TECHNICAL MEMORANDUM NAME

DATE: October 12, 2020

TO: West Linn Wilsonville School District

FROM: Scott Mansur, P.E., PTOE | DKS Associates
Jenna Bogert, E.I. | DKS Associates

SUBJECT: West Linn High School – Stadium and Parking Expansion Traffic Analysis P20079-001

INTRODUCTION

This memorandum contains a site evaluation and operations analysis for the stadium and parking lot expansion at West Linn High School in West Linn, Oregon. The West Linn-Wilsonville School District desires to expand the current stadium seating and add an additional 116 parking stalls to the site. Of the 116 new stalls, 98 will make up the new parking lot and 18 will be added to the existing south parking lot. A map of the study area is shown in Figure 1 below. The following sections include the estimated project trip generation, intersection analysis, and a site plan review.

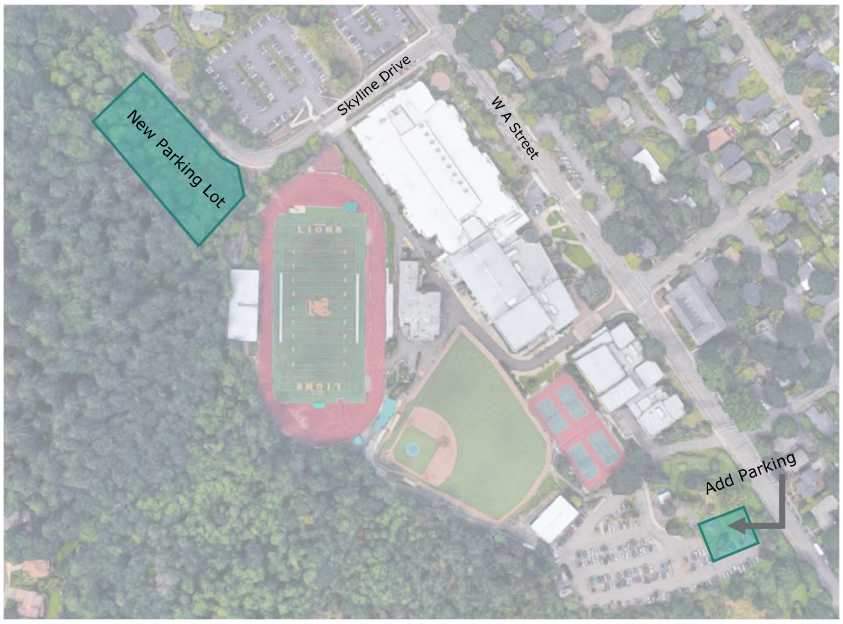


FIGURE 1: STUDY AREA

TRIP GENERATION

Trip generation is the method used to estimate the number of vehicles that are added to the roadway network by the proposed project during a specified period. The peak periods analyzed in this analysis are the a.m. peak hour and afternoon peak hour. The morning peak hour refers to the hour with the highest volume of vehicles between 7 and 9 a.m. The school afternoon peak hour refers to the hour with the highest volume of vehicles between 2 and 4 p.m.

It should be noted that the number of students attending the high school will not increase due to the project. However, the vehicle trip generation is expected to slightly increase due to the increase in parking on site that will be available to staff and students. It is anticipated that the parking addition will impact the site in two ways.

- Shift some of the existing on-street parking to off-street parking, and
- create new vehicle trips (existing students and staff choosing to drive to and from school instead of using other modes of travel like biking, walking, or bus).

To estimate the increase in trip generation for the a.m. and afternoon school peak hours, an assessment of the existing on-street parking was made. The number of on-street parking stalls on W. A Street (between the I-205 bridge and Skyline Drive) and McKillican Street (between W. A Street and 1st Court) is 62 stalls (see Figure 2). For this analysis, it was conservatively assumed that all 62 stalls are occupied by students and staff on a regular school day under existing conditions.

FIGURE 2: EXISITING ON-STREET PARKING

After the additional parking is added to the site (116 stalls), it is assumed that those 62 vehicles would instead park in the new on-site parking stalls. The remaining number of new parking stalls on site (54 stalls) would be filled with new vehicle trips by existing staff and students.

Therefore, there will be approximately 54 new a.m. peak hour trips and 54 new afternoon peak hour trips that are generated by the site due to the addition of 116 parking stalls. See Table 1 for the estimated trip generation.

TABLE 1: NEW VEHICLE TRIPS (TRIP GENERATION)

AM PEAK HOUR			AFTERNOON PEAK HOUR		
IN	OUT	TOTAL	IN	OUT	TOTAL
52	2	54	4	50	54

INTERSECTION ANALYSIS

This section contains the intersection analysis for the W. A Street/Skyline Drive intersection. The intersection of W. A Street/Skyline Drive provides access to two existing parking lots off Skyline Drive as well as the new proposed parking lot near the stadium. Intersection operations was analyzed at this intersection to determine if the intersection is still able to meet the City's standard for operations once the project has been built.

2020 VOLUME DEVELOPMENT

Due to the COVID-19 closures of businesses and schools, current traffic counts were not able to be collected for this project. Therefore, historical intersection turn movement volumes were utilized for this impact analysis and were factored to represent typical traffic conditions. The methodology for factoring the historical volumes is presented below.

Historical intersection traffic counts at the intersection from a previous West Linn High School project[1] were used in this analysis. The historical traffic counts for the a.m. and afternoon peak periods were collected in January 2014 and are provided in the appendix. A growth rate of 1% per year was applied to the through movements on W. A Street to account for background growth between 2014 and 2020.

Additionally, project trips associated with the high school's student growth between 2014 and 2020 were estimated and added to the historical traffic counts.[2] The trip generation generated by the high school between 2014 to 2020 was estimated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition.[3] These trips are shown in Table 2.

[1] West Linn High School Transportation Circulation Improvements, DKS Associates, May 2014.

[2] Student enrollment counts were provided by Amanda Blackburn via email on June 11, 2020.

[3] Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, 2017.

TABLE 2: HIGH SCHOOL TRIP GENERATION FROM 2014 TO 2020

SCENARIO	LAND USE (ITE CODE)	NUMBER OF STUDENTS	TRIP RATE	IN	OUT	TOTAL
AM PEAK HOUR						
2014	High School (530)	1,585	0.55	593	279	872
2020		1,881	0.55	703	332	1,035
GROWTH BETWEEN 2014 - 2020		**296**	**-**	**110**	**53**	**163**
AFTERNOON PEAK HOUR						
2014	High School (530)	1,585	0.33	167	356	523
2020		1,881	0.33	199	422	621
GROWTH BETWEEN 2014 - 2020		**296**	**-**	**32**	**66**	**98**

The growth from 2014 to 2020 was 163 trips in the a.m. peak hour and 98 trips in the afternoon peak hour for the high school site. Based on the location of on-site parking at the school, approximately 60% of these trips were assumed to travel through the intersection of W. A Street/Skyline Drive and are distributed amongst the intersection based on the 2014 turning movement counts.

The existing 2020 volumes that were developed for both the a.m. and afternoon school peak hour analysis are shown in Figure 4.

To estimate the Build volumes, the site trip in Table 1 were added to the existing 2020 volumes. The Build 2020 volumes for the study intersection are shown in Figure 4.

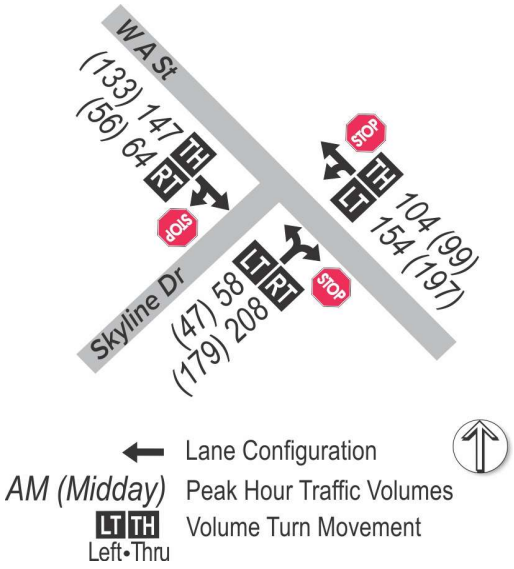


FIGURE 4: EXISTING 2020 VOLUMES

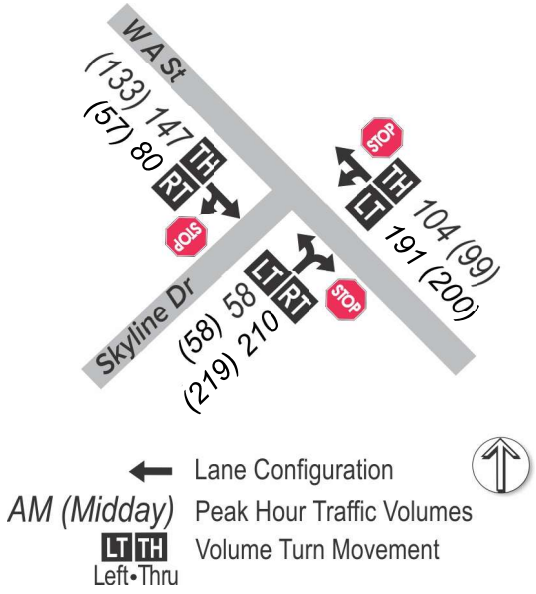


FIGURE 4: BUILD 2020 VOLUMES

INTERSECTION OPERATIONS

Traffic operations were analyzed for the a.m. and afternoon peak hours and were based on the Highway Capacity Manual, 6th Edition methodology for unsignalized intersections. Two scenarios were evaluated, Existing and Build. The Build scenario assumes that the stadium expansion and parking lot addition have been completed. The highway capacity reports are provided in the appendix.

The traffic operations were compared to the City of West Linn minimum operational standard. Specified in the City of West Linn Comprehensive Plan[4], the minimum operational standard is LOS "D".

TABLE 3: INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	PEAK HOUR	EXISTING		BUILD	
			DELAY	LOS	DELAY	LOS
W A ST/ SKYLINE DR	LOS D	A.M.	19.4	C	25.5	D
		AFTERNOON	14.9	B	17.2	C

V/C = VOLUME-TO-CAPACITY RATIO OF TOTAL INTERSECTION
DELAY = AVERAGE APPROACH DELAY (SEC) OF TOTAL INTERSECTION
LOS = LEVEL OF SERVICE BASED ON TOTAL AVERAGE DELAY

The delay and LOS shown in the table represent the average delay (secs) per vehicle for all approaches of the intersection. As shown in the table, the intersection operations meet the City's standard in both the a.m. and afternoon school peak hours after the construction of the project.

SITE PLAN REVIEW

The proposed site plan was provided by the project sponsor and can be found in the appendix.

DRIVEWAY ACCESS AND SIGHT DISTANCE

The proposed site plan shows a full driveway access to the new 84-stall parking lot on Skyline Drive. With a posted speed of 25 miles per hour, the sight distance requirement along Skyline Drive is 280 feet for vehicles turning left from the driveway and 240 feet for vehicles turning right from the driveway.[5] A preliminary sight distance evaluation at the proposed driveway location indicates there is sufficient available sight distance to meet the stated requirements. Prior to occupancy, sight distance at any new or modified access points will need to be verified,

[4] Comprehensive Plan, Goal 12, Page T-8, City of West Linn, Updated July 2017.

[5] American Association of State Highway and Transportation Officials (AASHTO), 2018, Table 9-7 and 9-9.

documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.

FRONTAGE IMPROVEMENTS

Frontage improvements to Skyline Drive should coordinated with the City's cross section standard for a collector. This includes upgraded facilities for vehicles, bicycles, and pedestrians as indicated in the City TSP roadway standards.[6] Per the TSP, collector roadways are required to have two 12-foot travel lanes, a 5-foot bicycle lanes on both sides, and a minimum of 6-foot sidewalks on both sides.

Currently, the width of the existing pavement along Skyline Drive is approximately 24 feet and there is sidewalk in front of the proposed project site with no striped bicycle facilities. The School District should work with the City of West Linn to construction frontage improvement that are consistent with existing street network but support implementation of the City's future street network.

PARKING IMPACTS

The site plan shows a total of 116 new vehicle parking stalls. The new stadium parking lot will be expected to have 98 parking stalls and the remaining 18 will be in the existing southern lot off W. A Street. Currently, students and staff park along W. A Street and McKillican Street, due to the lack of parking stalls on-site. It is expected that on-street parking in the adjacent neighborhood will be reduced with the addition of the new stadium parking stalls.

SUMMARY

The following are a list of the key findings from the traffic analysis for the West Linn High School stadium expansion and parking lot addition.

- The addition of 116 parking stalls to the high school is expected to shift 62 vehicles from the existing on-street parking in the adjacent neighborhood to the new parking lots, and generate a total of 54 new vehicle trips during the a.m. and afternoon peak hours.
- The intersection of W A Street/Skyline Drive is expected to meet the City's operating standard (LOS D) for both the a.m. and afternoon school peak hours after the buildout of the project.
- Based on preliminary sight distance evaluations, the driveway for the new parking lot meets AASHTO standards. Prior to occupancy, sight distance at any new or modified access points

[6] West Linn Transportation System Plan, March 28, 2016, Exhibit 7, and Table 28.

will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.

APPENDIX

2014 TRAFFIC COUNTS (COLLECTED DATA)

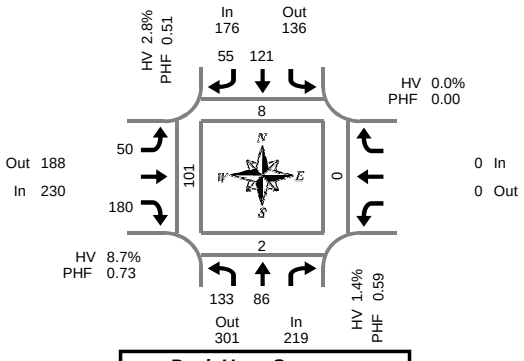
EXISTING SCENARIO - HIGHWAY CAPACITY MANUAL REPORTS

BUILD SCENARIO - HIGHWAY CAPACITY MANUAL REPORTS

SITE PLAN

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:35 AM to 8:35 AM

W A St & Skyline Dr

Tuesday, January 28, 2014
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
7:00 AM	3	5		0	4	2		0	4		5	0				0	23	0	0	0	20
7:05 AM	4	4		0	3	2		0	3		16	0				0	32	0	0	0	0
7:10 AM	5	7		1	8	1		0	4		16	0				0	41	0	0	0	2
7:15 AM	6	5		0	10	0		0	1		14	0				0	36	0	0	0	1
7:20 AM	8	8		0	8	2		0	1		18	0				0	45	0	0	0	2
7:25 AM	7	9		0	8	5		0	4		15	0				0	48	1	0	0	3
7:30 AM	4	7		0	5	4		0	2		10	0				0	32	0	0	0	3
7:35 AM	13	9		0	5	2		0	3		5	0				0	37	0	0	0	5
7:40 AM	3	8		0	10	2		0	3		10	0				0	36	0	0	0	0
7:45 AM	8	1		0	4	2		0	2		13	0				0	30	0	0	0	2
7:50 AM	5	6		0	7	0		0	0		12	0				0	30	1	1	0	3
7:55 AM	7	4		0	5	0		0	3		12	0				0	31	0	0	0	1
8:00 AM	7	4		0	10	1		0	4		15	0				0	41	0	0	0	4
8:05 AM	12	8		0	12	3		0	3		18	0				0	56	0	0	0	20
8:10 AM	14	8		0	14	5		0	6		20	0				0	67	2	0	0	12
8:15 AM	19	8		0	17	8		0	6		22	0				0	80	1	0	0	14
8:20 AM	18	16		0	16	16		0	6		16	0				0	88	2	0	0	16
8:25 AM	23	9		0	17	12		0	8		21	0				0	90	2	1	0	21
8:30 AM	4	5		0	4	4		0	6		16	0				0	39	0	0	0	3
8:35 AM	4	2		0	4	0		0	0		13	0				0	23	0	0	0	0
8:40 AM	7	1		0	1	4		0	0		9	0				0	22	0	0	0	0
8:45 AM	3	0		0	2	1		0	1		8	0				0	15	0	0	0	0
8:50 AM	6	0		0	4	1		0	0		5	0				0	16	0	0	0	0
8:55 AM	6	2		0	3	2		0	1		5	0				0	19	0	0	0	1
Total Survey	196	136		1	181	79		0	71		314	0				0	977	9	2	0	133

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
7:00 AM	12	16		1	15	5		0	11		37	0				0	96	0	0	0	22
7:15 AM	21	22		0	26	7		0	6		47	0				0	129	1	0	0	6
7:30 AM	20	24		0	20	8		0	8		25	0				0	105	0	0	0	8
7:45 AM	20	11		0	16	2		0	5		37	0				0	91	1	1	0	6
8:00 AM	33	20		0	36	9		0	13		53	0				0	164	2	0	0	36
8:15 AM	60	33		0	50	36		0	20		59	0				0	258	5	1	0	51
8:30 AM	15	8		0	9	8		0	6		38	0				0	84	0	0	0	3
8:45 AM	15	2		0	9	4		0	2		18	0				0	50	0	0	0	1
Total Survey	196	136		1	181	79		0	71		314	0				0	977	9	2	0	133

Peak Hour Summary
7:35 AM to 8:35 AM

By Approach	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	219	301	520	0	176	136	312	0	230	188	418	0	0	0	0	0	625	8	2	0	101
%HV	1.4%				2.8%				8.7%				0.0%				4.5%				
PHF	0.59				0.51				0.73				0.00				0.61				

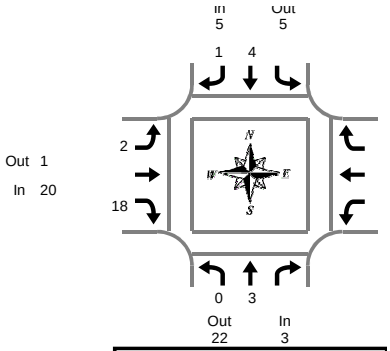
By Movement	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Total
	L	T		Total	T	R		Total	L		R	Total				Total	
Volume	133	86		219	121	55		176	50		180	230				0	625
%HV	0.0%	3.5%	NA	1.4%	3.3%	1.8%	NA	2.8%	4.0%	NA	10.0%	8.7%	NA	NA	NA	0.0%	4.5%
PHF	0.55	0.65		0.59	0.61	0.38		0.51	0.63		0.75	0.73				0.00	0.61

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
7:00 AM	73	73		1	77	22		0	30		146	0				0	421	2	1	0	42
7:15 AM	94	77		0	98	26		0	32		162	0				0	489	4	1	0	56
7:30 AM	133	88		0	122	55		0	46		174	0				0	618	8	2	0	101
7:45 AM	128	72		0	111	55		0	44		187	0				0	597	8	2	0	96
8:00 AM	123	63		0	104	57		0	41		168	0				0	556	7	1	0	91

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
7:35 AM to 8:35 AM

W A St & Skyline Dr

Tuesday, January 28, 2014
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
7:00 AM	0	1		1	0	0	0		0		0	0				0	1
7:05 AM	0	0		0	0	0	0		0		0	0				0	0
7:10 AM	1	1		2	0	0	0		0		0	0				0	2
7:15 AM	0	0		0	0	0	0		0		1	1				0	1
7:20 AM	0	1		1	1	0	1		0		0	0				0	2
7:25 AM	0	1		1	0	0	0		0		0	0				0	1
7:30 AM	0	0		0	1	0	1		0		0	0				0	1
7:35 AM	0	2		2	0	0	0		0		0	0				0	2
7:40 AM	0	0		0	0	0	0		0		0	0				0	0
7:45 AM	0	0		0	0	0	0		0		0	0				0	0
7:50 AM	0	1		1	0	0	0		0		0	0				0	1
7:55 AM	0	0		0	0	0	0		0		0	0				0	0
8:00 AM	0	0		0	1	0	1		0		0	0				0	1
8:05 AM	0	0		0	0	0	0		1		1	2				0	2
8:10 AM	0	0		0	1	0	1		0		3	3				0	4
8:15 AM	0	0		0	2	0	2		1		4	5				0	7
8:20 AM	0	0		0	0	1	1		0		4	4				0	5
8:25 AM	0	0		0	0	0	0		0		3	3				0	3
8:30 AM	0	0		0	0	0	0		0		3	3				0	3
8:35 AM	0	0		0	1	0	1		0		0	0				0	1
8:40 AM	0	0		0	0	0	0		0		0	0				0	0
8:45 AM	0	0		0	0	0	0		0		0	0				0	0
8:50 AM	2	0		2	0	0	0		0		0	0				0	2
8:55 AM	0	0		0	0	0	0		0		0	0				0	0
Total Survey	3	7		10	7	1	8		2		19	21				0	39

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
7:00 AM	1	2		3	0	0	0		0		0	0				0	3
7:15 AM	0	2		2	1	0	1		0		1	1				0	4
7:30 AM	0	2		2	1	0	1		0		0	0				0	3
7:45 AM	0	1		1	0	0	0		0		0	0				0	1
8:00 AM	0	0		0	2	0	2		1		4	5				0	7
8:15 AM	0	0		0	2	1	3		1		11	12				0	15
8:30 AM	0	0		0	1	0	1		0		3	3				0	4
8:45 AM	2	0		2	0	0	0		0		0	0				0	2
Total Survey	3	7		10	7	1	8		2		19	21				0	39

Heavy Vehicle Peak Hour Summary
7:35 AM to 8:35 AM

By Approach	Northbound W A St			Southbound W A St			Eastbound Skyline Dr			Westbound Skyline Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	22	25	5	5	10	20	1	21	0	0	0	28
PHF	0.38			0.31			0.42			0.00			0.44

By Movement	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Total
	L	T		Total	T	R	Total		L		R	Total				Total	
Volume	0	3		3	4	1	5		2		18	20				0	28
PHF	0.00	0.38		0.38	0.33	0.25	0.31		0.25		0.41	0.42				0.00	0.44

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

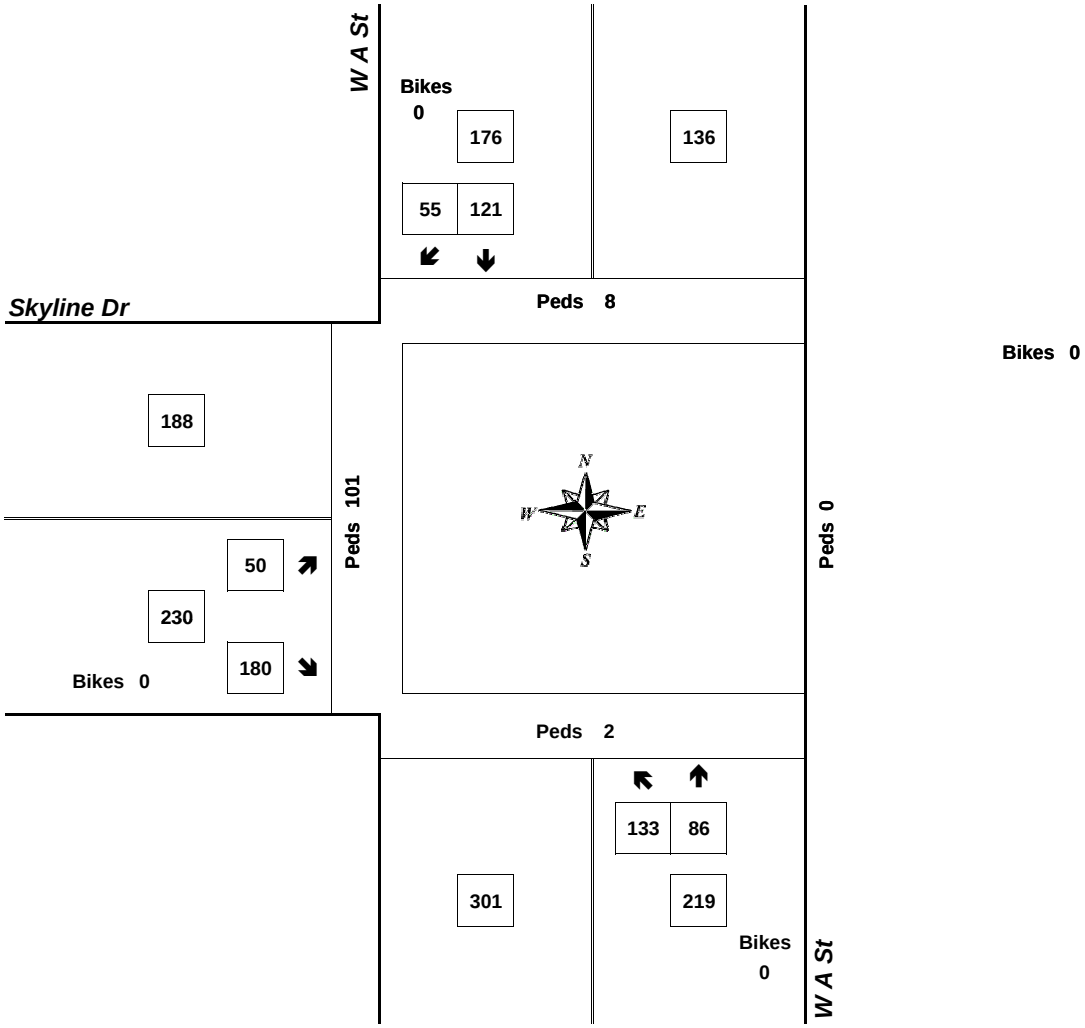
Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
7:00 AM	1	7		8	2	0	2		0		1	1				0	11
7:15 AM	0	5		5	4	0	4		1		5	6				0	15
7:30 AM	0	3		3	5	1	6		2		15	17				0	26
7:45 AM	0	1		1	5	1	6		2		18	20				0	27
8:00 AM	2	0		2	5	1	6		2		18	20				0	28

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

W A St & Skyline Dr

7:35 AM to 8:35 AM
Tuesday, January 28, 2014

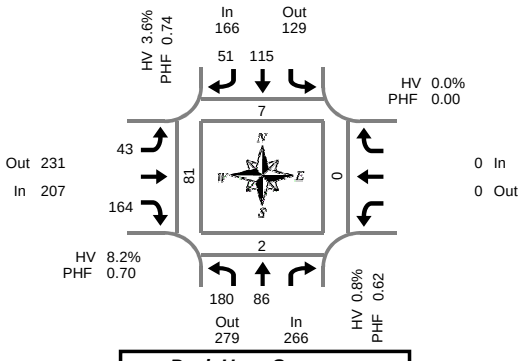


Approach	PHF	HV%	Volume
EB	0.73	8.7%	230
WB	0.00	0.0%	0
NB	0.59	1.4%	219
SB	0.51	2.8%	176
Intersection	0.61	4.5%	625

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
3:00 PM to 4:00 PM

W A St & Skyline Dr

Tuesday, January 28, 2014
2:00 PM to 4:00 PM

5-Minute Interval Summary
2:00 PM to 4:00 PM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R	Bikes		L		R	Bikes				Bikes		North	South	East	West
2:00 PM	8	2		0	1	0	0		3		7	0				0	21	0	0	0	0
2:05 PM	4	5		0	4	2	0		2		13	0				0	30	0	0	0	0
2:10 PM	11	2		0	3	2	0		2		11	0				0	31	0	0	0	1
2:15 PM	10	7		0	5	0	0		3		6	0				0	31	0	1	0	0
2:20 PM	11	2		0	2	2	0		2		4	0				0	23	0	0	0	0
2:25 PM	7	2		0	0	0	0		1		7	0				0	17	0	0	0	0
2:30 PM	7	0		0	1	2	0		3		3	0				0	16	0	0	0	1
2:35 PM	4	3		0	2	0	0		3		5	0				0	17	0	0	0	1
2:40 PM	8	5		0	2	1	0		0		7	0				0	23	0	0	0	1
2:45 PM	9	3		0	1	0	0		3		8	0				0	24	0	0	0	0
2:50 PM	5	2		0	4	4	0		2		8	0				0	25	0	0	0	0
2:55 PM	5	3		0	10	3	0		3		9	0				0	33	0	0	0	0
3:00 PM	6	2		0	6	2	0		6		19	0				0	41	0	0	0	1
3:05 PM	10	6		0	8	1	0		4		17	0				0	46	0	0	0	0
3:10 PM	7	9		0	17	2	0		5		8	0				0	48	5	2	0	38
3:15 PM	24	15		0	13	9	0		4		19	0				0	84	1	0	0	16
3:20 PM	24	15		0	8	7	0		5		25	0				0	84	1	0	0	10
3:25 PM	22	8		0	5	5	0		6		15	0				0	61	0	0	0	6
3:30 PM	25	3		0	9	4	0		5		7	0				0	53	0	0	0	2
3:35 PM	12	7		0	13	6	0		3		9	0				0	50	0	0	0	3
3:40 PM	16	6		0	11	6	0		0		17	1				0	56	0	0	0	2
3:45 PM	11	7		0	7	3	0		1		9	0				0	38	0	0	0	3
3:50 PM	11	4		0	11	6	0		1		8	0				0	41	0	0	0	0
3:55 PM	12	4		0	7	0	0		3		11	0				0	37	0	0	0	0
Total Survey	269	122		0	150	67	0		70		252	1				0	930	7	3	0	85

15-Minute Interval Summary
2:00 PM to 4:00 PM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R	Bikes		L		R	Bikes				Bikes		North	South	East	West
2:00 PM	23	9		0	8	4	0		7		31	0				0	82	0	0	0	1
2:15 PM	28	11		0	7	2	0		6		17	0				0	71	0	1	0	0
2:30 PM	19	8		0	5	3	0		6		15	0				0	56	0	0	0	3
2:45 PM	19	8		0	15	7	0		8		25	0				0	82	0	0	0	0
3:00 PM	23	17		0	31	5	0		15		44	0				0	135	5	2	0	39
3:15 PM	70	38		0	26	21	0		15		59	0				0	229	2	0	0	32
3:30 PM	53	16		0	33	16	0		8		33	1				0	159	0	0	0	7
3:45 PM	34	15		0	25	9	0		5		28	0				0	116	0	0	0	3
Total Survey	269	122		0	150	67	0		70		252	1				0	930	7	3	0	85

Peak Hour Summary
3:00 PM to 4:00 PM

By Approach	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	266	279	545	0	166	129	295	0	207	231	438	1	0	0	0	0	639	7	2	0	81
%HV	0.8%				3.6%				8.2%				0.0%				3.9%				
PHF	0.62				0.74				0.70				0.00				0.70				

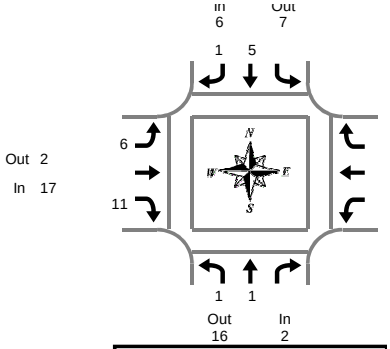
By Movement	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Total
	L	T		Total	T	R	Total		L		R	Total				Total	
Volume	180	86		266	115	51	166		43		164	207				0	639
%HV	0.6%	1.2%	NA	0.8%	4.3%	2.0%	3.6%		14.0%	NA	6.7%	8.2%	NA	NA	NA	0.0%	3.9%
PHF	0.63	0.55		0.62	0.76	0.61	0.74		0.67		0.69	0.70				0.00	0.70

Rolling Hour Summary
2:00 PM to 4:00 PM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R	Bikes		L		R	Bikes				Bikes		North	South	East	West
2:00 PM	89	36		0	35	16	0		27		88	0				0	291	0	1	0	4
2:15 PM	89	44		0	58	17	0		35		101	0				0	344	5	3	0	42
2:30 PM	131	71		0	77	36	0		44		143	0				0	502	7	2	0	74
2:45 PM	165	79		0	105	49	0		46		161	1				0	605	7	2	0	78
3:00 PM	180	86		0	115	51	0		43		164	1				0	639	7	2	0	81

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



W A St & Skyline Dr

Tuesday, January 28, 2014
2:00 PM to 4:00 PM

Peak Hour Summary
3:00 PM to 4:00 PM

Heavy Vehicle 5-Minute Interval Summary
2:00 PM to 4:00 PM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
2:00 PM	1	0		1	0	0	0		0		0	0				0	1
2:05 PM	0	0		0	0	0	0		0		0	0				0	0
2:10 PM	0	0		0	0	0	0		0		0	0				0	0
2:15 PM	0	0		0	0	0	0		0		1	1				0	1
2:20 PM	0	0		0	0	0	0		0		0	0				0	0
2:25 PM	0	0		0	0	0	0		0		1	1				0	1
2:30 PM	0	0		0	0	0	0		0		0	0				0	0
2:35 PM	0	0		0	0	0	0		2		0	2				0	2
2:40 PM	0	0		0	0	0	0		0		0	0				0	0
2:45 PM	0	1		1	0	0	0		0		1	1				0	2
2:50 PM	0	0		0	0	1	1		0		0	0				0	1
2:55 PM	0	0		0	0	0	0		0		1	1				0	1
3:00 PM	0	0		0	1	0	1		0		1	1				0	2
3:05 PM	0	1		1	1	0	1		0		0	0				0	2
3:10 PM	0	0		0	0	0	0		1		0	1				0	1
3:15 PM	1	0		1	2	0	2		0		2	2				0	5
3:20 PM	0	0		0	1	0	1		1		5	6				0	7
3:25 PM	0	0		0	0	0	0		2		1	3				0	3
3:30 PM	0	0		0	0	0	0		1		1	2				0	2
3:35 PM	0	0		0	0	0	0		1		0	1				0	1
3:40 PM	0	0		0	0	1	1		0		1	1				0	2
3:45 PM	0	0		0	0	0	0		0		0	0				0	0
3:50 PM	0	0		0	0	0	0		0		0	0				0	0
3:55 PM	0	0		0	0	0	0		0		0	0				0	0
Total Survey	2	2		4	5	2	7		8		15	23				0	34

Heavy Vehicle 15-Minute Interval Summary
2:00 PM to 4:00 PM

Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
2:00 PM	1	0		1	0	0	0		0		0	0				0	1
2:15 PM	0	0		0	0	0	0		0		2	2				0	2
2:30 PM	0	0		0	0	0	0		2		0	2				0	2
2:45 PM	0	1		1	0	1	1		0		2	2				0	4
3:00 PM	0	1		1	2	0	2		1		1	2				0	5
3:15 PM	1	0		1	3	0	3		3		8	11				0	15
3:30 PM	0	0		0	0	1	1		2		2	4				0	5
3:45 PM	0	0		0	0	0	0		0		0	0				0	0
Total Survey	2	2		4	5	2	7		8		15	23				0	34

Heavy Vehicle Peak Hour Summary
3:00 PM to 4:00 PM

By Approach	Northbound W A St			Southbound W A St			Eastbound Skyline Dr			Westbound Skyline Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	16	18	6	7	13	17	2	19	0	0	0	25
PHF	0.25			0.50			0.39			0.00			0.42

By Movement	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Total
	L	T		Total	T	R	Total		L		R	Total				Total	
Volume	1	1		2	5	1	6		6		11	17				0	25
PHF	0.25	0.25		0.25	0.42	0.25	0.50		0.38		0.34	0.39				0.00	0.42

Heavy Vehicle Rolling Hour Summary
2:00 PM to 4:00 PM

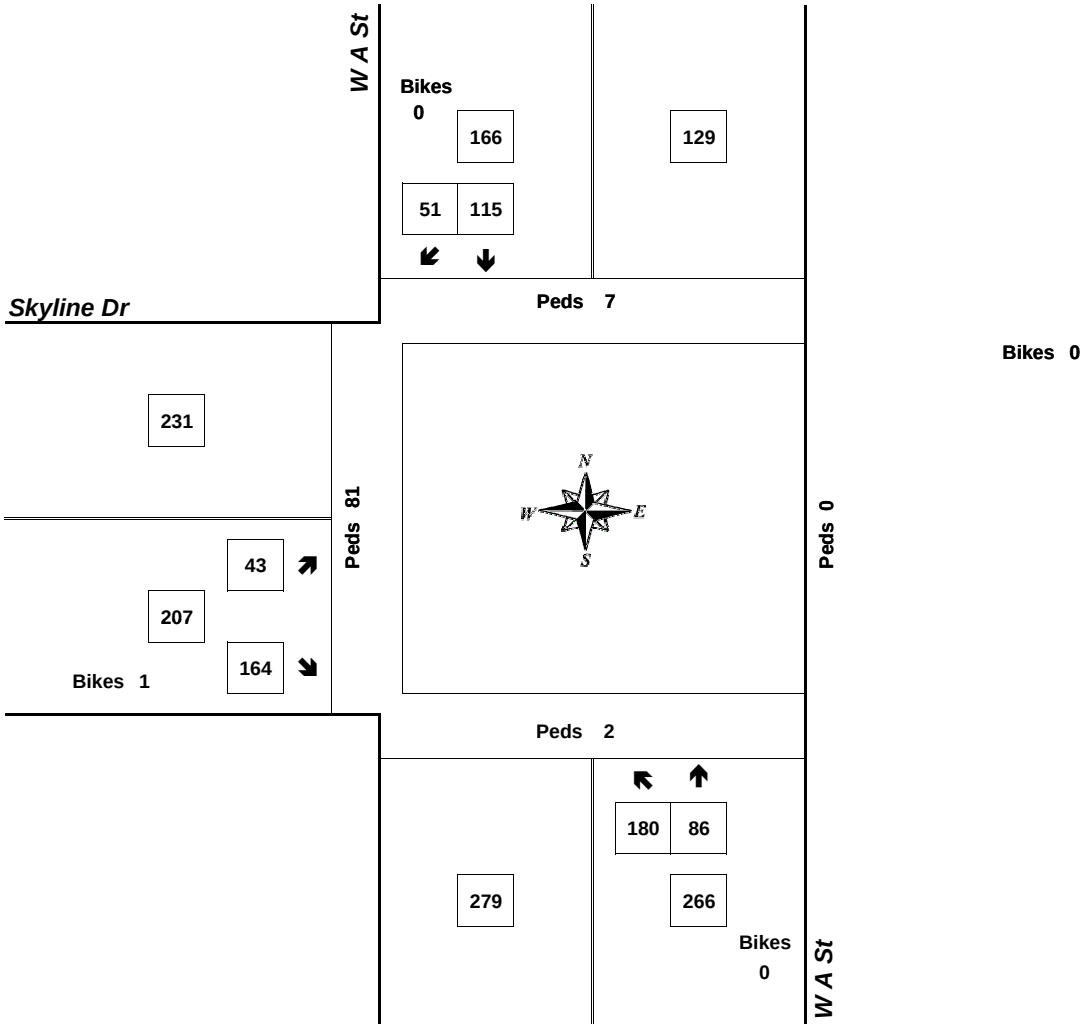
Interval Start Time	Northbound W A St				Southbound W A St				Eastbound Skyline Dr				Westbound Skyline Dr				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
2:00 PM	1	1		2	0	1	1		2		4	6				0	9
2:15 PM	0	2		2	2	1	3		3		5	8				0	13
2:30 PM	1	2		3	5	1	6		6		11	17				0	26
2:45 PM	1	2		3	5	2	7		6		13	19				0	29
3:00 PM	1	1		2	5	1	6		6		11	17				0	25

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

W A St & Skyline Dr

3:00 PM to 4:00 PM
Tuesday, January 28, 2014



Approach	PHF	HV%	Volume
EB	0.70	8.2%	207
WB	0.00	0.0%	0
NB	0.62	0.8%	266
SB	0.74	3.6%	166
Intersection	0.70	3.9%	639

Count Period: 2:00 PM to 4:00 PM

Intersection	
Intersection Delay, s/veh	19.4
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	58	208	154	104	147	64
Future Vol, veh/h	58	208	154	104	147	64
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61
Heavy Vehicles, %	4	10	0	3	3	2
Mvmt Flow	95	341	252	170	241	105
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	20.1	21.5	16.1
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	60%	22%	0%
Vol Thru, %	40%	0%	70%
Vol Right, %	0%	78%	30%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	258	266	211
LT Vol	154	58	0
Through Vol	104	0	147
RT Vol	0	208	64
Lane Flow Rate	423	436	346
Geometry Grp	1	1	1
Degree of Util (X)	0.695	0.683	0.558
Departure Headway (Hd)	5.914	5.638	5.807
Convergence, Y/N	Yes	Yes	Yes
Cap	605	637	616
Service Time	3.996	3.718	3.894
HCM Lane V/C Ratio	0.699	0.684	0.562
HCM Control Delay	21.5	20.1	16.1
HCM Lane LOS	C	C	C
HCM 95th-tile Q	5.5	5.3	3.4

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	47	179	197	99	133	56
Future Vol, veh/h	47	179	197	99	133	56
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	14	7	1	1	4	2
Mvmt Flow	67	256	281	141	190	80
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	13.9	17.4	12
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	67%	21%	0%
Vol Thru, %	33%	0%	70%
Vol Right, %	0%	79%	30%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	296	226	189
LT Vol	197	47	0
Through Vol	99	0	133
RT Vol	0	179	56
Lane Flow Rate	423	323	270
Geometry Grp	1	1	1
Degree of Util (X)	0.635	0.494	0.403
Departure Headway (Hd)	5.408	5.51	5.379
Convergence, Y/N	Yes	Yes	Yes
Cap	668	652	667
Service Time	3.447	3.554	3.425
HCM Lane V/C Ratio	0.633	0.495	0.405
HCM Control Delay	17.4	13.9	12
HCM Lane LOS	C	B	B
HCM 95th-tile Q	4.5	2.7	1.9

Intersection	
Intersection Delay, s/veh	25.5
Intersection LOS	D

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	58	210	191	104	147	80
Future Vol, veh/h	58	210	191	104	147	80
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61
Heavy Vehicles, %	4	10	0	3	3	2
Mvmt Flow	95	344	313	170	241	131
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	23.8	32	18.9
HCM LOS	C	D	C

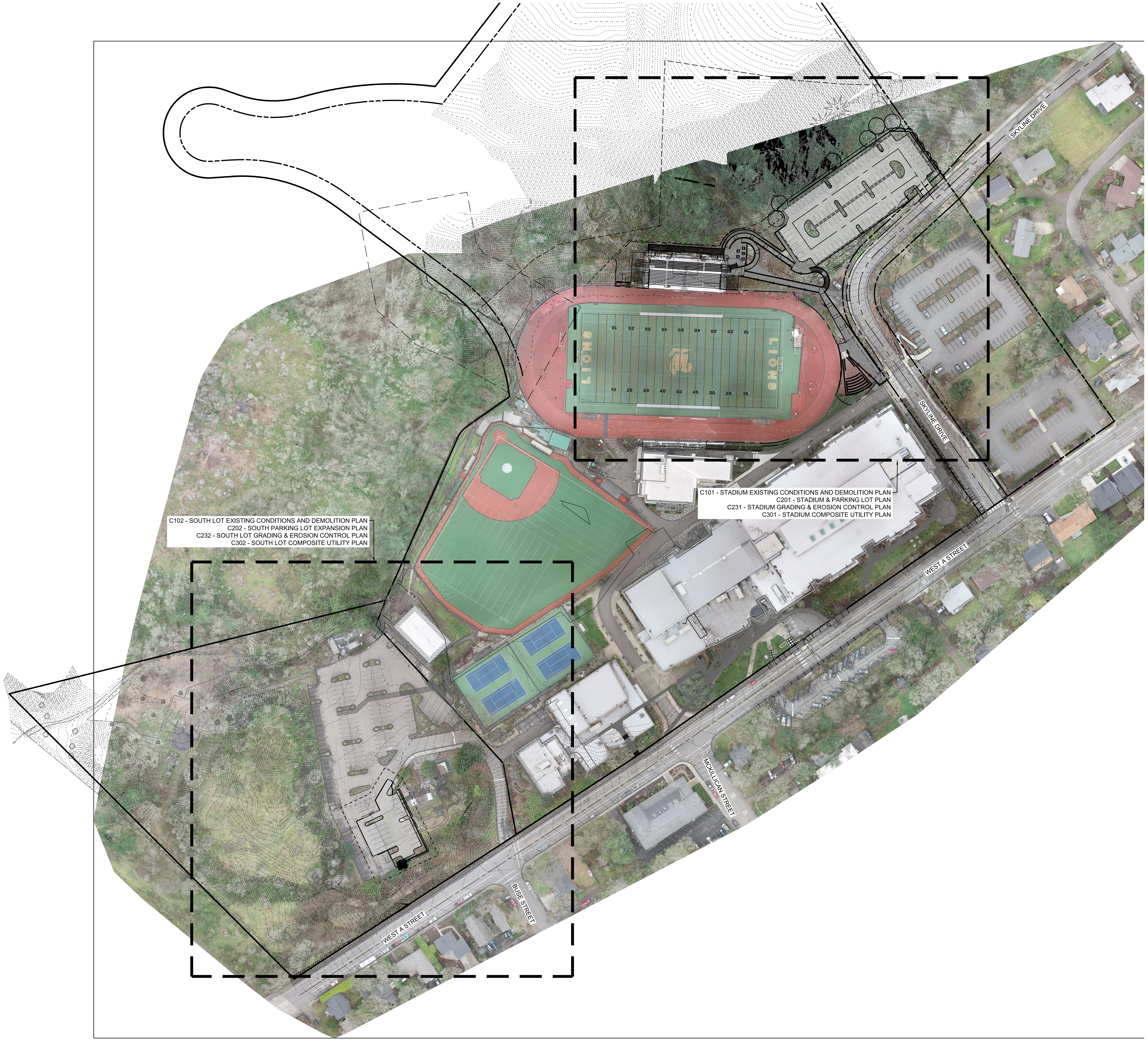
Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	65%	22%	0%
Vol Thru, %	35%	0%	65%
Vol Right, %	0%	78%	35%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	295	268	227
LT Vol	191	58	0
Through Vol	104	0	147
RT Vol	0	210	80
Lane Flow Rate	484	439	372
Geometry Grp	1	1	1
Degree of Util (X)	0.826	0.734	0.628
Departure Headway (Hd)	6.151	6.018	6.078
Convergence, Y/N	Yes	Yes	Yes
Cap	590	606	592
Service Time	4.2	4.018	4.13
HCM Lane V/C Ratio	0.82	0.724	0.628
HCM Control Delay	32	23.8	18.9
HCM Lane LOS	D	C	C
HCM 95th-tile Q	8.5	6.3	4.4

Intersection	
Intersection Delay, s/veh	17.2
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	58	219	200	99	133	57
Future Vol, veh/h	58	219	200	99	133	57
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	14	7	1	1	4	2
Mvmt Flow	83	313	286	141	190	81
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	17.3	19.8	13
HCM LOS	C	C	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	67%	21%	0%
Vol Thru, %	33%	0%	70%
Vol Right, %	0%	79%	30%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	299	277	190
LT Vol	200	58	0
Through Vol	99	0	133
RT Vol	0	219	57
Lane Flow Rate	427	396	271
Geometry Grp	1	1	1
Degree of Util (X)	0.674	0.615	0.428
Departure Headway (Hd)	5.677	5.597	5.67
Convergence, Y/N	Yes	Yes	Yes
Cap	632	641	632
Service Time	3.735	3.657	3.737
HCM Lane V/C Ratio	0.676	0.618	0.429
HCM Control Delay	19.8	17.3	13
HCM Lane LOS	C	C	B
HCM 95th-tile Q	5.2	4.2	2.1



LEGEND

- EXISTING LOT LINE
- EXISTING RIGHT OF WAY LINE
- EXISTING CONSERVATION EASEMENT LINE
- EXISTING FENCE LINE
- EXISTING WALL
- EXISTING WHITE STRIPING
- EXISTING DRAINAGE DITCH
- WATER RESOURCE AREA (WRA) BUFFER
- EXISTING CONCRETE
- 110 EXISTING MAJOR CONTOUR
- 108 EXISTING MINOR CONTOUR
- LIMITS OF GRADING
- PROPOSED RIGHT OF WAY LINE
- PROPERTY SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB
- PROPOSED ASPHALT
- PROPOSED RETAINING WALL
- PROPOSED WHITE PAVEMENT STRIPING

SCALE: 1" = 80

0 80 160 FT

CLIENT

WEST LINN WILSONVILLE SCHOOL DISTRICT

COPYRIGHT

ISSUES

No.	DESCRIPTION	DATE
1	LAND USE APPLICATION	08-19-2020
2	DESIGN DEVELOPMENT	10-07-2020

NOT FOR CONSTRUCTION

CONSULTANTS

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
COMMUNITY PLANNING
9600 SW NIMBUS AVE., SUITE 100; BEAVERTON, OR 97008

SEAL

EXPIRES: 12/31/21

IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT

WEST LINN HIGH SCHOOL PARKING/STADIUM ADDITIONS

5464 W A Street
West Linn, OR 97068
United States

PROJECT NO: 124724

DRAWN BY: **TEG, JTE**

CHECKED BY: **JDH**

PROJECT MGR: **JDH**

APPROVED BY: **JDH**

SHEET TITLE
OVERALL SITE PLAN

SHEET NUMBER C100

ISSUE 2

P:\19579-WLHS STADIUM EXPANSION\CAD\DD\19579-OVERALL SITE PLAN.DWG

SCALE CHECK 1 in 10mm