

MEMORANDUM

Date:	January 30, 2024	TG:	1.24001.00
To:	Marc Hayes – City of Arlington		
From:	Mike Swenson, PE, PTOE & Lily Hall – Transpo Group		
cc:	Trish Sherman – Dykeman Architects		
Subject:	Snohomish County Arlington Ops Center – Transportation Analysis		

This memorandum summarizes the transportation analysis completed for the proposed modernization of the existing Snohomish County Arlington Operations Center located at 19620 67th Avenue in Arlington. This memorandum includes a description of the proposed project, existing transportation network, planned improvements, collision history and existing traffic operations in the vicinity of the project site. As noted below, no increase in trip generation or change in access to the site is proposed with this initial phase.

Project Description

The Snohomish County Arlington Operations Center (AOC) Redevelopment Project will consolidate and modernize the county’s road, bridge, and fleet operations facility. Located at 19620 67th Ave NE in Arlington, the site encompasses 17.5 acres and has been operational since the early 1970s. The initial development phase, which is the focus of this analysis, includes constructing a new administration building, improving stormwater management, and creating a master plan for future site enhancements. No changes in staffing or activities on site are planned under this initial redevelopment phase resulting in no changes to the traffic volumes generated by the project site. Access to the site is currently located on 67th Avenue NE, south of 197th Street NE. No change in the access location or design is proposed with this initial phase of work.

Existing Transportation Network

The primary roadways, non-motorized facilities and transit facilities within the study area and their characteristics near the project site are described below.

67th Avenue NE is functionally classified by the City of Arlington as a minor arterial with a speed limit of 35 mph in the vicinity of the project site. 67th Avenue NE is a three-lane facility including a center two-way left-turn lane. Sidewalks are present along both sides of the roadway in the vicinity of the project site although no dedicated bicycle facilities are present in the vicinity of the project site.

197th Street NE is a two-lane roadway with a speed limit of 35 mph in the vicinity of the project site, classified as a local road by the City of Arlington. A sidewalk is present along the south side of 197th Street NE from 67th Avenue NE approximately 750 feet west. Where sidewalks are not provided, wide gravel shoulders are present although no dedicated bicycle facilities are provided in the vicinity of the project site.

Transit Service

Transit service in the vicinity of the project site is provided by Community Transit. The nearest transit stop to the project site is located approximately 0.4 miles to the north at the intersection of 67th Avenue NE and 204th Street NE and is served by Route 220 and Route 230. Community Transit’s Route 220 provides service between northeast Arlington and Smokey Point 7 days per week with approximately 10 roundtrips per day between 5:50 am and 2:15 pm on weekdays. Route 230 provides service between Darrington and Smokey Point on weekdays with two round trips per day, one during the AM peak hour and one during the PM peak hour.

Planned Improvements

Based on a review of the City of Arlington’s Six Year (2025-2030) Transportation Improvement Program (TIP) and Snohomish County’s 2025-2030 Six Year Transportation Improvement Program (TIP), no projects were identified that will affect the roadways, intersections or non-motorized facilities in the vicinity of the project site.

Existing Traffic Volumes

Existing weekday AM (7 to 9 a.m.) and PM (4 to 6 p.m.) peak period traffic counts were collected at the intersection of 67th Avenue NE/197th Street NE adjacent to the project site as well as the primary site access driveway along 67th Avenue NE in January 2025. Volumes are rounded to the nearest 5 vehicles to account for the daily fluctuations in traffic volumes. Attachment B illustrates the existing weekday peak hour traffic volumes at the study intersections as well as detailed traffic counts.

Traffic Operations

The existing traffic operations were evaluated at both the off-site study intersection and site access driveway. No future traffic operations were evaluated as no changes are proposed in the amount of traffic associated with the project site.

The operational characteristics of an intersection are determined by calculating the intersection level of service (LOS). At unsignalized intersections, LOS is measured in average delay per vehicle and is typically reported as the worst vehicle movement delay at any given intersection. Traffic operations and average vehicle delay for an intersection can be described qualitatively with a range of levels of service (LOS A through LOS F), with LOS A indicating free-flowing traffic and LOS F indicating extreme congestion and long vehicle delays. Attachment C contains a detailed explanation of LOS criteria and definitions.

Weekday peak hour traffic operations for existing conditions were evaluated at the study intersections based on the procedures identified in the *Highway Capacity Manual* (HCM 7th ed.) and using *Synchro 12*. *Synchro 12* is a software program that uses HCM methodology to evaluate intersection LOS and average vehicle delays.

Results for the existing and future without-project operations analyses are summarized in Table 1. Detailed LOS worksheets for the existing and future without-project analysis are included in Attachment D.

Table 1. Existing Weekday Peak Hour Intersection Operations

Intersection	Weekday AM Peak Hour			Weekday PM Peak Hour		
	LOS ¹	Delay ²	WM ³	LOS	Delay	WM
1. 67th Ave NE/197th St NE	C	21.1	EB	F	62.9	EB
2. 67th Ave NE/Site Driveway	B	13.2	EB	B	13.2	EB

1. Level of Service (A – F) as defined by the 7th Edition *Highway Capacity Manual* (HCM), Transportation Research Board.
2. Average delay per vehicle in seconds.
3. Worst movement reported for unsignalized intersections where EB = eastbound.

Table 1 shows that under existing conditions, both the off-site study intersection and the existing site driveway along 67th Avenue NE operate acceptably at LOS C or better during the weekday AM peak hour. During the existing weekday PM peak hour, the site driveway operates within standard at LOS B although the off-site intersection of 67th Avenue NE/197th Street NE operates below the City of Arlington’s established LOS D standard, operating at LOS F with approximately 63 seconds of delay. As noted above, no change in site traffic volumes are anticipated as part of this initial

phase of the project. As such, the existing operations at the 67th Avenue NE/197th Street NE would not be impacted by the proposed modernization project.

Traffic Safety

The five most recent years of collision records (January 1, 2019, to December 31, 2023) provided by the Washington State Department of Transportation (WSDOT) were reviewed within the study area to identify existing traffic safety issues in the vicinity of the project site. A summary of the total and average annual number of reported collisions at the off-site study intersection and along the site frontage on 67th Avenue NE are provided in Table 2.

Table 2. Study Intersection Collision Data Summary (2019 – 2023)

	Number of Reported Collisions					Total	Annual Average
	2019	2020	2021	2022	2023		
67th Ave NE/197th St NE	0	1	1	1	1	4	0.80
67th Ave NE along the Site Frontage	0	0	0	1	0	1	0.20

Source: WSDOT 2025.

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

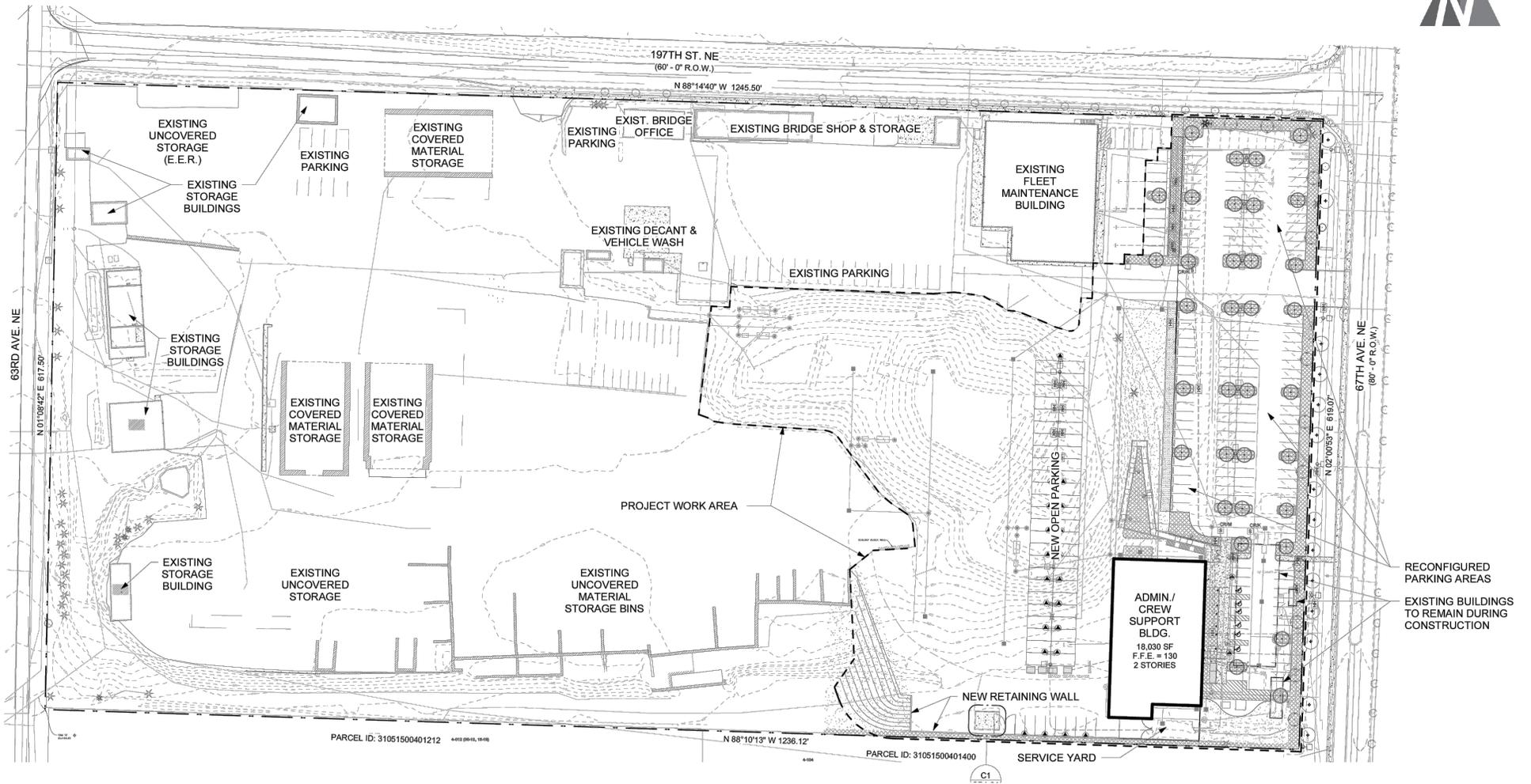
As shown in Table 2, the off-site study intersection of 67th Avenue NE/197th Street NE experienced 4 reported collisions over the last five-year period primarily resulting in property damage only and one possible injury. The collisions were caused primarily by left turning vehicles at the intersection of 67th Avenue NE/197th Street NE followed by one rear-end collision. One collision was reported along the site frontage on 67th Avenue NE approximately 225 feet south of the existing site driveway when a vehicle collided with a tree in the dark, resulting in property damage only. There were no collisions involving pedestrians or bicyclists and no fatalities reported in the last five-year period. Based on the review of existing collisions in the study area, no patterns or safety concerns were identified related to the existing access point or existing traffic generated by the AOC facility.

Conclusion

The Snohomish County Arlington Operations Center (AOC) redevelopment project aims to consolidate and modernize the county's road, bridge, and fleet operations facility located at 19620 67th Ave NE in Arlington. No changes in staffing or activities on site are planned during the initial redevelopment phase resulting in no changes to the traffic volumes generated by the project site. A review of the existing traffic safety and operations in the vicinity of the project site shown no patterns of safety or operational concerns with the exception of the operations at the intersection of 67th Avenue NE/197th Street NE during the weekday PM peak hour as it currently operates at LOS F with approximately 63 seconds of delay, failing to meet the City of Arlington's established standards.

Attachment A: Preliminary Site Plan





Preliminary Site Plan

Snohomish County Arlington Ops Center

ATTACHMENT

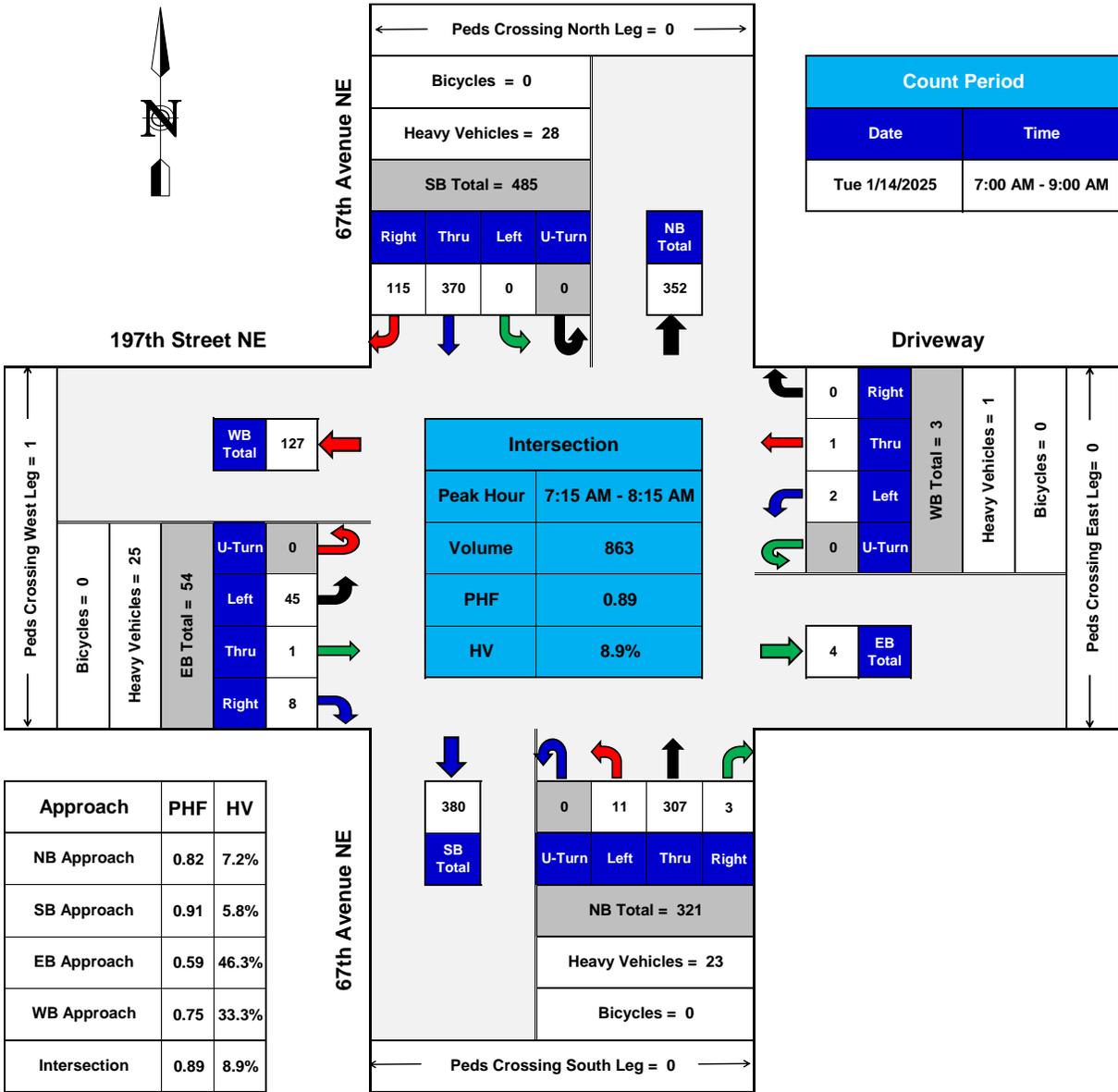
A



Attachment B: Traffic Counts and Existing Traffic Volumes



67th Avenue NE @ 197th Street NE
Arlington, WA



Approach	PHF	HV
NB Approach	0.82	7.2%
SB Approach	0.91	5.8%
EB Approach	0.59	46.3%
WB Approach	0.75	33.3%
Intersection	0.89	8.9%

PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY





INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: 67th Avenue NE @ 197th Street NE
Arlington, WA

DATE OF COUNT: Tue. 1/14/2025

COUNTED BY: TDG

START OF COUNT: 7:00 AM

DATE OF REDUCTION: 1/16/2025

TIME OF COUNT: 7:00 AM - 9:00 AM

DURATION OF COUNT (Hrs): 2

TIME INTERVAL ENDING AT	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound) Driveway							FROM WEST ON (Eastbound) 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
07:15 AM	0	0	7	0	1	72	32	0	0	3	0	6	52	1	0	0	0	0	2	0	0	0	0	5	0	8	1	1	176
07:30 AM	0	0	6	0	0	91	27	0	0	3	0	2	70	0	0	0	0	0	1	0	0	1	0	3	0	10	1	1	203
07:45 AM	0	0	8	0	0	93	36	0	0	5	0	3	89	1	0	0	0	0	0	0	0	0	3	0	8	0	1	231	
08:00 AM	0	0	5	0	0	109	24	0	0	8	0	3	95	0	0	0	0	0	1	0	0	0	0	5	0	9	0	1	242
08:15 AM	0	0	9	0	0	77	28	0	0	7	0	3	53	2	0	0	1	0	0	1	0	0	0	14	0	18	0	5	187
08:30 AM	0	0	7	0	0	62	11	0	0	7	0	4	50	1	0	0	0	0	0	0	0	0	0	5	0	10	0	1	139
08:45 AM	0	0	12	0	2	85	26	0	0	4	0	4	78	0	0	0	0	0	1	1	2	0	0	6	0	14	0	1	214
09:00 AM	0	0	4	0	0	86	17	0	0	8	0	0	81	1	0	0	0	0	0	0	0	0	2	0	16	0	1	202	
PEAK HOUR TOTALS	0	0	28	0	0	370	115	0	0	23	0	11	307	3	0	0	1	0	2	1	0	1	0	25	0	45	1	8	INTERSECTION
ALL MOVEMENTS	485							321							3							54							863
% HV	5.8%							7.2%							33.3%							46.3%							8.9%
PEAK HOUR FACTOR	0.91							0.82							0.75							0.59							0.89

HV = Heavy Vehicle

PHF = Peak Hour Factor

7:00 AM - 9:00 AM PEAK HOUR:

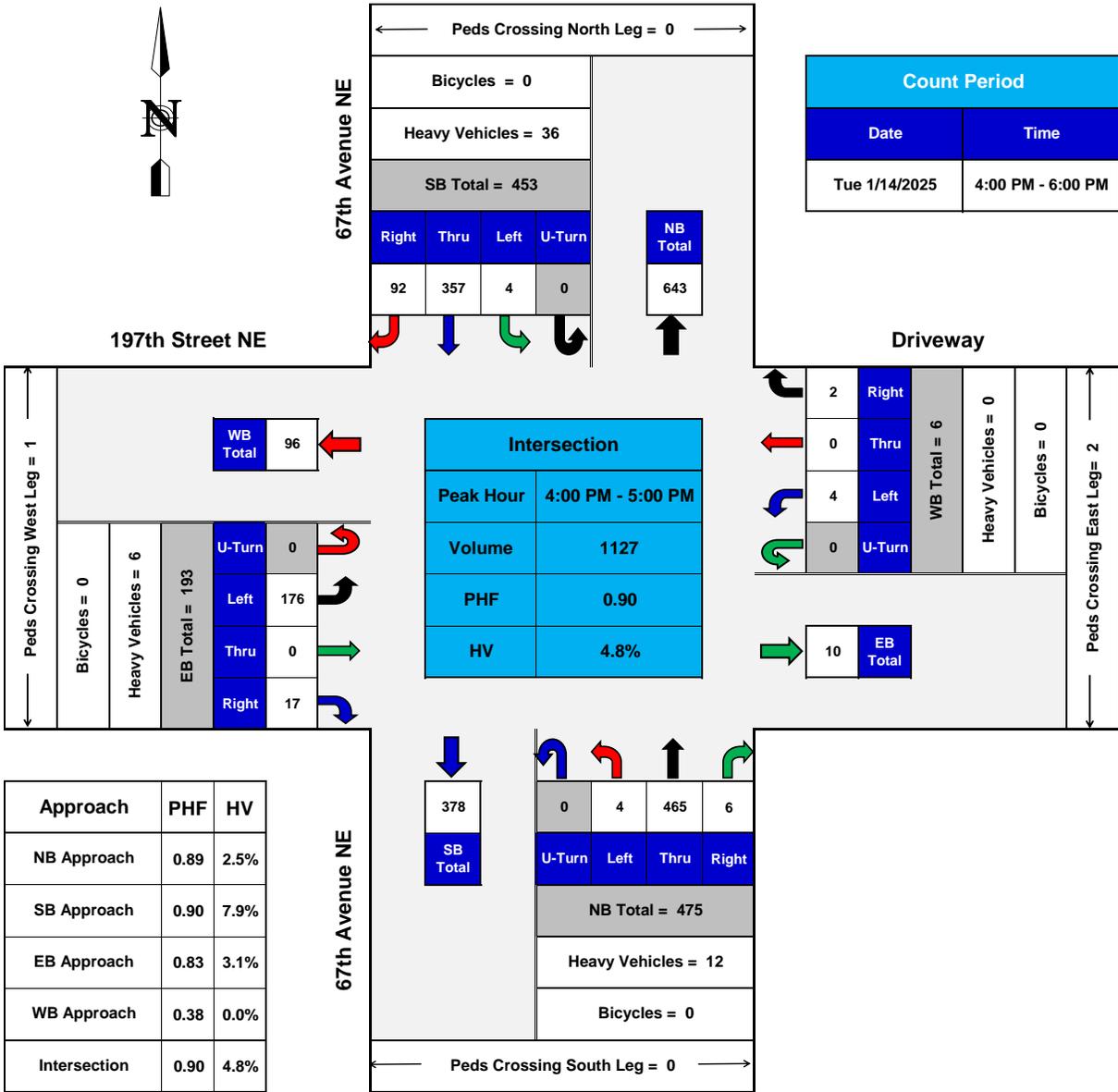
7:15 AM - 8:15 AM

ROLLING HOUR COUNT

TIME INTERVAL	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound) Driveway							FROM WEST ON (Eastbound) 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
7:00 AM - 8:00 AM	0	0	26	0	1	365	119	0	0	19	0	14	306	2	0	0	0	0	4	0	0	1	0	16	0	35	2	4	852
7:15 AM - 8:15 AM	0	0	28	0	0	370	115	0	0	23	0	11	307	3	0	0	1	0	2	1	0	1	0	25	0	45	1	8	863
7:30 AM - 8:30 AM	0	0	29	0	0	341	99	0	0	27	0	13	287	4	0	0	1	0	1	1	0	0	0	27	0	45	0	8	799
7:45 AM - 8:45 AM	0	0	33	0	2	333	89	0	0	26	0	14	276	3	0	0	1	0	2	2	2	0	0	30	0	51	0	8	782
8:00 AM - 9:00 AM	0	0	32	0	2	310	82	0	0	26	0	11	262	4	0	0	1	0	1	2	2	0	0	27	0	58	0	8	742
7:00 AM - 9:00 AM Total:	0	0	58	0	3	675	201	0	0	45	0	25	568	6	0	0	1	0	5	2	2	1	0	43	0	93	2	12	1594

67th Avenue NE @ 197th Street NE

Arlington, WA



PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY





INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: 67th Avenue NE @ 197th Street NE
Arlington, WA

DATE OF COUNT: Tue. 1/14/2025

COUNTED BY: TDG

START OF COUNT: 4:00 PM

DATE OF REDUCTION: 1/16/2025

TIME OF COUNT: 4:00 PM - 6:00 PM

DURATION OF COUNT (Hrs): 2

TIME INTERVAL ENDING AT	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound) Driveway							FROM WEST ON (Eastbound) 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
04:15 PM	0	0	6	0	0	86	18	0	0	4	0	2	131	1	1	0	0	0	0	0	0	1	0	2	0	54	0	4	296
04:30 PM	0	0	8	0	1	84	12	0	0	1	0	0	114	1	0	0	0	0	3	0	1	0	0	3	0	35	0	6	257
04:45 PM	0	0	8	0	0	102	24	0	0	5	0	2	126	1	0	0	0	0	1	0	0	0	0	1	0	51	0	5	312
05:00 PM	0	0	14	0	3	85	38	0	0	2	0	0	94	3	1	0	0	0	0	0	1	0	0	0	0	36	0	2	262
05:15 PM	0	0	6	0	2	91	13	0	0	2	0	0	112	6	1	0	0	0	0	0	5	0	0	0	0	36	0	3	268
05:30 PM	0	0	2	0	1	76	9	0	0	4	0	0	95	2	0	0	1	0	3	0	0	0	0	0	0	27	0	6	219
05:45 PM	0	0	2	0	1	58	10	0	0	0	0	1	74	0	0	0	0	0	1	0	3	0	0	0	0	13	0	4	165
06:00 PM	0	0	0	0	2	71	18	0	0	0	0	0	76	0	0	0	1	0	1	0	0	0	0	0	0	6	0	1	175
PEAK HOUR TOTALS	0	0	36	0	4	357	92	0	0	12	0	4	465	6	2	0	0	0	4	0	2	1	0	6	0	176	0	17	INTERSECTION
ALL MOVEMENTS	453							475							6							193							1127
% HV	7.9%							2.5%							0.0%							3.1%							4.8%
PEAK HOUR FACTOR	0.90							0.89							0.38							0.83							0.90

HV = Heavy Vehicle

PHF = Peak Hour Factor

4:00 PM - 6:00 PM PEAK HOUR:

4:00 PM - 5:00 PM

ROLLING HOUR COUNT

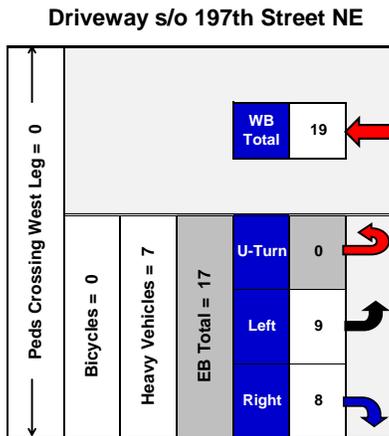
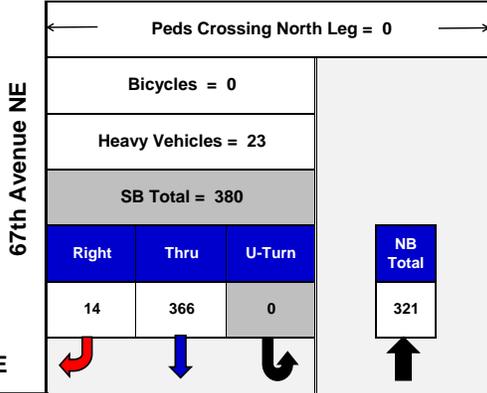
TIME INTERVAL	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound) Driveway							FROM WEST ON (Eastbound) 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
4:00 PM - 5:00 PM	0	0	36	0	4	357	92	0	0	12	0	4	465	6	2	0	0	0	4	0	2	1	0	6	0	176	0	17	1127
4:15 PM - 5:15 PM	0	0	36	0	6	362	87	0	0	10	0	2	446	11	2	0	0	0	4	0	7	0	0	4	0	158	0	16	1099
4:30 PM - 5:30 PM	0	0	30	0	6	354	84	0	0	13	0	2	427	12	2	0	1	0	4	0	6	0	0	1	0	150	0	16	1061
4:45 PM - 5:45 PM	0	0	24	0	7	310	70	0	0	8	0	1	375	11	2	0	1	0	4	0	9	0	0	0	0	112	0	15	914
5:00 PM - 6:00 PM	0	0	10	0	6	296	50	0	0	6	0	1	357	8	1	0	2	0	5	0	8	0	0	0	0	82	0	14	827
4:00 PM - 6:00 PM Total:	0	0	46	0	10	653	142	0	0	18	0	5	822	14	3	0	2	0	9	0	10	1	0	6	0	258	0	31	1954

67th Avenue NE @ Driveway s/o 197th Street NE

Arlington, WA

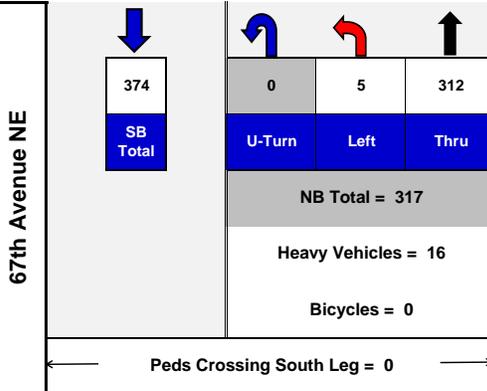


Count Period	
Date	Time
Tue 1/14/2025	7:00 AM - 9:00 AM



Intersection	
Peak Hour	7:15 AM - 8:15 AM
Volume	714
PHF	0.85
HV	6.4%

Approach	PHF	HV
NB Approach	0.85	5.0%
SB Approach	0.86	6.1%
EB Approach	0.61	41.2%
Intersection	0.85	6.4%



PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY





INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: 67th Avenue NE @ Driveway s/o 197th Street NE
Arlington, WA

DATE OF COUNT: Tue. 1/14/2025
 START OF COUNT: 7:00 AM
 TIME OF COUNT: 7:00 AM - 9:00 AM

COUNTED BY: TDG
 DATE OF REDUCTION: 1/16/2025
 DURATION OF COUNT (Hrs): 2

TIME INTERVAL ENDING AT	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound)							FROM WEST ON (Eastbound) Driveway s/o 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
07:15 AM	0	0	5	0	0	60	15	0	0	3	0	2	57	0	0	0	0	0	0	0	0	0	0	0	0	1	135		
07:30 AM	0	0	2	0	0	84	9	0	0	4	0	5	72	0	0	0	0	0	0	0	0	0	0	0	0	0	170		
07:45 AM	0	0	9	0	0	91	3	0	0	5	0	0	92	0	0	0	0	0	0	0	0	0	1	0	2	189			
08:00 AM	0	0	5	0	0	109	2	0	0	3	0	0	93	0	0	0	0	0	0	0	0	0	2	5	0	2	211		
08:15 AM	0	0	7	0	0	82	0	0	0	4	0	0	55	0	0	0	0	0	0	0	0	0	5	0	3	0	4	144	
08:30 AM	0	0	7	0	0	61	1	0	0	6	0	1	53	0	0	0	0	0	0	0	0	0	1	0	1	0	0	117	
08:45 AM	0	0	8	0	0	88	0	0	0	4	0	1	81	0	0	0	0	0	0	0	0	0	0	1	0	2	173		
09:00 AM	0	0	5	0	0	86	1	0	0	8	0	0	83	0	0	0	0	0	0	0	0	0	1	0	0	0	1	171	
PEAK HOUR TOTALS	0	0	23	0	0	366	14	0	0	16	0	5	312	0	0	0	0	0	0	0	0	0	7	0	9	0	8	INTERSECTION	
ALL MOVEMENTS	380							317							0							17							714
% HV	6.1%							5.0%							#N/A							41.2%							6.4%
PEAK HOUR FACTOR	0.86							0.85							#N/A							0.61							0.85

HV = Heavy Vehicle
 PHF = Peak Hour Factor

7:00 AM - 9:00 AM PEAK HOUR: 7:15 AM - 8:15 AM

ROLLING HOUR COUNT

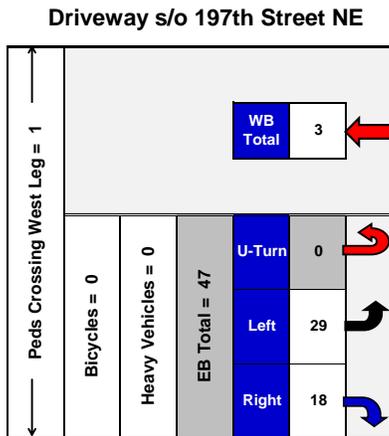
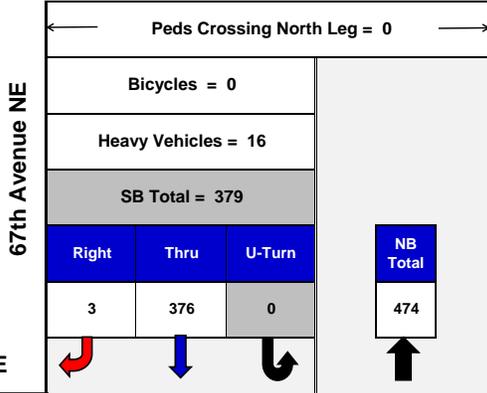
TIME INTERVAL	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound)							FROM WEST ON (Eastbound) Driveway s/o 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
7:00 AM - 8:00 AM	0	0	21	0	0	344	29	0	0	15	0	7	314	0	0	0	0	0	0	0	0	0	2	0	6	0	5	705	
7:15 AM - 8:15 AM	0	0	23	0	0	366	14	0	0	16	0	5	312	0	0	0	0	0	0	0	0	0	7	0	9	0	8	714	
7:30 AM - 8:30 AM	0	0	28	0	0	343	6	0	0	18	0	1	293	0	0	0	0	0	0	0	0	0	8	0	10	0	8	661	
7:45 AM - 8:45 AM	0	0	27	0	0	340	3	0	0	17	0	2	282	0	0	0	0	0	0	0	0	0	8	0	10	0	8	645	
8:00 AM - 9:00 AM	0	0	27	0	0	317	2	0	0	22	0	2	272	0	0	0	0	0	0	0	0	0	7	0	5	0	7	605	
7:00 AM - 9:00 AM Total:	0	0	48	0	0	661	31	0	0	37	0	9	586	0	0	0	0	0	0	0	0	0	9	0	11	0	12	1310	

67th Avenue NE @ Driveway s/o 197th Street NE

Arlington, WA

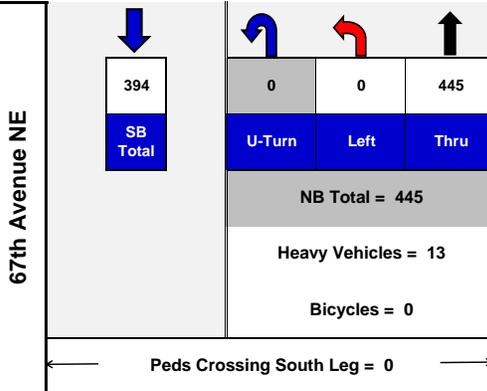


Count Period	
Date	Time
Tue 1/14/2025	4:00 PM - 6:00 PM



Intersection	
Peak Hour	4:00 PM - 5:00 PM
Volume	871
PHF	0.90
HV	3.3%

Approach	PHF	HV
NB Approach	0.88	2.9%
SB Approach	0.87	4.2%
EB Approach	0.27	0.0%
Intersection	0.90	3.3%



PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY





INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: 67th Avenue NE @ Driveway s/o 197th Street NE
Arlington, WA

DATE OF COUNT: Tue. 1/14/2025

COUNTED BY: TDG

START OF COUNT: 4:00 PM

DATE OF REDUCTION: 1/16/2025

TIME OF COUNT: 4:00 PM - 6:00 PM

DURATION OF COUNT (Hrs): 2

TIME INTERVAL ENDING AT	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound)							FROM WEST ON (Eastbound) Driveway s/o 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
04:15 PM	0	0	3	0	0	91	0	0	0	3	0	0	108	0	0	0	0	0	0	0	0	1	0	0	0	26	0	18	243
04:30 PM	0	0	3	0	0	90	2	0	0	2	0	0	113	0	0	0	0	0	0	0	0	0	0	0	1	0	0	206	
04:45 PM	0	0	5	0	0	108	1	0	0	6	0	0	126	0	0	0	0	0	0	0	0	0	0	2	0	0	237		
05:00 PM	0	0	5	0	0	87	0	0	0	2	0	0	98	0	0	0	0	0	0	0	0	0	0	0	0	0	185		
05:15 PM	0	0	1	0	0	94	0	0	0	2	0	0	113	0	0	0	0	0	0	0	0	0	0	2	4	0	2	213	
05:30 PM	0	0	5	0	0	85	0	0	0	4	0	0	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	182	
05:45 PM	0	0	0	0	0	63	0	0	0	1	0	1	74	0	0	0	0	0	0	0	0	0	0	1	0	0	139		
06:00 PM	0	0	1	0	0	73	0	0	0	0	0	0	75	0	0	0	0	0	0	0	0	0	0	1	0	0	149		
PEAK HOUR TOTALS	0	0	16	0	0	376	3	0	0	13	0	0	445	0	0	0	0	0	0	0	1	0	0	0	29	0	18	INTERSECTION	
ALL MOVEMENTS	379							445							0							47							871
% HV	4.2%							2.9%							#N/A							0.0%							3.3%
PEAK HOUR FACTOR	0.87							0.88							#N/A							0.27							0.90

HV = Heavy Vehicle
 PHF = Peak Hour Factor

4:00 PM - 6:00 PM PEAK HOUR: 4:00 PM - 5:00 PM

ROLLING HOUR COUNT

TIME INTERVAL	FROM NORTH ON (Southbound) 67th Avenue NE							FROM SOUTH ON (Northbound) 67th Avenue NE							FROM EAST ON (Westbound)							FROM WEST ON (Eastbound) Driveway s/o 197th Street NE							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
4:00 PM - 5:00 PM	0	0	16	0	0	376	3	0	0	13	0	0	445	0	0	0	0	0	0	0	1	0	0	0	29	0	18	871	
4:15 PM - 5:15 PM	0	0	14	0	0	379	3	0	0	12	0	0	450	0	0	0	0	0	0	0	0	0	2	0	7	0	2	841	
4:30 PM - 5:30 PM	0	0	16	0	0	374	1	0	0	14	0	0	434	0	0	0	0	0	0	0	0	0	2	0	6	0	2	817	
4:45 PM - 5:45 PM	0	0	11	0	0	329	0	0	0	9	0	1	382	0	0	0	0	0	0	0	0	0	2	0	5	0	2	719	
5:00 PM - 6:00 PM	0	0	7	0	0	315	0	0	0	7	0	1	359	0	0	0	0	0	0	0	0	0	2	0	6	0	2	683	
4:00 PM - 6:00 PM Total:	0	0	23	0	0	691	3	0	0	20	0	1	804	0	0	0	0	0	0	0	1	0	2	0	35	0	20	1554	



Existing Weekday Peak Hour Traffic Volumes

ATTACHMENT

Snohomish County Arlington Ops Center



A

Attachment C: LOS Definitions



Highway Capacity Manual 7th Edition

Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). Control delay is a complex measure based on many variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Table 1 summarizes the LOS criteria for signalized intersections, as described in the *Highway Capacity Manual 7th Edition* (Transportation Research Board, 2022).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F ¹	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 7th Edition*, Transportation Research Board, 2022, respectively.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop and two-way stop controlled. All-way stop controlled intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. Table 2 shows LOS criteria for unsignalized intersections.

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F ¹	>50

Source: *Highway Capacity Manual 7th Edition*, Transportation Research Board, 2022, respectively.

1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

Attachment D: LOS Worksheets

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	45	1	10	2	1	0	10	305	3	0	370	115
Future Vol, veh/h	45	1	10	2	1	0	10	305	3	0	370	115
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	100	-	-	100	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	46	46	46	33	33	33	7	7	7	6	6	6
Mvmt Flow	51	1	11	2	1	0	11	343	3	0	416	129

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	783	785	418	784	913	345	546	0	0	346	0	0
Stage 1	417	417	-	367	367	-	-	-	-	-	-	-
Stage 2	367	369	-	417	546	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.96	6.66	7.43	6.83	6.53	4.17	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.96	-	6.43	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.96	-	6.43	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.914	4.414	3.714	3.797	4.297	3.597	2.263	-	-	2.254	-	-
Pot Cap-1 Maneuver	264	278	551	276	243	633	999	-	-	1191	-	-
Stage 1	535	522	-	594	571	-	-	-	-	-	-	-
Stage 2	572	551	-	556	471	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	259	275	550	266	240	632	998	-	-	1191	-	-
Mov Cap-2 Maneuver	259	275	-	266	240	-	-	-	-	-	-	-
Stage 1	535	522	-	587	565	-	-	-	-	-	-	-
Stage 2	564	545	-	543	471	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Ctrl Dly, s/v	21.08		19.19		0.27		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	998	-	-	286	257	1191	-	-
HCM Lane V/C Ratio	0.011	-	-	0.22	0.013	-	-	-
HCM Ctrl Dly (s/v)	8.6	-	-	21.1	19.2	0	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	↑	↑	
Traffic Vol, veh/h	10	10	5	310	365	15
Future Vol, veh/h	10	10	5	310	365	15
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	41	41	5	5	6	6
Mvmt Flow	12	12	6	365	429	18

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	815	438	447	0	-	0
Stage 1	438	-	-	-	-	-
Stage 2	376	-	-	-	-	-
Critical Hdwy	6.81	6.61	4.15	-	-	-
Critical Hdwy Stg 1	5.81	-	-	-	-	-
Critical Hdwy Stg 2	5.81	-	-	-	-	-
Follow-up Hdwy	3.869	3.669	2.245	-	-	-
Pot Cap-1 Maneuver	299	544	1097	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	297	544	1097	-	-	-
Mov Cap-2 Maneuver	406	-	-	-	-	-
Stage 1	572	-	-	-	-	-
Stage 2	616	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	13.15	0.13	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1097	-	465	-	-
HCM Lane V/C Ratio	0.005	-	0.051	-	-
HCM Ctrl Dly (s/v)	8.3	-	13.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection												
Int Delay, s/veh	10.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	175	0	15	4	0	2	4	465	5	4	355	90
Future Vol, veh/h	175	0	15	4	0	2	4	465	5	4	355	90
Conflicting Peds, #/hr	1	0	1	2	0	2	1	0	2	2	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	100	-	-	100	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	0	0	0	3	3	3	8	8	8
Mvmt Flow	194	0	17	4	0	2	4	517	6	4	394	100

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	932	937	397	936	1035	523	495	0	0	524	0	0
Stage 1	404	404	-	530	530	-	-	-	-	-	-	-
Stage 2	528	533	-	405	504	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.1	6.5	6.2	4.13	-	-	4.18	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.5	4	3.3	2.227	-	-	2.272	-	-
Pot Cap-1 Maneuver	246	264	650	247	234	558	1063	-	-	1013	-	-
Stage 1	621	597	-	536	530	-	-	-	-	-	-	-
Stage 2	532	523	-	626	544	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	242	261	648	238	231	555	1062	-	-	1011	-	-
Mov Cap-2 Maneuver	242	261	-	238	231	-	-	-	-	-	-	-
Stage 1	618	594	-	533	527	-	-	-	-	-	-	-
Stage 2	527	520	-	606	541	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Ctrl Dly, s/v	62.86		17.52		0.07		0.08	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1062	-	-	255	294	1011	-	-
HCM Lane V/C Ratio	0.004	-	-	0.829	0.023	0.004	-	-
HCM Ctrl Dly (s/v)	8.4	-	-	62.9	17.5	8.6	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	6.6	0.1	0	-	-

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	WT		T	T	T	
Traffic Vol, veh/h	30	20	0	445	375	3
Future Vol, veh/h	30	20	0	445	375	3
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	3	3	4	4
Mvmt Flow	33	22	0	494	417	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	915	420	421	0	0
Stage 1	419	-	-	-	-
Stage 2	495	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-
Pot Cap-1 Maneuver	305	637	1133	-	-
Stage 1	668	-	-	-	-
Stage 2	616	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	305	636	1132	-	-
Mov Cap-2 Maneuver	431	-	-	-	-
Stage 1	667	-	-	-	-
Stage 2	616	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	13.19	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1132	-	495	-	-
HCM Lane V/C Ratio	-	-	0.112	-	-
HCM Ctrl Dly (s/v)	0	-	13.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-