

Woodburn Place Apartments

Traffic Impact Analysis
Woodburn, Oregon

Date:

June 30, 2022

Prepared by:

Tegan Enloe, PE



CHAPTER 1: INTRODUCTION AND SUMMARY

The applicant is proposing to build an apartment complex located on the north side of Molalla Road and directly across from June Way. The proposed development would build 258 apartment units. 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 N Pacific Hwy (99E)/ Molalla Rd (OR 211)
- 2 Molalla Rd (OR 211)/ Safeway Driveway
- 3 Molalla Rd (OR 211)/ June Way/ Woodburn Place Apartments Phase 2 Site Access
- 4 Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access
- 5 Molalla Rd (OR 211)/ Cooley Road

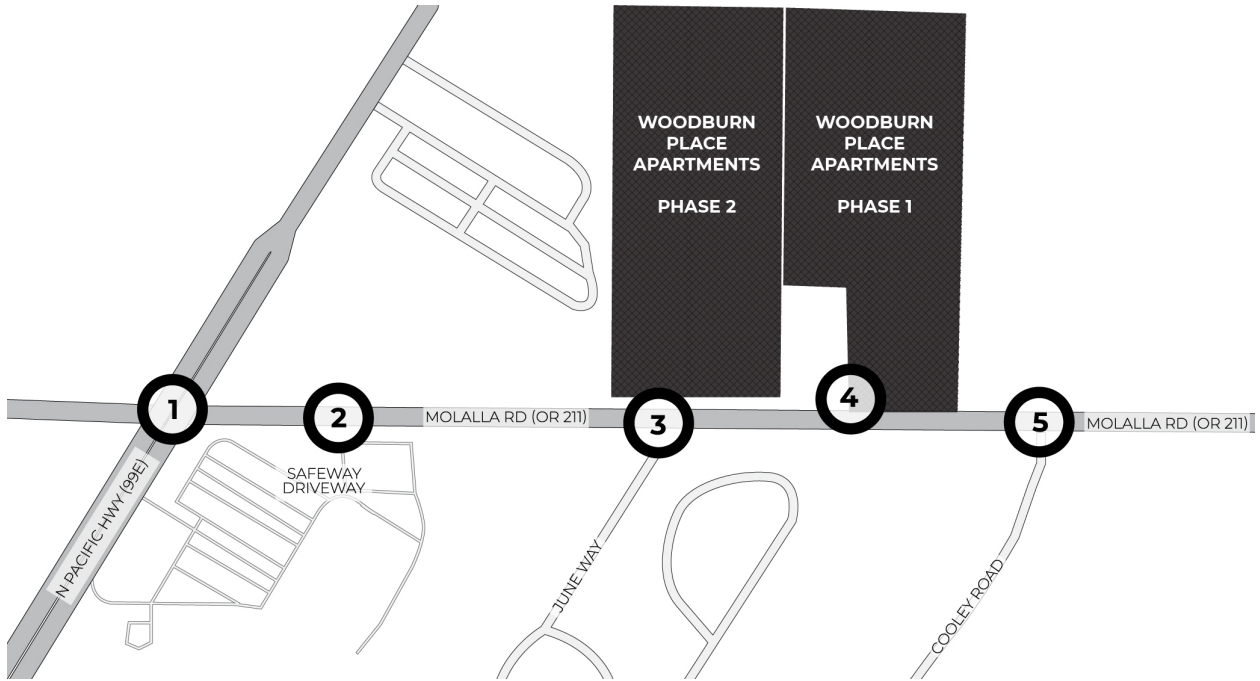


Figure 1: Study Area

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
<p>Study Area</p> <p>Number of Study Intersections</p> <p>Analysis Period</p> <p>Analysis Scenarios</p>	<p>Five</p> <p>Weekday AM and PM Peak Hours</p> <p>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</p>
<p>Project Site</p> <p>Existing Land Use</p> <p>Proposed Development</p> <p>Project Access</p>	<p>Vacant</p> <p>Multifamily housing; 258 units</p> <p>The development will have direct access to Molalla Rd (OR 211) via a north leg at the intersection of Molalla Rd (OR 211)/ June Way. The development will also connect to the previously approved development of the Woodburn Place Apartments Phase 1 located adjacent to this development and to the east.</p>

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 N Pacific Hwy (99E)/ Molalla Rd (OR 211)
- 2 Molalla Rd (OR 211)/ Safeway Driveway
- 3 Molalla Rd (OR 211)/ June Way
- 4 Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access
- 5 Molalla Rd (OR 211)/ Cooley Road

Table 2 shows the existing intersection operations at the study intersections. All study intersections are connections of two public streets, with the exception of Molalla Rd (OR 211) at the Safeway Driveway. This intersection is a private driveway access to the public street network and is included in the analysis because of previous interest from City Council. The intersections of N Pacific Hwy (99E)/ Molalla Rd (OR 211) and Molalla Rd (OR 211)/ Starbucks Driveway both fail mobility standards in the PM peak hour under the existing conditions.

Table 2: 2022 Existing Traffic at Study Intersection Operations

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	P.M. Peak Hour
1	N Pacific Hwy (99E) / Molalla Road (OR 211)	Signalized	0.90 V/C	V/C 0.79	<i>V/C 0.98</i>
2	Molalla Rd (OR 211)/ Safeway Driveway	Unsignalized (Two way stop)	0.95 V/C	V/C 0.03 (WBL), V/C 0.35 (NBL)	V/C 0.06 (WBL), <i>V/C 1.06 (NBL)</i>
3	Molalla Road (OR 211) / June Way	Unsignalized (Two way stop)	0.95 V/C	V/C <0.00 (WBL), V/C 0.16 (NB)	V/C <0.00 (WBL), V/C 0.17 (NB)
4	Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access	Unsignalized (Two way stop)	N/A	N/A	N/A
5	Molalla Road (OR 211) / Cooley Road	Unsignalized (Two way stop)	0.95 V/C	V/C 0.04 (WBL), V/C 0.17 (NB)	V/C 0.15 (WBL), V/C 0.32 (NB)

V/C = Volume-to-Capacity Ratio of Worst Movement

LOS = Level of Service of Worst Movement

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

Reports for Intersection 1 are provided for both the 6th Ed and 2000 versions of the HCM. V/C values are calculated using the 6th Ed methodology.

Project Traffic Impact

Build out of the multifamily housing is expected to be completed 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.

The intersections of N Pacific Hwy (99E)/ Molalla Rd (OR 211) and Molalla Rd (OR 211)/ Starbucks Driveway both fail mobility standards in the PM peak hour under 2024 conditions prior to construction of the proposed project. When the project is added, the intersection of N Pacific Hwy (99E)/ Molalla Rd (OR 211) also fails in the AM peak hour.

Table 3: 2024 Background Intersection Operations (Without Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	P.M. Peak Hour
1	N Pacific Hwy (99E) / Molalla Road (OR 211)	Signalized	0.90 V/C	V/C 0.86	<i>V/C 1.04</i>
2	Molalla Rd (OR 211)/ Safeway Driveway	Unsignalized (Two way stop)	0.95 V/C	V/C 0.03 (WBL), V/C 0.41 (NBL)	V/C 0.07 (WBL), <i>V/C 1.31 (NBL)</i>
3	Molalla Road (OR 211) / June Way	Unsignalized (Two way stop)	0.95 V/C	V/C < 0.00 (WBL), V/C 0.19 (NB)	V/C < 0.00 (WBL), V/C 0.21 (NB)
4	Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access	Unsignalized (Two way stop)	0.95 V/C	V/C 0.02 (EBL), V/C 0.10 (SB)	V/C 0.06 (EBL), V/C 0.08 (SB)
5	Molalla Road (OR 211) / Cooley Road	Unsignalized (Two way stop)	0.95 V/C	V/C 0.04 (WBL), V/C 0.18 (NB)	V/C 0.16 (WBL), V/C 0.38 (NB)

V/C = Volume-to-Capacity Ratio of Worst Movement

LOS = Level of Service of Worst Movement

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

Reports for Intersection 1 are provided for both the 6th Ed and 2000 versions of the HCM. V/C values are calculated using the 6th Ed methodology.

Table 4: 2024 Total Intersection Operations (With Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	P.M. Peak Hour
1	N Pacific Hwy (99E) / Molalla Road (OR 211)	Signalized	0.90 V/C	<i>V/C 0.92</i>	<i>V/C 1.08</i>
2	Molalla Rd (OR 211)/ Safeway Driveway	Unsignalized (Two way stop)	0.95 V/C	V/C 0.03 (WBL), V/C 0.48 (NBL)	V/C 0.07 (WBL), <i>V/C 1.50 (NBL)</i>
3	Molalla Road (OR 211) / June Way/ Woodburn Place Apartments Phase 2 Site Access	Unsignalized (Two way stop)	0.95 V/C	V/C 0.02 (EBL), V/C 0.31 (NB)	V/C 0.06 (EBL), V/C 0.39 (NB)
4	Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access	Unsignalized (Two way stop)	0.95 V/C	VC 0.02 (EBL), V/C 0.10 (SB)	V/C 0.06 (EBL), V/C 0.08 (SB)
5	Molalla Road (OR 211) / Cooley Road	Unsignalized (Two way stop)	0.95 V/C	V/C 0.04 (WBL), V/C 0.19 (NB)	V/C 0.16 (WBL), V/C 0.41 (NB)

V/C = Volume-to-Capacity Ratio of Worst Movement

LOS = Level of Service of Worst Movement

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

Reports for Intersection 1 are provided for both the 6th Ed and 2000 versions of the HCM. V/C values are calculated using the 6th Ed methodology.

Key Findings

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

- The proposed development would generate 102 (23 in, 79 out) AM peak hour trips and 101 (62 in, 39 out) PM peak hour vehicle trips.
- The intersections of N Pacific Hwy (99E)/ Molalla Rd (OR 211) and Molalla Rd (OR 211)/ Starbucks Driveway fail mobility standards under 2022 existing, 2024 background and 2024 total (with proposed development) traffic conditions.
- The intersection of N Pacific Hwy (99E)/ Molalla Rd (OR 211) fails mobility standards under 2022 existing, 2024 background and 2024 total (with proposed development) traffic conditions. The developments impact to this can be mitigated by the addition of a southbound left turn lane (creating dual southbound left turn lanes) and a short receiving lane on Molalla Rd. The developers proportional share contribution to this improvement would be 7.6%.

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 a multifamily complex located on the north side of Molalla Road and directly across from June Way. The proposed development would build 258 apartment units.

Existing Traffic Volumes and Operations

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

- 1 N Pacific Hwy (99E)/ Molalla Rd (OR 211)
- 2 Molalla Rd (OR 211)/ Safeway Driveway
- 3 Molalla Rd (OR 211)/ June Way
- 4 Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access
- 5 Molalla Rd (OR 211)/ Cooley Road

The project study area is currently under construction, which makes data collection unreliable for the next several months. Counts at the project study intersections were previously collected in September 2019 and February 2021 as part of the development review process for the Woodburn Place Apartments Phase 1 TIA. These counts are less than three years old and will be used for this analysis as well. A 1.3% annual growth rate is used to adjust the traffic counts to existing volumes. Seasonal adjustment factors are also used to convert to the 30th HV values for analysis. Site generated trips from the Pacific Valley Apartments are added to the existing traffic volumes. This development was in-process during the Woodburn Place Apartments Phase 1 traffic study and were therefore not included in the traffic count collection data.

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 system peak hour is identified as 7:05 – 8:05 AM, and the PM system peak hour as 4:10 – 5:10 PM.

Figure 2: 2022 Existing Volumes AM Peak Hour

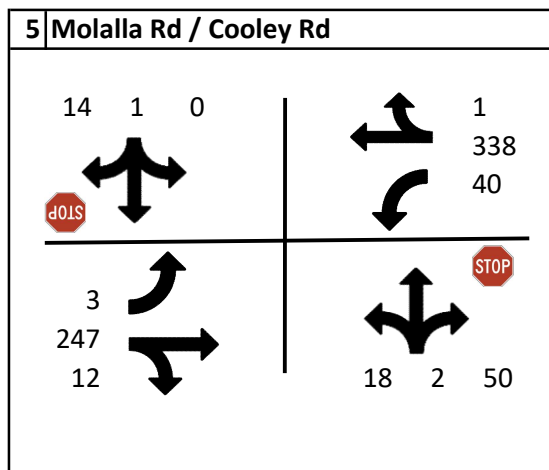
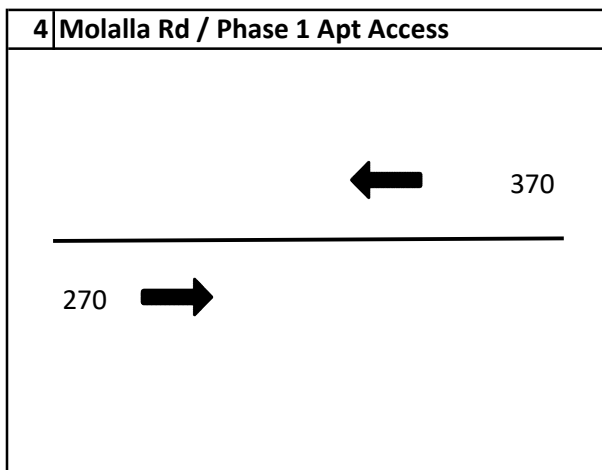
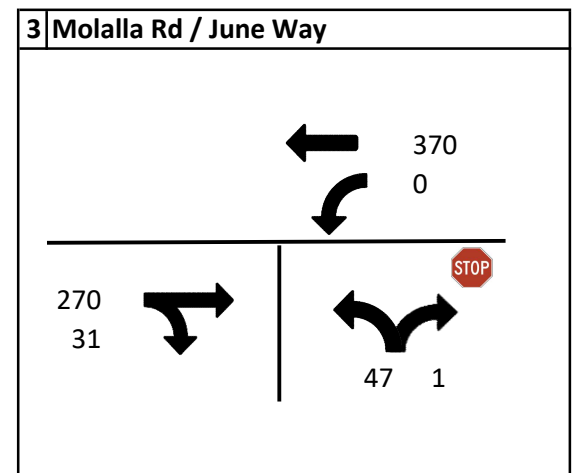
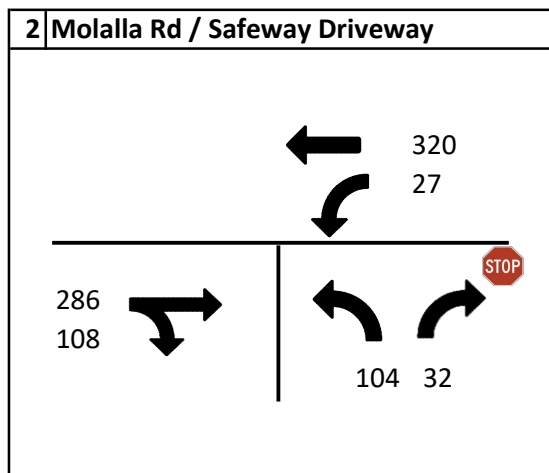
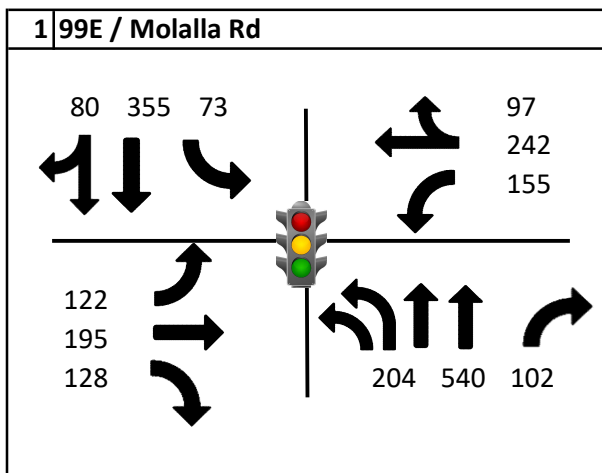
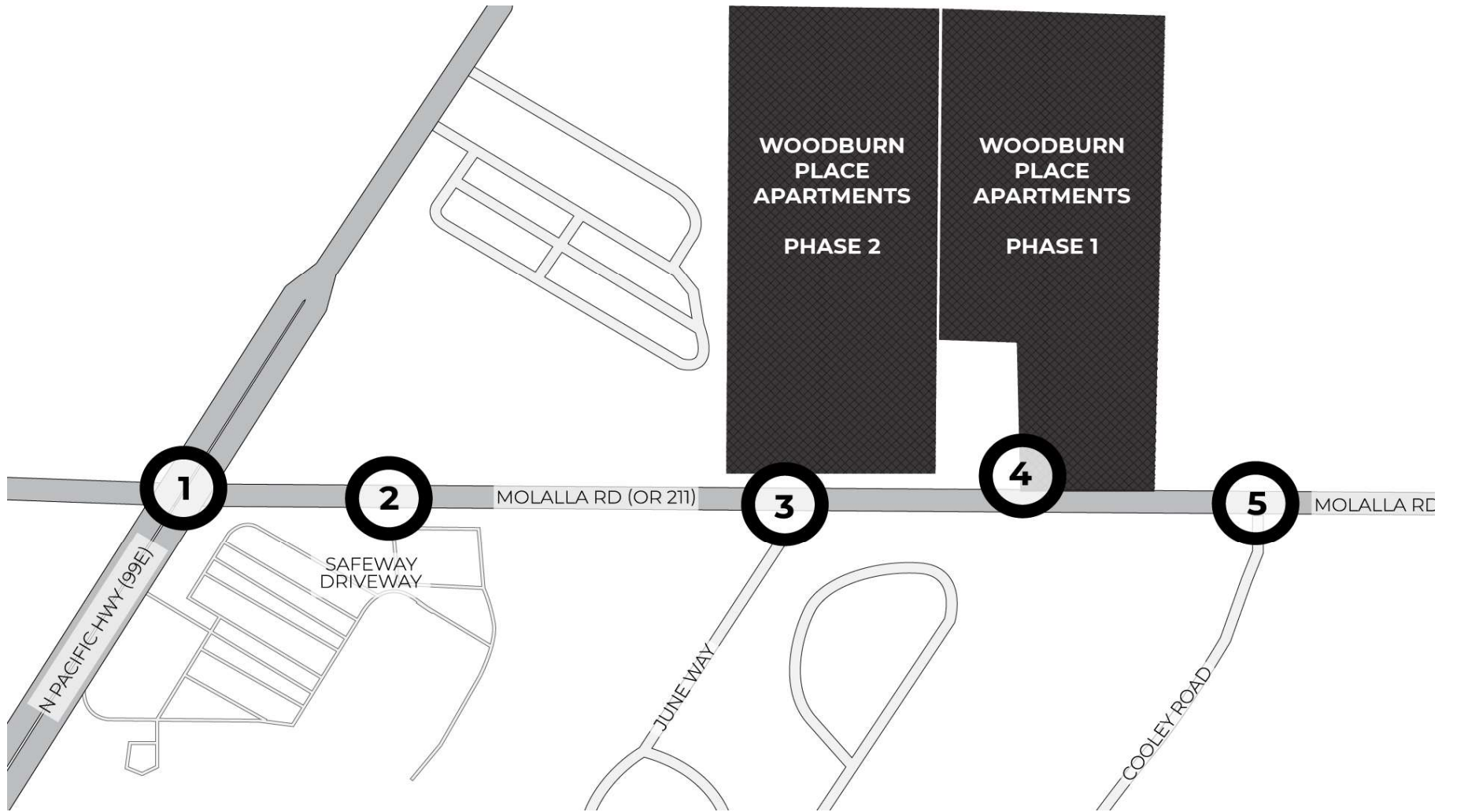
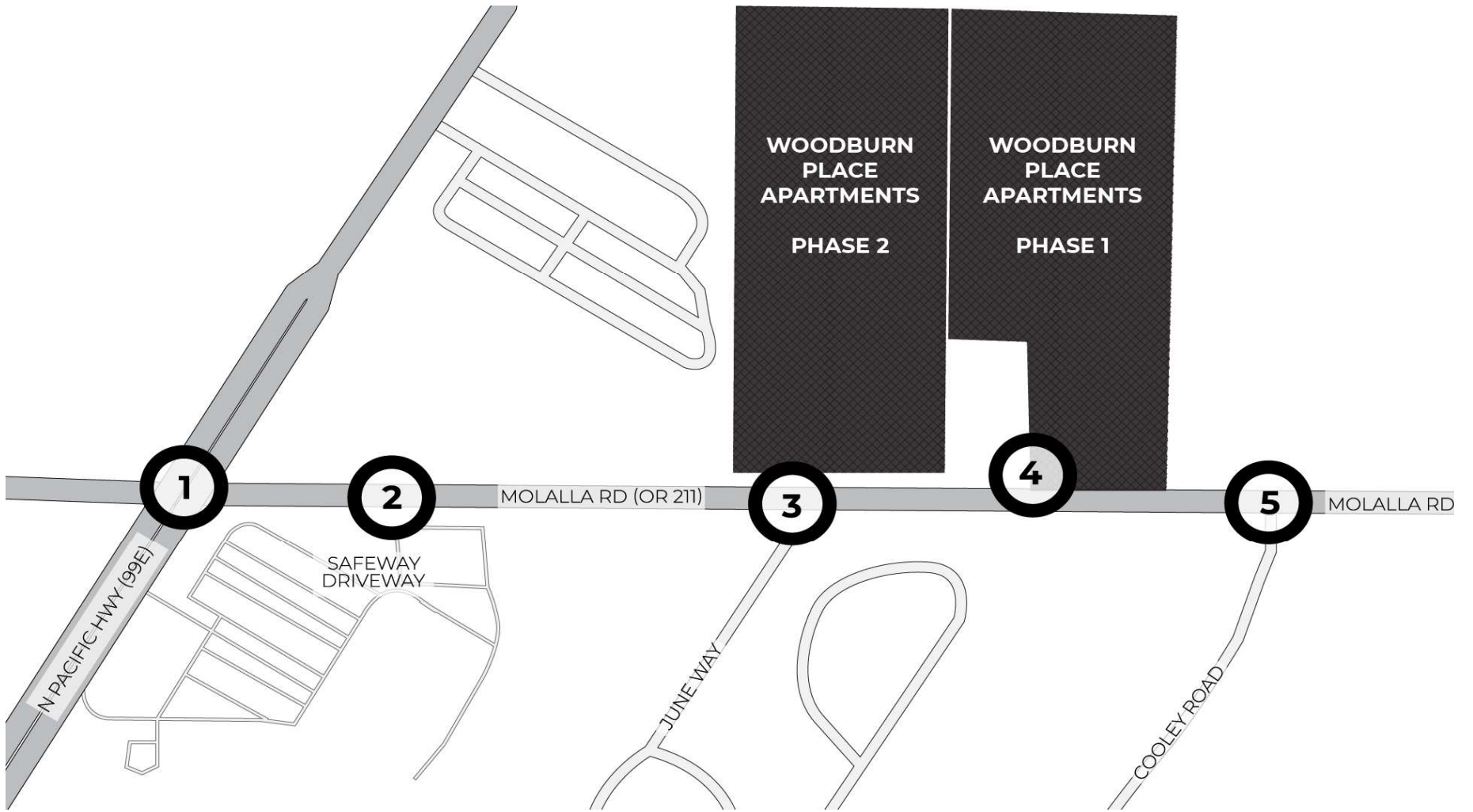


Figure 3: 2022 Existing Volumes PM Peak Hour



1 99E / Molalla Rd	
121 863 164	78 294 225
167 366 306	282 520 137

2 Molalla Rd / Safeway Driveway	
412 268	477 47
	214 128

3 Molalla Rd / June Way	
495 56	409 3
	35 4

4 Molalla Rd / Phase 1 Apt Access	
495	410

5 Molalla Rd / Cooley Rd	
3 2 1	0 388 126
4 427 64	19 0 58

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 2016¹ Highway Capacity Manual methodology is used to establish intersection operations. **Appendix C** provides detailed reports summarizing these results. **Appendix D** provides information on how the volumes were developed for analysis. All analysis scenarios (existing, background and total) assume a saturation flow rate of 1750 pcphgl. This saturation flow rate was assumed for the Woodburn Place Apartments Phase 1 analysis and is carried through this study for consistency.

The intersections of N Pacific Hwy (99E)/ Molalla Rd (OR 211) and Molalla Rd (OR 211)/ Starbucks Driveway both fail mobility standards in the PM peak hour under the existing conditions.

Table 5: 2022 Existing Intersection Operations

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	P.M. Peak Hour
1	N Pacific Hwy (99E) / Molalla Road (OR 211)	Signalized	0.90 V/C	V/C 0.79	V/C 0.98
2	Molalla Rd (OR 211)/ Safeway Driveway	Unsignalized (Two way stop)	0.95 V/C	V/C 0.03 (WBL), V/C 0.35 (NBL)	V/C 0.06 (WBL), V/C 1.06 (NBL)
3	Molalla Road (OR 211) / June Way	Unsignalized (Two way stop)	0.95 V/C	V/C <0.00 (WBL), V/C 0.16 (NB)	V/C <0.00 (WBL), V/C 0.17 (NB)
4	Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access	N/A	N/A	N/A	N/A
5	Molalla Road (OR 211) / Cooley Road	Unsignalized (Two way stop)	0.95 V/C	V/C 0.04 (WBL), V/C 0.17 (NB)	V/C 0.15 (WBL), V/C 0.32 (NB)

V/C = Volume-to-Capacity Ratio of Worst Movement

LOS = Level of Service of Worst Movement

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

Reports for Intersection 1 are provided for both the 6th Ed and 2000 versions of the HCM. V/C values are calculated using the 6th Ed methodology.

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

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 included in the analysis. Crash rates are calculated at three of the study intersections. The intersection of Molalla Rd (Or 211)/ Woodburn Place Apartments Phase 1 Site Access is an unbuilt connection and would not have record of crash history. The intersection of Molalla Rd (OR 211)/ Safeway Driveway is not included because it is a private access. Intersection crash rates are compared with ODOT's 90th percentile crash rates from Exhibit 4-1 of ODOT's Analysis Procedures Manual (APM).

The calculated crash rates at the intersections of Molalla Rd (OR 211)/ June Way and Molalla Rd (OR 211)/ Cooley Road are below their corresponding 90th percentile crash rate, which indicates the intersections do not experience more crashes than similar locations throughout the state. The intersection of N Pacific Hwy (99E)/ Molalla Rd (OR 211) has a calculated crash rate that exceeds the 90th percentile crash rate. This indicates the location could benefit from a separate intersection safety analysis. The intersection of N Pacific Hwy (99E)/ Molalla Rd (OR 211) is also identified in the ODOT 2020 SPIS List as being in the top 5% list. Additionally, there is a location on Molalla Rd (OR 211) about midway between the intersections of N Pacific Hwy (99E) and June Way that is identified as being in the top 15% list in the ODOT TransGIS database.

Table 6A: Crash Rate Analysis

No.	Intersection	AADT	5 Year Crash Total (2016-2020)	Crash Rate	Intersection Type	90 th Percentile Crash Rate
1	N Pacific Hwy (99E)/ Molalla Rd (OR 211)	32,697	71	1.19	4SG	0.860
3	Molalla Rd (OR 211)/ June Way	9,476	5	0.289	3ST	0.293
5	Molalla Rd (OR 211)/ Cooley Road	10,327	0	N/A	3ST	0.293

Note: AADT is estimated assuming the intersection PM Peak Hour traffic is approximately 10% of the AADT. Locations exceeding 90th percentile crash rates are shown with ***bold/italicized***

Table 7B: Crash Trends Analysis

No.	Intersection	Fatal Crashes	Injury A Crashes	Pedestrian Involved Crashes	Bicycle Involved Crashes
1	N Pacific Hwy (99E)/ Molalla Rd (OR 211)	0	3	1	0
3	Molalla Rd (OR 211)/ June Way	0	0	0	0
5	Molalla Rd (OR 211)/ Cooley Road	N/A	N/A	N/A	N/A

CHAPTER 3: BACKGROUND TRAFFIC

The multifamily housing is expected to be completed in 2024. To account for traffic growth a 1.3% annual growth rate is used to forecast the existing conditions traffic volumes to future background traffic volumes on roads within the study area. This growth rate is calculated using the ODOT 2040 Future Volumes Table. Additional details are provided in **Appendix D**. Phase 1 of the Woodburn Place Apartments is currently under construction and included as an in-process development for this 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 methodology² is used to establish intersection operations **Appendix F** provides detailed reports summarizing these results.

The intersections of N Pacific Hwy (99E)/ Molalla Rd (OR 211) and Molalla Rd (OR 211)/ Starbucks Driveway fail mobility standards in the PM peak hour under 2024 conditions prior to construction of the proposed project.

Table 8: 2024 Background Intersection Operations (Without Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	P.M. Peak Hour
1	N Pacific Hwy (99E) / Molalla Road (OR 211)	Signalized	0.90 V/C	V/C 0.86	V/C 1.04
2	Molalla Rd (OR 211)/ Safeway Driveway	Unsignalized (Two way stop)	0.95 V/C	V/C 0.03 (WBL), V/C 0.41 (NBL)	V/C 0.07 (WBL), V/C 1.31 (NBL)
3	Molalla Road (OR 211) / June Way	Unsignalized (Two way stop)	0.95 V/C	V/C < 0.00 (WBL), V/C 0.19 (NB)	V/C < 0.00 (WBL), V/C 0.21 (NB)
4	Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access	Unsignalized (Two way stop)	0.95 V/C	V/C 0.02 (EBL), V/C 0.10 (SB)	V/C 0.06 (EBL), V/C 0.08 (SB)
5	Molalla Road (OR 211) / Cooley Road	Unsignalized (Two way stop)	0.95 V/C	V/C 0.04 (WBL), V/C 0.18 (NB)	V/C 0.16 (WBL), V/C 0.38 (NB)

V/C = Volume-to-Capacity Ratio of Worst Movement

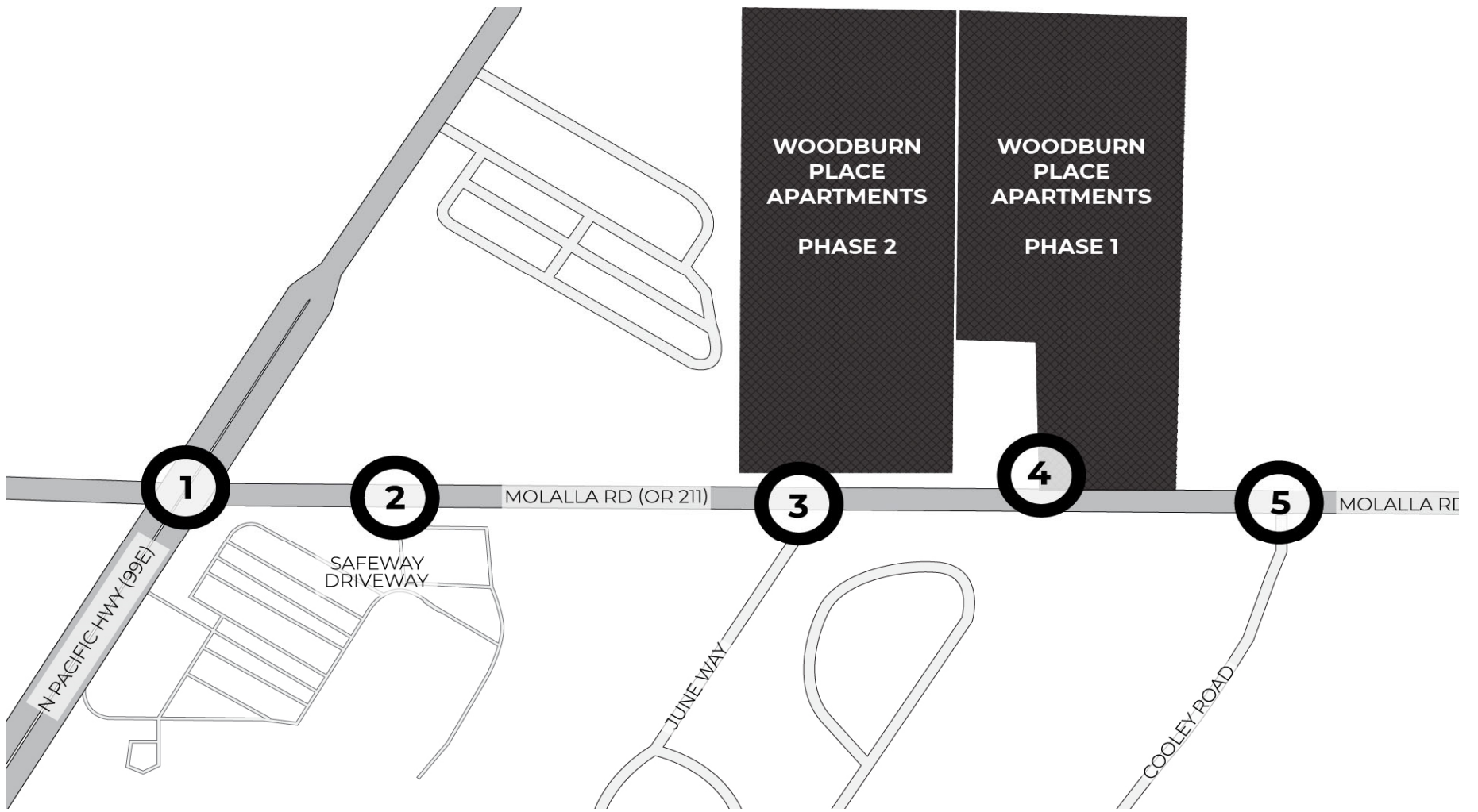
LOS = Level of Service of Worst Movement

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

Reports for Intersection 1 are provided for both the 6th Ed and 2000 versions of the HCM. V/C values are calculated using the 6th Ed methodology

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 99E / Molalla Rd	
82	365 80
114	268
174	
125	209 554 110
207	
131	

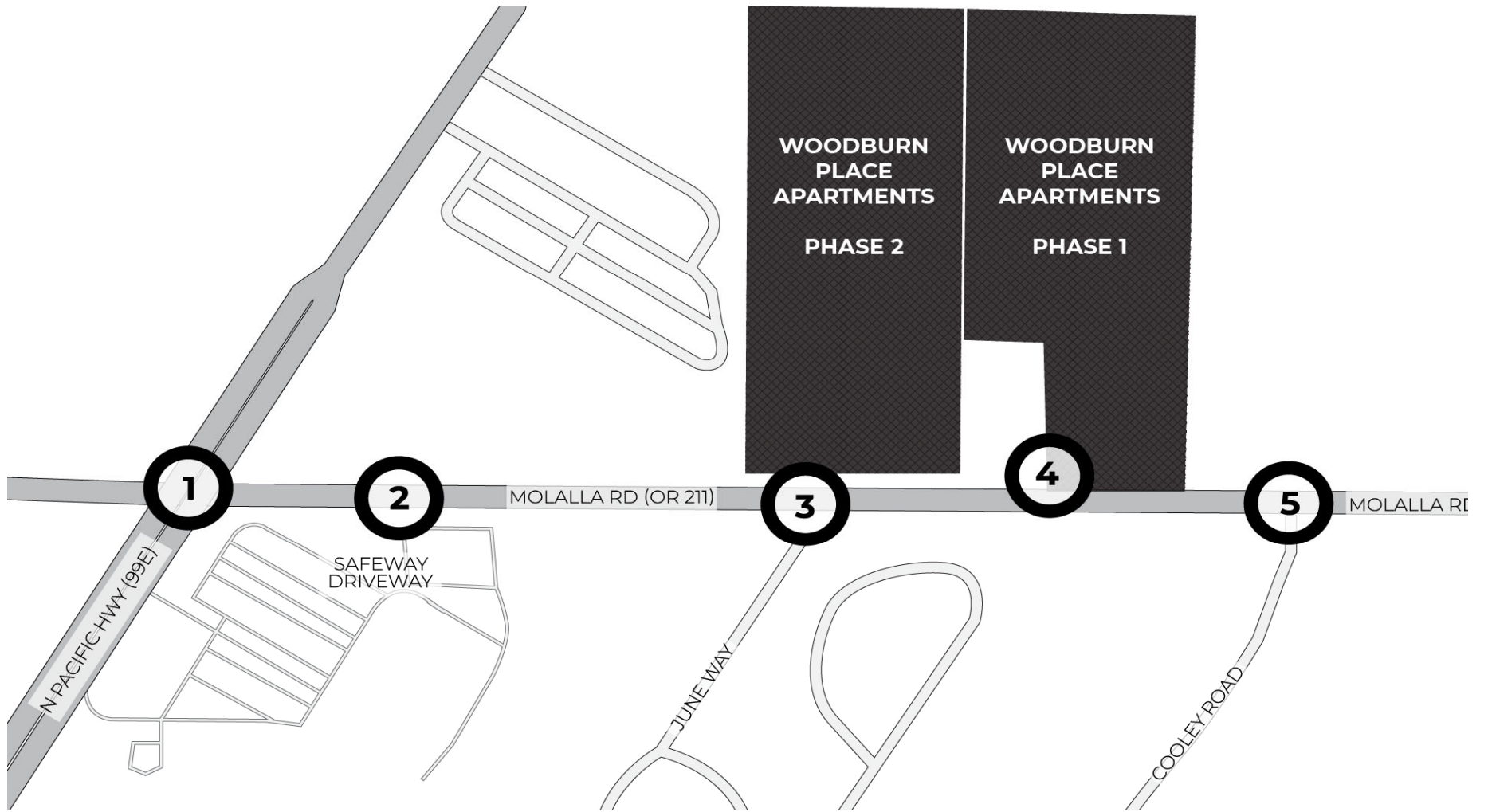
2 Molalla Rd / Safeway Driveway	
378	28
310	107 33
110	

3 Molalla Rd / June Way	
429	2
294	49 2
32	

4 Molalla Rd / Phase 1 Apt Access	
51 7	2 380
18	
277	

5 Molalla Rd / Cooley Rd	
15 1 0	1 348 41
3 257 15	19 2 51

Figure 5: 2024 Background Volumes PM Peak Hour



1 99E / Molalla Rd	
124 885 183	90 314 241
172 397 313	289 534 155

2 Molalla Rd / Safeway Driveway	
475 275	521 48
	220 131

3 Molalla Rd / June Way	
559 58	451 4
	36 7

4 Molalla Rd / Phase 1 Apt Access	
33 5	7 420
54 507	

5 Molalla Rd / Cooley Rd	
3 2 1	0 402 129
5 441 68	22 0 60

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 N Pacific Hwy (99E)/ Molalla Rd (OR 211)
- 2 Molalla Rd (OR 211)/ Safeway Driveway
- 3 Molalla Rd (OR 211)/ June Way/ Woodburn Place Apartments Phase 2 Site Access
- 4 Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access
- 5 Molalla Rd (OR 211)/ Cooley Road

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 221: Multifamily Housing (Mid-Rise) Not Close to Rail Transit. Trip generation values are provided in **Table 8**.

Table 9: Trip Generation Summary

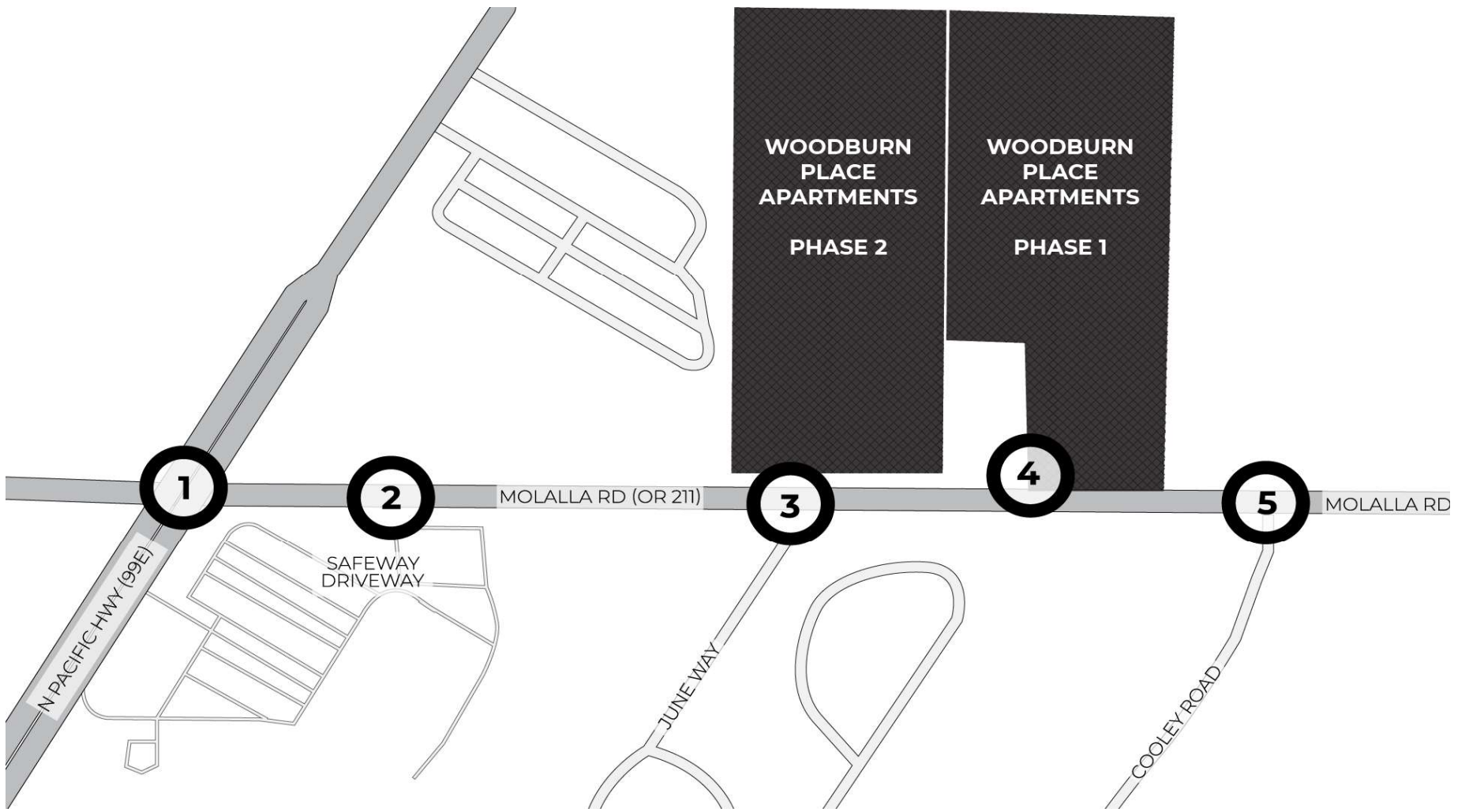
Land Use (ITE Codes)	Dwelling Units	Time Period	Trip Generation Rate	Peak Hour Trips		
				In	Out	Total
Multi-Family Mid-Rise Not Close to Rail Transit (LUC 221)	258	AM Peak	Equation	23	79	102
TOTAL AM PEAK HOUR				23	79	102
Multi-Family Mid-Rise Not Close to Rail Transit (LUC 221)	258	PM Peak	Equation	62	39	101
TOTAL PM PEAK HOUR				62	39	101

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 99E / Molalla Rd	
<p>0 0 6</p>	<p>20 28 20</p>

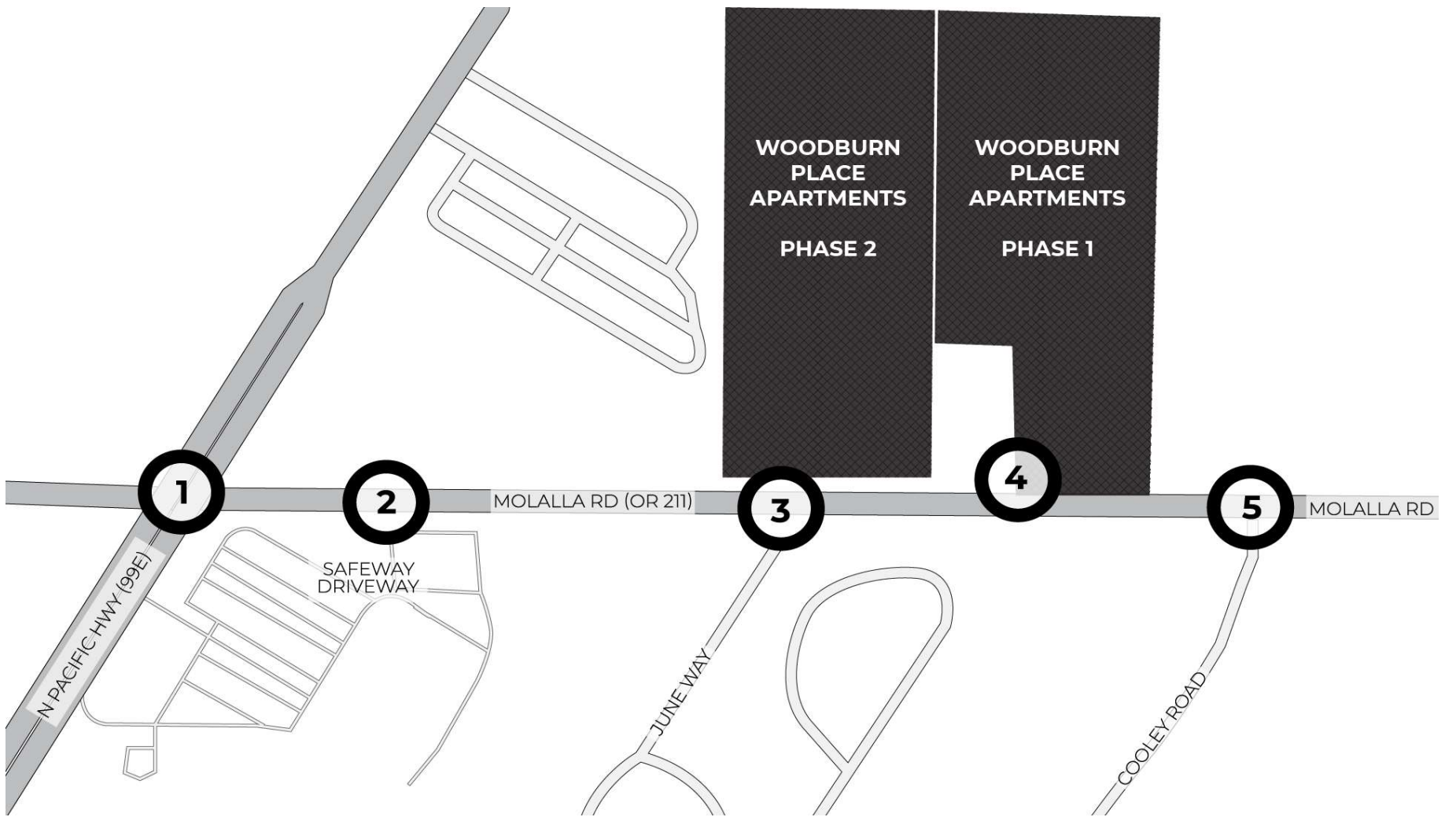
2 Molalla Rd / Safeway Driveway	
<p>20 0</p>	<p>68 0</p>

3 Molalla Rd / June Way	
<p>68 2 9</p>	<p>2 0 0</p>

4 Molalla Rd / Phase 1 Apt Access	
<p>0 0</p>	<p>0 2</p>

5 Molalla Rd / Cooley Rd	
<p>0 0 0</p>	<p>0 1 0</p>

Figure 7: Site Generated Volumes PM Peak Hour



1 99E / Molalla Rd	
0 0 15	10
	14
	10
0	
22	0 0 16
0	

2 Molalla Rd / Safeway Driveway	
	34
	0
53	
0	0 0

3 Molalla Rd / June Way	
34 1 4	7
	0
	0
53	
0	0 2 0
0	

4 Molalla Rd / Phase 1 Apt Access	
0 0	0
	7
0	
4	

5 Molalla Rd / Cooley Rd	
0 0 0	0
	4
	0
0	
2	3 0 0
2	

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 to establish intersection operations. **Appendix G** provides detailed reports for the operational results.

The intersection of N Pacific Hwy (99E)/ Molalla Rd (OR 211) fails mobility standards in both the AM and PM peak hours under total traffic conditions. The intersection of Molalla Rd (OR 211)/ Starbucks Driveway fail mobility standards in the PM peak hour.

Table 10: 2024 Total Intersection Operations (with Project)

No.	Intersection	Traffic Control	Operating Standard	AM Peak Hour	P.M. Peak Hour
1	N Pacific Hwy (99E) / Molalla Road (OR 211)	Signalized	0.90 V/C	V/C 0.92	V/C 1.08
2	Molalla Rd (OR 211)/ Safeway Driveway	Unsignalized (Two way stop)	0.95 V/C	V/C 0.03 (WBL), V/C 0.48 (NBL)	V/C 0.07 (WBL), V/C 1.50 (NBL)
3	Molalla Road (OR 211) / June Way/ Woodburn Place Apartments Phase 2 Site Access	Unsignalized (Two way stop)	0.95 V/C	V/C 0.02 (EBL), V/C 0.31 (NB)	V/C 0.06 (EBL), V/C 0.39 (NB)
4	Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access	Unsignalized (Two way stop)	0.95 V/C	VC 0.02 (EBL), V/C 0.10 (SB)	V/C 0.06 (EBL), V/C 0.08 (SB)
5	Molalla Road (OR 211) / Cooley Road	Unsignalized (Two way stop)	0.95 V/C	V/C 0.04 (WBL), V/C 0.19 (NB)	V/C 0.16 (WBL), V/C 0.41 (NB)

V/C = Volume-to-Capacity Ratio of Worst Movement

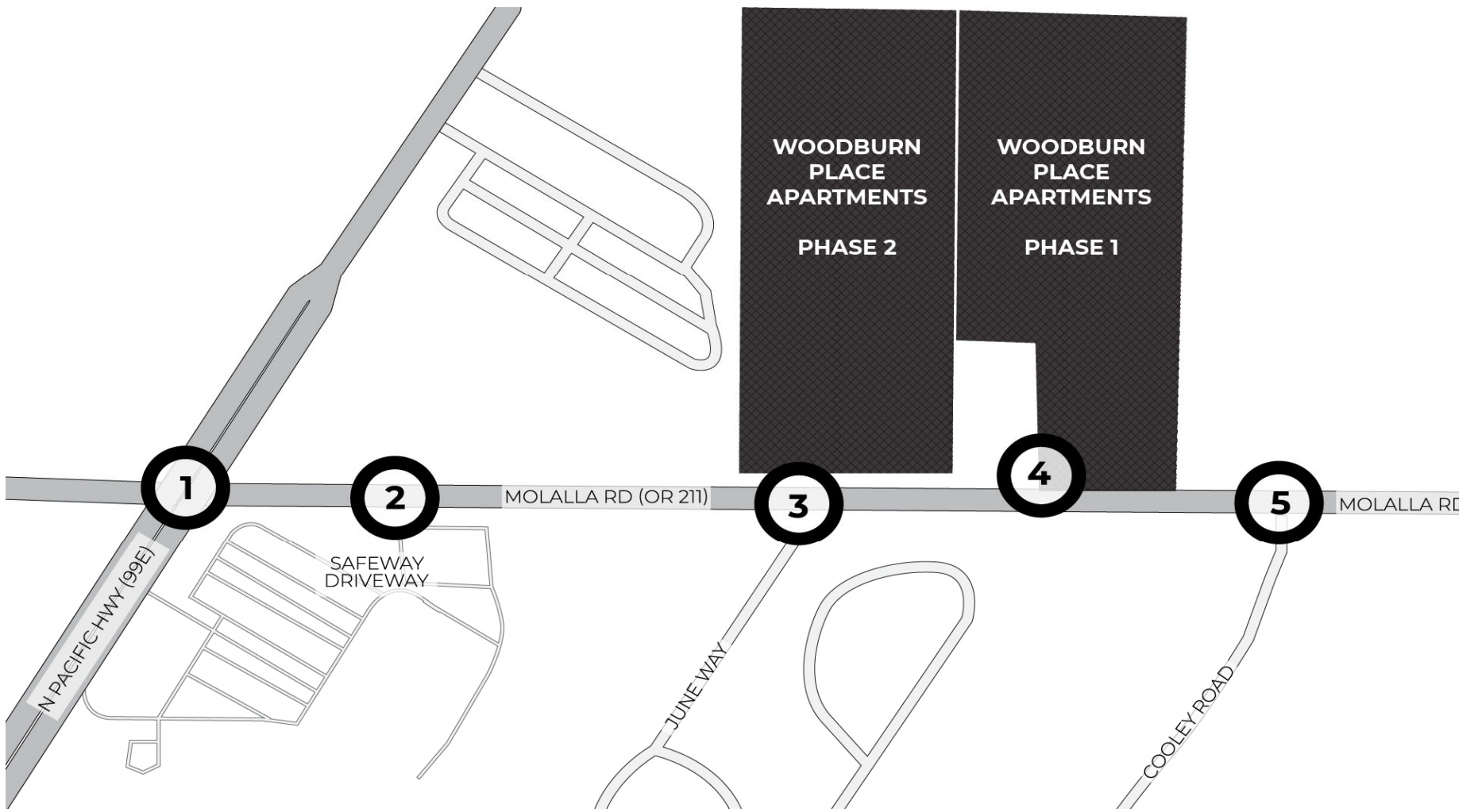
LOS = Level of Service of Worst Movement

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Reports for Intersection 1 are provided for both the 6th Ed and 2000 versions of the HCM. V/C values are calculated using the 6th Ed methodology.

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

Figure 8: 2024 Total Volumes AM Peak Hour



1 99E / Molalla Rd	
82	365 86
134	296
194	
125	209 554 116
215	
131	

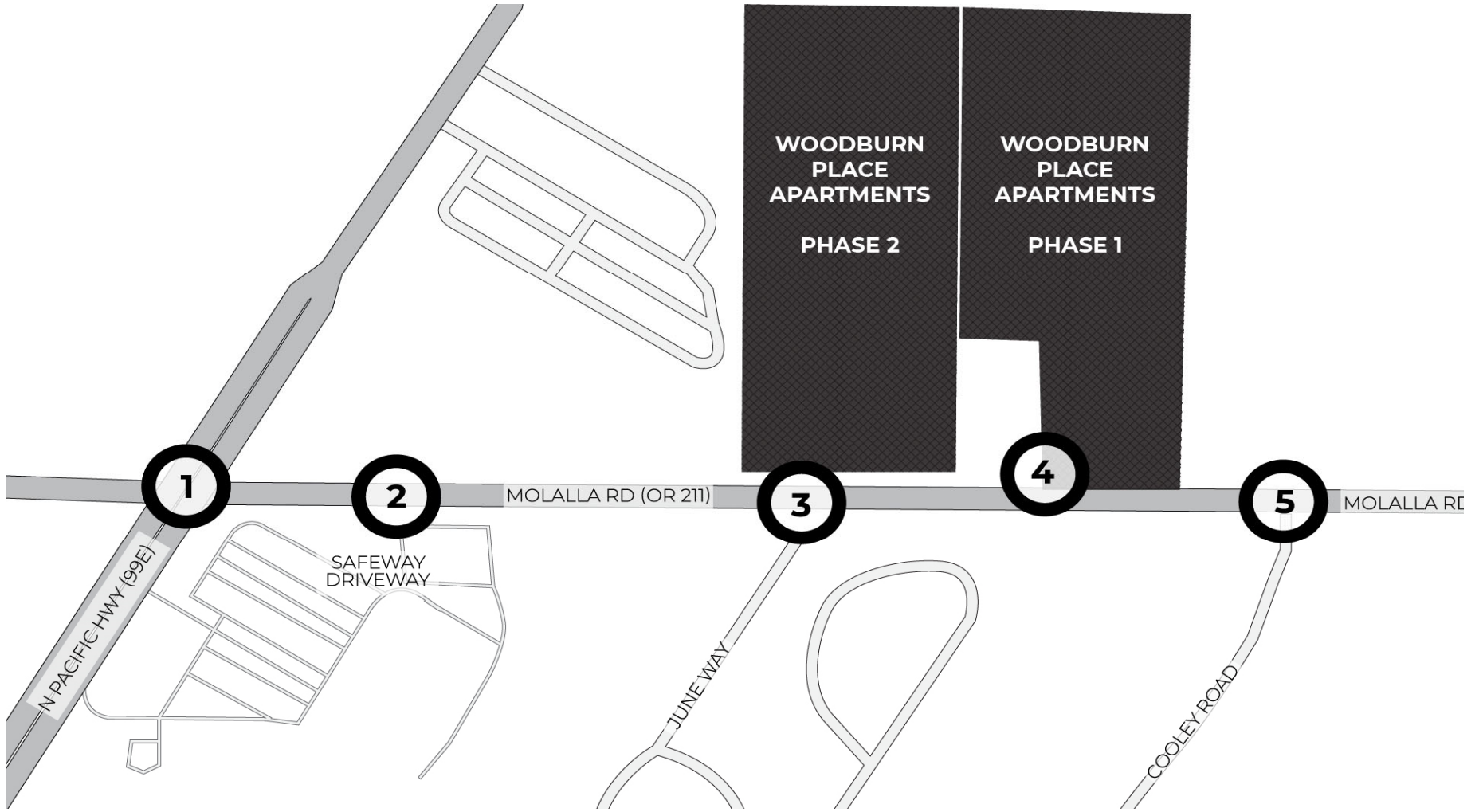
2 Molalla Rd / Safeway Driveway	
446	28
330	107 33
110	

3 Molalla Rd / June Way	
68 2 9	2 429 2
20 294 32	49 1 2

4 Molalla Rd / Phase 1 Apt Access	
51 7	2 382
18 286	

5 Molalla Rd / Cooley Rd	
15 1 0	1 349 41
3 262 19	20 2 51

Figure 9: 2024 Total Volumes PM Peak Hour



1 99E / Molalla Rd	
124	885 198
100	328
251	
172	289 534 171
419	
313	

2 Molalla Rd / Safeway Driveway	
528	555
275	48
	220 131

3 Molalla Rd / June Way	
34	7
1	451
4	4
53	36
559	2
58	7

4 Molalla Rd / Phase 1 Apt Access	
33	7
5	427
54	
511	

5 Molalla Rd / Cooley Rd	
3	0
2	406
1	129
5	25
443	0
70	60

Queuing Analysis

ODOT request queuing analysis be performed at study locations under their jurisdiction that exceed mobility standards. The analysis shows the intersection of N Pacific Hwy (99E)/ Molalla Rd (OR 211) exceeds mobility standards for the PM peak hour under 2022 existing, 2024 background, and 2024 total conditions. **Table 10** outlines queuing analysis results for the PM peak hour in the 2024 background and total conditions. All turn lane queuing can fit within available storage with the exception of the northbound left turn lane.

Table 11: Queuing Results - N Pacific Hwy (99E) at Molalla Rd (OR211)

Approach	Available Storage (ft)	PM Peak Hour	
		2024 Background	2024 Total
NBL	350	<i>375</i>	<i>375</i>
NBR	230	150	225
SBL	>1,000	400	400
EBL	900	425	450
EBR	900	250	300
WBL	300	250	275

Values are rounded up to the nearest increment of 25 feet.

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

Mitigations

Two intersections within the study area fail applicable mobility standards. Opportunities to address these capacity constraints are discussed in this section.

N Pacific Hwy (99E)/ Molalla Rd (OR 211)

The intersection of N Pacific Hwy (OR 99E)/ Molalla Rd (OR 211) is a long standing and well-known capacity constraint in the area. During the Woodburn Place Apartments Phase 1 land use process, this intersection also failed to meet mobility standards. At that time, a dedicated westbound right turn lane was suggested by the City as a viable option for improvement.

Addition of a dedicated westbound right turn lane would also provide value for the Woodburn Place Apartments Phase 2 development. When added to the study intersection, the V/C for the PM peak hour in the total traffic conditions reduces from 1.08 to 1.07, which is closer to background conditions but not below the background scenario V/C of 1.04. Another option considered is to add a second dedicated southbound left turn lane with a small receiving lane on Molalla Rd. When added the V/C for the PM Peak Hour in the total traffic conditions reduces to 1.03, which brings it back below the 2024 PM peak

hour background conditions levels. Combining both options reduces the V/C to a 1.02 for the PM peak hour total traffic conditions.

Table 12: N Pacific Hwy (99E)/ Molalla Rd (OR 211) Mitigation Options

Scenario	Operating Standard	P.M. Peak Hour
2024 Background	0.90 V/C	V/C 1.04
2024 Total		V/C 1.08
2024 Total with WBR		V/C 1.07*
2024 Total with SBL		V/C 1.03*
2024 Total with WBR + SBL		V/C 1.02*

* Intersection V/C ratios are calculated using the HCM 2000 methodology. HCM 6th Edition results are not available for all scenarios considered as mitigation options.

These options are larger scale fixes needed to mitigate not only the developer's contribution, but additional capacity deficiencies resulting from regional and local growth. In addition, they both require land acquisitions that exceed the applicants proportional share impact to the signal. The applicant's proportional share of each mitigation is calculated by using the site generated trips added to that movement/lane improvement and dividing by the total number of trips using the movement. For the westbound right turn lane, the developer proportional share is 10.0%. For the southbound left turn lane, the developer's share is 7.6%.

Key Findings

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

- The proposed development would generate 102 (23 in, 79 out) AM peak hour trips and 101 (62 in, 39 out) PM peak hour vehicle trips.
- The intersections of N Pacific Hwy (99E)/ Molalla Rd (OR 211) and Molalla Rd (OR 211)/ Starbucks Driveway fail mobility standards under 2022 existing, 2024 background and 2024 total (with proposed development) traffic conditions.
- The intersection of N Pacific Hwy (99E)/ Molalla Rd (OR 211) fails mobility standards under 2022 existing, 2024 background and 2024 total (with proposed development) traffic conditions. The developments impact to this can be mitigated by the addition of a southbound left turn lane (creating dual southbound left turn lanes) and a short receiving lane on Molalla Rd. The developers proportional share contribution to this improvement would be 7.6%.