Oak Grove Subdivision

Traffic Impact Analysis
Salem, Oregon

Date:
June 28, 2022

Prepared by:
Tegan Enloe, PE

ENLOE
CONSULTING, LLC

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

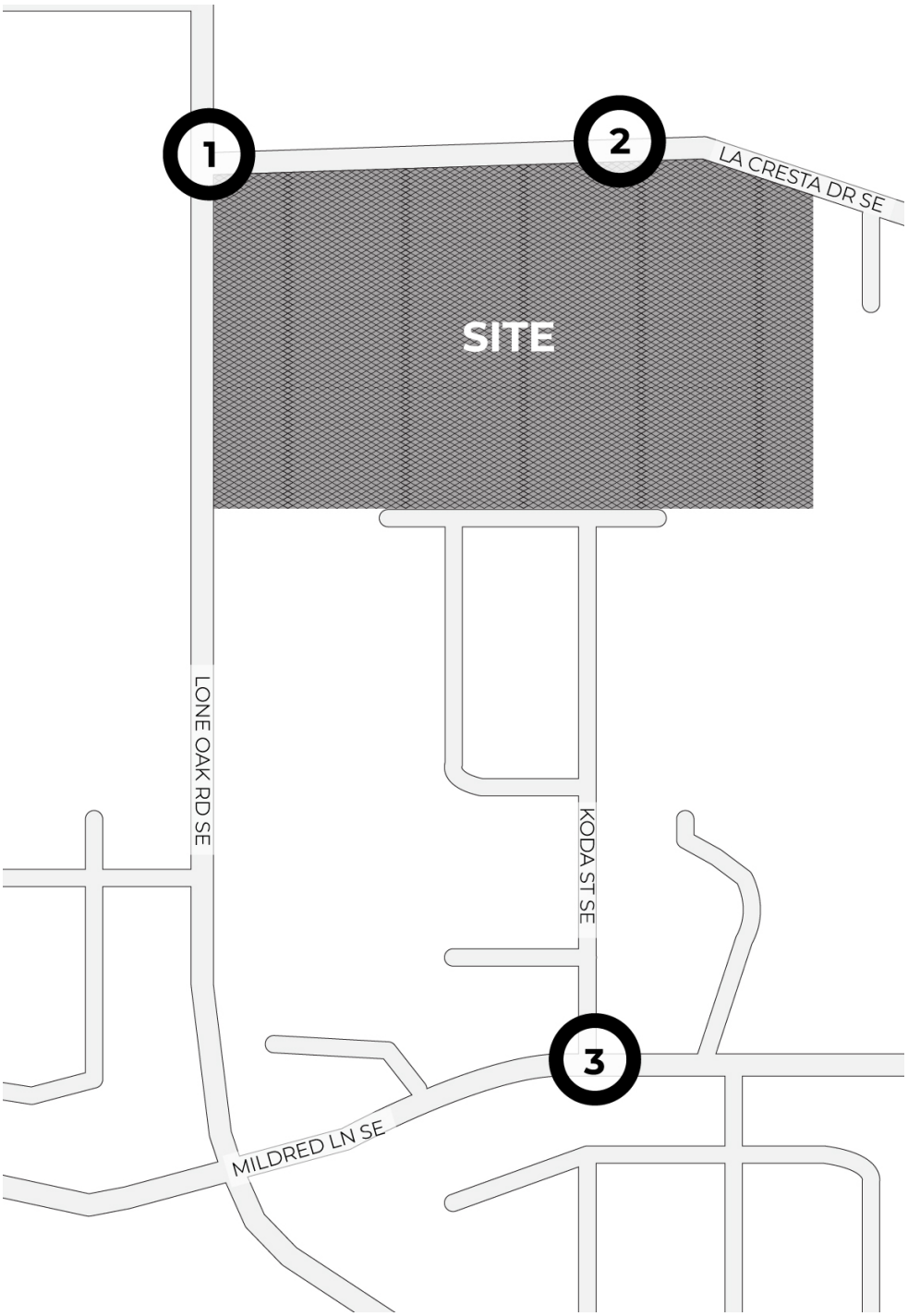

Figure 1: Study Area

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)

LOS = Level of Service of Worst Movement
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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

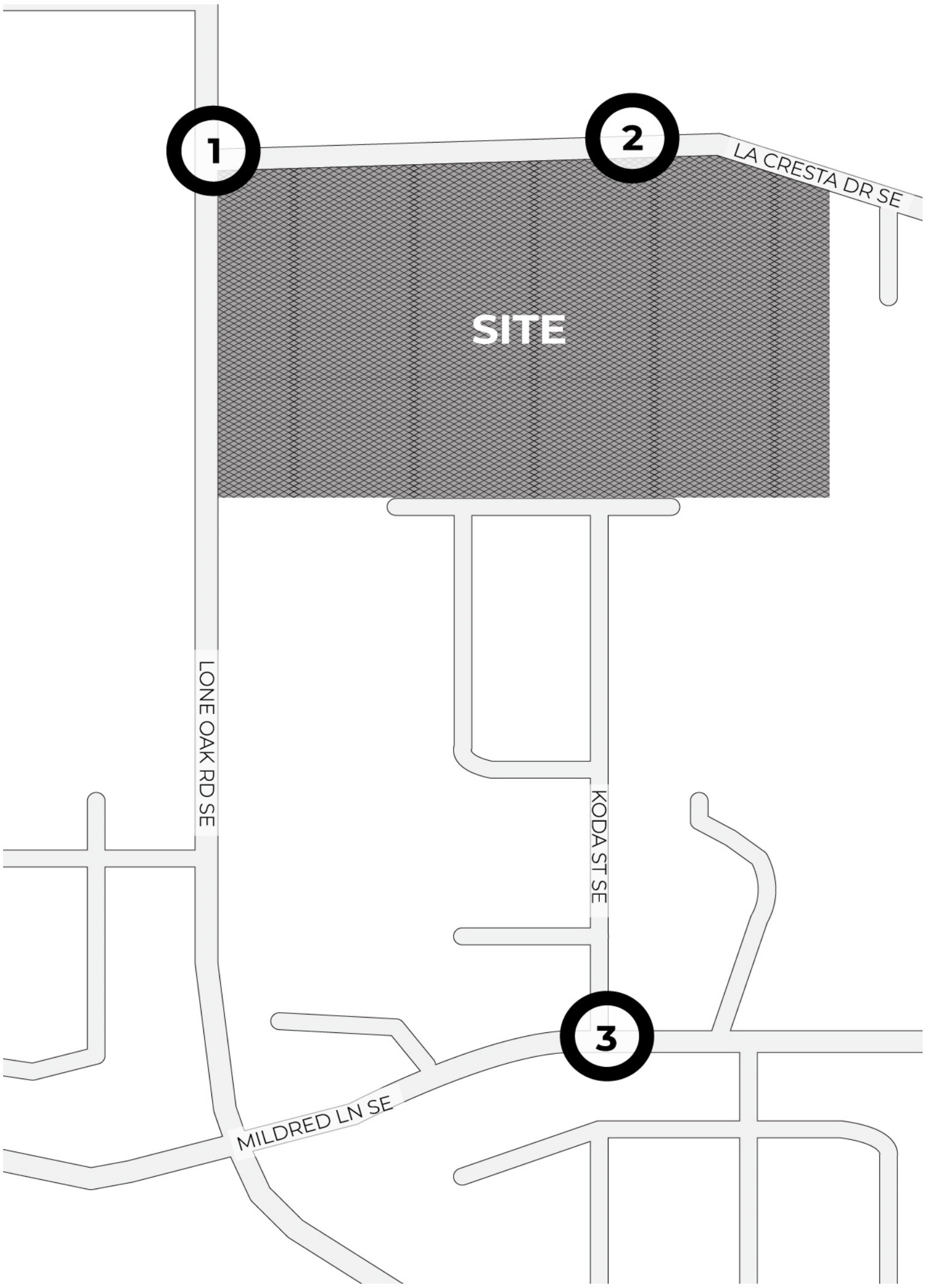
Existing AM and PM peak hour traffic operations were analyzed at the following study intersections:

1 Lone Oak Rd SE/ La Cresta Dr SE

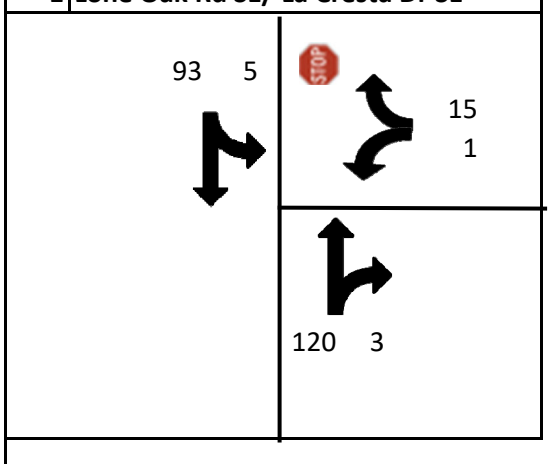
3 Mildred Ln SE/ Koda St SE

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.

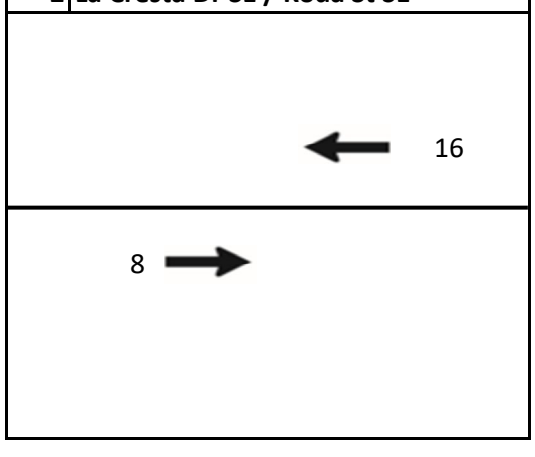
Figure 2: 2022 Existing Volumes AM Peak Hour



1	Lone Oak Rd SE/ La Cresta Dr SE



2	La Cresta Dr SE / Koda St SE



3	Mildred Ln SE / Koda St SE

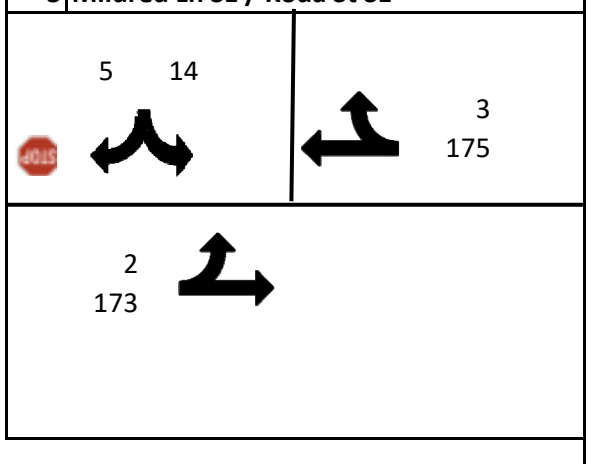
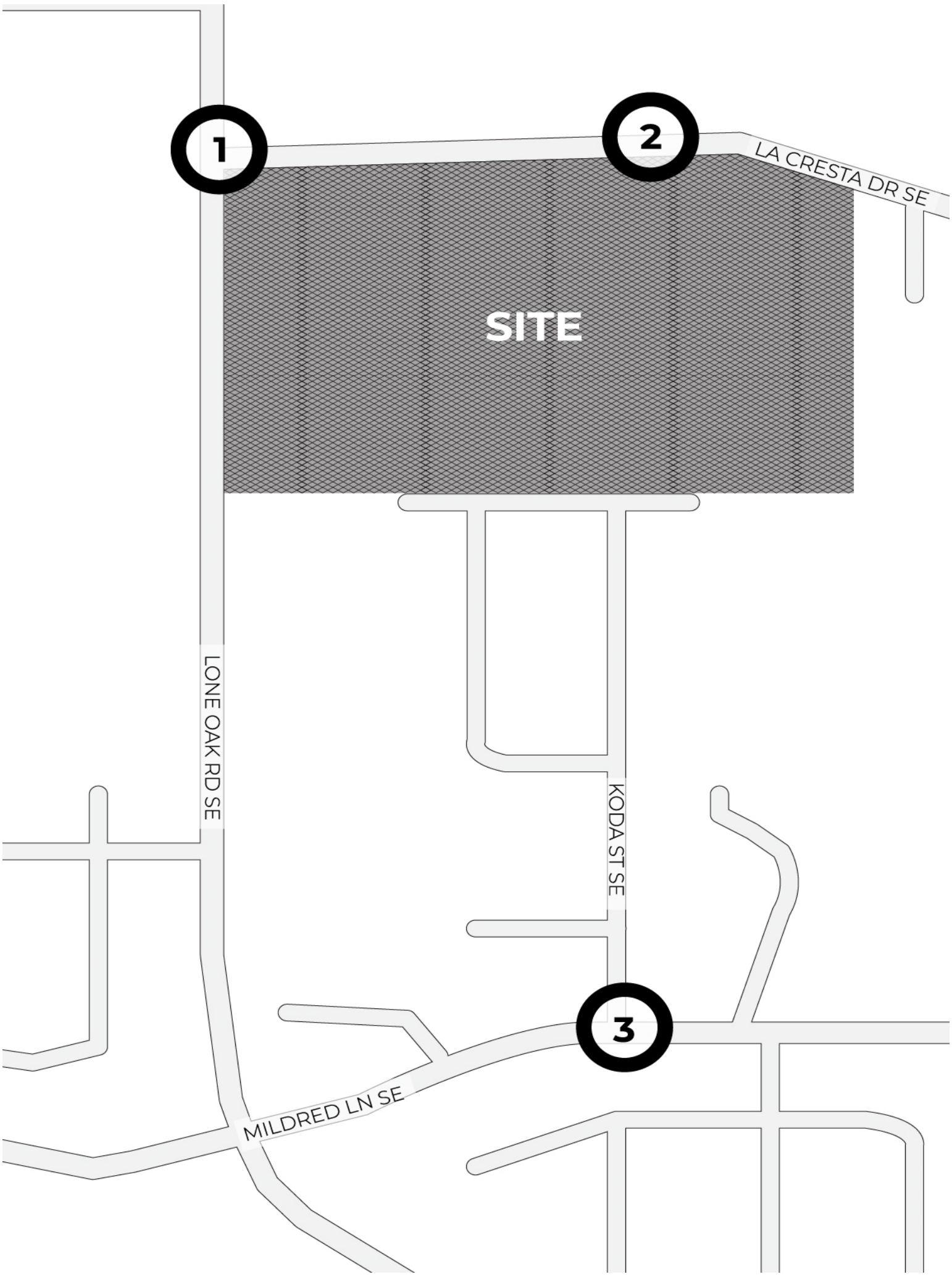
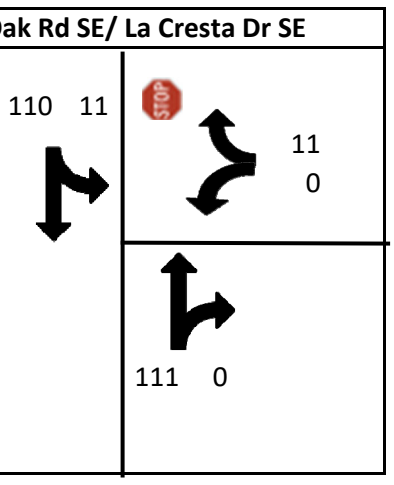


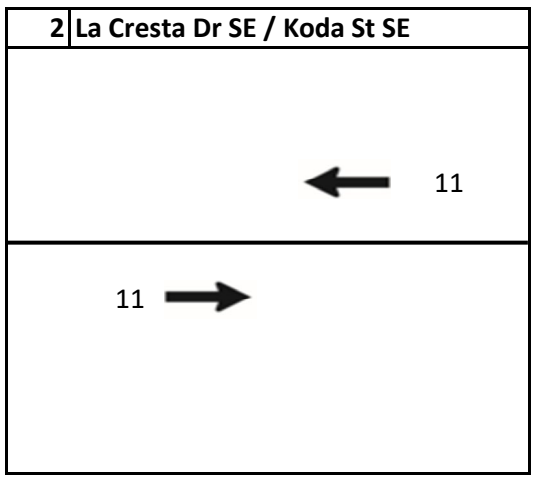
Figure 3: 2022 Existing Volumes PM Peak Hour



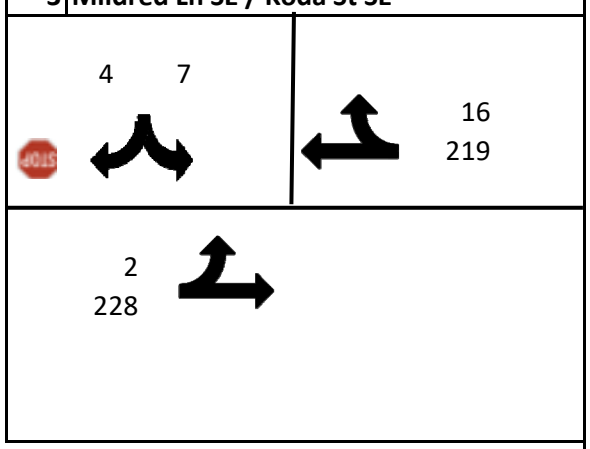
1	Lone Oak Rd SE/ La Cresta Dr SE



2	La Cresta Dr SE / Koda St SE



3	Mildred Ln SE / Koda St SE



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 methodology[1] 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
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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 show 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 methodology[2] 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
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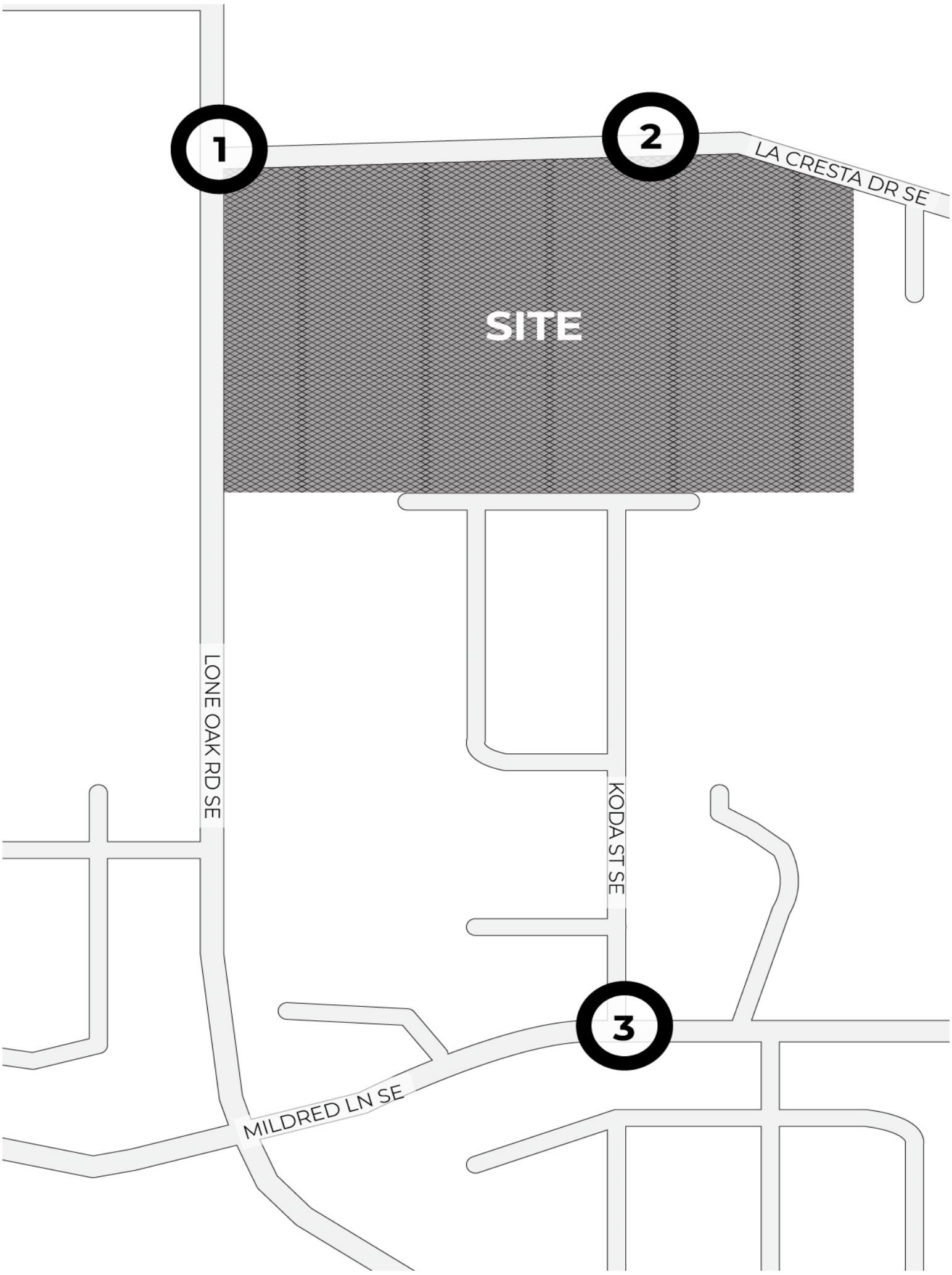
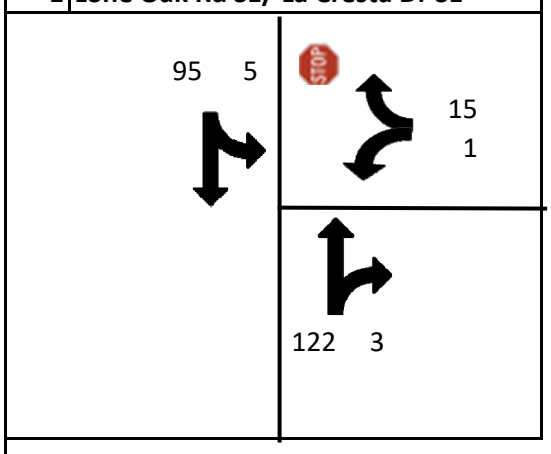
[2] *Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis*, Transportation Research Board, Washington DC, 2016.

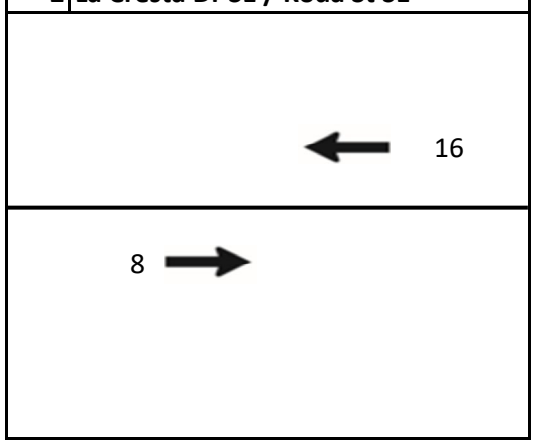
Figure 4: 2024 Background Volumes AM Peak Hour



1	Lone Oak Rd SE/ La Cresta Dr SE



2	La Cresta Dr SE / Koda St SE



3	Mildred Ln SE / Koda St SE

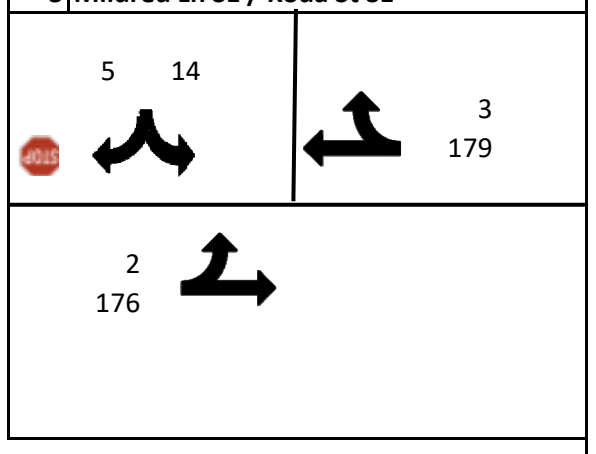
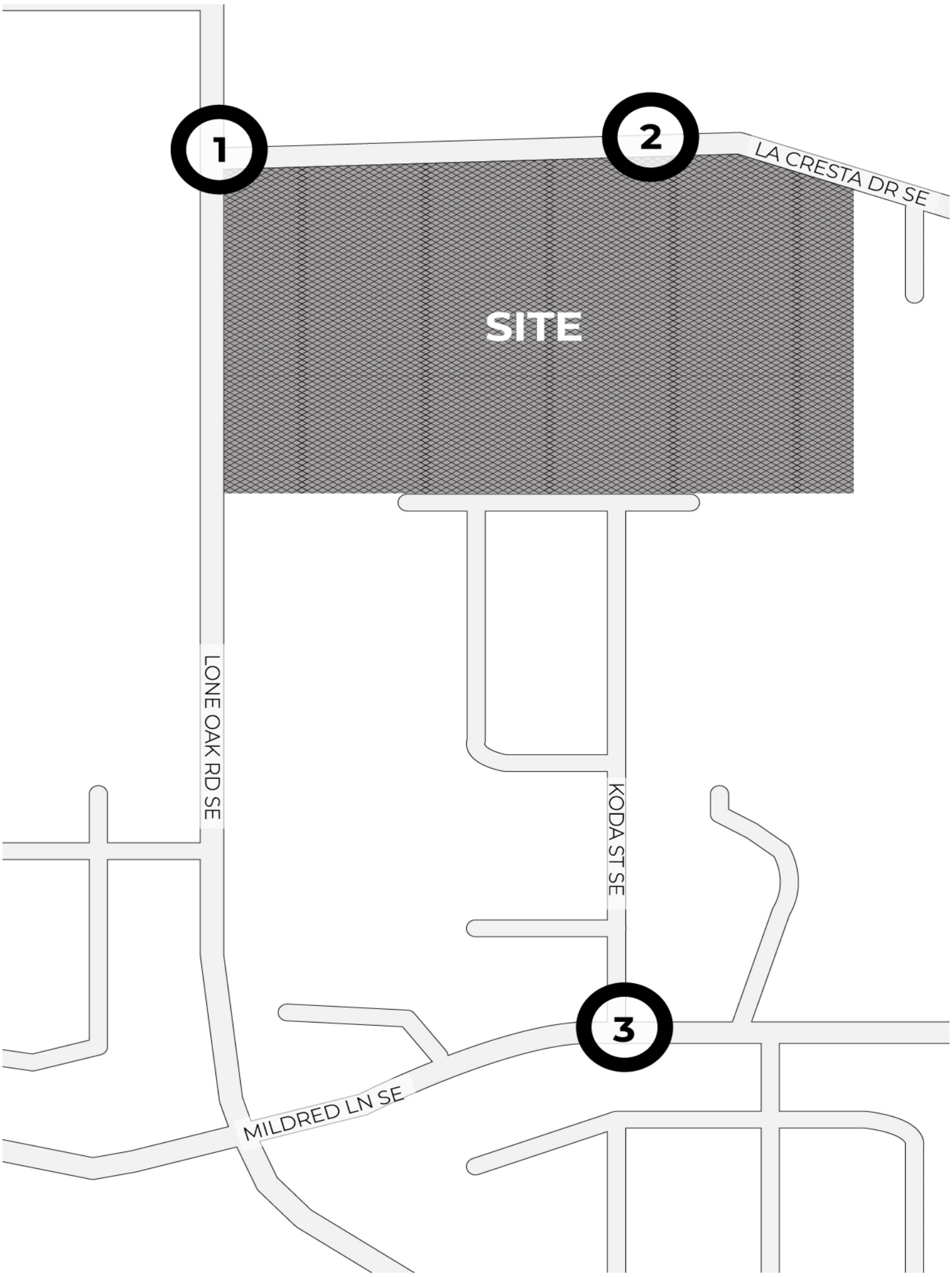
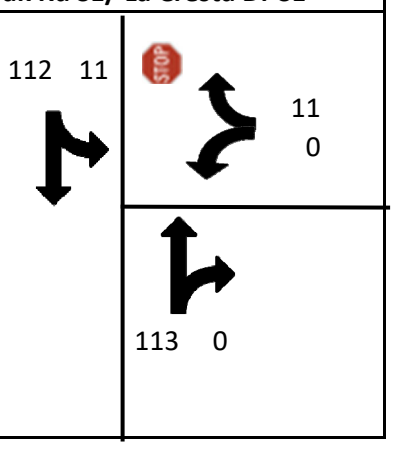


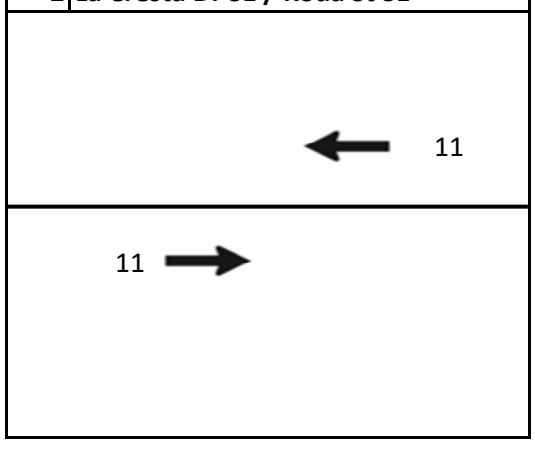
Figure 5: 2024 Background Volumes PM Peak Hour



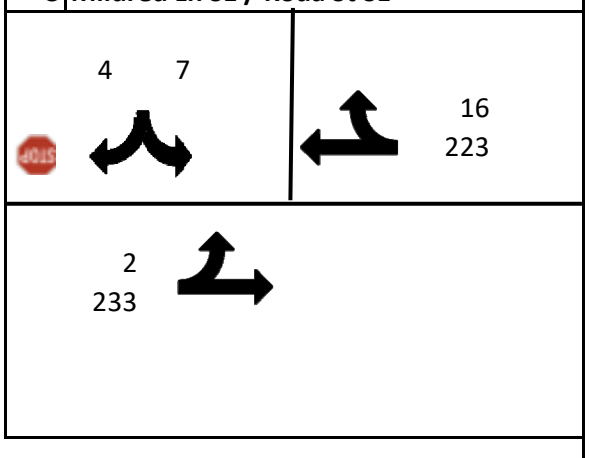
1	Lone Oak Rd SE/ La Cresta Dr SE



2	La Cresta Dr SE / Koda St SE



3	Mildred Ln SE / Koda St SE



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

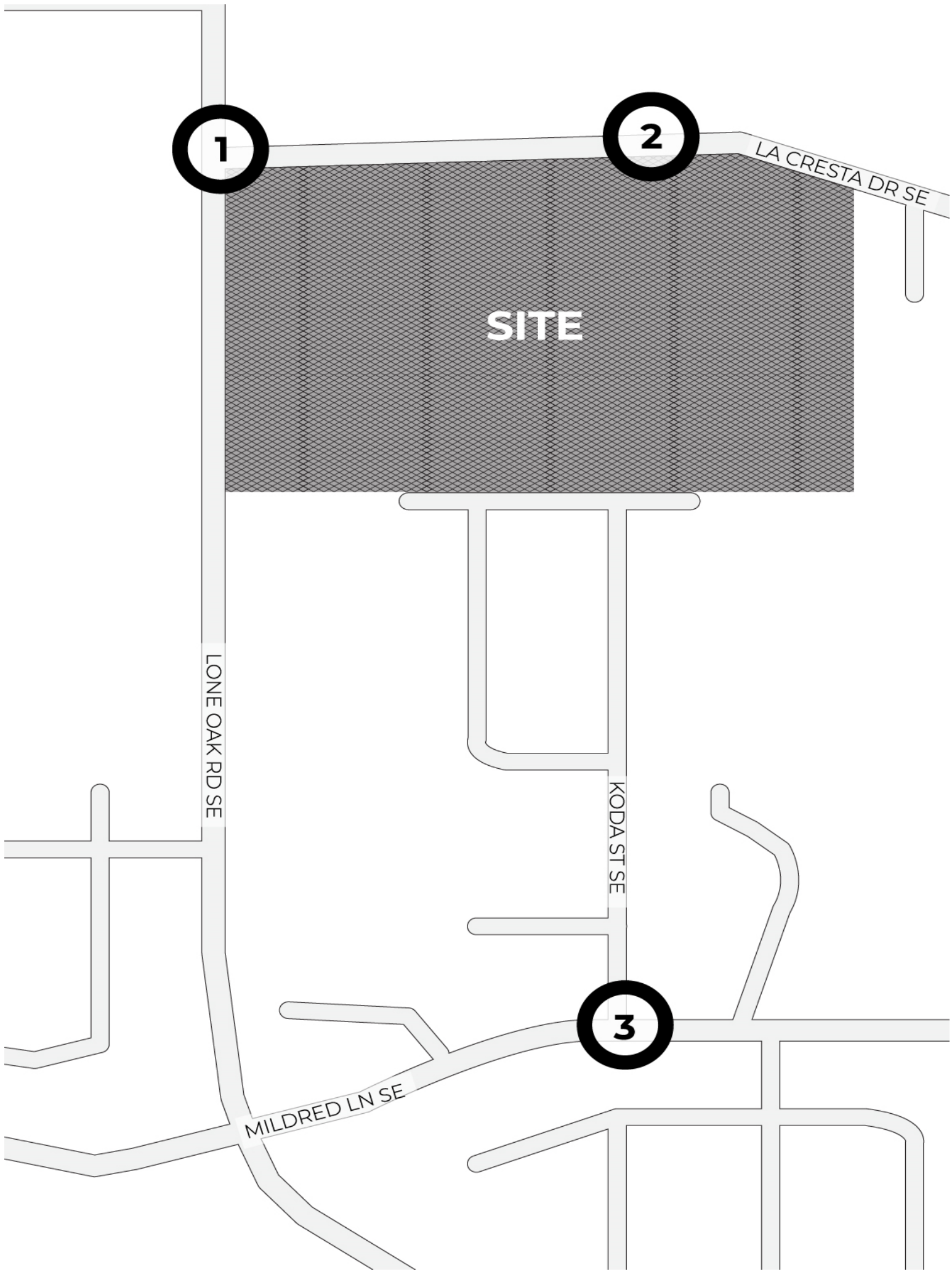
Land Use (ITE Code)	Units	Time Period	Peak Hour Trips		
			In	Out	Total
Single Family Detached (210)	54	AM Peak	11	31	43
		PM Peak	35	21	56
		Daily	-	-	572

Trip Distribution

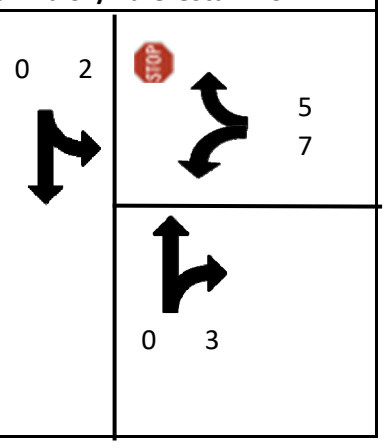
Trip distribution provides an estimation of where trips from the development originate and end on the study area network. This is represented as percentages where large portions of the trips generated enter and exit the project study area. The trip distribution percentages are included in **Appendix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

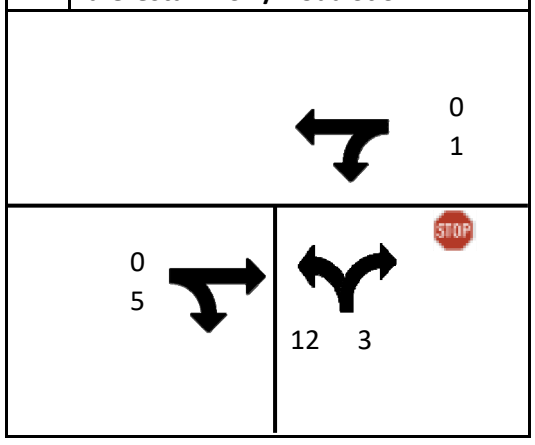
Figure 6: Site Generated Volumes AM Peak Hour



1	Lone Oak Rd SE/ La Cresta Dr SE



2	La Cresta Dr SE / Koda St SE



3	Mildred Ln SE / Koda St SE

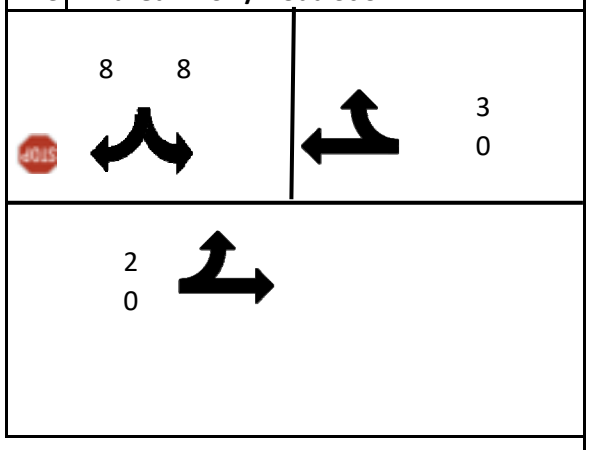
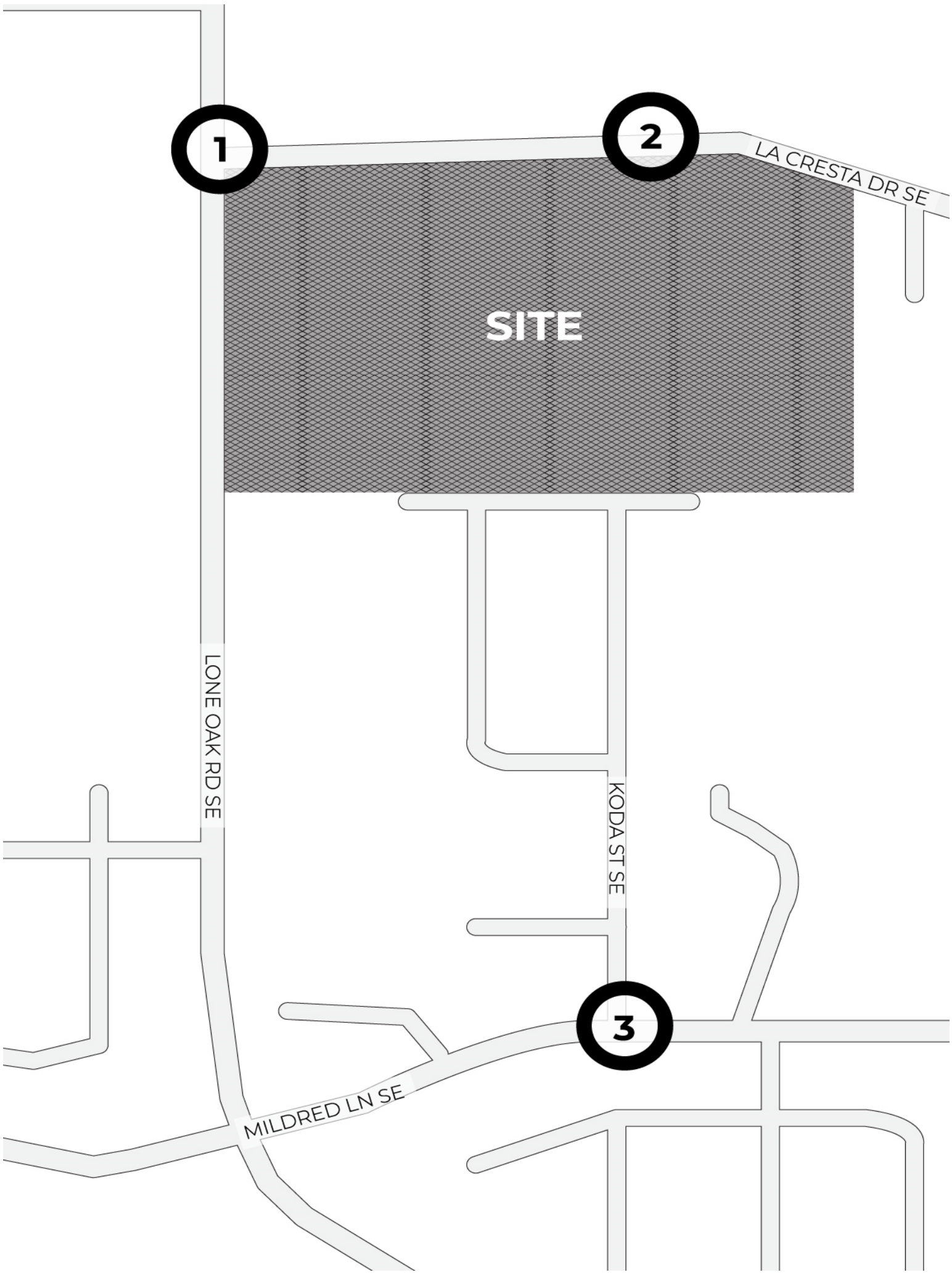
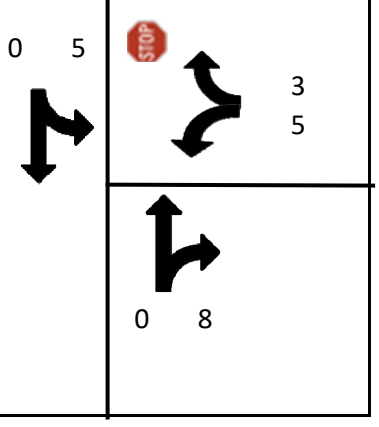


Figure 7: Site Generated Volumes PM Peak Hour



1	Lone Oak Rd SE/ La Cresta Dr SE



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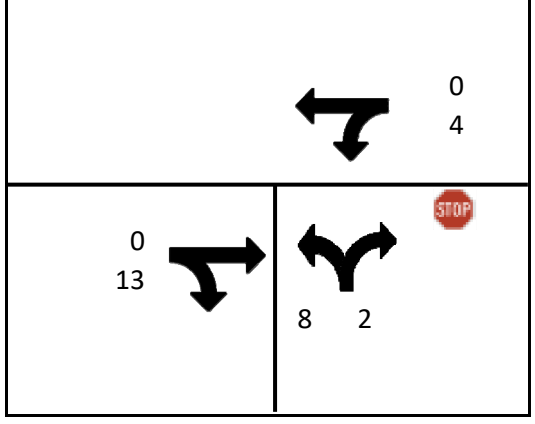
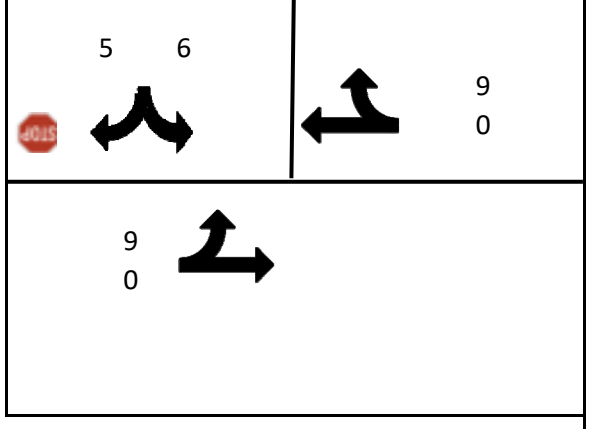


3	Mildred Ln SE / Koda St SE



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 methodology[4] 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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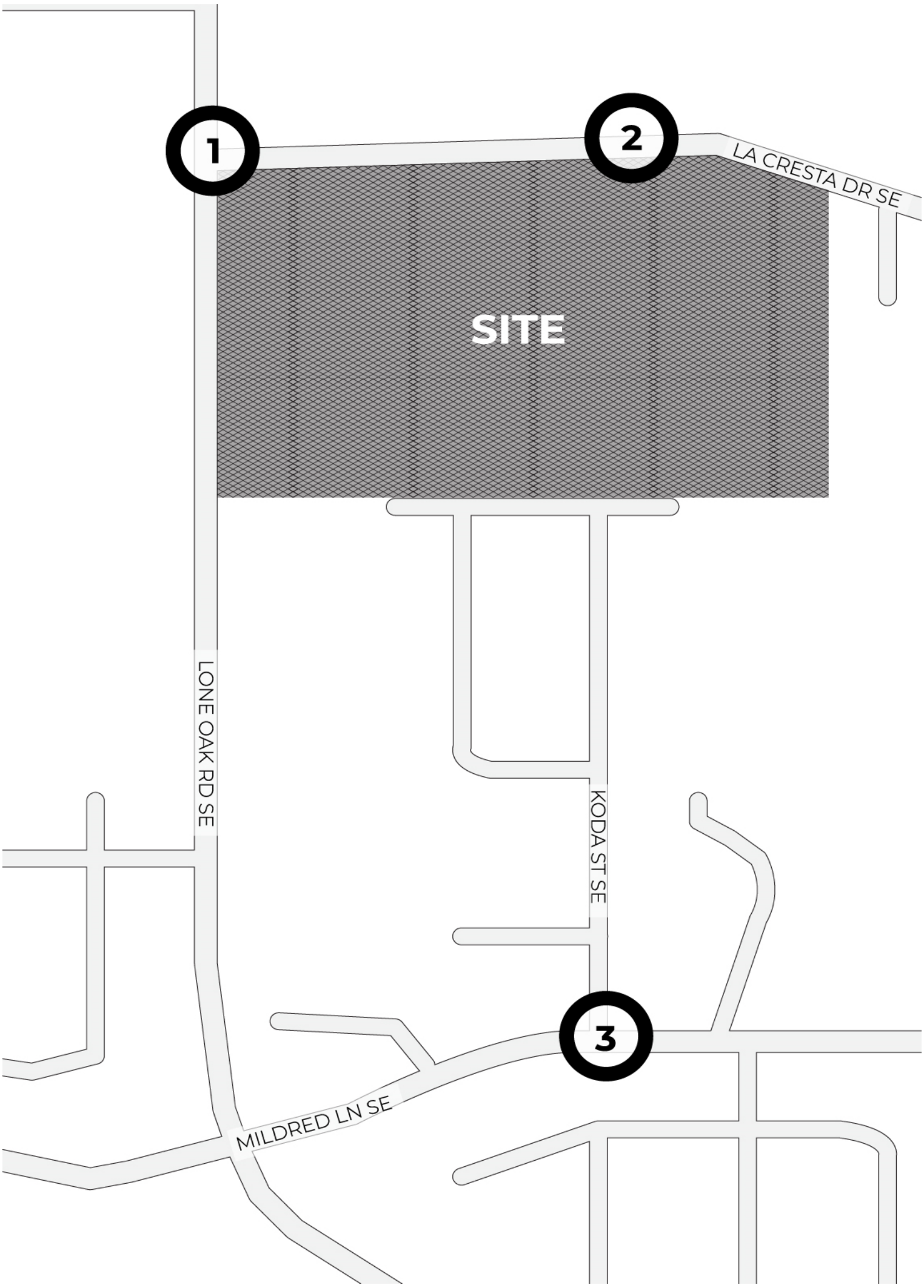
Table 9: Queuing Results

No.	Intersection	Movement	Available Storage (ft)	2024 Total AM Peak Hour 95th Percentile	2024 Total PM Peak Hour 95th 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



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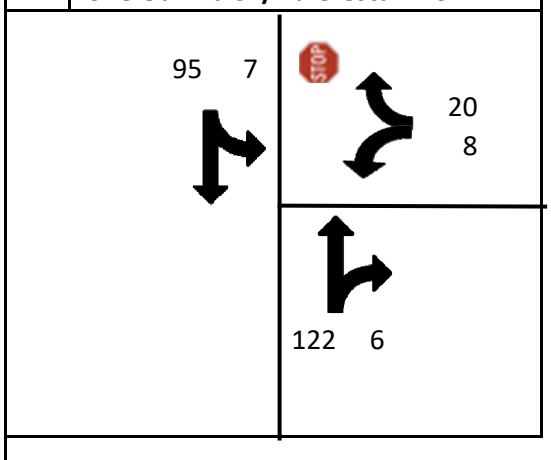

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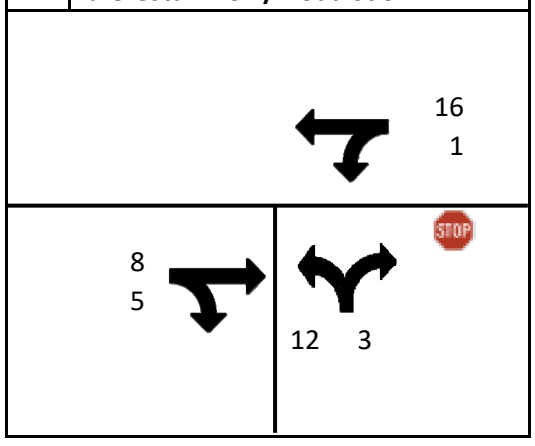


3	Mildred Ln SE / Koda St SE

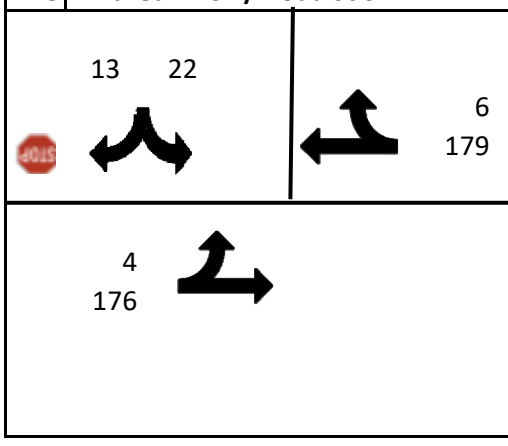
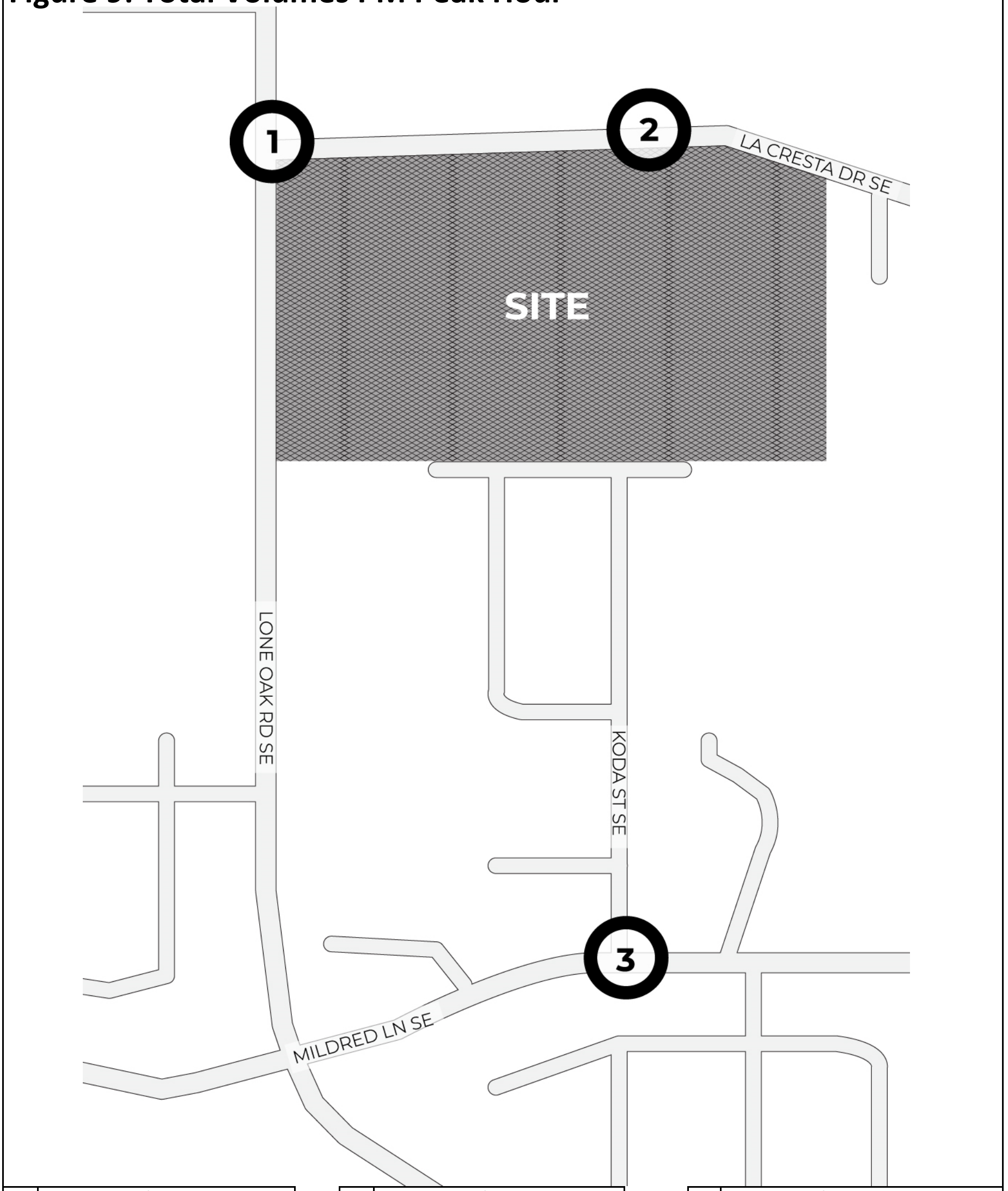


Figure 9: Total Volumes PM Peak Hour



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

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.