

January 31, 2023

Project #: 28681

Paul Coffelt
City of Lynnwood
20816 44th Ave. W, STE 230
Lynnwood, WA 98046-5008**RE: Transportation Impact Analysis (TIA) Update for the Lynnwood Automotive Dealerships**

Dear Paul:

This document includes an update to a previously prepared TIA (dated April 23, 2021) for two automotive dealerships proposed on one site along SR 99 in Lynnwood, Washington. The site is located between 186th Place SW and 188th Street SW, is bounded by single-family homes to the north and west, and is bounded by an existing Harley Davidson motorcycle dealership to the south. The site is being expanded in two phases to repurpose the existing Harley Davidson dealership and demolish one of two existing buildings in use by Harley Davidson. Figure 1 displays the site vicinity map, and Figure 2 displays the proposed site plan for the project. The northern part of the site will be occupied by a Porsche dealership which is currently under construction and is scheduled for occupancy in 2023. Build-out and occupancy of the southern part of the site, which will include a BMW dealership, is anticipated in 2024.

The April 2021 TIA was approved by City of Lynnwood and included both the Porsche and BMW dealerships, albeit assuming they would be constructed only using the site north of Harley Davidson. This document compares the estimated revised trip generation for both dealerships and compares it with the approved trip generation in the April 2021 TIA. As documented herein, the proposed change in site plan will result in a reduction in net new trips on the surrounding roadway system compared to the findings in the April 2021 TIA. As such, the findings and recommendations of the April 2021 remain valid, and no additional mitigation measures are recommended.

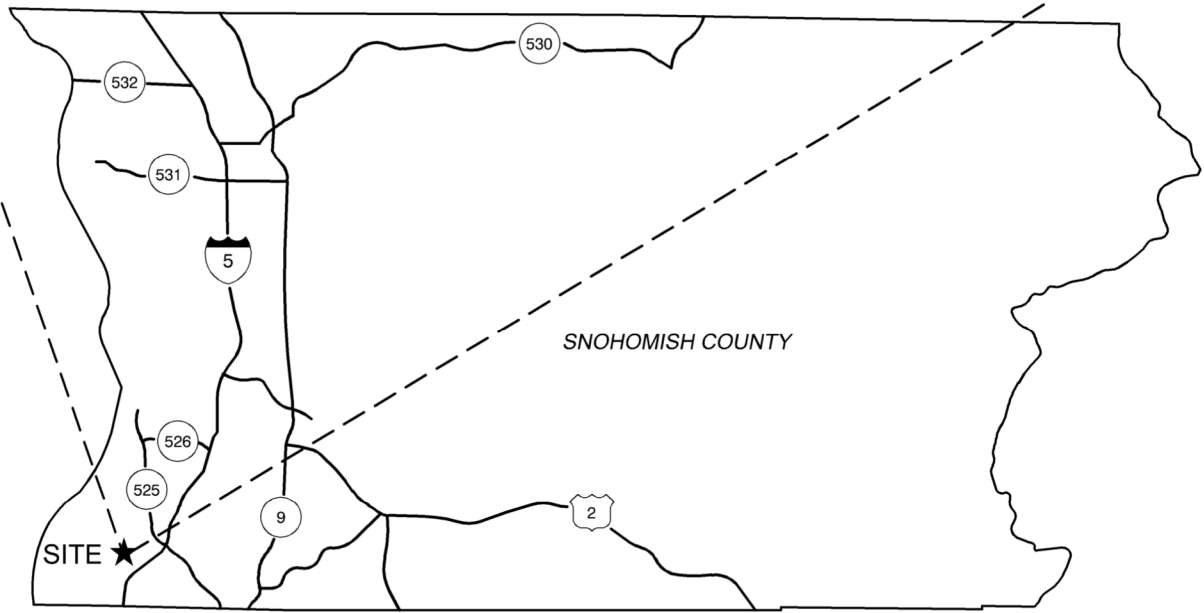
The remainder of this document includes a revised trip assignment (including the approved Porsche dealership, the BMW dealership, and removal of the Harley Davidson trips), updated total traffic conditions assessment after build-out, updated access configuration, and findings and recommendations. *Appendix "A" contains the April 2021 TIA.*

BACKGROUND

The original site plan included a phased development of two automotive dealerships located between the existing Harley Davidson dealership and 186th Place SW, with two site accesses: one full access driveway along the 186th Place SW frontage approximately 350 feet west of SR 99, and the other driveway along the SR 99 frontage approximately 325 feet south of 186th Place SW, to be restricted to right-in/right-out/left-out through the use of a raised separator and revised lane striping within the existing center two-way left-turn lane of SR 99. No internal access through the Harley Davidson dealership to the south was assumed. The April 2021 TIA assumed up to 91,578 square feet of gross floor area for the two dealerships combined.

The scope of work in the April 2021 TIA included the following study intersections:

1. SR 99/188th Street SW
2. SR 99/Site Access (future)
3. SR 99/186th Place SW
4. 186th Place SW/Site Access (future)

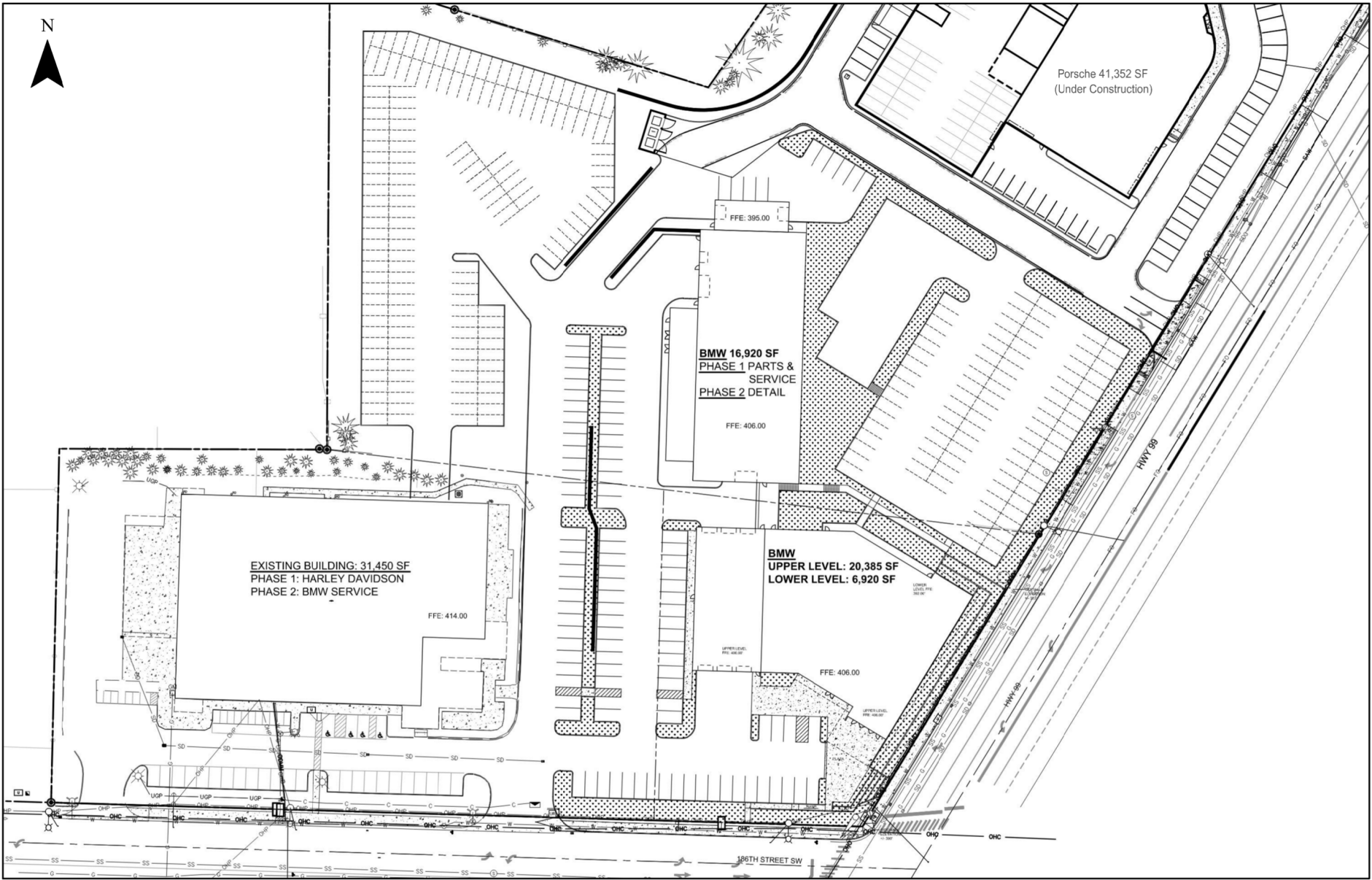


- Study Intersection

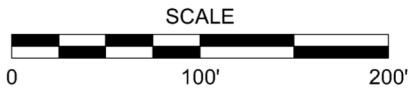
Site Vicinity Map
Lynnwood, Washington

Figure
1

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Site Plan provided by 3J Consulting on 12/14/2022



Proposed Site Plan
Lynnwood, Washington

Figure
2

H:\2020661 - Lynnwood BMW Dealership\report\figs\20661_fig2.dwg Jan 26, 2023 - 7:31am - zbugg Layout Tab: 02 SitePlan

In addition to these four study intersections, the following existing Harley Davidson site accesses have been added to the study for trip tracking purposes only (no additional traffic analysis as a result of a net reduction in trips):

- 5. East Harley Davidson site access/188th Street SW
- 6. West Harley Davidson site access/188th Street SW

TRIP GENERATION

APRIL 2021 SITE PLAN

Trip generation rates for the proposed dealerships were based on the Institute of Transportation Engineers (ITE) *Trip Generation, 10th Edition* (Reference 1). Table 1 displays the approved trip generation for the two dealerships, including a reduction for pass-by trips.

Table 1. Trip Generation (April 2021 TIA)

Building	Land Use	ITE Code	Size (ft ²)	Weekday Trips	Weekday PM Peak Hour Trips		
					Total	In	Out
North dealership	Auto Sales (New)	840	34,076	948	83	33	50
South dealership	Auto Sales (New)	840	57,502	1,600	140	56	84
Total			91,578	2,548	223	89	134
Less Pass-By (20%)*				510	44	22	22
Total Net Trips				2,038	179	67	112

*A localized pass-by rate was identified based on conversations with City staff. The Cities of Burien, WA and Kent, WA both apply a 25% pass-by trip reduction to auto sales land use. Due to the anticipated upscale nature of the proposed dealerships, a lower pass-by trip reduction of 20% was agreed-upon by City staff and applied to the analysis.

ITE has released an updated version of *Trip Generation* (11th Edition) since preparation of the April 2021 TIA. However, the weekday daily peak hour trip generation rate for a new automobile dealership did not change between the 10th and 11th editions. The weekday PM peak hour trip generation rate decreased by less than one percent from the 10th to the 11th edition as a result of one additional study being added to the dataset. Given this small change, the net decrease in estimated trip generation, and a desire for consistency between analyses, the 10th Edition rates are used in this analysis.

PORSCHE DEALERSHIP (ACTUAL BUILT)

While the original 2021 TIA assumed up to 91,578 square feet of new automotive dealership, the actual build-out area for the Porsche dealership will be 41,352 square feet. Table 2 displays the estimated trip generation for the Porsche dealership as planned.

Table 2. Trip Generation (Porsche Dealership – Actual Built)

Building	Land Use	ITE Code	Size (ft ²)	Weekday Trips	Weekday PM Peak Hour Trips		
					Total	In	Out
Porsche dealership	Auto Sales (New)	840	41,352	1,152	100	40	60
<i>Less Pass-By (20%)</i>				230	20	10	10
Total Net Trips				922	80	30	50

By comparing the results of Tables 1 and 2, the as-built size of the Porsche dealership is projected to result in 1,116 fewer weekday trips than the approved trip generation in the April 2021 TIA. Likewise, 99 fewer weekday PM peak hour trips are projected. These are treated as vested trips for the purposes of this analysis.

PROPOSED BMW DEALERSHIP

The gross floor area of the proposed BMW dealership will be up to 88,452 square feet. Table 3 displays the estimated trip generation associated with the BMW dealership.

Table 3. Trip Generation (BMW Dealership)

Building	Land Use	ITE Code	Size (ft ²)	Weekday Trips	Weekday PM Peak Hour Trips		
					Total	In	Out
BMW dealership	Auto Sales (New)	840	88,452	2,462	215	86	129
<i>Less Pass-By (20%)</i>				492	44	22	22
Total Net Trips				1,970	171	64	107

As part of initial construction of the BMW dealership, the east Harley Davidson building (currently 13,583 square feet) will be demolished, and the west Harley Davidson building (currently 31,450 square feet) will remain (continuing to operate as a Harley Davidson Dealership). As part of Phase 2 of the BMW dealership, all of the existing Harley Davidson dealership in the west building will be repurposed to service the BMW dealership. Table 4 displays the estimated trip generation associated with the existing Harley Davidson dealership, which will be credited against the net new BMW trips summarized in Table 3. For simplicity, all of the Harley Davidson trips are combined, even though the west building may not be repurposed as BMW (Phase 2) until several years after construction of the new BMW site. Note that no driveway counts at the Harley Davidson accesses were performed, so the number of trips shown in Table 3 is an estimate based on industry standard references (ITE Trip Generation).

Table 4. Trip Generation (Harley Davidson – to be Removed/Repurposed)

Building	Land Use	ITE Code	Size (ft ²)	Weekday Trips	Weekday PM Peak Hour Trips		
					Total	In	Out
West building	Auto Sales (New)	840	31,450	876	76	30	46
East building	Auto Sales (New)	840	13,583	378	33	13	20
Total			45,033	1,254	109	43	66
Less Pass-By (20%)				250	22	11	11
Total Net Trips				1,004	87	32	55

SUMMARY

Table 5 calculates the net impact of the BMW dealership by subtracting the Harley-Davidson trips and the vested trips from the approved April 2021 TIA from the BMW dealership trips. As shown, build-out of the proposed BMW dealership is projected to result in fewer weekday trips and fewer weekday PM peak hour trips added to the surrounding transportation system than what was approved in the April 2021 TIA, when accounting for the actual build-out area of the Porsche dealership and the removed trips from Harley Davidson.

Table 5. Net New Trip Impact of BMW Dealership

Trip Description	Weekday Trips	Weekday PM Peak Hour Trips		
		Total	In	Out
BMW Dealership – Proposed	1,970	171	64	107
Harley Davidson – to be Removed	-1,004	-87	-32	-55
Remaining Vested Trips – from April 2021 TIA	-1,116	-99	-37	-62
Net New Trip Impact	-150	-15	-5	-10

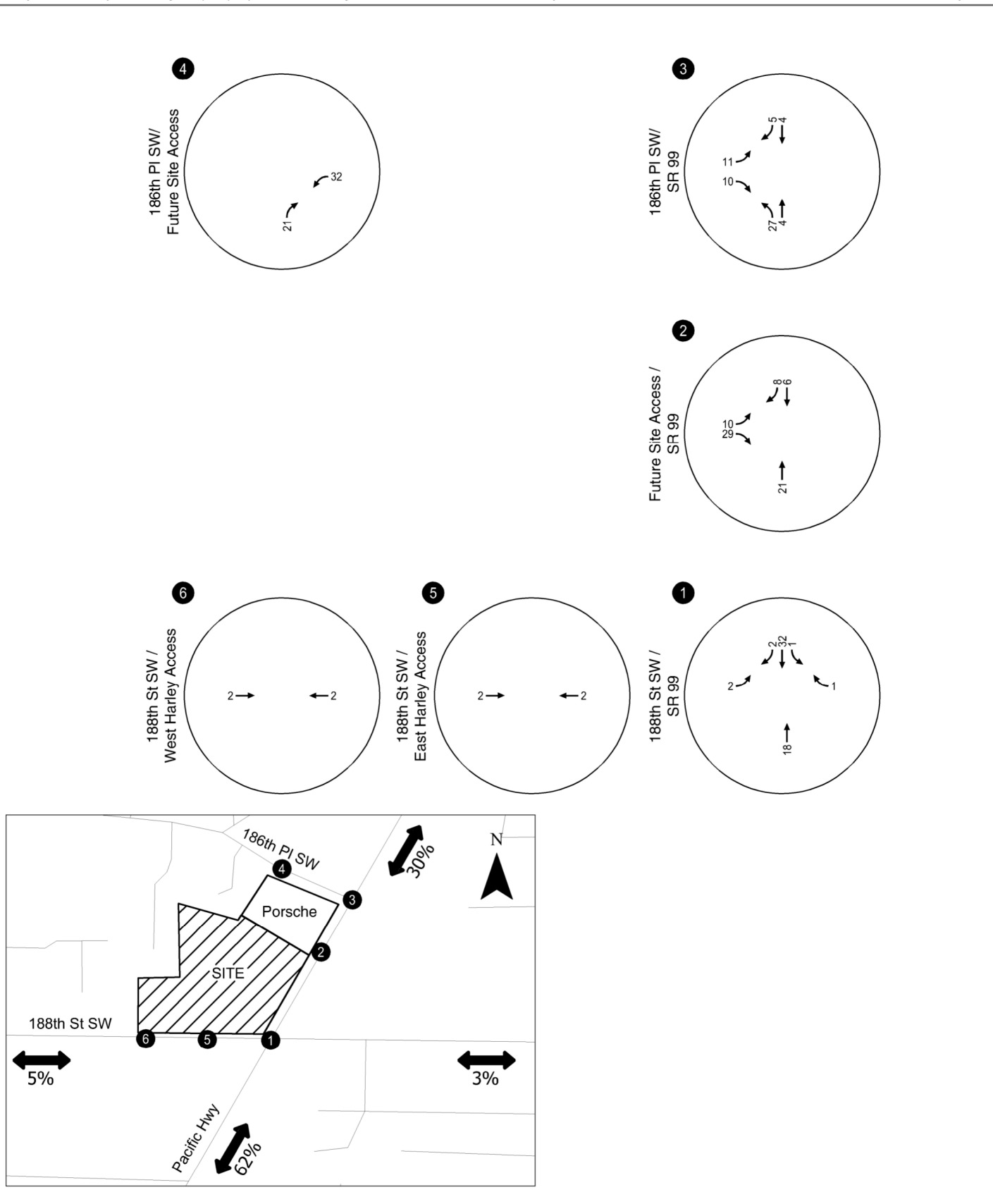
TRIP ASSIGNMENT

While the BMW dealership is not projected to result in an impact to the transportation system beyond what was shown in the April 2021 TIA, it will shift some of the proposed building area closer to the existing Harley Davidson accesses on 188th St SW. Furthermore, internal connectivity will be provided between the Porsche and BMW dealerships, therefore potentially distributing trips to the site driveways more evenly. The following figures document the net driveway trip assignment (net new plus pass-by) for the combined BMW and Porsche site:

- Figure 3 – Revised Porsche Trip Assignment
- Figure 4 – BMW Trip Assignment
- Figure 5 – Harley Davidson Trips to be Removed
- Figure 6 – Net Driveway Trips (summation of Figures 3 and 4, less Figure 5)

Note that the assumed trip distribution from the April 2021 TIA was used for consistency.

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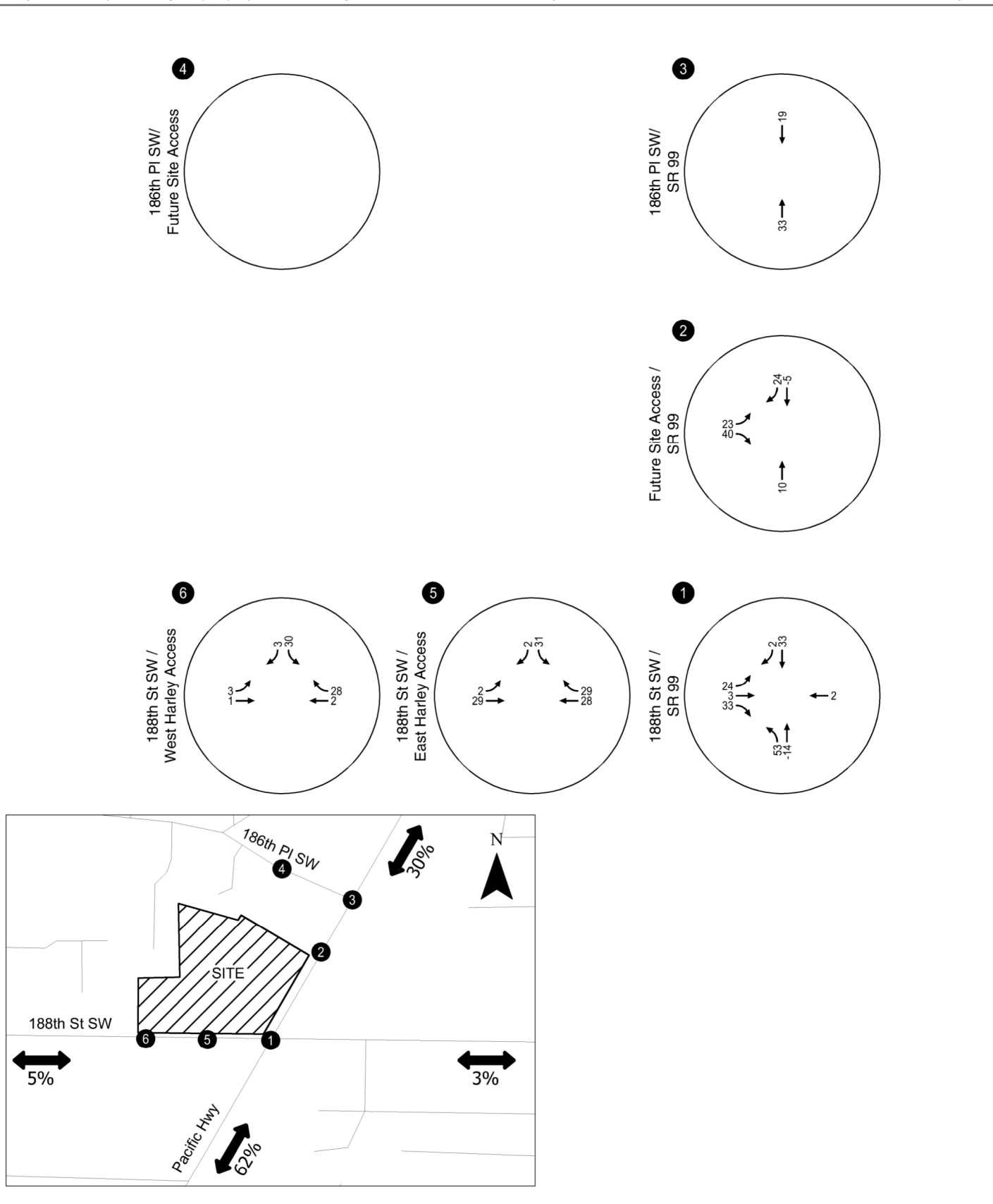


- TRIP DISTRIBUTION
 XX%
 Negative values indicate pass-by trips

Revised Porsche Dealership Trips
 Weekday PM Peak Hour
 Lynnwood, Washington

Figure
 3

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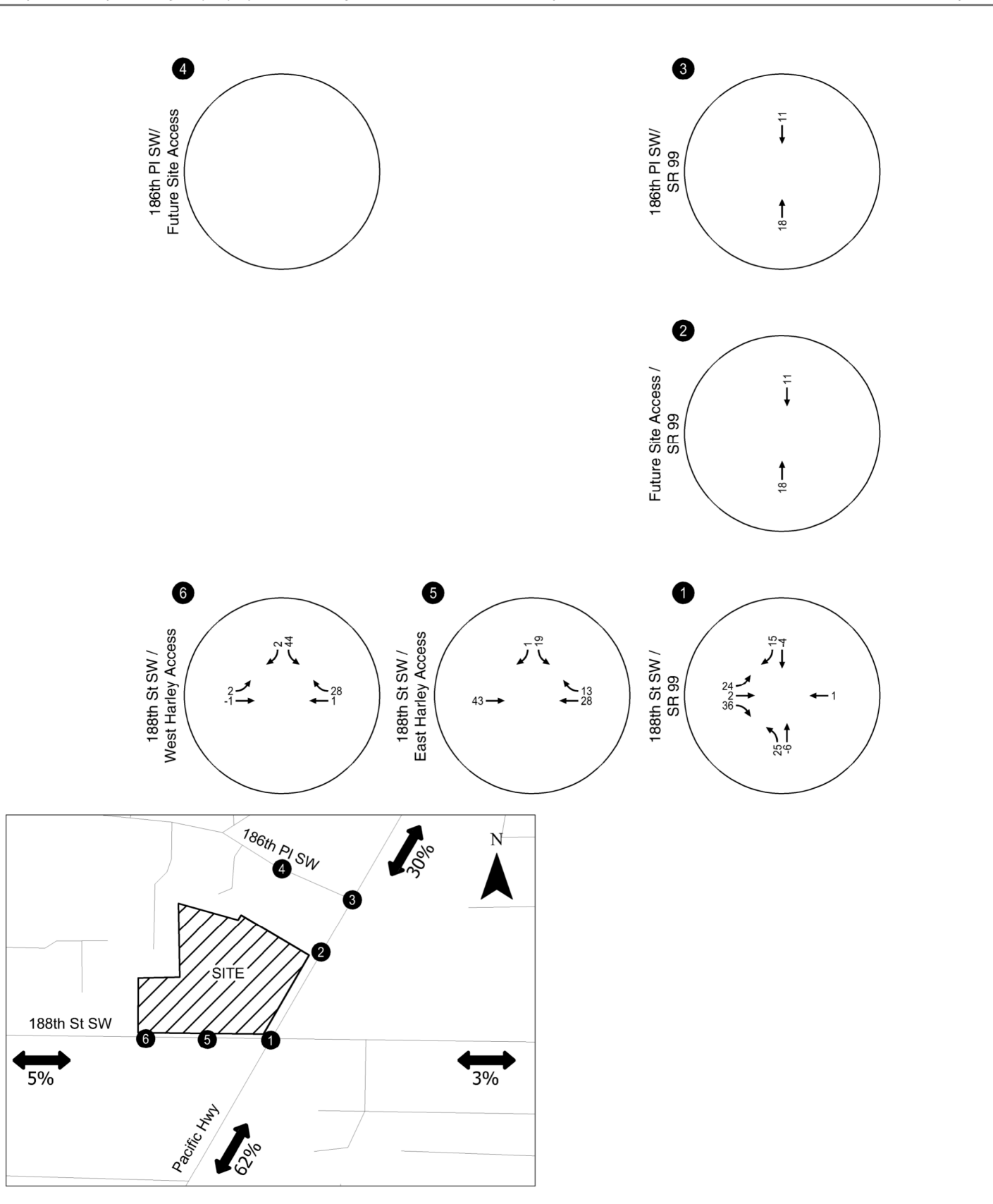


- TRIP DISTRIBUTION
 XX%
 Negative values indicate pass-by trips

BMW Dealership Trips
Weekday PM Peak Hour
Lynnwood, Washington

Figure
4

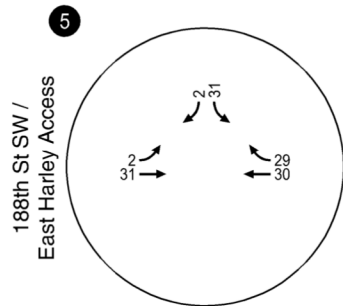
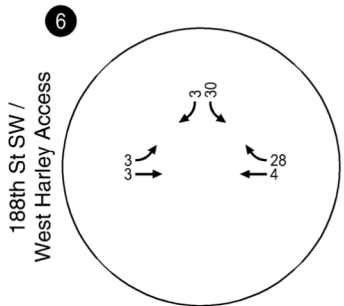
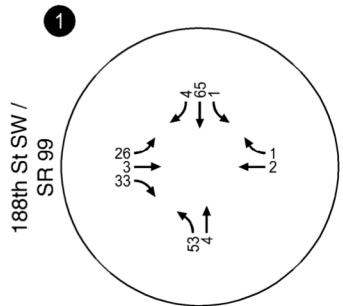
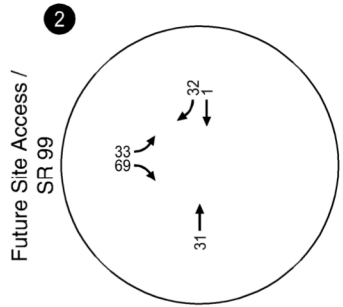
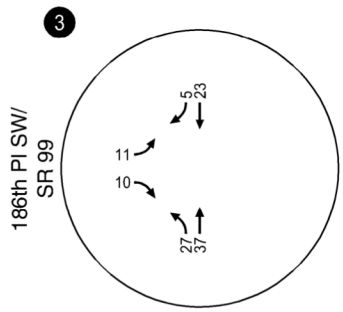
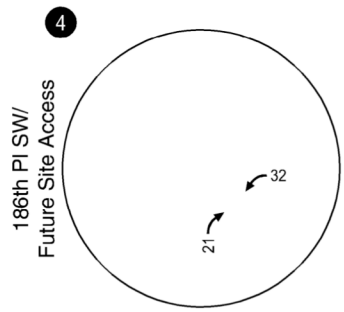
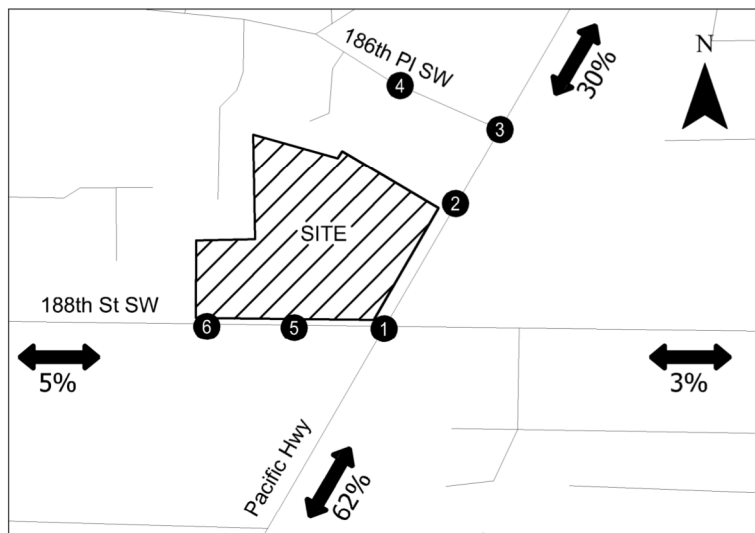
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Harley Davidson Trips (To Be Removed)
Weekday PM Peak Hour
Lynnwood, Washington

Figure 5

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XX% - TRIP DISTRIBUTION
Negative values indicate pass-by trips

Net Driveway Trips
Weekday PM Peak Hour
Lynnwood, Washington

Figure
6

TOTAL BUILD-OUT TRAFFIC CONDITIONS

Figure 7 displays the year 2022 background traffic volumes (prior to build-out of either dealership) from the April 2021 TIA. The net new driveway trips shown in Figure 6 were added to the weekday PM peak hour background traffic volumes in Figure 7 to arrive at the revised build-out year total traffic volumes, shown in Figure 8. The original 2021 TIA assumed a build-out year of 2022. For purposes of consistency, the build-out year has been kept at 2022 (no additional background traffic growth has been added).

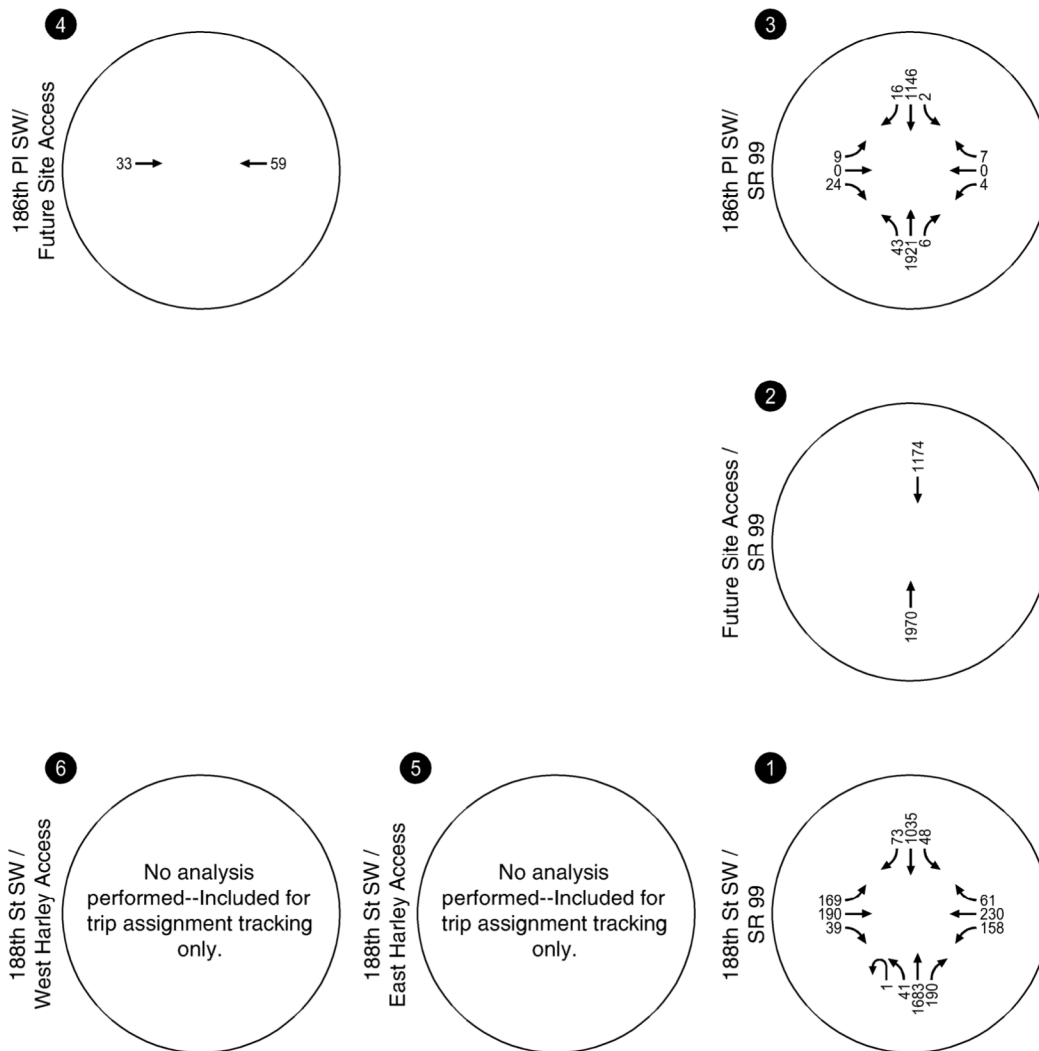
Figure 7 also displays the corresponding traffic operations at the original study intersections from the April 2021 TIA. As shown, each of the study intersections are projected to continue meeting applicable operating standards after full build-out of the BMW dealership. Appendix "B" contains the revised year 2022 total traffic analysis worksheets.

95TH-PERCENTLINE QUEUING ANALYSIS

Table 6 displays the revised 95th-percentile queues at the study intersections under total traffic conditions after full build-out of the BMW dealership. As shown, all queues are projected to be accommodated within the existing turn lane storage lengths, with the following exceptions:

Table 6. Summary of 95th-percentile Queues

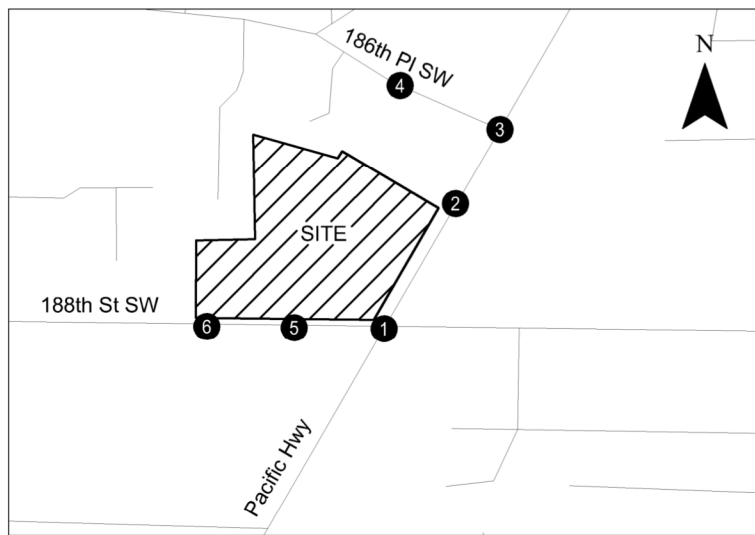
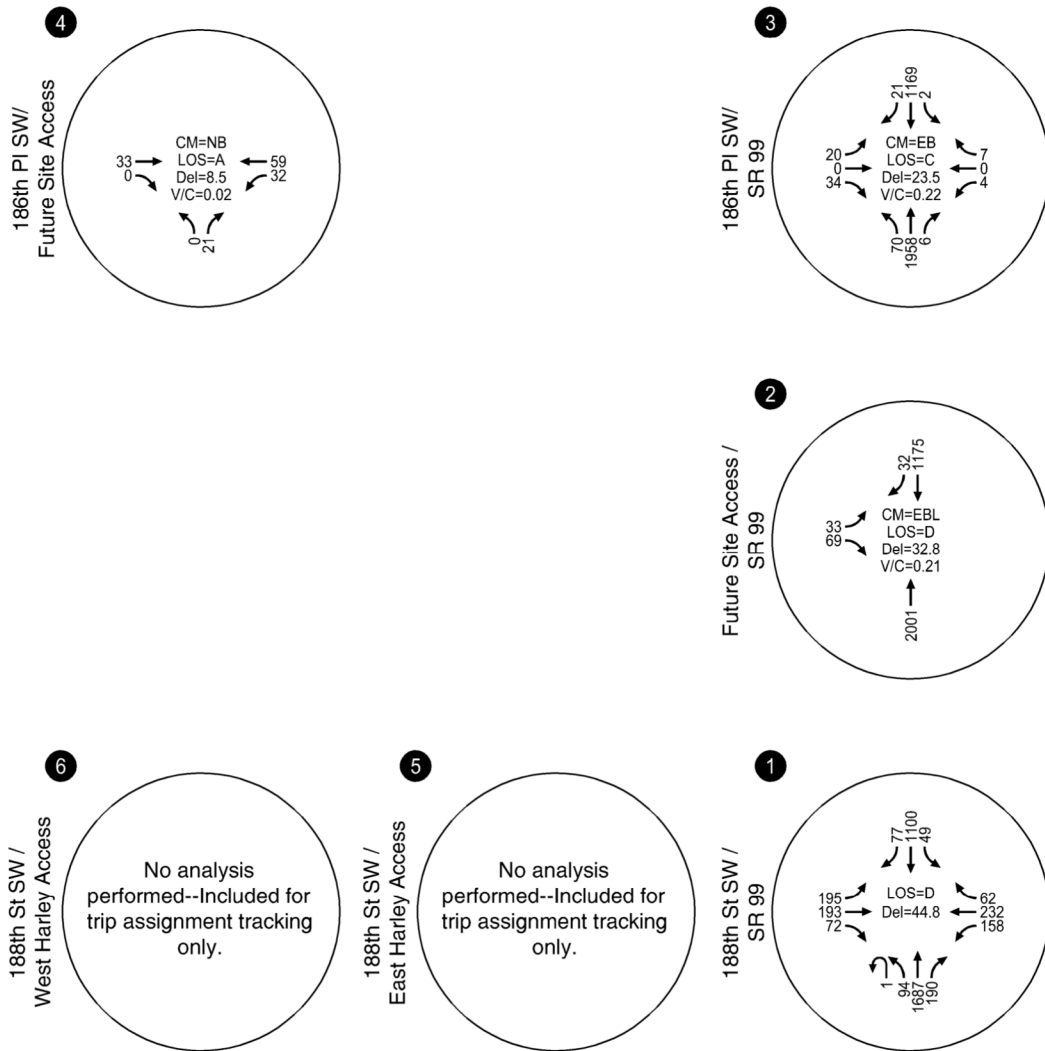
Intersection	Movement	Queue Storage (ft)	95 th -percentile Queue (ft), 2022 Total Traffic	Adequate Storage Provided?
1: SR 99/ 188 th Street SW	EB L	140	375	No
	EB T/R	-	300	Yes
	WB L	160	300	No
	WB T/R	-	500	Yes
	NB L	220	175	Yes
	NB T	-	925	Yes
	NB R	-	25	Yes
	SB L	140	100	Yes
	SB T	-	550	Yes
	SB R	-	25	Yes
2: SR 99/ Site Access	EB L	25*	25	Yes
	EB R	25*	25	Yes
3: SR 99/ 186 th Place SW	EB L/T/R	-	25	Yes
	WB L/T/R	-	25	Yes
	NB L	100	25	Yes
	SB L	100	<25	Yes
4: 186th Place SW/ Site Access	WB L/T	-	25	Yes
	NB L/R	25*	25	Yes



Year 2022 Background Traffic Volumes
Weekday PM Peak Hour
Lynnwood, Washington

Figure
7

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Revised Year 2022 Total Traffic Conditions
Weekday PM Peak Hour
Lynnwood, Washington

Figure
8

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)
 CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

As shown, all queues are projected to continue to be accommodated within the existing turn lane storage lengths during the weekday PM peak hour after full build-out of the proposed BMW dealership. Note the following queues may extend into the two-way center turn lane:

- The eastbound left-turn queue on 188th Street SW at SR 99 is projected to exceed the painted storage length; however, the estimated queue of 375 feet can be accommodated within the existing two-way left-turn lane.
- The westbound left-turn queue on 188th Street SW at SR 99 is projected to exceed the painted storage length; however, the estimated queue of 300 feet can be accommodated within the existing two-way left-turn lane.

As such, no improvements are recommended to address queuing related deficiencies at the study intersections as a result of the traffic volumes associated with the proposed BMW dealership.

FINDINGS AND RECOMMENDATIONS

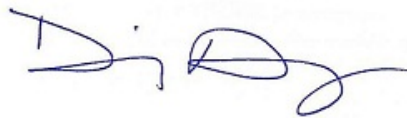
Based on the results of this TIA update, the proposed BMW dealership can be developed while maintaining acceptable levels of service at the study intersections. No additional recommendations are proposed beyond those identified in the April 2021 Lynnwood Automotive Dealerships TIA.

We trust this document adequately addresses the transportation-related impacts of the proposed dealerships. If you have any questions, please contact us at 503-535-7462.

Sincerely,
KITTELSON & ASSOCIATES, INC.



Zachary Bugg, PhD
Associate Engineer



Diego Arguea
Associate Engineer



Anthony Yi, PE
Senior Principal Engineer

REFERENCES

1. Institute of Transportation Engineers. *Trip Generation, 10th Edition*. ITE: Washington, DC, 2017.

APPENDIX

- A. April 2021 Lynnwood Automotive Dealerships Transportation Impact Analysis
- B. Revised 2022 Total Traffic Conditions Traffic Analysis Worksheets

Appendix A

April 2021 Lynnwood Automotive Dealerships Transportation Impact Analysis

April 23, 2021

Project #: 25946

Paul Coffelt
City of Lynnwood
20816 44th Ave. W, STE 230
Lynnwood, WA 98046-5008

RE: Transportation Impact Analysis (TIA) for the Lynnwood Automotive Dealerships

Dear Paul,

Two new automotive dealerships are being proposed on one site along SR 99 in Lynnwood, Washington. The site is located between 186th Place SW and 188th Street SW, is bounded by single-family homes to the north and west and is bounded by an existing Harley Davidson motorcycle dealership to the south. A site vicinity map is provided in Figure 1.

The proposed dealerships will be accessed via two driveways, one on SR 99 and one on 186th Place SW. Occupancy of the dealerships is expected in 2022. Figure 2 displays the proposed site plan for the project.

This study has been prepared to analyze the impacts of the proposed dealerships, consistent with City requirements. As documented herein, the proposed dealerships can be constructed while maintaining acceptable traffic operations and safety at the study intersections, provided the following mitigation measures and recommendations.

Mitigation Measures

- Provide a full-access driveway on 186th Place SW per the proposed site plan (see page 4, Figure 2).
- Provide a right-in, right-out, left-out driveway on SR 99 per the proposed site plan (see page 4, Figure 2). Construct a raised traffic separator and provide revised lane striping at the site driveway at SR 99 to restrict left-in movements into the site from SR 99. A concept design is provided in Exhibit 1 of this report (see page 13), and additional details are provided with the civil engineering drawings under separate cover.

Recommendations

- At the time of building permit, refer to the localized trip generation information presented in Table 9 of this report. The resultant trip generation is estimated at 148 weekday PM peak hour trips (64 inbound and 84 outbound).

- Landscaping, signage, and above-ground utilities along the site frontage and near the site access should be located and maintained so that adequate sight distance can be provided at the site access driveways on SR 99 and 186th Place SW.

Additional details of the methodology, findings, and recommendations are provided herein.

STUDY SCOPE AND ANALYSIS METHDOLOGY

This section provides an overview of the TIA scope, methodology, applicable operating standards, and report structure.

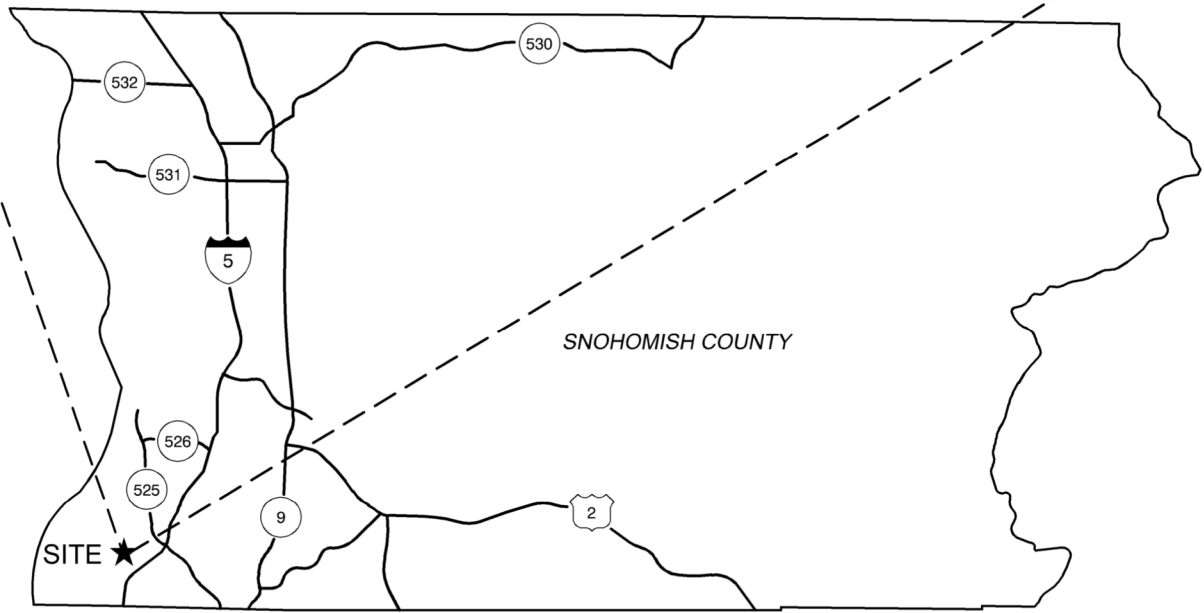
Study Scope

This report identifies the transportation-related impacts associated with the proposed dealerships. The study intersections and scope were developed through email correspondence with City staff. Operational analyses were performed during the weekday PM peak period at four affected intersections. For ease of review, the intersections listed below are numbered to correspond with the numbering of the report figures.

1. SR 99/188th Street SW
2. SR 99/Site Access (future)
3. SR 99/186th Place SW
4. 186th Place SW/Site Access (future)

This report evaluates the following transportation issues:

- Existing intersection operations, including control delay, and 95th percentile queuing analysis;
- Crash data analysis for the most recent five-year period;
- Year 2022 background conditions analysis;
- Year 2022 (anticipated buildout and occupancy) total conditions analysis, assuming construction of the dealerships; and
- Conclusions and recommendations.

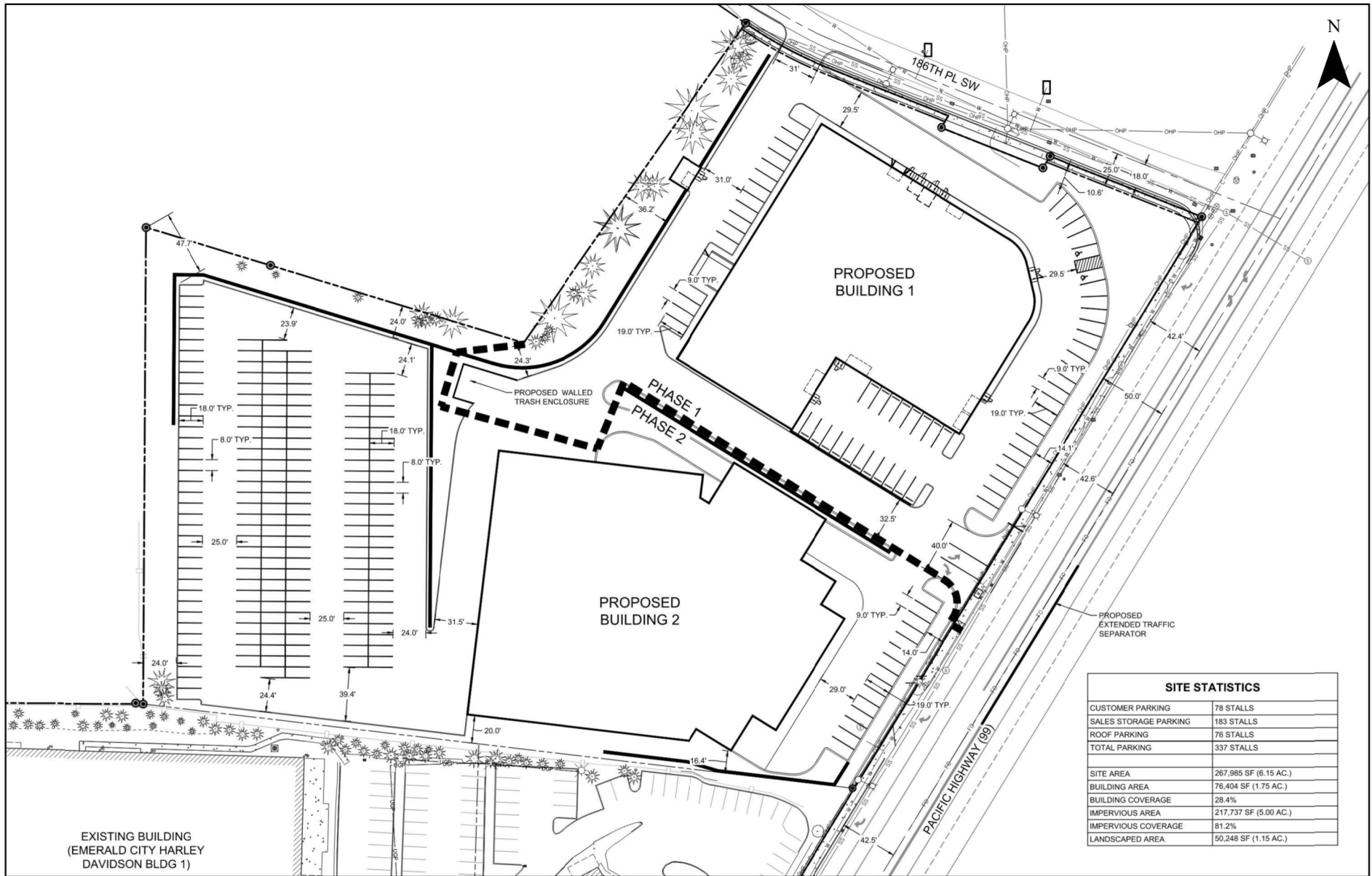


- Study Intersection

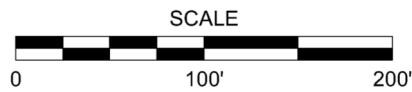
Site Vicinity Map
Lynnwood, Washington

Figure
1

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Site Plan provided by 3J Consulting on 4/8/2021



Proposed Site Plan
Lynnwood, Washington

Figure
2

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Applicable Operating Standards and Analysis Methodology

Per the City of Lynnwood Comprehensive Plan (Reference 1), the acceptable level of service (LOS) standard during the PM peak hour is “E” for arterials and “C” for local streets for state highway sections identified as Highways of Statewide Significance (HSS). The section of SR 99 through Lynnwood is not classified as HSS, and the corresponding LOS standard for the critical movement is LOS “E” (Comprehensive Plan, Page 5.13). Per the WSDOT Level of Service Standard for State Routes (Reference 2), the LOS standard for SR 99 is “E.”

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the *Highway Capacity Manual, 6th Edition* (HCM 6th Edition, Reference 3). The analysis herein evaluates the peak 15-minute flow rate during the peak hour analysis period¹. For this reason, the analyses reflect conditions that are only likely to occur for 15-minutes out of each average peak hour and will likely operate more efficiently during the other times of day. The study intersections were analyzed using the Synchro 10 software package.

EXISTING CONDITIONS

The existing conditions analysis identifies site conditions and the current operational and geometric characteristics of roadways within the study area. The purpose of this section is to set the stage for a basis of comparison to future conditions.

Site Conditions and Adjacent Land Uses

The site is currently vacant and is zoned as HMU (Highway 99 Mixed Use), bordered by single-family homes to the north and west and an existing Harley Davidson motorcycle dealership to the south.

Transportation Facilities

Table 1 summarizes the existing transportation characteristics of the key roadways located within the study area. Figure 3 illustrates the existing lane configurations and traffic control devices in place at the study intersections and the proposed lane configurations at the site driveways. Note a continuous right turn/bus/bike lane is provided in both directions in SR 99 through the study area. To reflect a conservative analysis, no through vehicles were assumed to use these lanes.

¹WSDOT level of service standards apply to a peak hour of analysis; therefore, the level of service and queuing results shown on SR 99 may operate better than what is shown for the 15-minute analysis.

Table 1. Existing Transportation Facilities

Roadway	Classification ¹	Cross Section	Speed Limit (mph)	Sidewalks	Bicycle Lanes	Median	On-street parking
SR 99	Principal Arterial	7 lanes	45	Yes	Yes	TWLTL ²	No
186 th Place SW	Local Street	2 lanes	25	No	No	None	No
188 th Street SW	Major Collector ³	3 lanes	30	Yes	Yes	TWLTL	No

¹Per Lynnwood Comprehensive Plan (Reference 1)

²TWLTL: Two-way left-turn lane

³Per WASHDOT Functional Classification Map

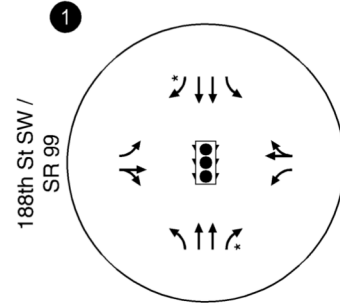
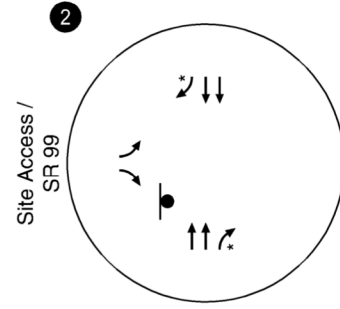
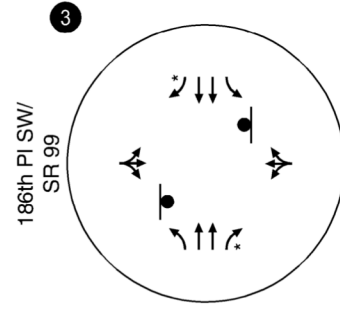
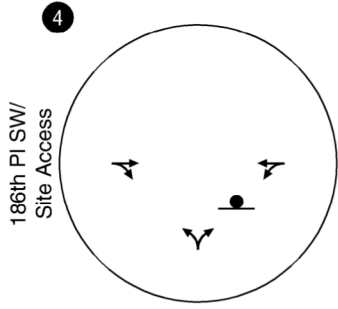
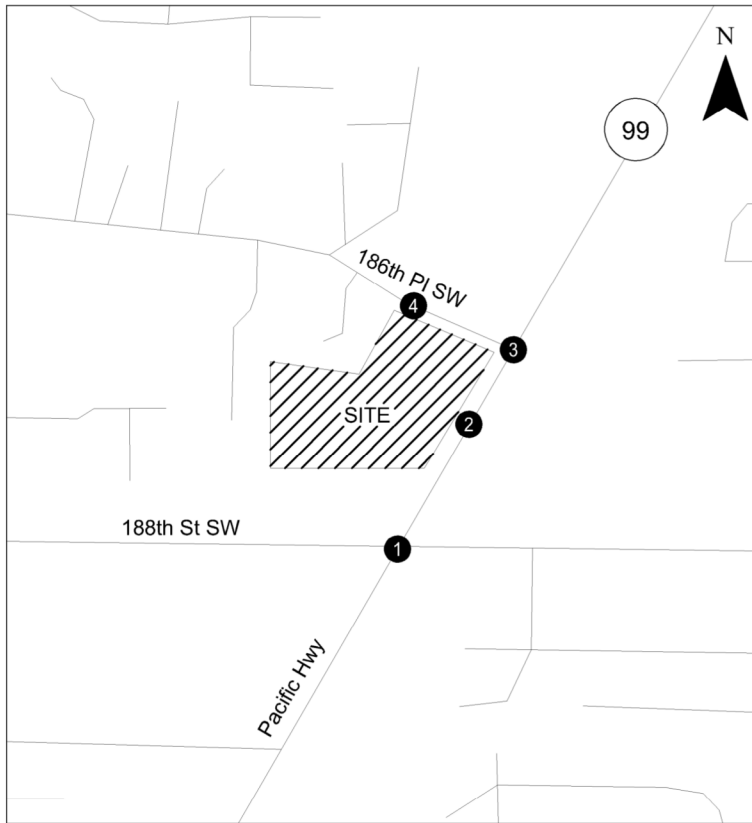
Pedestrian and Bicycle Facilities



Both SR 99 and 188th Street SW have sidewalks on both sides of the road. 186th Place SW has sidewalks only on the north side of the road at the intersection with Highway 99, and no other sidewalks are provided along 186th Place. Bicycle lanes are striped on either side of 188th Street SW, and there is a shared bus/bike lane present on either side of SR 99. There are no bike lanes present on 186th Place SW.

Transit Facilities

Local bus service is provided by Community Transit, with two routes passing the site along SR 99. The 101 route runs 2-3 times an hour during the peak hour, and the Swift Blue runs every 10 minutes during the peak hour. The nearest northbound stop (serving the 101 bus) is located directly across the street from the site, and the nearest southbound stop (also serving the 101 bus) is provided 600 feet south of the site. (Reference 4). SR 99 is a transit signal priority corridor, but due to the heavy peak hour passenger car volume in both directions of SR 99 and long green intervals for through traffic, transit signal priority phasing was not reflected in the Synchro model.

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-  - STOP SIGN
-  - TRAFFIC SIGNAL

*Buses/bicycles may use as through lane

Lane Configurations and Traffic Control Devices
Lynnwood, Washington

Figure 3

Existing Traffic Volumes and Peak Hour Operations

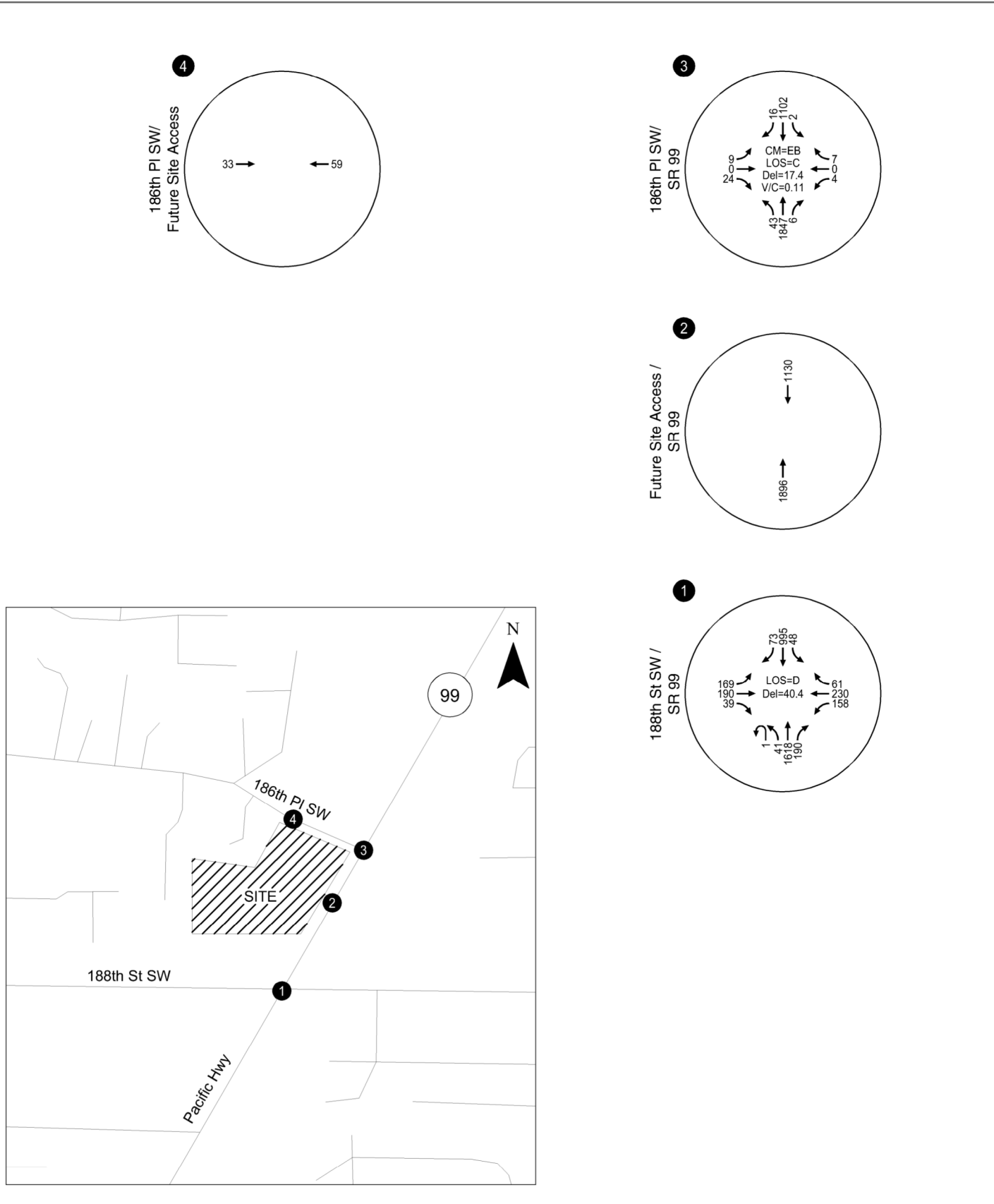
The turning movement traffic volumes used in this analysis were conducted at the study intersections in July 2018, and the afternoon system peak hour was identified as 5:00 – 6:00 PM. At the time of report preparation, the State of Washington had not yet returned to traffic volumes typical of pre-COVID-19 traffic levels. As a result, it was not possible to collect more recent typical traffic count volume data at the study intersections. City of Lynnwood staff provided traffic count data at the study intersections collected in July 2018, as well as signal detector data from the SR 99/188th Street SW intersection from February 2018 and February 2020 for comparison. Note that the detector data reflect the number of detector actuations recorded during the PM peak hour, which is typically lower than the actual traffic volume. Table 2 provides a comparison of the 2018 and 2020 detector data.

Table 2. Comparison of Detector Data at SR 99/188th Street SW

Date	Total Entering Volume (Detector Actuations Only)
February 14, 2018 (Wednesday)	3,574
February 12, 2020 (Wednesday)	2,969
Change	-17%

As shown, the detector volume decreased by 17 percent from 2018 to 2020. Assuming the ratio of traffic volume to detector actuations remained the same within that time span, this would indicate a decrease in overall traffic volumes since 2018. This reduction was assumed to be a result of the impact of the COVID-19 pandemic, and the decrease in detector volume also confirmed that current traffic count volumes would not reflect accurate operating conditions. At the direction of the City, the 2018 traffic count volumes were used to develop year 2020 base volumes by applying a two percent annual growth factor to the traffic volumes on mainline SR 99. Figure 4 summarizes the existing conditions year 2020 turning movement counts used in this analysis at each of the study intersections during the weekday PM peak hour. *Appendix “A” includes the traffic count data used in this study.*

The volumes shown in Figure 4 were used to assess the existing operations at the study intersections. City of Lynnwood staff provided the signal timing information for the SR 99/188th Street SW intersection, which operates under adaptive signal control. As shown, all the study intersections currently meet City and WSDOT standards. Note the westbound approach at the 186th Place SW/SR 99 intersection, which is an unsignalized driveway at the Eunia Plaza, currently operates at LOS E under the weekday PM peak hour. No level-of-service standard is defined for driveways – as such, per direction of City of Lynnwood engineering staff, the critical movement reported in corresponding figures and in the report narrative reflect the operations of the eastbound approach on 186th Place SW intersection. *Appendix “B” includes the existing conditions traffic analysis worksheets.*



Existing Traffic Conditions
 Weekday PM Peak Hour
 Lynnwood, Washington

Figure
 4

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)
 CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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WSDOT Crash Data

WSDOT provided the latest five years of available reported crash data at the study intersections, summarized in Table 3 below.

Table 3. Summary of WSDOT Crash Data (December 1, 2015 to November 30, 2020)

Intersection	Crash Severity			Crash Type							Total Crashes	Crash Rate
	Fatal	Injury	PDO*	Rear End	Angle	Turning	Sideswipe	Bicycle	Head On	Fixed Object		
SR 99/188 th St SW	0	20	54	45	15	6	5	1	1	1	74	1.09**
SR 99/186 th Pl SW	1	5	14	11	5	2	2	0	0	0	20	0.38**

*Property damage only

**Reported crashes per million entering vehicles

SR 99/188th Street SW experienced an average of approximately 15 crashes a year, with approximately 70% of these being property-damage only during varying times of day and varying weather conditions. No fatal crashes were identified. The majority of these crashes were rear-end incidents.

SR 99/186th Place SW experienced an average of 4 crashes per year, with one fatal crash in 2020 involving a southbound motorcycle on SR 99 and a northbound left turning movement—this crash occurred during daylight hours under dry roadway conditions, and no contributing factor was listed in the detailed crash history report provided by WSDOT. Approximately 70% of the crashes were property damage only, and approximately half were rear-end incidents (predominantly on southbound SR 99).

At the time of preparation of this report, no WSDOT STIP² projects are identified at either study intersection. Based on review of the crash data and the operations analysis herein, no patterns or trends were identified that would trigger safety-related mitigation as a result of the added site development traffic. The addition of sidewalks and related frontage improvements along 186th Place SW associated with site development are expected to improve sight distance on the southwest corner of the SR 99 intersection.

Appendix “C” contains the raw crash data from WSDOT.

² Statewide Transportation Improvement Program (2020-2023)

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system will operate in the year 2022 when the proposed dealerships are expected to be fully built and occupied. The impact of site-generated traffic during the typical weekday PM peak hour was examined as follows:

- Year 2022 background traffic conditions (build-out year without the incremental increase in dealership-generated traffic) were analyzed at each of the study intersections;
- New site-generated trips were estimated for build-out of the dealerships and distributed to the study area intersections; and
- Year 2022 total traffic conditions (including dealership-generated trips) were analyzed at each of the study intersections.

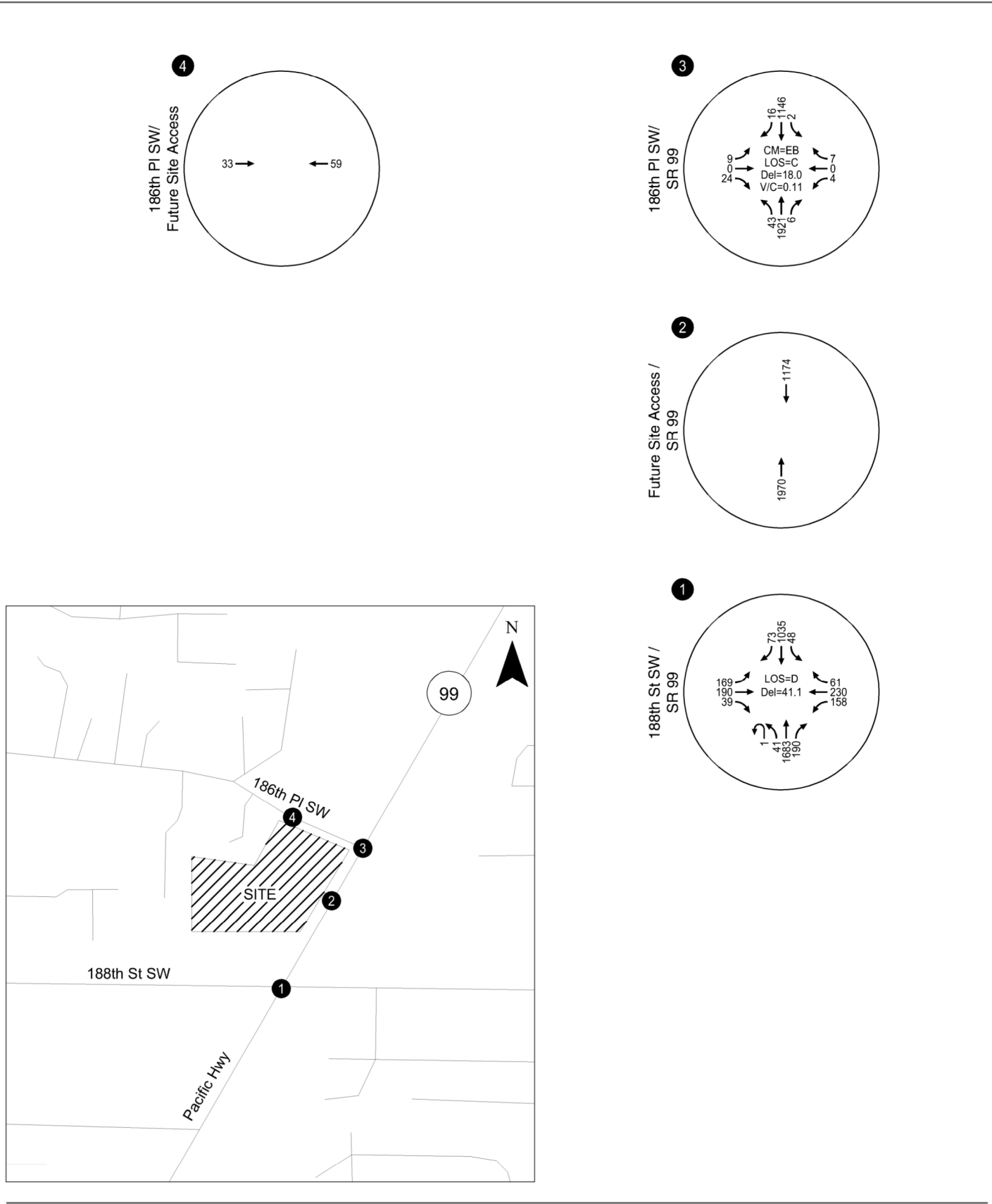
2022 Background Traffic Conditions

The background traffic analysis identifies how the study area's transportation system will operate in the year the proposed dealerships are expected to open (2022). No funded transportation improvement projects were identified in the analysis that would affect the study intersections. At the direction of the City, a two percent annual growth rate was applied to the existing mainline traffic volumes on SR 99 to account for general traffic growth in the site vicinity. Traffic volumes on 188th Street SW and 186th Place SW were not increased in the 2022 background traffic conditions.

In addition to the background growth assumption, one in-process development was identified by the City: a proposed UPS Distribution Center at 18100 Highway 99. City engineering staff indicated that this development's trip generation would not have a measurable impact on the intersections in this study area during the PM peak hour. Therefore, no additional in-process trips were added to the background traffic volumes beyond the two percent annual growth that represents general regional growth in the area.

Figure 5 illustrates the resulting forecast 2022 background traffic volumes at the study intersections during the weekday PM peak hour. As shown, all study intersections are forecast to continue operating acceptably during the weekday PM peak hour.

Appendix "D" contains the year 2022 background traffic analysis worksheets.



Year 2022 Background Traffic Conditions
 Weekday PM Peak Hour
 Lynnwood, Washington

Figure 5

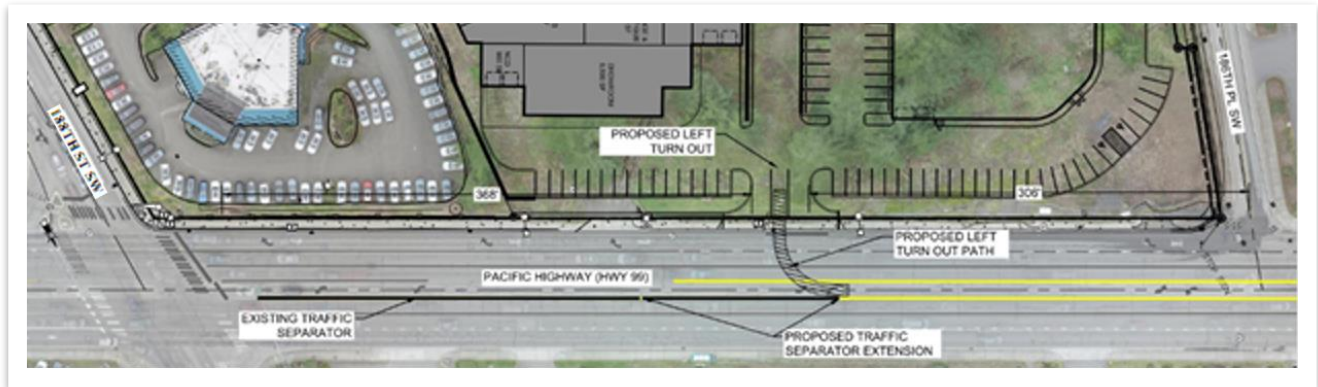
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 LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)
 CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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Proposed Development Plan

The proposed development plan includes two auto dealerships which will be constructed on a phased timeline. This analysis includes the full development scenario, and any construction phasing will be coordinated between the applicant and City staff. Based on the current site plan, one driveway is proposed along the SR 99 frontage approximately 325 feet south of 186th Place SW. This driveway will provide turning movements restricted to right-in-right-out and left-out to SR 99. No left-in movement will be permitted, restricted by the raised median as shown in Figure 2 and further illustrated in Exhibit 1 below. Additional details and conceptual exhibit of the potential design are included as part of the application package under separate cover. A conceptual rendering of the median treatment and resultant center-lane striping is shown below in Exhibit 1.

Exhibit 1. Left-Out Median Treatment



In addition to access to SR 99, one full access driveway is proposed along the 186th Place SW frontage approximately 350 feet west of SR 99. Occupancy of the dealerships is assumed to occur in 2022, and the analysis herein includes full buildout of the site.

Trip Generation

Trip generation rates for the proposed dealerships were prepared based on the Institute of Transportation Engineers (ITE) *Trip Generation, 10th Edition* (Reference 5). Table 4 displays the estimated trip generation for the proposed dealerships. To reflect a conservative analysis, no trips were internalized between the two dealerships.

Table 4. Trip Generation

Building	Land Use	ITE Code	Size (ft ²)	Weekday Trips	Weekday PM Peak Hour Trips		
					Total	In	Out
North dealership	Auto Sales (New)	840	34,076	948	83	33	50
South dealership	Auto Sales (New)	840	57,502	1,600	140	56	84
Total			91,578	2,548	223	89	134
<i>Less Pass-By (20%)*</i>				510	44	22	22
Total Net New Trips				2,038	179	67	112

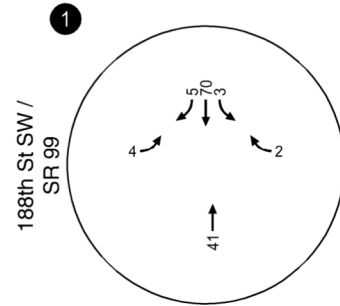
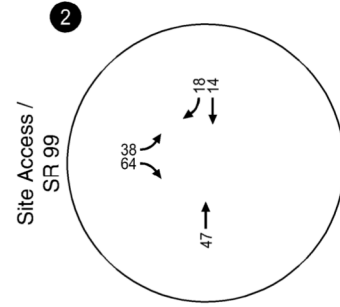
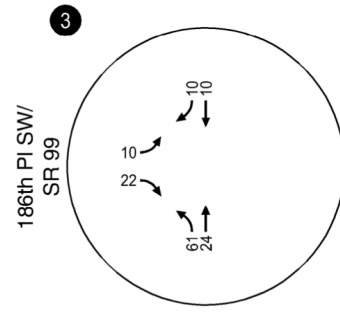
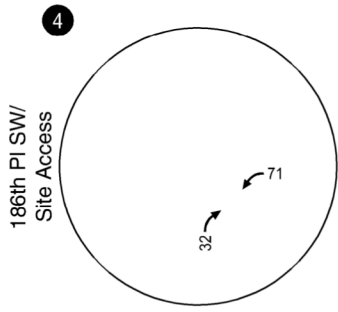
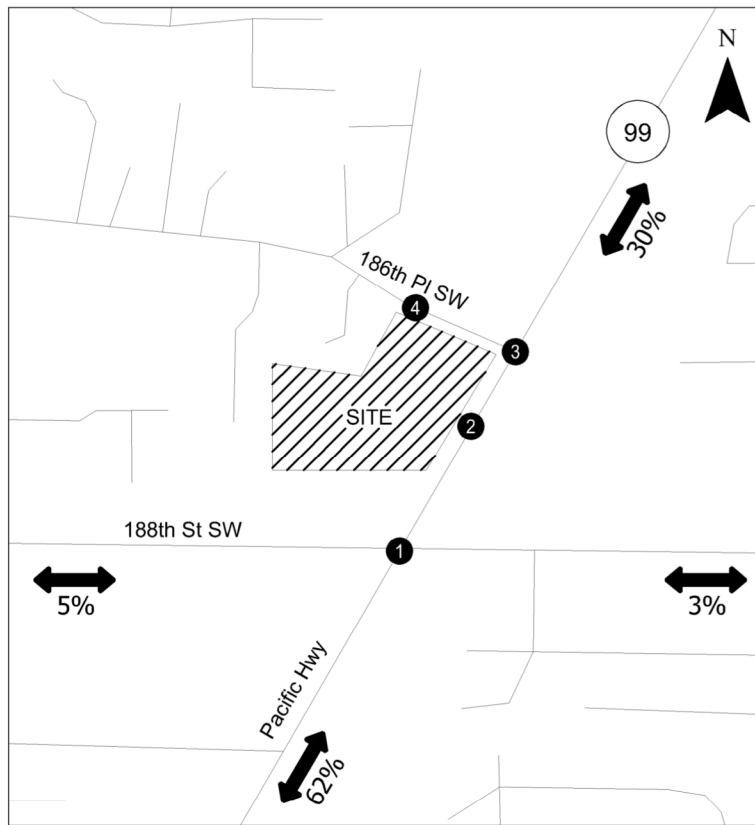
*A localized pass-by rate was identified based on conversations with City staff. The Cities of Burien, WA and Kent, WA both apply a 25% pass-by trip reduction to auto sales land use. Due to the anticipated upscale nature of the proposed dealerships, a lower pass-by trip reduction of 20% was agreed-upon by City staff and applied to the analysis.

The above trip generation estimate is based on national rates published by ITE and was used in this analysis for the purposes of reflecting a reasonable worst-case trip generation scenario on the roadway system. Local data was collected at three similar auto dealerships in Lynnwood and the resulting trip generation at similar dealerships is lower than that in Table 4. As such, the analysis in this report reflects reasonable worst-case trip generation impacts, and the actual operations of intersections and driveways are expected to be better than the conditions presented herein. The local data summarized later in this report should be applied to the calculation of the site Transportation Impact Fee (TrIF) at the time of building permit. Additional details of the local trip generation data are provided at the end of this report in the *TrIF Considerations* section.

Trip Distribution/Assignment

The trip distribution pattern for the proposed dealerships was developed based on existing travel patterns and a review of the market share analysis for the automobile dealerships. As shown in Figure 6, 30 percent of site-generated trips were assumed to be distributed to/from the north on SR 99 and 70 percent of site-generated trips were assumed to be distributed to/from the south on SR 99 (and then distributed according to existing turning movement volumes at SR 99/188th Street SW) based on market and demographic data provided by the applicant. This analysis also assumes all vehicle trips originate to/from SR 99. Recognizing that there may be a small percentage of vehicles that originate from the west, this assumption reflects a potential reasonable worst-case impact to the 186th Place SW/SR 99 intersection.

H:\2528946 - Lynnwood Holman Automotive\figs\2528946_fig6.dwg Apr 09, 2021 - 7:38am - zbugg Layout Tab: 06 TripDist



XX% - TRIP DISTRIBUTION
 Negative values indicate pass-by trips

Site-Generated Trips
 Weekday PM Peak Hour
 Lynnwood, Washington

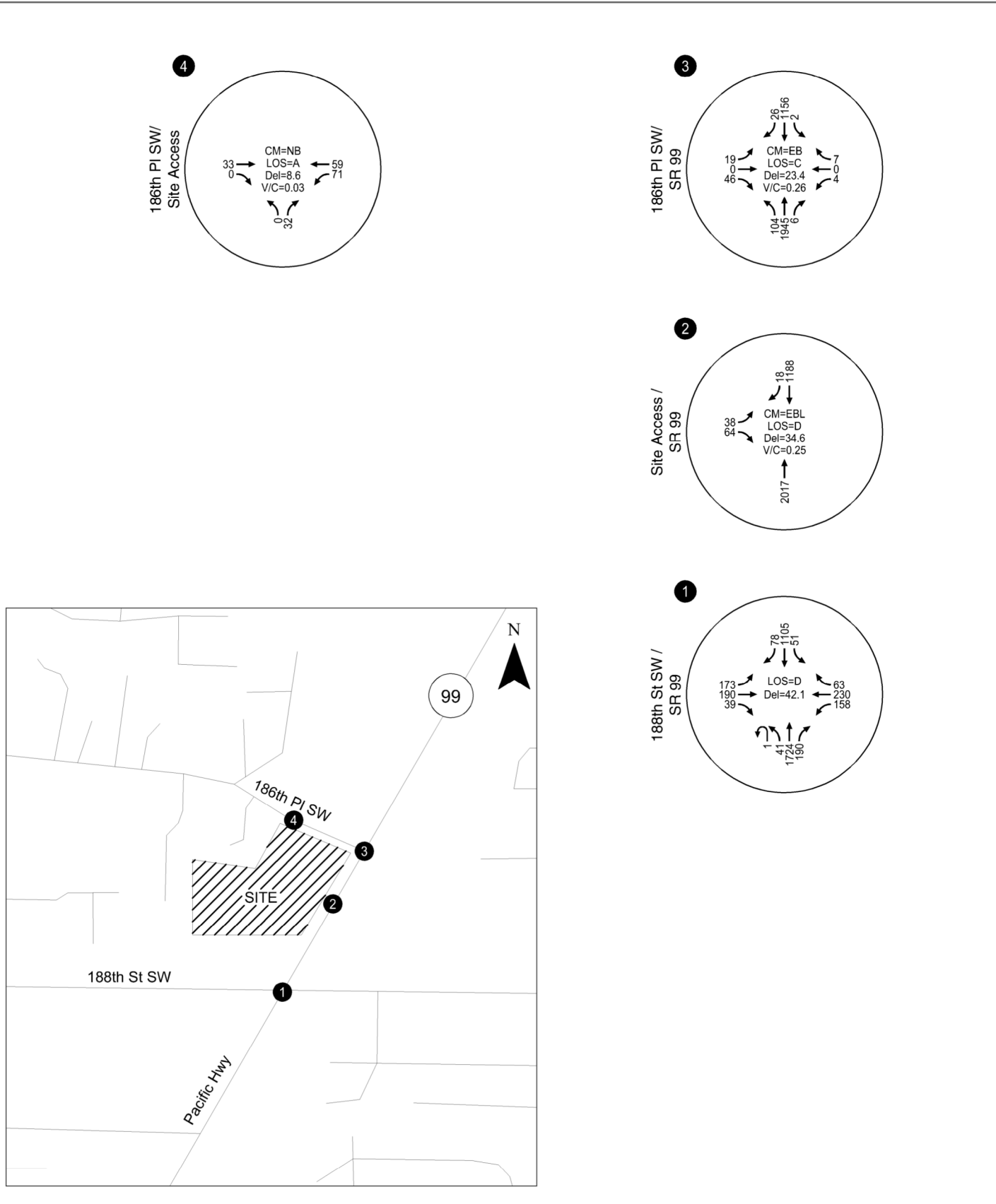
Figure
6

2022 Total Traffic Conditions

The total traffic conditions analysis forecasts how the study area's transportation system will operate with the inclusion of traffic from the proposed dealerships. The estimated site-generated traffic shown in Figure 6 was added to the 2022 background traffic volumes for the weekday PM peak hour shown in Figure 5 to arrive at the 2022 total traffic volumes shown in Figure 7.

As shown in Figure 7, all the study intersections are forecast to continue to meet the operational standards during the weekday PM peak hour.

Appendix "E" contains the year 2022 total traffic analysis worksheets.



Year 2022 Total Traffic Conditions
Weekday PM Peak Hour
Lynnwood, Washington

Figure
7

H:\25125946 - Lynnwood Holman Automotive\figs\25946_figs.dwg Apr 09, 2021 - 7:42am - zbugg Layout Tab: 07 Total

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)
 CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

95th-percentile Queuing Analysis

A 95th-percentile queuing analysis was performed using Synchro at each of the study intersections. Table 5 summarizes the existing and future 95th-percentile queues for each movement during the weekday PM peak hour. Queues are rounded to the nearest vehicle length and assumed to be approximately 25 feet. 95th-percentile queue information is contained in Appendix “B”, Appendix “D”, and Appendix “E”.

Table 5. Summary of 95th-percentile Queues

Intersection	Movement	Queue Storage (ft)	95th-percentile Queue (ft)			Adequate Storage Provided?
			Existing	2022 Background	2022 Total	
			PM	PM	PM	
1: SR 99/ 188 th Street SW	EB L	140	325	325	325	No
	EB T/R	-	300	300	300	Yes
	WB L	160	300	300	300	No
	WB T/R	-	300	500	500	Yes
	NB L	220	100	100	100	Yes
	NB T	-	775	900	950	Yes
	NB R	-	125	125	125	Yes
	SB L	140	100	100	100	Yes
	SB T	-	425	475	500	Yes
2: SR 99/ Site Access	EB L	25*			25	Yes
	EB R	25*			25	Yes
3: SR 99/ 186 th Place SW	EB L/T/R	-	25	25	25	Yes
	WB L/T/R	-	25	25	25	Yes
	NB L	100	25	25	25	Yes
	NB T	-	<25	<25	<25	Yes
	NB R	-	<25	<25	<25	Yes
	SB L	100	<25	<25	<25	Yes
	SB T	-	<25	<25	<25	Yes
4: 186th Place SW/ Site Access	WB L/T	-			25	Yes
	NB L/R	25*			25	Yes

EB=eastbound, WB=westbound, NB=northbound, SB=southbound, L=left, T=through, R=right, L/T/R=shared left/through/right, T/R=shared through/right

*Driveway storage based on project site plan

As shown, all queues are projected to be accommodated within the existing turn lane storage lengths under year 2022 total traffic conditions during the weekday PM peak hour, with the following exceptions:

- The eastbound left-turn queue on 188th Street SW at SR 99 is projected to exceed the painted storage length under year 2022 background and total weekday PM peak hour conditions; however, the estimated queue of 325 feet can be accommodated within the existing two-way left-turn lane.
- The westbound left-turn queue on 188th Street SW at SR 99 is projected to exceed the painted storage length under year 2022 background and total conditions during the weekday PM peak hour; however, the estimated queue of 300 feet can be accommodated within the existing two-way left-turn lane.

Traffic from the proposed development is not forecast to increase the queue lengths over existing conditions. As such, no improvements are recommended to address the queues at the study intersections as a result of the traffic volumes associated with the proposed development.

SR 99 Site Access Sensitivity

The left-out movement proposed at the site access on SR 99 provides significant relief to the eastbound approach to SR 99 from 186th Place SW. While the analysis herein assumes a left-out/right-in/right-out as proposed, a sensitivity analysis was prepared to document the impact of no left-out movement at the site access (right-in/right-out only). Table 6 compares the level of service, delay, v/c ratio, and 95th-percentile queues at the site access on SR 99 and on the eastbound 186th Place SW approach at SR 99 under each access scenario.

Table 6. Access Scenario Comparison

Access Scenario	Eastbound 186 th Pl SW at SR 99			
	LOS	Delay (s)	v/c	95th-percentile Queue (ft)
Right-In/Right Out	E	47	0.57	75
Right-In/Right-Out/Left-Out (as proposed)	C	23	0.26	25

As shown above, the left-out movement as proposed at the site access on SR 99 provides significant improvement of the LOS and queuing at the stop-controlled eastbound approach of SW 186th Place. As such, the site plan as proposed provides the least impact to capacity operations at the study intersections.

TrIF Considerations

As referenced previously in *Trip Generation* (Page 14), local auto dealership sites were observed and trip generation data was collected at the site driveways to develop a trip generation rate that reflects the characteristics of regional traffic patterns at auto dealerships in Lynnwood, Washington. Consistent with City of Lynnwood code section 3.105.070 *Independent Fee Calculations*, the methodology was confirmed with City of Lynnwood traffic engineer. The data collection methodology and resultant trip generation rate are summarized below.

Three sites within Lynnwood were selected based on proximity to state highway facilities, similarity in size to the proposed site, and dealerships that are considered luxury brands similar to the proposed dealerships. The sites were vetted and confirmed with City of Lynnwood engineering staff and are listed below:

- Mercedes-Benz of Lynnwood - 17800 Hwy 99 Lynnwood, WA 98037
- Jaguar Land Rover Dealership Seattle - 19910 Poplar Way Lynnwood, WA 98036
- Lexus of Seattle - 20300 Hwy 99 Lynnwood, WA 98036

Each of the site driveways above were observed during the weekday PM peak period (4:00 – 6:00 PM), and the number of trips in and out of each site were documented during the peak hour within that time period. The gross leasable area (GLA) of each dealership was obtained to calculate the trip generation rate per thousand square feet of GLA. The results are summarized in Table 7 below.

Table 7. Trip Generation Study Summary

Site	Size (SF)	Observed Analysis Period	Peak Hour of Generator	Weekday PM Peak Hour		
				In	Out	Total
Mercedes-Benz of Lynnwood	34,100	4:00 - 6:00 PM	4:45 - 5:45 PM	35	34	69
Lexus of Seattle	33,753	4:00 - 6:00 PM	4:10 - 5:10 PM	20	43	63
Jaguar Land Rover Dealership Seattle	28,968	4:00 - 6:00 PM	4:00 - 5:00 PM	18	19	37

The total trips above were observed during the same period as the COVID-19 pandemic. As such, the same calibration factor is applied to the trip generation data in Table 7. The volumes are increase by 17 percent to arrive at the trip generation rate shown below in Table 8.

Table 8. Calibrated Trip Generation Study Summary

Site	Size (SF)	Observed Total Trips	Calibrated Total Trips (increase by 17%)	Calibrated Trip Generation Rate (Trips/1,000 SF)
Mercedes-Benz of Lynnwood	34,100	69	81	2.38
Lexus of Seattle	33,753	63	74	2.19
Jaguar Land Rover Dealership Seattle	28,968	37	43	1.48
Average Trip Generation Rate				2.02

The calibrated trip generation rate in Table 8 is applied to the proposed development size of 91,578 square feet. The resulting trip generation (and proportional in/out split) thus expected from the proposed development using this rate is summarized in Table 9 below.

Table 9. Proposed Development Resulting Estimated Trips

Site	Size (SF)	Trip Generation Rate (trips/1,000 SF)	Weekday PM Peak Hour		
			Total	In	Out
Proposed Development	91,578	2.02	185	80	105
<i>Less Pass-by (20%)</i>			(37)	(16)	(21)
Total Net New Trips			148	64	84

As summarized in Table 9, application of local data results in a trip generation of approximately 148 trips during the weekday PM peak hour. At the time of building permit application, the trips shown in Table 9 should be considered for applicable TrIF assessments.

The raw trip generation data for each car dealership is included in Appendix "F."

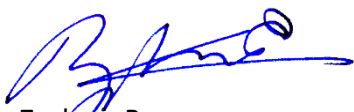
FINDINGS AND RECOMMENDATIONS

Based on the results of this transportation impact analysis, the proposed dealerships can be developed while maintaining acceptable levels of service at the study intersections. The primary recommendations of this study are summarized as follows:

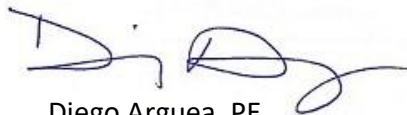
- Provide a full-access driveway on 186th Place SW per the proposed site plan (see page 4, Figure 2).
- Provide a right-in, right-out, left-out driveway on SR 99 per the proposed site plan (see page 4, Figure 2). Construct a raised traffic separator and provide revised lane striping at the site driveway at SR 99 to restrict left-in movements into the site from SR 99. A concept design is provided in Exhibit 1 of this report (see page 13), and additional details are provided with the civil engineering drawings under separate cover.
- At the time of building permit, refer to the localized trip generation information presented in Table 9 of this report. The resultant trip generation is estimated at 148 weekday PM peak hour trips (64 inbound and 84 outbound).
- Landscaping, signage, and above-ground utilities along the site frontage and near the site access should be located and maintained so that adequate sight distance can be provided at the site access driveways on SR 99 and 186th Place SW.

We trust this document adequately addresses the transportation-related impacts of the proposed dealerships. If you have any questions, please contact us at 503-535-7462.

Sincerely,
KITTELSON & ASSOCIATES, INC.



Zachary Bugg
Senior Engineer



Diego Arguea, PE
Associate Engineer



Anthony Yi, PE
Senior Principal Engineer

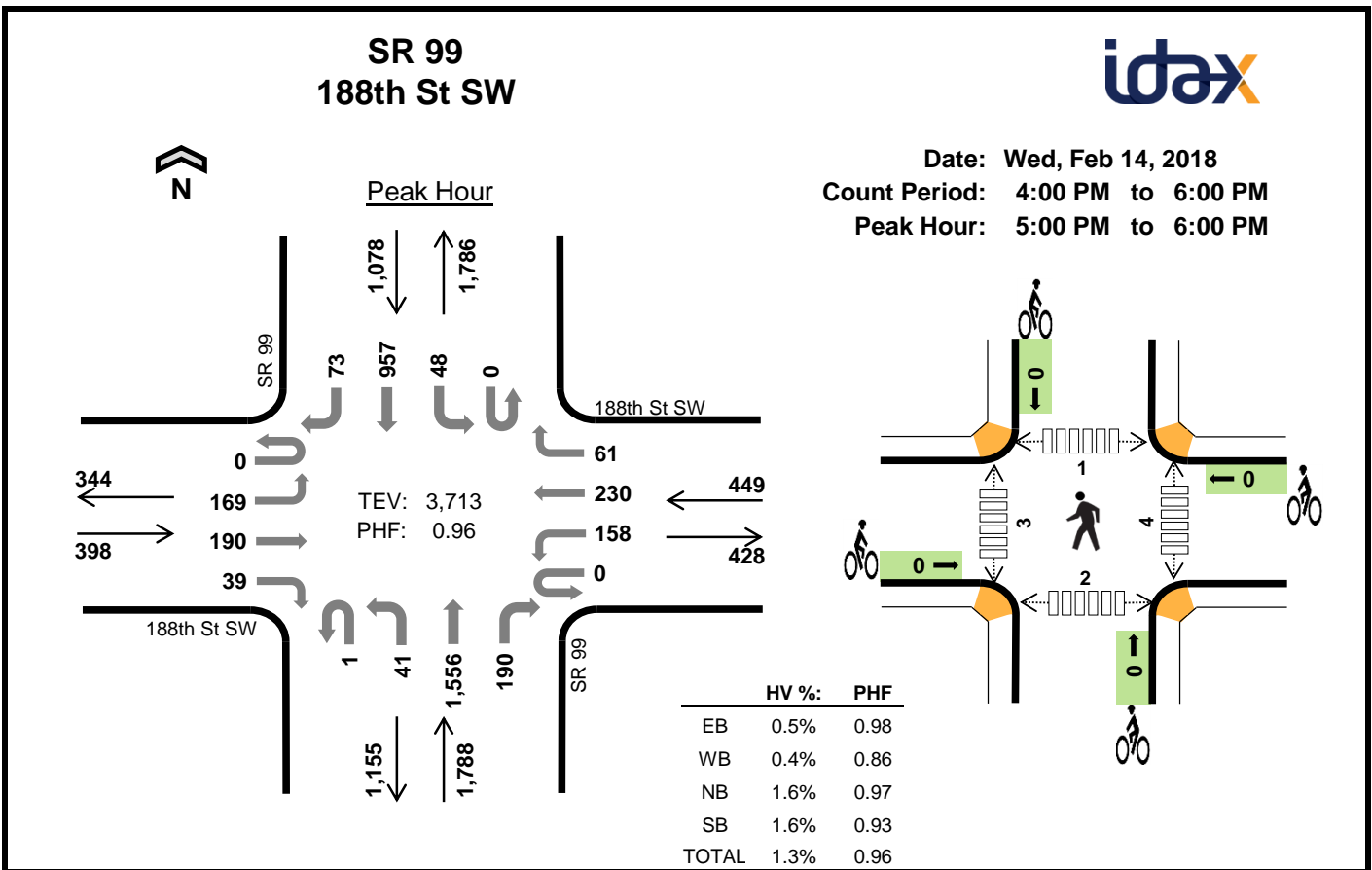
REFERENCES

1. City of Lynnwood, WA. *Lynnwood Comprehensive Plan*. 2015.
2. Washington Department of Transportation. *Level of Service Standards for State Routes*. 2019.
3. Transportation Research Board. *Highway Capacity Manual, 6th Edition*. 2015.
4. Community Transit. *Bus Schedules & Route Map*. 2020.
5. Institute of Transportation Engineers. *Trip Generation: 10th Edition*. 2017.

APPENDIX

- A. Traffic Counts
- B. Existing Conditions Traffic Analysis Worksheets
- C. WSDOT Crash Data
- D. 2022 Background Conditions Traffic Analysis Worksheets
- E. 2022 Total Conditions Traffic Analysis Worksheets
- F. Local Trip Generation Data

Appendix A
Traffic Counts



Two-Hour Count Summaries

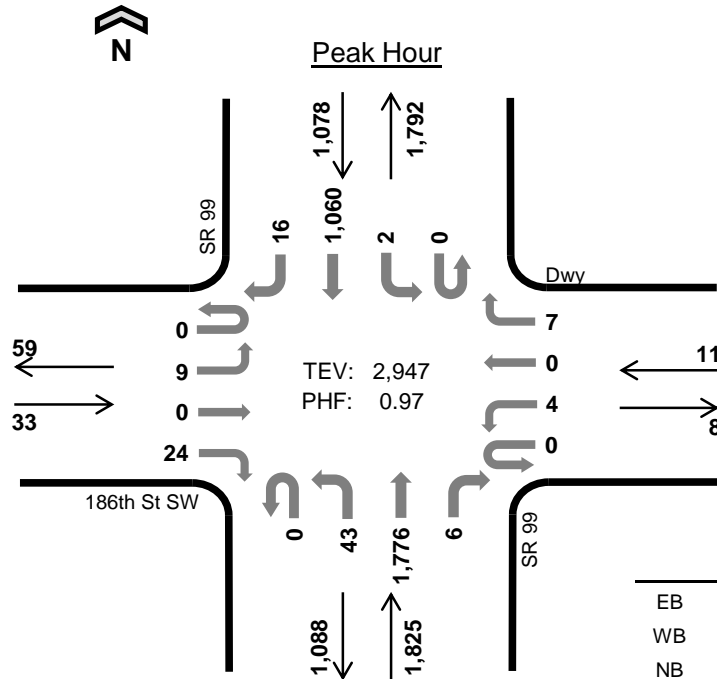
Interval Start	188th St SW Eastbound				188th St SW Westbound				SR 99 Northbound				SR 99 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	43	57	6	0	46	45	16	0	9	377	47	0	9	215	21	891	0
4:15 PM	0	29	51	18	0	40	44	15	0	9	348	46	0	13	238	22	873	0
4:30 PM	0	27	40	1	0	40	56	17	0	13	362	44	0	21	253	23	897	0
4:45 PM	0	36	47	8	0	46	53	18	1	6	362	43	0	11	253	17	901	3,562
5:00 PM	0	44	40	13	0	37	57	18	0	13	366	45	0	8	264	15	920	3,591
5:15 PM	0	50	43	9	0	47	45	17	0	10	408	44	0	9	216	24	922	3,640
5:30 PM	0	38	51	10	0	42	71	18	1	12	380	50	0	21	256	13	963	3,706
5:45 PM	0	37	56	7	0	32	57	8	0	6	402	51	0	10	221	21	908	3,713
Count Total	0	304	385	72	0	330	428	127	2	78	3,005	370	0	102	1,916	156	7,275	0
Peak Hour	0	169	190	39	0	158	230	61	1	41	1,556	190	0	48	957	73	3,713	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	2	7	4	16	0	0	0	0	0	0	2	3	0	5
4:15 PM	2	1	10	9	22	0	0	0	0	0	1	1	1	0	3
4:30 PM	3	0	5	12	20	2	0	0	0	2	1	3	3	3	10
4:45 PM	1	0	4	7	12	1	0	0	0	1	0	1	2	1	4
5:00 PM	1	1	8	4	14	0	0	0	0	0	0	2	1	0	3
5:15 PM	1	0	5	10	16	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	9	1	11	0	0	0	0	0	4	0	0	2	6
5:45 PM	0	0	6	2	8	0	0	0	0	0	0	1	0	0	1
Count Total	11	5	54	49	119	3	0	0	0	3	6	10	10	6	32
Peak Hour	2	2	28	17	49	0	0	0	0	0	4	3	1	2	10

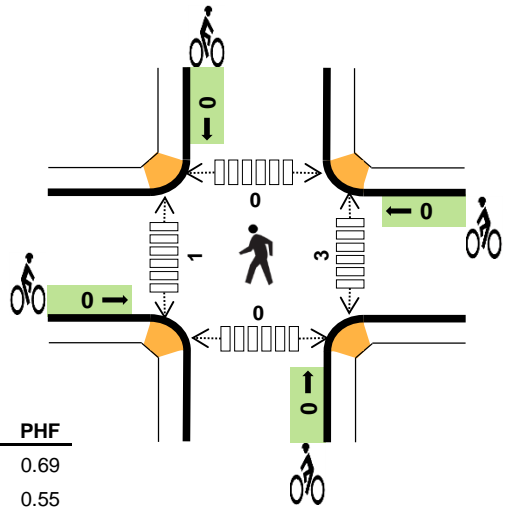


SR 99 186th St SW



Date: Wed, Feb 14, 2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

	HV %:	PHF
EB	0.0%	0.69
WB	0.0%	0.55
NB	1.5%	0.96
SB	1.6%	0.88
TOTAL	1.5%	0.97



Two-Hour Count Summaries

Interval Start	186th St SW				Dwy				SR 99				SR 99				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	4	0	5	0	0	0	0	0	11	441	0	0	0	249	5	715	0
4:15 PM	0	3	0	9	0	0	0	2	0	5	394	4	0	1	268	9	695	0
4:30 PM	0	2	0	6	0	1	0	0	0	13	396	1	0	0	297	3	719	0
4:45 PM	0	6	0	9	0	0	0	2	0	16	386	3	0	2	266	3	693	2,822
5:00 PM	0	2	0	3	0	2	0	3	0	12	436	1	0	0	274	3	736	2,843
5:15 PM	0	2	0	8	0	0	0	0	0	9	462	2	0	0	238	6	727	2,875
5:30 PM	0	1	0	5	0	1	0	0	0	12	434	1	0	0	302	3	759	2,915
5:45 PM	0	4	0	8	0	1	0	4	0	10	444	2	0	2	246	4	725	2,947
Count Total	0	24	0	53	0	5	0	11	0	88	3,393	14	0	5	2,140	36	5,769	0
Peak Hour	0	9	0	24	0	4	0	7	0	43	1,776	6	0	2	1,060	16	2,947	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	5	5	10	0	0	0	0	0	0	2	0	0	2
4:15 PM	0	0	10	8	18	0	0	0	0	0	2	0	0	0	2
4:30 PM	0	0	5	12	17	0	0	0	0	0	1	0	0	0	1
4:45 PM	0	0	4	5	9	0	0	0	0	0	1	3	0	0	4
5:00 PM	0	0	8	4	12	0	0	0	0	0	1	0	0	0	1
5:15 PM	0	0	5	9	14	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	9	2	11	0	0	0	0	0	2	1	0	0	3
5:45 PM	0	0	6	2	8	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	52	47	99	0	0	0	0	0	7	6	0	0	13
Peak Hour	0	0	28	17	45	0	0	0	0	0	3	1	0	0	4

Appendix B
Existing Conditions Traffic
Analysis Worksheets

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

03/01/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	169	190	39	158	230	61	1	41	1618	190	48	995
Future Volume (veh/h)	169	190	39	158	230	61	1	41	1618	190	48	995
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	2136	2121	2121	1611	1597	1597		2027	2027	2027	1817	1817
Adj Flow Rate, veh/h	176	198	0	165	240	54		43	1685	136	50	1036
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	0	1	1		2	2	2	2	2
Cap, veh/h	204	394		185	260	59		57	2065	921	71	1890
Arrive On Green	0.10	0.19	0.00	0.12	0.21	0.21		0.03	0.54	0.54	0.04	0.55
Sat Flow, veh/h	2034	2121	0	1535	1262	284		1931	3852	1718	1731	3453
Grp Volume(v), veh/h	176	198	0	165	0	294		43	1685	136	50	1036
Grp Sat Flow(s),veh/h/ln	2034	2121	0	1535	0	1545		1931	1926	1718	1731	1726
Q Serve(g_s), s	12.8	12.6	0.0	15.9	0.0	28.0		3.3	54.1	6.0	4.3	29.1
Cycle Q Clear(g_c), s	12.8	12.6	0.0	15.9	0.0	28.0		3.3	54.1	6.0	4.3	29.1
Prop In Lane	1.00		0.00	1.00		0.18		1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	204	394		185	0	319		57	2065	921	71	1890
V/C Ratio(X)	0.86	0.50		0.89	0.00	0.92		0.75	0.82	0.15	0.71	0.55
Avail Cap(c_a), veh/h	285	438		266	0	371		270	2065	921	242	1890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.5	54.9	0.0	65.0	0.0	58.3		72.2	28.7	17.5	71.0	22.0
Incr Delay (d2), s/veh	17.6	1.0	0.0	22.0	0.0	26.4		7.1	3.7	0.3	4.8	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.2	11.2	0.0	11.8	0.0	19.3		3.1	32.8	4.5	3.5	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.1	55.9	0.0	86.9	0.0	84.8		79.4	32.4	17.9	75.8	23.1
LnGrp LOS	F	E		F	A	F		E	C	B	E	C
Approach Vol, veh/h		374	A		459				1864			1100
Approach Delay, s/veh		69.2			85.5				32.4			25.4
Approach LOS		E			F				C			C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	85.9	22.1	31.8	8.5	87.6	19.0	34.9				
Change Period (Y+Rc), s	4.0	5.5	4.0	4.0	4.0	5.5	4.0	4.0				
Max Green Setting (Gmax), s	21.0	54.5	26.0	31.0	21.0	54.5	21.0	36.0				
Max Q Clear Time (g_c+I1), s	6.3	56.1	17.9	14.6	5.3	31.1	14.8	30.0				
Green Ext Time (p_c), s	0.0	0.0	0.3	0.9	0.0	10.1	0.2	1.0				

Intersection Summary

HCM 6th Ctrl Delay	40.4
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

03/01/2021



Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	73
Future Volume (veh/h)	73
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1817
Adj Flow Rate, veh/h	14
Peak Hour Factor	0.96
Percent Heavy Veh, %	2
Cap, veh/h	843
Arrive On Green	0.55
Sat Flow, veh/h	1540
Grp Volume(v), veh/h	14
Grp Sat Flow(s),veh/h/ln	1540
Q Serve(g_s), s	0.6
Cycle Q Clear(g_c), s	0.6
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	843
V/C Ratio(X)	0.02
Avail Cap(c_a), veh/h	843
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	15.5
Incr Delay (d2), s/veh	0.0
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(95%),veh/ln	0.4
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	15.5
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 6th TWSC
 3: SR 99 & 186th PI SW/18601 Pacific Hwy

03/01/2021

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↗↗	↗	↗	↗↗	↗
Traffic Vol, veh/h	9	0	24	4	0	7	43	1847	6	2	1102	16
Future Vol, veh/h	9	0	24	4	0	7	43	1847	6	2	1102	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	0	100	-	0
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	-6	-	-	0	-	-	-2	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	9	0	25	4	0	7	44	1904	6	2	1136	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2180	3138	568	2564	3148	952	1152	0	0	1910	0	0
Stage 1	1140	1140	-	1992	1992	-	-	-	-	-	-	-
Stage 2	1040	1998	-	572	1156	-	-	-	-	-	-	-
Critical Hdwy	6.3	5.3	6.3	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	55	32	518	13	11	264	614	-	-	315	-	-
Stage 1	318	407	-	64	107	-	-	-	-	-	-	-
Stage 2	354	206	-	477	273	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	50	30	518	12	10	264	614	-	-	315	-	-
Mov Cap-2 Maneuver	162	129	-	49	67	-	-	-	-	-	-	-
Stage 1	295	405	-	59	99	-	-	-	-	-	-	-
Stage 2	320	191	-	451	271	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.4		44.7		0.3		0	
HCM LOS	C		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	614	-	-	324	102	315	-
HCM Lane V/C Ratio	0.072	-	-	0.105	0.111	0.007	-
HCM Control Delay (s)	11.3	-	-	17.4	44.7	16.5	-
HCM Lane LOS	B	-	-	C	E	C	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.4	0	-

Appendix C
WSDOT Crash Data

Appendix D
2022 Background Traffic
Conditions Traffic Analysis
Worksheets

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

03/01/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	169	190	39	158	230	61	1	41	1683	190	48	1035
Future Volume (veh/h)	169	190	39	158	230	61	1	41	1683	190	48	1035
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	2136	2121	2121	1611	1597	1597		2027	2027	2027	1817	1817
Adj Flow Rate, veh/h	176	198	0	165	240	54		43	1753	136	50	1078
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	0	1	1		2	2	2	2	2
Cap, veh/h	204	394		185	260	59		57	2065	921	71	1890
Arrive On Green	0.10	0.19	0.00	0.12	0.21	0.21		0.03	0.54	0.54	0.04	0.55
Sat Flow, veh/h	2034	2121	0	1535	1262	284		1931	3852	1718	1731	3453
Grp Volume(v), veh/h	176	198	0	165	0	294		43	1753	136	50	1078
Grp Sat Flow(s),veh/h/ln	2034	2121	0	1535	0	1545		1931	1926	1718	1731	1726
Q Serve(g_s), s	12.8	12.6	0.0	15.9	0.0	28.0		3.3	58.1	6.0	4.3	30.8
Cycle Q Clear(g_c), s	12.8	12.6	0.0	15.9	0.0	28.0		3.3	58.1	6.0	4.3	30.8
Prop In Lane	1.00		0.00	1.00		0.18		1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	204	394		185	0	319		57	2065	921	71	1890
V/C Ratio(X)	0.86	0.50		0.89	0.00	0.92		0.75	0.85	0.15	0.71	0.57
Avail Cap(c_a), veh/h	285	438		266	0	371		270	2065	921	242	1890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.5	54.9	0.0	65.0	0.0	58.3		72.2	29.6	17.5	71.0	22.3
Incr Delay (d2), s/veh	17.6	1.0	0.0	22.0	0.0	26.4		7.1	4.6	0.3	4.8	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.2	11.2	0.0	11.8	0.0	19.3		3.1	35.1	4.5	3.5	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.1	55.9	0.0	86.9	0.0	84.8		79.4	34.2	17.9	75.8	23.6
LnGrp LOS	F	E		F	A	F		E	C	B	E	C
Approach Vol, veh/h		374	A		459				1932			1142
Approach Delay, s/veh		69.2			85.5				34.1			25.8
Approach LOS		E			F				C			C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	85.9	22.1	31.8	8.5	87.6	19.0	34.9				
Change Period (Y+Rc), s	4.0	5.5	4.0	4.0	4.0	5.5	4.0	4.0				
Max Green Setting (Gmax), s	21.0	54.5	26.0	31.0	21.0	54.5	21.0	36.0				
Max Q Clear Time (g_c+I1), s	6.3	60.1	17.9	14.6	5.3	32.8	14.8	30.0				
Green Ext Time (p_c), s	0.0	0.0	0.3	0.9	0.0	10.1	0.2	1.0				

Intersection Summary

HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

03/01/2021



Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	73
Future Volume (veh/h)	73
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1817
Adj Flow Rate, veh/h	14
Peak Hour Factor	0.96
Percent Heavy Veh, %	2
Cap, veh/h	843
Arrive On Green	0.55
Sat Flow, veh/h	1540
Grp Volume(v), veh/h	14
Grp Sat Flow(s),veh/h/ln	1540
Q Serve(g_s), s	0.6
Cycle Q Clear(g_c), s	0.6
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	843
V/C Ratio(X)	0.02
Avail Cap(c_a), veh/h	843
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	15.5
Incr Delay (d2), s/veh	0.0
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(95%),veh/ln	0.4
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	15.5
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 6th TWSC
 3: SR 99 & 186th PI SW/18601 Pacific Hwy

03/01/2021

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↑↑	↗	↗	↑↑	↗
Traffic Vol, veh/h	9	0	24	4	0	7	43	1921	6	2	1146	16
Future Vol, veh/h	9	0	24	4	0	7	43	1921	6	2	1146	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	0	100	-	0
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	-6	-	-	0	-	-	-2	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	9	0	25	4	0	7	44	1980	6	2	1181	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2263	3259	591	2663	3269	990	1197	0	0	1986	0	0
Stage 1	1185	1185	-	2068	2068	-	-	-	-	-	-	-
Stage 2	1078	2074	-	595	1201	-	-	-	-	-	-	-
Critical Hdwy	6.3	5.3	6.3	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	49	28	502	11	9	249	590	-	-	294	-	-
Stage 1	303	393	-	57	98	-	-	-	-	-	-	-
Stage 2	340	193	-	463	260	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	45	26	502	10	8	249	590	-	-	294	-	-
Mov Cap-2 Maneuver	154	121	-	44	61	-	-	-	-	-	-	-
Stage 1	280	390	-	53	91	-	-	-	-	-	-	-
Stage 2	306	179	-	437	258	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18	49.6	0.3	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	590	-	-	311	92	294	-
HCM Lane V/C Ratio	0.075	-	-	0.109	0.123	0.007	-
HCM Control Delay (s)	11.6	-	-	18	49.6	17.3	-
HCM Lane LOS	B	-	-	C	E	C	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	0.4	0	-

Appendix E
2022 Total Traffic Conditions
Traffic Analysis Worksheets

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

04/09/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	173	190	39	158	230	63	1	41	1724	190	51	1105
Future Volume (veh/h)	173	190	39	158	230	63	1	41	1724	190	51	1105
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	2136	2121	2121	1611	1597	1597		2027	2027	2027	1817	1817
Adj Flow Rate, veh/h	180	198	0	165	240	56		43	1796	136	53	1151
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	0	1	1		2	2	2	2	2
Cap, veh/h	207	400		185	260	61		57	2050	914	72	1878
Arrive On Green	0.10	0.19	0.00	0.12	0.21	0.21		0.03	0.53	0.53	0.04	0.54
Sat Flow, veh/h	2034	2121	0	1535	1252	292		1931	3852	1718	1731	3453
Grp Volume(v), veh/h	180	198	0	165	0	296		43	1796	136	53	1151
Grp Sat Flow(s),veh/h/ln	2034	2121	0	1535	0	1544		1931	1926	1718	1731	1726
Q Serve(g_s), s	13.1	12.5	0.0	15.9	0.0	28.2		3.3	61.3	6.0	4.5	34.2
Cycle Q Clear(g_c), s	13.1	12.5	0.0	15.9	0.0	28.2		3.3	61.3	6.0	4.5	34.2
Prop In Lane	1.00		0.00	1.00		0.19		1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	207	400		185	0	321		57	2050	914	72	1878
V/C Ratio(X)	0.87	0.49		0.89	0.00	0.92		0.75	0.88	0.15	0.74	0.61
Avail Cap(c_a), veh/h	285	438		266	0	371		270	2050	914	242	1878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.4	54.4	0.0	65.0	0.0	58.3		72.2	30.8	17.8	71.1	23.4
Incr Delay (d2), s/veh	18.4	0.9	0.0	22.0	0.0	26.7		7.1	5.6	0.3	5.4	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.5	11.1	0.0	11.8	0.0	19.4		3.1	37.1	4.6	3.8	19.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.7	55.4	0.0	86.9	0.0	85.0		79.4	36.4	18.2	76.5	24.9
LnGrp LOS	F	E		F	A	F		E	D	B	E	C
Approach Vol, veh/h		378	A		461			1975				1223
Approach Delay, s/veh		69.4			85.7			36.1				27.0
Approach LOS		E			F			D				C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	85.3	22.1	32.3	8.5	87.1	19.3	35.1				
Change Period (Y+Rc), s	4.0	5.5	4.0	4.0	4.0	5.5	4.0	4.0				
Max Green Setting (Gmax), s	21.0	54.5	26.0	31.0	21.0	54.5	21.0	36.0				
Max Q Clear Time (g_c+I1), s	6.5	63.3	17.9	14.5	5.3	36.2	15.1	30.2				
Green Ext Time (p_c), s	0.0	0.0	0.3	0.9	0.0	9.8	0.2	1.0				

Intersection Summary

HCM 6th Ctrl Delay	42.1
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

04/09/2021



Movement	SBR
Lane Configurations	7
Traffic Volume (veh/h)	78
Future Volume (veh/h)	78
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1817
Adj Flow Rate, veh/h	19
Peak Hour Factor	0.96
Percent Heavy Veh, %	2
Cap, veh/h	838
Arrive On Green	0.54
Sat Flow, veh/h	1540
Grp Volume(v), veh/h	19
Grp Sat Flow(s),veh/h/ln	1540
Q Serve(g_s), s	0.9
Cycle Q Clear(g_c), s	0.9
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	838
V/C Ratio(X)	0.02
Avail Cap(c_a), veh/h	838
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	15.8
Incr Delay (d2), s/veh	0.0
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(95%),veh/ln	0.6
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	15.8
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗		↑↑↑	↑↑	↗
Traffic Vol, veh/h	38	64	0	2017	1188	18
Future Vol, veh/h	38	64	0	2017	1188	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	30	0	-	-	-	0
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	-2	3	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	2	2	0
Mvmt Flow	39	66	0	2079	1225	19

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2057	613	-	0	-	0
Stage 1	1225	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Critical Hdwy	6.25	6.9	-	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.65	3.3	-	-	-	-
Pot Cap-1 Maneuver	66	440	0	-	-	-
Stage 1	239	-	0	-	-	-
Stage 2	365	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	66	440	-	-	-	-
Mov Cap-2 Maneuver	160	-	-	-	-	-
Stage 1	239	-	-	-	-	-
Stage 2	365	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	160	440	-	-
HCM Lane V/C Ratio	-	0.245	0.15	-	-
HCM Control Delay (s)	-	34.6	14.6	-	-
HCM Lane LOS	-	D	B	-	-
HCM 95th %tile Q(veh)	-	0.9	0.5	-	-

HCM 6th TWSC
3: SR 99 & 186th PI SW/18601 Pacific Hwy

04/09/2021

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↗	↗	↗	↗	↗
Traffic Vol, veh/h	19	0	46	4	0	7	104	1945	6	2	1156	26
Future Vol, veh/h	19	0	46	4	0	7	104	1945	6	2	1156	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	0	100	-	0
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	-6	-	-	0	-	-	-2	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	20	0	47	4	0	7	107	2005	6	2	1192	27

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2413	3421	596	2819	3442	1003	1219	0	0	2011	0	0
Stage 1	1196	1196	-	2219	2219	-	-	-	-	-	-	-
Stage 2	1217	2225	-	600	1223	-	-	-	-	-	-	-
Critical Hdwy	6.3	5.3	6.3	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	39	23	499	8	7	244	579	-	-	288	-	-
Stage 1	299	390	-	46	82	-	-	-	-	-	-	-
Stage 2	292	170	-	459	254	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	32	19	499	6	6	244	579	-	-	288	-	-
Mov Cap-2 Maneuver	122	99	-	31	44	-	-	-	-	-	-	-
Stage 1	244	387	-	37	67	-	-	-	-	-	-	-
Stage 2	231	139	-	412	252	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.4		66.1		0.6		0	
HCM LOS	C		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	579	-	-	262	70	288	-
HCM Lane V/C Ratio	0.185	-	-	0.256	0.162	0.007	-
HCM Control Delay (s)	12.6	-	-	23.4	66.1	17.6	-
HCM Lane LOS	B	-	-	C	F	C	-
HCM 95th %tile Q(veh)	0.7	-	-	1	0.5	0	-

HCM 6th TWSC
4: Site Access & 186th PI SW

04/09/2021

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	33	0	71	59	0	32
Future Vol, veh/h	33	0	71	59	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-6	-	-	6	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	34	0	73	61	0	33

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	34	0	241
Stage 1	-	-	-	-	34
Stage 2	-	-	-	-	207
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1591	-	752
Stage 1	-	-	-	-	994
Stage 2	-	-	-	-	832
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1591	-	717
Mov Cap-2 Maneuver	-	-	-	-	717
Stage 1	-	-	-	-	994
Stage 2	-	-	-	-	793

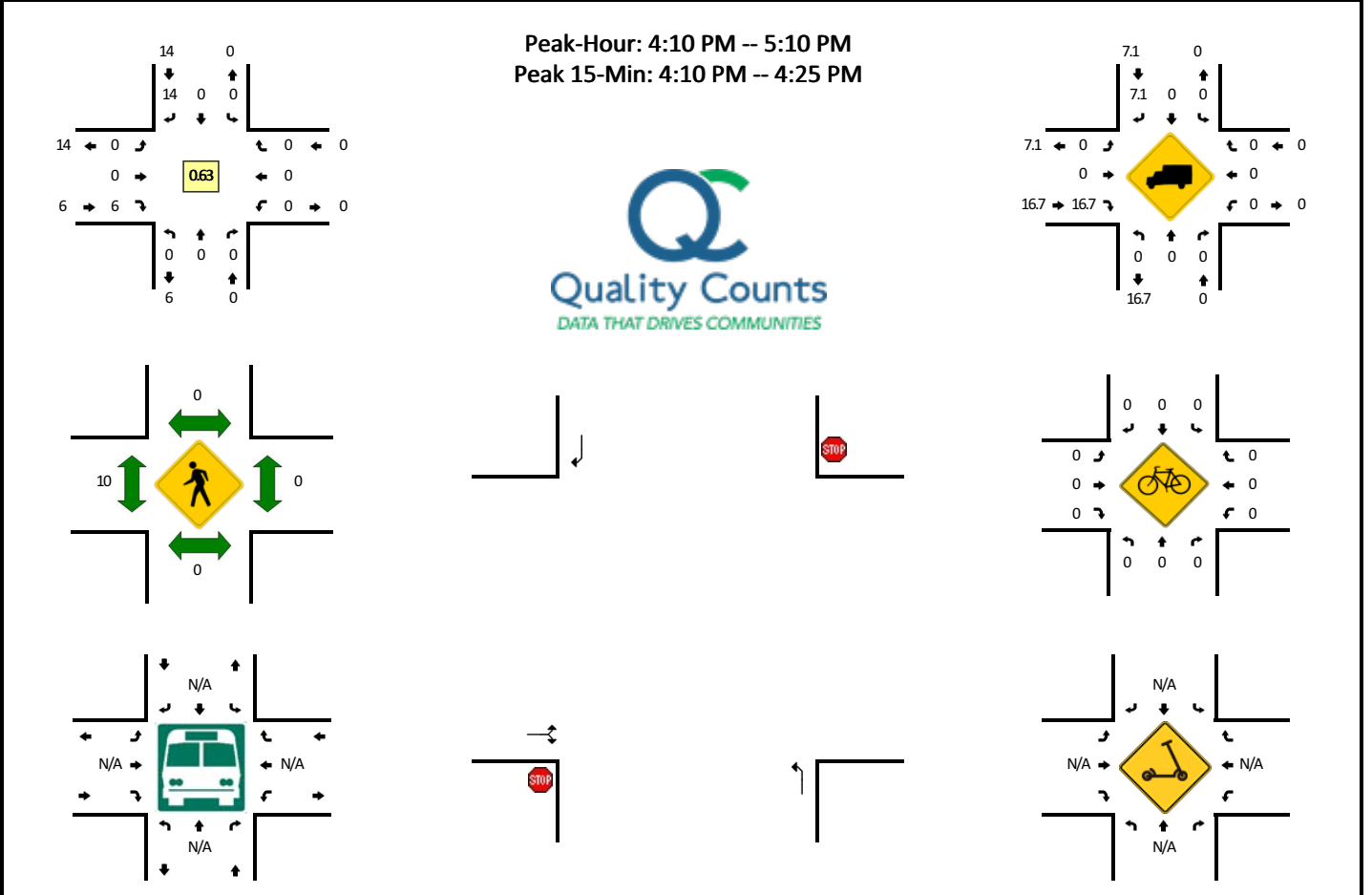
Approach	EB	WB	NB
HCM Control Delay, s	0	4	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1045	-	-	1591	-
HCM Lane V/C Ratio	0.032	-	-	0.046	-
HCM Control Delay (s)	8.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Appendix F
Local Trip Generation Data

LOCATION: Pacific Hwy -- Mercedes Benz North Dwy
CITY/STATE: Lynnwood, WA

QC JOB #: 15343901
DATE: Wed, Mar 3 2021

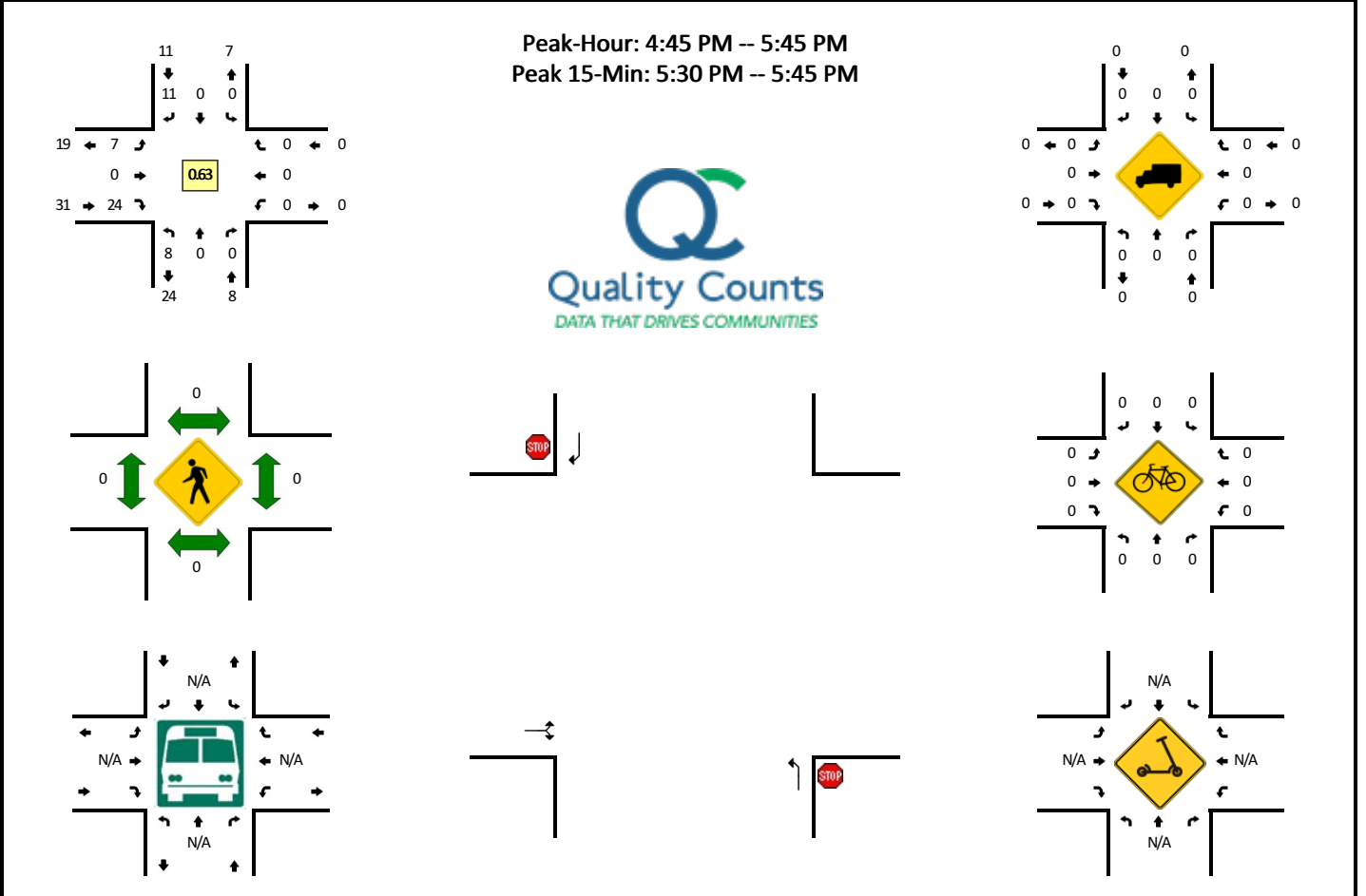


5-Min Count Period Beginning At	Pacific Hwy (Northbound)				Pacific Hwy (Southbound)				Mercedes Benz North Dwy (Eastbound)				Mercedes Benz North Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	3	
4:15 PM	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	4	
4:20 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:50 PM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	
4:55 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	18
5:00 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	19
5:05 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	20
5:10 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	18
5:15 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	17
5:20 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	18
5:25 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	18
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
5:40 PM	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	4	19
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
5:50 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	18
5:55 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	18
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	16	0	0	0	16	0	0	0	0	0	32	
Heavy Trucks	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	8	
Buses																		
Pedestrians		0				0				16				0			16	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Pacific Hwy -- Mercedes Benz South Dwy
CITY/STATE: Lynnwood, WA

QC JOB #: 15343902
DATE: Wed, Mar 3 2021

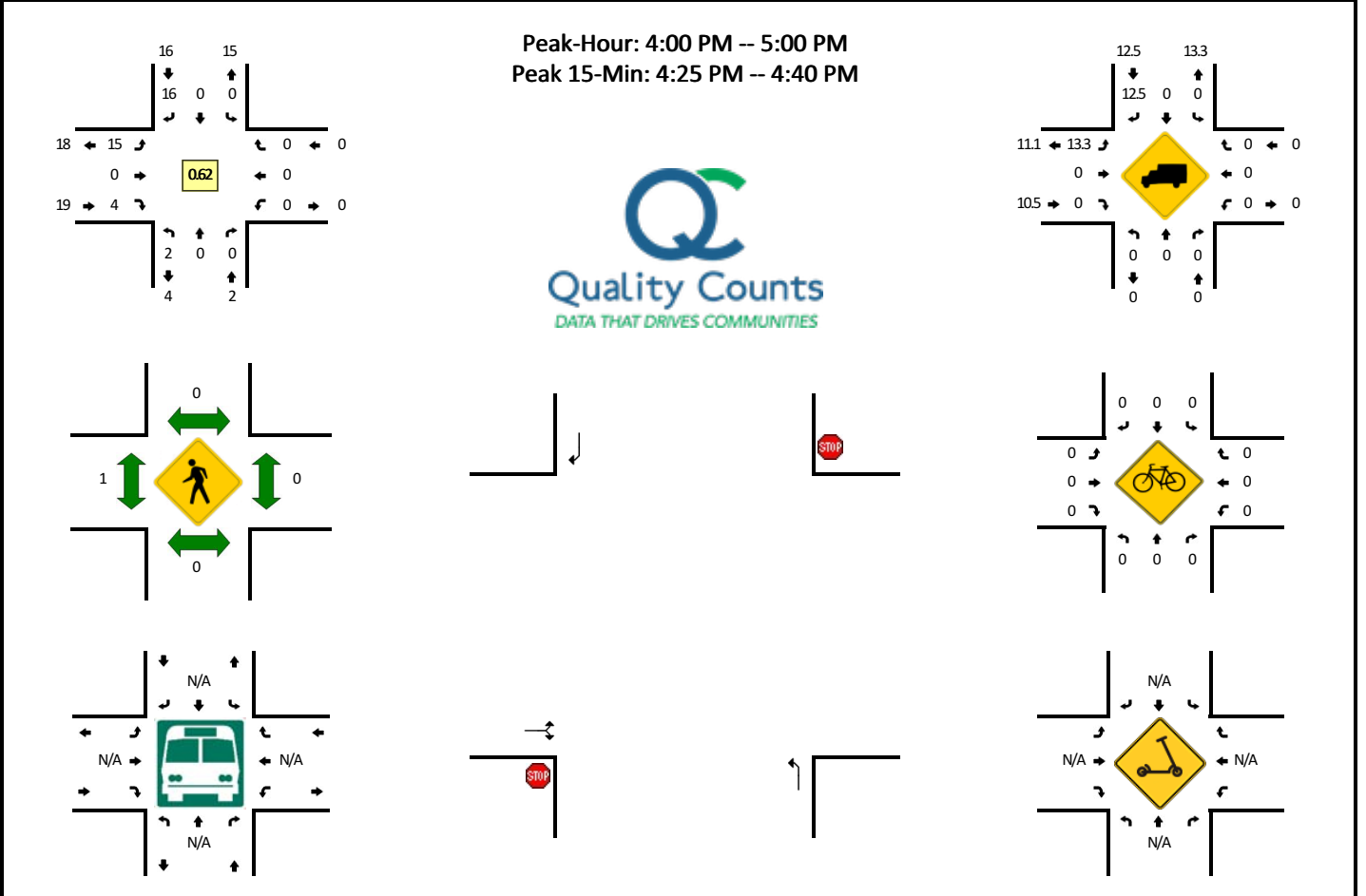


5-Min Count Period Beginning At	Pacific Hwy (Northbound)				Pacific Hwy (Southbound)				Mercedes Benz South Dwy (Eastbound)				Mercedes Benz South Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:05 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
4:20 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	
4:25 PM	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	
4:30 PM	4	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	
4:35 PM	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	
4:50 PM	0	0	0	0	0	0	1	0	1	0	4	0	0	0	0	0	6	
4:55 PM	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	
5:00 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	
5:05 PM	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3	
5:10 PM	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	
5:15 PM	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	
5:20 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
5:25 PM	1	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	4	
5:30 PM	0	0	0	0	0	0	3	0	2	0	4	0	0	0	0	0	9	
5:35 PM	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	4	
5:40 PM	1	0	0	0	0	0	3	0	2	0	1	0	0	0	0	0	7	
5:45 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	
5:50 PM	1	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	6	
5:55 PM	1	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	4	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	0	0	0	0	0	36	0	16	0	24	0	0	0	0	0	80	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Poplar Way -- Jaguar Land Rover Dwy
CITY/STATE: Lynnwood, WA

QC JOB #: 15343903
DATE: Wed, Mar 3 2021

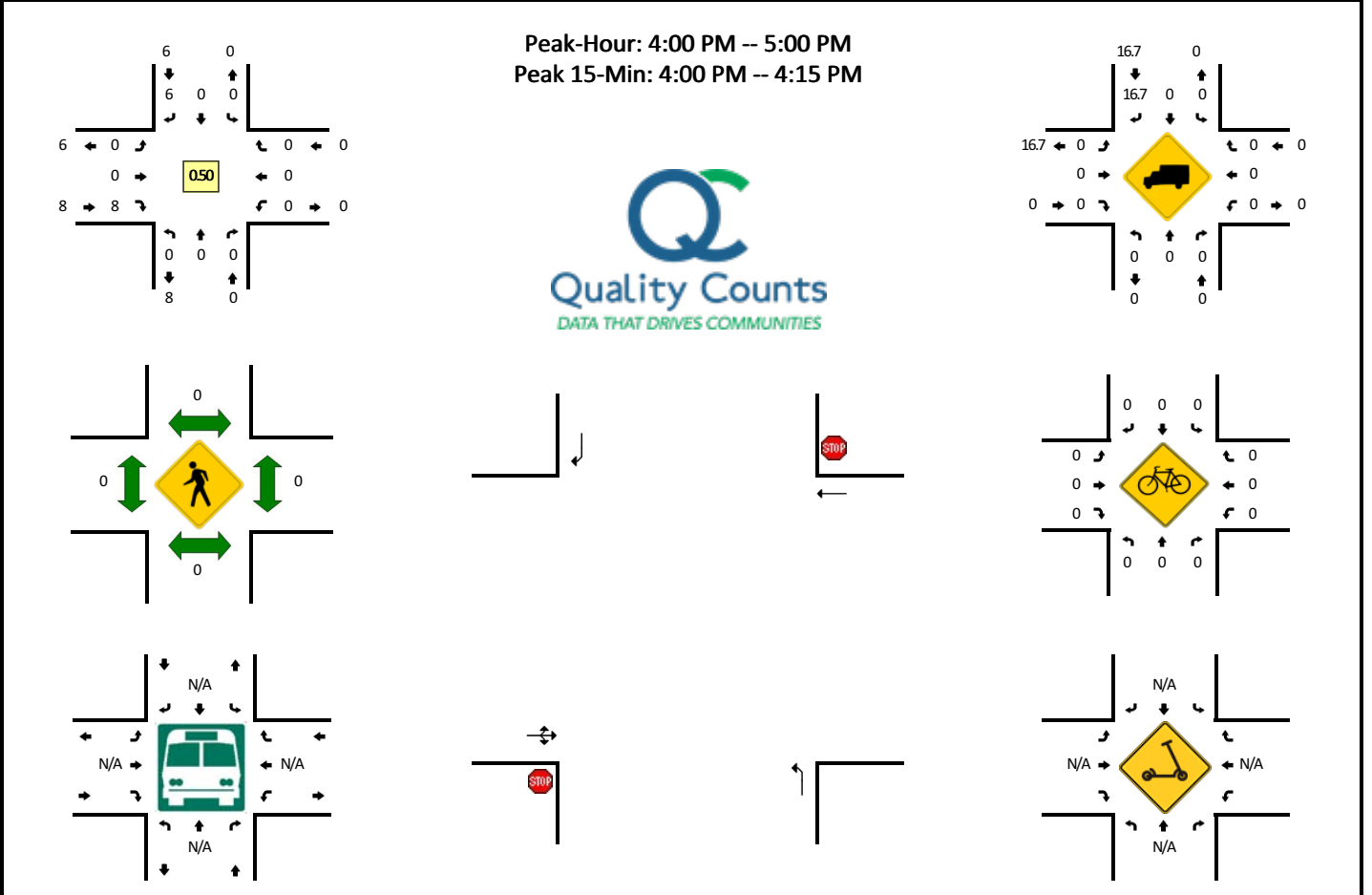


5-Min Count Period Beginning At	Poplar Way (Northbound)				Poplar Way (Southbound)				Jaguar Land Rover Dwy (Eastbound)				Jaguar Land Rover Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	1	0	3	0	1	0	0	0	0	0	5	
4:05 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
4:10 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:20 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	
4:25 PM	1	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	4	
4:30 PM	0	0	0	0	0	0	2	0	3	0	2	0	0	0	0	0	7	
4:35 PM	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4	
4:40 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	
4:45 PM	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3	
4:50 PM	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	4	
4:55 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	37
5:00 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	34
5:05 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	34
5:10 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	34
5:15 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	35
5:20 PM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3	36
5:25 PM	1	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0	5	37
5:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	32
5:35 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	29
5:40 PM	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3	30
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
5:50 PM	1	0	0	0	0	0	4	0	0	0	3	0	0	0	0	0	8	31
5:55 PM	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4	33
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	0	0	0	0	0	24	0	24	0	8	0	0	0	0	0	60	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0				0				4				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Pacific Hwy -- Lexus Dwy
CITY/STATE: Lynnwood, WA

QC JOB #: 15343904
DATE: Wed, Mar 3 2021

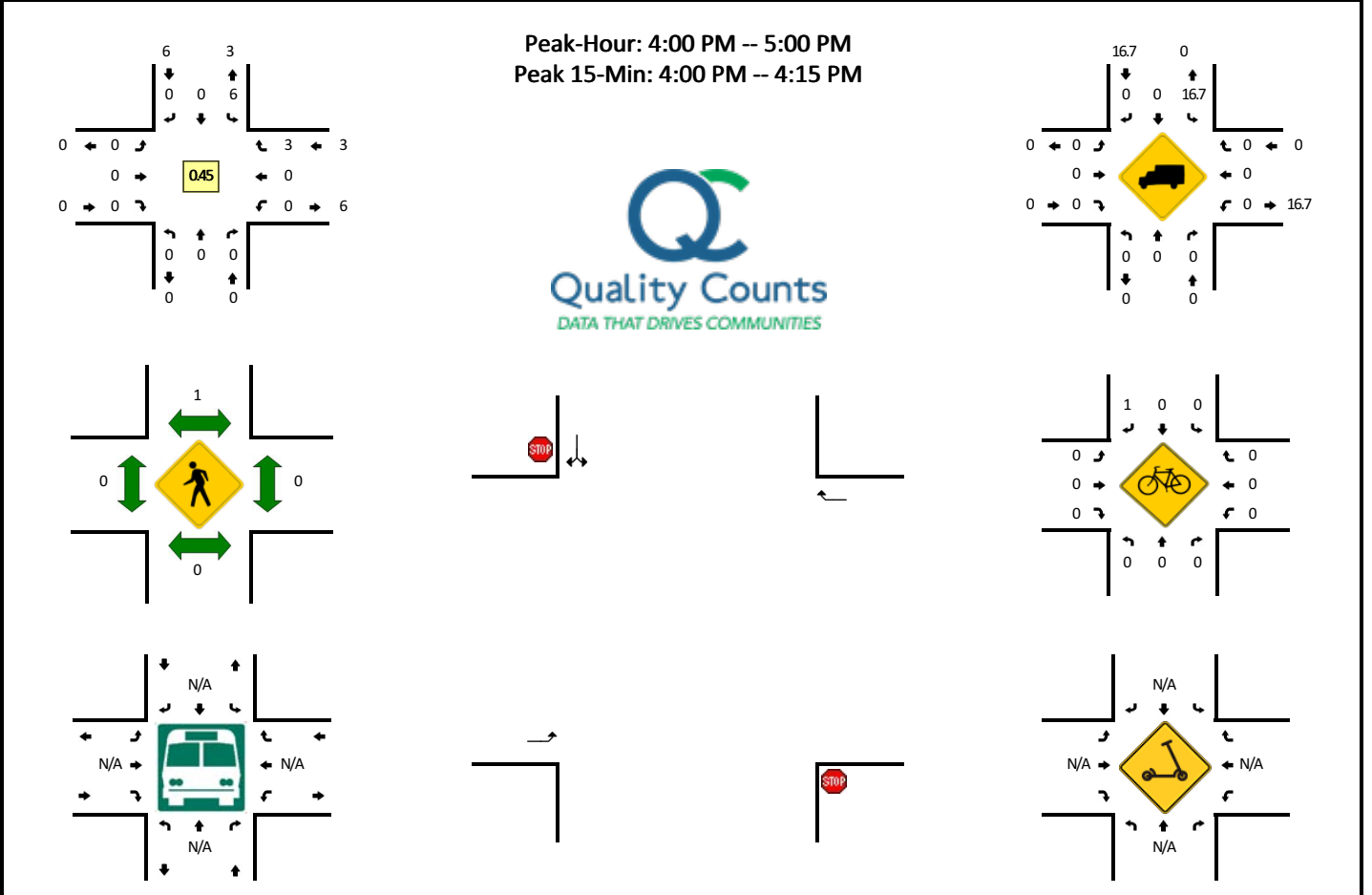


5-Min Count Period Beginning At	Pacific Hwy (Northbound)				Pacific Hwy (Southbound)				Lexus Dwy (Eastbound)				Lexus Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	4	
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:20 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:35 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
5:05 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	13
5:10 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	10
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:25 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	7
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	5
5:50 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	9
5:55 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	10
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	12	0	0	0	16	0	0	0	0	0	28	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																	0	
Pedestrians		0			0				0				0				0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

LOCATION: Lexus Dwy -- 204th St SW
CITY/STATE: Lynnwood, WA

QC JOB #: 15343905
DATE: Wed, Mar 3 2021

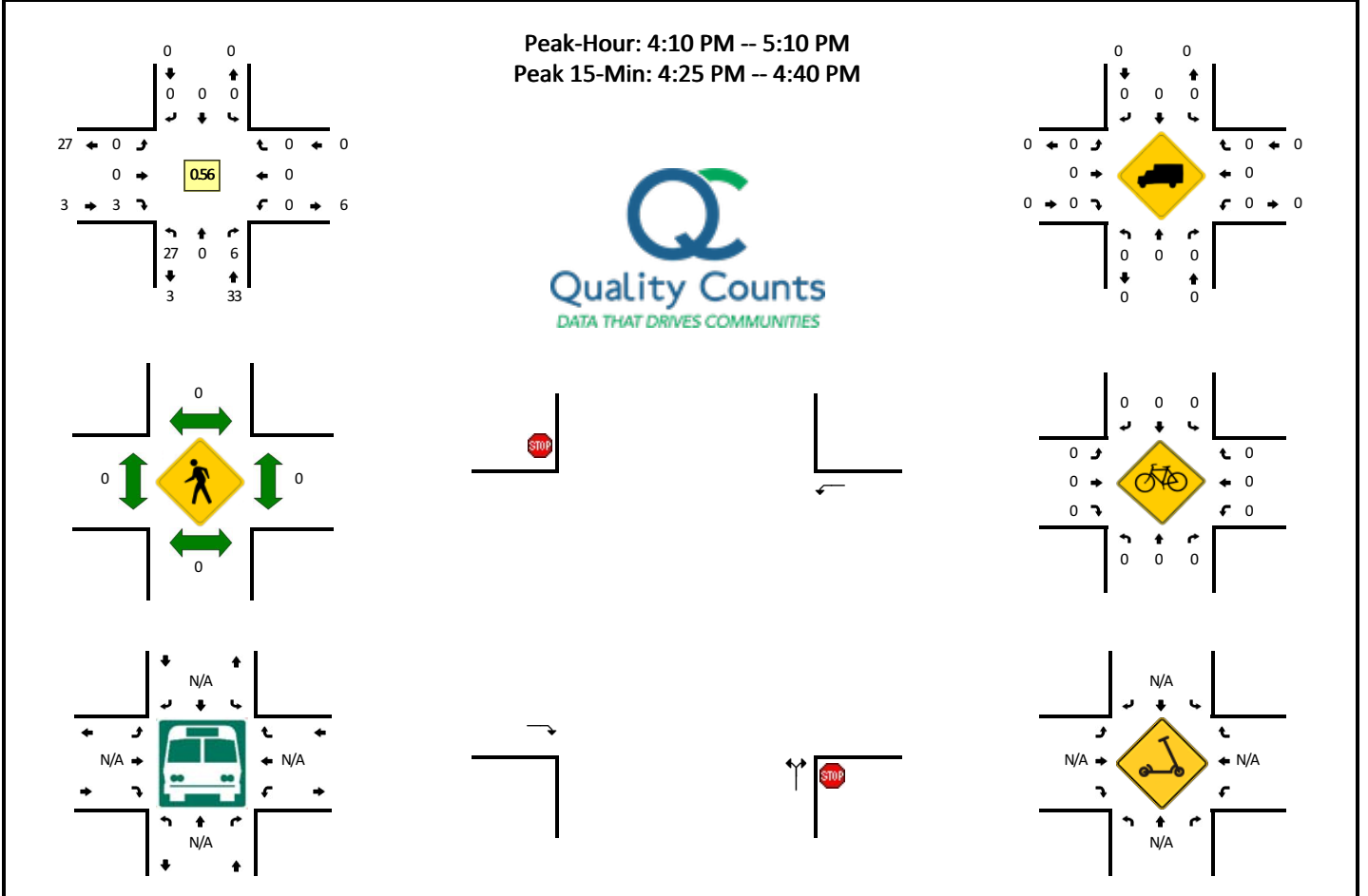


5-Min Count Period Beginning At	Lexus Dwy (Northbound)				Lexus Dwy (Southbound)				204th St SW (Eastbound)				204th St SW (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
4:05 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	3	
4:10 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4:20 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	9
5:05 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	7
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	16	0	0	0	0	0	0	0	0	0	4	0	20	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0			0				0				0				0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: East Lexus Dwy -- 202nd St SW
CITY/STATE: Lynnwood, WA

QC JOB #: 15343906
DATE: Wed, Mar 3 2021

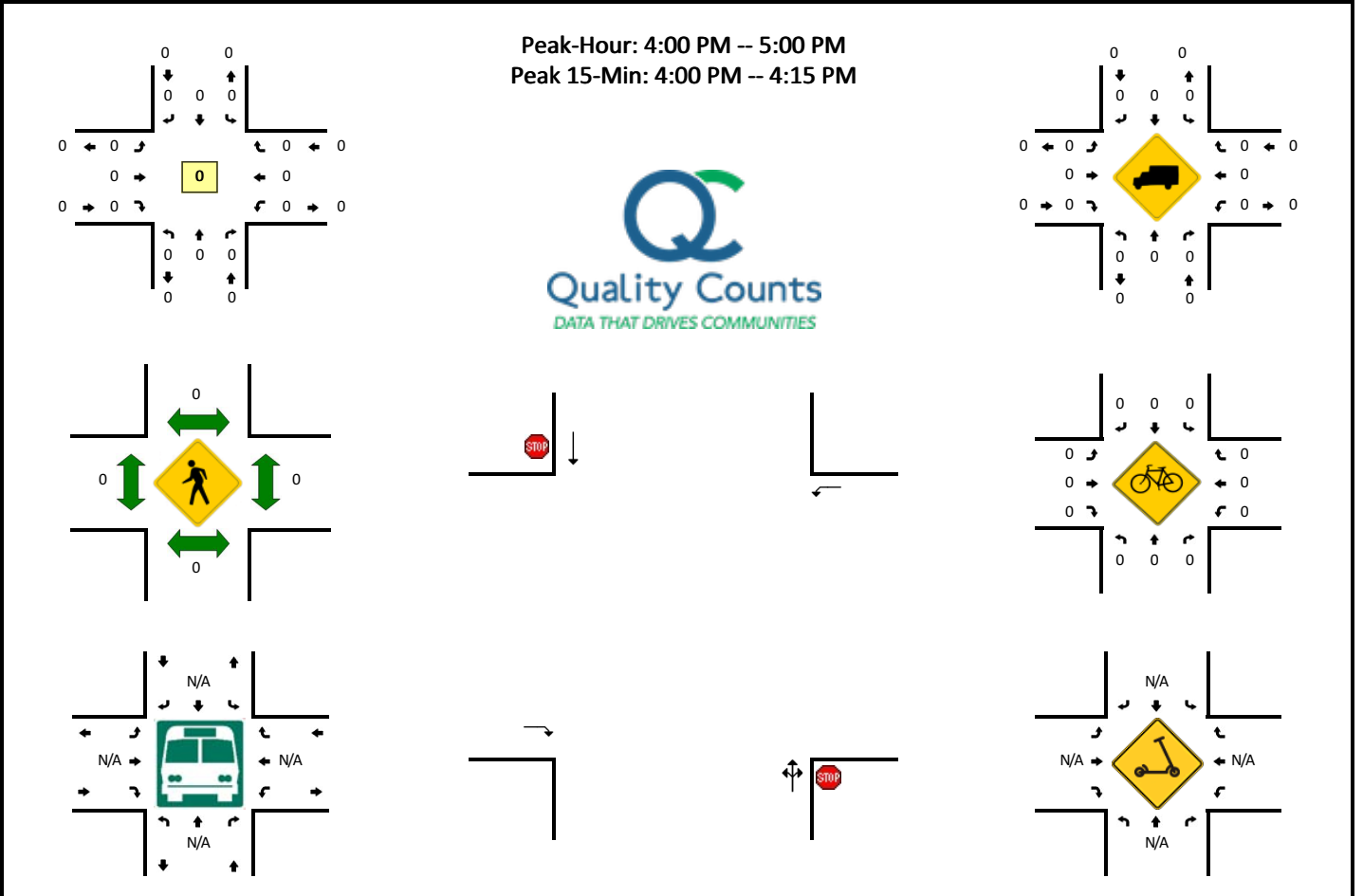


5-Min Count Period Beginning At	East Lexus Dwy (Northbound)				East Lexus Dwy (Southbound)				202nd St SW (Eastbound)				202nd St SW (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:15 PM	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
4:25 PM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
4:30 PM	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
4:35 PM	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
4:40 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:45 PM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
4:50 PM	1	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	4	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32
5:05 PM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	36
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
5:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	31
5:20 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	32
5:25 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	30
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
5:35 PM	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	3	20
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	16
5:50 PM	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	15
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	16
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	52	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	64	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: West Lexus Dwy -- 202nd St SW
CITY/STATE: Lynnwood, WA

QC JOB #: 15343907
DATE: Wed, Mar 3 2021



5-Min Count Period Beginning At	West Lexus Dwy (Northbound)				West Lexus Dwy (Southbound)				202nd St SW (Eastbound)				202nd St SW (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

Appendix B

Revised 2022 Total Traffic Conditions Traffic Analysis Worksheets

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

01/26/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	195	193	72	158	232	62	1	94	1687	190	49	1100
Future Volume (veh/h)	195	193	72	158	232	62	1	94	1687	190	49	1100
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	2136	2121	2136	1611	1597	1611		2027	2027	2027	1817	1817
Adj Flow Rate, veh/h	203	201	0	165	242	55		98	1757	136	51	1146
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0		2	2	2	2	2
Cap, veh/h	230	425		185	262	60		121	2007	895	71	1724
Arrive On Green	0.11	0.20	0.00	0.12	0.21	0.21		0.06	0.52	0.52	0.04	0.50
Sat Flow, veh/h	2034	2121	0	1535	1259	286		1931	3852	1718	1731	3453
Grp Volume(v), veh/h	203	201	0	165	0	297		98	1757	136	51	1146
Grp Sat Flow(s),veh/h/ln	2034	2121	0	1535	0	1545		1931	1926	1718	1731	1726
Q Serve(g_s), s	14.7	12.6	0.0	15.9	0.0	28.3		7.5	60.3	6.2	4.4	37.3
Cycle Q Clear(g_c), s	14.7	12.6	0.0	15.9	0.0	28.3		7.5	60.3	6.2	4.4	37.3
Prop In Lane	1.00		0.00	1.00		0.19		1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	230	425		185	0	322		121	2007	895	71	1724
V/C Ratio(X)	0.88	0.47		0.89	0.00	0.92		0.81	0.88	0.15	0.72	0.66
Avail Cap(c_a), veh/h	285	438		266	0	371		270	2007	895	242	1724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.5	53.0	0.0	65.0	0.0	58.2		69.4	31.6	18.7	71.1	28.1
Incr Delay (d2), s/veh	22.7	0.8	0.0	22.0	0.0	26.8		4.7	5.7	0.4	5.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.1	11.1	0.0	11.8	0.0	19.5		6.9	36.8	0.2	3.6	21.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.2	53.8	0.0	86.9	0.0	85.0		74.1	37.3	19.0	76.0	30.2
LnGrp LOS	F	D		F	A	F		E	D	B	E	C
Approach Vol, veh/h		404	A		462				1991			1215
Approach Delay, s/veh		71.1			85.7				37.9			31.9
Approach LOS		E			F				D			C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	83.7	22.1	34.1	13.4	80.4	21.0	35.2				
Change Period (Y+Rc), s	4.0	5.5	4.0	4.0	4.0	5.5	4.0	4.0				
Max Green Setting (Gmax), s	21.0	54.5	26.0	31.0	21.0	54.5	21.0	36.0				
Max Q Clear Time (g_c+I1), s	6.4	62.3	17.9	14.6	9.5	39.3	16.7	30.3				
Green Ext Time (p_c), s	0.0	0.0	0.3	0.9	0.1	8.7	0.2	1.0				

Intersection Summary

HCM 6th Ctrl Delay	44.8
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

1: SR 99 & 188th St SW

01/26/2023



Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	77
Future Volume (veh/h)	77
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1817
Adj Flow Rate, veh/h	18
Peak Hour Factor	0.96
Percent Heavy Veh, %	2
Cap, veh/h	769
Arrive On Green	0.50
Sat Flow, veh/h	1540
Grp Volume(v), veh/h	18
Grp Sat Flow(s),veh/h/ln	1540
Q Serve(g_s), s	0.9
Cycle Q Clear(g_c), s	0.9
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	769
V/C Ratio(X)	0.02
Avail Cap(c_a), veh/h	769
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	19.0
Incr Delay (d2), s/veh	0.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(95%),veh/ln	0.6
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	19.1
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 6th TWSC
2: SR 99 & Site Access

01/26/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗		↑↑↑	↑↑	↗
Traffic Vol, veh/h	33	69	0	2001	1175	32
Future Vol, veh/h	33	69	0	2001	1175	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	30	0	-	-	-	0
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	-2	3	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	2	2	0
Mvmt Flow	34	71	0	2063	1211	33

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2036	606	-	0	-	0
Stage 1	1211	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Critical Hdwy	6.25	6.9	-	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.65	3.3	-	-	-	-
Pot Cap-1 Maneuver	68	445	0	-	-	-
Stage 1	243	-	0	-	-	-
Stage 2	368	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	68	445	-	-	-	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	243	-	-	-	-	-
Stage 2	368	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	163	445	-	-
HCM Lane V/C Ratio	-	0.209	0.16	-	-
HCM Control Delay (s)	-	32.8	14.6	-	-
HCM Lane LOS	-	D	B	-	-
HCM 95th %tile Q(veh)	-	0.8	0.6	-	-

HCM 6th TWSC
 3: SR 99 & 186th PI SW/18601 Pacific Hwy

01/26/2023

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↗	↗	↗	↗	↗
Traffic Vol, veh/h	20	0	34	4	0	7	70	1958	6	2	1169	21
Future Vol, veh/h	20	0	34	4	0	7	70	1958	6	2	1169	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	0	100	-	0
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	-6	-	-	0	-	-	-2	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	21	0	35	4	0	7	72	2019	6	2	1205	22

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	2363	3378	603	2770	3394	1010	1227	0	0	2025	0	0
Stage 1	1209	1209	-	2163	2163	-	-	-	-	-	-	-
Stage 2	1154	2169	-	607	1231	-	-	-	-	-	-	-
Critical Hdwy	6.3	5.3	6.3	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.3	4.3	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	42	24	494	9	8	241	575	-	-	284	-	-
Stage 1	295	386	-	50	87	-	-	-	-	-	-	-
Stage 2	313	179	-	455	252	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	37	21	494	8	7	241	575	-	-	284	-	-
Mov Cap-2 Maneuver	136	108	-	37	51	-	-	-	-	-	-	-
Stage 1	258	383	-	44	76	-	-	-	-	-	-	-
Stage 2	266	157	-	420	250	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.5		57.3		0.4		0	
HCM LOS	C		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	575	-	-	250	80	284	-
HCM Lane V/C Ratio	0.126	-	-	0.223	0.142	0.007	-
HCM Control Delay (s)	12.2	-	-	23.5	57.3	17.8	-
HCM Lane LOS	B	-	-	C	F	C	-
HCM 95th %tile Q(veh)	0.4	-	-	0.8	0.5	0	-

HCM 6th TWSC
4: Site Access & 186th PI SW

01/26/2023

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	33	0	32	59	0	21
Future Vol, veh/h	33	0	32	59	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-6	-	-	6	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	34	0	33	61	0	22
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	34	0	161	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	127	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1591	-	835	1045
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1591	-	817	1045
Mov Cap-2 Maneuver	-	-	-	-	817	-
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	885	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	2.6	8.5			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1045	-	-	1591	-	
HCM Lane V/C Ratio	0.021	-	-	0.021	-	
HCM Control Delay (s)	8.5	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	