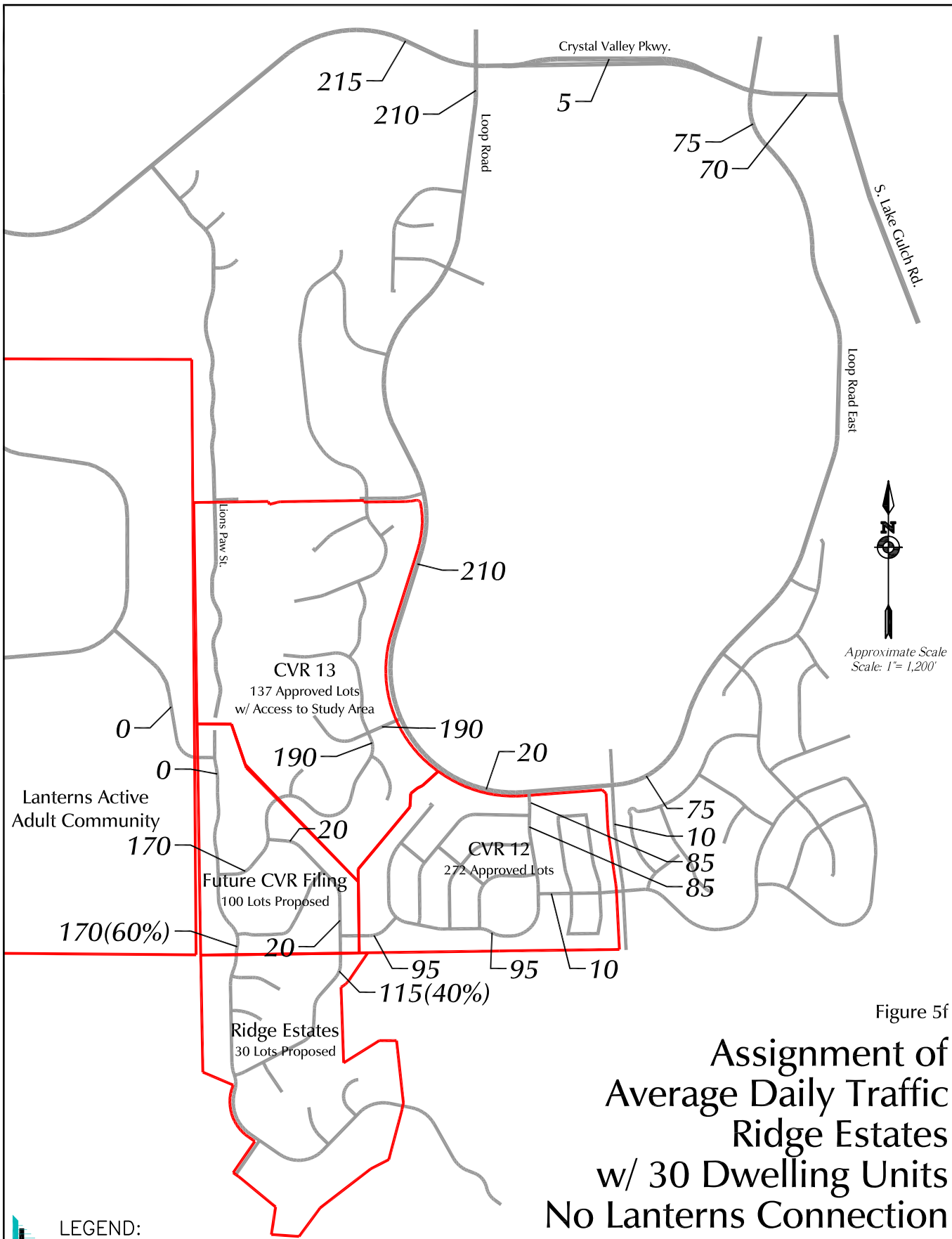
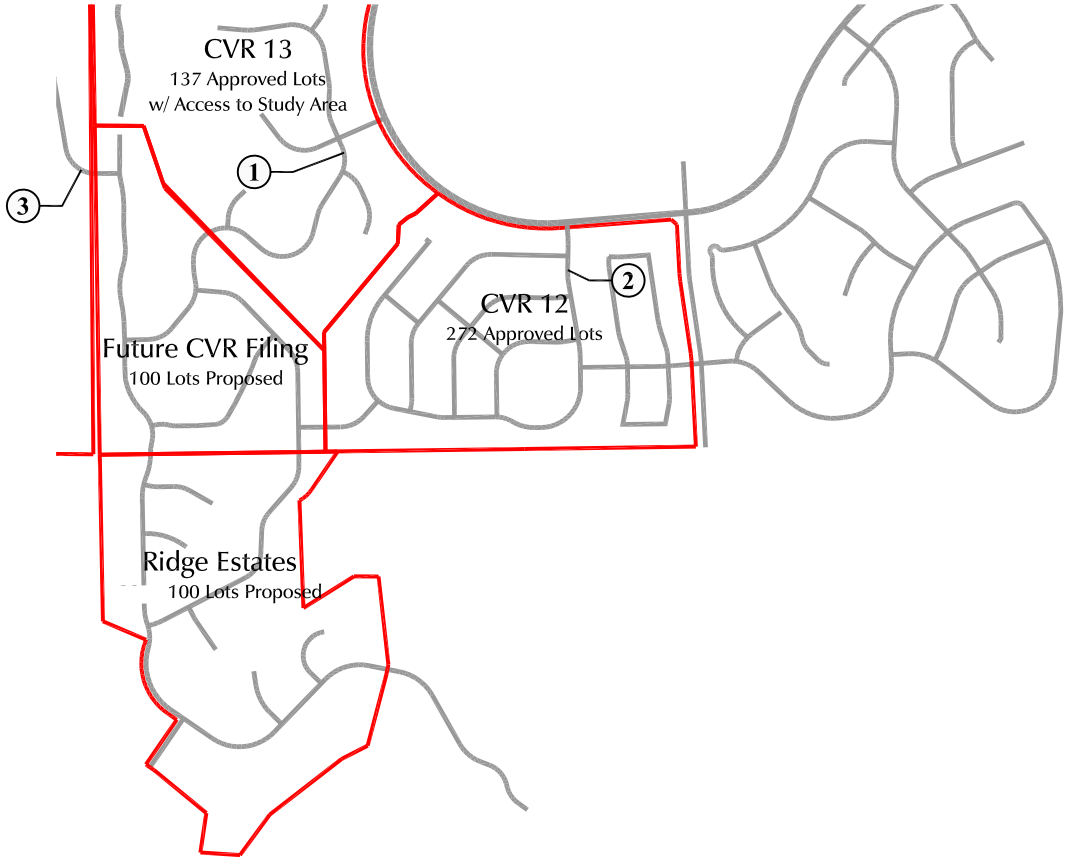


Figure 5f

Assignment of Average Daily Traffic Ridge Estates w/ 30 Dwelling Units No Lanterns Connection 60%/40% Split

Ridge Estates (LSC #150660)





Approximate Scale
Scale: 1"= 1,200'

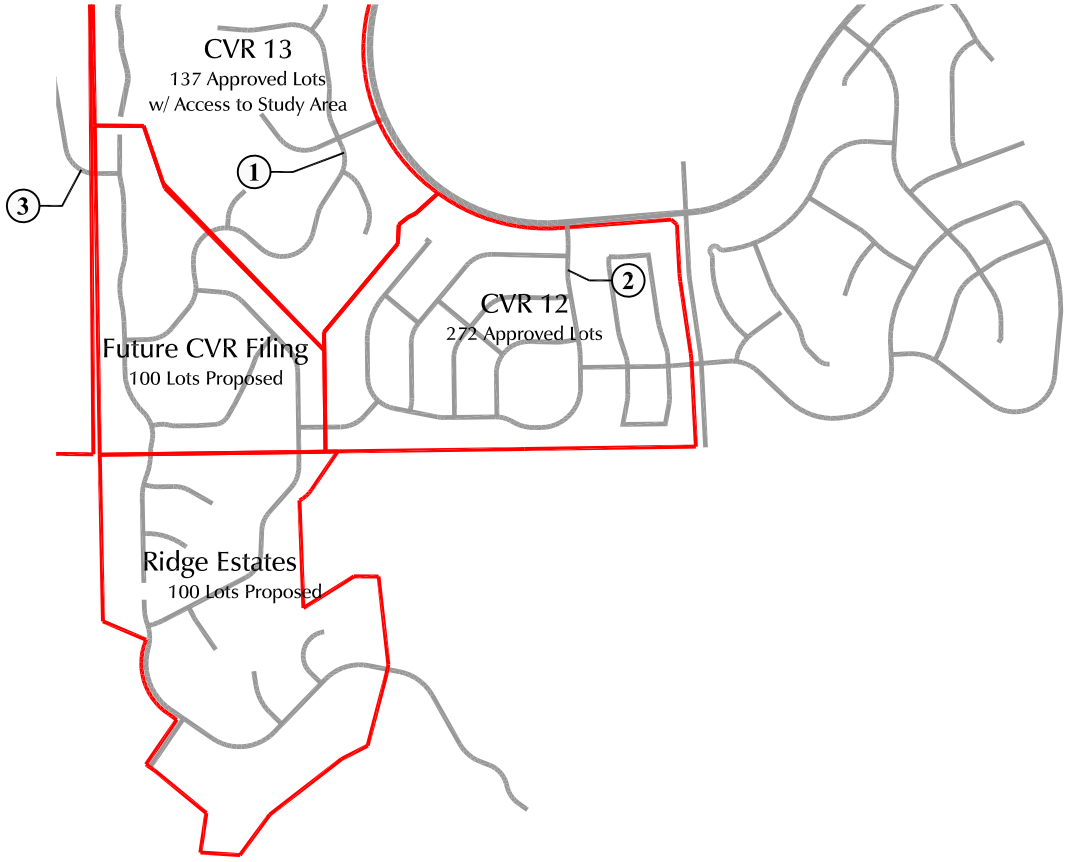
Lanterns Connection 100 Ridge Estates Lots	No Lanterns Connection 100 Ridge Estates Lots	No Lanterns Connection 30 Ridge Estates Lots
(1) CVR 12 = 0 CVR 13 = 395 Lanterns = 390 Future Filing = 405 Ridge Estates = 245 Total = 1,435	(1) CVR 12 = 0 CVR 13 = 435 Lanterns = 0 Future Filing = 850 Ridge Estates = 690 Total = 1,975	(1) CVR 12 = 0 CVR 13 = 435 Lanterns = 0 Future Filing = 850 Ridge Estates = 205 Total = 1,490
(2) CVR 12 = 1,190 CVR 13 = 0 Lanterns = 0 Future Filing = 75 Ridge Estates = 230 Total = 1,495	(2) CVR 12 = 1,275 CVR 13 = 0 Lanterns = 0 Future Filing = 75 Ridge Estates = 230 Total = 1,580	(2) CVR 12 = 1,275 CVR 13 = 0 Lanterns = 0 Future Filing = 75 Ridge Estates = 70 Total = 1,420
(3) CVR 12 = 105 CVR 13 = 40 Lanterns = 390 Future Filing = 445 Ridge Estates = 445 Total = 1,425	(3) CVR 12 = 0 CVR 13 = 0 Lanterns = 0 Future Filing = 0 Ridge Estates = 0 Total = 0	(3) CVR 12 = 0 CVR 13 = 0 Lanterns = 0 Future Filing = 0 Ridge Estates = 0 Total = 0

Figure 6a

Summary of ADT On Various Streets at Build-Out for Three Scenarios 66%/34% Split

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.





Approximate Scale
Scale: 1"= 1,200'

	Lanterns Connection 100 Ridge Estates Lots	No Lanterns Connection 100 Ridge Estates Lots	No Lanterns Connection 30 Ridge Estates Lots
1	CVR 12 = 0 CVR 13 = 395 Lanterns = 390 Future Filing = 405 Ridge Estates = 200 Total = 1,390	CVR 12 = 0 CVR 13 = 435 Lanterns = 0 Future Filing = 850 Ridge Estates = 645 Total = 1,930	CVR 12 = 0 CVR 13 = 435 Lanterns = 0 Future Filing = 850 Ridge Estates = 190 Total = 1,475
2	CVR 12 = 1,190 CVR 13 = 0 Lanterns = 0 Future Filing = 75 Ridge Estates = 270 Total = 1,535	CVR 12 = 1,275 CVR 13 = 0 Lanterns = 0 Future Filing = 75 Ridge Estates = 270 Total = 1,620	CVR 12 = 1,275 CVR 13 = 0 Lanterns = 0 Future Filing = 75 Ridge Estates = 85 Total = 1,435
3	CVR 12 = 105 CVR 13 = 40 Lanterns = 390 Future Filing = 445 Ridge Estates = 445 Total = 1,425	CVR 12 = 0 CVR 13 = 0 Lanterns = 0 Future Filing = 0 Ridge Estates = 0 Total = 0	CVR 12 = 0 CVR 13 = 0 Lanterns = 0 Future Filing = 0 Ridge Estates = 0 Total = 0

Figure 6b

Summary of ADT On Various Streets at Build-Out for Three Scenarios 60%/40% Split

Ridge Estates (LSC #150660)

LSC TRANSPORTATION CONSULTANTS, INC.

TOWN OF CASTLE ROCK COLORADO

Public Works Department

"Our mission is to provide outstanding service, safety and support for transportation infrastructure and maintenance."

TO: Bob Goebel, Director of Public Works

THRU: Ryan Germeroth, Transportation Planning & Traffic Engineering Manager

FROM: Jacob Vargish, Public Works Development Supervisor

DATE: January 26, 2017

SUBJECT: Summary Ridge Estates Traffic Sensitivity Analysis

Executive Summary

The purpose of this memo is to provide a summary of a traffic impact memo and supplement that was performed by a third party traffic consultant, Felsburg Holt & Ullevig, regarding the proposed annexation and development of Ridge Estates, see attachment A and B. These memos provide a recommendation on the number of allowed dwelling units for three scenarios of development build out, as well as the street network that must be constructed either by this applicant or by other developments in the vicinity to support dwelling units. For reference please see figure 1 to identify the surrounding development filings and the access locations that are analyzed in this study.

Transportation Impact

Three development areas will have impacts to local streets by Ridge Estates traffic, Crystal Valley Ranch F12 and F13 (CVR F12 & CVR F13), and Future Crystal Valley Filing (Future CVR). Lanterns development to the west of Crystal Valley Ranch will have traffic that contribute to the Crystal Valley Ranch local streets as well as provide a connection for other developments to another collector roadway. There is no other planned access out of Ridge Estates into the Town traffic system and therefore it is critical to balance the proposed development to ensure the Town system can handle the proposed traffic and not create a negative impact on these surrounding entitled developments.

Only CVR F12 is presently under construction and therefore three scenarios for buildout of the surrounding connections is considered. For each scenario a

recommendation is made for the number of dwelling units in Ridge Estates that can be supported on Town streets without exceeding the volume criteria. Those scenarios and their assumptions are described below.

The applicant proposed three access points to collector class roadways that shows the maximum allowed volume of traffic on each of those local streets. A sensitivity analysis is done that shifts up to 10% of the assigned trips (or 10% of dwelling units analyzed) of one of the access points to an alternative access point. A recommendation is made on what roadway connections need to be built prior to support building further dwelling units in Ridge Estates.

Scenario 1:
Full Build Out of CVR Filing 12 and Ridge Estates Only
Assumptions:

- No vehicular connections to the Lanterns project or CVR Filing 13
- Only connections to/from Ridge Estates are through CVR Filing 12 with a minimal number of vehicles using the local road network in CVR 12 to connect to Ditmars Lane
- 100% of Ridge Estates traffic assigned to Locations 3 and 4
- Street thresholds set at 1,500 vpd, per local street criteria.
-

Scenario 2:
Full Build Out of CVR Filing 12, Filing 13, Future CVR, and Ridge Estates
Assumptions:

- 100 DUs in Future CVR
- No vehicular connections to the Lanterns project
- Connections to/from Ridge Estates are through Future CVR, CVR Filing 12 and CVR Filing 13 with a minimal number of vehicles using the local road network in CVR 12 to connect to Ditmars Lane
- CVR 12 site related traffic that was assigned to Location 6 has been redistributed to Location 4 and Location 5, with a 60/40 split, respectively.
- 100 percent of CVR 13 site generated traffic has been assigned to the Location 1 roadway to access the Loop Road.
- Future CVR site related traffic that was assigned to Location 6 has been redistributed to Location 1 and Location 3, with an 85/15 split, respectively.
- Ridge Estates traffic that was assigned to Location 6 has been redistributed to Location 1 and Location 3, with an approximate 50/50 split.
- Street thresholds set at 1,500 vpd, per local street criteria.

Scenario 3:
Full Build Out of Lanterns, CVR Filing 12, Filing 13, Future CVR, and Ridge Estates
Assumptions:

- 100 DUs in Future CVR

- Connections to/from Ridge Estates are through Lanterns, Future CVR, CVR Filing 12 and CVR Filing 13 with a minimal number of vehicles using the local road network in CVR 12 to connect to Ditmars Lane
- 10 present of Ridge Estates and Future CVR trips were redistributed from Location 6 to Locations 3 and 4.
- 100 percent of CVR 13 site generated traffic has been assigned to the Location 1 roadway to access the Loop Road.
- Street thresholds set at 1,500 vpd, per local street criteria.

Recommendation

Staff recommends reducing the number of dwelling units to be constructed in Ridge Estates based on what the local street networks in surrounding neighborhoods can support. Staff also recommends roadway connections to be constructed to support these dwelling units.

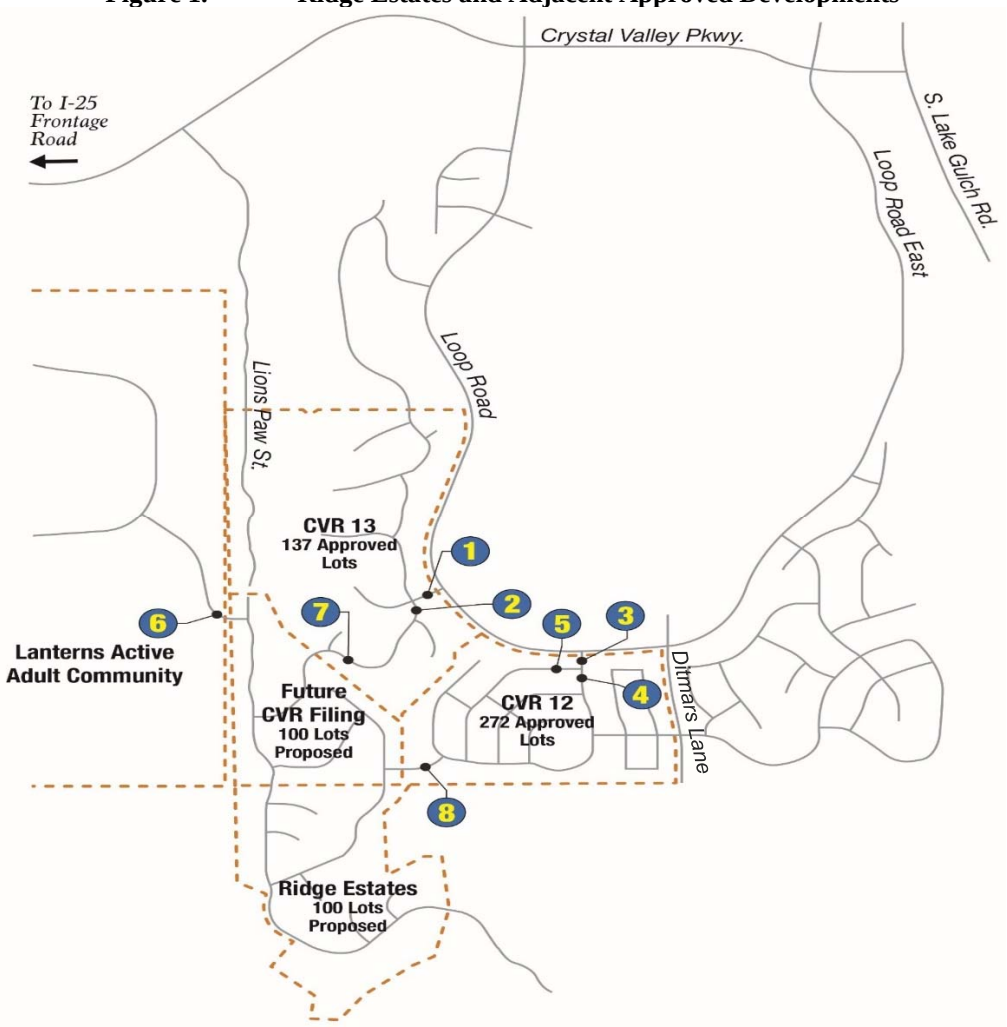
In Scenario 1, when only CVR 12 and Ridge Estates are constructed. Ridge Estates maximum number of dwelling units should be 26. To support the Ridge Estates development either developer in CVR F12 or applicant for Ridge Estates must ensure roadways at access 3, 4, 5, 8, and a connection to Ditmars Lane are constructed to support these dwelling units.

In Scenario 2, when CVR 12, CVR 13, Future CVR and Ridge Estates are constructed. Ridge Estates maximum number of dwelling units should be 29. To support the Ridge Estates development either developer in CVR F12, CVR 13, Future CVR or applicant for Ridge Estates must ensure roadways at access 1, 2, 3, 4, 5, 7, 8, and a connection to Ditmars Lane are constructed to support these dwelling units.

In Scenario 3, when all of Lanterns, CVR 12, CVR 13, Future CVR and Ridge Estates are constructed. Ridge Estates maximum number of dwelling units should be 42. To support the Ridge Estates development either developer in CVR F12, CVR 13, Future CVR, Lanterns or applicant for Ridge Estates must ensure roadways at access 1, 2, 3, 4, 5, 6, 7, 8, and a connection to Ditmars Lane are constructed to support these dwelling units.

This recommendation takes into account the flexibility of traffic choosing to use another access as opposed to their assumed access. In the full build out case, this means 4 dwelling units of the 42 would use alternative access from the assumed trip distribution. Additionally to arrive at this full build out recommendation 10 dwelling units of the 100 proposed for the Future CVR would use an alternative access from the distribution assumptions.

Figure 1. Ridge Estates and Adjacent Approved Developments



Attachment A

FELSBURG HOLT & ULLEVIG

connecting and enhancing communities

January 20, 2017

MEMORANDUM

To: Ryan Germeroth, PE, Transportation Planning & Traffic Engineering Manager
Jacob Vargish, Public Works Development Supervisor

From: Elliot Sulsky, PE, AICP
Rachel S. Ackermann, EI

Re: Castle Rock Ridge Estates Review Memo
FHU Reference No. 115038-03

Ridge Estates is a newly proposed development south of Castle Rock, Colorado. The development proposal consists of 100 proposed residential single family lots. The Ridge Estates development is seeking entitlements and an annexation agreement.

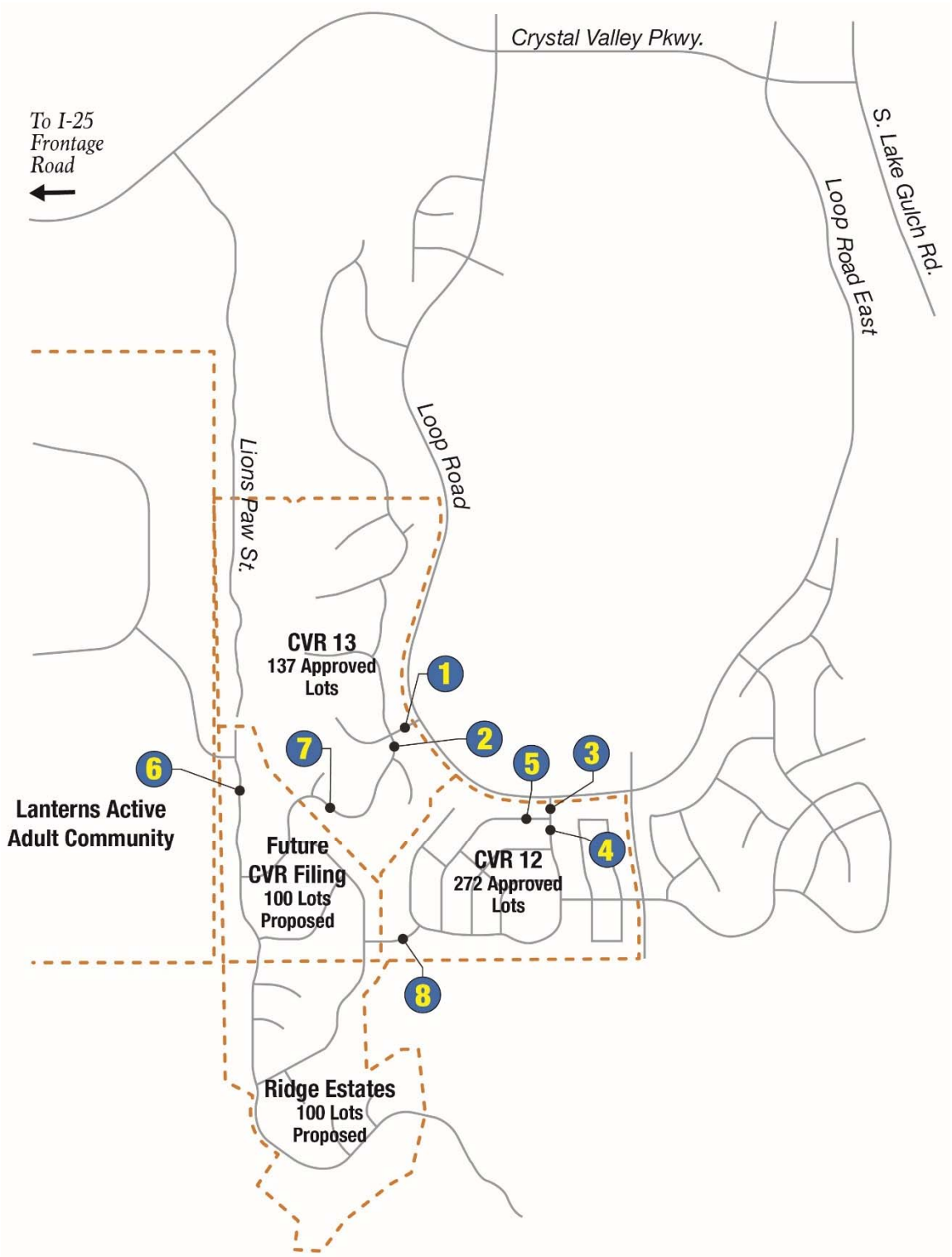
The Town of Castle Rock has expressed concern that the site generated traffic associated with the proposed development will exceed the capacity of the local streets in adjacent developments. **Figure 1** identifies nearby developments and roadway segments where there may be the potential for combined site generated traffic volumes from all the development to exceed the allowable volumes.

This memorandum summarizes a review of the traffic analyses provided by the Ridge Estates traffic engineer to evaluate the potential impacts of the Ridge Estates development on the Crystal Valley Ranch local road network.

TOWN OF CASTLE ROCK DESIGN CRITERIA

The Town of Castle Rock Transportation Design Criteria Manual specifies that the average daily traffic volume on residential local roads is not to exceed 1,500 vehicles per day (vpd). On **Figure 1**, Location 1 and Location 3 are not projected to have residential lot frontages and were therefore approved to exceed 1,500 vpd. However, Location 2, Location 4, Location 5, Location 6, Location 7 and Location 8 all must comply with the 1,500 vpd threshold requirements for allowable local road daily traffic volumes.

Figure 1. Ridge Estates and Adjacent Approved Developments



TOWN OF CASTLE ROCK REVISED NEIGHBORHOOD TRAFFIC CALMING PROGRAM

The Town of Castle Rock adopted a revised Neighborhood Traffic Calming Program (NTCP) in 2015 to address concerns about vehicle speeds and cut through traffic on residential streets. From the NTCP, to be eligible a traffic study must show that the following thresholds are met or exceeded:

- The 85th percentile speed is 30 miles per hour (mph) or greater; in the case of streets with posted speed limits higher than 25 mph, the 85th percentile speed must be at least 5 mph over the posted speed limit, **AND** a residential street must have a daily traffic volume greater than 500 vpd or at least 20 percent of the traffic must be determined to be "cut through traffic"
- A collector street within a residential area must have a traffic volume greater than 1,500 vpd.

If Location 2, Location 4, Location 5, Location 6, Location 7 or Location 8 meet or exceed the 500 vpd threshold, those local streets may be eligible to participate in the NTCP. It is important to keep in mind that vehicle speeds also must have an 85th percentile speed of 30 mph or greater to qualify for the program.

ADJACENT DEVELOPMENTS

Other residential developments adjacent to, or near, the proposed Ridge Estates development are also shown on **Figure 1**.

The Ridge Estates development is located south of a development called Crystal Valley Ranch Filing 12 (CVR 12). CVR 12 is currently under construction and a part of a larger Crystal Valley Ranch development that is split between multiple filings: CVR 12, Crystal Valley Ranch Filing 13 (CVR 13) and a future Crystal Valley Ranch (Future CVR) filing between CVR 13 and Ridge Estates. The CVR developments have approved annexations and entitlements.

This memorandum evaluates the full build-out analysis for all the developments discussed above. Additionally, this memorandum also evaluates the potential traffic impacts associated with the following build-out/phasing scenarios:

- **CVR 12 and Ridge Estates** – This scenario assumes that the only connections to/from Ridge Estates are through CVR 12 with a minimal number of vehicles using the local road network in CVR 12 to connect to Ditmars Lane.
- **CVR 12, CVR 13, Future CVR and Ridge Estates** – In addition to the connections summarized in the CVR 12 and Ridge Estates scenario, this scenario also includes a connection to/from the north to the Loop Road, using the local road network in the CVR 13 and Future CVR developments.

FULL BUILD-OUT SCENARIO

The full build-out scenario, as evaluated in the *LSC Memo*, evaluates the full buildout of all five developments including the potential connection to/from Lanterns. As summarized in the *LSC Memo*, the evaluation shows that Location 1 and Location 3 are expected to exceed 1,500 vpd, which were approved as entry streets. Locations 2, 4, 5, 6 are projected to experience less than 1,500 vpd.

However, it is important to note that Locations 2, 4 and 6 are very close to exceeding the 1,500 vpd threshold; 1,435 vpd, 1,495 vpd and 1,425 vpd respectively. These projected volumes do not provide much flexibility for traffic patterns that deviate from the assumptions outlined in the analysis.

FHU has reviewed the distribution assumptions for each of the developments and conducted a sensitivity analysis for the distribution assumptions. Because FHU felt that the overall distribution assumption was reasonable, a 10 percent sensitivity analysis was conducted; it was assumed that fluctuations greater than 10 percent would indicate the need to reconsider the baseline distribution assumptions.

Individually, the following changes in distribution assumptions indicate that in one or more local road segment (Location 2, 4 or 6) would exceed the allowable 1,500 vpd threshold:

- Future CVR: a 1 percent shift to Location 3 (from Location 1 or 6)
- Ridge Estates: a 1 percent shift to Location 3 (from Location 1 or 6)
- CVR 12: 5 percent shift to Location 6 (from Location 3)
- Future CVR: 10 percent shift to Location 3 (from Location 1 or 6)
- Future CVR: 10 percent shift to Location 6 (from Location 1)
- Ridge Estates: 10 percent shift to Location 1 (from Location 3 or 6)
- Ridge Estates: 10 percent shift to Location 6 (from Location 1 or 3)

The projected volumes at each location for each of the scenarios summarized above are shown on **Table 1**. **Table 1** identifies locations where traffic volumes are expected to exceed the:

- 1,500 vpd threshold but are considered entry streets (shown in green)
- 1,500 vpd threshold for local streets (shown in red)
- 500 vpd, therefore potentially qualifying the street for the NTCP (shown in orange), should the traffic conditions meet both criteria of the Program.

Table 1. Distribution Sensitivity Analysis Results

Distribution Assumptions	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
LSC Build-out Distribution Assumptions	1740	1435	2270	1495	775	1425	1080	465
Future CVR: 1% to Location 3 from Location 1	1735	1430	2280	1505	775	1425	1075	475
Future CVR: 1% to Location 3 from Location 6	1740	1435	2280	1505	775	1415	1080	475
Ridge Estates: 1% to Location 3 from Location 1	1735	1430	2280	1505	775	1425	1075	475
Ridge Estates: 1% to Location 3 from Location 6	1740	1435	2280	1505	775	1410	1080	475
CVR 12: 5% to Location 6 from Location 3	1740	1435	2170	1435	735	1525	1080	565
Future CVR: 10% to Location 3 from Location 1	1650	1345	2360	1585	775	1425	990	555
Future CVR: 10% to Location 3 from Location 6	1740	1435	2360	1585	775	1330	1080	555
Future CVR: 10% to Location 6 from Location 1	1650	1345	2270	1495	775	1515	990	465
Ridge Estates: 10% to Location 1 from Location 3	1835	1530	2180	1405	775	1425	1175	375
Ridge Estates: 10% to Location 1 from Location 6	1835	1530	2270	1495	775	1330	1175	465
Ridge Estates: 10% to Location 6 from Location 1	1650	1345	2270	1495	775	1515	990	465
Ridge Estates: 10% to Location 6 from Location 3	1740	1435	2180	1405	775	1515	1080	375

This analysis indicates that the ability for Locations 2, 4 and 6 to remain under the 1,500 vpd threshold is highly dependent on the accuracy of the distribution/route choice assumptions. Additionally, most locations will meet the traffic volume threshold criteria for the NTCP. However, it is important to note the ability of Location 8 to qualify for the NTCP is rather sensitive to the distribution assumptions.

The following tables summarize the projected vehicular volumes by location under various build-out scenarios for the distribution conditions under which Location 2, Location 4 and Location 6 are projected to exceed 1,500 vpd.

Table 2. Ridge Estates – 10% to Location 1 from Location 6 Scenario: Traffic Volumes Associated with Percent Build-out of Ridge Estates

# of DUs (% Buildout)	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
100 DUs (100%)	1835	1530	2270	1495	775	1330	1175	465
90 DUs (90%)	*1800*	*1495*	*2250*	*1475*	*775*	*1295*	*1140*	*445*
80 DUs (80%)	1765	1460	2225	1450	775	1260	1105	420
70 DUs (70%)	1735	1430	2200	1425	775	1225	1075	395
60 DUs (60%)	1700	1395	2180	1405	775	1190	1040	375
50 DUs (50%)	1665	1360	2155	1380	775	1155	1005	350
40 DUs (40%)	1630	1325	2135	1360	775	1120	970	330
30 DUs (30%)	1595	1290	2110	1335	775	1085	935	305
20 DUs (20%)	1565	1260	2085	1310	775	1050	905	280
10 DUs (10%)	1530	1225	2065	1290	775	1015	870	260
No Ridge Estates	1495	1190	2040	1265	775	980	835	235

To comply with the design criteria traffic volume thresholds for local roads, it has been calculated that Location 2 can only accommodate projected traffic from 90 Ridge Estates single family DUs under the following modified distribution assumption: 10 percent shift of Ridge Estates site generated traffic to Location 1 from Location 6, as shown in **Table 2**.

Table 3. Future CVR – 10% to Location 3 from Location 6 Scenario: Traffic Volumes Associated with Percent Build-out of Ridge Estates

# of DUs (% Buildout)	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
100 DUs (100%)	1740	1435	2360	1585	775	1330	1080	555
90 DUs (90%)	1715	1410	2340	1565	775	1285	1055	535
80 DUs (80%)	1690	1385	2315	1540	775	1240	1030	510
70 DUs (70%)	1665	1360	2290	1515	775	1195	1005	485
60 DUs (60%)	*1640*	*1335*	*2270*	*1495*	*775*	*1150*	*980*	*465*
50 DUs (50%)	1620	1315	2245	1470	775	1110	960	440
40 DUs (40%)	1595	1290	2225	1450	775	1065	935	420
30 DUs (30%)	1570	1265	2200	1425	775	1020	910	395
20 DUs (20%)	1545	1240	2175	1400	775	975	885	370
10 DUs (10%)	1520	1215	2155	1380	775	930	860	350
No Ridge Estates	1495	1190	2130	1355	775	885	835	325

To comply with the design criteria traffic volume thresholds for local roads, it has been calculated that Location 4 can only accommodate projected traffic from 60 Ridge Estates single family DUs under the following modified distribution assumption: 10 percent shift of Future CVR site generated traffic to Location 3 from Location 6, as shown in **Table 3**.

Table 4. CVR 12 – 5% to Location 6 from Location 3 Scenario: Traffic Volumes Associated with Percent Build-out of Ridge Estates

# of DUs (% Buildout)	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
100 DUs (100%)	1740	1435	2170	1435	735	1525	1080	565
93 DUs (93%)	*1725*	*1420*	*2155*	*1420*	*735*	*1495*	*1065*	*550*
90 DUs (90%)	1715	1410	2150	1415	735	1480	1055	545
80 DUs (80%)	1690	1385	2125	1390	735	1435	1030	520
70 DUs (70%)	1665	1360	2100	1365	735	1390	1005	495
60 DUs (60%)	1640	1335	2080	1345	735	1345	980	475
50 DUs (50%)	1620	1315	2055	1320	735	1305	960	450
40 DUs (40%)	1595	1290	2035	1300	735	1260	935	430
30 DUs (30%)	1570	1265	2010	1275	735	1215	910	405
20 DUs (20%)	1545	1240	1985	1250	735	1190	885	380
10 DUs (10%)	1520	1215	1965	1230	735	1125	860	360
No Ridge Estates	1495	1190	1940	1205	735	1080	835	335

To comply with the design criteria traffic volume thresholds for local roads, it has been calculated that Location 6 can only accommodate projected traffic from 93 Ridge Estates single family DUs under the following modified distribution assumption: 10 percent shift of CVR 12 site generated traffic to Location 6 from Location 3, as shown in **Table 4**.

Town of Castle Rock staff have also indicated that a new elementary school is to be located on the north side of the Loop Road, just north of Location 3, and a neighborhood recreation center is currently located to the north along Loop Road. In addition, a new middle school and regional park will be located just north of Crystal Valley Parkway at the Loop Road intersection. The new schools and other destinations exemplifies the vulnerability of Location 3 to minor shifts in distribution assumptions, particularly from Future CVR and Ridge Estates. The *LSC Memo* and analysis accounted for a total of 64 daily trips to from the school from the Future CVR and Ridge Estates developments, but not the other destinations in the area. Location 4 is projected to serve 1,495 vpd and a slight variation in actual enrollment rates could result in Location 4 exceeding 1,500 vpd.

CVR 12 AND RIDGE ESTATES SCENARIO

This scenario evaluates the full buildout of only CVR 12 and Ridge Estates. Under this scenario, it is assumed that CVR 12 and Ridge Estates developments do NOT have vehicular access to Locations 1, 2 and 6.

The proposed Ridge Estates development includes 100 residential single family dwelling units (DUs) that are estimated to generate approximately 950 daily vehicle trips.

This scenario includes the following modifications to the *LSC Memo* site generated trip distribution assumptions:

- CVR 12 site generated traffic that was assigned to Location 6 in the full build-out scenario has been redistributed to Location 4 and Location 5, with a 60/40 split respectively.
- 100 percent of Ridge Estates site generated traffic has been assigned to the Location 4 roadway (and Location 3) to access the Loop Road.

Under the full buildout scenario for Ridge Estates and CVR 12, the daily traffic volumes are projected to exceed the allowable 1,500 vpd on local roads at Locations 3 and 5, an approved condition for these entry streets. **Table 7** summarizes the projected vehicular volumes by location under various build-out scenarios.

Table 5. CVR 12 and Ridge Estates Scenario: Traffic Volumes Associated with Percent Build-out of Ridge Estates

# of DUs (% Buildout)	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
100 DUs (100%)	0	0	2990	2175	815	0	0	950
90 DUs (90%)	0	0	2900	2085	815	0	0	855
80 DUs (80%)	0	0	2805	1990	815	0	0	760
70 DUs (70%)	0	0	2715	1900	815	0	0	665
60 DUs (60%)	0	0	2620	1805	815	0	0	570
50 DUs (50%)	0	0	2530	1715	815	0	0	475
40 DUs (40%)	0	0	2440	1625	815	0	0	380
30 DUs (30%)	0	0	2345	1530	815	0	0	285
26 DUs (26%)	*0*	*0*	*2310*	*1495*	*815*	*0*	*0*	*250*
20 DUs (20%)	0	0	2255	1440	815	0	0	190
10 DUs (10%)	0	0	2160	1345	815	0	0	95
No Ridge Estates	0	0	2070	1255	815	0	0	0

To comply with the design criteria traffic volume thresholds for local roads, it has been calculated that Location 4 can only accommodate projected traffic from 26 Ridge Estates single family DUs. **Table 5** also illustrates that without the Ridge Estates development, Location 5 is projected to meet the NTCP 500 vpd threshold with CVR 12 traffic volumes alone. For this scenario, Location 8 is projected to meet the 500 vpd threshold at approximately 55 percent build-out (55 DUs).

CVR 12, CVR 13, FUTURE CVR AND RIDGE ESTATES

This scenario has been evaluated at full buildout of CVR 12, CVR 13, Future CVR and Ridge Estates. Under this scenario, the developments are projected to contribute traffic to Locations 1, 2, 3, 4 and 5; excluding the potential connection to the Lanterns development (Location 6).

This scenario includes the following modifications to the *LSC Memo* distribution assumptions:

- CVR 12 site related traffic that was assigned to Location 6 has been redistributed to Location 4 and Location 5, with a 60/40 split, respectively.
- 100 percent of CVR 13 site generated traffic has been assigned to the Location 1 roadway to access the Loop Road.
- Future CVR site related traffic that was assigned to Location 6 has been redistributed to Location 1 and Location 3, with an 85/15 split, respectively.
- Ridge Estates traffic that was assigned to Location 6 has been redistributed to Location 1 and Location 3, with an approximate 50/50 split.

Table 6. CVR 12, CVR 13, Future CVR and Ridge Estates Scenario: Traffic Volumes Associated with Percent Build-out of Ridge Estates

# of DUs (% Buildout)	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
100 DUs (100%)	1995	1675	2665	1850	815	0	1255	650
90 DUs (90%)	1945	1625	2620	1805	815	0	1205	600
80 DUs (80%)	1900	1580	2570	1755	815	0	1160	550
70 DUs (70%)	1855	1535	2525	1710	815	0	1115	500
62 DUs (62%)	*1815*	*1495*	*2490*	*1675*	*815*	*0*	*1075*	*465*
60 DUs (60%)	1805	1485	2480	1665	815	0	1065	455
50 DUs (50%)	1760	1440	2435	1620	815	0	1020	405
40 DUs (40%)	1715	1395	2390	1575	815	0	975	355
30 DUs (30%)	1665	1345	2345	1530	815	0	925	310
29 DUs (29%)	*1630*	*1310*	*2310*	*1495*	*815*	*0*	*890*	*270*
20 DUs (20%)	1620	1300	2300	1485	815	0	880	260
10 DUs (10%)	1570	1250	2255	1440	815	0	830	215
No Ridge Estates	1525	1205	2210	1395	815	0	785	165

The evaluation of the CVR 12, CVR 13, Future CVR and Ridge Estates scenario indicates that without the connection to the Lanterns development, Locations 2 and 4 will all exceed the 1,500 vpd allowable threshold.

To comply with the design criteria traffic volume thresholds for local roads, it has been calculated that Location 4 can only accommodate projected traffic from 29 Ridge Estates single family DUs (29 percent of build-out); Location 2 can accommodate up to 62 percent build-out. **Table 6** also illustrates that without the Ridge Estates development, Location 5 is projected to meet the NTCP volume threshold of 500 vpd. For this scenario, Location 8 is projected to meet the 500 vpd threshold at approximately 70 percent build-out (70 DUs).

CONCLUSION

The *LSC Memo* concluded that daily traffic volumes on local streets projected to be impacted by the Ridge Estates are not expected to exceed 1,500 vpd. The volumes on two entry streets (Locations 1 and 3) are expected to exceed 1,500 vpd, however, since there are no lot frontages on these streets, this condition was approved.

This memo has evaluated a few alternative development scenarios and found that the volumes on local roads in the study area have an increased potential for exceeding the allowable 1,500 vpd under the following scenarios:

- Full Build-out Scenario
    - 100 DUs from the Ridge Estates development could be accommodated under the LSC distribution assumptions.
    - Shifts to distribution assumptions for individual developments result in projected volumes exceeding the 1,500 vpd threshold
        - 60 DUs from the Ridge Estates development could be accommodated under the most conservative of the distribution assumptions evaluated - 10% shift of Future CVR site generated trips to Location 3 from Location 6
    - Deviations in projected enrollment rates at the new school located on the north side of the Loop Road
- CVR 12 and Ridge Estates scenario
    - Can accommodate 26 DUs from Ridge Estates development
- CVR 12, CVR 13, Future CVR and Ridge Estates (no connection to Lanterns)
    - Local road network cannot accommodate 100 DU/full build-out of the Ridge Estates development
    - Can accommodate 29 DUs from Ridge Estates development

Attachment B

FELSBURG HOLT & ULLEVIG

connecting and enhancing communities

January 20, 2017

MEMORANDUM

To: Ryan Germeroth, PE, Transportation Planning & Traffic Engineering Manager
Jacob Vargish, Public Works Development Supervisor

From: Elliot Sulsky, PE, AICP
Rachel S. Ackermann, EI

Re: Castle Rock Ridge Estates Review Memo
FHU Reference No. 115038-03

Ridge Estates is a newly proposed development in southeast Castle Rock, Colorado. The development proposal consists of 100 proposed residential single family lots. The Ridge Estates development is seeking entitlements and an annexation agreement.

The Town of Castle Rock has expressed concern that the site generated traffic associated with the proposed development will exceed the capacity of the local streets in adjacent developments. **Figure 1** identifies nearby developments and roadway segments where there may be the potential for combined site generated traffic volumes from all the development to exceed the allowable volumes.

A review of the traffic analyses provided by the Ridge Estates traffic engineer to evaluate the potential impacts of the Ridge Estates development on the Crystal Valley Ranch local road network has been addressed in a separate memorandum.

This memorandum summarizes supplementary sensitivity analyses to the evaluate the compounding effects of changes to distribution assumptions for multiple developments.

The Town of Castle Rock staff have requested the following two compounded scenarios:

- 10 percent to Location 1 from Location 6 for both the Future CVR development and the Ridge Estates Development.
- 10 percent to Location 3 from Location 6 for both the Future CVR development and the Ridge Estates Development.

The following tables summarize the associated site generated traffic volumes and percent build-out of Ridge Estates that could be accommodated under each scenario.

6300 South Syracuse Way, Suite 600 Centennial, CO 80111 tel 303.721.1440 fax 303.721.0832
www.fhueng.com info@fhueng.com

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Figure 1. Ridge Estates and Adjacent Approved Developments

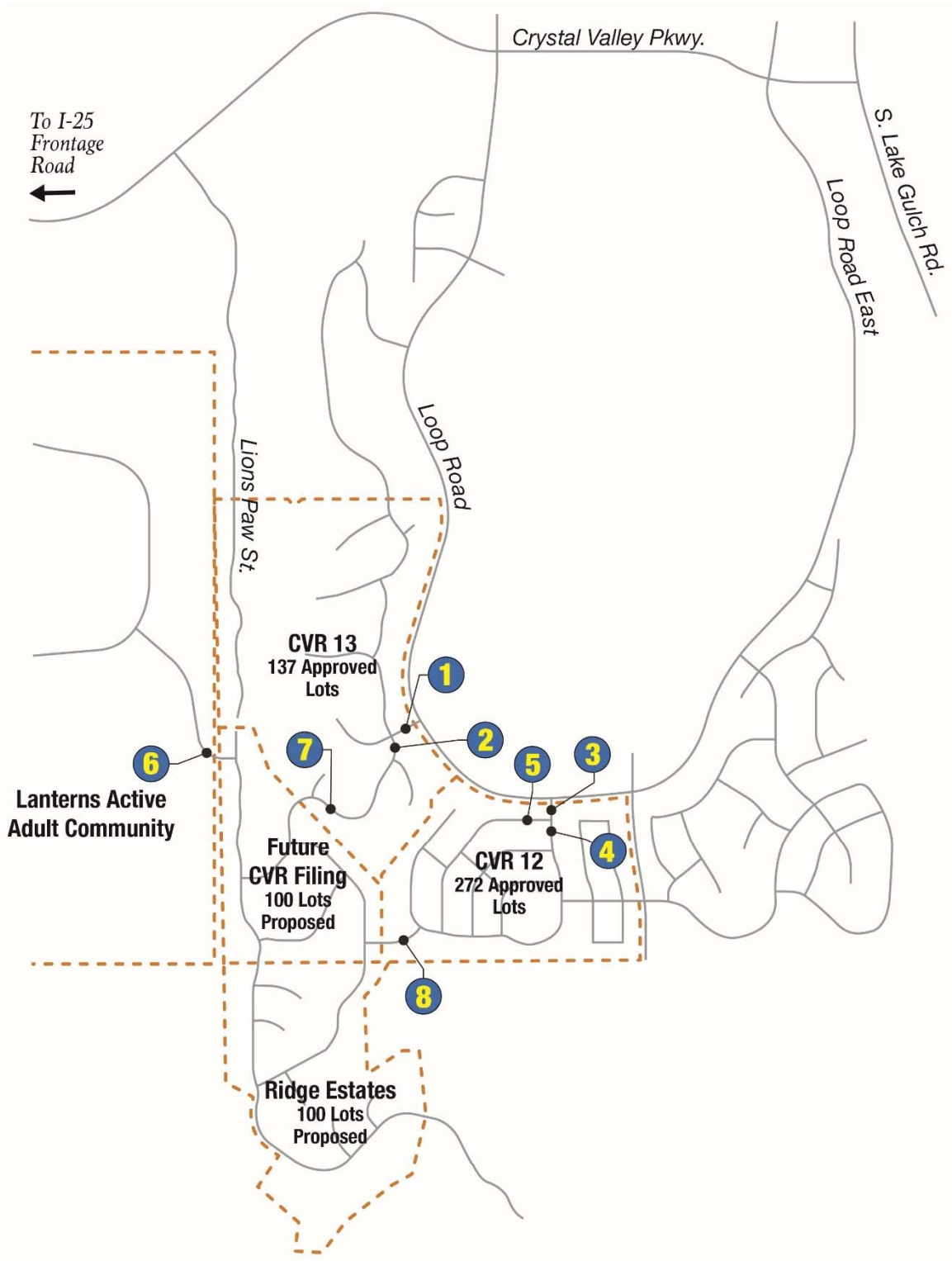


Table 1. 10 percent to Location 1 from Location 6 for both the Future CVR development and the Ridge Estates Development: Traffic Volumes Associated with Percent Build-out of Ridge Estates

# of DUs (% Buildout)	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
100 DUs (100%)	1930	1625	2270	1495	775	1235	1270	465
90 DUs (90%)	1895	1590	2250	1475	775	1200	1235	445
80 DUs (80%)	1860	1555	2225	1450	775	1165	1200	420
70 DUs (70%)	1830	1525	2200	1425	775	1130	1170	395
62 DUs (62%)	*1800*	*1495*	*2185*	*1410*	*775*	*1100*	*1140*	*380*
60 DUs (60%)	1795	1490	2180	1405	775	1095	1135	375
50 DUs (50%)	1760	1455	2155	1380	775	1060	1100	350
40 DUs (40%)	1725	1420	2135	1360	775	1025	1065	330
30 DUs (30%)	1690	1385	2110	1335	775	990	1030	305
20 DUs (20%)	1660	1355	2085	1310	775	955	1000	280
10 DUs (10%)	1625	1320	2065	1290	775	920	965	260
No Ridge Estates	1590	1285	2040	1265	775	885	930	235

To comply with the design criteria traffic volume thresholds for local roads, it has been calculated that Location 2 can only accommodate projected traffic from 62 Ridge Estates single family DUs under the following modified distribution assumption: 10 percent shift of Future CVR and Ridge Estates site generated traffic to Location 6 from Location 1, as shown in **Table 1**.

Table 2. 10 percent to Location 3 from Location 6 for both the Future CVR development and the Ridge Estates Development: Traffic Volumes Associated with Percent Build-out of Ridge Estates

# of DUs (% Buildout)	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8
100 DUs (100%)	1740	1435	2455	1680	775	1240	1080	650
90 DUs (90%)	1715	1410	2425	1650	775	1205	1055	620
80 DUs (80%)	1690	1385	2390	1615	775	1165	1030	585
70 DUs (70%)	1665	1360	2360	1585	775	1130	1005	555
60 DUs (60%)	1640	1335	2330	1555	775	1095	980	525
50 DUs (50%)	1620	1315	2295	1520	775	1060	960	490
42 DUs (42%)	*1600*	*1295*	*2270*	*1495*	*775*	*1035*	*940*	*465*
40 DUs (40%)	1595	1290	2265	1490	775	1025	935	460
30 DUs (30%)	1570	1265	2230	1455	775	990	910	425
20 DUs (20%)	1545	1240	2200	1425	775	955	885	395
10 DUs (10%)	1520	1215	2165	1390	775	920	860	360
No Ridge Estates	1495	1190	2135	1360	775	885	835	330

To comply with the design criteria traffic volume thresholds for local roads, it has been calculated that Location 4 can only accommodate projected traffic from 42 Ridge Estates single family DUs under the following modified distribution assumption: 10 percent shift of Future CVR and Ridge Estates site generated traffic to Location 6 from Location 3, as shown in **Table 2**.

LSC TRANSPORTATION CONSULTANTS, INC.

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Denver, CO 80206
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FAX (303) 333-1107
E-mail: lsc@lscdenver.com

March 2, 2017

Mr. Gregg Brown
Crystal Valley Ranch Development Company
Gregg@cvranch.com

Re: Ridge Estates
Traffic Memorandum
Castle Rock, CO
(LSC #150660)

Dear Mr. Brown:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic memorandum for the proposed Ridge Estates development.

BACKGROUND INFORMATION

LSC Analyses

LSC has completed multiple analyses of the proposed Ridge Estates residential development proposed for annexation into the Town of Castle Rock. The latest traffic study is dated September 19, 2016 and shows the existing and proposed roadway system could accommodate 100 dwelling units in the future filing of Crystal Valley Ranch (CVR Future Filing) immediately north of Ridge Estates as well as 100 dwelling units in Ridge Estates. All intersections were shown operating at acceptable levels of service with these 200 future dwelling units. These two parcels have three connections to enter/exit the neighborhood - through Crystal Valley Ranch Filing 13 (CVR Filing 13), through Crystal Valley Ranch Filing 12 (CVR Filing 12), and a future connection west through the Lanterns residential development. Each of the three connections has a 1,500 vehicle per day capacity for a total capacity of 4,500 vehicles per day.

The January 16, 2017 *Ridge Estates Supplemental Letter* by LSC estimated a buildout daily trip assignment for the area that showed the following daily traffic volumes:

CVR Filing 13 south of Entry Street	1,435 vehicles per day
CVR Filing 12 south of Entry Street	1,495 vehicles per day
Lanterns Connection	1,425 vehicles per day
	4,355 vehicles per day

These buildout daily volumes are 96.8 percent of the available capacity without exceeding the 1,500 vehicles per day limit on a local street. Because demand is expected to be so close to capacity, Town Public Works staff commissioned a peer review by Felsburg Holt & Ullevig

(FHU) to conduct a sensitivity analysis to determine if any of the three connections could exceed 1,500 vehicles per day with variations in the assumed trip assignment.

FHU ANALYSES

First Analysis

FHU conducted two separate sensitivity analyses dated January 20, 2017. The first analysis stated the overall distribution assumptions in the LSC analyses are reasonable. Because the overall distribution is appropriate, FHU completed a ten percent sensitivity analysis for the assignment of future Ridge Estates traffic and for the assignment of CVR Future Filing traffic. This analysis reviewed multiple scenarios with the most limiting being a shift of ten percent of the CVR Future Filing trips from the Lanterns connection to the CVR Filing 12 connection. This scenario would allow for 100 dwelling units in the CVR Future Filing but only about 61 dwelling units in Ridge Estates. This drop would lower the daily trip generation impact on the three connections from 4,355 vehicle-trips per day to 3,984 vehicle-trips per day and lower the percentage of the 4,500 vehicles per day capacity from about 96.8 percent to about 88.5 percent. This reduction from a total of 200 dwelling units to a total of 161 dwelling units will provide about 3.5 times more excess capacity.

Second Analysis

Upon review of the first FHU analysis, Town Public Works staff requested FHU consider a more conservative analysis that assumes both the CVR Future Filing and Ridge Estates have a ten percent shift to various locations. This analysis was also dated January 20, 2017. The most limiting condition was found to be a shift of ten percent from the Lanterns connection to the CVR Filing 12 connection for both parcels. This scenario would allow for 100 dwelling units in the CVR Future Filing but only 42 dwelling units in Ridge Estates. A further review of the data shows the calculated unit count as 43 dwelling units - the 42 dwelling unit limit is a result of rounding all numbers to the nearest five vehicles. This drop would lower the daily trip generation impact on the three connections from 4,355 vehicles per day to 3,803 vehicles per day and lower the percentage of the 4,500 vehicles per day capacity from about 96.8 percent to about 84.5 percent. This reduction from a total of 200 dwelling units to a total of 142 dwelling units will provide nearly five times more excess capacity.

TOWN OF CASTLE ROCK POSITION

Upon review of the two FHU sensitivity analyses, Town Public Works staff has taken the position that a maximum of 100 dwelling units be allowed in the CVR Future Filing but only 42 dwelling units be allowed in Ridge Estates to provide a high level of confidence that no local streets exceed 1,500 vehicles per day at buildout.

APPLICANT POSITION

The project team has met with Town Public Works staff multiple times to negotiate greater than 142 dwelling units for the combined projects but has come to the conclusion that this is the maximum density that could be supported by Public Works staff. You have requested to maintain a total of 142 dwelling units but be allowed to provide a split within the range of 100/42 and 90/52 to allow some flexibility as the project moves through the process. The FHU

analyses showed the location with the greatest chance of exceeding 1,500 vehicles per day would be the CVR Filing 12 connection. The attached Conceptual Site Plan A shows a layout with 100 dwelling units in the CVR Future Filing and 42 dwelling units in Ridge Estates. The attached Conceptual Site Plan B shows a layout with 90 dwelling units in the CVR Future Filing and 52 dwelling units in Ridge Estates. The ten lots in the CVR Future Filing that are the closest to CVR Filing 12 were shifted into the western and southern areas of Ridge Estates. It is our opinion that the impacts to the three access routes will be very similar for these two conceptual layouts.

SUMMARY

We recommend the Town Public Works staff allow 90 dwelling units in the CVR Future Filing and 52 dwelling units in Ridge Estates as an equivalent to 100 dwelling units in the CVR Future Filing and 42 dwelling units in Ridge Estates. This flexibility will have a negligible effect on buildout trip assignment. A total of 142 total dwelling units will provide a greater than 15 percent buffer between the total trips generated (3,803 vpd) and the capacity of the three local access connections (4,500 vpd). The initial request for a total of 200 dwelling units would have left a buffer of only about three percent.

* * * * *

We trust this information will assist you in planning for the proposed Ridge Estates development. Please contact me if you have any questions or need further assistance.

Respectfully submitted,

LSC Transportation Consultants, Inc.

COLORADO LICENSED CHRISTOPHER S. MCGRANAHAN 39018 PROFESSIONAL ENGINEER

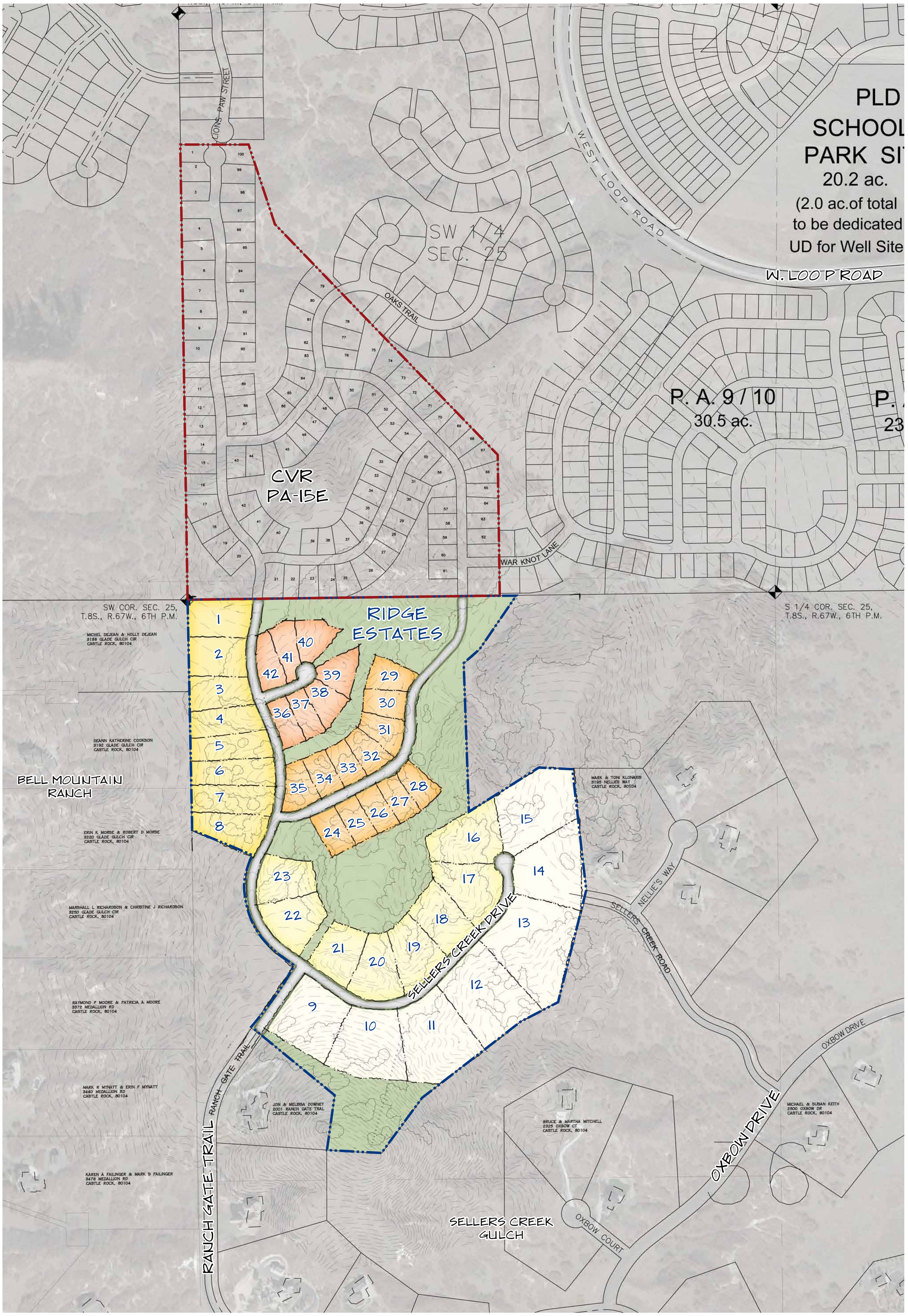
By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

3-2-17

CSM/wc

Enclosures: Conceptual Site Plan A
Conceptual Site Plan B

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SITE SUMMARY:

RIDGE ESTATES	42 UNITS
CRYSTAL VALLEY RANCH PA-15E	100 UNITS
TOTAL	142 UNITS

LEGEND:

AREA 'A'	2.0 -3.0 AC	(300'X300' AVG.)
AREA 'B'	1.00-1.25 AC	(180'X250' AVG.)
AREA 'C'	1.00-1.15 AC	(125'X300' AVG.)
AREA 'D'	0.50-.60 AC	(115'X200' AVG.)
AREA 'E'	0.50-.55 AC	(100'X225' AVG.)

Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

Conceptual Site Plan 'A'

March 1, 2017

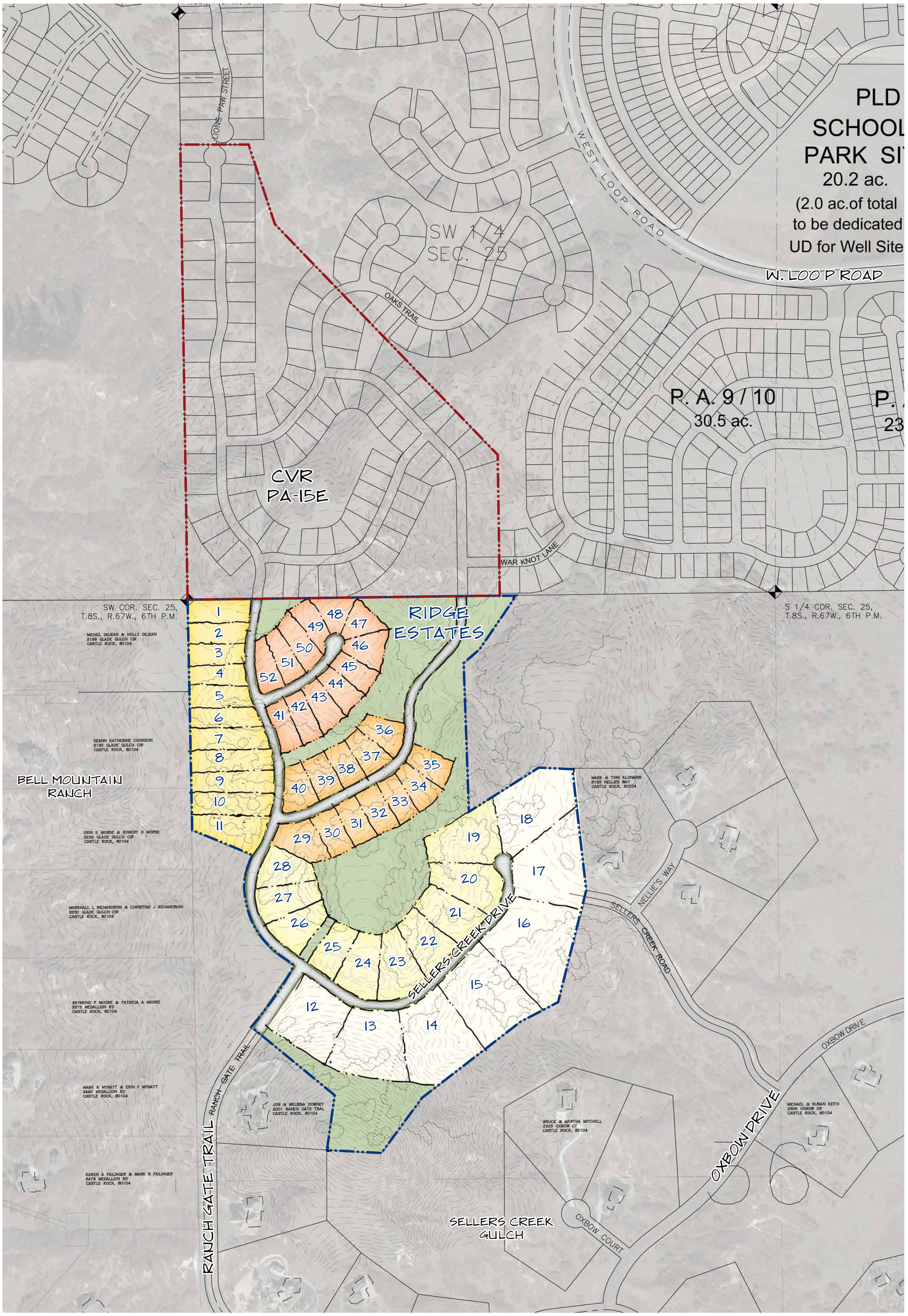
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Prepared by:

THE HENRY DESIGN GROUP
LAND PLANNING • LANDSCAPE ARCHITECTURE & DESIGN
1501 WAZEE STREET SUITE 1-C DENVER, COLORADO 80202 P 303-446-2368 F 303-446-0958



SITE SUMMARY:

RIDGE ESTATES	52 UNITS
CRYSTAL VALLEY RANCH PA-15E	90 UNITS
TOTAL	142 UNITS

LEGEND:

AREA 'A'	2.0 -3.0 AC	(300'X300' AVG.)
AREA 'B'	0.75-1.5 AC	(150'X250' AVG.)
AREA 'C'	0.50-1.0 AC	(100'X250' AVG.)
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Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

Conceptual Site Plan 'B'

March 1, 2017

N

0 200' 400' 600'

Scale: 1" = 200'

Prepared by:

THE HENRY DESIGN GROUP
LAND PLANNING • LANDSCAPE ARCHITECTURE & DESIGN
1501 WAZEE STREET SUITE 1-C DENVER, COLORADO 80202 P 303-446-2368 F 303-446-0958

A

405

New Alignment from Lanterns

445

75

25

100

PLD
SCHOOL
PARK SI
20.2 ac.
(2.0 ac.of total
to be dedicated
UD for Well Site

W. LOOP ROAD

WEST LOOP ROAD

LIONS PAW STREET

SW 1/4
SEC. 25

OAKS TRAIL

P. A. 9 / 10
30.5 ac.

P.
23

CVR
PA-15E

WAR KNOT LANE

SW COR. SEC. 25,
T.8S., R.67W., 6TH P.M.

S 1/4 COR. SEC. 25,
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MICHEL DEJEAN & HOLLY DEJEAN
3188 GLADE GULCH CIR
CASTLE ROCK, 80104

RIDGE
ESTATES

Future CVR Filing
Daily Trip Assignment
w/ 100 DUs

DEANN KATHERINE COOKSON
3192 GLADE GULCH CIR
CASTLE ROCK, 80104

BELL MOUNTAIN
RANCH

ERIN K MORSE & ROBERT D MORSE
3220 GLADE GULCH CIR
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2500 OXBOW DR
CASTLE ROCK, 80104

SELLERS CREEK DRIVE

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SELLERS CREEK
GULCH

SITE SUMMARY:

RIDGE ESTATES	42 UNITS
CRYSTAL VALLEY RANCH PA-15E	100 UNITS
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Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

Conceptual Site Plan 'A'

March 1, 2017

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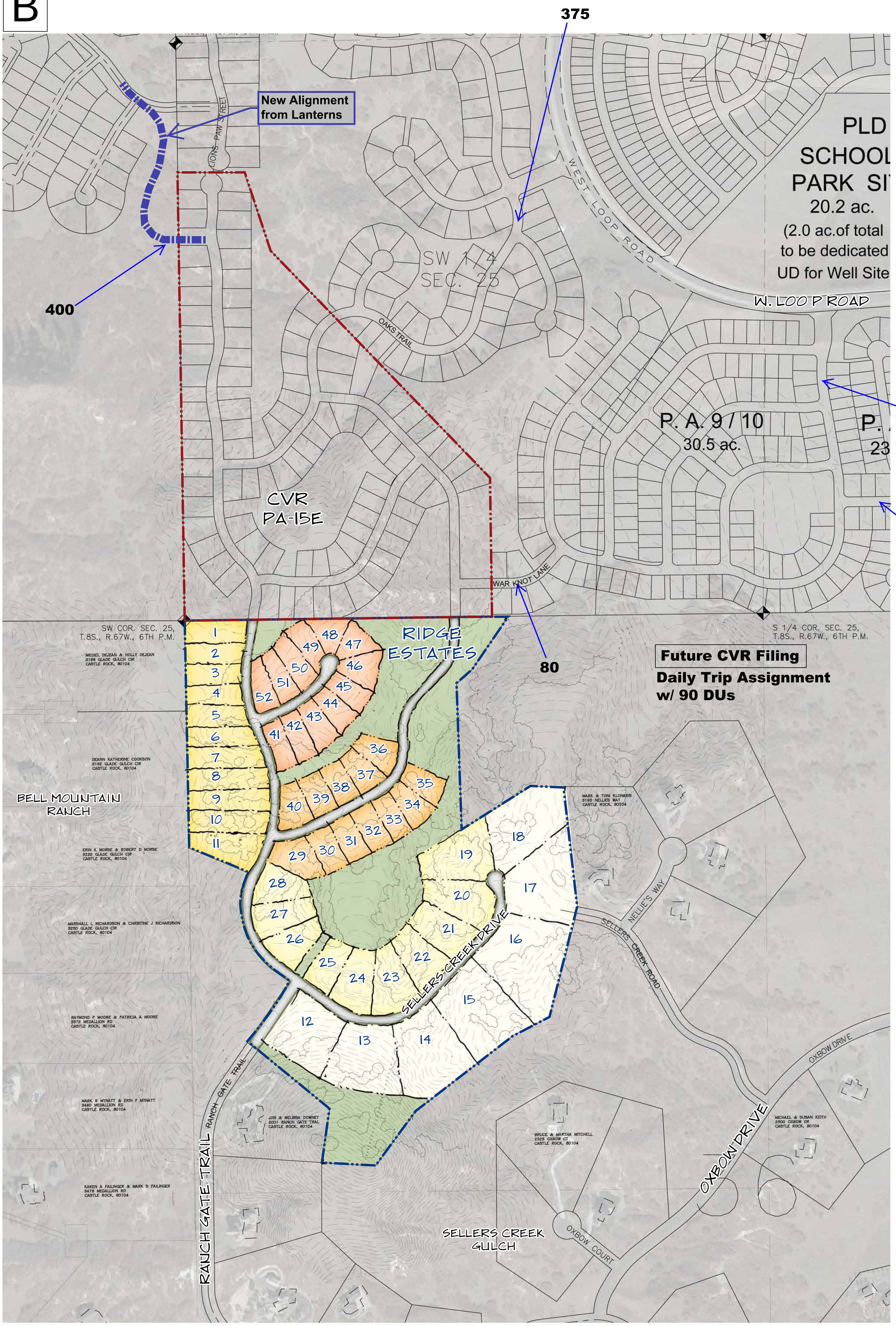
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B



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Ridge Estates & Crystal Valley Ranch PA-15E

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C

85

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RIDGE
ESTATES

1 2 3 4 5 6 7 8
40 41 42 39 38 37 36 29 30 31 32 33 34 35 28 27 26 25 24

Ridge Estates
Daily Trip Assignment
w/ 42 DUs

DEANN KATHERINE COOKSON
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9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

SELLERS CREEK DRIVE

NELLIE'S WAY

SELLERS CREEK ROAD

OXBOW DRIVE

RANCH GATE TRAIL

SELLERS CREEK
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Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

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D

115

New Alignment from Lanterns

230

LIONS PAW STREET

OAKS TRAIL

WEST LOOP ROAD

SW 1/4 SEC. 25

PLD SCHOOL PARK SI
20.2 ac.
(2.0 ac.of total to be dedicated UD for Well Site

W. LOOP ROAD

115

P. A. 9 / 10
30.5 ac.

P. A
23

35

CVR PA-15E

WAR KNOT LANE

150

SW COR. SEC. 25, T.8S., R.67W., 6TH P.M.

S 1/4 COR. SEC. 25, T.8S., R.67W., 6TH P.M.

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CASTLE ROCK, 80104

RIDGE ESTATES

Ridge Estates

Daily Trip Assignment w/ 52 DUs

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CASTLE ROCK, 80104

BELL MOUNTAIN RANCH

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E Total Trip Assignment A + C or B + D

490

New Alignment from Lanterns

630

175

55

230

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UD for Well Site

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WEST LOOP ROAD

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Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

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March 1, 2017

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LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street
Denver, CO 80206
(303) 333-1105
FAX (303) 333-1107
E-mail: lsc@lscdenver.com

January 17, 2018

Mr. Gregg Brown
Crystal Valley Ranch Development Company
Gregg@cvranch.com

Re: Ridge Estates
Traffic Memorandum
Castle Rock, CO
(LSC #150660)

Dear Mr. Brown:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic memorandum for the proposed Ridge Estates development.

BACKGROUND INFORMATION

LSC Analyses

LSC has completed multiple analyses of the proposed Ridge Estates residential development proposed for annexation into the Town of Castle Rock. The latest traffic study is dated September 19, 2016 and shows the existing and proposed roadway system could accommodate 100 dwelling units in the future filing of Crystal Valley Ranch (CVR Future Filing) immediately north of Ridge Estates as well as 100 dwelling units in Ridge Estates. All intersections were shown operating at acceptable levels of service with these 200 future dwelling units. These two parcels have three connections to enter/exit the neighborhood - through Crystal Valley Ranch Filing 13 (CVR Filing 13), through Crystal Valley Ranch Filing 12 (CVR Filing 12), and a future connection west through the Lanterns residential development. Each of the three connections has a 1,500 vehicle per day capacity for a total capacity of 4,500 vehicles per day.

The January 16, 2017 *Ridge Estates Supplemental Letter* by LSC estimated a buildout daily trip assignment for the area that showed the following daily traffic volumes:

CVR Filing 13 south of Entry Street	1,435 vehicles per day
CVR Filing 12 south of Entry Street	1,495 vehicles per day
Lanterns Connection	1,425 vehicles per day
	4,355 vehicles per day

These buildout daily volumes are 96.8 percent of the available capacity without exceeding the 1,500 vehicles per day limit on a local street. Because demand is expected to be so close to capacity, Town Public Works staff commissioned a peer review by Felsburg Holt & Ullevig (FHU)

to conduct a sensitivity analysis to determine if any of the three connections could exceed 1,500 vehicles per day with variations in the assumed trip assignment.

FHU ANALYSES

First Analysis

FHU conducted two separate sensitivity analyses dated January 20, 2017. The first analysis stated the overall distribution assumptions in the LSC analyses are reasonable. Because the overall distribution is appropriate, FHU completed a ten percent sensitivity analysis for the assignment of future Ridge Estates traffic and for the assignment of CVR Future Filing traffic. This analysis reviewed multiple scenarios with the most limiting being a shift of ten percent of the CVR Future Filing trips from the Lanterns connection to the CVR Filing 12 connection. This scenario would allow for 100 dwelling units in the CVR Future Filing but only about 61 dwelling units in Ridge Estates. This drop would lower the daily trip generation impact on the three connections from 4,355 vehicle-trips per day to 3,984 vehicle-trips per day and lower the percentage of the 4,500 vehicles per day capacity from about 96.8 percent to about 88.5 percent. This reduction from a total of 200 dwelling units to a total of 161 dwelling units will provide about 3.5 times more excess capacity.

Second Analysis

Upon review of the first FHU analysis, Town Public Works staff requested FHU consider a more conservative analysis that assumes both the CVR Future Filing and Ridge Estates have a ten percent shift to various locations. This analysis was also dated January 20, 2017. The most limiting condition was found to be a shift of ten percent from the Lanterns connection to the CVR Filing 12 connection for both parcels. This scenario would allow for 100 dwelling units in the CVR Future Filing but only 42 dwelling units in Ridge Estates. This drop would lower the daily trip generation impact on the three connections from 4,355 vehicles per day to 3,803 vehicles per day and lower the percentage of the 4,500 vehicles per day capacity from about 96.8 percent to about 84.5 percent. This reduction from a total of 200 dwelling units to a total of 142 dwelling units will provide nearly five times more excess capacity.

TOWN OF CASTLE ROCK POSITION

Upon review of the two FHU sensitivity analyses, Town Public Works staff has taken the position that a maximum of 100 dwelling units be allowed in the CVR Future Filing but only 42 dwelling units be allowed in Ridge Estates to provide a high level of confidence that no local streets exceed 1,500 vehicles per day at buildout.

APPLICANT POSITION

The project team has met with Town Public Works staff multiple times to negotiate greater than 142 dwelling units for the combined projects but has come to the conclusion that 142 dwelling units is the maximum density that could be supported by Public Works staff. It is our understanding from correspondence with planning staff in May, 2017 that the applicant will maintain a total maximum of 142 dwelling units but be allowed to provide a split within the range of 100/42 and 90/52 assuming all three roadway connections are provided (through Filing 12,

through Filing 13, and through the Lanterns) to allow some flexibility as the project moves through the process. This position is supported by the following:

The FHU analyses showed the location with the greatest chance of exceeding 1,500 vehicles per day would be the CVR Filing 12 connection. The attached figures show the estimated trip assignment for various scenarios as follows:

- Figure A - Trip Assignment for 100 dwelling units in the Future CVR Filing;
- Figure B - Trip Assignment for 90 dwelling units in the Future CVR Filing;
- Figure C - Trip Assignment for 42 dwelling units in Ridge Estates;
- Figure D - Trip Assignment for 52 dwelling units in Ridge Estates;
- Figure E - Total Trip Assignment for the sum of Figure A and Figure C or for the sum of Figure B and Figure D - the trip assignments are expected to be the same for the two scenarios.

For these two scenarios to have equivalent trip assignments, the lot layouts would need to be consistent with those shown in the various figures.

SUMMARY

We recommend the Town Public Works staff view 90 dwelling units in the CVR Future Filing and 52 dwelling units in Ridge Estates as an equivalent to 100 dwelling units in the CVR Future Filing and 42 dwelling units in Ridge Estates consistent with our correspondence with planning staff in May, 2017. This flexibility will have a negligible effect on buildout trip assignment. A total of 142 total dwelling units will provide a greater than 15 percent buffer between the total trips generated (3,803 vpd) and the capacity of the three local access connections (4,500 vpd). The initial request for a total of 200 dwelling units would have left a buffer of only about three percent.

* * * * *

We trust this information will assist you in planning for the proposed Ridge Estates development. Please contact me if you have any questions or need further assistance.

Respectfully submitted,

LSC Transportation Consultants, Inc.



By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

1-17-18

CSM/wc

Enclosures: Figures A - E

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Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

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PLD
SCHOOL
PARK SI
20.2 ac.
(2.0 ac.of total
to be dedicated
UD for Well Site

W. LOOP ROAD

WEST LOOP ROAD

LIONS PAW STREET

SW 1/4
SEC. 25

OAKS TRAIL

P. A. 9 / 10
30.5 ac.

P.
23

CVR
PA-15E

WAR KNOT LANE

SW COR. SEC. 25,
T.8S., R.67W., 6TH P.M.

S 1/4 COR. SEC. 25,
T.8S., R.67W., 6TH P.M.

MICHEL DEJEAN & HOLLY DEJEAN
3188 GLADE GULCH CIR
CASTLE ROCK, 80104

RIDGE
ESTATES

Ridge Estates
Daily Trip Assignment
w/ 42 DUs

DEANN KATHERINE COOKSON
3192 GLADE GULCH CIR
CASTLE ROCK, 80104

BELL MOUNTAIN
RANCH

ERIN K MORSE & ROBERT D MORSE
3220 GLADE GULCH CIR
CASTLE ROCK, 80104

MARSHALL L RICHARDSON & CHRISTINE J RICHARDSON
3250 GLADE GULCH CIR
CASTLE ROCK, 80104

RAYMOND P MOORE & PATRICIA A MOORE
3372 MEDALLION RD
CASTLE ROCK, 80104

MARK R MYNATT & ERIN F MYNATT
3440 MEDALLION RD
CASTLE ROCK, 80104

KAREN A FAILINGER & MARK S FAILINGER
3478 MEDALLION RD
CASTLE ROCK, 80104

JON & MELISSA DOWNEY
2001 RANCH GATE TRAIL
CASTLE ROCK, 80104

MARK & TONI KLONARIS
3195 NELLIES WAY
CASTLE ROCK, 80104

BRUCE & MARTHA MITCHELL
2325 OXBOW CT
CASTLE ROCK, 80104

MICHAEL & SUSAN KEITH
2500 OXBOW DR
CASTLE ROCK, 80104

SELLERS CREEK DRIVE

NELLIE'S WAY

SELLERS CREEK ROAD

OXBOW DRIVE

OXBOW COURT

RANCH GATE TRAIL

SELLERS CREEK
GULCH

SITE SUMMARY:

RIDGE ESTATES	42 UNITS
CRYSTAL VALLEY RANCH PA-15E	100 UNITS
TOTAL	142 UNITS

LEGEND:

AREA 'A'	2.0 -3.0 AC	(300'X300' AVG.)
AREA 'B'	1.00-1.25 AC	(180'X250' AVG.)
AREA 'C'	1.00-1.15 AC	(125'X300' AVG.)
AREA 'D'	0.50-.60 AC	(115'X200' AVG.)
AREA 'E'	0.50-.55 AC	(100'X225' AVG.)

Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

Conceptual Site Plan 'A'

March 1, 2017

N

0 200' 400' 600'
Scale: 1" = 200'

Prepared by:
THE HENRY DESIGN GROUP
LAND PLANNING • LANDSCAPE ARCHITECTURE & DESIGN
1501 WAZEE STREET SUITE 1-C DENVER, COLORADO 80202 P 303-446-2368 F 303-446-0958

D

115

230

115

35

150

Ridge Estates

Daily Trip Assignment
w/ 52 DUs

SITE SUMMARY:

RIDGE ESTATES	52 UNITS
CRYSTAL VALLEY RANCH PA-15E	90 UNITS
TOTAL	142 UNITS

LEGEND:

AREA 'A'	2.0 -3.0 AC	(300'X300' AVG.)
AREA 'B'	0.75-1.5 AC	(150'X250' AVG.)
AREA 'C'	0.50-1.0 AC	(100'X250' AVG.)
AREA 'D'	0.50-.60 AC	(110'X200' AVG.)
AREA 'E'	0.50-.55 AC	(100'X225' AVG.)

Ridge Estates & Crystal Valley Ranch PA-15E

Castle Rock, Colorado

Conceptual Site Plan 'B'

March 1, 2017

Scale: 1" = 200'

Prepared by:

THE HENRY DESIGN GROUP
LAND PLANNING • LANDSCAPE ARCHITECTURE & DESIGN
1501 WAZEE STREET SUITE 1-C DENVER, COLORADO 80202 P 303-446-2368 F 303-446-0958

E Total Trip Assignment A + C or B + D

490

630

175

55

230

PLD
SCHOOL
PARK SI
20.2 ac.
(2.0 ac.of total
to be dedicated
UD for Well Site

W. LOOP ROAD

WEST LOOP ROAD

LIONS PAW STREET

SW 1/4
SEC. 25

OAKS TRAIL

P. A. 9 / 10
30.5 ac.

P.
23

CVR
PA-15E

WAR KNOT LANE

SW COR. SEC. 25,
T.8S., R.67W., 6TH P.M.

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Castle Rock, Colorado

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