

Oak Grove Subdivision

Traffic Impact Analysis
Salem, Oregon

Date:

June 28, 2022

Prepared by:

Tegan Enloe, PE



CHAPTER 1: INTRODUCTION AND SUMMARY

The applicant proposes to construct single family detached housing, located east of Lone Oak Rd SE and south of La Cresta Dr SE in Salem, OR. The subdivision would create 54 single family detached houses. Enloe Consulting, LLC, is contracted to prepare the traffic analysis for the proposed development as part of their land use application. This analysis will include information that addresses the traffic impact analysis (TIA) land use requirements. This analysis is focused on intersections identified as being in the study area, based on guidance from City, and shown in **Figure 1**.

- 1 Lone Oak Rd SE/ La Cresta Dr SE
- 2 La Cresta Dr SE/ Koda St SE
- 3 Mildred Ln SE/ Koda St SE

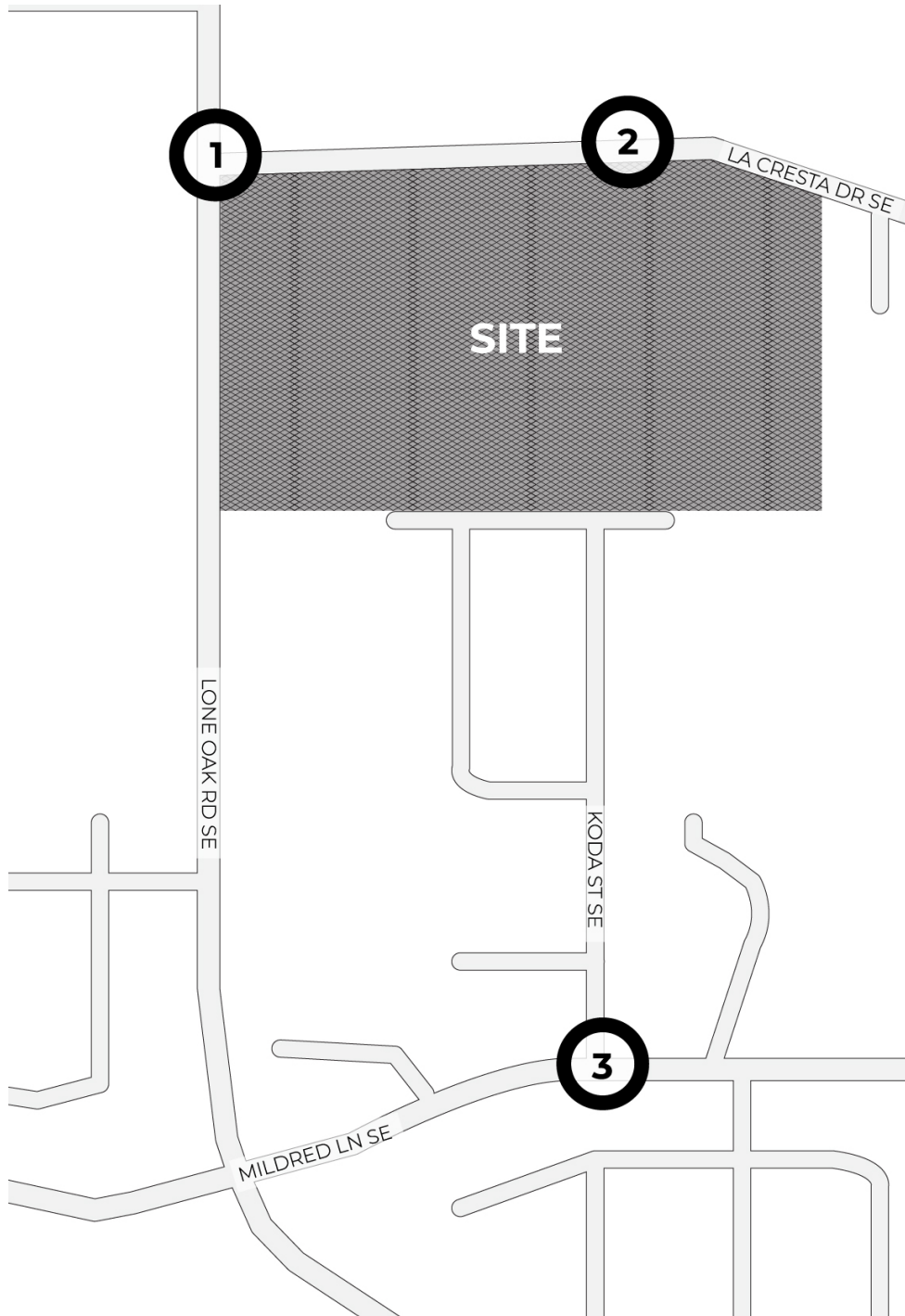


Figure 1: Study Area

Appendix A provides the site plan of the proposed development. **Table 1** lists important characteristics of the study area and proposed project.

Table 1: Key Study Area and Proposed Development Characteristics

Characteristics	Information
Study Area	
Number of Study Intersections	Three
Analysis Period	Weekday AM and PM Peak Hours
Analysis Scenarios	2022 Existing Conditions, AM Peak Hour 2022 Existing Conditions, PM Peak Hour 2024 Background Traffic, AM Peak Hour 2024 Background Traffic, PM Peak Hour 2024 Total Traffic (Background + Site), AM Peak Hour 2024 Total Traffic (Background + Site), PM Peak Hour
Project Site	
Existing Land Use	Vacant
Proposed Development	Single Family Detached Housing; 54 units
Project Access	The development proposes will extend Koda St SE to the north to create a new connection with La Cresta Dr SE. Trips will also be able to access the network via an existing connection of Konda St SE at Mildred Ln SE.

Existing Conditions and Intersection Operations

Transportation operations for the existing roadway network are evaluated to establish a baseline of performance. The following intersections were identified for existing conditions evaluation:

- 1 Lone Oak Rd SE/ La Cresta Dr SE
- 3 Mildred Ln SE/ Koda St SE

Table 2 shows the existing intersection operations at the study intersections.

Table 2: 2022 Existing Traffic at Study Intersection Operations

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	PM Peak Hour
1	Lone Oak SE/ La Cresta Dr SE	Unsignalized Two way stop	LOS E	LOS A (WB)	LOS A (WB)
3	Mildred Ln SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS B (SB)	LOS B (SB)

LOS = Level of Service of Worst Movement

Locations exceeding mobility standards are shown with ***bold/italicized***

Project Traffic Impact

Build out of the subdivision is expected to be complete in 2024. To determine whether the proposed project will result in off-site traffic impacts, future traffic volumes are estimated. **Tables 3 and 4** provide the intersection operations for the future scenarios with and without project traffic.

Table 3: 2024 Background Intersection Operations (Without Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	PM Peak Hour
1	Lone Oak SE/ La Cresta Dr SE	Unsignalized Two way stop	LOS E	LOS A (WB)	LOS A (WB)
3	Mildred Ln SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS B (SB)	LOS B (SB)

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Table 4: 2024 Total Intersection Operations (With Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	PM Peak Hour
1	Lone Oak SE/ La Cresta Dr SE	Unsignalized Two way stop	LOS E	LOS A (WB)	LOS A (WB)
2	La Cresta Dr SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS A (NB)	LOS A (NB)
3	Mildred Ln SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS B (SB)	LOS B (SB)

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Key Findings

Key findings associated with the proposed development include the following items:

- The proposed development would generate 43 (11 in, 31 out) AM peak hour trips and 56 (35 in, 21 out) PM peak hour vehicle trips.
- All study intersections are expected to operate within mobility standards with the addition of the proposed site for the 2024 opening year.

CHAPTER 2: EXISTING CONDITIONS

This chapter provides documentation of existing study area conditions, including the project site, study area roadway network, and existing traffic volumes and operations.

Project Site

The applicant proposes to construct single family detached housing, located east of Lone Oak Rd SE and south of La Cresta Dr SE in Salem, OR. The subdivision would create 54 single family detached houses.

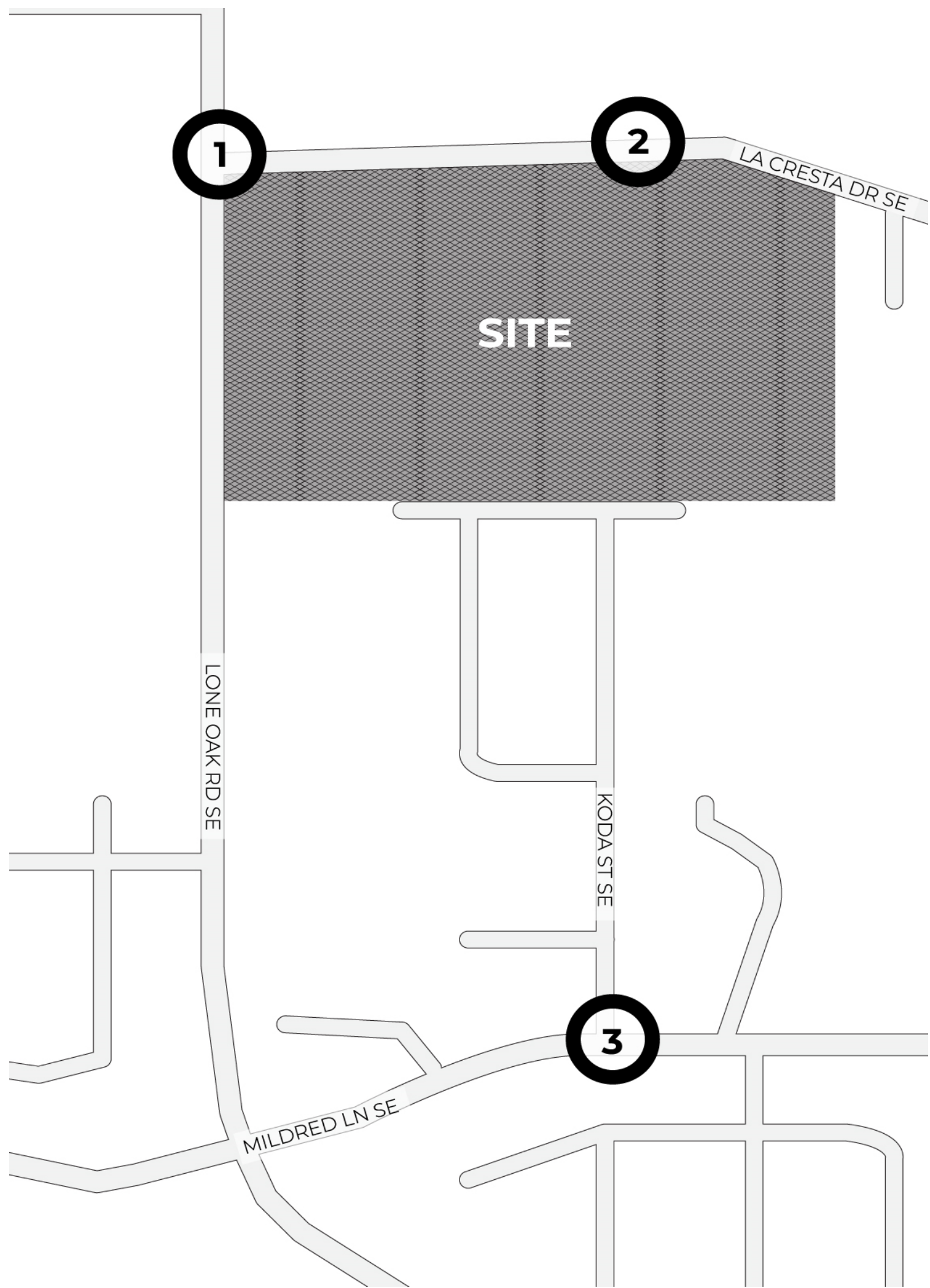
Existing Traffic Volumes and Operations

Existing AM and PM peak hour traffic operations were analyzed at the following study intersections:

- 1 Lone Oak Rd SE/ La Cresta Dr SE
- 3 Mildred Ln SE/ Koda St SE

Traffic counts were collected on Tuesday, May 24, 2022, for use in this study. The peak hour traffic volumes analyzed under existing conditions are shown in **Figure 2 and Figure 3**, with the detailed traffic counts included in **Appendix B**. The AM peak hour is 7:30 – 8:30 AM and the PM peak hour is 3:45– 4:45 PM.

Figure 2: 2022 Existing Volumes AM Peak Hour

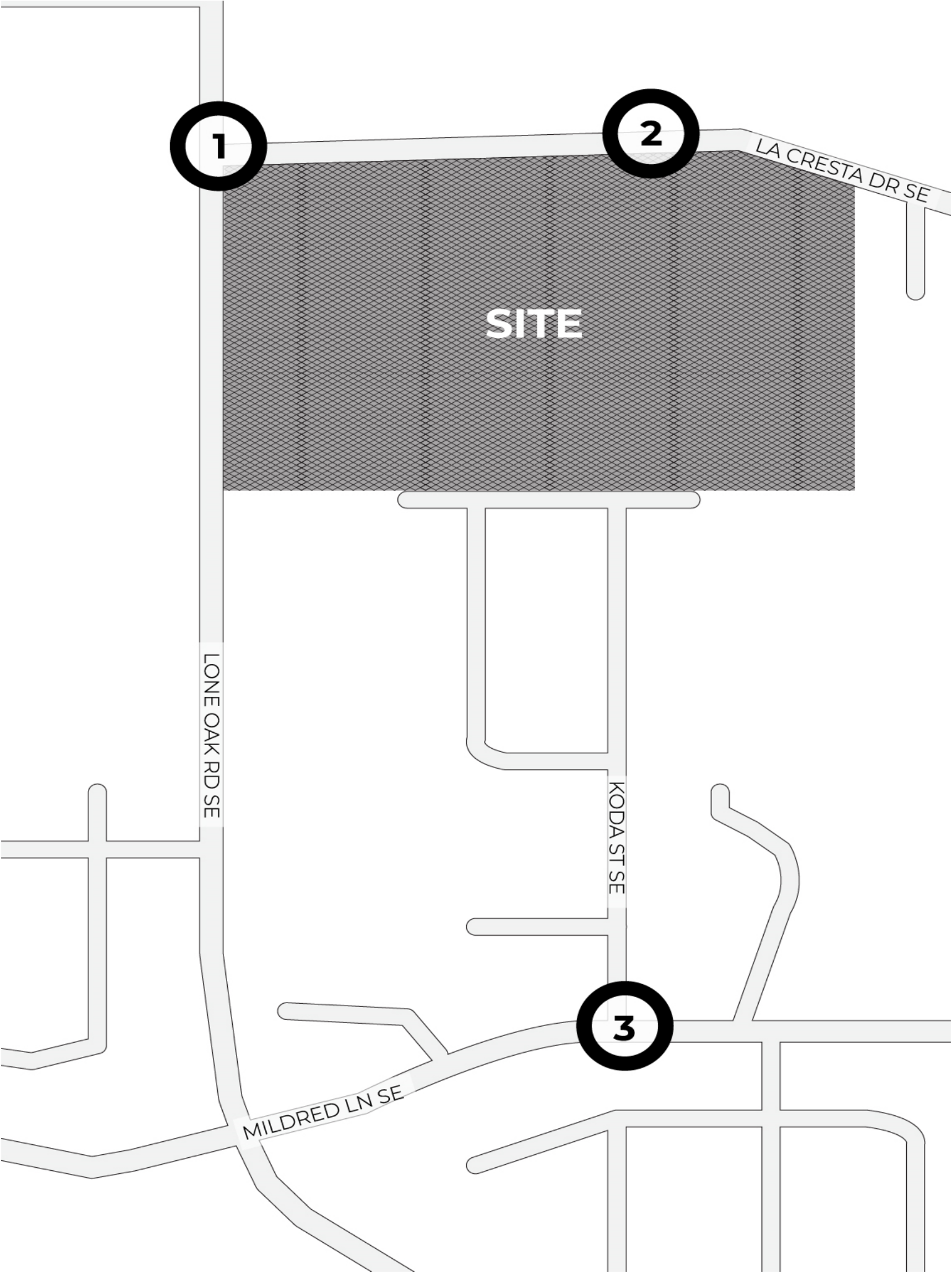


1 Lone Oak Rd SE/ La Cresta Dr SE	
93 5 ↓	15 1 ↘ ↗ STOP
	120 3 ↑

2 La Cresta Dr SE / Koda St SE	
	← 16
8 →	

3 Mildred Ln SE / Koda St SE	
5 14 ↘ ↗ STOP	3 175 ←
2 173 ↘ ↗	

Figure 3: 2022 Existing Volumes PM Peak Hour



1 Lone Oak Rd SE/ La Cresta Dr SE	
110 11 	  11 0
	 111 0

2 La Cresta Dr SE / Koda St SE	
	 11
11	

3 Mildred Ln SE / Koda St SE	
4 7  	 16 219
2 228	

Existing Operating Conditions

Existing traffic operations at the study intersections were evaluated for the AM and PM peak hours. The estimated operational results of each study intersection are shown in **Table 5**. The 2016 Highway Capacity Manual methodology¹ is used for unsignalized intersections. **Appendix C** provides detailed reports summarizing these results. **Appendix D** provides information on how the volumes were developed for analysis. All study intersections meet existing mobility standards.

Table 5: 2022 Existing Intersection Operations

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	PM Peak Hour
1	Lone Oak SE/ La Cresta Dr SE	Unsignalized Two way stop	LOS E	LOS A (WB)	LOS A (WB)
3	Mildred Ln SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS B (SB)	LOS B (SB)

LOS = Level of Service of Worst Movement

Locations exceeding mobility standards are shown with ***bold/italicized***

Crash Analysis

The five most recent years of crash records (Jan 1, 2016- Dec 31, 2020) for the study area were obtained from Oregon Department of Transportation (ODOT's) online database. A copy of these records is provided in **Appendix E**. Crashes identified by ODOT as intersectional for the two cross streets were queried for the analysis. The ODOT crash database does not have any recorded crashes at Lone Oak SE/ La Cresta Dr SE or Mildred Ln SE/ Koda St SE for the past five years.

¹ Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis, Transportation Research Board, Washington DC, 2016.

CHAPTER 3: BACKGROUND TRAFFIC

Construction for the single family detached housing is expected to be completed in 2024. To account for traffic growth a 1% growth rate is used to forecast the existing traffic volumes to future background traffic volumes on roads within the study area. This growth rate is approximated using traffic growth trends from the surrounding areas. Additional details are provided in **Appendix D**. No in process developments are identified in the study area. Background traffic volumes are shown in **Figures 4 and 5**.

Background Intersection Operations

The background traffic operations of each study intersection are shown in **Table 7**. The 2016 Highway Capacity Manual methodology² is used for operational analysis at the unsignalized intersections.

Appendix F provides detailed reports summarizing these results. All study intersections meet mobility standards.

Table 6: 2024 Background Intersection Operations (without Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	PM Peak Hour
1	Lone Oak SE/ La Cresta Dr SE	Unsignalized Two way stop	LOS E	LOS A (WB)	LOS A (WB)
3	Mildred Ln SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS B (SB)	LOS B (SB)

LOS = Level of Service of Worst Movement

Locations exceeding mobility standards are shown with ***bold/italicized***

² Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis, Transportation Research Board, Washington DC, 2016.

Figure 4: 2024 Background Volumes AM Peak Hour

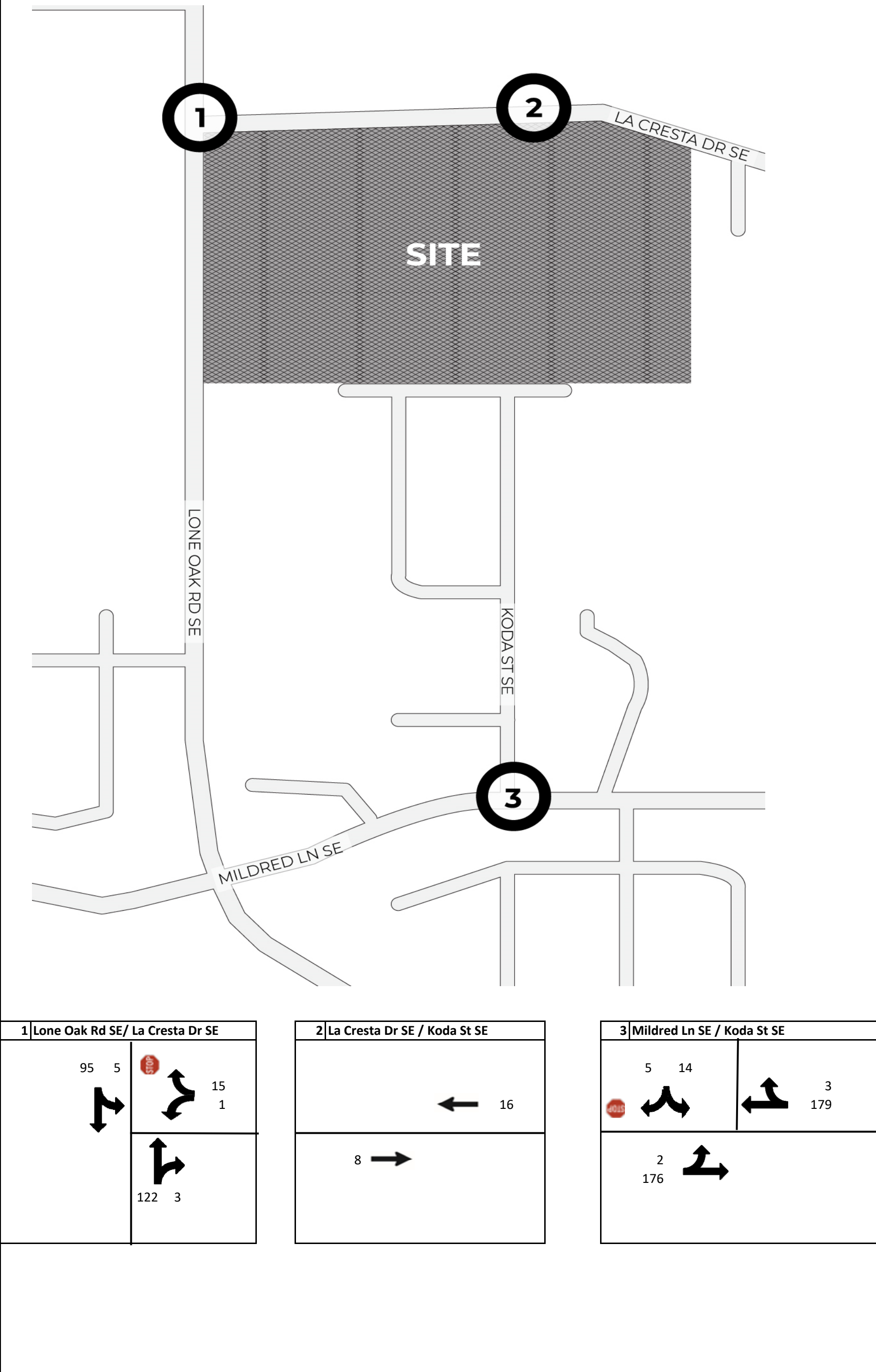
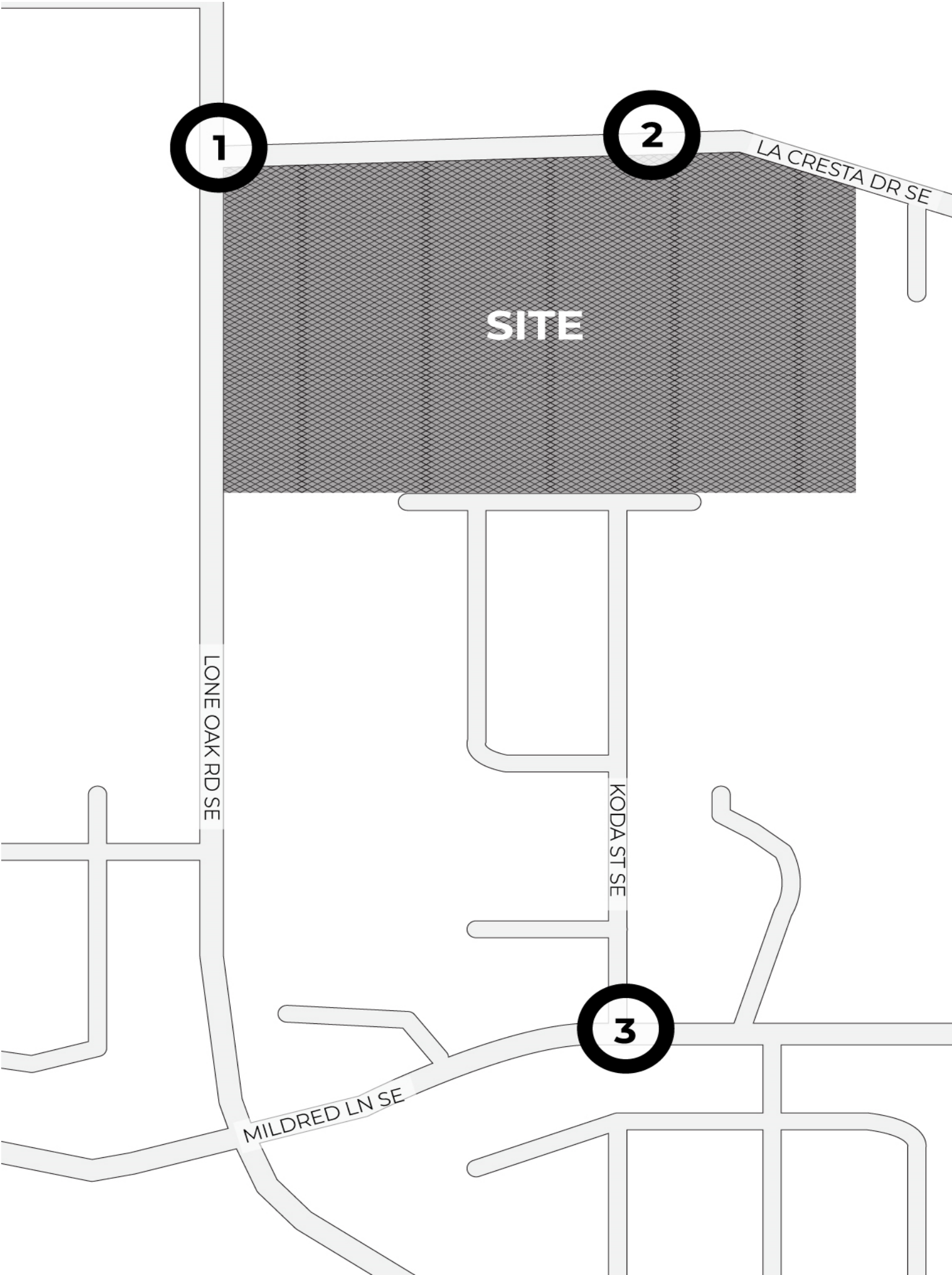


Figure 5: 2024 Background Volumes PM Peak Hour



1 Lone Oak Rd SE/ La Cresta Dr SE	
112 11 	  11 0
	 113 0

2 La Cresta Dr SE / Koda St SE	
	 11
11	

3 Mildred Ln SE / Koda St SE	
4 7  	 16 223
2 233	

CHAPTER 4: PROJECT IMPACTS

This chapter reviews impacts the proposed development may have on the study area transportation system. The focus of the impact analysis is on the following study intersections:

- 1 Lone Oak Rd SE/ La Cresta Dr SE
- 2 La Cresta Dr SE/ Koda St SE
- 3 Mildred Ln SE/ Koda St SE

Trip Generation

Trip generation is used to estimate the number of vehicle trips added to the roadway network by a development during a specified period. In this case, the AM and PM peak hour periods are studied. Trip generation estimates are established using data and methodology provided by the Institute of Transportation Engineers (ITE).³

Trip generation values for the proposed development are estimated using the ITE Trip Generation Manual, 11th Edition, and the Land Use Code 210: Single Family Detached. Trip generation values are provided in **Table 8**.

Table 7: Trip Generation Summary

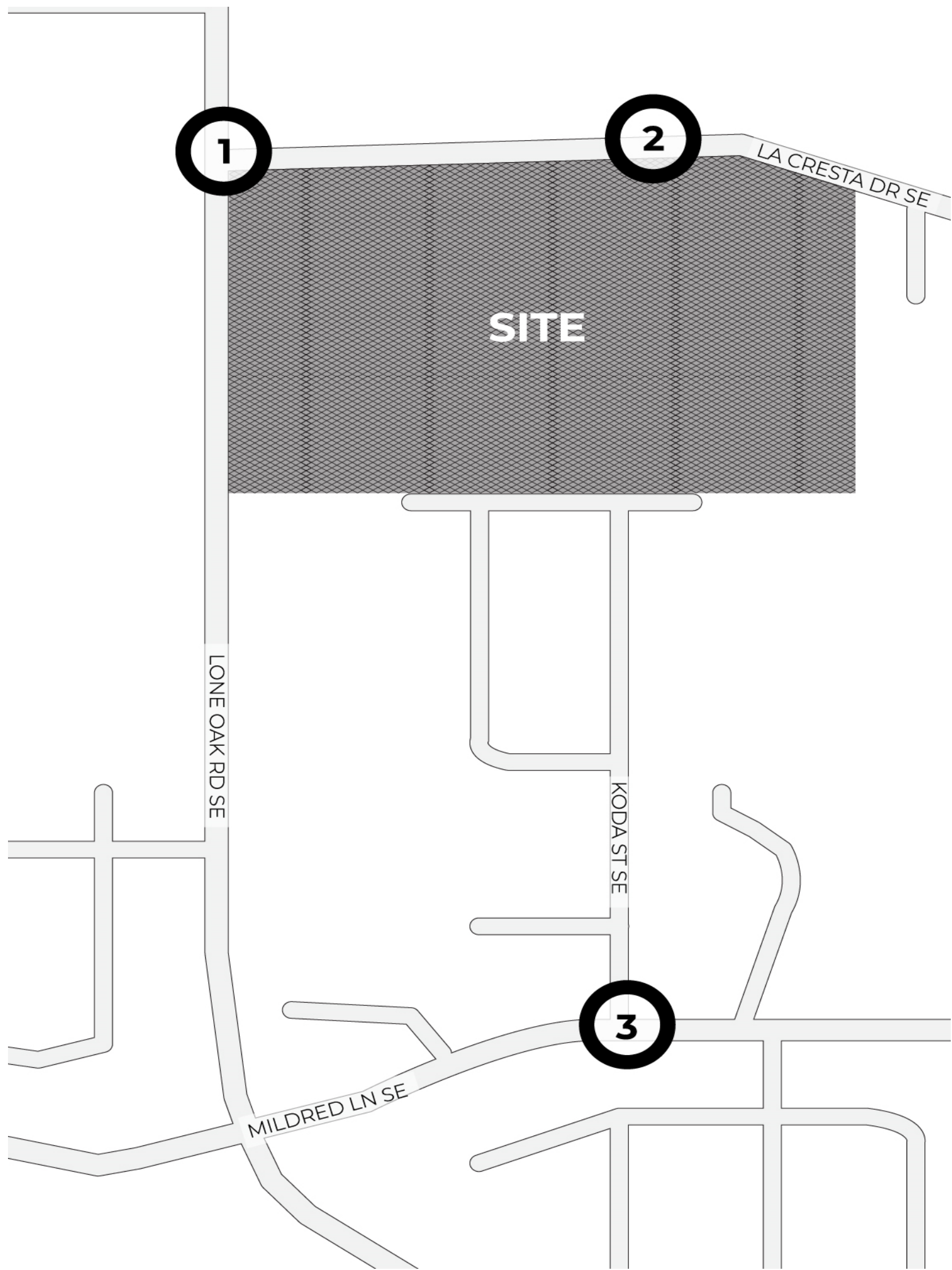
Land Use (ITE Code)	Units	Time Period	Peak Hour Trips		
			In	Out	Total
Single Family Detached (210)	54	AM Peak	11	31	43
		PM Peak	35	21	56
		Daily	-	-	572

Trip Distribution

Trip distribution provides an estimation of where trips from the development originate and end on the study area network. This is represented as percentages where large portions of the trips generated enter and exit the project study area. The trip distribution percentages are included in **Appendix D**. **Figures 6 and 7** show the trips generated by the study distributed on the network.

³ *Trip Generation, 11th Edition*, Institute of Transportation Engineers, 2021.
Enloe Consulting, LLC

Figure 6: Site Generated Volumes AM Peak Hour

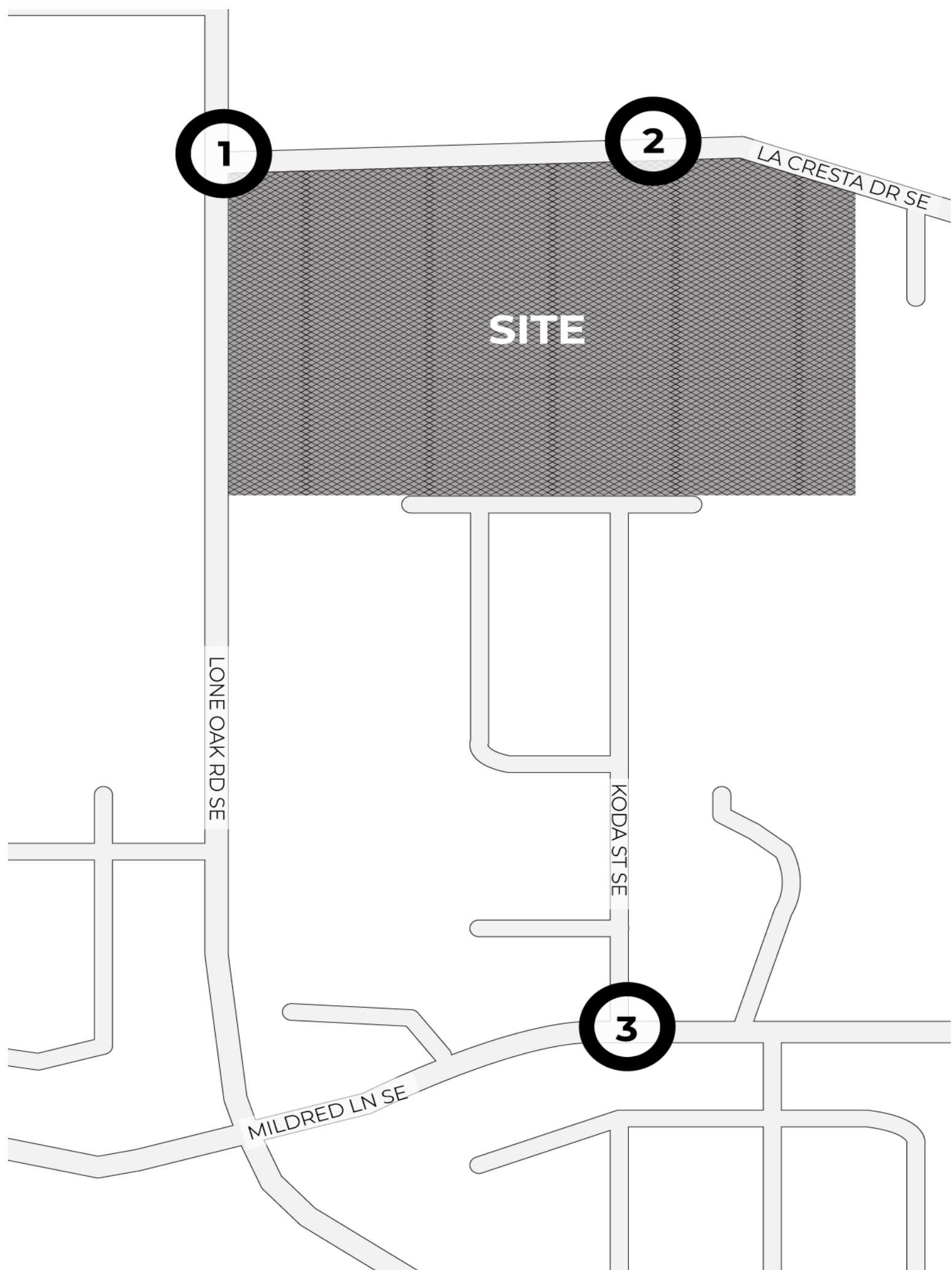


1 Lone Oak Rd SE/ La Cresta Dr SE	
02 	  57
	 03

2 La Cresta Dr SE / Koda St SE	
	 01
05 	  123

3 Mildred Ln SE / Koda St SE	
88  	 30
20 	

Figure 7: Site Generated Volumes PM Peak Hour



1 Lone Oak Rd SE/ La Cresta Dr SE	
05 	  35
	 08

2 La Cresta Dr SE / Koda St SE	
	 04
013 	 82 

3 Mildred Ln SE / Koda St SE	
56 	 90
90 	

Future Traffic Volumes with the Proposed Development

The estimated trips associated with the proposed development are added to the background volumes to estimate the total traffic scenario traffic volumes. **Figure 8 and Figure 9** show the 2024 total traffic volumes used for the opening year analysis.

Table 9 lists the study intersection total traffic operating conditions for the AM and PM peak hours. The 2016 Highway Capacity Manual methodology⁴ is used for unsignalized intersections. **Appendix G** provides detailed reports for the operational results.

Based on the operational analysis, all study intersections will function within their applicable mobility standards for the planned opening year with the proposed development.

Table 8: 2024 Total Intersection Operations (with Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	PM Peak Hour
1	Lone Oak SE/ La Cresta Dr SE	Unsignalized Two way stop	LOS E	LOS A (WB)	LOS A (WB)
2	La Cresta Dr SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS A (NB)	LOS A (NB)
3	Mildred Ln SE/ Koda St SE	Unsignalized Two way stop	LOS E	LOS B (SB)	LOS B (SB)

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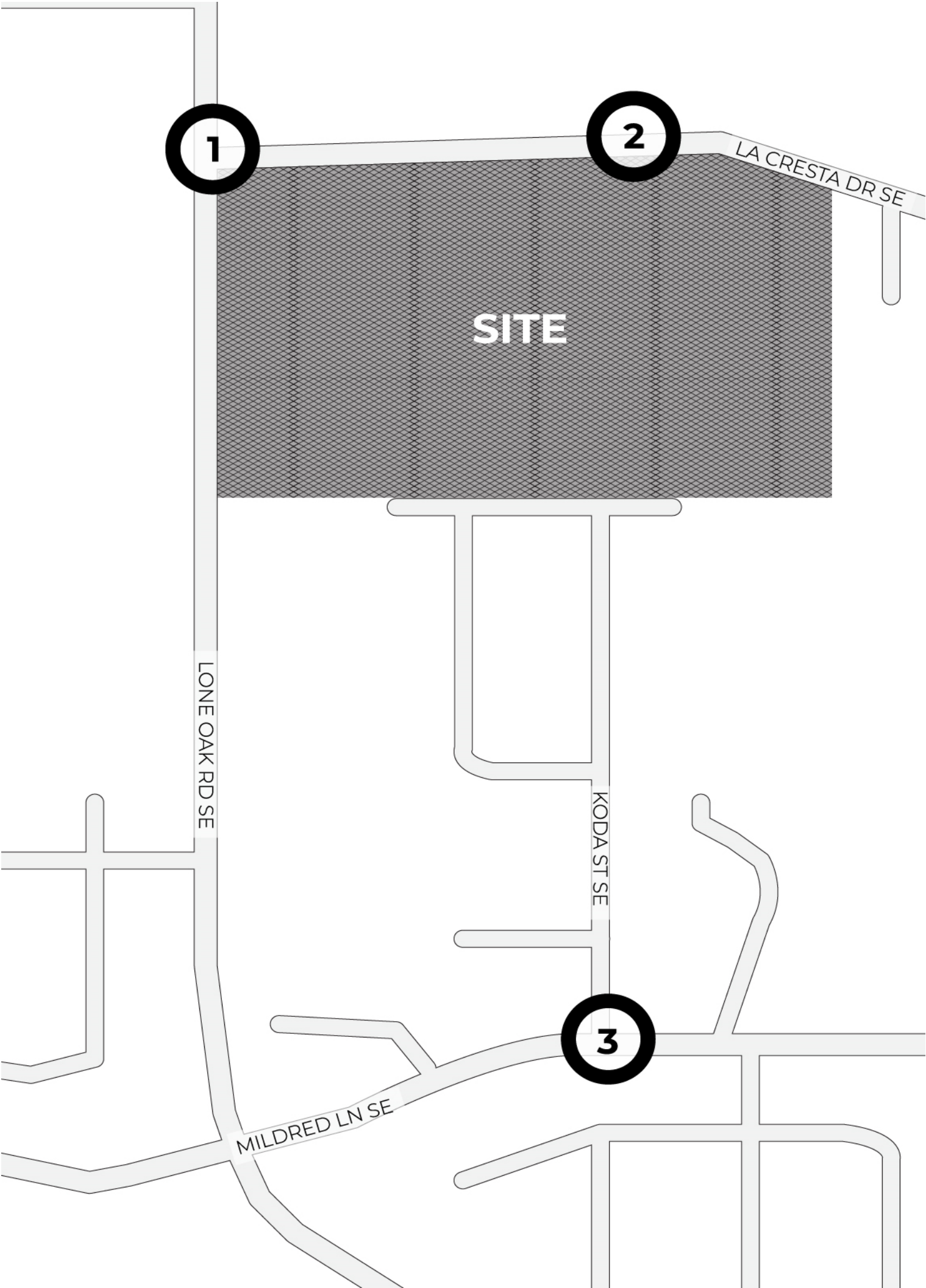
Locations exceeding mobility standards are shown with ***bold/italicized***

Table 9: Queuing Results

No.	Intersection	Movement	Available Storage (ft)	2024 Total AM Peak Hour 95 th Percentile	2024 Total PM Peak Hour 95 th Percentile
1	Lone Oak SE/ La Cresta Dr SE	WBL/R	600	50	45
		SBL	250	10	20
2	La Cresta Dr SE/ Koda St SE	NBL/R	500	45	40
3	Mildred Ln SE/ Koda St SE	EBL	270	15	30
		SBL/R	230	55	50

⁴ Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis, Transportation Research Board, Washington DC, 2016.

Figure 8: Total Volumes AM Peak Hour

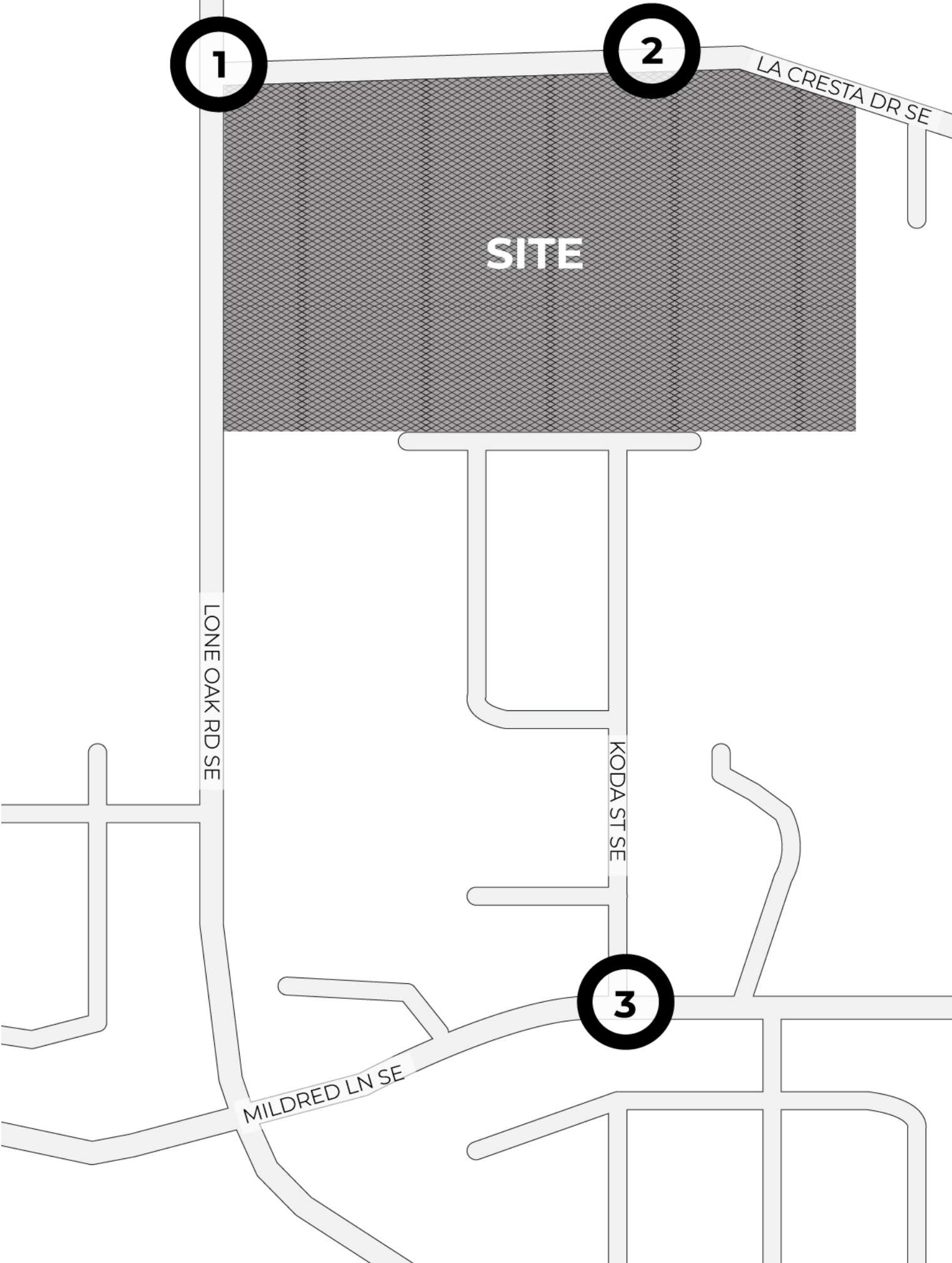


1 Lone Oak Rd SE/ La Cresta Dr SE	
95 7 ↓	STOP ↗ ↘ 20 8
	↑ 122 6

2 La Cresta Dr SE / Koda St SE	
	↙ ↘ 16 1
8 5 ↙ ↘	↙ ↘ 12 3

3 Mildred Ln SE / Koda St SE	
13 22 ↙ ↘	↙ ↘ 6 179
4 176 ↙ ↘	

Figure 9: Total Volumes PM Peak Hour



1 Lone Oak Rd SE/ La Cresta Dr SE	
112 16 	  14 5
	 113 8

2 La Cresta Dr SE / Koda St SE	
	 11 4
11 13 	 8 2

3 Mildred Ln SE / Koda St SE	
9 13  	 25 223
11 233 	

Key Findings

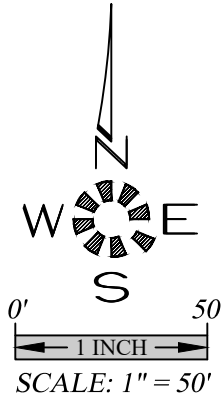
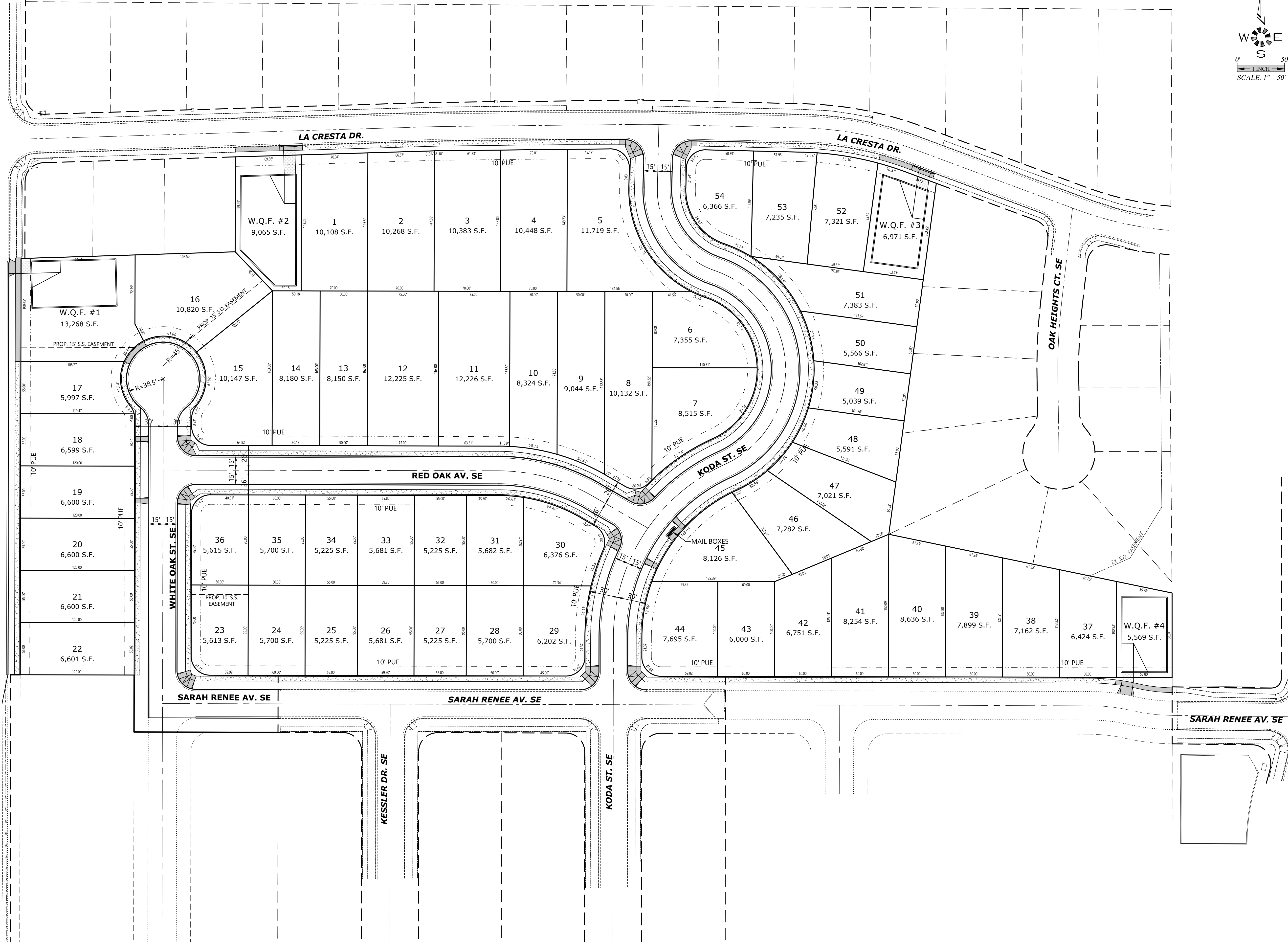
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- All study intersections are expected to operate within mobility standards with the addition of the proposed site for the 2024 opening year.

APPENDIX A: PROPOSED SITE PLAN

U:\Projects\7154 - Lone Oak\51203\Draw\02\7154p.dwg, P11-596, 4/7/2022, 11:19:37 AM, 10:16

LONE OAK RD. SE



LOT LAYOUT PLAN

OAK GROVE

NO CHANGES, MODIFICATIONS
OR REVISIONS SHALL BE
MADE TO THESE DRAWINGS
WITHOUT WRITTEN
AUTHORIZATION FROM THE
DESIGN ENGINEER.
DIMENSIONS & NOTES TAKE
PRECEDENCE OVER
GRAPHICAL REPRESENTATION.

Design: M.D.G.
Drawn: D.G.G.
Checked: J.J.G.
Date: JUNE 2021
Scale: AS SHOWN
As-Built: _____

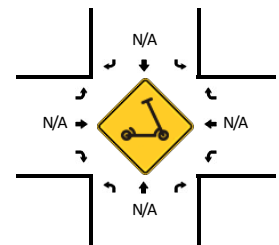
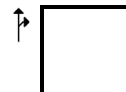
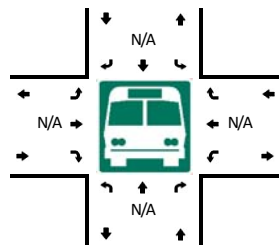
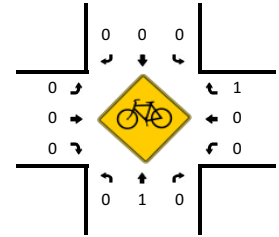
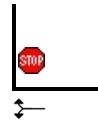
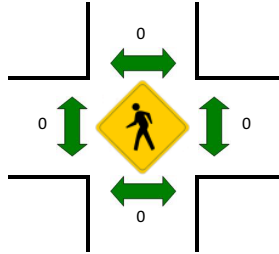
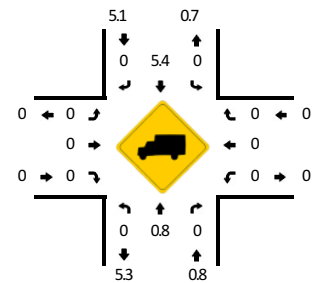
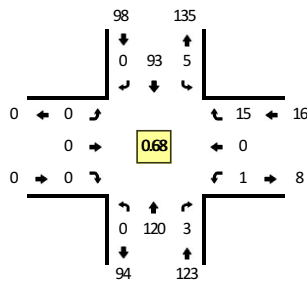


EXPIRES: 06-30-2021
JOB # 7154

APPENDIX B: TRAFFIC COUNTS

LOCATION: Lone Oak Rd SE -- La Cresta Dr SE**CITY/STATE:** Salem, OR**QC JOB #:** 15840703**DATE:** Tue, May 24 2022

Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

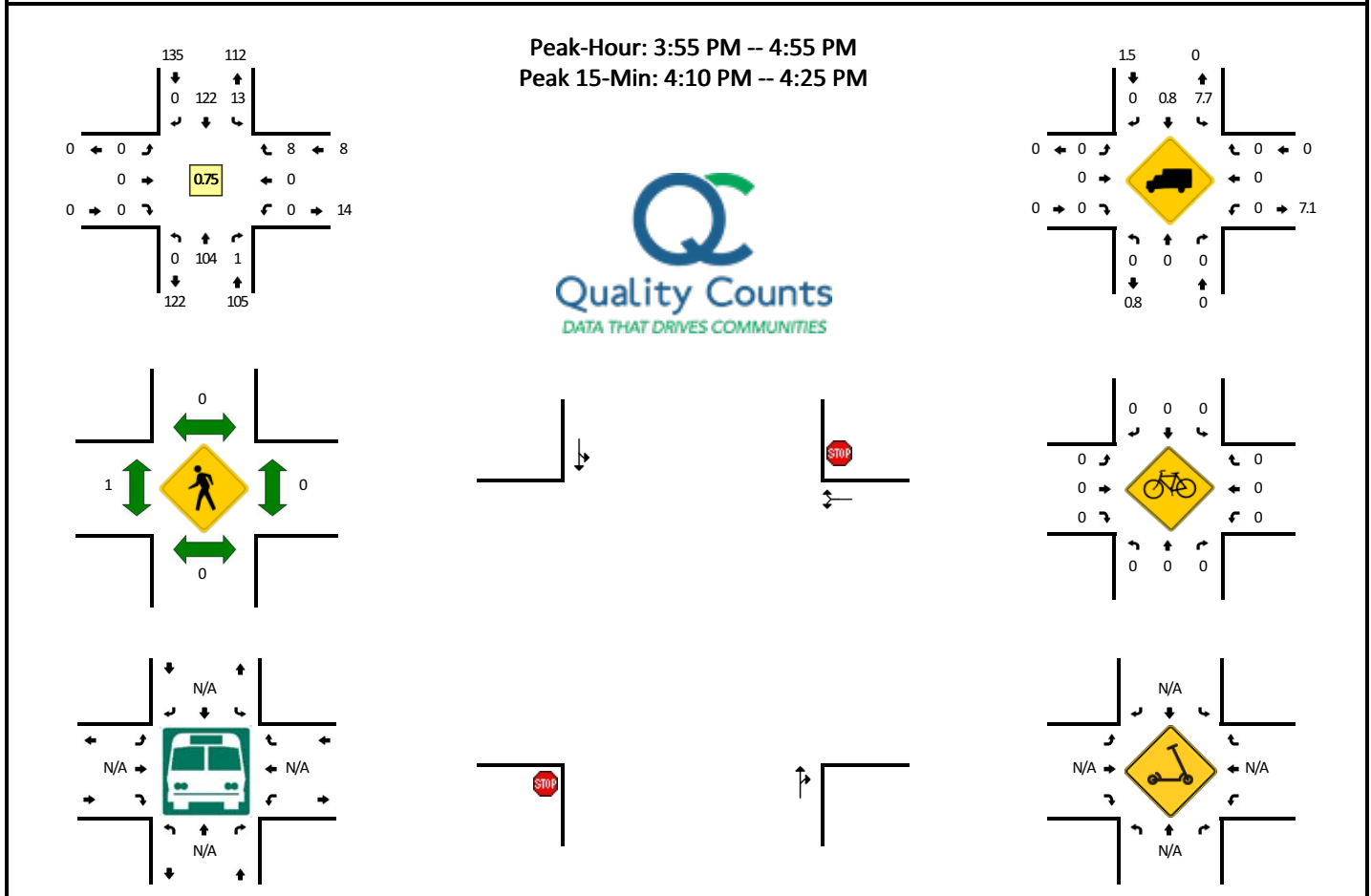


5-Min Count Period Beginning At	Lone Oak Rd SE (Northbound)				Lone Oak Rd SE (Southbound)				La Cresta Dr SE (Eastbound)				La Cresta Dr SE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
6:05 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	
6:10 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	
6:15 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	
6:20 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	3	
6:25 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	
6:30 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
6:35 AM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
6:40 AM	0	3	0	0	0	1	0	0	0	0	0	0	1	0	0	0	5	
6:45 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	
6:50 AM	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6	
6:55 AM	0	3	0	0	1	1	0	0	0	0	0	0	0	0	1	0	6	47
7:00 AM	0	6	0	0	0	1	0	0	0	0	0	0	0	0	2	0	9	52
7:05 AM	0	10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	11	61
7:10 AM	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	7	66
7:15 AM	0	7	0	0	0	2	0	0	0	0	0	0	0	0	2	0	11	74
7:20 AM	0	8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	9	80
7:25 AM	0	6	0	0	0	4	0	0	0	0	0	0	0	0	0	0	10	86
7:30 AM	0	19	2	0	0	6	0	0	0	0	0	0	0	0	0	0	27	110
7:35 AM	0	21	0	0	0	12	0	0	0	0	0	0	0	0	3	0	36	141
7:40 AM	0	9	0	0	1	12	0	0	0	0	0	0	0	0	2	0	24	160
7:45 AM	0	14	0	0	1	10	0	0	0	0	0	0	0	0	2	0	27	183
7:50 AM	0	13	0	0	1	13	0	0	0	0	0	0	0	0	0	0	27	204
7:55 AM	0	9	0	0	0	7	0	0	0	0	0	0	0	0	1	0	17	215
8:00 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0	2	0	12	218
8:05 AM	0	8	0	0	1	9	0	0	0	0	0	0	1	0	4	0	23	230
8:10 AM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	8	231
8:15 AM	0	4	0	0	1	4	0	0	0	0	0	0	0	0	1	0	10	230
8:20 AM	0	3	1	0	0	8	0	0	0	0	0	0	0	0	0	0	12	233
8:25 AM	0	11	0	0	0	3	0	0	0	0	0	0	0	0	0	0	14	237
8:30 AM	0	7	0	0	0	6	0	0	0	0	0	0	0	0	3	0	16	226
8:35 AM	0	5	0	0	0	4	0	0	0	0	0	0	1	0	0	0	10	200
8:40 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	179
8:45 AM	0	3	0	0	1	2	0	0	0	0	0	0	0	0	0	0	6	158
8:50 AM	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0	0	11	142
8:55 AM	0	3	0	0	0	9	0	0	0	0	0	0	0	0	0	0	12	137

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	196	8	0	4	120	0	0	0	0	0	0	0	0	20	0	348
Heavy Trucks	0	0	0		0	12	0		0	0	0		0	0	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	
<i>Comments:</i>																	

LOCATION: Lone Oak Rd SE -- La Cresta Dr SE
CITY/STATE: Salem, OR

QC JOB #: 15840704
DATE: Tue, May 24 2022



5-Min Count Period Beginning At	Lone Oak Rd SE (Northbound)				Lone Oak Rd SE (Southbound)				La Cresta Dr SE (Eastbound)				La Cresta Dr SE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	3	0	0	1	11	0	0	0	0	0	0	0	0	1	0	16	
3:05 PM	0	5	0	0	2	3	0	0	0	0	0	0	0	0	0	0	10	
3:10 PM	0	10	0	0	0	9	0	0	0	0	0	0	0	0	0	0	19	
3:15 PM	0	10	0	0	0	8	0	0	0	0	0	0	0	0	0	0	18	
3:20 PM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	1	0	9	
3:25 PM	0	5	0	0	1	9	0	0	0	0	0	0	0	0	0	0	15	
3:30 PM	0	1	0	0	1	10	0	0	0	0	0	0	0	0	2	0	14	
3:35 PM	0	3	0	0	0	9	0	0	0	0	0	0	0	0	0	0	12	
3:40 PM	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0	0	11	
3:45 PM	0	9	0	0	0	3	0	0	0	0	0	0	0	0	3	0	15	
3:50 PM	0	8	0	0	1	6	0	0	0	0	0	0	0	0	0	0	15	
3:55 PM	0	13	0	0	1	6	0	0	0	0	0	0	0	0	1	0	21	175
4:00 PM	0	14	0	0	0	7	0	0	0	0	0	0	0	0	1	0	22	181
4:05 PM	0	11	0	0	0	7	0	0	0	0	0	0	0	0	2	0	20	191
4:10 PM	0	7	0	0	2	25	0	0	0	0	0	0	0	0	1	0	35	207
4:15 PM	0	10	0	0	0	12	0	0	0	0	0	0	0	0	1	0	23	212
4:20 PM	0	10	0	0	1	14	0	0	0	0	0	0	0	0	0	0	25	228
4:25 PM	0	4	0	0	0	9	0	0	0	0	0	0	0	0	0	0	13	226
4:30 PM	0	7	0	0	1	4	0	0	0	0	0	0	0	0	1	0	13	225
4:35 PM	0	12	0	0	1	6	0	0	0	0	0	0	0	0	0	0	19	232
4:40 PM	0	6	0	0	4	11	0	0	0	0	0	0	0	0	1	0	22	243
4:45 PM	0	2	1	0	1	10	0	0	0	0	0	0	0	0	0	0	14	242
4:50 PM	0	8	0	0	2	11	0	0	0	0	0	0	0	0	0	0	21	248
4:55 PM	0	3	0	0	0	8	0	0	0	0	0	0	0	0	0	0	11	238
5:00 PM	0	6	0	0	2	5	0	0	0	0	0	0	0	0	0	0	13	229
5:05 PM	0	5	0	0	1	7	0	0	0	0	0	0	0	0	0	0	13	222
5:10 PM	0	2	0	0	0	10	0	0	0	0	0	0	0	0	0	0	12	199
5:15 PM	0	8	0	0	1	9	0	0	0	0	0	0	0	0	0	0	18	194
5:20 PM	0	8	0	0	0	6	0	0	0	0	0	0	0	0	1	0	15	184
5:25 PM	0	6	0	0	1	6	0	0	0	0	0	0	0	0	1	0	14	185
5:30 PM	0	6	0	0	2	9	0	0	0	0	0	0	0	0	0	0	17	189
5:35 PM	0	9	0	0	2	5	0	0	0	0	0	0	0	0	0	0	16	186
5:40 PM	0	8	0	0	0	8	0	0	0	0	0	0	0	0	2	0	18	182
5:45 PM	0	6	0	0	2	4	0	0	0	0	0	0	0	0	0	0	12	180
5:50 PM	0	3	0	0	2	9	0	0	0	0	0	0	0	0	1	0	15	174
5:55 PM	0	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0	6	169

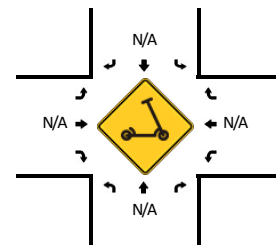
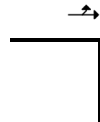
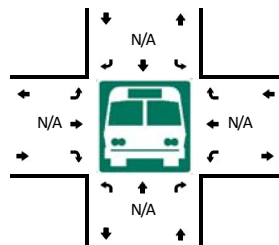
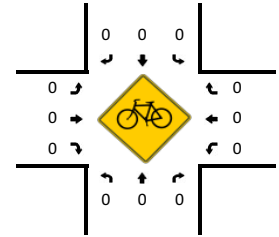
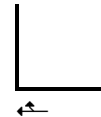
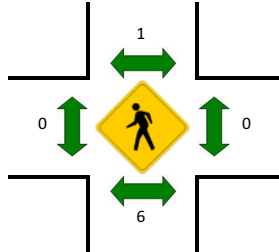
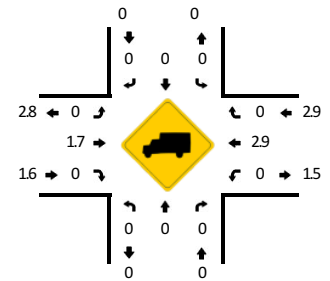
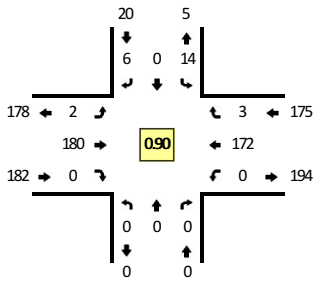
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	108	0	0	12	204	0	0	0	0	0	0	0	0	8	0	332
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	
<i>Comments:</i>																	

Report generated on 6/2/2022 4:35 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

LOCATION: Koda St SE -- Mildred Ln SE**CITY/STATE:** Salem, OR**QC JOB #:** 15840705**DATE:** Tue, May 24 2022

Peak-Hour: 7:35 AM -- 8:35 AM
 Peak 15-Min: 8:00 AM -- 8:15 AM



5-Min Count Period Beginning At	Koda St SE (Northbound)				Koda St SE (Southbound)				Mildred Ln SE (Eastbound)				Mildred Ln SE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	1	0	0	0	0	3	0	0	0	2	0	0	6	100
6:05 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3	
6:10 AM	0	0	0	0	1	0	0	0	0	4	0	0	0	2	0	0	7	
6:15 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	4	0	0	9	
6:20 AM	0	0	0	0	2	0	0	0	0	1	0	0	0	2	0	0	5	
6:25 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	0	7	
6:30 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	8	
6:35 AM	0	0	0	0	2	0	0	0	0	7	0	0	0	6	1	0	16	
6:40 AM	0	0	0	0	1	0	0	0	0	5	0	0	0	3	0	0	9	
6:45 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	8	
6:50 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11	
6:55 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	0	11	
7:00 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	7	1	0	12	
7:05 AM	0	0	0	0	1	0	0	0	0	10	0	0	0	8	0	0	19	
7:10 AM	0	0	0	0	1	0	1	0	0	6	0	0	0	5	0	0	13	
7:15 AM	0	0	0	0	0	0	0	0	0	10	0	0	0	17	0	0	27	
7:20 AM	0	0	0	0	1	0	1	0	1	13	0	0	0	8	0	0	24	165
7:25 AM	0	0	0	0	3	0	0	0	0	8	0	0	0	3	0	0	14	172
7:30 AM	0	0	0	0	2	0	0	0	0	11	0	0	0	13	0	0	26	190
7:35 AM	0	0	0	0	2	0	0	0	0	20	0	0	0	8	0	0	30	204
7:40 AM	0	0	0	0	1	0	0	0	0	20	0	0	0	9	1	0	31	226
7:45 AM	0	0	0	0	3	0	0	0	0	14	0	0	0	17	1	0	35	253
7:50 AM	0	0	0	0	0	0	1	0	0	14	0	0	0	14	0	0	29	271
7:55 AM	0	0	0	0	0	0	1	0	0	14	0	0	0	15	0	0	30	290
8:00 AM	0	0	0	0	2	0	0	0	0	15	0	0	0	17	0	0	34	312
8:05 AM	0	0	0	0	0	0	0	0	1	19	0	0	0	19	0	0	39	332
8:10 AM	0	0	0	0	2	0	0	0	0	11	0	0	0	19	0	0	32	351
8:15 AM	0	0	0	0	2	0	3	0	1	12	0	0	0	14	0	0	32	356
8:20 AM	0	0	0	0	0	0	0	0	0	11	0	0	0	18	0	0	29	361
8:25 AM	0	0	0	0	0	0	0	0	0	12	0	0	0	12	1	0	25	372
8:30 AM	0	0	0	0	2	0	1	0	0	18	0	0	0	10	0	0	31	377
8:35 AM	0	0	0	0	0	0	0	0	1	15	0	0	0	11	0	0	27	374
8:40 AM	0	0	0	0	0	0	0	0	0	11	0	0	0	11	0	0	22	365
8:45 AM	0	0	0	0	1	0	1	0	0	10	0	0	0	13	0	0	25	355
8:50 AM	0	0	0	0	0	0	1	0	0	15	0	0	0	11	1	0	28	354
8:55 AM	0	0	0	0	1	0	0	0	0	10	0	0	0	16	0	0	27	351

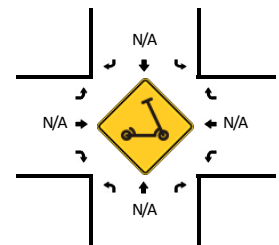
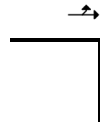
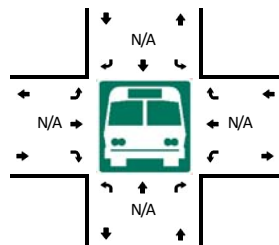
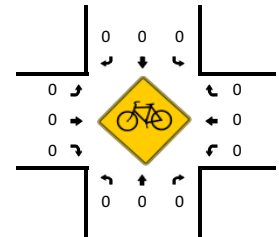
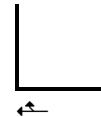
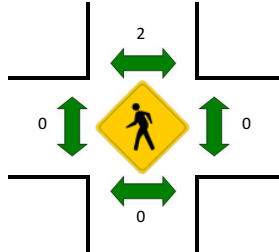
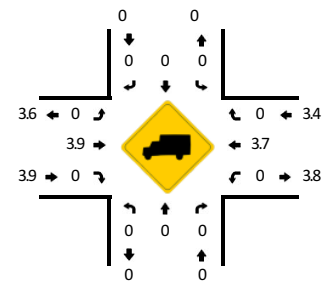
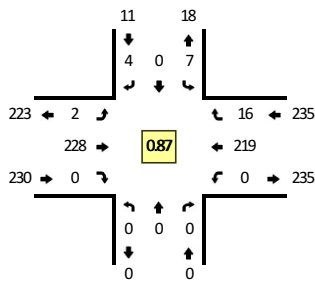
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	16	0	0	0	4	180	0	0	0	220	0	0	420
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	8	0		8
Buses																	
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	
<i>Comments:</i>																	

Report generated on 6/2/2022 4:35 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

LOCATION: Koda St SE -- Mildred Ln SE**CITY/STATE:** Salem, OR**QC JOB #:** 15840706**DATE:** Tue, May 24 2022

Peak-Hour: 3:45 PM -- 4:45 PM
 Peak 15-Min: 4:05 PM -- 4:20 PM



5-Min Count Period Beginning At	Koda St SE (Northbound)				Koda St SE (Southbound)				Mildred Ln SE (Eastbound)				Mildred Ln SE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	0	0	0	1	0	1	0	0	13	0	0	0	11	0	0	26	
3:05 PM	0	0	0	0	0	0	0	0	1	12	0	0	0	17	0	0	30	
3:10 PM	0	0	0	0	0	0	0	0	0	12	0	0	0	20	0	0	32	
3:15 PM	0	0	0	0	1	0	0	0	0	13	0	0	0	17	0	0	31	
3:20 PM	0	0	0	0	1	0	1	0	1	5	0	0	0	12	2	0	22	
3:25 PM	0	0	0	0	0	0	0	0	0	14	0	0	0	13	0	0	27	
3:30 PM	0	0	0	0	0	0	0	0	2	18	0	0	0	18	0	0	38	
3:35 PM	0	0	0	0	2	0	0	0	0	21	0	0	0	16	0	0	39	
3:40 PM	0	0	0	0	1	0	0	0	1	20	0	0	0	17	1	0	40	
3:45 PM	0	0	0	0	1	0	1	0	1	17	0	0	0	19	3	0	42	
3:50 PM	0	0	0	0	0	0	0	0	0	10	0	0	0	21	0	0	31	
3:55 PM	0	0	0	0	2	0	1	0	0	11	0	0	0	13	1	0	28	386
4:00 PM	0	0	0	0	0	0	2	0	0	15	0	0	0	22	0	0	39	399
4:05 PM	0	0	0	0	1	0	0	0	0	22	0	0	0	18	0	0	41	410
4:10 PM	0	0	0	0	0	0	0	0	0	25	0	0	0	18	0	0	43	421
4:15 PM	0	0	0	0	1	0	0	0	0	31	0	0	0	20	1	0	53	443
4:20 PM	0	0	0	0	1	0	0	0	0	15	0	0	0	23	2	0	41	462
4:25 PM	0	0	0	0	0	0	0	0	1	17	0	0	0	8	2	0	28	463
4:30 PM	0	0	0	0	0	0	0	0	0	18	0	0	0	21	2	0	41	466
4:35 PM	0	0	0	0	1	0	0	0	0	19	0	0	0	19	3	0	42	469
4:40 PM	0	0	0	0	0	0	0	0	0	28	0	0	0	17	2	0	47	476
4:45 PM	0	0	0	0	0	0	0	0	0	18	0	0	0	17	0	0	35	469
4:50 PM	0	0	0	0	1	0	1	0	1	16	0	0	0	9	0	0	28	466
4:55 PM	0	0	0	0	2	0	0	0	0	15	0	0	0	17	0	0	34	472
5:00 PM	0	0	0	0	0	0	0	0	0	15	0	0	0	20	0	0	35	468
5:05 PM	0	0	0	0	0	0	0	0	0	14	0	0	0	17	0	0	31	458
5:10 PM	0	0	0	0	1	0	1	0	0	18	0	0	0	17	0	0	37	452
5:15 PM	0	0	0	0	0	0	0	0	0	19	0	0	0	21	0	0	40	439
5:20 PM	0	0	0	0	0	0	1	0	1	12	0	0	0	13	1	0	28	426
5:25 PM	0	0	0	0	0	0	0	0	1	9	0	0	0	17	1	0	28	426
5:30 PM	0	0	0	0	0	0	0	0	0	18	0	0	0	17	4	0	39	424
5:35 PM	0	0	0	0	0	0	0	0	0	25	0	0	0	17	2	0	44	426
5:40 PM	0	0	0	0	0	0	0	0	1	17	0	0	0	28	1	0	47	426
5:45 PM	0	0	0	0	2	0	0	0	0	14	0	0	0	25	0	0	41	432
5:50 PM	0	0	0	0	0	0	0	0	0	13	0	0	0	29	2	0	44	448
5:55 PM	0	0	0	0	1	0	0	0	0	11	0	0	0	11	2	0	25	439

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	8	0	0	0	0	312	0	0	0	224	4	0	548
Heavy Trucks	0	0	0		0	0	0		0	16	0		0	4	0		20
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	
<i>Comments:</i>																	

Report generated on 6/2/2022 4:35 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

APPENDIX C:

SYNCHRO REPORTS – 2022 EXISTING AM + PM

HCM 6th TWSC

1: Lone Oak Rd SE/Lone Oak Rd SE & La Cresta Dr SE

06/27/2022

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	15	120	3	5	93
Future Vol, veh/h	1	15	120	3	5	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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	1	1	5	5
Mvmt Flow	1	22	176	4	7	137

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	329	178	0
Stage 1	178	-	-
Stage 2	151	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	670	870	-
Stage 1	858	-	-
Stage 2	882	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	667	870	-
Mov Cap-2 Maneuver	667	-	-
Stage 1	858	-	-
Stage 2	878	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	854	1378
HCM Lane V/C Ratio	-	-	0.028	0.005
HCM Control Delay (s)	-	-	9.3	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC

1: Lone Oak Rd SE/Lone Oak Rd SE & La Cresta Dr SE

06/27/2022

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	11	111	1	11	110
Future Vol, veh/h	1	11	111	1	11	110
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	9	9	2	2	2	2
Mvmt Flow	1	15	152	1	15	151

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	336	155	0
Stage 1	155	-	-
Stage 2	181	-	-
Critical Hdwy	6.49	6.29	-
Critical Hdwy Stg 1	5.49	-	-
Critical Hdwy Stg 2	5.49	-	-
Follow-up Hdwy	3.581	3.381	-
Pot Cap-1 Maneuver	645	873	-
Stage 1	856	-	-
Stage 2	834	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	636	871	-
Mov Cap-2 Maneuver	636	-	-
Stage 1	854	-	-
Stage 2	824	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	845	1422
HCM Lane V/C Ratio	-	-	0.019	0.011
HCM Control Delay (s)	-	-	9.3	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
3: Mildred Ln SE & Koda St SE

06/27/2022

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	173	175	3	14	5
Future Vol, veh/h	2	173	175	3	14	5
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	3	3	0	0
Mvmt Flow	2	194	197	3	16	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	201	0	0 398 200
Stage 1	-	-	- 200 -
Stage 2	-	-	- 198 -
Critical Hdwy	4.12	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.218	-	- 3.5 3.3
Pot Cap-1 Maneuver	1371	-	- 611 846
Stage 1	-	-	- 838 -
Stage 2	-	-	- 840 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1370	-	- 609 845
Mov Cap-2 Maneuver	-	-	- 609 -
Stage 1	-	-	- 835 -
Stage 2	-	-	- 839 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1370	-	-	-	657
HCM Lane V/C Ratio	0.002	-	-	-	0.032
HCM Control Delay (s)	7.6	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th TWSC
3: Mildred Ln SE & Koda St SE

06/27/2022

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	228	219	16	7	4
Future Vol, veh/h	2	228	219	16	7	4
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	4	3	3	0	0
Mvmt Flow	2	262	252	18	8	5

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	272	0	0 529 263
Stage 1	-	-	- 263 -
Stage 2	-	-	- 266 -
Critical Hdwy	4.14	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.236	-	- 3.5 3.3
Pot Cap-1 Maneuver	1280	-	- 514 781
Stage 1	-	-	- 786 -
Stage 2	-	-	- 783 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1278	-	- 511 780
Mov Cap-2 Maneuver	-	-	- 511 -
Stage 1	-	-	- 783 -
Stage 2	-	-	- 781 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1278	-	-	-	584
HCM Lane V/C Ratio	0.002	-	-	-	0.022
HCM Control Delay (s)	7.8	0	-	-	11.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX D: METHODS AND ASSUMPTIONS MEMORANDUM

MEMORANDUM

DATE: June 28, 2022

TO: Tony Martin/City of Salem

FROM: Tegan Enloe, PE/Enloe Consulting, LLC

SUBJECT: Oak Grove TIA: Methods & Assumptions

The applicant proposes to construct single family detached housing, located east of Lone Oak Rd SE and south of La Cresta Dr SE in Salem, OR. The subdivision would create 54 single family detached houses. This memorandum outlines key analysis assumptions and methodology to be used in the traffic impact analysis for the proposed development.

Trip Generation

Trip generation values for the proposed development are estimated using the ITE Trip Generation Manual, 11th Edition, and the Land Use Code 210: Single Family Detached. These values will be added to the Background Traffic to develop Total Traffic volumes.

Table 1: Trip Generation

Land Use (ITE Code)	Units	Time Period	Peak Hour Trips		
			In	Out	Total
Single Family Detached (210)	54	AM Peak	11	31	43
		PM Peak	35	21	56
		Daily	-	-	572

Trip Distribution

Trip distribution patterns are recommended based on calculations from existing traffic counts. The following distribution patterns are proposed:

- 16% north on Lone Oak Rd SE
- 23% south on Lone Oak Rd SE
- 10% east on La Cresta Dr SE
- 26% east on Mildred Ln SE
- 25% west on Mildred Ln SE

Scenarios

The traffic analysis will be completed under the assumption that full build out will occur in 2024.

The following analysis scenarios are proposed for review:

- 2022 Existing Conditions, AM Peak Hour
- 2022 Existing Conditions, PM Peak Hour
- 2024 Background Traffic, AM Peak Hour
- 2024 Background Traffic, PM Peak Hour
- 2024 Total Traffic (Background + Site), AM Peak Hour
- 2024 Total Traffic (Background + Site), PM Peak Hour

Study Intersections

The following intersections are suggested for inclusion in the TIA study:

- 1 Lone Oak Rd SE/ La Cresta Dr SE
- 2 La Cresta Dr SE/ Koda St SE
- 3 Mildred Ln SE/ Koda St SE

Analysis Volumes

Traffic counts were collected on Tuesday, May 24, 2022, for use in this study. Seasonal adjustment is not recommended as the counts were collected on a typical weekday while school was in session. An annual growth



rate of 1% is proposed to be applied linearly to the existing volumes. This value is consistent with calculated growth rates used in other traffic impact analyses within the City of Salem.

Planned Improvements

No capital improvement or other planned improvement projects are identified for inclusion in the background and total traffic analysis.

In Process Developments

No in-process developments have been identified for inclusion.

APPENDIX E: CRASH DATA REPORTS

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING
LONE OAK RD at LA CRESTA DR, City of Salem, Marion County, 01/01/2016 to 12/31/2020

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CITY OF SALEM, MARION COUNTY

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING
HILDRED LN at KODA ST, City of Salem, Marion County, 01/01/2016 to 12/31/2020

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CITY OF SALEM, MARION COUNTY

MILDRED LN at KODA ST, City of Salem, Marion County, 01/01/2016 to 12/31/2020

APPENDIX F:
SYNCHRO REPORTS – 2024 BACKGROUND AM + PM

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	15	122	3	5	95
Future Vol, veh/h	1	15	122	3	5	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	1	1	5	5
Mvmt Flow	1	22	179	4	7	140

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	335	181	0
Stage 1	181	-	-
Stage 2	154	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	664	867	-
Stage 1	855	-	-
Stage 2	879	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	660	867	-
Mov Cap-2 Maneuver	660	-	-
Stage 1	855	-	-
Stage 2	874	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	850	1374
HCM Lane V/C Ratio	-	-	0.028	0.005
HCM Control Delay (s)	-	-	9.4	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC

1: Lone Oak Rd SE/Lone Oak Rd SE & La Cresta Dr SE

06/27/2022

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	11	113	1	11	112
Future Vol, veh/h	1	11	113	1	11	112
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	9	9	2	2	2	2
Mvmt Flow	1	15	155	1	15	153

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	341	158	0
Stage 1	158	-	-
Stage 2	183	-	-
Critical Hdwy	6.49	6.29	-
Critical Hdwy Stg 1	5.49	-	-
Critical Hdwy Stg 2	5.49	-	-
Follow-up Hdwy	3.581	3.381	-
Pot Cap-1 Maneuver	641	869	-
Stage 1	854	-	-
Stage 2	832	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	632	867	-
Mov Cap-2 Maneuver	632	-	-
Stage 1	852	-	-
Stage 2	822	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	841	1419
HCM Lane V/C Ratio	-	-	0.02	0.011
HCM Control Delay (s)	-	-	9.4	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
3: Mildred Ln SE & Koda St SE

06/27/2022

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	176	179	3	14	5
Future Vol, veh/h	2	176	179	3	14	5
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	3	3	0	0
Mvmt Flow	2	198	201	3	16	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	205	0	0 406 204
Stage 1	-	-	- - 204 -
Stage 2	-	-	- - 202 -
Critical Hdwy	4.12	-	- - 6.4 6.2
Critical Hdwy Stg 1	-	-	- - 5.4 -
Critical Hdwy Stg 2	-	-	- - 5.4 -
Follow-up Hdwy	2.218	-	- - 3.5 3.3
Pot Cap-1 Maneuver	1366	-	- - 605 842
Stage 1	-	-	- - 835 -
Stage 2	-	-	- - 837 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1365	-	- - 603 841
Mov Cap-2 Maneuver	-	-	- - 603 -
Stage 1	-	-	- - 832 -
Stage 2	-	-	- - 836 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1365	-	-	-	652
HCM Lane V/C Ratio	0.002	-	-	-	0.033
HCM Control Delay (s)	7.6	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th TWSC
3: Mildred Ln SE & Koda St SE

06/27/2022

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	233	223	16	7	4
Future Vol, veh/h	2	233	223	16	7	4
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	4	3	3	0	0
Mvmt Flow	2	268	256	18	8	5

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	276	0	0 539 267
Stage 1	-	-	- - 267 -
Stage 2	-	-	- - 272 -
Critical Hdwy	4.14	-	- - 6.4 6.2
Critical Hdwy Stg 1	-	-	- - 5.4 -
Critical Hdwy Stg 2	-	-	- - 5.4 -
Follow-up Hdwy	2.236	-	- - 3.5 3.3
Pot Cap-1 Maneuver	1275	-	- - 507 777
Stage 1	-	-	- - 782 -
Stage 2	-	-	- - 778 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1273	-	- - 504 776
Mov Cap-2 Maneuver	-	-	- - 504 -
Stage 1	-	-	- - 779 -
Stage 2	-	-	- - 776 -

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1273	-	-	-	578
HCM Lane V/C Ratio	0.002	-	-	-	0.022
HCM Control Delay (s)	7.8	0	-	-	11.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX G:

SYNCHRO REPORTS – 2024 TOTAL AM + PM

HCM 6th TWSC

1: Lone Oak Rd SE/Lone Oak Rd SE & La Cresta Dr SE

06/27/2022

Intersection

Int Delay, s/veh 1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	20	122	6	7	95
Future Vol, veh/h	8	20	122	6	7	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	1	1	5	5
Mvmt Flow	12	29	179	9	10	140

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	344	184	0
Stage 1	184	-	-
Stage 2	160	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	657	864	-
Stage 1	852	-	-
Stage 2	874	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	652	864	-
Mov Cap-2 Maneuver	652	-	-
Stage 1	852	-	-
Stage 2	867	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	791	1368
HCM Lane V/C Ratio	-	-	0.052	0.008
HCM Control Delay (s)	-	-	9.8	7.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

HCM 6th TWSC

1: Lone Oak Rd SE/Lone Oak Rd SE & La Cresta Dr SE

06/27/2022

Intersection

Int Delay, s/veh 1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	14	113	8	16	112
Future Vol, veh/h	5	14	113	8	16	112
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	9	9	2	2	2	2
Mvmt Flow	7	19	155	11	22	153

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	360	163	0
Stage 1	163	-	-
Stage 2	197	-	-
Critical Hdwy	6.49	6.29	-
Critical Hdwy Stg 1	5.49	-	-
Critical Hdwy Stg 2	5.49	-	-
Follow-up Hdwy	3.581	3.381	-
Pot Cap-1 Maneuver	625	864	-
Stage 1	849	-	-
Stage 2	820	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	613	862	-
Mov Cap-2 Maneuver	613	-	-
Stage 1	847	-	-
Stage 2	806	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	779	1407
HCM Lane V/C Ratio	-	-	0.033	0.016
HCM Control Delay (s)	-	-	9.8	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
2: Koda St SE & La Cresta Dr SE

06/27/2022

Intersection

Int Delay, s/veh 3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	8	5	1	16	12	3
Future Vol, veh/h	8	5	1	16	12	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	1	17	13	3

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	14
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1604
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1604
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	998	-	-	1604	-
HCM Lane V/C Ratio	0.016	-	-	0.001	-
HCM Control Delay (s)	8.7	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 6th TWSC
2: Koda St SE & La Cresta Dr SE

06/27/2022

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	13	4	11	8	2
Future Vol, veh/h	11	13	4	11	8	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	14	4	12	9	2

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	26
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1588
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1588
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	987	-	-	1588	-
HCM Lane V/C Ratio	0.011	-	-	0.003	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th TWSC
3: Mildred Ln SE & Koda St SE

06/27/2022

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	176	179	6	22	13
Future Vol, veh/h	4	176	179	6	22	13
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	3	3	0	0
Mvmt Flow	4	198	201	7	25	15

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	209	0	0 412 206
Stage 1	-	-	- - 206 -
Stage 2	-	-	- - 206 -
Critical Hdwy	4.12	-	- - 6.4 6.2
Critical Hdwy Stg 1	-	-	- - 5.4 -
Critical Hdwy Stg 2	-	-	- - 5.4 -
Follow-up Hdwy	2.218	-	- - 3.5 3.3
Pot Cap-1 Maneuver	1362	-	- - 600 840
Stage 1	-	-	- - 833 -
Stage 2	-	-	- - 833 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1361	-	- - 597 839
Mov Cap-2 Maneuver	-	-	- - 597 -
Stage 1	-	-	- - 830 -
Stage 2	-	-	- - 832 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1361	-	-	-	669
HCM Lane V/C Ratio	0.003	-	-	-	0.059
HCM Control Delay (s)	7.7	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

HCM 6th TWSC
3: Mildred Ln SE & Koda St SE

06/27/2022

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	233	223	25	13	9
Future Vol, veh/h	11	233	223	25	13	9
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	4	3	3	0	0
Mvmt Flow	13	268	256	29	15	10

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	287	0	0 567 273
Stage 1	-	-	- 273 -
Stage 2	-	-	- 294 -
Critical Hdwy	4.14	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.236	-	- 3.5 3.3
Pot Cap-1 Maneuver	1264	-	- 488 771
Stage 1	-	-	- 778 -
Stage 2	-	-	- 761 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1262	-	- 480 770
Mov Cap-2 Maneuver	-	-	- 480 -
Stage 1	-	-	- 767 -
Stage 2	-	-	- 759 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1262	-	-	-	567
HCM Lane V/C Ratio	0.01	-	-	-	0.045
HCM Control Delay (s)	7.9	0	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Queuing and Blocking Report

Baseline

06/27/2022

Intersection: 1: Lone Oak Rd SE/Lone Oak Rd SE & La Cresta Dr SE

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	51	13
Average Queue (ft)	19	0
95th Queue (ft)	47	7
Link Distance (ft)	701	837
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Koda St SE & La Cresta Dr SE

Movement	NB
Directions Served	LR
Maximum Queue (ft)	34
Average Queue (ft)	14
95th Queue (ft)	41
Link Distance (ft)	1645
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Mildred Ln SE & Koda St SE

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	27	54
Average Queue (ft)	1	24
95th Queue (ft)	11	53
Link Distance (ft)		1645
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Lone Oak Rd SE/ Lone Oak Rd SE & Mildred Ln SE

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

Baseline

06/27/2022

Intersection: 1: Lone Oak Rd SE/Lone Oak Rd SE & La Cresta Dr SE

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	45	37
Average Queue (ft)	16	2
95th Queue (ft)	44	16
Link Distance (ft)	701	837
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Koda St SE & La Cresta Dr SE

Movement	NB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	12
95th Queue (ft)	38
Link Distance (ft)	1645
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Mildred Ln SE & Koda St SE

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	49	53
Average Queue (ft)	5	17
95th Queue (ft)	28	46
Link Distance (ft)		1645
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Baseline

06/27/2022

Intersection: 6: Lone Oak Rd SE/ Lone Oak Rd SE & Mildred Ln SE

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0