

Date:	October 17, 2022
To:	Julie Warncke, City of Salem
From:	Joe Bessman, PE
Project Reference No.:	1774
Project Name:	Landaggard Drive NW TSP Amendment



The purpose of this memorandum is to provide formal documentation on the proposed shift in the Landaggard Drive NW *Collector* alignment from Orchard Heights to Doaks Ferry Road NW. This modification is being proposed as part of the Titan Hill LLC multifamily project that will construct this portion of the *Collector* to serve as the primary access to the proposed 427-unit multifamily development. Figure 1 illustrates the proposed TSP amendment.

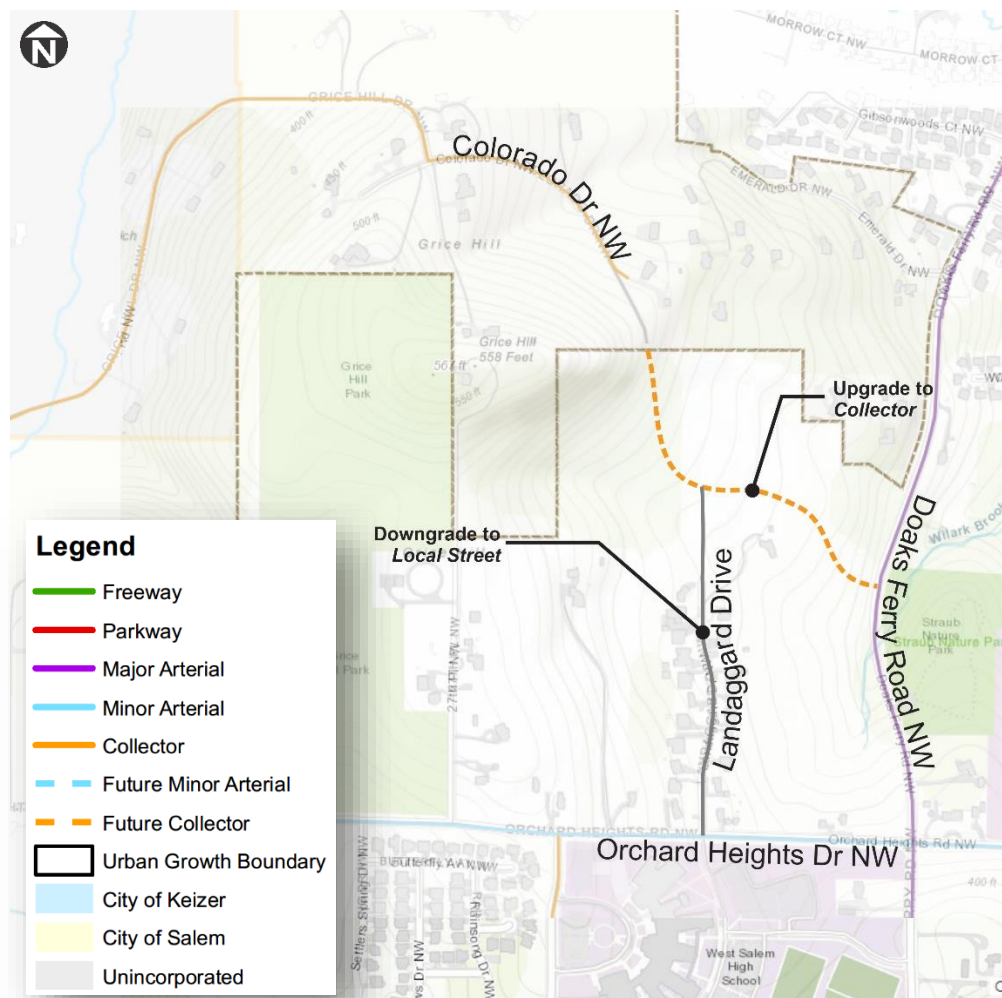


Figure 1. Proposed TSP Amendment. Map Source: Marion County GIS, 2022.

BACKGROUND

The City of Salem's 2013 Transportation System Plan includes a proposed alignment for Landaggard Drive NW that extends along Colorado Way NW and Grice Hill Drive NW, forming a looped connection with Orchard Heights Road NW, as shown in Figure 2. This alignment relies on portions of streets that were constructed with residential uses to the prior Marion County standard, lacking sidewalks, bicycle lanes, and the City's current structural pavement section for a Collector. Portions of the overall corridor extend beyond the City's adopted Urban Growth Boundary.

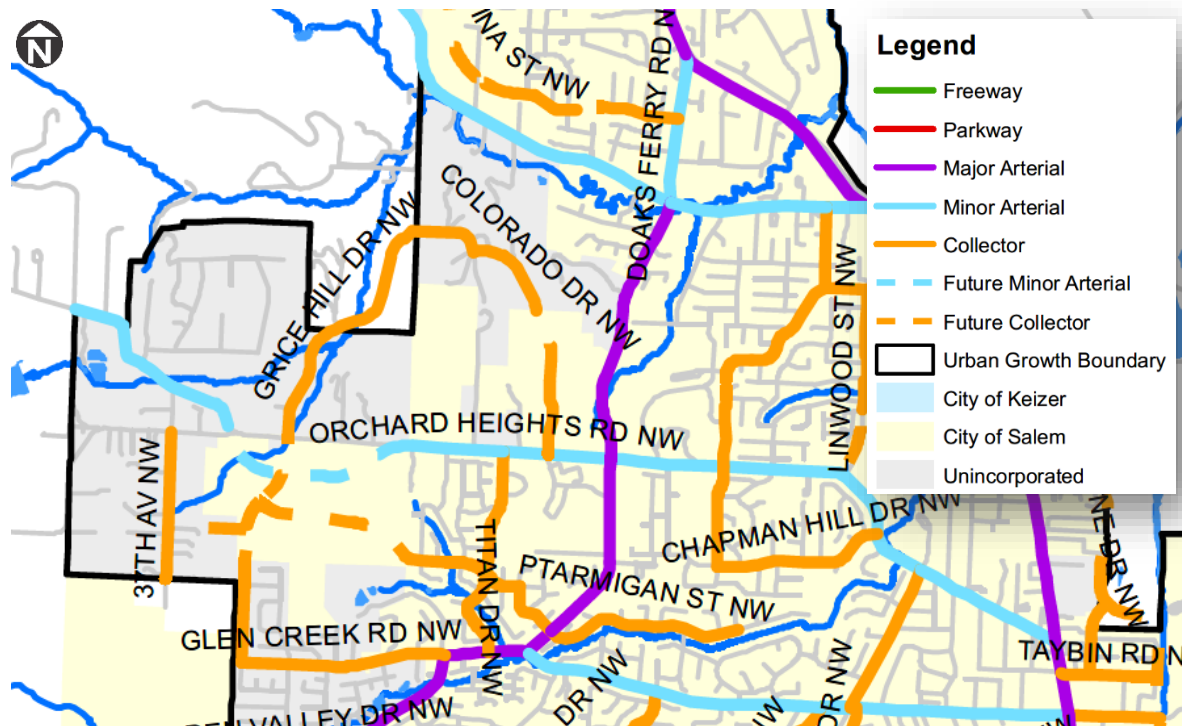


Figure 2. City of Salem Street System Element. Source: 2013 Transportation System Plan, Figure 3-11.

The proposed development of the Titan Hill, LLC multifamily project will provide the eastern connection of this Collector. As discussed within the prior zone change application, if the continuation of the Collector were extended south along the built segment of Landaggard Drive NW it would route the majority of the site-generated trips from the multifamily project through a more rural residential neighborhood, connecting with the Orchard Heights Road NW entrance to West Salem High School.

The subsequent Transportation Impact Analysis dated September 28, 2022 shows that this Collector connection to Orchard Heights Drive NW does not provide adequate capacity to support the school operations and the additional Titan Hill multifamily trips. Without the project the intersection operates at a Level of Service "E" and on the borderline of the Level of Service "F" standard in the morning, and with the project would operate with a failing level of service both in the morning and evening periods (see Table 1). In addition, the route serves as the most direct pedestrian connection from the apartments to the high school, and there are 49 pedestrian crossings during the peak afternoon hour occurring today.

Table 1. Summary of Year 2025 Traffic Operations with Landaggard Dr NW Collector Designation

(Source: September 28, 2022 Transportation Impact Analysis, Table 10)

Intersection	Performance Standard	Weekday AM Peak Hour				Weekday PM Peak Hour/ ODOT 30 th Highest Hour			
		LOS	Delay (sec)	v/c Ratio	95 th % Queue	LOS	Delay (sec)	v/c Ratio	95 th % Queue
Year 2025 No-Build Traffic Conditions									
2: Orchard Heights Rd/ Landaggard Dr	LOS E v/c ≤ 0.90	SB LOS E	SB 49.3	SB 0.21	SB: 25 ft WBL: 50 ft NBL: 25 ft NBR: 50 ft	SB LOS D	SB 31.9	SB 0.17	SB: 25 ft WBL: 25 ft NBL: 25 ft NBR: 50 ft
Year 2025 With Project Traffic Conditions									
2: Orchard Heights Rd/ Landaggard Dr	LOS E v/c ≤ 0.90	SB LOS F NB LOS E	SB >100 NB 42.7	SB 0.21 NB 0.15	SB: 150 ft WBL: 50 ft NBL: 25 ft NBR: 50 ft	SB LOS F NB LOS D	SB 54.2 NB 29.8	SB 0.51 NB 0.25	SB: 75 ft WBL: 25 ft NBL: 25 ft NBR: 50 ft

The recommendations in the Transportation Impact Analysis and supported in the staff report include construction of a new pedestrian refuge median in place of the existing eastbound left-turn lane to support and enhance access to the high school. This school crossing will include signing, a marked pedestrian crossing on the western approach, new accessible ramps, and overhead illumination to enhance its visibility. As the intersection is located along a sloped portion of Orchard Heights Drive NW, this median will allow pedestrians to cross a narrowed roadway section with more reaction time and better visibility provided to eastbound drivers approaching the school crossing on the downgrade.

These pedestrian crossing modifications and the current streetscape of Landaggard Drive NW do not support the increased mobility classification identified within the Transportation System Plan. Extension of the Collector alignment to Doaks Ferry Road NW (*Major Arterial*) in lieu of Orchard Heights Drive NW (*Minor Arterial*) allows the connection to occur at a “T” intersection that can better support the identified mobility function.

TRANSPORTATION SYSTEM PLAN IMPLICATIONS

The City’s Transportation System Plan identifies the connection into Landaggard Drive NW and West Salem High School’s Orchard Heights Drive entrance. While discussion of this specific alignment is not provided within the adopted Transportation System Plan, the intent appears to be connecting the urbanizable lands on the northwest quadrant of Orchard Heights Drive NW and Doaks Ferry Road NW with an access route containing two connections to the public street system. The proposed realignment of the eastern connection onto Doaks Ferry Road NW provides a better connection for the following reasons:

- Traffic on area roads increases toward the urban area located to the east. Connection to Doaks Ferry Road NW allows the highest-volume portion of this route to be constructed to the City’s *Collector* standard with bicycle lanes and sidewalks, rather than rely on a segment of Landaggard Drive NW that was built to a rural standard.
- Connectivity to West Salem High School’s entrance will be preserved. The network of streets will continue to provide the Landaggard Drive NW connection but will retain this route as a *Local Street*.

- The proposed pedestrian crossing will partially restrict movements at the Orchard Heights Drive NW/Landaggard Drive NW intersection (see Figure 3), eliminating the eastbound left-turn lane (or requiring that vehicles turn from the through lane pending the final design requirements). This will help to reduce cut-through volumes through the existing neighborhood.

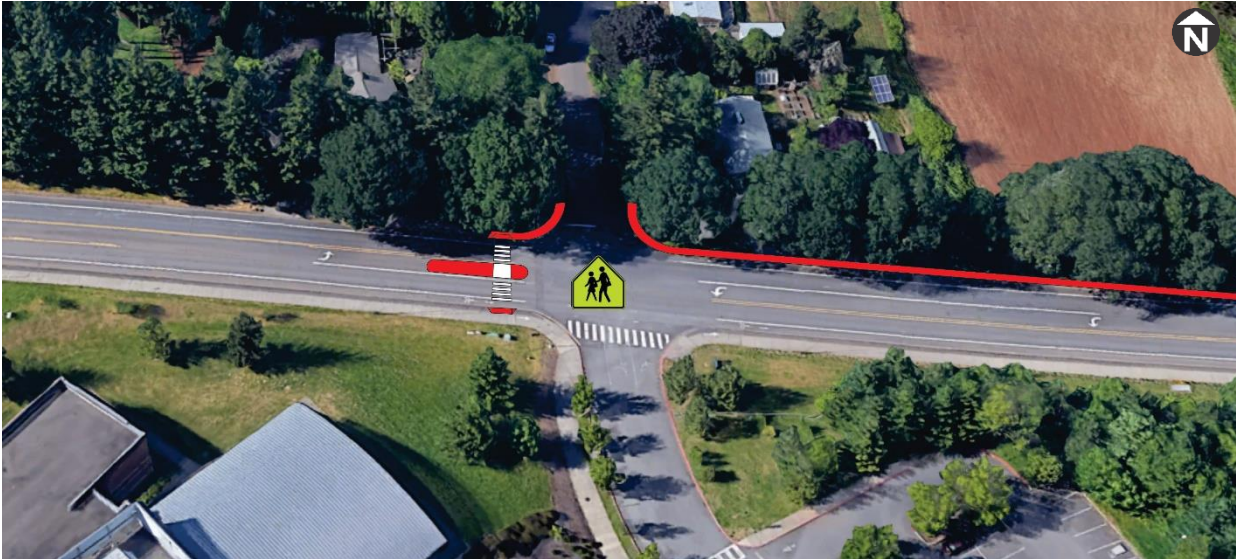


Figure 3. Conceptual school crossing layout. Aerial source: Google Earth, 2022.

- Area travel distances will be roughly equivalent. The route to the signalized Doaks Ferry Road NW/Orchard Heights Dr NW intersection will be nearly identical (see Figure 4). Traffic heading toward the traffic signal will benefit with the Doaks Ferry Road NW connection occurring as a right-turn, instead of the left-turn onto Orchard Heights Drive along a downhill segment at a school entrance.

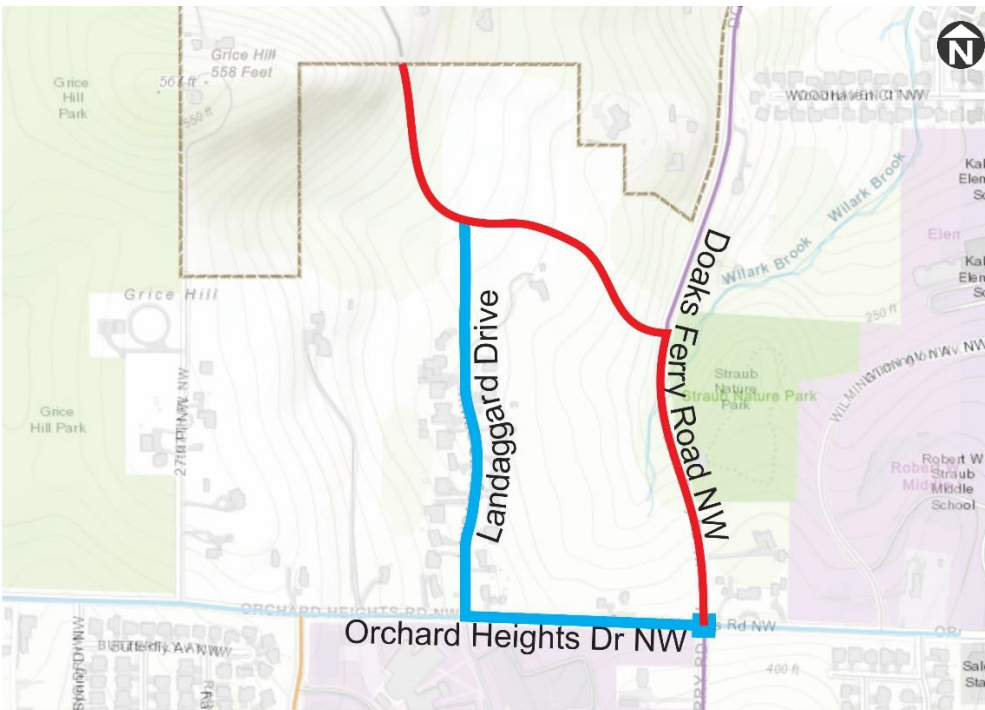


Figure 4. Comparative travel distance toward the City Center.

With the shift in the Collector alignment east to Doaks Ferry Road NW, it is recommended that traffic control provide priority to the through route, to further discouraging use of Landaggard Drive NW. Given the steep topography, if a direct alignment of the route is not possible through the Titan Hill site it is recommended that the intersection with Landaggard Drive NW and the new collector be designated as an all-way stop, with the new Collector pavement section designed to its wider standard to encourage use of Landaggard Drive NW for throughput.

Overall, there are no disadvantages of the realigned Collector that were identified in terms of safety, operations, or land use compatibility. Consistent with staff comments at the rezone hearing for the Titan Hill multifamily site, the realignment of the Collector east to Doaks Ferry Road NW provides a more logical extension of the Collector alignment, particularly given the built area constraints and compatibility along the current section of Landaggard Drive NW.

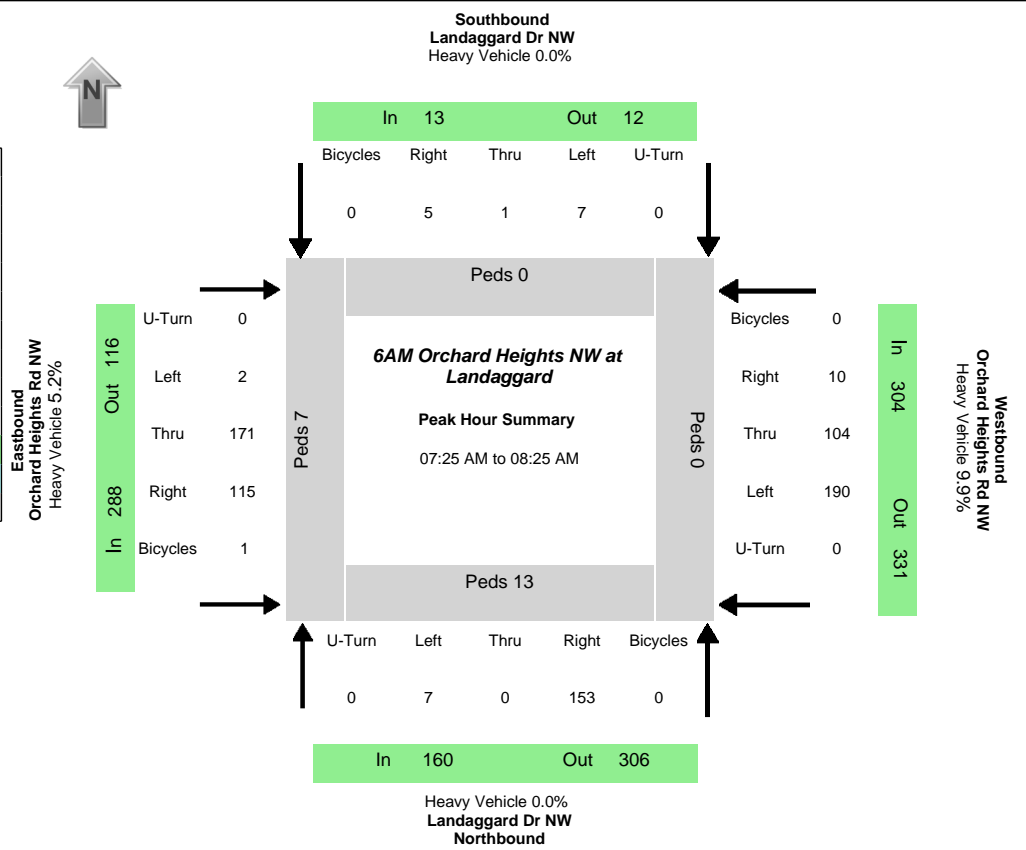
RECOMMENDATIONS

As outlined herein, it is recommended that the City of Salem Transportation System Plan be amended as shown in Figure 1, with Landaggard Drive NW downgraded to a *local street* and the easterly extension to Doaks Ferry Road NW reclassified to a *Collector*. This provides a design that can better support the proposed Titan Hill multifamily site, improves school crossing and access safety to West Salem High School, and allows the Collector connection to operate within acceptable City performance standards long-term. Thank you for the opportunity to provide these materials, I can be reached at (503) 997-4473 or via email at joe@transightconsulting.com.

Attachments:

- Orchard Heights Rd NW/Landaggard Drive NW Traffic Count, Weekday AM Peak Hour
- Orchard Heights Rd NW/Landaggard Drive NW Traffic Count, Weekday PM Peak Hour

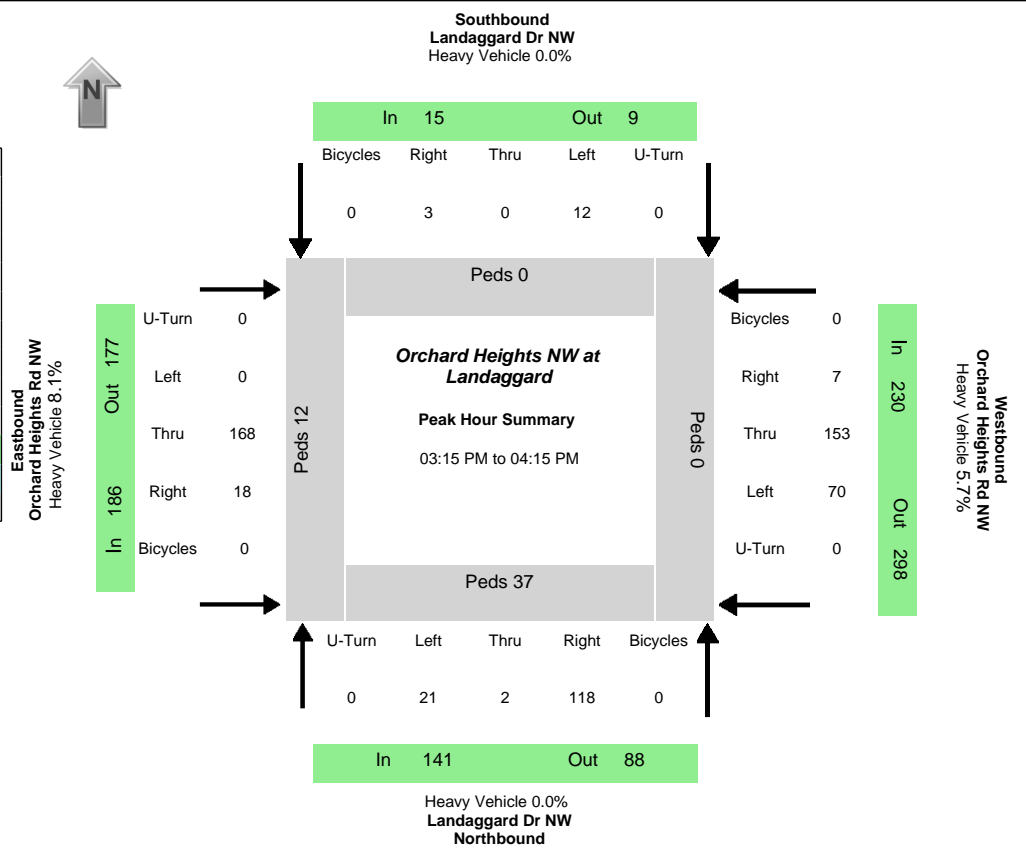
Data Provided by K-D-N.com 503-594-4224	
N/S street	Landaggard Dr NW
E/W street	Orchard Heights Rd NW
City, State	Salem OR
Site Notes	
Location	44.96044 - -123.083449
Start Date	Tuesday, September 13, 2022
Start Time	06:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:25:00 AM
Peak 15 Min Start	08:00:00 AM
PHF (15-Min Int)	0.66



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
7	0	153	0	7	1	5	0	2	171	115	0	190	104	10	0	160	13	288	304	306	12	116	331
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.8%	0.0%	0.0%	10.5%	0.0%	100.0%	0.0%	0.0%	0.0%	5.2%	9.9%	6.5%	83.3%	0.0%	4.5%
PHV- Bicycles																PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				Sum	in Crosswalk				Sum		
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		NB	SB	EB	WB			
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	13	0	7	0	20		
All Vehicle Volumes																							
Time	Northbound Landaggard Dr NW				Southbound Landaggard Dr NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min Sum	1 HR Sum					
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn							
06:00:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0							
06:05:00 AM	0	0	0	0	1	0	0	0	0	4	0	0	0	5	0	0							
06:10:00 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	7	0	0	26						
06:15:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	24						
06:20:00 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	0	23						
06:25:00 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	8	0	0	25						
06:30:00 AM	1	0	0	0	1	0	0	0	0	7	0	0	0	5	1	0	38						
06:35:00 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0	0	36						
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06:45:00 AM	0	0	0	0	1	0	0	0	0	7	0	0	0	6	0	0	38						
06:50:00 AM	0	0	1	0	1	0	0	0	0	3	0	0	1	6	0	0	43						
06:55:00 AM	0	0	0	0	1	0	0	0	0	8	0	0	0	6	1	0	42	132					
07:00:00 AM	0	0	0	0	0	0	0	0	0	16	1	0	0	3	1	0	49	149					
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07:10:00 AM	1	0	0	0	2	0	0	0	0	11	1	0	2	3	1	0	61	167					
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07:40:00 AM	0	0	5	0	0	0	0	0	0	12	1	0	6	16	2	0	118	303					
07:45:00 AM	0	0	6	0	0	0	0	0	0	11	4	0	20	8	0	0	119	338					
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07:55:00 AM	1	0	13	0	0	1	0	0	0	9	19	0	25	7	0	0	172	433					

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08:15:00 AM	2	0	27	0	2	0	0	0	0	15	10	0	21	12	2	0	281	734
08:20:00 AM	1	0	11	0	0	0	0	0	0	17	8	0	19	6	0	0	251	765
08:25:00 AM	0	0	3	0	0	0	0	0	0	14	3	0	5	3	0	0	181	759
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08:40:00 AM	0	0	1	0	1	0	0	0	0	17	0	0	1	13	0	0	81	722
08:45:00 AM	0	0	2	0	2	0	0	0	0	13	1	0	1	11	0	0	78	703
08:50:00 AM	0	0	0	0	2	0	0	0	0	11	1	0	1	13	0	0	91	683
08:55:00 AM	0	0	0	0	0	0	0	0	0	9	0	0	2	8	2	0	79	629

Data Provided by K-D-N.com 503-594-4224	
N/S street	Landaggard Dr NW
E/W street	Orchard Heights Rd NW
City, State	Salem OR
Site Notes	
Location	44.96044 - -123.083449
Start Date	Tuesday, September 13, 2022
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:15:00 PM
Peak 15 Min Start	03:20:00 PM
PHF (15-Min Int)	0.58



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
21	2	118	0	12	0	3	0	0	168	18	0	70	153	7	0	141	15	186	230	88	9	177	298
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.9%	0.0%	0.0%	2.9%	7.2%	0.0%	0.0%	0.0%	0.0%	8.1%	5.7%	2.3%	0.0%	6.2%	5.0%
PHV - Bicycles																PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				Sum	in Crosswalk				Sum		
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		NB	SB	EB	WB			
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	12	0	49		
All Vehicle Volumes																							
Time	Northbound Landaggard Dr NW				Southbound Landaggard Dr NW				Eastbound Orchard Heights Rd NW				Westbound Orchard Heights Rd NW				15 Min Sum	1 HR Sum					
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn							
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02:05:00 PM	1	0	0	0	1	0	0	0	0	4	0	0	1	6	0	0							
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04:20:00 PM	0	0	5	0	0	0	0	0	0	0	9	0	0	2	7	0	0	100	504
04:25:00 PM	1	0	0	0	1	0	0	0	0	0	7	2	0	1	8	1	0	80	449
04:30:00 PM	1	0	0	0	0	0	0	0	0	0	6	2	0	5	12	1	0	71	384
04:35:00 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	3	12	0	0	66	347
04:40:00 PM	1	0	2	0	0	0	1	0	0	0	8	1	0	1	9	0	0	68	339
04:45:00 PM	0	0	1	0	0	0	0	0	0	1	9	0	0	4	9	1	0	66	331
04:50:00 PM	0	0	0	0	1	0	0	0	0	0	10	1	0	4	9	1	0	74	333
04:55:00 PM	1	0	4	0	1	0	0	0	0	0	6	2	0	2	8	1	0	76	328
05:00:00 PM	0	0	0	0	0	0	0	0	0	0	9	2	0	5	6	2	0	75	322
05:05:00 PM	0	1	1	0	0	1	0	0	0	0	10	1	0	6	14	3	0	86	326
05:10:00 PM	3	0	1	0	1	0	0	0	0	0	15	3	0	1	6	0	0	91	315
05:15:00 PM	0	0	1	0	1	0	0	0	0	0	8	2	0	1	11	0	0	91	303
05:20:00 PM	2	0	0	0	1	0	0	0	0	0	8	0	0	1	14	1	0	81	307
05:25:00 PM	1	0	1	0	0	0	0	0	0	0	5	1	0	1	15	1	0	76	311
05:30:00 PM	0	0	1	0	1	0	0	0	0	0	4	1	0	3	13	1	0	76	308
05:35:00 PM	1	0	1	0	0	0	0	0	0	0	6	0	0	0	15	2	0	74	315
05:40:00 PM	1	0	1	0	1	0	0	0	0	1	6	0	0	2	9	0	0	70	313
05:45:00 PM	0	0	0	0	0	0	0	0	0	0	5	1	0	1	7	0	0	60	302
05:50:00 PM	1	0	0	0	0	0	0	0	0	0	9	0	0	1	8	0	0	54	295
05:55:00 PM	0	0	0	0	0	0	0	0	0	0	10	1	0	0	8	0	0	52	289